CORRECTIVE MEASURES IMPLEMENTATION REPORT

FORMER KOP-FLEX FACILITY

EMERSUB 16 LLC

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CERTIFICATION

I certify that the information contained in or accompanying this Corrective Measures Implementation (CMI) Report is true, accurate, and complete.

As to any portion of this CMI Report for which I cannot personally verify accuracy, I certify under penalty of law that this 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

1 INTRODUCTION

1.1 GENERAL

WSP USA Inc. (WSP) has prepared this Corrective Measures Implementation (CMI) Report to describe the activities conducted for the soil and groundwater remediation at the Former Kop-Flex Facility Site (Site) located in Hanover, Maryland. The Site is identified as Brownfield Master Inventory number MD0286 as assigned by the Maryland Department of the Environment (MDE) Land Restoration Program. WSP is submitting this report on behalf of EMERSUB 16 LLC, a subsidiary of Emerson Electric Co., in accordance with the requirement specified in Section VI.B.1.b of the Resource Conservation and Recovery Act (RCRA) Administrative Order on Consent (Docket No. RCRA-03-2016-0170 CA) between EMERSUB 16 and the U.S. Environmental Protection Agency (USEPA), Region III (Consent Order).

Overall, the corrective measures implemented at the Site fulfill the requirements specified in Section VI of the Consent Order. This section of the Consent Order references the activities described in the Response Action Plan (RAP) Revision 2.0, October 2015 (WSP 2015a) and subsequent addenda, which were reviewed and approved by MDE. The corrective measures involve the implementation of systems to address risks associated with the presence of chlorinated volatile organic compounds (VOCs) and 1,4-dioxane in the vadose zone soil, and the surficial (unconfined) and confined water-bearing zones on the Former Kop-Flex Facility property. The selected remedy for the affected portions of the aquifer comprised the installation and operation of a groundwater extraction and treatment system (System) to provide both hydraulic containment and recovery of dissolved VOCs migrating in the groundwater.

1.2 SITE DESCRIPTION AND HISTORY

The Site is located at 7555 and 7565 Harmans Road in Hanover, Anne Arundel County, Maryland (Figure 1). The Site occupies a total area of approximately 25 acres and is bordered to the north by a Verizon Communications maintenance facility; to the south and east by the Williams-Scotsman facility and to the west by undeveloped land along Stony Run, a tributary of the Patapsco River. Stony Run flows northward and eventually discharges into the Patapsco River, which is located 7 miles from the site. In addition to this stream, several small pond areas have been identified and mapped near the Site.

The facility was constructed on previously undeveloped land in 1969 by the Koppers Company. In 1986, an employee group purchased the company from Koppers and formed Kop-Flex, Inc. (Kop-Flex). In 1996, Emerson Electric acquired Kop-Flex. Kop-Flex formerly manufactured flexible couplings for the mechanical power transmission industry, which included universal joints, gear spindles, forgings, and power transmission components. A former forge building on the property produced precision forging of metal parts and included heat treatment and nitriding capabilities. The facility also provided a repair and maintenance program for the components.

Manufacturing operations at the facility ceased in late 2012. After shutting down production activities, all equipment and machine lines were decommissioned and removed from the facility. In December 2014, Emerson transferred the property to EMERSUB 16 LLC during the sale of this business unit and in preparation for the future transfer of the property to a third party for redevelopment. The property was eventually sold to TC Harmans Road LLC, a corporate entity established by Trammell Crow that would comprise the owner of the redeveloped property. At present, Harmans Road Associates LLC is the designated owner of the newly developed commercial property.

During 2016 and early 2017, the property was repurposed for commercial use. The development of the property involved the demolition of the existing manufacturing buildings and construction of two (north and south) warehouse buildings separated by a truck loading dock area. A site plan of the newly developed commercial property is shown in Figure 2.

1.3 ENVIRONMENTAL SETTING

1.3.1 GEOLOGY

The former Kop-Flex site lies within the Atlantic Coastal Plain physiographic province. In Anne Arundel County, Maryland, this province is characterized by alternating layers of predominately Cretaceous-age sand and clay sediments that range in thickness from a few tens of feet along the northwestern boundary with Howard County to as much as 2,500 feet in southeastern Anne Arundel County. Based on regional hydrogeologic cross-sections for these sedimentary deposits, the inter-layered sequence of sand and clay units dips gently to both the south and east from the northern part of the county.

Evaluation of borehole lithologic data obtained from field investigations indicates the coastal plain deposits at the site comprise a complexly inter-bedded sequence of predominately coarse-grained (sand with gravel and fines) and fine-grained (silt and clay) units. The deposits in the uppermost 45 feet to 60 feet are characterized by zones of coarse-grained (sand to clayey sand) and fine-grained (silty to sandy clay to clayey to sandy silt) sediments exhibiting variable thickness and noticeable lateral and vertical heterogeneity. These inter-bedded and inter-fingering coarse and fine-grained units are underlain by a layer of hard, dense silty clay to clayey silt sediments. This fine-grained unit varies in thickness from less than 10 feet in the northern and western portions of the Site to a very thick (approximately 65 feet) sequence in the southern-most portion of the Site. A review of the boring logs indicates this fine-grained layer is ubiquitous within the stratigraphic sequence.

The deeper deposits consist primarily of sand and gravelly sand with occasional discontinuous layers of inter-mixed clay and silt sediments of variable thickness. Based on correlation of the lithologic data, the top of this unit occurs at depths ranging from approximately 50 feet below ground surface (bgs) in the northwest portion of the site to approximately 100 feet bgs near the southeastern corner of the property. Evaluation of the lithologic data indicates the gravelly sand deposits are more spatially extensive than similar lithofacies in the shallow (<60 feet) subsurface.

1.3.2 HYDROGEOLOGY

The stratified deposits comprising the Atlantic Coastal Plain from Virginia to New Jersey form an inter-layered sequence of aquifers and confining beds. In Anne Arundel County, the upper-most water-bearing unit is typically represented by an unconfined surficial aquifer of variable thickness within alluvial and terrace deposits. The surficial aquifer is underlain by several confined aquifers that include the Patuxent, Lower and Upper Patapsco, and Magothy. These aquifers may be unconfined over their outcrop areas, although locally less permeable materials may exist at the surface. Downdip (southeast) of the outcrop and subcrop areas, the aquifers become confined, although the confining units may thin and be regionally discontinuous.

The predominately coarse-grained sediments comprising the stratigraphic sequence represent the primary zones for groundwater flow at the site. The deposits overlying the hard silt and clay layer at the Site constitute a shallow, or "surficial", aquifer within the hydrogeologic system. Deeper sand deposits are inferred to comprise the confined portion of the Lower Patapsco aquifer. The hard silt and clay deposits of approximately 45 feet in the north to 60+ feet in the south form an aquitard that hydraulically separates the unconfined and confined portions of the Lower Patapsco aquifer. In the southern-most portion of the site, these fine-grained, low permeability deposits are believed to represent the Patapsco Confining Unit.

For the surficial aquifer, groundwater typically occurs under an unconfined condition. Given the presence of appreciable clayey deposits in the shallow subsurface in some areas, groundwater within the sand lenses and layers may locally occur under a partially, or semi-, confined condition within this hydrogeologic unit. The groundwater surface is encountered at depths ranging from 15 feet to 18 feet near the eastern site boundary to less than 10 feet in areas to the north and west of the building. Groundwater flow within the surficial aquifer is in a generally west to northwest direction toward Stony Run (Figure 3). The consistency in the west to northwest gradient over the entire thickness of the surficial aquifer indicates good hydraulic communication between the transmissive sand intervals within this hydrogeologic unit.

Groundwater in the confined portion of the Lower Patapsco aquifer occurs at depths ranging from approximately 30 feet bgs in the northwest portion of the site to 45 feet bgs along the southern site boundary in wells screened within this hydrogeologic unit Based on contouring of water level data from site monitoring wells, the direction of groundwater flow in the confined Lower Patapsco aquifer is to the south-southeast (Figure 4), which is consistent with published studies of the Coastal Plain Aquifer System in Anne Arundel County, Maryland. In the southern portion of the site, the significant head differences in monitoring wells completed at depths of less than and greater than 60 feet bgs indicate that the hard silt and clay deposits serve as a good confining layer, or aquitard, between the unconfined and confined portions of the Lower Patapsco aquifer. However, spatial variations in the lithology and thickness of the sediments comprising the aquitard and associated sedimentary structures within the fine-grained deposits may provide mechanisms for downward leakage of groundwater.

1.4 SUMMARY OF SOIL AND GROUNDWATER CONTAMINATION

1.4.1 SOIL

SOUTHWEST PORTION OF FORMER MANUFACTURING BUILDING (AOC 1)

Soil sampling conducted during the initial site investigation activities detected the presence of chlorinated VOCs and petroleum hydrocarbons in the unsaturated (vadose) zone beneath a former machining area in the southwest portion of the former manufacturing building (Area of Concern [AOC] 1) on the property. Based on these findings, a dual-phase extraction (DPE) system was installed and operated to recover chlorinated VOC mass present in the vadose zone soils.

During late 2012 and early 2013, supplemental sampling activities were performed to gather updated soil quality data and assess the effectiveness of the DPE system. Although the DPE system had been successful in recovering contaminant mass, the sampling results indicate the continued presence of elevated VOC concentrations in the subsurface. Given these findings, additional source area removal activities were conducted in late 2013 and early 2014 to further reduce VOC mass in the unsaturated soil and reduce the potential for constituent migration. The remedial activities involved the excavation of VOC-containing soils to a depth of 15 feet below the building floor in two rectangular areas, the locations of which are provided in Figure 5. The excavated soil was characterized and either transported offsite for disposal (total VOC concentrations greater than 1 milligram per kilogram [mg/kg]) or reused as backfill in the excavations (total VOC concentrations less than 1 mg/kg).

The remaining (unexcavated) vadose zone soil in AOC 1 contains residual levels of site-related VOCs. Unsaturated material to a depth of less than 10 feet below grade (including the recently excavated areas) has total VOC concentrations of less than 3 mg/kg. Slightly higher VOC levels may locally exist in the unexcavated areas.

OUTSIDE AREA NEAR EAST-CENTRAL PORTION OF FORMER MANUFACTURING BUILDING (AOC 2)

Soil and shallow groundwater sampling activities were conducted in the area east of the former manufacturing building between 2006 and 2008, and again in 2012, to further characterize the extent of highly impacted, VOC-containing soil material in this portion of the site. The soil sampling results indicated the presence of VOC-affected soil at depths of greater than 8 feet bgs in the area, and the observed presence of solvent-derived dense non-aqueous phase liquid (DNAPL) at one location immediately adjacent to the east building wall of the former building. In addition, concentrations of 1,1,1-trichloroethane (TCA) indicative of DNAPL were detected in shallow groundwater samples beginning at approximately 8 to 10 feet bgs near the former building wall and extending vertically and laterally from this area to the east and west.

Based on evaluation of the sampling data, source area soil removal was conducted in late 2013 to reduce VOC mass in the unsaturated and saturated soils in the area and reduce the potential for chemical of concern (COC) migration. The removal activities involved the excavation of VOC-impacted soils to depths ranging from 18 feet to 23 feet bgs (Figure 5). The management, characterization, and final disposition of the excavated soil material were similar to the procedures described for the AOC 1 excavation activities.

The remaining vadose zone soils to a depth of 8 feet bgs have non-detect to very low VOC concentrations. Based on the sampling data, soils with 1,1,1-TCA concentrations above 10 mg/kg are locally present at depths below 8 feet outside of the excavation areas. Given the depth to groundwater is typically less than 13 feet bgs in this portion of the site, the majority of the remaining VOC mass appears to be present in the upper-most portion of the saturated zone.

1.4.2 GROUNDWATER

SURFICIAL AQUIFER

For the Surficial aquifer, the VOCs of concern are 1,1,1-TCA and its degradation products (e.g., 1,1-dichloroethene [DCE] and 1,1-dichloroethane [DCA]), chlorinated ethenes such as trichloroethene (TCE) and tetrachloroethene (PCE), and 1,4-dioxane. The highest VOC levels in shallow groundwater are found in the eastern portion of the site, and decrease in the direction of groundwater flow. VOCs associated with AOC 2 have migrated westward (downgradient) and commingled with VOCs associated with the AOC 1 source area below the former manufacturing building. Based on evaluation of the historical sampling data, no site-related VOCs appear to have migrated offsite at levels of concern in the shallow hydrogeologic unit.

CONFINED LOWER PATAPSCO AQUIFER

The VOCs detected in samples from wells installed in the confined portion of the Lower Patapsco aquifer are consistent with those identified for the shallow water-bearing zone: 1,1,1-TCA and its degradation products, chlorinated ethenes, and 1,4-dioxane. Overall, VOC impacts in this deeper hydrogeologic unit extend from the AOC 2 source area to the off-property areas to the south-southeast. The highest VOC concentrations occur near the eastern portion of the new south warehouse building and off-property well MW-24D, which is located immediately downgradient of the property.

1.5 REPORT ORGANIZATION AND CONTENTS

The information provided in the CMI Report will be presented in the following sections:

- Introduction
- Corrective Measures Requirements
- Soil Corrective Measures
- Groundwater Corrective Measures
- Conclusions and Planned Activities

As discussed in the October 2015 RAP, the current property owner – Harmans Road Associates LLC – is responsible for the successful implementation of corrective measures linked to the development of the property for commercial use (WSP 2015a). These activities included the appropriate management of all soil/fill material pursuant to the MDE requirements specified in the RAP, and the installation of engineering controls to mitigate potential future exposure to VOCs present in the soil and groundwater on the property. In addition, the responsibility for implementation of institutional controls (i.e., use restrictions) for the Site through the recordation of an Environmental Covenant was also delegated to TC Harmans Road LLC. All areas of the Site will be subject to the institutional controls specified in the Environmental Covenant. Given the preparation of these documents by a separate party, information on the recordation of the Environmental Covenant on the land deed and completion of the development-related corrective measures activities - including submittal of a Site Management Plan - are only summarized in this CMI Report.

EMERSUB 16 was responsible for the implementation of the corrective measures to address the VOC-affected groundwater at the site. Therefore, most of the information provided in this CMI Report will focus on the construction, operation, and monitoring activities conducted on the former Kop-Flex facility property for the containment and removal of contaminants from the aquifer system. Since this report also satisfies the Construction Completion Report submittal requirement for the groundwater system under the October 2015 RAP, information is also provided on work performed on properties adjoining the former Kop-Flex facility property (e.g., Williams-Scotsman facility).

2 CORRECTIVE MEASURES REQUIREMENTS

2.1 CORRECTIVE ACTION OBJECTIVES

2.1.1 SOIL

The results of an updated (March 2015) site-specific risk assessment determined that concentrations of contaminants in Site soil were either below the applicable non-residential cleanup criteria or did not pose an unacceptable human health risk (WSP 2015b). Therefore, no additional corrective action was deemed necessary beyond the previously completed remedial activities. However, some future activities could increase the possible exposure to residual contaminants present in the vadose zone via the direct contact or inhalation pathways. Given these potential future risks, the corrective action objectives (CAOs) for the Site soil consist of the following:

- preventing worker contact to soil with possible residual contaminants during intrusive (digging) activities
- implementing procedures for the proper management of soil generated during trenching and excavation activities in areas of known or potentially impacted soil
- controlling the potential migration of volatile contaminants into new buildings or enclosed structures

The implementation of engineering and institutional controls, including property use restrictions, were deemed sufficient to reduce the potential risk of exposure to residual contaminants in vadose zone soils. For the engineering controls, regular inspection and maintenance, as required, will need to be performed to ensure the continued attainment of the CAOs for the Site soil. The above goals are consistent with the CAOs for Site soils mentioned in Section IV.A of the Statement of Basis (March 2016) prepared by USEPA, Region III.

2.1.2 GROUNDWATER

Overall, the objective of the groundwater corrective measures is to prevent potential human and ecological exposure to contaminants present in the aquifer system at the Site. Specific CAOs for the impacted groundwater include:

- controlling the migration of contaminated groundwater beyond the property boundary
- reducing contaminant mass in the aquifer system
- restricting groundwater use on the property to prevent potential exposure to contaminants present at concentrations above applicable human health criteria

Contaminant mass removal from the groundwater system should be facilitated by previously completed soil remedial activities in the eastern portion of the Site. The attainment of these CAOs will ensure the protection of human health and the environment and be consistent with commercial use of the property. The above goals are consistent with the CAOs for groundwater described in Section IV.B of the USEPA Statement of Basis (March 2016).

2.2 CHEMICALS OF CONCERN

The COCs represent constituents that have been linked to past Site-related activities and were used as indicators of impacted environmental media during previous investigations. Historical manufacturing activities, which included the storage of hazardous materials and wastes, resulted in the release of chemicals to the ground surface and subsurface soils. Historical soil sampling indicated elevated levels of chlorinated VOCs in the vadose zone soil at the Site, although past

remedial activities have addressed areas with the highest concentrations of these chemicals on the property. Even though the available sampling data indicates VOCs are not present at levels of concern, this group of chemicals – particularly chlorinated compounds and 1,4-dioxane – represent the primary COCs in the soil material The updated risk assessment also identified polychlorinated biphenyls along with the metals arsenic and mercury as chemicals of potential concern at the Site (WSP 2015b). However, these chemicals are not considered to be of concern because there is no known source that can be linked to previous facility operations.

COCs that are relatively mobile in soil could potentially migrate to the groundwater system. Based on historical sampling data, the groundwater COCs consist of chlorinated VOCs and 1,4-dioxane. These compounds are consistent with the primary COCs identified in the vadose zone soils at the site. Based on historical groundwater monitoring data, specific chlorinated VOCs that have been detected at concentrations above the applicable groundwater comparative criteria include:

- 1,1,1-TCA
- 1,1-DCA
- 1,1-DCE
- 1,2-DCA
- Chloroethane
- cis-1,2-dichloroethene
- Tetrachloroethene
- Trichloroethene
- Vinyl chloride

2.3 NUMERICAL CLEANUP CRITERIA

As discussed above, the cleanup of impacted soil has been completed and the updated risk assessment did not identify any unacceptable risk to current and future site occupants. Since active remediation is not required, soil cleanup criteria were not developed as part of the Site corrective measures. Institutional and engineering controls were implemented during the property redevelopment to ensure that Site occupants are not exposed to residual COCs that may pose a human health risk.

The following represent the property-specific, numeric cleanup criteria for groundwater at the Site.

COC	Groundwater Cleanup Criteria (µg/L)
1,1,1-Trichloroethane	200
1,1-Dichloroethane	90
1,1-Dichloroethene	7
1,2-Dichloroethane	5
Chloroethane	3.6
cis-1,2-Dichloroethene	70
Tetrachloroethene	5
Trichloroethene	5
Vinyl chloride	2
1,4-Dioxane	15

Using the aquifer designations provided in the most recent (June 2008) MDE Cleanup Standards, both the unconfined (surficial) and confined portions of the Lower Patapsco aquifer at the Site meet the definition of a Type I aquifer in the state of Maryland. Given this classification and non-applicability of any exception, the remediation criteria selected for the chlorinated VOCs are the numeric groundwater cleanup levels for Type I/II aquifers specified in Table 1 of the MDE Cleanup Standards.

The cleanup criterion for 1,4-dioxane, which is not included in the list of VOCs with established groundwater cleanup standards, was determined from an evaluation of calculated risk-based concentrations in groundwater. Using the current default exposure factors developed by USEPA and a target cancer risk of 1E-5, the calculated risk-based criterion for 1,4-dioxane is 7.8 µg/l. This value assumes the exposure pathway is from direct ingestion of the chemical via a drinking water source. Given the depth to groundwater and placement of a groundwater use restriction on the property, the direct ingestion exposure pathway would be incomplete for potential onsite receptors. For any groundwater discharged to Stony Run with 1,4-dioxane levels greater than 7.8 µg/l, the concentration in the surface water would rapidly decrease due to mixing with flow from upstream areas. Based on these conditions, an alternate, property-specific groundwater cleanup criterion of 15 µg/l, or approximately twice the calculated risk-based level, is proposed for the Site.

3 SOIL CORRECTIVE MEASURES

3.1 OVERVIEW

Engineering controls and institutional controls were selected as the soil corrective measures in the USEPA Final Decision and Response to Comments (FDRTC) included in the Consent Order and RAP (WSP 2015a). The objective of the soil corrective measures is to reduce the potential risk of exposure to residual contaminants in vadose zone soils through direct contact and vapor intrusion. The soil corrective measures implemented during property redevelopment in 2016-2017 include:

- Use of the Soil Management Plan included in the RAP, which provided procedures to limit exposure during excavation activities in AOC 1 where low VOC concentrations are present in soil.
- Installation of a soil cap over VOC-affected soils in AOC 1, consisting of the former manufacturing building slab capped by the new warehouse building slab.
- Installation of passive vapor mitigation systems under the new building floor slabs.

A clarification to the installation of the soil cap over the VOC-affected soils in AOC 1 was provided in the June 3, 2016 RAP Addendum (WSP 2016a). Specifications for the engineering controls as well as the implementation procedures by the property developer are to be provided in a separate report.

Institutional controls to be implemented in accordance with the Consent Order will consist of filing a land deed notice restricting the property to non-residential use, and developing and implementing soil management procedures for any intrusive activities performed within the known VOC-affected area. Pursuant to the RAP referenced in Section VI of the Consent Order, the institutional controls will be implemented by the property owner and documented in a separate submittal.

3.2 COMPLIANCE WITH CORRECTIVE ACTION OBJECTIVES

Information on compliance with the corrective action objectives (CAOs) for the implemented corrective actions will be provided in a separate report.

4 GROUNDWATER CORRECTIVE MEASURES

4.1 OVERVIEW

A groundwater collection and treatment system (System) and institutional controls were selected as the groundwater corrective measures at the Site. As provided in the FDRTC included in the Consent Order, the CAOs for groundwater include:

- controlling potential migration of groundwater with VOCs exceeding applicable human health criteria beyond the Kop-Flex property boundary
- restricting groundwater use on the former Kop-Flex property to prevent potential exposure to VOCs present at concentrations above applicable human health criteria
- reducing concentrations of VOCs in the aquifer system

(The above CAOs are consistent with the groundwater response action objectives presented in the Section 7.3 of the October 2015 RAP.)

The System is designed to prevent migration of groundwater with VOCs exceeding applicable human health criteria beyond the former Kop-Flex property boundary through groundwater extraction, and remove the VOC mass from extracted groundwater through treatment prior to discharge to a surface water body.

The future environmental covenant for the property will include a groundwater use restriction to reduce the potential for:

- Use of and exposure to the VOC-impacted groundwater
- Any artificial penetration of the groundwater-bearing unit(s) containing affected groundwater that could result in potential cross-contamination of clean groundwater-bearing units
- Installation of any new groundwater wells on the Property, except those used for investigative or remediation purposes and approved in advance by MDE
- Use of groundwater for any purpose (including drinking and washing) and the release of groundwater to surface water bodies, whether such release is the result of human activities or is naturally occurring
- Use of the property for other than commercial activities

The institutional controls will be implemented by the property owner in accordance with the Consent Order and RAP.

Additional on-property monitoring wells were installed to provide water level and water quality data to assess the performance and effectiveness of the System. Select existing wells in conflict with the property redevelopment and no longer included as part of the monitoring program were abandoned. All on-property well abandonment and installation activities specified in the RAP, as referenced in the Consent Order, were conducted during the corrective measures implementation phase.

Additional investigations specified in Section 3 of the RAP, but not included as part of the work to be performed under Section VI of the Consent Order, involved the completion of drilling and groundwater profiling on adjacent properties. The specified investigation activities were conducted at the Williams-Scotsman facility; however, similar work has not been performed on the Verizon property due to the lack of an executed access agreement. (EMERSUB 16 is continuing discussions with Verizon to finalize an agreement allowing access to perform this field work.) Even though these activities are not part of the scope of work, the data gathered from these investigations can augment the understanding of groundwater conditions at the Site. Therefore, the investigation results are discussed in the CMI Report for informational purposes.

4.2 GROUNDWATER COLLECTION AND TREATMENT SYSTEM CONSTRUCTION SUMMARY

Construction of the System was initiated on September 13, 2016, and completed on March 10, 2017. The System start-up was initiated on March 10, 2017, with continuous operation beginning on March 29, 2017.

The treatment system layout is shown on Figure 6, and the as-built package for the groundwater collection and treatment system is provided as Appendix A. 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 Lower Patapsco aquifer. The extracted groundwater is routed to the treatment system building. The groundwater is processed through various treatment equipment to meet the National Pollutant Discharge Elimination System (NPDES) permit discharge limits, then discharged to Stony Run via Outfall 001. Based on MDE Air and Radiation Management Administration regulations, no treatment is required for the off gas generated treatment system operation. Therefore, off gas is discharged directly to the atmosphere.

4.2.1 CONSTRUCTION PREPARATIONS

Before construction was initiated for the groundwater treatment system, WSP provided notifications to the property owner and MDE, and secured the permits required to complete the work.

PERMITS

In accordance with Anne Arundel County regulations, WSP secured building permit number B02327831 for the construction of the building to house the treatment equipment.

Maryland State Discharge Permit Number 15-DP-3442, NPDES Permit MD 0069094 (Permit) was issued by MDE in September 2016 for the discharge of treated water from the groundwater remediation system. The NPDES permit became effective on November 1, 2016, and has an expiration date of October 31, 2021.

Water Appropriation and Use Permit Number AA2004G016 (02) for the water withdraws from the State's surface and/or underground waters was issued by MDE on September 11, 2015.

During the design phase, WSP determined that the air emissions from the treatment system were exempt from any requirements under the MDE Air Quality Permits Program. System monitoring, provided in Section 4.5.1 of this report, indicates the actual flow rate and VOC concentrations are below the design values inputted into the air emissions calculations in the RAP. This confirms the System air emissions are exempt from air monitoring requirements.

4.2.2 RECOVERY WELLS

INSTALLATION AND DEVELOPMENT

Three shallow and two deep recovery wells with co-located piezometers were installed using roto-sonic drilling techniques in accordance with the RAP and RAP Addendum #1 (February 2016). The shallow recovery wells were located along the western side of the south building, and the deep recovery wells were located along the property line on the south side of the site (Figure 7). The drilling activities started on August 23, 2016, and the installation, development, and yield testing of all recovery wells was completed in September 2016. The boring logs for the recovery wells are provided in Appendix B, and the construction details and pump information are provided in Table 1.

Based on the groundwater surface elevation and hydrostratigraphy, the shallow recovery wells were installed at depths of approximately 61 feet to 62 feet BGS. Each shallow well was completed using 4-inch diameter, Schedule 40 polyvinyl chloride (PVC) blank riser and 0.020 slotted screen, with a 35-foot screened interval. The co-located piezometers were constructed of 1-inch diameter Schedule 40 PVC screen and blank casing, with the well screen having a 0.020-inch slot size. The deep recovery wells were installed to depths of 126 feet BGS and 147 feet BGS using 6-inch diameter, Schedule 80 PVC

riser and 0.020-inch slotted screen. Each deep recovery well was completed with a 40-foot screened interval. The co-located piezometers were constructed of 1-inch diameter Schedule 40 PVC screen and blank casing, with the well screen having a 0.020-inch slot size.

Once the recovery well and piezometer were installed, a sand filter pack was placed into the borehole to a minimum of 3 feet above the top of the screened intervals. A minimum 3-foot thick layer of fine (#10) sand was added directly above the coarser sand filter pack. Directly above the fine sand, a hydrated bentonite seal was completed to a minimum thickness of 3 feet. After allowing sufficient hydration time for the bentonite, the borehole was grouted to 4 feet BGS, to allow for installation of the well vault and piping. The wells and piezometers were sealed at the surface using locking caps.

The recovery wells were developed using the following techniques:

— flushing with potable water;
— mechanical surging and swabbing to remove fine sediments from the sand filter pack and surrounding aquifer material; and
— purging with an electric submersible pump to further reduce the solids content in the well discharge

The sequencing of these techniques was refined throughout the development activities, and many of the techniques were employed multiple times on the same recovery well to ensure proper development. Generally, the well was mechanically surged and swabbed followed by purging of the solids-containing water generated during the surging/swabbing process using a submersible pump until a yield of approximately 20 gallons per minute (gpm) was maintained from the well.

YIELD TESTING

After completing the well development activities, each of the recovery wells was yield tested to ensure attainment of the designed pumping rate specified in the RAP. The drilling contractor, with oversight by WSP personnel, completed the yield testing of the groundwater recovery wells in September 2016. The yield tests involved the short-term pumping of groundwater from each well individually at a rate approximating the design extraction rate and monitoring the drawdown in the pumping well.

For each test, the well was pumped at a constant rate for approximately 2 hours using a submersible pump. The test pumping rates in the shallow wells varied from 4 to 5 gpm. The test pumping rates for the deep wells were approximately 25 gpm. The pumping rate for each well was selected based on the observed drawdown during development. As part of the testing activities, depth to water measurements were collected prior to and during pumping to determine the well drawdown during the test.

Table 2 includes information pertaining to the performance and results of the recovery well yield tests. The specific capacity, or yield per unit of drawdown, was calculated for each well using water level and pumping rate data from the latter portions of the test. The well specific capacities varied significantly between the shallow and deep recovery wells. The specific capacities for the shallow recovery wells ranged from 0.38 gpm per foot (gpm/ft.) to approximately 0.85 gpm/ft., while the specific capacities in the deep recovery wells were 1.71 gpm/ft. in RW-1D and 1.27 gpm/ft. in RW-2D. Overall, the test results indicate the recovery wells are capable of yielding water at the design extraction rates. The drawdown in well RW-2S may be slightly higher compared to the other shallow recovery wells as indicated by the lower specific capacity for this well.

4.2.3 GROUNDWATER EXTRACTION, CONVEYANCE, AND TREATMENT SYSTEM

GROUNDWATER EXTRACTION PUMPS

The Grundfos model 5SQE-90 electrical submersible pump was installed in shallow recovery wells RW-1S, RW-2S, and RW-3S, and the Grundfos model 45S20-5 electrical submersible pump was installed in deep recovery wells RW-1D and RW-2D. The pump installation depths are provided on Table 1. These pumps can overcome the estimated head losses at the shallow and deep wells.

CONVEYANCE PIPING

Recovered groundwater is transferred from the extraction wells to the equipment building, and treated water transferred from the equipment building to the outfall, via high density polyethylene (HDPE) conveyance piping (Appendix A, Sheet C-101). The water conveyance piping was sized to optimize in-pipe water velocities to reduce deposition of solids and minimize the total dynamic head required for conveyance of water from the submersible pumps to the equipment building. Therefore, the conveyance pipe diameters vary depending upon factors such as hydraulic distance from the equipment building and flow rate over the piping section (Appendix A). The water conveyance piping was installed at a depth of at least 3 feet bgs, approximately 6 inches below the frost line in Anne Arundel County, Maryland (Anne Arundel County 2016). As provided in the RAP Addendum #4, dated June 23, 2016, the proposed carrier piping was deemed an unnecessary component of the design, given that a control system, flow meters, and pressure gages monitor system flows and pressures to detect and send alerts for potential water leaks (WSP 2016b). Therefore, the carrier pipe was not installed.

The electric power supply line and control wiring for operating the submersible pumps was emplaced inside Schedule 40 PVC electrical conduit. The electrical supply line and control wiring conduits was installed 12 to 18 inches above the water conveyance piping, or at an approximate depth of 2 feet bgs.

The pipe bedding and compacted backfill consisted of native soil excavated from the pipe trench. In high-traffic areas (i.e., sections underneath driveway), Portland cement was mixed into the native backfill soil for added stability. Detector tape stating "Caution: Electrical Line Buried Below" and "Caution: Water Line Buried Below" was placed above the electrical conduit and conveyance pipe, respectively. After backfilling to the appropriate grade, surface cover was completed by the property developer as part of their site construction activities.

At pipe junctions, the conveyance piping from an individual extraction well or section of wells was connected to the main conveyance header. At each recovery well, the conveyance piping was connected with the pumps in each well vault via down-well electrical wiring and discharge hose.

The treated water is conveyed from the treatment building in a single HDPE conveyance pipe and discharged into Stony Run through Outfall 001.

WELL VAULTS, PIPE JUNCTION VAULTS, VALVE VAULTS, AND CLEANOUTS

The recovery wellheads are housed in prefabricated concrete H-20 traffic load approved vaults with a securable, pneumatic assist hinged aluminium lid. The vault interior is 4 feet long x 4 feet wide x 4 feet deep, with 6-inch thick side walls, 8-inch thick bottom wall and an 8-inch thick lid. The lid includes an automatic, aluminium "hold-open" arm that engages when the lid is fully opened. Non-shrink, waterproof sealant is applied around pipe and conduit penetrations into the vault and a neoprene gasket around the lid seals the vaults to water.

The components in the shallow and deep recovery well vaults are identical except for their sizing. The deep well components are fit for 2-inch Schedule 80 PVC pipe from the well head to the 3-inch or 4-inch HDPE conveyance lines. The shallow well components are fit for 1-inch Schedule 80 PVC pipe from the well head to the 2-inch HDPE conveyance lines. The well heads are fitted with pitless adapters with 1-inch and 2-inch drop pipes for the shallow and deep wells, respectively. From the pitless adapter, additional components include a brass swing check valve, sampling valve, pressure gauge, totalizing flow meter, shut off valve, and several vibration dampening clamps to stabilize the pipe.

Three junction vaults tie laterals from the shallow recovery wells to the main conveyance piping header. The three junction vaults have two pipelines running through them, a 4-inch water conveyance pipe from the deep wells (RW-1D and RW-2D) and a 2-inch water conveyance pipe from the lateral shallow wells (RW-1S, RW-2S, and RW-3S). In addition, Schedule 40 PVC conduits for electrical power and control to the shallow and deep recovery well pumps are routed through the junction vaults. The piping and other components (e.g., cleanouts and T's) in the vaults are constructed of Sch. 80 PVC. A fully pressure rated Series 735 transition piece for PVC/HDPE manufactured by Poly-Cam, Inc. is used to connect the HDPE conveyance piping outside of the vaults to the PVC pipe within the vaults. The components in the vaults are comprised of transition pieces, Sch. 80 PVC reducers, 2-inch or 4-inch PVC lateral wye and cleanouts with threaded caps, and 2-inch Sch. 80 PVC T-joints.

Iron precipitation or sediment build-up may occur within the water conveyance piping upstream of the treatment equipment. Therefore, pipe cleanouts were installed at all water conveyance pipe junctions and changes in direction to

allow access for cleaning inside the pipes and fittings. Each cleanout is housed within a concrete vault. The cleanout ports are 3-inch Sch. 80 threaded ports for the deep well conveyance piping and 2-inch Sch. 80 threaded ports for the shallow well conveyance piping.

TREATMENT BUILDING

A pre-engineered building was constructed from September 2016 through March 2017, in accordance with Anne Arundel County Building Permit No. B02327831. The building construction, originally scheduled to begin in June 2016, was delayed following the discovery of an underground storage tank at the building's proposed location. The tank and associated soil material were excavated and disposed of offsite by the property developer's consultant in accordance with federal and state regulations. (Additional information on the tank removal will be provided in a separate submittal.)

The treatment building is equipped with an overhead door and personnel door, and houses the treatment equipment, satellite waste accumulation area, and a work area for storing tools and performing maintenance activities. The building layout is shown in Figure 6. The building is connected to electrical power, city water, internet, and natural gas for system operations and remote monitoring. A sanitary sewer connection is also provided for sewage discharge (e.g., boiler water discharge). As mentioned previously, treated water from the System is discharged to Outfall 001 in accordance with the NPDES permit, and is not discharged to the sanitary sewer.

TREATMENT EQUIPMENT

As stated in the RAP (WSP 2015a), the groundwater is treated to meet the applicable MDE groundwater standards for COCs and effluent limits established in the NPDES permit, which includes a total VOCs limit of 100 µg/l. A copy of the NPDES permit is provided as Appendix C, and the effluent limits from the NPDES permit are listed in Table 3. The treatment equipment is comprised of an equalization tank to regulate flow, bag filters for suspended solids removal, a metering pump for the addition of an iron sequestering agent, 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. Transfer pumps are used to transfer water through the treatment equipment. All treatment equipment operates in accordance with the specifications provided in the RAP (WSP 2015a), except for the in-line aerator, which was specified in the RAP Addendum #1 dated February 24, 2016 (WSP 2016c).

In January 2017, samples were collected from the five recovery wells to evaluate for the presence of potential resin foulants in the groundwater, including methylene blue active substances (MBAS) surfactants, gasoline and diesel-range total petroleum hydrocarbons, chlorinated herbicides, chlorinated pesticides, and semi-volatile organic compounds. The laboratory analytical report is provided as Appendix D, and the results are tabulated in Table 4. Low levels of surfactants, which can bind to synthetic resin and inhibit its long-term effectiveness at VOC and 1,4-dioxane removal, were detected in three recovery wells, RW-2S (0.045 milligrams per liter [mg/l]), RW-3S (0.023 mg/l), and RW-2D (0.045 mg/l). Soap residue from decontamination of pumps during recovery well development and sampling was believed to be the cause of the low surfactant levels detected in the groundwater samples. Liquid phase granular activated carbon (GAC), which was one of the contingency treatments provided in the RAP (WSP 2015a), was selected to remove the residual surfactants from the water. Prior to System startup, one 2,000-pound GAC vessel was installed between the two bag filter vessels and upstream of the synthetic resin. The System influent concentrations of surfactant were below detection limits in the initial influent samples collected on March 13, March 15, March 20, and March 23, 2017, indicating that the initiation of groundwater extraction from the wells had removed the residual surfactants from groundwater (Table 5). Therefore, the GAC vessel was taken out of service on March 28, 2017, and the spent GAC was disposed of offsite in accordance with federal and state regulations.

PROCESS LOGIC CONTROL

Computerized process logic control (PLC) is used to automate actuation of the System's equipment, including groundwater collection from the subsurface, groundwater conveyance to the treatment system, transfer of groundwater through the treatment equipment, and discharge of treated groundwater. The PLC includes remote monitoring and control capabilities, and email transmittal of alarm conditions. In the event of a high priority alarm condition (e.g., preventive overflow switch is activated), a System-wide shutdown is activated.

RESIN REGENERATION PROCESS

Steam process equipment including a boiler, superheater, and reheater are used to remove the absorbed organic constituents from the resin. The two synthetic resin vessels are arranged in a lead-lag configuration until the lead vessel reaches its absorption capacity for organic constituents, based on the volume processed. At that time, the lag vessel is switched into the lead position, and the 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 organic constituents is discharged to the atmosphere through a reheater. Once the regeneration process is completed, the vessel is returned to operation as the lag vessel, and the cycle is repeated.

As mentioned in Sections 4.2.1 and 4.5.1, the air emissions from the treatment system were determined to be exempt from any requirements under the MDE Air Quality Permits Program.

4.3 GROUNDWATER MONITORING ACTIVITIES

4.3.1 WELL ABANDONMENT

Based on the development plan for the property, monitoring wells situated within the planned footprint of the new warehouse buildings and other site features (e.g., utility lines) were abandoned to facilitate construction activities. In addition, WSP decommissioned wells within the truck loading dock area between the proposed warehouse buildings, except for the MW-16/MW-16D well pair, due to health and safety hazards associated with working in an area with a high volume of truck traffic.

A total of 21 wells were abandoned at the site (Figure 8). All wells were decommissioned in accordance with the applicable methods and procedures specified in the Maryland well construction regulations. At each location, the concrete pad was removed and the well casing was cut to approximately 1 foot below grade. The well casing was backfilled using a bentonite-cement grout, emplaced for the bottom to the surface using a tremie pipe. After plugging the well, each location was backfilled to match the existing grade. A completed Water Well Abandonment Sealing Report was prepared for each well and submitted to the MDE in accordance with the well regulations (Appendix E).

4.3.2 INSTALLATION OF ADDITIONAL GROUNDWATER MONITORING WELLS

ONSITE AREA

Five shallow and two deep monitoring wells were installed using roto-sonic drilling techniques in accordance with the Groundwater Monitoring Plan included in the RAP. The shallow monitoring wells (MW-5R, MW-38R, MW-42, MW-43, and MW-44; see Figure 7) are located in the western portion of the Site to monitor the conditions in the shallow groundwater zone in response to pumping. Based on the utility plan for the property development, previously installed wells MW-05 and MW-38 were abandoned and re-installed as similarly constructed replacement wells MW-05R and MW-38R in the immediately surrounding area. The deep monitoring wells (MW-40D and MW-41D; see Figure 7) were located on the southern portion of the site to monitor the efficacy of the aquifer response to pumping from deep recovery wells. The boring logs for the new monitoring wells are provided in Appendix B.

The shallow monitoring wells MW-5R, MW-38R, and MW-42 were installed in the predominantly fine-grained deposits of the upper portion of the surficial zone, and well MW-43 and MW-44 were completed in the underlying sand deposits. Each shallow well was completed using 2-inch diameter, Schedule 40 PVC blank riser and 0.020-inch slotted screen. The deep monitoring wells were installed in the coarse-grained sand deposits comprising the confined Lower Patapsco aquifer. Well MW-40D was completed in the upper portion of this hydrogeologic unit to monitor conditions along the western plume boundary, and MW-41D was installed deeper to evaluate conditions in the lower portion of the aquifer. Each deep monitoring well was constructed using 2.5-inch diameter, Schedule 80 PVC blank riser and 0.020-inch slotted screen. Both the shallow and deep monitoring wells were completed with 10-foot screen intervals.

After the well casing was installed down-hole, a sand filter pack was placed into the borehole to a minimum depth of 3 feet above the top of the screened interval. Directly above the sand filter pack, a hydrated bentonite seal was completed to a minimum thickness of 3 feet. After allowing sufficient hydration time for the bentonite, the borehole was grouted to approximately 1 foot bgs. The wells were completed at the surface using flush-grade, traffic-rated well covers, and the tops of the casings sealed with locking caps.

The newly installed wells were developed by extracting groundwater from the casing using a suitably-sized submersible pump. Turbidity, pH, temperature and specific conductivity were periodically monitored during the development process to ensure that water representative of the aquifer is entering the well screen. Development continued until the discharge was relatively free of fine suspended sediments.

WILLIAMS-SCOTSMAN PROPERTY

In accordance with the RAP, groundwater profiling was conducted at an offsite on the neighboring William Scotsman property in mid-March 2017. Based on the VOC field screening results, a shallow monitoring well (MW-45) was installed at this location to serve as an upgradient monitoring point for the shallow groundwater zone. The location of this offsite monitoring well is shown in Figure 7.

The borehole was advanced to a total depth of 60 feet bgs using roto-sonic drilling techniques. During completion of the well borehole, depth-discrete groundwater samples were collected from depths of approximately 27 feet BGS and 37 feet BGS for field screening using compound-specific colorimetric tubes and laboratory analysis. The groundwater sampling activities did not extend to depths greater than 37 feet bgs due to the presence of silty clay deposits to the termination depth. At each sampling depth, groundwater was purged from the sampler using a small electric submersible pump. Hydrogeochemical parameters (temperature, pH and specific conductivity) were monitored during the purging process to ensure the sampler was collecting water representative of the aquifer system. Each groundwater sample was field screened for 1,1-DCE using a Color-Tec© method, and the field screening results recorded in a field notebook. All groundwater samples were submitted to the Phase Separation Science laboratory in Baltimore, Maryland and analyzed for VOCs using USEPA SW-846 test method 8260B.

The field screening results did not suggest the presence of 1,1-DCE at levels above the numerical cleanup levels of 7 µg/l. Based on lithologic and VOC field screening, the borehole was backfilled using bentonite chips to 39 feet bgs, and a ten-foot, schedule 40 PVC 0.20 slot screen was installed from 28 feet to 38 feet bgs. The boring logs for the monitoring well are provided in Appendix B.

4.3.3 BASELINE GROUNDWATER SAMPLING EVENT (DECEMBER 2016 AND JANUARY 2017)

One round of groundwater samples was collected from selected monitoring and recovery wells to characterize the baseline hydrogeochemistry of the Surficial and Lower Patapsco aquifers, respectively. These data will be evaluated along with sampling data obtained during operation of the hydraulic containment systems to evaluate capture of the VOC-impacted groundwater and removal of contaminant mass from the aquifers. Baseline samples were collected from the recovery wells and most of the monitoring wells in early December 2016. For three monitoring wells (MW-1D, MW-23D, and MW-41D), samples could not be collected until early January 2017, due to the inaccessibility of the wells until mid-December 2016.

Field measurements of the depth to standing water in monitoring wells and recovery well piezometers was obtained with an electronic water level indicator prior to sampling. All field measurements were recorded in a bound field notebook. The water level measurements and corresponding hydraulic head values for the wells are provided in Table 6.

Groundwater samples were collected from the monitoring wells using a passive sampling method (HydraSleeve™). The HydraSleeve™ is one of several passive sampling technologies capable of collecting representative groundwater samples for analysis of chlorinated VOCs and 1,4-dioxane (Parker and Clark 2002, Montgomery Watson Harza 2002, Parsons Corporation 2005, and ITRC 2006). The 2.5-foot long HydraSleeve™ sampler was attached to a weighted, nylon suspension tether and set at the pre-determined depth within the screen interval. The placement of the HydraSleeve™ involved lowering the sampler so the valve/opening is at the prescribed depth (Table 7). The suspension line was then secured at the well head to ensure the sampler remains at the designated depth during the two-week re-stabilization period.

Following equilibration, the groundwater sample was collected by continuously pulling upward on the HydraSleeve™ until full. The HydraSleeve™ was carefully removed from the well, and the sample immediately collected in the appropriate containers to minimize the diffusive loss of VOCs through the polyethylene wall of the sampler. The procedures for sample labeling, custody and shipping followed the requirements specified in the WSPs Field Standard Operating Procedures (SOPs) (Appendix F). The groundwater samples were analyzed for VOCs using USEPA SW-846 Test Method 8260B and 1,4-dioxane using modified USEPA Method 8260B with Selected Ion Monitoring (SIM).

During the baseline sampling event, groundwater samples were collected from the recovery well piezometers using a low-flow sampling technique. The procedures for low-flow sampling are outlined in WSPs Field SOP (Appendix F). Sampling depths were chosen to coincide with coarse-grained sections of the respective aquifer to ensure representative results. The groundwater samples were analyzed for VOCs using USEPA SW-846 Test Method 8260B and 1,4-dioxane using modified USEPA Method 8260B with SIM.

4.3.4 MW-45 SAMPLING (MARCH 2017)

A groundwater sample was collected from the MW-45 using the low-flow sampling method. A QED bladder pump was lowered into the well and secured at a depth where the pump intake would be at the center of the screened interval, approximately 33 feet bgs. The sample was the collected by introducing air into the pump's polyethylene bladder, which in turn forced water to be lifted into Teflon lined tubing for collection at the surface. Water quality parameters, including temperature, pH, conductivity, oxidation/reduction potential, turbidity, and dissolved oxygen, were monitored using a Horiba U52 water quality probe, until all parameters reached a state of equilibrium, signifying that fresh aquifer water was being collected by the pump. Following equilibration, the groundwater sample was collected via the same Teflon lined tube. The procedures for sample labeling, custody and shipping followed the requirements specified in the WSPs Field SOPs (Appendix F). The groundwater samples were analyzed for VOCs using USEPA SW-846 Test Method 8260B and 1,4-dioxane using modified USEPA Method 8260B with SIM.

4.3.5 WATER LEVEL MONITORING DURING INITIAL REMEDIAL PUMPING

A synoptic round of depth to water measurements was gathered from the wells comprising the water level monitoring network in early February 2017 before the start of pumping from the recovery wells in the respective water-bearing zone. The water levels in the monitoring wells were manually measured using an electronic water level indicator. Groundwater level elevations were determined from the field measurements and survey information for each well. The elevation data was contoured using geostatistical methods (kriging) to characterize the static, or non-pumping, groundwater surface at the site.

During the initial week of continuous pumping (March 29 – April 5, 2017), the monitoring wells included in the water level monitoring networks for each aquifer comprised two groups with respect to the measurement frequency. The first group consisted of monitoring points located in the presumed drawdown area created by groundwater extraction. During the first week of extraction from each aquifer, water level measurements were obtained hourly using pressure transducers installed in the wells and listed below.

Surficial Aquifer	Lower Patapsco Aquifer
MW-03	MW-1D
MW-05R	MW-16D
MW-16	MW-21D
MW-18	MW-22D
MW-38R	MW-24D
MW-39	MW-40D
MW-42	MW-41D
MW-43	RW-1D
MW-44	RW-2D
RW-1S	
RW-2S	
RW-3S	

Water level measurements were collected twice per day from the remaining wells, which represented the second group of monitoring points. The depth to water in these wells was measured using an electronic water level indicator. These data were examined to evaluate the aquifer hydraulic response during system operation and the significance of any hydraulic head fluctuations. The water level data provided an early indication of the response to pumping from the shallow and deep recovery wells, and an initial steady-state condition was reached approximately two days after start-up in the shallow unconfined zone and <0.5-day for the confined Lower Patapsco aquifer.

During the second week of pumping, synoptic rounds of water level measurements were collected every two days from all wells, then weekly for the next four weeks. Manual depth to water measurements were made at the monitoring points using an electronic water level indicator. These data were used to monitor further changes in the hydraulic head distribution in both water-bearing zones during continued groundwater pumping, particularly in areas distant from the extraction points to evaluate containment of the VOC plumes.

4.3.6 SEMI-ANNUAL GROUNDWATER SAMPLING EVENT (MAY 2017)

In accordance with the Groundwater Monitoring Plan, groundwater samples were collected from the shallow and deep recovery wells and designated monitoring wells during the week of May 1, 2017. Groundwater samples were collected from the shallow and deep monitoring wells using the HydraSleeve sampler. The samplers were deployed to the same depths within the well screens as those set for the baseline sampling event. Following equilibration, samples were obtained by continuously pulling upward on each HydraSleeve until full, and then immediately decanting a representative portion of the collected water into the laboratory-supplied containers. For the recovery wells, the groundwater samples were collected directly from an in-line sampling port located in the well-head vault. The procedures for sample labeling, custody and shipping followed the requirements specified in the WSPs Field SOPs. The groundwater samples were submitted to the 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 SIM.

4.4 BASELINE GROUNDWATER MONITORING RESULTS

4.4.1 SHALLOW (UNCONFINED) ZONE

Groundwater in the shallow, unconfined hydrogeologic unit flows in a generally west-northwest direction across most of the site (Figure 3). The relatively high groundwater elevation at the MW-09 location indicates the transient presence of localized southerly flow paths in the eastern portion of the Site. Overall, the inferred groundwater flow direction resembles the flow pathways determined from the evaluation of historical water level data for the Site.

Sample results for the shallow recovery and monitoring wells are presented in Table 8, respectively. Copies of the certified laboratory reports for the samples are included in Appendix D. The following site-related VOCs were detected above the property-specific groundwater cleanup criteria in samples from multiple wells screened within the shallow hydrogeologic unit:

- 1,1,1-TCA
- 1,1-DCE
- 1,1-DCA
- 1,4-dioxane

While acetone and 2-Butanone were detected in the groundwater sample from RW-1D (172 µg/L and 137 µg/L respectively), the presence of these compounds is likely related to the well installation activities.

Figure 9 depicts the inferred distribution of 1,1-DCE – one of the least attenuated VOCs - in samples from wells screened in sandy intervals within the surficial water-bearing zone. For pre-existing wells that were retained for the Site corrective measures monitoring program, the 1,1-DCE concentrations are similar between the December 2016 baseline samples and those collected during previous sampling events. The highest levels of 1,1-DCE and other VOCs were detected in the

sample collected from monitoring well MW-16, which is located near the north wall of the South Warehouse in the eastern portion of the loading dock area. Elevated VOC levels were also detected in the samples from monitoring wells MW-04 and MW-20 near the eastern Site boundary and recovery wells RW-1S and RW-2S situated hydraulically downgradient of MW-16. Concentrations of chlorinated VOCs and 1,4-dioxane decrease to trace and non-detect levels in samples collected from the downgradient monitoring wells along the western Site boundary (e.g., MW-03, MW-39 and MW-42). No site-related VOCs were detected at these monitoring points at concentrations exceeding the property-specific cleanup criteria.

4.4.2 DEEP (CONFINED) ZONE

Figure 4 depicts the potentiometric surface contours for the confined portion of the Lower Patapsco aquifer based on the contouring of water level data from the deep, on-property monitoring wells. Evaluation of the head contours indicates generally south-southeast flow paths for groundwater in this deeper hydrogeologic unit. As with the shallow zone, the inferred direction of groundwater flow is consistent with that determined from previous water level measurements for this portion of the aquifer system.

The sample results for the deep wells are included in Table 8, with copies of the certified laboratory reports provided in Appendix D. Lower VOC concentrations were detected in the groundwater samples collected from the wells completed in the deeper, confined zone of the Lower Patapsco aquifer. For the site-related COCs, only 1,1-DCE and 1,4-dioxane were found at levels above the property-specific groundwater cleanup standards. The inferred distribution of 1,1-DCE in this portion of the aquifer system is shown in Figure 10. Groundwater samples collected from the upper sand deposits comprising this hydrogeologic unit had 1,1-DCE concentrations ranging from 18 µg/l (well MW-40D) to 375 µg/l (well MW-1D). This VOC was not detected in the sample from well MW-41D, which is screened in the lower portion of the aquifer. This sampling result can be used to delimit the vertical extent of the 1,1-DCE in the deep confined zone. The horizontal and vertical distribution of 1,4-dioxane mimics that of 1,1-DCE, with detected levels varying from non-detect to greater than 200 µg/l. As with the shallow hydrogeologic unit, the VOC concentrations in the samples from the pre-existing monitoring wells are similar between the December 2016 baseline samples and those collected during previous monitoring events at the site.

4.5 OPERATIONS AND MONITORING FOR COMPLIANCE WITH CORRECTIVE ACTION OBJECTIVES

The initial performance monitoring for compliance with COAs was performed from start-up (March 10, 2017) through end of second quarter 2017 (June 30, 2017). Performance monitoring beyond this period will be presented in future Progress Reports, to be submitted in accordance with the RAP. An operations, maintenance, and monitoring manual for the System will be provided to MDE under a separate cover.

4.5.1 SYSTEM DISCHARGE VOLUMES AND OPERATIONAL EFFICIENCY

The System discharge volume represents the volume of treated water discharged from the System to Outfall 001, and is measured using the effluent flow totalizer within the treatment building. The discharge flow is continuous while the System is in operation, with the rate dependent on the influent flow from the extraction wells. Each well's recovery pump speed, or extraction rate, was adjusted during the initial weeks of startup using its dedicated pump controller until the desired rate was achieved to attain hydraulic containment.

The individual extraction rates were gradually increased over the first several weeks of operation while the treatment equipment and PLC settings were evaluated and fine-tuned, as necessary, to maximize operations. System operations were initiated on March 10, 2017, for a short (2-hour) period at a discharge flow rate of 20 gpm. During the week of March 13 through 17, 2017, WSP operated the System up to 8 hours per day while gradually increasing the flow from 20 gpm to a maximum of 70 gpm. The System was operated continuously at a flow rate of approximately 72 gpm during the week of March 20 through 24, 2017. The System was restarted on March 29, 2017, at a flow rate of approximately 72 gpm, and remained in continuous operation thereafter. Recovery well extraction rates during steady state operation are provided below:

Location	Average Extraction Rate, Steady State (gpm)
RW-1S	4.2
RW-2S	3.6
RW-3S	2.4
RW-1D	28.0
RW-2D	34.1

The combined flow rate (72 gpm) in steady state operation is near the anticipated flow rate (79 gpm) and below the maximum flow rate (95 gpm) used in the System design calculations provided in the RAP (WSP 2015a). Therefore, the System is designed to handle this flow rate. The effluent flow totalizer and total flow rate readings are recorded daily by the System's datalogger, and downloaded by WSP staff at least once per month. Based on the effluent flow counter, 10,220,563 gallons of treated water were discharged from startup through June 30, 2017 (Table 9). Additional flow data is provided in Appendix G.

The system was operational 89% of the time from startup through end of second quarter 2017, with the downtime limited to the first month of operation. All five recovery wells were operational during the periods of System operation.

4.5.2 MAINTENANCE ACTIVITIES

Routine System maintenance performed included changing bag filters, replenishing the feed supply of caustic and sequestrant treatment chemicals, recalibrating and cleaning the inline pH probe, and cleaning debris from the sump. The synthetic resin was regenerated an average of twice per week using a steam removal process.

The pH buffering system was adjusted during the initial months of operations after the discharge pH dropped below the NPDES permitted range (6.5 to 8.5 standard units [s.u.]). The programming for the caustic pump operation was modified to improve consistency with respect to caustic addition, and the inline pH probe was relocated to upstream of the in-line aerators to improve accuracy of pH measurement. The sequestering agent was taken offline on June 5, 2017, based on consistently low dissolved iron concentrations in the influent since System startup.

4.5.3 TREATMENT PERFORMANCE MONITORING

Performance of the System treatment equipment is monitored by collecting and analyzing water samples from in-line sample ports. Treatment system samples were collected at the System influent port (VSP-1), before the bag filters (VSP-2), carbon effluent (while present), after the bag filters (VSP-3), at the lead (primary) synthetic resin (AMBERSORB™™) vessel effluent, and the System effluent port (VSP-4). During the first month of System operation, samples were collected at least once per week, then monthly thereafter. The water samples were analyzed for VOCs using USEPA SW-846 Test Method 8260B and 1,4-dioxane using EPA Test Method SW-846 Test Method 8260 with SIM. As mentioned previously, several System samples from startup through March 23, 2017, were also analyzed for MBAS Surfactants using Standard Method SM 5540; all results for MBAS Surfactants were below detection limits. Analytical results are provided for the System influent in Table 10, lead AMERBERSORB™ effluent in Table 11, and System effluent in Table 12. A list of additional parameters monitored in accordance with the NPDES permit are provided in Table 3.

VOC results were compared to the cleanup criteria, as provided in Section 2.3 of this report. Only two chlorinated VOCs, 1,1-DCA and 1,1-DCE, were detected in the influent results above their respective cleanup criteria (90 µg/l and 7 µg/l). 1,4-dioxane was also detected above the cleanup criterion (15 µg/l). The predominant compounds detected in the System influent samples, representing on average 97% of the total VOC mass in the influent, include 1,1,1-TCA, 1,1-DCA, 1,1-DCE, and 1,4-dioxane.

The influent total VOC and 1,4-dioxane concentrations were also compared to the anticipated and maximum (worst case) concentrations applied in the System design to confirm the treatment equipment is appropriate for actual conditions. The total influent VOC concentrations from startup (March 10, 2017) through end of second quarter 2017 (June 30, 2017),

excluding 1,4-dioxane, ranged from 416.4 µg/l (June 21, 2017) to 603.8 µg/l (April 3, 2017), which compare to the System design anticipated concentration of 516 µg/l and maximum concentration of 911 µg/l. The 1,4-dioxane concentrations in the influent from startup through end of the second quarter ranged from 190 µg/l (June 21, 2017) to 440 µg/l (March 15, 2017; Table 10), which compare to the System design anticipated concentration of 374 µg/l and maximum concentration of 911 µg/l. The System was designed to handle the maximum (worst case) concentrations. As the influent total VOC and 1,4-dioxane concentrations are below the maximum concentrations, the treatment equipment is appropriate for the influent concentrations.

Samples were collected periodically from the carbon effluent and lead AMBERSORB™ effluent during startup and analyzed for VOCs and 1,4-dioxane. VOCs were not detected at concentrations above the laboratory detection limits in any of the samples from these locations. 1,4-dioxane was detected in the carbon effluent samples on March 20 and 23, 2017 (150 µg/l and 410 µg/l, respectively), and the March 23 and April 3, 2017, samples collected from the lead AMBERSORB™ effluent (2.1 µg/l and 25 µg/l, respectively). The carbon vessel was located upstream of both AMBERSORB™ vessels, and the lead AMBERSORB™ effluent is located prior to 1,4-dioxane treatment in the final AMBERSORB™ vessel; therefore, the 1,4-dioxane concentrations in these sample locations are anticipated.

Effluent (discharge) samples from the System were collected in accordance with the NPDES permit (Table 12), with additional samples collected periodically during the initial months of operation to confirm treatment efficiency (Table 13). No VOCs or 1,4-dioxane were detected in the effluent treatment system water samples at concentrations above the laboratory detection limits. The System results indicate 100% treatment efficiency for VOCs and 1,4-dioxane; therefore, the System is operating as designed.

NPDES discharge monitoring reports are submitted to MDE monthly through the electronic data reporting system. Copies of the DMRs are provided as Appendix H. All results were within the permit limits, except for the following:

- The pH dropped slightly below the permit range (6.5 to 8.5 s.u.) on several instances during startup due to operational deficiencies with the pH adjustment system. Modifications were implemented to improve the operation and monitoring of the pH adjustment system throughout the startup period.
- An analytical result for total zinc of 179 mg/l in the sample collected on March 20, 2017, which is above the permit limit (120 mg/l). The source of the zinc exceedance was not identified based on a review of the available site data. However, the zinc results in the other effluent samples collected through June 30, 2017, were well below the permit limit.

Notifications of these exceedances were submitted to MDE in accordance with the permit; copies of the exceedance notifications are provided in Appendix H.

4.5.4 VOC AND 1,4-DIOXANE REMOVAL

The System influent VOC and 1,4-dioxane results and effluent flow totalizer readings were used to calculate mass removal. The predominant VOCs (1,1,1-TCA, 1,1-DCA, and 1,1-DCE) detected in the influent samples are included in the VOC removal analysis. The cumulative mass removal is detailed in Appendix G. A summary of mass removal for total VOCs and 1,4-Dioxane is provided in Table 9.

An estimated 4.2 pounds (22.2 gallons) of 1,1,1-TCA, 8.5 pounds (51.2 gallons) of 1,1-DCA, and 30.5 pounds 1,1-DCE (160.5 gallons) were removed by the System from startup through June 30, 2017, which composes an estimated 43.3 pounds (233.9 gallons) of total VOCs removed. An estimated 21.2 pounds (119.9 gallons) of 1,4-dioxane were also removed by the System from Startup through June 30, 2017.

4.5.5 GROUNDWATER DRAWDOWN AND CAPTURE

SHALLOW (UNCONFINED) ZONE

Time vs. drawdown plots for selected unconfined zone monitoring wells in the western portion of the Site during the first 8 days of continuous remedial pumping (March 29 to April 6, 2017) are provided in Figure 11. As shown in the data plots, the groundwater surface in proximity to the shallow recovery wells appears to have achieved a quasi-steady state condition within 1-2 days of the start of continuous pumping. In addition, a detectable, albeit small, water level change

was observed in well MW-03 which is located approximately 300 feet downgradient of the line of recovery wells. The rapid water level response to groundwater pumping from the recovery wells is also reflected by short-term reduction in drawdown when the System was shut-down for a very short period the morning of March 31, 2017.

Groundwater level contour maps under pre- and post-pumping conditions were developed to assess changes in the hydraulic head conditions after initiation of water withdrawals with the System operation. As discussed in Section 1.3, the gross hydrostratigraphy of the unconfined zone in the western portion of the site consists of silt and clay deposits in the upper portion of the saturated zone and predominately sand sediments in the lower portion, although horizontal and vertical heterogeneity is present within the sequence. Given the planned groundwater extraction in this area and slight head differences between wells screened in the clayey and sandy units, separate contour maps were prepared using data from wells screened in the clayey deposits at or just below the groundwater surface and those completed in the predominately sand deposits in the lower portion of the shallow, unconfined zone. Additionally, water level data collected for the piezometers co-located with the shallow recovery well were utilized in developing the groundwater elevation maps. The decision to include measurements is based on the very low withdrawal rates from these wells (2.4 gpm to 4.2 gpm), which range from 33% to 58% of the long-term sustainable yield determined from a similarly constructed well during the 2014 aquifer testing activities.

Given the periodic extraction of groundwater from the shallow and deep recovery wells beginning in early March, water level data collected on February 1, 2017, were evaluated to depict pre-withdrawal hydraulic head conditions in the unconfined zone. The non-pumping contour maps for the water table and piezomteric surface in the lower portion of the unconfined zone are provided in Figures 12 and 13, respectively. Overall, the groundwater flow paths inferred from the head contours are resemble previously collected rounds of data, with flow in the unconfined zone generally moving towards the northwest and the Stony Run drainage area.

Contour maps developed from water level data collected after the start of continuous remedial pumping in late March 2017 show the effects of groundwater withdrawals from the shallow recovery wells on the flow system. During the first week of extraction, the most pronounced head changes (i.e., drawdown) occurred within the more permeable, sand-rich deposits comprising the lower portion of the unconfined zone, as indicated by the piezometric surface contours shown in Figures 14 and 15. (Water table contour maps were not prepared for this pumping period because of the limited number of water level monitoring points and smaller observed head changes.) Based on these data, a noticeable depression in the piezometric surface, centered around recovery well RW-2S, has developed a short time following the initiation of continuous remedial pumping. The higher drawdown around wells RW-2S and RW-3S is believed to reflect the superposition of drawdown from the simultaneous pumping of the three shallow recovery wells combined with a reduction in the thickness of the lower sand unit southward from the area around RW-2S. The influence of these factors could be accentuated by the lack of recharge to the sand unit due to the buildings and surface pavement, and predominately clayey deposits in the shallow subsurface.

The water level contour maps shown in Figures 16 through 19 depict the head conditions in the shallow, unconfined zone after more than 2 weeks (Figures 16 and 17) and approximately 6 weeks (Figures 18 and 19) of continuous pumping. These data can be presumed to approach a steady state condition with respect to groundwater withdrawals from the unconfined zone. Figures 16 (April 17, 2017) and 18 (May 8, 2017) show a slight localized depression in the water table around monitoring well MW-38R in response to pumping. The more pronounced hydraulic response at this well compared to the other water table wells is due to the presence of coarse-grained sand and gravel deposits in the lower portion of the screened interval. (As indicated in the boring logs, the screened intervals for recovery wells RW-1S and RW-2S extends into the overlying clayey deposits.) The piezometric surface for the lower sand unit during the same time periods generally resembles the head contours during the first week of remedial pumping (Figures 17 and 19). The only noticeable difference is a lowering of the hydraulic head around well MW-39, which is located downgradient of the recovery wells, from the April 17th to May 8th measurements rounds.

Assuming horizontally isotropic conditions within this hydrogeologic unit, flow vectors were superimposed on the head contours to depict the movement of groundwater in response to hydraulic gradients created during remedial pumping (Figures 20 and 21). The inferred extent of the 1,1-DCE plume is overlain with the flow vectors shown for the lower portion of the shallow zone. Even though 1,1-DCE is present over the entire thickness of the unconfined zone in the eastern portion of the site, this compound was not detected at a reporting limit of 1 µg/l in the baseline (December 2016) samples from the water table monitoring wells in the western portion of the site. Given this site-wide distribution of 1,1-DCE, the plume depicted in Figure 21 generally reflects concentrations in the predominately sand portions of the shallow zone. Based on the data evaluation, the groundwater inflow (or capture) area for the shallow recovery well system

appears to encompass the width of the 1,1-DCE plume in the shallow, unconfined zone (Figure 21). The inferred flow paths depicted in Figure 20 indicate 1,1-DCE and other dissolved VOCs in the upper portion of the unconfined zone will migrate towards the area around RW-1S. Comparison of hydraulic heads of monitoring wells MW-18 and MW-42 indicate a downward component of flow from the clayey unit to the underlying sand unit in response to remedial pumping. Any vertical leakage of VOC-containing groundwater would be captured as part of the inflow to well RW-2S and possibly RW-1S.

DEEP (CONFINED) ZONE

Figure 22 presents plots of time vs. drawdown for selected confined zone monitoring wells in the southern portion of the Site during the initial 8 days of continuous pumping from the deep groundwater recovery wells. The potentiometric surface for the confined portion of the aquifer appears to have been attained a steady-state condition approximately 1 day following the initiation of remedial pumping. The slightly higher steady-state drawdown measured in the monitoring wells surrounding the recovery wells reflects the greater withdrawal rates from this portion of the aquifer system.

Groundwater contour maps were generated to assess changes in the hydraulic head conditions in response to remedial pumping by the deep recovery wells. There are a couple of minor differences in the approach used to develop the head contours for the confined portion of the Lower Patapsco aquifer. First, given the greater thickness and less pronounced vertical heterogeneity compared to the unconfined hydrogeologic unit, a single contour map was prepared for each round of water level measurements using data from wells screened in the upper portion of this water-bearing zone. Second, due to the presence of monitoring wells in close proximity to deep recovery wells, water level data from the nearby monitoring wells, rather than the co-located recovery well piezometers, was utilized in determining the hydraulic head distribution.

The potentiometric surface contour map for the confined portion of the aquifer system under non-pumping conditions is provided in Figure 23. As with the shallow, unconfined hydrogeologic unit, evaluation of the head contours indicates groundwater flow paths consistent with previously collected rounds of data. Groundwater flow in the confined zone is to the south-southeast towards Maryland State Route 100.

Figures 24 and 25 depict the potentiometric surfaces 8 hours and approximately 2 days (March 31st), respectively, after the start of continuous pumping from the deep recovery wells. Comparison of the pre-pumping and pumping contour maps shows the creation of a well-developed, elongate hydraulic sink along the southern property boundary soon after the initiation of groundwater withdrawals from the deep recovery wells. The more pronounced drawdown around well RW-2D largely reflects the slightly higher pumping rate for this well (34 gpm) compared to recovery well RW-1D (28 gpm). Based on the specific capacity determined for RW-2D, the 6 gpm difference in the withdrawal rate would result in an additional 4.5-5 feet of drawdown in the aquifer around RW-2D. Aquifer heterogeneity and/or variations in leakage from the overlying shallow (unconfined) zone may also impart some influence on the observed drawdown in response to pumping. Based on the March 31, 2017 head contours, the decline in the potentiometric surface extends hydraulically upgradient more than 800 feet and downgradient more than 250 feet from the extraction points. Potentiometric surface contour maps for the confined portion of the Lower Patapsco aquifer after more than 2 weeks and 6 weeks of continuous pumping are provided in Figures 26 and 27, respectively. The head distributions, which can be presumed to reflect a steady state pumping condition, generally resemble the March 31, 2017, contour map showing the head distribution early the first week of groundwater withdrawal.

Groundwater flow vectors for a horizontally isotropic aquifer material were generated for the confined zone using the hydraulic head contours for the April 17, 2017, round of water level measurements. The flow paths associated with the inferred potentiometric contours, together with extent of the 1,1-DCE plume in the confined zone, are provided in Figure 28. Based on the flow paths in response to the hydraulic gradients created during pumping, the groundwater inflow (or capture) area for the deep recovery wells appears to encompass the inferred width of the 1,1-DCE plume in the confined portion of the Lower Patapsco aquifer.

In contrast to the shallow zone where the recovery wells fully penetrate the unconfined hydrogeologic unit, the deep recovery wells only partially penetrate the sandy aquifer material comprising the confined water-bearing zone. The hydraulic heads at monitoring well MW-41D, which is screened in the lower portion of the water-bearing sand deposits, were compared with the potentiometric surface contours to qualitatively evaluate the vertical hydraulic gradients in the vicinity of the recovery wells. Based on the water level measurements, the head for well MW-41D (82.5 to 83 feet MSL; see Table 6) are greater that the head value of approximately 78-79 feet MSL in the upper portion of the aquifer, thereby

indicating an upward vertical flow component within the confined zone. The upward movement of groundwater indicated by this head differential is sufficient to contain the entire vertical extent of the VOC plume.

4.5.6 GROUNDWATER SAMPLING RESULTS

WELL MW-45 ON WILLIAMS-SCOTSMAN PROPERTY

The groundwater sample collected in late March 2017 from MW-45 contained very low concentrations of 1,1-DCE (1.9 µg/l) and 1,4-dioxane (2.3 µg/l), which were both below the applicable Groundwater Cleanup Standards (Section 2.2). A copy of the certified laboratory report for the sample is included in Appendix D. The 1,1-DCE concentration in the well sample is consistent with the groundwater profiling data, which detected this compound at 4.2 µg/l at 27 feet bgs and non-detect (less than 1 µg/l) at 37 feet bgs. The well and groundwater profiling sampling results can be used to delineate the eastern extent of the site-related VOCs in the shallow, unconfined zone at the Site.

MAY 2017 SEMI-ANNUAL MONITORING EVENT

The analytical results for the site-related VOCs detected in the monitoring and recovery well samples are summarized in Table 14. A copy of the certified laboratory reports for the samples are included in Appendix D.

For the shallow (unconfined) zone, concentrations for the primary site-related VOCs in the recovery well samples are generally similar to the baseline (December 2016) results, with the minor variations believed to reflect the difference in the sampling method and operational status of the wells. Total VOC concentrations of greater than 2,000 µg/l were detected in the RW-1S and RW-2S samples, while significantly lower levels are present in the groundwater at RW-3S (Figure 29). The spatial variability in the VOC concentrations may be related the thicker clayey layer in the upper portion of the shallow zone near well RW-3S, which could have limited the vertical migration of COCs to the underlying sand deposits that are the primary source of water extracted by the recovery wells. Additional sampling data are needed to better discern changes in VOC levels in response to groundwater extraction by the shallow recovery wells. Some initial notes from a comparison of the baseline and May 2017 results include the following (Figure 29):

- Decrease in concentrations in samples for wells screened just below the water table in the eastern portion of the Site (e.g., MW-04 and MW-09);
- Increase in 1,4-dioxane concentrations in samples from wells screened in the upper clayey unit in the western portion of the Site (e.g., MW-05R and MW-38R); and
- Presence of detectable concentrations in the May 2017 sample from well MW-44.

No VOCs were detected at concentrations above the cleanup criteria in the samples from wells situated near the western Site boundary.

Total VOC concentrations were higher in the May 2017 samples from the deep recovery wells compared to the baseline data, although as indicated above, the apparent increase may simply reflect the sampling method and well status for each event. More importantly, the sampling data consistently indicate higher VOC levels in the samples for well RW-2D in the southeastern portion of the Site compared to RW-1D (Figure 30). Overall, the concentrations for the primary site-related VOCs are similar for the baseline and May 2017 groundwater samples collected from the monitoring wells. The only noticeable difference is a slight increase in concentrations in the samples from monitoring well MW-21D, which is close to recovery well RW-1D (Figure 30). Additionally, the VOC concentrations in the samples collected from well MW-41D in the lower portion of the confined aquifer remain below the cleanup criteria. This data supports the presence of an upward hydraulic gradient in response to the remedial pumping for the deep recovery wells.

5 CONCLUSIONS AND PLANNED ACTIVITIES

5.1 CONCLUSIONS

Remedial measures to address VOC-affected soil and groundwater at the Former Kop-Flex Facility Site are being performed pursuant to the requirements of the MDE Land Restoration Program and Consent Order between EMERSUB 16 and the USEPA. The corrective action was implemented to address risks associated with chlorinated VOCs and 1,4-dioxane in the vadose zone soil and groundwater on the property. The selected groundwater remedy described in the October 2015 RAP, which is referenced in Section VI of the Consent Order, comprised the installation and operation of a groundwater extraction and treatment system to provide both hydraulic containment and recovery of VOCs migrating in the aquifer system. The CMI Report was prepared to document the status of the groundwater corrective measures described in the RAP. The report also fulfills the groundwater Construction Completion Report requirement specified in Section 14.1 of the RAP. Information related to the corrective measures implemented by the property owner for the soil and soil vapor will be provided in a subsequent submittal.

The treatment equipment is comprised of an equalization tank to regulate flow from the recovery wells, bag filters for suspended solids removal, a metering pump for the addition of an iron sequestering agent, 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. Transfer pumps are used to transfer water through the treatment equipment. The extraction and treatment of VOC-contaminated groundwater from the multi-aquifer system was initiated on March 10, 2017, with continuous pumping operation commencing the end of March.

The System was operational 92% of the time from startup through end of second quarter 2017, with the only downtime occurring during the initial month of startup. All five recovery wells were operational during the periods of System operation. Over 10 million gallons of water were treated and discharged by the System from startup through end of second quarter 2017, at an average continuous flow rate of 72 gpm.

As detailed in Appendix G, an estimated 4.2 pounds (22.2 gallons) of 1,1,1-TCA, 8.5 pounds (51.2 gallons) of 1,1-DCA, and 30.5 pounds 1,1-DCE (160.5 gallons) were removed by the System from startup through June 30, 2017, which composes an estimated 43.3 pounds (233.9 gallons) of total chlorinated VOCs removed. An estimated 21.2 pounds (119.9 gallons) of 1,4-dioxane were also removed by the System from Startup through June 30, 2017. No VOCs or 1,4-dioxane were detected in the treatment system effluent samples at concentrations above the laboratory detection limits. The System results therefore indicate 100% treatment efficiency for VOCs and 1,4-dioxane, and the system is operating as designed. System monitoring results indicate the actual flow rate and VOC concentrations are below the design maximum flow rate and VOC concentrations inputted into the air emissions calculations in the RAP. This confirms the System air emissions are exempt from air monitoring requirements.

Groundwater level and quality data were gathered to evaluate System performance and effectiveness. Implementation of the monitoring program included the installation of shallow and deep monitoring wells on the newly developed property and the collection of water level and water quality data from the impacted aquifers.

All activities for evaluating the groundwater conditions have been implemented, except for the installation of the deep monitoring well on the adjacent Verizon property to the north of the Site. EMERSUB 16 is currently in negotiations with the property owner to gain access for the installation of this groundwater monitoring well.

Based on the data obtained during the initial system operation, the continued extraction of groundwater from the shallow and deep recovery wells at the current pumping rate should ensure the presence of capture zones of sufficient extent to remove VOC mass from the aquifer system and prevent any future off-property transport of site-related VOCs from the former Kop-Flex facility. Additional groundwater sampling data needs to be collected to more fully evaluate the influence of remedial pumping on the VOC plumes in the shallow (unconfined) and deep (confined) zones.

5.2 PLANNED ACTIVITIES

VOC-affected groundwater in both the shallow, unconfined hydrogeologic unit and confined portion of the Lower Patapsco aquifer will continue to be extracted from the recovery wells at the Site. The collection of impacted groundwater at the current pumping rates will effectively contain the VOC plumes in the aquifer system, thereby ensuring VOCs at concentrations above the cleanup criteria do not migrate further downgradient to Stony Run (unconfined zone) and off-property areas (confined zone). Treatment of the extracted groundwater will be performed in accordance with the process and procedures specified in the Operations & Maintenance Manual, to be provided to MDE under a separate cover, to ensure compliance with the effluent limitations in the discharge permit. System monitoring will continue in accordance with the RAP and NPDES permit. Based on the previous discharge monitoring results, no modification of the treatment system is deemed necessary.

WSP has begun implementing the water level and water quality monitoring activities specified in the approved GMP to gather data to evaluate the effectiveness of the hydraulic containment systems. Based on the GMP, quarterly water level data will be collected from the monitoring wells and recovery wells for the remainder of 2017 to verify effective plume capture by the hydraulic containment systems. If long-term changes to the pumping schedule are implemented, additional water level data may be obtained to evaluate the effect on the aquifer hydraulic response and associated plume capture. During the rest of 2017, the collection of groundwater quality data for the Site will be performed as follows:

— Recovery wells – quarterly

— Monitoring wells – semi-annual

For the shallow, unconfined zone, WSP proposes to include new well MW-45 on the Williams-Scotsman property to the monitoring network described in the approved GMP. Given the location of this well with respect to the site, groundwater samples will be collected on an annual basis to evaluate the water quality in the area east of the VOC plume. In addition, water levels will be measured at the same frequency as the other shallow monitoring wells in the groundwater level monitoring network.

As mentioned in Section 4.1, the non-execution of an access agreement with Verizon has prevented completion of the drilling and groundwater profiling activities on the Verizon facility property to the north of the Site during the implementation phase. EMERSUB 16 is continuing negotiations with Verizon to finalize an agreement allowing access to perform this field work. Upon execution of the access agreement, WSP and its drilling subcontractor will mobilize to the Verizon property to complete the required groundwater investigation activities.

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- WSP USA Corp. 2016c. Response Action Plan Addendum, Former Kop-Flex Facility, Hanover, Maryland. February 24.

7 ACROYNMS

AOC	Area of Concern
bgs	below ground surface
CMI	Corrective Measures Implementation
COAs	corrective action objectives
COC	chemical of concern
DCA	1,1-dichloroethane
DCE	1,1-dichloroethene
DNAPL	dense non-aqueous phase liquid
DPE	dual phase extraction
GAC	granular active carbon
GMP	Groundwater Monitoring Plan
gpm	gallons per minute
HDPE	high density polyethylene
MBAS	methylene blue active substances
MDE	Maryland Department of the Environment
NPDES	National Pollutant Discharge Elimination System
PCE	tetrachloroethene
PLC	process logic control
PVC	polyvinyl chloride
RAP	Response Action Plan
RCRA	Resource Conservation and Recovery Act
s.u.	standard units
SIM	selected iron monitoring
SOP	standard operating procedure
TCA	1,1,1-trichloroethane
TCE	trichloroethene
USEPA	U.S. Environmental Protection Agency
VOCs	volatile organic compounds

FIGURES

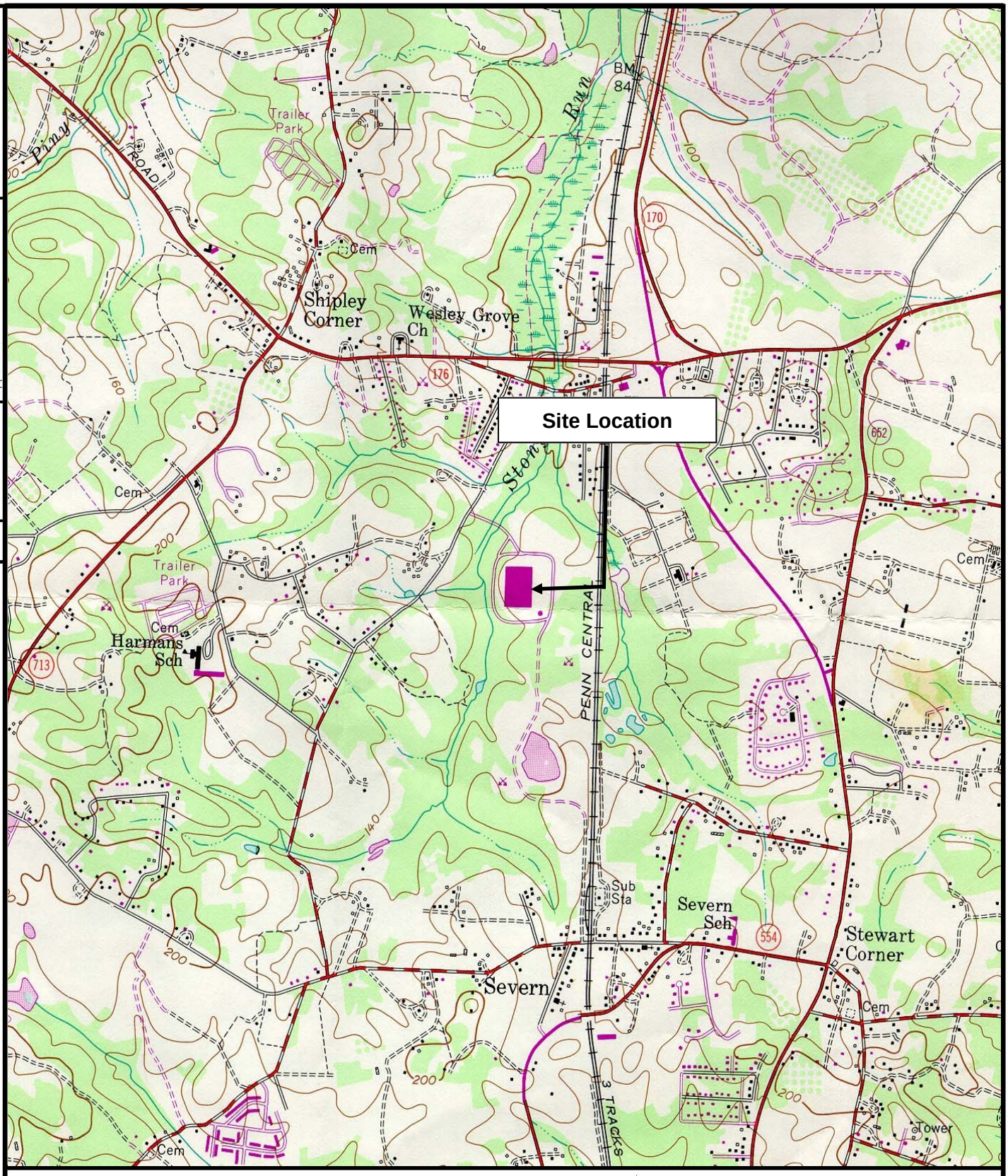
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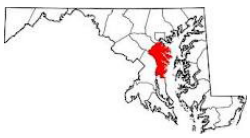
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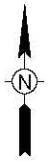
Drawn By:

A



REFERENCE:
7.5 MINUTE SERIES TOPOGRAPHIC QUADRANGLE
RELAY, MARYLAND
PHOTOREVISED 1974 SCALE 1:24,000





0 1000 2000 4000
SCALE, FEET

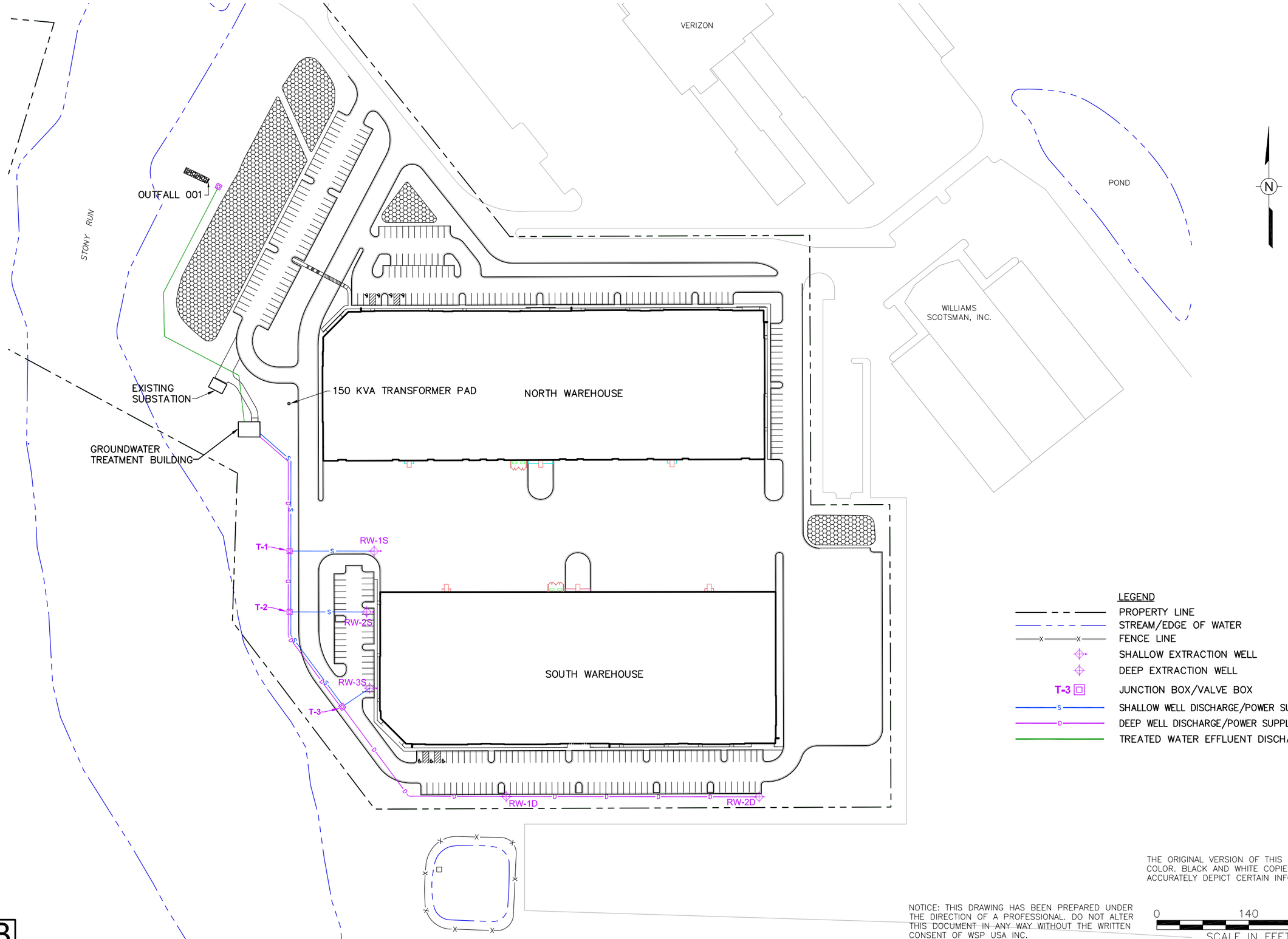
WSP USA
13530 Dulles Technology Drive
Suite 300, Herndon, Virginia 20171
(703) 709-6000

FIGURE 1

SITE LOCATION MAP

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI



Drawn By: EGC
Checked:
Approved: REJ 7/13/2017
DWG Name: 314V0390-047

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

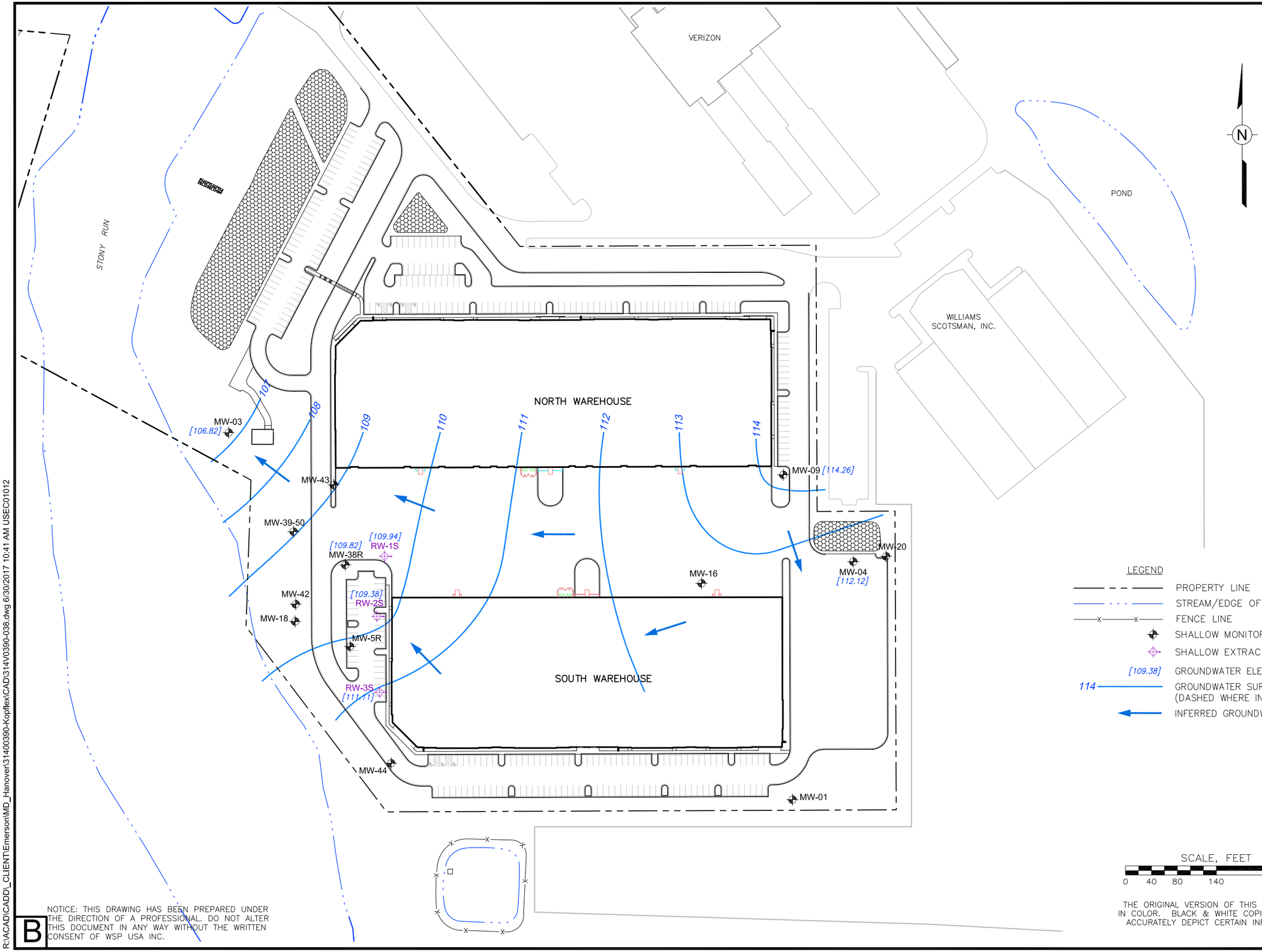
FIGURE 2

SITE PLAN WITH
HYDRAULIC CONTAINMENT SYSTEM

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

B

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FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 3

GROUNDWATER SURFACE CONTOUR MAP – DECEMBER 2016

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

VERIZON

POND

STONY RUN

WILLIAMS SCOTSMAN, INC.

MW-27D

[90.06] MW-23D

90

NORTH WAREHOUSE

MW-09

[89.19] MW-16D

89

MW-40 [88.96]

SOUTH WAREHOUSE

88

MW-22D [88.07]

MW-41D

87

MW-01D [86.59]

[88.50] MW-21D

RW-1D

RW-2D

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- DEEP MONITORING WELL
- DEEP EXTRACTION WELL
- [89.19] GROUNDWATER ELEVATION (FEET MSL)
- 89 GROUNDWATER SURFACE CONTOUR (DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW

SCALE, FEET

0 40 80 140 280

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FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 4

POTENTIOMETRIC SURFACE CONTOUR MAP FOR CONFINED LOWER PATAPSCO AQUIFER – DECEMBER 2016

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13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
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VERIZON

POND

STONY RUN

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

AOC 1

AOC 2

MW-27D
MW-23D
MW-03
MW-43
MW-09
MW-39
MW-38R
RW-1S
MW-42
MW-18
RW-2S
MW-5R
MW-40D
RW-3S
MW-16
MW-16D
MW-20
MW-04
MW-44
MW-41D
MW-22D
MW-21D
RW-1D
RW-2D
MW-01D
MW-01
MW-24D

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- SHALLOW EXTRACTION WELL
- DEEP EXTRACTION WELL
- SOURCE AREA SOIL EXCAVATION

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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

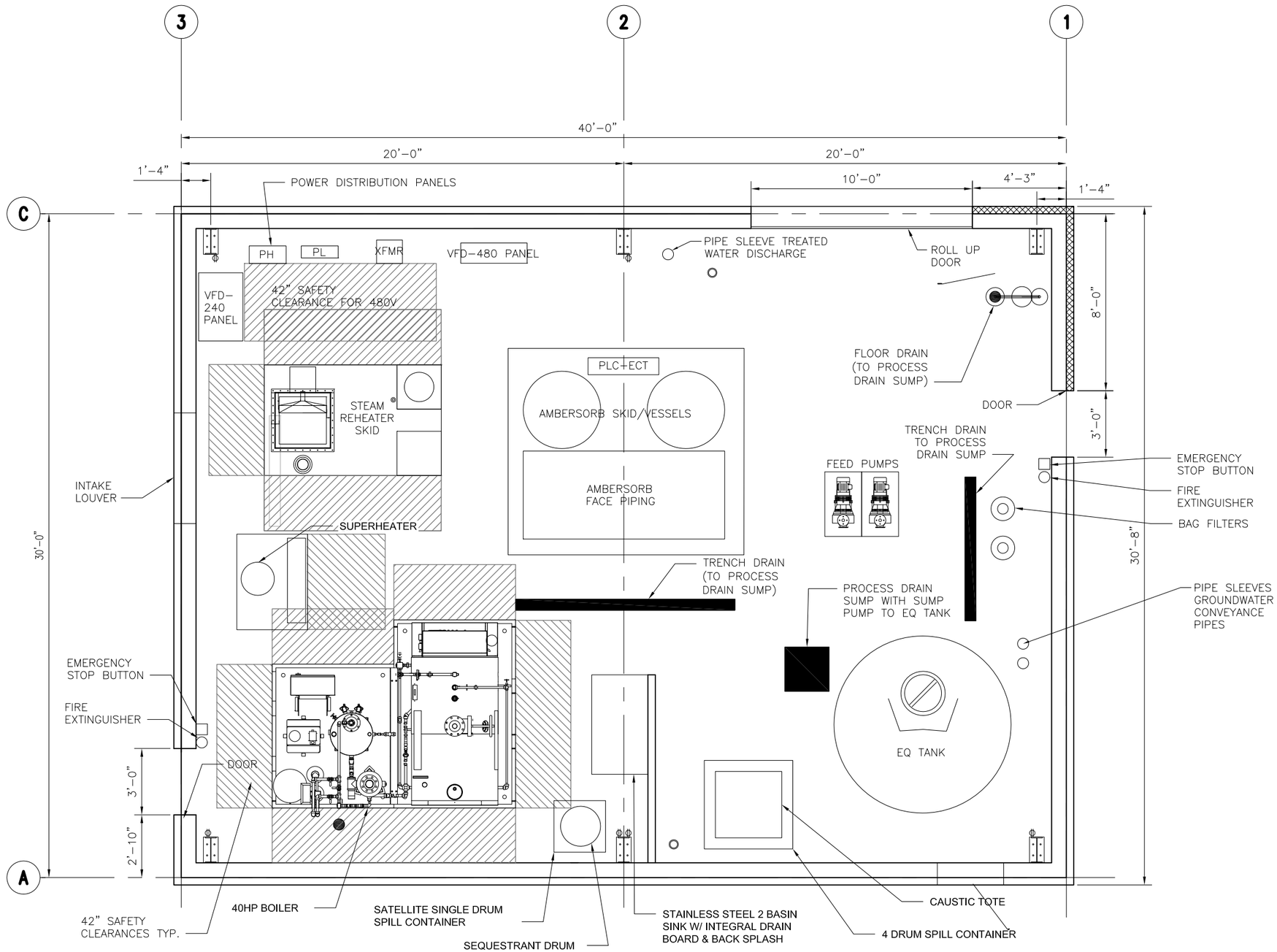
FIGURE 5

SOIL EXCAVATION AREAS IN AOC 1 AND AOC 2

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FORMER KOPFLEX FACILITY
HANOVER, MARYLAND
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

Figure 6

AS-BUILT FIRST FLOOR PLAN
GROUNDWATER COLLECTION AND
TREATMENT SYSTEM

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TEL: +1 703.709.6500

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VERIZON

POND

STONY RUN

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-27D
MW-23D
MW-03
MW-43
MW-09
MW-39
MW-38R
RW-1S
MW-42
RW-2S
MW-18
MW-5R
MW-40D
RW-3S
MW-44
MW-41D
MW-21D
RW-1D
RW-2D
MW-01D
MW-01
MW-22D
MW-45
MW-20
MW-04
MW-16
MW-16D
MW-24D

LEGEND

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

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PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 7

GROUNDWATER EXTRACTION WELL AND MONITORING WELL LOCATIONS

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SUITE 300
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TEL: +1 703.709.6500

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CONC. MON.

MW-27D

MW-07

MW-23D

MW-19

MW-03

LOCATION OF NEW
REMEDIATION SHED

MW-39

OW-2

MW-38

OW-1

TW-1

MW-18

MW-05

STONY RUN

MAIN
MANUFACTURING
BUILDING

MW-11

MW-10

MW-09

MW-15

MW-16

MW-16D

MW-2D

MW-02

MW-12

MW-14

MW-26D

MW-17

MW-17D

MW-06

MW-21D

TW-2

MW-01

MW-1D

MW-04

MW-20

MW-08

MW-22D

POND

WILLIAMS
SCOTSMAN, INC.

LEGEND

- SHALLOW MONITORING WELL
- SHALLOW MONITORING WELL DESIGNATED FOR ABANDONMENT
- LOWER PORTION OF SURFICIAL AQUIFER MONITORING WELL
- LOWER PORTION OF SURFICIAL AQUIFER MONITORING WELL DESIGNATED FOR ABANDONMENT
- DEEP MONITORING WELL
- DEEP MONITORING WELL DESIGNATED FOR ABANDONMENT
- OBSERVATION WELL/PIEZOMETER DESIGNATED FOR ABANDONMENT
- TEST WELL DESIGNATED FOR ABANDONMENT

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0 140 280
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B

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PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

Figure 8

WELLS AND PIEZOMETERS ABANDONED
AS PART OF PROPERTY REDEVELOPMENT

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VERIZON

STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03
ND

MW-43
171

MW-09
104

MW-39-50
1.7

MW-38R

RW-1S
957

MW-20
MW-04
173
1,020

MW-42
ND

MW-18
ND

RW-2S
971

MW-5R
ND

RW-3S
1.2

MW-16
26,200
7,000

MW-44
ND

MW-01
ND

700
70
7

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW MONITORING WELL
- SHALLOW EXTRACTION WELL
- 104 — 1,1-DCE CONCENTRATIONS (ug/l)
- 7 — 1,1-DCE ISO-CONCENTRATION CONTOUR (DASHED WHERE INFERRED)

SCALE, FEET

0 40 80 140 280

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HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 9

INFERRED 1,1-DCE DISTRIBUTION IN SHALLOW UNCONFINED GROUNDWATER ZONE

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SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

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VERIZON

POND

STONY RUN

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-27D
ND

MW-23D
140

MW-16D
254

MW-40D
18.1

MW-41D

MW-22D
31.5

MW-01D
375

MW-21D
23.4

RW-1D
39.3

RW-2D
257

MW-24D
701

7

70

700

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- DEEP MONITORING WELL
- DEEP EXTRACTION WELL
- 254 — 1,1-DCE CONCENTRATION (ug/l)
- 1,1-DCE ISO-CONCENTRATION CONTOUR

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HANOVER, MARYLAND

PREPARED FOR
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ST. LOUIS, MISSOURI

FIGURE 10

INFERRED 1,1-DCE DISTRIBUTION IN CONFINED LOWER PATAPSCO AQUIFER

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HERNDON, VA 20171
TEL: +1 703.709.6500

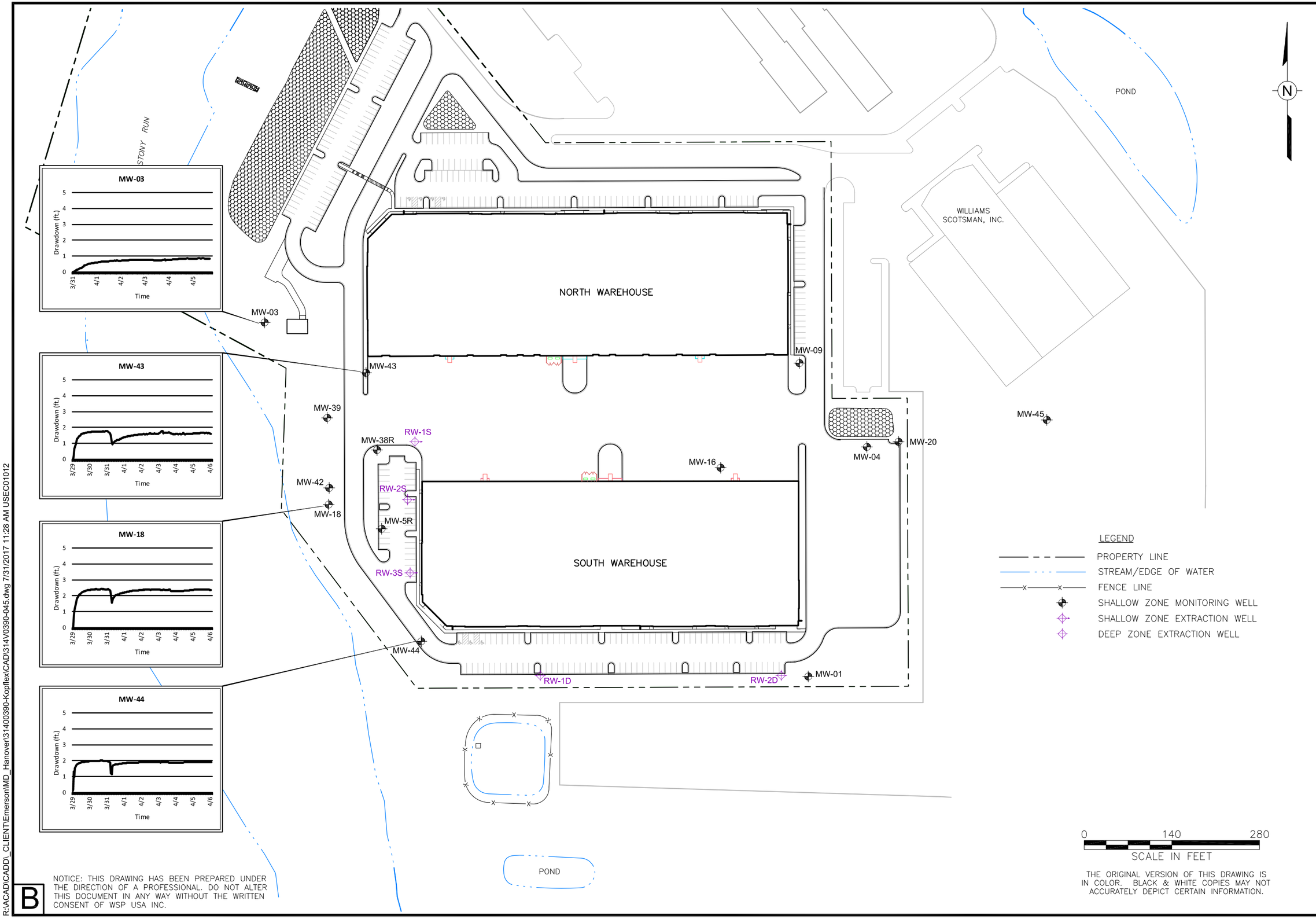


FIGURE 11

TIME vs. DRAWDOWN PLOTS FOR MONITORING WELLS SCREENED IN THE LOWER, SAND-RICH PORTION OF THE UNCONFINED ZONE IN THE WESTERN PORTION OF THE SITE – MARCH 29 – APRIL 6, 2017

FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

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Approved: KG
DWG Name: 314V0390-045

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SUITE 300
HERNDON, VA 20171
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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

107 108 109 110 111 112 113

MW-03 [106.77]

MW-39

MW-43

[113.80] MW-09

MW-38R [109.64]

RW-1S

MW-42 [109.64]

MW-18

RW-2S

MW-5R [110.01]

RW-3S

MW-16

MW-20

MW-04 [113.26]

MW-44

RW-1D

RW-2D

MW-01 [113.82]

POND

N

LEGEND

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

0 140 280
SCALE IN FEET

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HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 12

WATER TABLE CONTOUR MAP
FEBRUARY 1, 2017

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

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03

MW-43 [103.49]

MW-39 [103.64]

MW-38R

RW-1S [109.73]

MW-42

MW-18 [104.26]

RW-2S [109.48]

MW-5R

RW-3S [111.16]

MW-44 [111.85]

MW-09

MW-16 [112.88]

MW-04

MW-20 [113.16]

RW-1D

RW-2D

MW-01

105

107

109

111

113

POND

LEGEND

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

0 140 280

SCALE IN FEET

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HANOVER, MARYLAND
PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 13

PIEZOMETRIC SURFACE CONTOUR MAP
FOR LOWER PORTION OF SHALLOW ZONE
FEBRUARY 1, 2017

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

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03
105.86

MW-43
102.23

MW-39
102.03

RW-1S
105.20

MW-18
102.63

RW-2S
95.12

RW-3S
102.46

MW-44
109.89

MW-16
111.17

MW-20

104
105
106
107
108
109
110
111
99
100
101
102
103

N

LEGEND

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

0 140 280
SCALE IN FEET

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Approved: KG 7/12/2017
DWG Name: 3140390-032

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

FIGURE 14

GROUNDWATER SURFACE IN LOWER PORTION OF UNCONFINED ZONE AFTER 8 HOURS OF REMEDIAL PUMPING

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

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03
105.77

MW-43
101.89

MW-39
101.65

RW-1S
104.81

RW-2S
94.74

RW-3S
101.78

MW-18
102.21

MW-16
111.09

MW-20

MW-44
109.79

105
104
98
99
100
101
102
111
105
106
107
108
109
110

POND

LEGEND

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

0 140 280
SCALE IN FEET

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

FIGURE 15

GROUNDWATER SURFACE IN LOWER PORTION OF THE UNCONFINED ZONE (MARCH 31, 2017)

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13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

106 107 108 109 110 111 112 113

MW-09 113.62

MW-04 113.27

MW-38R 105.56

RW-1S

MW-42 106.35

RW-2S

MW-5R 107.03

RW-3S

MW-01 113.90

POND

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW MONITORING WELL
- SHALLOW EXTRACTION WELL
- 113.27 GROUNDWATER SURFACE ELEVATION (FEET MSL)
- GROUNDWATER SURFACE CONTOUR

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 16

GROUNDWATER SURFACE CONTOUR MAP
AFTER 2.5 WEEKS OF PUMPING
(APRIL 17, 2017)

WSP USA Inc.
13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03
106.70

MW-39
104.76

MW-43

RW-1S
102.30

RW-2S
94.36

RW-3S
101.67

MW-18
101.91

MW-44
109.87

MW-16
111.92

MW-45

MW-20

106
107
108
109
110
111
98
99
100
101
102
103
104
105

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- INTERMEDIATE MONITORING WELL
- SHALLOW EXTRACTION WELL
- 113.64 GROUNDWATER SURFACE ELEVATION (FEET MSL)
- GROUNDWATER 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 17

PIEZOMETRIC SURFACE IN THE LOWER PORTION OF SHALLOW (UNCONFINED) ZONE AFTER 2.5 WEEKS OF PUMPING (APRIL 17, 2017)

WSP USA Inc.
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SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

106

107

108

109

110

111

112

113

MW-09
113.76

MW-38R
105.44

RW-1S

MW-42
106.23

RW-2S

MW-5R
106.90

RW-3S

MW-04
113.49

MW-01
113.99

POND

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW MONITORING WELL
- SHALLOW EXTRACTION WELL
- 113.49 GROUNDWATER SURFACE ELEVATION (FEET MSL)
- GROUNDWATER 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 18

GROUNDWATER SURFACE CONTOUR MAP
AFTER APPROXIMATELY 6 WEEKS OF PUMPING
(MAY 8, 2017)

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SUITE 300
HERNDON, VA 20171
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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03
106.73

MW-43

MW-39
101.60

RW-1S
102.11

RW-2S
93.76

MW-18
101.82

RW-3S
100.94

MW-44
109.83

MW-45

MW-20
113.16

MW-16
112.19

98
100
102
104
106
108
110
112

POND

N

LEGEND

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

0 140 280
SCALE IN FEET

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HANOVER, MARYLAND
PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 19

PIEZOMETRIC SURFACE IN THE LOWER PORTION OF SHALLOW (UNCONFINED) ZONE AFTER APPROXIMATELY 6 WEEKS OF PUMPING (MAY 8, 2017)

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

106

107

108

109

110

111

112

113

MW-09
113.62

MW-04
113.27

MW-38R
105.56

RW-1S

RW-2S

MW-42
106.35

MW-5R
107.03

RW-3S

MW-01
113.90

POND

N

LEGEND

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

0 140 280
SCALE IN FEET

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FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND
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ST. LOUIS, MISSOURI

FIGURE 20

INFERRED GROUNDWATER FLOW PATHS IN THE UPPER PORTION OF THE UNCONFINED ZONE (APRIL 17, 2017)

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03
106.70

MW-43

MW-39
104.76

RW-1S
102.30

RW-2S
94.36

MW-18
101.94

RW-3S
101.67

MW-44
109.87

MW-16
111.92

MW-20

106
105
107
108
109
110
111
98
99
100
101
102
103
104
105

POND

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW ZONE MONITORING WELL
- SHALLOW ZONE EXTRACTION WELL
- 113.64 GROUNDWATER SURFACE ELEVATION (FEET MSL)
- GROUNDWATER SURFACE CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW VECTOR
- 1,1–DCE PLUME BOUNDARY (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 21

INFERRED GROUNDWATER FLOW PATHS IN THE LOWER PORTION OF THE UNCONFINED ZONE (APRIL 17, 2017)

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13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

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STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-27D

MW-23D

MW-16D

MW-40D

MW-41D

MW-22D

MW-01D

MW-21D

MW-24D

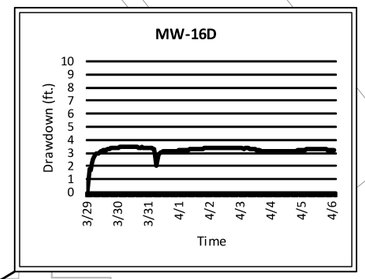
RW-1S

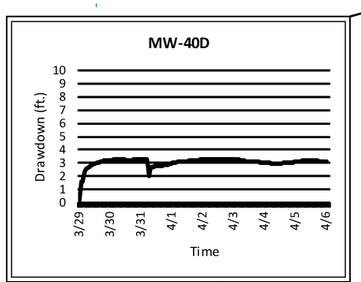
RW-2S

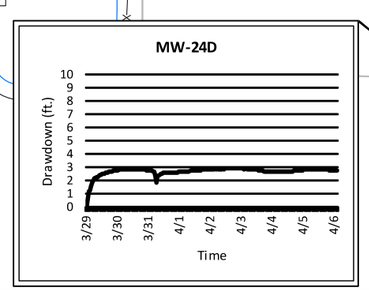
RW-3S

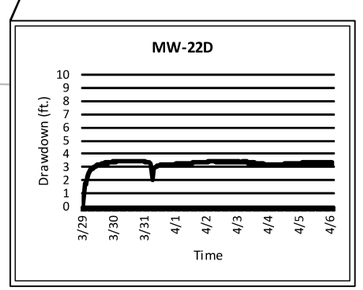
RW-1D

RW-2D









LEGEND

PROPERTY LINE

STREAM/EDGE OF WATER

FENCE LINE

DEEP ZONE MONITORING WELL

SHALLOW ZONE EXTRACTION WELL

DEEP ZONE EXTRACTION WELL

0 140 280

SCALE IN FEET

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HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 22

TIME vs. DRAWDOWN PLOTS FOR
DEEP (CONFINED) ZONE MONITORING WELLS
MARCH 29 – APRIL 6, 2017

WSP USA Inc.
13530 DULLES TECHNOLOGY DR
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STONY RUN

MW-27D

MW-23D
[90.46]

NORTH WAREHOUSE

POND

WILLIAMS
SCOTSMAN, INC.

RW-1S

RW-2S

RW-3S

MW-16D
[89.38]

MW-40D
[89.16]

SOUTH WAREHOUSE

MW-41D

MW-22D

[88.71]
MW-21D
RW-1D

[87.18]
MW-01D
RW-2D

MW-24D
[83.37]

POND

90
89
88
87
86
85
84

N

LEGEND

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

0 140 280
SCALE IN FEET

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FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND

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EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 23

POTENTIOMETRIC SURFACE CONTOUR MAP
FOR CONFINED ZONE OF LOWER
PATAPSCO AQUIFER – FEBRUARY 1, 2017

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

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STONY RUN

MW-27D

MW-23D
89.11

NORTH WAREHOUSE

POND

WILLIAMS
SCOTSMAN, INC.

N

89

88

87

86

85

84

83

82

MW-16D
86.82

MW-40D
86.92

SOUTH WAREHOUSE

MW-41D

MW-22D 85.65

MW-01D
73.06

MW-21D
79.17

RW-1D

RW-2D

76

77

78

79

80

81

MW-24D
81.47

POND

LEGEND

PROPERTY LINE

STREAM/EDGE OF WATER

FENCE LINE

DEEP (CONFINED) ZONE MONITORING WELL

DEEP EXTRACTION WELL

106.38 GROUNDWATER SURFACE ELEVATION (FEET MSL)

GROUNDWATER SURFACE CONTOUR
(DASHED WHERE INFERRED)

0 140 280

SCALE IN FEET

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FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND

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ST. LOUIS, MISSOURI

FIGURE 24

POTENTIOMETRIC SURFACE OF THE CONFINED PORTION OF THE LOWER PATAPSCO AQUIFER AFTER 8 HOURS OF REMEDIAL PUMPING

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HERNDON, VA 20171
TEL: +1 703.709.6500

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STONY RUN

MW-27D

MW-23D
88.81

NORTH WAREHOUSE

SOUTH WAREHOUSE

POND

WILLIAMS
SCOTSMAN, INC.

MW-16D
86.49

MW-40D
86.49

MW-41D

MW-22D
85.14

MW-21D
79.01

RW-1D

RW-2D

MW-01D
72.88

MW-24D
80.90

89
88
87
86
85
84
83
82
81
80
79
78
77
76
75

N

LEGEND

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

0 140 280
SCALE IN FEET

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FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND

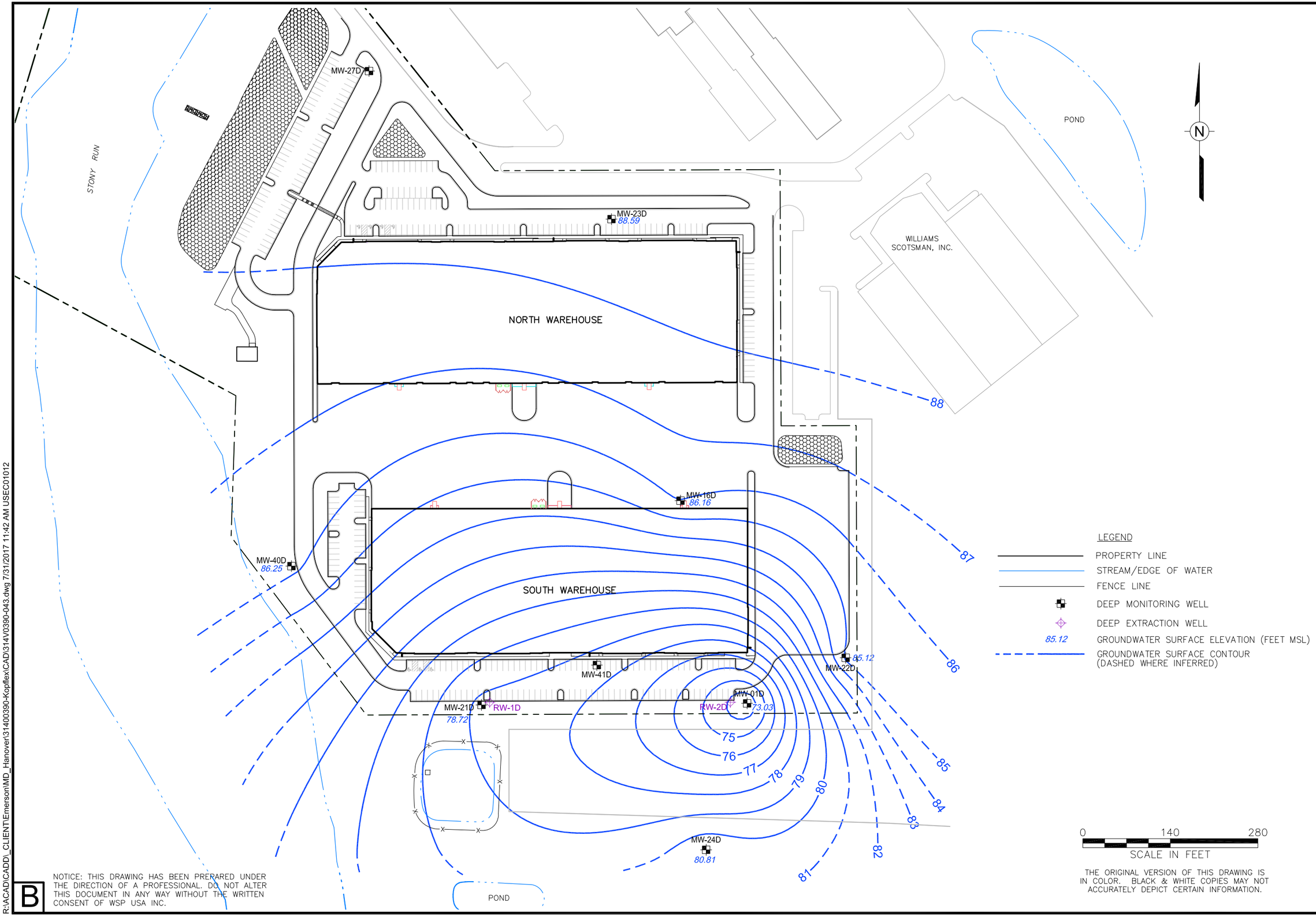
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ST. LOUIS, MISSOURI

FIGURE 25

POTENTIOMETRIC SURFACE OF THE CONFINED PORTION OF THE LOWER PATAPSCO AQUIFER (MARCH 31, 2017)

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

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DWG Name: 314V0390-043

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HANOVER, MARYLAND

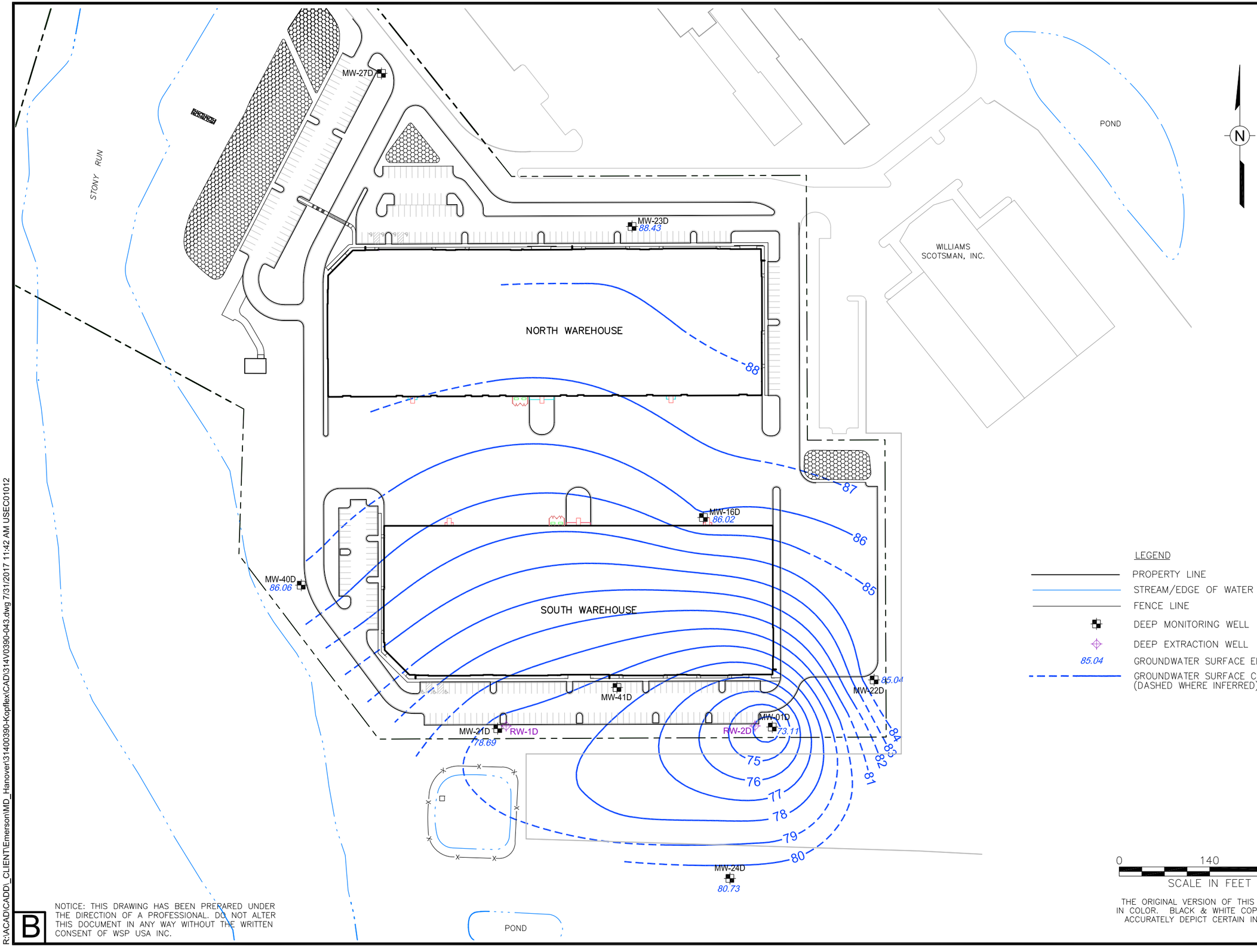
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EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 26

POTENTIOMETRIC SURFACE IN CONFINED PORTION OF THE LOWER PATAPSCO AQUIFER AFTER 2.5 WEEKS OF PUMPING (APRIL 17, 2017)

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13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

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Approved: RG
DWG Name: 314V0390-043

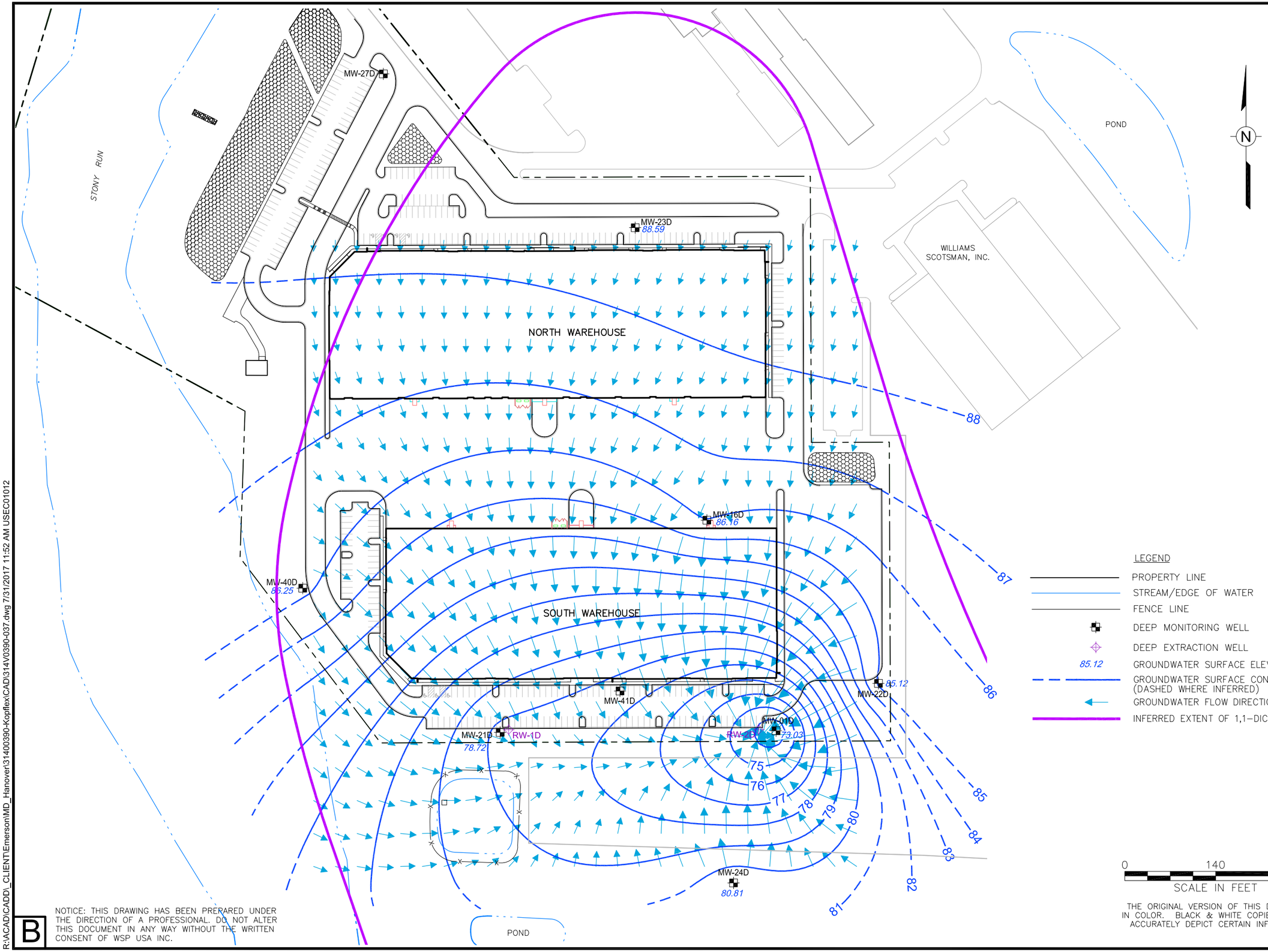
FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND
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ST. LOUIS, MISSOURI

FIGURE 27

POTENTIOMETRIC SURFACE CONTOUR MAP
FOR CONFINED ZONE OF LOWER
PATAPSCO AQUIFER – MAY 8, 2017

WSP USA Inc.
13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
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Checked: RJW 5/31/2017
Approved: KG
DWG Name: 314V0390-037

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FIGURE 28

INFERRED GROUNDWATER FLOW PATHS IN CONFINED PORTION OF THE LOWER PATAPSCO AQUIFER (APRIL 17, 2017)

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VERIZON

POND

STONY RUN

WILLIAMS
SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03

MW-43

MW-09

MW-39

MW-38R

RW-1S

MW-42

MW-18

RW-2S

MW-5R

RW-3S

MW-44

MW-01

MW-45

MW-20

MW-04

MW-16

MW-03	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	1 U	1 U
1,1-DCE	1 U	1 U
1,4-DIOXANE	4.6	2 U

MW-43	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	15.9	21.3
1,1-DCE	**171**	**177**
1,4-DIOXANE	**237**	**206**

RW-1S	Dec-16	May-17
1,1,1-TCA	59.3	35.5
1,1-DCA	**468**	**711**
1,1-DCE	**957**	**1,210**
1,4-DIOXANE	**1,420**	**1,370**

MW-39	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	1 U	1 U
1,1-DCE	1.7	1.1
1,4-DIOXANE	2.5	3

MW-38R	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	3.8	6
1,1-DCE	1 U	1 U
1,4-DIOXANE	**18.3**	**42.6**

MW-42	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	1 U	1 U
1,1-DCE	1 U	1 U
1,4-DIOXANE	4.8	8

MW-18	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	1 U	1 U
1,1-DCE	1 U	1 U
1,4-DIOXANE	2 U	2 U

RW-2S	Dec-16	May-17
1,1,1-TCA	**232**	**426**
1,1-DCA	**198**	**95.7**
1,1-DCE	**971**	**622**
1,4-DIOXANE	**1,190**	**949**

MW-5R	Dec-16	May-17
1,1,1-TCA	1.4	2.7
1,1-DCA	1 U	1.4
1,1-DCE	1 U	1.4
1,4-DIOXANE	**16.5**	**78.2**

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

MW-44	Dec-16	May-17
1,1,1-TCA	1 U	27.7
1,1-DCA	1 U	6.6
1,1-DCE	1 U	5.9
1,4-DIOXANE	2 U	**49.1**

MW-09	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	4.5	2.9
1,1-DCE	**104**	**63.8**
1,4-DIOXANE	**95.5**	**20.8**

MW-20	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	**99.7**	**161**
1,1-DCE	**173**	**286**
1,4-DIOXANE	**767**	**967**

MW-04	Dec-16	May-17
1,1,1-TCA	31.7	13
1,1-DCA	**259**	**103**
1,1-DCE	**1,020**	**459**
1,4-DIOXANE	**576**	**252**

MW-16	Dec-16	May-17
1,1,1-TCA	**4,390**	**8,930**
1,1-DCA	**6,420**	**7,910**
1,1-DCE	**26,200**	**10,500**
1,4-DIOXANE	**1,450**	**971**

LEGEND

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

MW-04	Dec-16	May-17
1,1,1-TCA	31.7	13
1,1-DCA	**259**	**103**
1,1-DCE	**1,020**	**459**
1,4-DIOXANE	**576**	**252**

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.

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SCALE IN FEET

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FIGURE 29

VOC CONCENTRATIONS IN BASELINE (DEC. 2016 AND JAN. 2017) AND SEMI-ANNUAL (MAY 2017) GROUNDWATER SAMPLES FROM SHALLOW ZONE RECOVERY AND MONITORING WELLS

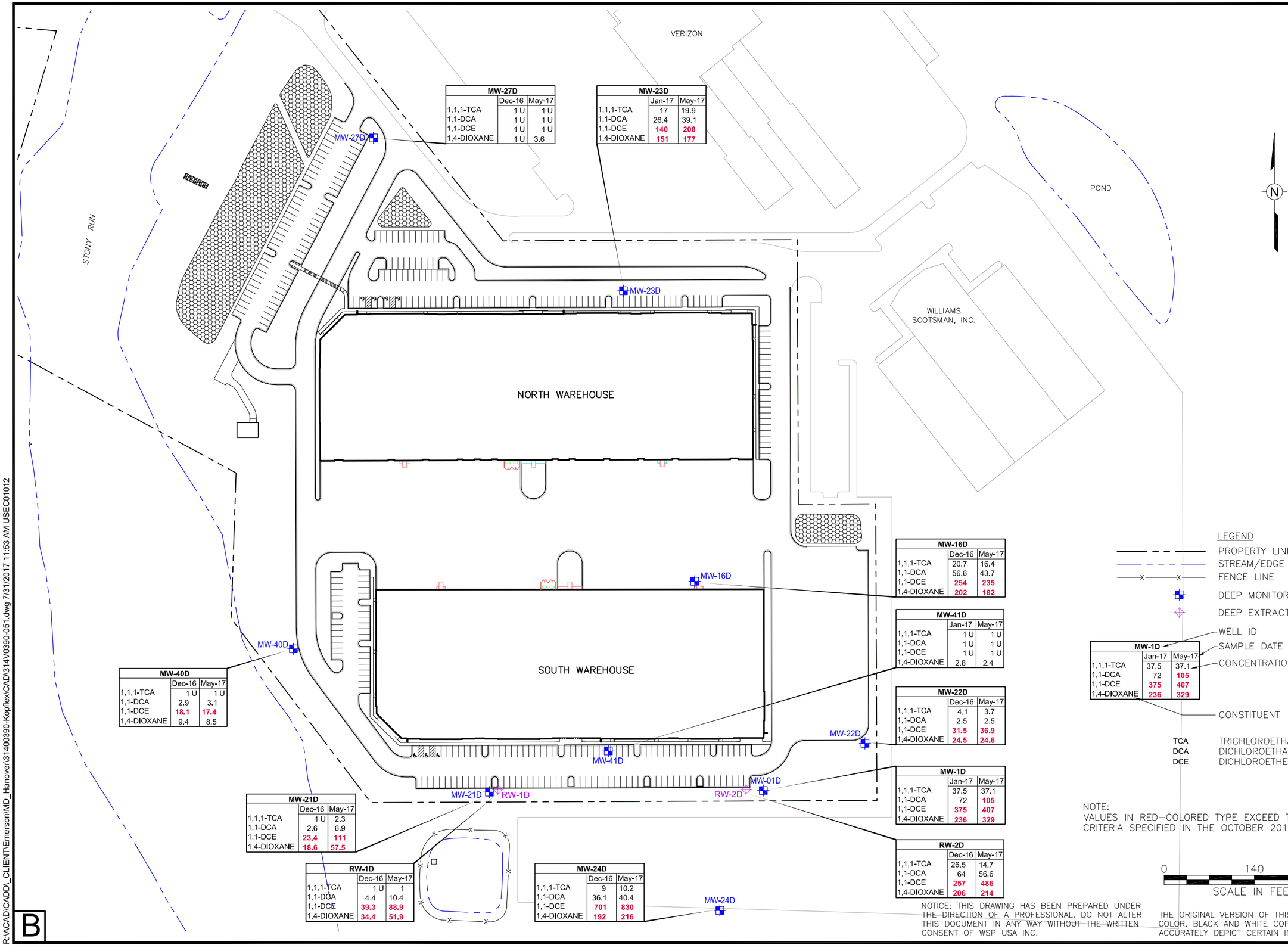
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HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

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Approved: REJ 7/26/2017
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MW-27D	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	1 U	1 U
1,1-DCE	1 U	1 U
1,4-DIOXANE	1 U	3.6

MW-23D	Jan-17	May-17
1,1,1-TCA	17	19.9
1,1-DCA	26.4	39.1
1,1-DCE	140	208
1,4-DIOXANE	151	177

MW-16D	Dec-16	May-17
1,1,1-TCA	20.7	16.4
1,1-DCA	56.6	43.7
1,1-DCE	254	235
1,4-DIOXANE	202	182

MW-41D	Jan-17	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	1 U	1 U
1,1-DCE	1 U	1 U
1,4-DIOXANE	2.8	2.4

MW-22D	Dec-16	May-17
1,1,1-TCA	4.1	3.7
1,1-DCA	2.5	2.5
1,1-DCE	31.5	36.9
1,4-DIOXANE	24.5	24.6

MW-1D	Jan-17	May-17
1,1,1-TCA	37.5	37.1
1,1-DCA	72	105
1,1-DCE	375	407
1,4-DIOXANE	236	329

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

MW-40D	Dec-16	May-17
1,1,1-TCA	1 U	1 U
1,1-DCA	2.9	3.1
1,1-DCE	18.1	17.4
1,4-DIOXANE	9.4	8.5

MW-21D	Dec-16	May-17
1,1,1-TCA	1 U	2.3
1,1-DCA	2.6	6.9
1,1-DCE	23.4	111
1,4-DIOXANE	18.6	57.5

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

MW-24D	Dec-16	May-17
1,1,1-TCA	9	10.2
1,1-DCA	36.1	40.4
1,1-DCE	701	830
1,4-DIOXANE	192	216

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

MW-1D	Jan-17	May-17
1,1,1-TCA	37.5	37.1
1,1-DCA	72	105
1,1-DCE	375	407
1,4-DIOXANE	236	329

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.

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SCALE IN FEET

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FORMER KOP-FLEX FACILITY SITE
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ST. LOUIS, MISSOURI

FIGURE 30

VOC CONCENTRATIONS IN BASELINE (DEC. 2016 AND JAN. 2017) AND SEMI-ANNUAL (MAY 2017) GROUNDWATER SAMPLES FROM DEEP ZONE RECOVERY AND MONITORING WELLS

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TABLES

Table 1

Recovery Well Schedule and Pump Installation Details
Former Kop-Flex Facility
Hanover, MD

Location ID	Installation Date	Total Borehole Depth (ft- bgs)	RECOVERY WELL					PIEZOMETER				
			Diameter and Material	Screen Type	Screened Interval (ft-bgs)	Recovery Pump Model	Pump Installation Depth (ft-bgs)	Diameter and Material	Screen Type	Screened Interval (ft-bgs)		
RW-1S	9/12/2016	62	4" Sch.40 PVC	4" Sch.40 PVC Screen, 0.010" slot size	27 - 62	Grundfos 5SQE-90	50	1" Sch. 40 PVC	1" Sch. 40 PVC, 0.020" slot size	27	-	62
RW-2S	9/11/2016	60.5	4" Sch.40 PVC	4" Sch.40 PVC Screen, 0.010" slot size	25.5 - 60.5	Grundfos 5SQE-90	50	1" Sch. 40 PVC	1" Sch. 40 PVC, 0.020" slot size	25.5	-	60.5
RW-3S	9/10/2016	62	4" Sch.40 PVC	4" Sch.40 PVC Screen, 0.010" slot size	27 - 62	Grundfos 5SQE-90	50	1" Sch. 40 PVC	1" Sch. 40 PVC, 0.020" slot size	27	-	62
RW-1D	9/9/2016	126	6" Sch.80 PVC	6" Sch.80 PVC Screen, 0.020" slot size	86 - 126	Grundfos 45S20-5	90	1" Sch. 80 PVC	1" Sch. 40 PVC, 0.020" slot size	86	-	126
RW-2D	8/24/2016	147	6" Sch.80 PVC	6" Sch.80 PVC Screen, 0.020" slot size	105.5 - 146	Grundfos 45S20-5	90	1" Sch. 80 PVC	1" Sch. 40 PVC, 0.020" slot size	106	-	146

a/ ft-bgs = feet below ground surface; PVC = polyvinyl chloride; " = inch

Table 2

Recovery Well Yield Testing
Former Kop-Flex Facility
Hanover, MD

Location ID	Test Date	Pre-pumping Depth to Water (ft TOC)	Pumping Rate (gpm)	Drawdown (ft TOC)	Specific Capacity (gpm/ft)	Depth to Water at End of Pumping (ft TOC)
RW-1S	9/25/2016	15.0	4.5	5.3	0.85	20.3
RW-2S	9/25/2016	15.6	4.5	11.8	0.38	27.4
RW-3S	9/26/2016	15.5	4.5	6.9	0.65	22.4
RW-1D	9/27/2016	43.6	25	14.6	1.71	58.2
RW-2D	9/27/2016	48.7	25	19.7	1.27	68.3

a/ ft = feet; TOC = top of casing; gpm = gallons per minute;

Table 3

NPDES Permit Effluent Limits and Monitored Parameters
Former Kop-Flex Facility
Hanover, MD

	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				Frequency of Analysis	Sample Type
PARAMETER	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS		
Flow	Report	Report	gpd					1/month	Measured
Total Purgeable Organics						**100**	ug/l	1/month	Grab
BOD_5					**30**	**45**	mg/l	1/month	Grab
Dissolved Oxygen				**5**			mg/l	1/month	Grab
pH				**6.5**		**8.5**	s.u.	1/month	Grab
Total Suspended Solids (TSS)	Report (lbs/month)	2031 (lbs/year)	As noted		**30**	**45**	mg/l	1/month	Calculated
Total Zinc					**120**	**120**	ug/l	1/month	Grab
Dissolved Zinc						Report	ug/l	1/month	Grab
Total Copper					**9**	**13**	ug/l	1/month	Grab
Dissolved Copper						Report	ug/l	1/month	Grab
Total Nickel						470	ug/l	1/month	Grab
Dissolved Nickel						Report	ug/l	1/month	Grab
Total Lead						**65**	ug/l	1/month	Grab
Dissolved Lead						Report	ug/l	1/month	Grab
Hardness (as CaCO3)						Report	mg/l	1/month	Grab
Nitrogen, Total	Report (lbs/month)	Report (lbs/year)	As noted			Report	mg/l	1/quarter	Calculated
Ammonia (as N)						Report	mg/l	1/quarter	Grab
Nitrate-Nitrite (as N)						Report	mg/l	1/quarter	Grab
Organic Nitrogen (as N)						Report	mg/l	1/quarter	Grab

a/ gpd = gallons per day, lbs = pounds, ug/l= micrograms per liter; mg/l = milligrams per liter; s.u. = standard units

Table 4

Recovery Well Sampling for Resin Foulant Compounds
Former Kop-Flex Facility
Hanover, MD

Parameters	Well ID: / Sample Date:	RW-1S 1/25/17	RW-2S 1/25/17	RW-3S 1/25/17	RW-1D 1/25/17	RW-2D 1/23/17
	Method					
MBAS Surfactants (mg LAS/l)	SM 5540 C-11	0.020 U	0.045	0.023	0.020 U	0.045
Dissolved Organic Carbon (mg/l)	SM20 5310B	2.3	2.7	1.3	0.95	0.84
Total Organic Carbon (mg/l)	SM20 5310B	1.9	2.7	0.83	0.5 U	0.67
Tannin/Lignin (mg/l)		0.1	0.2	0.1 U	0.1 U	0.1 U
Total Petroleum Hydrocarbons - DRO (mg/l)	SW-846 8015C	0.11 U	0.11 U	0.10 U	0.11 U	0.11 U
Total Petroleum Hydrocarbons-GRO (mg/l)	SW-846 8015C	0.71	0.97	0.1 U	0.1 U	0.1
VCP Chlorinated Herbicides (µg/l)	SW-846 8151A					
2,4,5-TP (Silvex)		0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
2,4-D		1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Dalapon		4.6 U	4.6 U	4.6 U	4.6 U	4.6 U
Dinoseb		0.95 U	0.95 U	0.95 U	0.95 U	0.95 U
VCP Organochlorine Pesticides (µg/l)	SW-846 8081B					
4,4-DDD		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
4,4-DDE		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
4,4-DDT		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Aldrin		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Dieldrin		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Endosulfan I		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Endosulfan II		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Endosulfan sulfate		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Endrin aldehyde		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Endrin ketone		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Endrin		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Heptachlor epoxide		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Heptachlor		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Methoxychlor		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Toxaphene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
alpha-BHC		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
alpha-Chlordane		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
beta-BHC		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
delta-BHC		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
gamma-BHC (Lindane)		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
gamma-Chlordane		0.04 U	0.04 U	0.04 U	0.04 U	0.04 U

Table 4

Recovery Well Sampling for Resin Foulant Compounds
Former Kop-Flex Facility
Hanover, MD

Parameters	Well ID: / Sample Date:	RW-1S 1/25/17	RW-2S 1/25/17	RW-3S 1/25/17	RW-1D 1/25/17	RW-2D 1/23/17
	Method					
VCP Semivolatile Organic Compounds (µg/l)	SW-846 8270C					
1,2'-Dichlorobenzene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,3'-Dichlorobenzene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,4-Dichlorobenzene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,5-Trichlorophenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dimethylphenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrophenol		10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chlorophenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylnaphthalene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Methylphenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3&4-Methylphenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3,3-Dichlorobenzidine		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chloroaniline		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acenaphthylene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Anthracene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(a)anthracene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(a)pyrene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(b)fluoranthene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(g,h,i)perylene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(k)fluoranthene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bis(2-ethylhexyl)adipate		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbazole		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chrysene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Di-n-butyl phthalate		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibenz(a,h)anthracene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibenzofuran		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Diethyl phthalate		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Fluoranthene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Fluorene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorobenzene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachlorobutadiene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachlorocyclopentadiene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachloroethane		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Indeno(1,2,3-c,d)Pyrene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isophorone		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
N-Nitrosodi-n-propyl amine		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
N-Nitrosodiphenylamine		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Nitrobenzene		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Pentachlorophenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Phenol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Pyrene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Squalene (TIC)		5	5.4	5.0 U	5.1	5.0 U
bis(2-chloroethyl) ether		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
bis(2-chloroisopropyl) ether		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
bis(2-ethylhexyl) phthalate		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

Table 4

Recovery Well Sampling for Resin Foulant Compounds
Former Kop-Flex Facility
Hanover, MD

Parameters	Well ID: / Sample Date:	RW-1S 1/25/17	RW-2S 1/25/17	RW-3S 1/25/17	RW-1D 1/25/17	RW-2D 1/23/17
	Method					
VCP Volatile Organic Compounds (µg/l)	SW-846 8260B					
1,1,1-Trichloroethane		59	1300	1.9	1.0 U	31
1,1,2,2-Tetrachloroethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane		1.0 U	1.5	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane		690	220	9.7	5	80
1,1-Dichloroethene		1000	1300	10	37	250
1,2,4-Trimethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane		10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane		6.3	4.6	1.0 U	1.0 U	4.6
1,2-Dichloropropane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (MEK)		10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone		10 U	10 U	10 U	10 U	10 U
Benzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide		10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane		10	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform		1.0 U	1.0	1.0 U	1.0 U	1.0 U
Chloromethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl-t-Butyl Ether		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride		3.9	9.0	1.0 U	1.0 U	1.0 U
Styrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene		1.0 U	1.5	2.6	1.0 U	1.0 U
Trichloroethene		7.0	13	1.0 U	1.0	1.5
Vinyl chloride		1.3	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene		8.0	1.6	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m&p-Xylene		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
n-Butylbenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
n-Propylbenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

a/ U = not detected at a concentration above the method detection limit; mg/l = milligrams per liter; mg/l = micrograms per liter

Table 5

Surfactant Results
Former Kop-Flex Facility
Hanover, MD

	Sample Location			
Date Sampled	**Influent VSP-1**		**Carbon Effluent**	
03/13/17	0.02	U	0.02	U
03/15/17	0.02	U	0.02	U
03/20/17	0.02	U	0.02	U
03/23/17	0.10	U	0.10	U

a/ All concentrations in milligrams per liter
b/ U = Not detected at concentration above the method detection limit
c/ Granular Active Carbon removed on 3/28/2017

Table 6

Historical Water Level Data
Former Kop Flex Facility
Hanover, MD

		Date:	12/7/2016		2/1/2017		3/21/2017		4/7/2017		4/10/2017		4/13/2017		4/17/2017		5/1/2017		5/8/2017	
Well ID	**Zone**	**TOC elevation (ft MSL)**	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*	*Depth to Water (Ft BTOC)*	*Groundwater Elevation (ft MSL)*
MW-01	S	129.8	-	-	15.98	113.82	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
MW-03	S	113.6	6.78	106.82	6.83	106.77	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
MW-04	S	124.4	12.28	112.12	11.14	113.26	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
MW-5R	S	123.5	15.87	107.63	13.49	110.01	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
MW-09	S	125.1	10.84	114.26	11.30	113.80	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
MW-16	S	124.0	10.92	113.08	11.12	112.88	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
MW-18	S	125.1	20.77	104.33	20.84	104.26	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
MW-20	S	125.4	-	-	12.24	113.16	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
MW-38R	S	125.4	15.58	109.82	15.76	109.64	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
MW-39	S	124.6	-	-	20.96	103.64	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
MW-42	S	125.9	16.18	109.72	16.26	109.64	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
MW-43	S	122.8	19.25	103.55	19.31	103.49	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
MW-44	S	127.1	14.93	112.17	15.25	111.85	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
MW-45	S	126.7	-	-	-	-	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
RW-1S	S	122.9	12.96	109.94	13.17	109.73	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
RW-2S	S	123.5	14.12	109.38	14.02	109.48	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
RW-3S	S	125.4	14.29	111.11	14.24	111.16	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
MW-1D	D	129.4	42.81	86.59	42.22	87.18	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
MW-16D	D	124.1	34.91	89.19	34.72	89.38	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
MW-21D	D	126.3	37.8	88.50	37.59	88.71	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
MW-22D	D	128.9	40.78	88.07	40.49	88.36	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
MW-23D	D	125.2	35.14	90.06	34.74	90.46	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
MW-24D	D	129.1	46.3	82.80	45.73	83.37	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
MW-27D	D	117.2	29.66	87.54	26.78	90.42	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
MW-40D	D	124.1	35.14	88.96	34.94	89.16	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
MW-41D	D	127.1	41.98	85.12	41.44	85.66	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
RW-1D	D	126.9	38.53	88.37	38.19	88.71	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
RW-2D	D	127.4	42.31	85.09	41.62	85.78	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

a/ S= Shallow Zone, D= Deep Zone; ft MSL = feet above mean sea level; ft BTOC = feet below top of casing

Table 7

Baseline Groundwater Elevations and Sampling Depths (December 2016 to January 2017)
Former Kop-Flex Facility
Hanover, MD

Well ID	Top of Casing Elevation (ft MSL)	Depth To Water (ft BGS)	Groundwater Elevation (ft MSL)	Well Depth (ft BGS)	Well Screened Interval (ft BGS)	Pump Intake Depth (ft BGS)	HydraSleeve Deployment Depth (ft BGS)	HydraSleeve Sample Interval (ft BGS)
MONITORING WELLS								
Shallow (Unconfined) Zone								
MW-03	113.6	6.78	106.82	21.7	11.7-21.7	NA	20.2	17.7-20.2
MW-04	124.4	12.28	112.12	34.3	24.3-34.3	NA	32.5	30-32.5
MW-5R	123.5	15.87	107.63	33	23-33	NA	31.5	29-31.5
MW-09	125.1	10.84	114.26	25	15-25	NA	20	17.5-20
MW-16	124.0	10.92	113.08	50.2	40.2-50.2	NA	45.2	42.7-45.2
MW-18	125.1	20.77	104.33	58.3	48.3-58.3	NA	56.5	54-56.5
MW-20	125.4	14.69	110.71	50	45-50	NA	46	44.5-46
MW-38R	125.4	15.58	109.82	33.3	23.3-33.3	NA	31.5	29-31.5
MW-39	124.6	20.92	103.68	54	44-54	NA	52.5	50-52.5
MW-42	125.9	16.18	109.72	33.2	23.2-33.2	NA	31.5	29-31.5
MW-43	122.8	19.25	103.55	47.5	37.5-47.5	NA	45.5	43-45.5
MW-44	127.1	14.93	112.17	42.8	32.8-42.8	NA	40.5	38-40.5
Deep (Confined) Zone								
MW-1D	129.4	42.81	86.59	112.2	102.2-112.2	NA	110.7	108.2-110.7
MW-16D	124.1	34.91	89.19	100.2	90.2-100.2	NA	95.2	92.7-95.2
MW-21D	126.3	37.8	88.50	106	96-106	NA	104.5	102-104.5
MW-22D (b)	128.9	40.78	88.12	114.9	104.9-114.9	NA	113.5	111-113.5
MW-23D	125.2	35.14	90.06	93.09	85-95	NA	93.5	91-93.5
MW-27D	117.2	29.66	87.54	117.3	107.3-117.3	NA	115.5	113-115.5
MW-40D	124.1	35.14	88.96	95.8	85.8-95.8	NA	93.5	91-93.5
MW-41D	127.1	41.98	85.12	164	154-164	NA	162.5	160-162.5
RECOVERY WELLS								
Shallow (Unconfined) Zone								
RW-1S	122.9	12.96	109.94	62	27-62	47	NA	NA
RW-2S	123.5	14.12	109.38	60.5	25.5-60.5	45	NA	NA
RW-3S	125.4	14.29	111.11	62	27-62	47	NA	NA
Deep (Confined) Zone								
RW-1D	126.9	38.53	88.37	126	86-126	106	NA	NA
RW-2D	127.4	42.31	85.09	145.6	105.6-145.6	107	NA	NA

a/ ft MSL = feet above mean sea level; ft BGS = feet below ground surface
NA = not applicable

b/ Well cover was damaged during construction and a small amount of sediment entered the casing.
The well will be redeveloped to remove the sediment in the near future.

Table 8

Monitoring and Recovery Wells Sampling Event (December 2016 - January 2017)
Former Kop Flex Facility
Hanover, MD

		Shallow Monitoring Wells																				Shallow Recovery Wells					
	Well ID:	**MW-03**		**MW-04**		**MW-5R**		**MW-09**		**MW-16**		**MW-200 (c)**		**MW-18**		**MW-20**		**MW-38R**		**MW-39**		**MW-42**		**MW-43**		**MW-44**		**RW-1S**		**RW-2S**		**RW-3S**	
Parameters	**Groundwater Cleanup Standards (µg/L) (b)**	12/8/2016		12/7/2016		12/7/2016		12/8/2016		12/8/2016		12/8/2016		12/7/2016		12/7/2016		12/7/2016		12/7/2006		12/7/2016		12/7/2016		12/7/2016		12/6/2016		12/6/2016	
Volatile Organic Compounds (US EPA Method 8260)																															
1,1,1-Trichloroethane	200	1.0	U	31.7		1.4		1.0	U	**4,390**		**4,330**		1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	59.3		**232**		1.4	
1,1-Dichloroethane	90	1.0	U	**259**		1.0	U	4.5		**6,420**		**6,060**		1.0	U	**99.7**		3.8		1.0	U	1.0	U	15.9		1.0	U	**468**		**198**		4.6	
1,1-Dichloroethene	7	1.0	U	**1,020**		1.0	U	**104**		**26,200**		**24,500**		1.0	U	**173**		1.0	U	1.7		1.0	U	**171**		1.0	U	**957**		**971**		**7.2**	
1,2-Dichloroethane	5	1.0	U	10	U	1.0	U	1.0	U	200	U	125	U	1.0	U	**5.1**		1.0	U	1.0	U	1.0	U	2.1		1.0	U	5	U	5	U	1.0	U
Chloroethane	3.6	1.0	U	10	U	1.0	U	1.0	U	200	U	125	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	5	U	5	U	1.0	U
cis-1,2-Dichloroethene	70	1.0	U	10	U	1.0	U	1.0	U	200	U	125	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	6.3		5	U	1.0	U
Tetrachloroethene	5	1.0	U	10	U	1.0	U	1.0	U	200	U	125	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	5	U	5.0	U	1.0	U
Trichloroethene	5	1.0	U	10	U	1.0	U	1.0	U	200	U	125	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	5	U	5	U	1.0	U
Vinyl chloride	2	1.0	U	10	U	1.0	U	1.0	U	200	U	125	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	5	U	5.0	U	1.0	U
Volatile Organic Compounds (US EPA Method 8260 - SIM)																															
1,4-Dioxane	15	4.6		**576**		**16.5**		**95.5**		**1,450**		**1,390**		2.0	U	**767**		**18.3**		2.5		4.8		**237**		2.0	U	**1,420**		**1,190**		5.9	

		Deep Monitoring Wells																		Deep Recovery Wells					
Parameters	**Groundwater Cleanup Standards (µg/L) (b)**	**MW-01D**		**MW-16D**		**MW-21D**		**MW-22D**		**MW-23D**		**MW-24D**		**MW-27D**		**MW-40D**		**MW-41D**		**RW-1D**		**RW-2D**		**MW-100 (c)**	
Volatile Organic Compounds (US EPA Method 8260)		1/2/2017		12/8/2016		12/7/2016		12/7/2016		1/2/2017		12/8/2016		12/7/2016		12/7/2016		1/2/2017		12/6/2016		12/6/2016		12/6/2016	
1,1,1-Trichloroethane	200	37.5		20.7		1.0	U	4.1		17.0		9.0		1.0	U	1.0	U	1.0	U	1.0	U	26.5		28.6	
1,1-Dichloroethane	90	72		56.6		2.6		2.5		26.4		36.1		1.0	U	2.9		1.0	U	4.4		64		66.5	
1,1-Dichloroethene	7	**375**		**254**		**23.4**		**31.5**		**140**		**701**		1.0	U	**18.1**		1.0	U	**39.3**		**257**		**278**	
1,2-Dichloroethane	5	4.7		2.9		1.0	U	1.0	U	1.0	U	**5.2**		1.0	U	1.0	U	1.0	U	1.0	U	3.3		3.3	
Chloroethane	3.6	1.0	U	2.0	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	2.0	U	2.0	U
cis-1,2-Dichloroethene	70	1.0	U	2.0	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	2.0	U	2.0	U
Tetrachloroethene	5	1.0	U	2.0	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	2.0	U	2.0	U
Trichloroethene	5	1.0	U	2.0	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	2.0	U	2.0	U
Vinyl chloride	2	1.0	U	2.0	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	2.0	U	2.0	U
Volatile Organic Compounds (US EPA Method 8260 - SIM)																									
1,4-Dioxane	15	**236**		**202**		**18.6**		**24.5**		**151**		**192**		1.0	U	9.4		2.8		**34.4**		**206**		**220**	

a/ ug/L = micrograms per liter; U = not detected above method detection limits; EPA = Environmental Protection Agency; SIM = selected ion method; VOCs= volatile organic compounds; SIM = selected ion method.
Results shown in **bold** and highlight exceed the comparison standard.
b/ Numeric cleanup standards from WSP's October 2, 2015, Response Action Plan, Revision 2.
c/ MW-200 is a duplicate of RW-1S; MW-100 is a duplicate of RW-2D

Table 9

Treated Water Flow and Mass Removal Summary
Former Kop Flex Facility
Hanover, MD

Year	Month	Total Volume Discharged (Gals)	Estimated VOCs Removed Mass (lbs)	Estimated VOCs Removed Volume (Gals)	Estimated 1,4-Dioxane Removed Mass (lbs)	Estimated 1,4-Dioxane Removed Volume (Gals)
2017	March	809,756	4.0	1.7	2.3	1.0
	April	3,084,170	15.0	34.9	7.7	19.4
	May	3,287,318	13.9	83.5	6.4	42.9
	June	3,039,318	10.4	113.8	4.8	56.6
	TOTAL:	10,220,563	43.3	233.9	21.2	119.9

a/ Gals = Gallons, lbs = pounds, VOCs = volatile organic compounds

Table 10

Influent Sample Data
Former Kop-Flex Facility
Hanover, MD

Analyte Name	Units	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
Volatile Organic Compounds (US EPA Method 8260)													
1,1,1-Trichloroethane	ug/L	71-55-6	200	55	150	92	81	82	62	55	49	41	39
1,1-Dichloroethane	ug/L	75-34-3	90	**180**	**200**	**110**	**140**	**150**	**140**	**140**	**120**	86	59
1,1-Dichloroethene	ug/L	75-35-4	7	**260**	**360**	**260**	**360**	**360**	**390**	**380**	**410**	**360**	**310**
1,2-Dichloroethane	ug/L	107-06-2	5	2	2	3	3	4	4	4	3	3	2.1
Chloroethane	ug/L	75-00-3	36	3	3	2	2	2	3	3	3	3	2.7
cis-1,2-Dichloroethene	ug/L	156-59-2	70	2	2	1	2	2	3	3	2	2	1.4
Tetrachloroethene	ug/L	127-18-4	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	ug/L	79-01-6	5	2	3	2	3	3	3	3	3	3	2.2
Vinyl Chloride	ug/L	75-01-4	2	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
Volatile Organic Compounds (US EPA Method 8260 - SIM)													
1,4-Dioxane	ug/L	71-55-6	15	**250**	**440**	**360**	**330**	**340**	**330**	**290**	**270**	**220**	**190**

a/ ug/L = micrograms per liter; EPA = Environmental Protection Agency; SIM = selected ion method; VOCs= volatile organic compounds; MBAS = methylene blue active substances
Results shown in highlight and **bold** exceed the comparison standard.

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 11

Lead Ambersorb Effluent Sample Data
Former Kop-Flex Facility
Hanover, MD

Analyte Name	Units	Cas#	Groundwater Cleanup Standards (µg/L) (b)	Lead Ambersorb 03/13/2017		Lead Ambersorb 03/14/2017		Lead Ambersorb 3/15/2017		Lead Ambersorb 3/20/2017		Lead Ambersorb 3/23/2017		Lead Ambersorb 3/29/2017		Lead Ambersorb 4/3/2017		Lead Ambersorb 4/12/2017		Lead Ambersorb 4/19/2017	
Volatile Organic Compounds (US EPA Method 8260)																					
1,1,1-Trichloroethane	ug/L	71-55-6	200	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
1,1-Dichloroethane	ug/L	75-34-3	90	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
1,1-Dichloroethene	ug/L	75-35-4	7	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-Dichloroethane	ug/L	107-06-2	5	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
Chloroethane	ug/L	75-00-3	36	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
cis-1,2-Dichloroethene	ug/L	156-59-2	70	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
Tetrachloroethene	ug/L	127-18-4	5	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
Trichloroethene	ug/L	79-01-6	5	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
Vinyl Chloride	ug/L	75-01-4	2	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
		TOTAL VOCs:	-	ND		ND		ND		ND		ND		ND		ND		ND		ND	
Volatile Organic Compounds (US EPA Method 8260 - SIM)																					
1,4-Dioxane	ug/L	71-55-6	15	1.0	U	1.0	U	1.0	U	1.0	U	2.1		1.0	U	**25.0**		1.0	U	2.4	

a/ ug/L = micrograms per liter; U = concentrations not detected above the method detection limit, ND = non-detect; EPA = Environmental Protection Agency; SIM = selected ion method; VOCs= volatile organic compounds
Results shown in highlight and **bold** exceed the comparison standard.

b/ Constituents of concern displayed have numeric cleanup standards from Section 6 of WSP's October 2, 2015, Response Action Plan, Revision 2.
All other constituents have numeric cleanup standards generated from 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

Table 12

NPDES Effluent Sample Data
Former Kop-Flex Facility
Hanover, MD

Analyte Name	Units	Sample ID: / Date: / Cas#	Effluent VSP-4 03/13/2017		Effluent VSP-4 3/20/2017		Effluent VSP-4 3/29/2017		Effluent VSP-4 3/30/2017	Effluent VSP-4 4/3/2017		Effluent VSP-4 5/8/2017		Effluent VSP-4 6/21/2017	
Volatile Organic Compounds (US EPA Method 624)															
1,1,1-Trichloroethane	ug/L	71-55-6	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
1,1-Dichloroethane	ug/L	75-34-3	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
1,1-Dichloroethene	ug/L	75-35-4	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
1,2-Dichloroethane	ug/L	107-06-2	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
Chloroethane	ug/L	75-00-3	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
Tetrachloroethylene	ug/L	127-18-4	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
Trichloroethene	ug/L	79-01-6	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
Vinyl Chloride	ug/L	75-01-4	5.0	U	5.0	U	5.0	U	NA	5.0	U	5.0	U	5.0	U
		TOTAL VOCs:	ND		ND		ND		ND	ND		ND		ND	
Total Metals and Hardness															
Calcium	ug/L	7440-70-2	28,600		3,650		3,400		NA	2,840		NA		3,440	
Copper	ug/L	7440-50-8	1.0	U	1.0	U	1.0	U	NA	3.2		4.7		4.3	
Hardness (Ca & Mg)	mg/L	HARDCAMG	91		15		14		NA	12		15		14	
Lead	ug/L	7439-92-1	1.0	U	1.0	U	1.0	U	NA	1	U	1	U	1.0	U
Magnesium	ug/L	7439-95-4	4,690		1,470		1,260		NA	1,220		NA		1,400	
Nickel	ug/L	7440-02-0	1.5		29.9		2.6		NA	7.7		9.4		9.2	
Zinc	ug/L	7440-66-6	20	U	179		27.2		NA	24.7		20.2		20	U
Dissolved Metals															
Copper	ug/L	7440-50-8	1.0	U	1.0	U	1.0	U	NA	1.4		3.5		1.9	
Lead	ug/L	7439-92-1	1.0	U	1.0	U	1.0	U	NA	1.0	U	1.0	U	1.0	U
Nickel	ug/L	7440-02-0	1.0	U	27.3		2.5		NA	8		9.3		9.3	
Zinc	ug/L	7440-66-6	20	U	163		20	U	NA	20	U	20	U	20	U
Total Suspended Solids															
Total Suspended Solids	mg/L	-	1.0	U	1.0	U	1.0	U	NA	1.0	U	1.0	U	2.0	U
Biological Oxygen Demand															
Biological Oxygen Demand, 5 Day	mg/L	-	2.0	U	2.0	U	3.0	U	NA	2.0	U	2.0	U	5.0	U
Field Parameters															
pH	S.U.	-	7.29		6.88		6.84		NA	6.56		6.72		7.05	
Dissolved Oxygen	mg/l	-	7.081		8.14		10.65		NA	7.35		11.05		13.50	
Flow Rate	gpd	-	43,200		93,600		108,000		NA	103,680		102,240		102,816	
Nitrogen (b)															
Nitrogen, Total	mg/l		NA		NA		NA		5.71		NA	37.44027631		NA	
Ammonia (as N)	mg/l	7664-41-7	NA		NA		NA		0.02	U	NA	0.02	U	NA	
Nitrate (as N)	mg/l	7727-37-9	NA		NA		NA		0.68		NA	0.91		NA	
Nitrite (as N)	mg/l	7727-37-9	NA		NA		NA		0.1	U	NA	0.1	U	NA	
Organic Nitrogen (as N)	mg/l	7727-37-9	NA		NA		NA		0.4	U	NA	0.4	U	NA	
Nitrogen, Total Kjeldahl	mg/l	7727-37-9	NA		NA		NA		0.4	U	NA	0.4	U	NA	

a/ NPDES = National Pollutant Discharge Elimination System; EPA = Environmental Protection Agency; NA = Not Available; U = Not detected at a concentration above the method detection limit; VOCs = Volatile Organic Compounds; mg/l = milligrams per liter; ug/l = micrograms per liter.

b/ Nitrogen sampled quarterly

Table 13

System Effluent Sample Data
Former Kop-Flex Facility
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)	
Volatile Organic Compounds (US EPA Method 8260)																					
1,1,1-Trichloroethane	71-55-6	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
1,1-Dichloroethane	75-34-3	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
1,1-Dichloroethene	75-35-4	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
1,2-Dichloroethane	107-06-2	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
Chloroethane	75-00-3	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
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	
Tetrachloroethene	127-18-4	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
Trichloroethene	79-01-6	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
Vinyl Chloride	75-01-4	NA		1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	1.0	U	1.0	U	NA	
	TOTAL VOCs:	NA		ND		ND		NA		ND		NA		ND		ND		ND		NA	
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

a/ VOCs were analyzed by Method 624 to fulfill the NPDES permit requirement. See NPDES monitoring table for results.

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

Table 14

Annual, Semi-Annual, Quarterly Sampling Event (May 2017)
Former Kop Flex Facility
Hanover, MD

		Shallow Monitoring Wells												Shallow Recovery Wells			
	Well ID:	**MW-03**	**MW-04**	**MW-5R**	**MW-09**	**MW-16**	**MW-18**	**MW-20**	**MW-38R**	**MW-39**	**MW-42**	**MW-43**	**MW-44**	**RW-1S**	**MW-200 (c)**	**RW-2S**	**RW-3S**
Parameters	**Groundwater Cleanup Standards (µg/L) (b)**	5/1/2017	5/2/2017	5/1/2017	5/2/2017	5/2/2017	5/1/2017	5/2/2017	5/1/2017	5/1/2017	5/1/2017	5/1/2017	5/1/2017	5/1/2017	5/2/2017	5/1/2017	5/1/2017
Volatile Organic Compounds (US EPA Method 8260)																	
1,1,1-Trichloroethane	200	1.0 U	13.0	2.7	1.0 U	**8,930**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	27.7	35.5	31.3	**426**	1.0 U
1,1-Dichloroethane	90	1.0 U	**103**	1.4	2.9	**7,910**	1.0 U	**161**	6.0	1.0 U	1.0 U	21.3	6.6	**711**	**741**	**95.7**	1.0 U
1,1-Dichloroethene	7	1.0 U	**459**	1.4	**63.8**	**10,500**	1.0 U	**286**	1.0 U	1.1	1.0 U	**177**	5.9	**1,210**	**1,320**	**622**	1.2
1,2-Dichloroethane	5	1.0 U	4.0 U	1.0 U	1.0 U	100 U	1.0 U	**7.3**	1.0 U	1.0 U	1.0 U	2.1	1.0 U	10 U	10 U	5.0 U	1.0 U
Chloroethane	3.6	1.0 U	4.0 U	1.0 U	1.0 U	**225**	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	**25.5**	**24.6**	5.0 U	1.0 U
cis-1,2-Dichloroethene	70	1.0 U	4.0 U	1.0 U	1.0 U	100 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	10 U	10 U	5.0 U	1.0 U
Tetrachloroethene	5	1.0 U	4.0 U	1.0 U	1.0 U	100 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	10 U	10 U	5.00 U	1.0 U
Trichloroethene	5	1.0 U	4.0 U	1.0 U	1.0 U	100 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	10 U	10 U	**5.3**	1.0 U
Vinyl chloride	2	1.0 U	4.0 U	1.0 U	1.0 U	100 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	10 U	10 U	5.0 U	1.0 U
Volatile Organic Compounds (US EPA Method 8260 - SIM)																	
1,4-Dioxane	15	2.0 U	**252**	**78.2**	**20.8**	**971**	2.0 U	**967**	**42.6**	3.0	8.0	**206**	**49.1**	**1,370**	**1,000**	**949**	3.8

		Deep Monitoring Wells										Deep Recovery Wells	
		MW-1D	**MW-16D**	**MW-100 (c)**	**MW-21D**	**MW-22D**	**MW-23D**	**MW-24D**	**MW-27D**	**MW-40D**	**MW-41D**	**RW-1D**	**RW-2D**
Parameters	**Groundwater Cleanup Standards (µg/L) (b)**	5/1/2017	5/2/2017	5/2/2017	5/1/2017	5/1/2017	5/1/2017	5/2/2017	5/1/2017	5/1/2017	5/1/2017	5/1/2017	5/1/2017
Volatile Organic Compounds (US EPA Method 8260)													
1,1,1-Trichloroethane	200	37.1	16.4	17.3	2.3	3.7	19.9	10.2	1.0 U	1.0 U	1.0 U	1.0	14.7
1,1-Dichloroethane	90	**105**	43.7	46.5	6.9	2.5	39.1	40.4	1.0 U	3.1	1.0 U	10.4	56.6
1,1-Dichloroethene	7	**407**	**235**	**246**	**111**	**36.9**	**208**	**830**	1.0 U	**17.4**	1.0 U	**88.9**	**486**
1,2-Dichloroethane	5	**5.7**	2.9	2.8	1.4	1.0 U	2.4	**5.6**	1.0 U	1.0 U	1.0 U	1.0 U	4.5
Chloroethane	3.6	2.5 U	2.0 U	2.0 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
cis-1,2-Dichloroethene	70	2.5 U	2.0 U	2.0 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
Tetrachloroethene	5	2.5 U	2.0 U	2.0 U	1.0 U	1.0 U	2.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	4.0 U
Trichloroethene	5	2.5 U	2.0 U	2.0 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
Vinyl chloride	2	2.5 U	2.0 U	2.0 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U
Volatile Organic Compounds (US EPA Method 8260 - SIM)													
1,4-Dioxane	15	**329**	**182**	**202**	**37.5**	**24.6**	**177**	**216**	3.6	8.5	2.4	**51.9**	**214**

a/ ug/L = micrograms per liter; U = not detected above method detection limits; EPA = Environmental Protection Agency; SIM = selected ion method; VOCs= volatile organic compounds; SIM = selected ion method.
Results shown in **bold** and highlight exceed the comparison standard.
b/ Numeric cleanup standards from WSP's October 2, 2015, Response Action Plan, Revision 2.
c/ MW-200 is a duplicate of RW-1S; MW-100 is a duplicate of MW-16D.

A AS-BUILT DRAWINGS

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31400390-E-601	E-601	ELECTRICAL DETAILS
31400390-E-602	E-602	ELECTRICAL DETAILS

TITLE SHEET

GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR

EMERSON
ST. LOUIS, MISSOURI

D

REVISIONS

REV	DESCRIPTION			
1	ISSUED AS FINAL 07/31/2017	Revised:	Chkd:	Appr.:
1		Revised:	Chkd:	Appr.:
1		Revised:	Chkd:	Appr.:
1		Revised:	Chkd:	Appr.:

SEAL

STATE OF MARYLAND — JAMES KOSCHMIDER — 43361 — REGISTERED PROFESSIONAL ENGINEER

DATE 4/6/16

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TITLE SHEET

GROUNDWATER COLLECTION AND TREATMENT SYSTEM AS-BUILTS
FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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SHEET T-101

Drawing Number
314P0390-D15

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GENERAL REQUIREMENTS:

1. THE CONTRACTOR'S SCOPE OF WORK IS PROVIDED IN ENCLOSURE B OF THE REQUEST FOR PROPOSAL. THE SCOPE OF WORK CONSISTS OF INSTALLING COMPONENTS FOR A NEW GROUNDWATER TREATMENT SYSTEM. CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF WELL FIELD, INCLUDING WELL VAULTS AND TEE CLEANOUT/JUNCTION VAULTS, WATER TRANSFER PIPING, ELECTRICAL WIRING AND CONDUIT, WELL HEAD PIPING AND INSTRUMENTATION, SUBMERSIBLE PUMP, AND DOWNWELL TUBING. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE INSTALLATION OF ALL TREATMENT EQUIPMENT AND UTILITIES, AND EFFLUENT DISCHARGE PIPING FROM THE TREATMENT BUILDING TO THE DISCHARGE LOCATION AT STONY RUN. FABRICATION, DELIVERY, AND INSTALLATION OF THE TREATMENT EQUIPMENT BUILDING UNDERSLAB PIPING, AS WELL AS RECOVERY WELL INSTALLATION, SHALL BE COMPLETED BY OTHERS (TREATMENT BUILDING CONTRACTOR).

2. CONTRACTOR SHALL COORDINATE WITH TREATMENT BUILDING CONTRACTOR FOR THE CONNECTION OF INFLUENT GROUNDWATER CONVEYANCE PIPING AND ELECTRICAL LINES FROM THE RECOVERY WELL FIELD TO THE BUILDING, AS WELL AS THE CONNECTION OF EFFLUENT DISCHARGE PIPING FROM THE BUILDING TO THE DISCHARGE LOCATION AT STONY RUN.

3. PROPERTY REDEVELOPMENT IS ONGOING, AND ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THE SITE FEATURES DEPICTED ON THESE PLANS. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND DIMENSIONS OF UTILITIES BEFORE INITIATING WORK UNDER THIS CONTRACT.

4. CONTRACTOR SHALL VERIFY WITH ENGINEER THEIR PROPOSED STAGING AREAS FOR A CONSTRUCTION TRAILER, EQUIPMENT, AND MATERIALS.

5. PROPOSED LOCATIONS OF VAULTS AND SUBSURFACE PIPING SHALL BE MUTUALLY FIELD VERIFIED BY CONTRACTOR AND ENGINEER PRIOR TO STARTING WORK TO MINIMIZE DISRUPTION AND/OR DAMAGE TO SITE FEATURES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS BETWEEN PLANS AND ACTUAL FIELD CONDITIONS ARE DISCOVERED. ANY DEVIATIONS FROM THE SPECIFICATIONS IN THESE PLANS ARE TO BE REVIEWED AND APPROVED BY ENGINEER BEFORE IMPLEMENTATION OF SUCH DEVIATIONS.

6. CONTRACTOR IS RESPONSIBLE FOR PERFORMING WORK IN A MANNER THAT COMPLIES WITH LOCAL GOVERNMENT, CITY OR COUNTY LAWS AND ORDINANCES. THE FOLLOWING PERMITS WILL BE OBTAINED BY WSP IN ADVANCE OF CONSTRUCTION: NPDES WATER DISCHARGE PERMIT, WATER APPROPRIATION AND USE PERMIT, BUILDING PERMIT FOR TREATMENT BUILDING CONSTRUCTION, AND WELL CONSTRUCTION PERMITS. CONTRACTOR SHALL COORDINATE AND OBTAIN ANY ADDITIONAL PERMITS REQUIRED TO COMPLETE THE CONSTRUCTION SCOPE OF WORK.

7. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF THE PERSONS OR PROPERTY. THE CONTRACTOR SHALL INSTALL AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL SAFEGUARDS NECESSARY FOR THE SAFETY AND PROTECTION OF THEIR EMPLOYEES AS REQUIRED IN ACCORDANCE WITH THESE LAWS.

8. ALL WORK WILL OCCUR ON A PRIVATE PROPERTY. CONTRACTOR SHALL ESTABLISH AND MAINTAIN, IN COORDINATION WITH THE ENGINEER AND OWNER, EQUIPMENT TRAFFIC PATTERNS WHICH BOTH MINIMIZE DISTURBANCE OF DAILY OPERATIONS OF THE OWNER FACILITY AND FACILITATE EFFICIENT PERFORMANCE OF WORK. WHEN WORKING WITHIN AN ACTIVE DRIVEWAY, CONTRACTOR SHALL MAINTAIN ONE OPEN LANE FOR PASSING VEHICLES. CONTRACTOR SHALL ALSO PROVIDE TRAFFIC CONTROLS AS NECESSARY.

9. ALL MATERIALS AND EQUIPMENT REQUIRED FOR PERFORMANCE OF WORK SHALL BE STAGED IN AREAS APPROVED BY ENGINEER AND OWNER.

10. ALL SURFACES, UTILITIES, AND STRUCTURES LOCATED OUTSIDE THE DESIGNATED WORK AREAS THAT ARE DAMAGED OR DESTROYED AS A RESULT OF CONTRACTOR'S OR CONTRACTOR'S SUBCONTRACTOR'S ACTIONS PERFORMED UNDER THIS CONTRACT SHALL BE RESTORED TO PRE-EXISTING CONDITIONS SOLELY AT CONTRACTOR'S EXPENSE IN A TIMELY MANNER.

11. CONSTRUCTION DEBRIS, WASTE MATERIALS, PACKAGING MATERIAL AND THE LIKE SHALL BE REMOVED FROM THE WORK SITE DAILY. ANY DIRT OR MUD WHICH IS TRACKED ONTO PAVED OR SURFACED ROADWAYS SHALL BE CLEANED IMMEDIATELY. STORED MATERIAL NOT IN TRAILERS SHALL BE NEATLY STACKED WHEN STORED.

12. ALL WASTE MATERIALS GENERATED FROM THE COMPLETION OF THE WORK SPECIFIED IN THESE PLANS SHALL BE TRANSPORTED AND DISPOSED AT OFFSITE FACILITIES, APPROVED BY ENGINEER AND OWNER, IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.

13. UPON COMPLETION OF THE PROJECT AND AFTER REMOVAL OF ALL EQUIPMENT AND MATERIALS, DISTURBED AREAS OUTSIDE DRIVEWAY (E.G., GRASS AREAS) SHALL BE RESTORED TO THE ORIGINAL CONDITION. SURFACE RESTORATION IS NOT REQUIRED FOR AREAS WITHIN DRIVEWAY (E.G., ASPHALT) USED BY CONTRACTOR.

14. FOR ALL FILL MATERIALS, CONTRACTOR MUST SELECT FROM A LIST OF PRE-APPROVED SUPPLIERS, OR PROVIDE A LETTER FROM AN ALTERNATE SUPPLIER DOCUMENTING THE SOURCES OF THE MATERIALS AND WHETHER THEY CONTAIN ANY HAZARDOUS SUBSTANCES. THE APPROVAL OF FILL MATERIALS IS SUBJECT TO THE REVIEW AND APPROVAL BY ENGINEER AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT PRIOR TO USE.

TRENCHING:

1. TRENCHES FOR UNDERGROUND GROUNDWATER PIPE INSTALLATION SHALL BE 24 INCHES WIDE AND EXCAVATED TO A MINIMUM DEPTH OF 40 INCHES. TRENCHES FOR UNDERGROUND ELECTRICAL CONDUIT INSTALLATION SHALL BE A MINIMUM OF 24 INCHES WIDE AND EXCAVATED TO A MINIMUM DEPTH OF 36 INCHES OR 38 INCHES, AS SPECIFIED IN THE ELECTRICAL DETAILS. TRENCH DEPTHS AND DIMENSIONS MAY BE MODIFIED IN THE FIELD BY ENGINEER AS NECESSARY TO ADDRESS UNANTICIPATED SITE CONDITIONS.

2. ALL PAVEMENT TO BE REMOVED FOR EXCAVATION OF TRENCHES SHALL BE SAW CUT. THE WIDTH OF THE PAVEMENT CUT SHALL BE SUFFICIENT TO ALLOW EXCAVATION OF TRENCHES TO THE SPECIFIED DIMENSIONS. ALL DEMOLISHED PAVEMENT DEBRIS SHALL BE STOCKPILED AND DISPOSED OF OR RECYCLED AT OFF-SITE FACILITY IN ACCORDANCE WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

3. PIPE BEDDING SHALL BE PLACED BY HAND IN MAXIMUM 6-INCH LIFTS TO THE DIMENSIONS INDICATED. EACH LIFT SHALL BE COMPACTED USING A VIBRATORY PLATE OR HAND TAMPING DEVICE WITH A MINIMUM TWO FULL PASSES PER LIFT.

4. THE GROUNDWATER CONVEYANCE PIPE BEDDING MATERIAL SHALL CONSIST OF COMPACTED GRANULAR BEDDING. INSIDE THE ASPHALT AREA, BACKFILL MATERIAL ABOVE PIPE BEDDING SHALL CONSIST OF CEMENT-STABILIZED NATIVE SOIL, MIXED TOGETHER AT A RATIO OF APPROXIMATELY 142 POUNDS (ONE AND ONE-HALF 94-LB SACKS) OF CEMENT PER CUBIC YARD OF NATIVE SOIL. BACKFILL MATERIAL SHALL BE PLACED AND GRADED FLUSH WITH THE SURFACE ELEVATION OF THE EXISTING NATIVE SOIL SURROUNDING THE TRENCH. BACKFILL SHALL BE PLACED IN MAXIMUM 6 INCH LIFTS AND COMPACTED USING A HAND OR MOTORIZED TAMPER, MINIMUM OF TWO PASSES PER LIFT.

5. THE ELECTRICAL CONDUIT PIPE BEDDING MATERIAL SHALL CONSIST OF TYPE 3/8 MATERIAL FROM BOTTOM OF TRENCH TO A DEPTH OF 12 INCHES BELOW GROUND SURFACE, FOLLOWED BY TYPE II BACKFILL. BACKFILL MATERIAL SHALL BE PLACED AND GRADED FLUSH WITH THE SURFACE ELEVATION OF THE EXISTING NATIVE SOIL SURROUNDING THE TRENCH. BACKFILL SHALL BE PLACED IN MAXIMUM 6 INCH LIFTS AND COMPACTED USING A HAND OR MOTORIZED TAMPER, MINIMUM OF TWO PASSES PER LIFT.

6. SURFACE RESTORATION OF TRENCHING AREAS OUTSIDE DRIVEWAY (E.G., GRASS SEEDING) WILL BE COMPLETED BY CONTRACTOR. HOWEVER, SURFACE RESTORATION OF TRENCHING AREAS WITHIN DRIVEWAY (E.G., PAVEMENT REPLACEMENT) WILL BE COMPLETED BY OTHERS.

7. EXCAVATED NATIVE SOIL NOT USED FOR BACKFILL SHALL BE DISPOSED OF OFF-SITE PER APPLICABLE STATE AND FEDERAL REGULATIONS, OR STOCKPILED ONSITE FOR REUSE BY THE PROPERTY REDEVELOPER AS FILL MATERIAL, SUBJECT TO APPROVAL BY ENGINEER AND PROPERTY REDEVELOPER.

8. STOCKPILED SOIL SHALL BE PLACED ON POLYETHYLENE SHEETING AND COVERED AT ALL TIMES EXCEPT LOADING TO ENSURE NO RUNOFF IS GENERATED. THE MATERIAL SHALL BE STAGED ONSITE AT A LOCATION APPROVED BY ENGINEER AND OWNER.

PIPE INSTALLATION:

1. ALL UNDERGROUND WATER CONVEYANCE PIPING SHALL CONSIST OF HDPE OR SCH. 80 PVC, WITH DIAMETERS SHOWN IN THE CIVIL PLANS. HDPE PIPING SHALL CONFORM TO ASTM F2619, AND SCH. 80 PVC PIPING SHALL CONFORM TO ASTM D1784. SCH. 80 PVC PIPE FITTINGS SHALL CONFORM TO ASTM 2466.

2. ALL ABOVEGROUND PIPING SHALL CONFORM TO THE MATERIALS SHOWN ON THE LINE LIST, VALVE AND INSTRUMENT LIST PROVIDED IN APPENDIX C OF THE SCOPE OF WORK. ALL ABOVEGROUND PIPING SHALL BE INSTALLED PER ECT PIPING SPECIFICATION 40 05 00 (APPENDIX D OF SCOPE OF WORK).

3. ALL UNDERGROUND ELECTRICAL CONDUIT PIPING SHALL CONSIST OF SCH. 40 PVC, WITH DIAMETERS SHOWN IN THE ELECTRICAL PLANS. SCH. 40 PVC PIPING SHALL CONFORM TO ASTM D1785, AND SCH. 40 PVC PIPE FITTINGS SHALL CONFORM TO ASTM 2466.

4. ROUTE PIPING IN ACCORDANCE WITH SYSTEM SITE PLAN PROVIDED IN THE CIVIL AND ELECTRICAL PLANS. MAINTAIN STRAIGHT RUNS OF PIPING WHERE FEASIBLE. PIPE ROUTE MAY BE ADJUSTED IN THE FIELD TO AVOID UNANTICIPATED OBSTRUCTIONS UPON APPROVAL OF ENGINEER.

5. UPON COMPLETION OF PIPE INSTALLATION AND BACKFILL, METALLIC OR MAGNETIC TAPE, SUITABLE FOR OUTDOOR SERVICE, SHALL BE PLACED AS SHOWN ON THE DRAWINGS.

ELECTRICAL INSTALLATION:

SEE ELECTRICAL DRAWINGS FOR ELECTRICAL INSTALLATION NOTES.

REVISIONS

REV	DESCRIPTION		
1	ISSUED AS FINAL 07/31/2017	Checked: RJC 7/31/2017	Appr.:
1	Revised:	Check:	Appr.:
1	Revised:	Check:	Appr.:
1	Revised:	Check:	Appr.:

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APPROVED:

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GENERAL NOTES

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
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SHEET G-101

Drawing Number
314P0390-D16

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OUTFALL 001

STONY RUN

PARKING AREA

445

175' TO FIRE HYDRANT

EXISTING SUBSTATION

150 KVA TRANSFORMER PAD

PROPOSED COMMERCIAL BUILDING

M□-03

M□-23D

PARKING AREA

WILLIAMS SCOTSMAN, INC.

□R□□ND□ ATER TREATMENT □□ILDIN□

□EI□□T: 14-0□
DIMEN□I□N□ 40-0□x 30-0□
□□ILDIN□ AREA: 1 200 FT²
□R□□ERT□ LINE □ET□ACK DI□TANCE: 60□
LIMIT□ □F DI□T□R□ED AREA: 1 600 FT²
T□□□F FL□□R: 115-9"

90' TO FIRE LANE

M□-43

M□-09

T-1

T-2

T-3

M□-38R

M□-42

M□-18

M□-5R

M□-40D

EXISTING STORM SEWER MANHOLE

M□-44

A□C 2

M□-16

M□-16D

M□-04

M□-20

A□C 1

PROPOSED COMMERCIAL BUILDING

M□-41D

M□-22D

M□-21D

M□-01D

M□-01

M A C A D A M D R I V E

R□-1

R□-2

R□-3

R□-1D

R□-2D

127

90

35

47

133

170

147

385

56

135

391

N

REFERENCE:

PLANNED PROPERTY LAYOUT IS BASED ON DEVELOPMENT PLANS PROVIDED BY AXIOM ENGINEERING, INC. ON MARCH 18, 2015.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

50 0 50 100
SCALE, FEET

LEGEND

- M□-04 SHALLOW MONITORING WELL
- M□-18 INTERMEDIATE MONITORING WELL
- M□-21D DEEP MONITORING WELL
- R□-2□ SHALLOW EXTRACTION WELL
- R□-2D DEEP EXTRACTION WELL
- T-3 JUNCTION BOX/VALVE BOX
- 30 PIPE SECTION LENGTH
- STORM SEWER INLET/GRATE
- FIRE HYDRANT/VALVE PER NFPA24, DPW/DU SPECIFICATIONS
- S SHALLOW WELL DISCHARGE/POWER SUPPLY TRENCH
- D DEEP WELL DISCHARGE/POWER SUPPLY TRENCH
- TREATED WATER EFFLUENT DISCHARGE
- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SS SANITARY SEWER
- ST STORM SEWER
- W WATER LINE
- E ELECTRIC LINE
- T TELEPHONE LINE
- T&E TELEPHONE & ELECTRIC LINES
- G GAS LINE
- OHE OVERHEAD ELECTRIC LINE
- (E) ELECTRICAL TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (W) WATER TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (G) GAS TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (SS) SANITARY TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (T) TELEPHONE TIE-IN LOCATION FOR GROUNDWATER SYSTEM

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REVISIONS

REV	DESCRIPTION			
1	ISSUED AS FINAL 07/31/2017	Revised:	Chkd:	Appr.:
2		Revised:	Chkd:	Appr.:
3		Revised:	Chkd:	Appr.:

SEAL

STATE OF MARYLAND — KEVIN KOSTELNIK — 21663 — REGISTERED PROFESSIONAL ENGINEER

DATE

DRAWN BY

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GROUNDWATER TREATMENT SYSTEM AS-BUILT SITE PLAN

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
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SHEET C-101

Drawing Number
314P0390-D17

VAULT INSTALLATION:

1. RECOVERY WELL VAULTS AND TEE CLEANOUT/JUNCTION VAULTS SHALL BE INSTALLED IN ACCORDANCE WITH THE COORDINATES AND TOP OF VAULT ELEVATIONS PROVIDED IN THE CIVIL PLANS.

2. CONTRACTOR SHALL DRILL 1–INCH WEEP–HOLES IN THE BASE ON EACH RECOVERY VAULT AND TEE CLEANOUT/ JUNCTION VAULT FOR DRAINAGE.

3. EXCAVATED NATIVE SOIL NOT USED FOR BACKFILL SHALL BE STOCKPILED ONSITE FOR REUSE BY THE PROPERTY REDEVELOPER AS FILL MATERIAL, SUBJECT TO APPROVAL BY ENGINEER AND PROPERTY REDEVELOPER.

4. CONTRACTOR SHALL PLACE AND COMPACT A 6–INCH LAYER OF GRAVEL BENEATH EACH VAULT.

RECOVERY WELL PUMP AND EQUIPMENT INSTALLATION:

1. THE RECOVERY WELL PUMP AND ALL EQUIPMENT SHOWN ON THE CIVIL PLANS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. THIS WORK SHALL INCLUDE THE PIPING, FITTINGS, CONTROLS, AND METERING EQUIPMENT LOCATED WITHIN THE VAULTS.

2. CONTRACTOR SHALL INSTALL ALL INSTRUMENTS TO FACE UP FOR READINGS AT THE WELL HEAD.

3. DOWN WELL WATER CONVEYANCE TUBING SHALL BE SIZED AND SELECTED IN ACCORDANCE WITH THE PUMP MODEL SPECIFIED ON THE CIVIL PLANS.

WELL HEAD AND TEE CLEANOUT/JUNCTION VAULT COMPLETION:

1. ALL PIPE PENETRATIONS THROUGH THE WELL HEAD VAULTS AND VALVE BOXES SHALL BE SEALED FOR WATER–TIGHTNESS USING A WATERPROOF, NON–SHRINKING SEALANT SUITABLE FOR UNDERGROUND USE.

2. A SINGLE LID, H–20 RATING VAULT LID WITH HINGE AND GAS SPRING LIFT ASSIST MECHANISM SHALL BE USED FOR THE WELL VAULTS.

RECOVERY WELL SCHEDULE

LOCATION	WELL DIAMETER (INCHES)	TOTAL WELL DEPTH (FT BGS)	SCREENED INTERVAL (FT BGS)	PUMP INTAKE DEPTH (FT BGS)	PUMP MANUFACTURER	PUMP MODEL	PUMP DIAMETER (INCHES)	PUMP MOTOR HORSEPOWER (HP)	PUMP VOLTAGE (VOLTS)	PHASE	APPROX. FLOW RATE (GPM)
RW–1S	4	62	27–62	50	GRUNDFOS	5SQE–90	2	0.5	240	1	4.2
RW–2S	4	60.5	25.5–60.5	50	GRUNDFOS	5SQE–90	2	0.5	240	1	3.6
RW–3S	4	62	27–62	50	GRUNDFOS	5SQE–90	2	0.5	240	1	2.5
RW–1D	6	126	86–126	90	GRUNDFOS	45S20–5	3	2	460	3	28
RW–2D	6	147	105.5–145.5	90	GRUNDFOS	45S20–5	3	2	460	3	34

COORDINATES AND ELEVATIONS FOR GROUNDWATER TREATMENT SYSTEM COMPONENTS

LOCATION	NORTHING	EASTING	ELEVATION
EQUIPMENT BLDG. NORTHEAST CORNER	540576.49	1396652.49	–
EQUIPMENT BLDG. NORTHWEST CORNER	540576.54	1396612.49	–
EQUIPMENT BLDG. SOUTHEAST CORNER	540546.49	1396652.45	–
EQUIPMENT BLDG. SOUTHWEST CORNER	540546.54	1396612.45	–
T1 TEE BOX	540374.6	1396687.4	125.2
T2 TEE BOX	540277.5	1396686.4	125.4
T3 TEE BOX	540137.2	1396769.3	125.6
RW–1S	540375.4	1396817.2	123.8
RW–2S	540280.7	1396806.2	124.5
RW–3S	540165.7	1396809.8	126.7
RW–1D	539999.7	1397018.6	127.5
RW–2D	539999.4	1397402.8	128.2
ELECTRICAL PULL BOX 1	540579.5	1396657.8	116.0
ELECTRICAL PULL BOX 2	540370.8	1396684.4	125.0
ELECTRICAL PULL BOX 3	540281.4	1396683.6	125.2

REVISIONS

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1	ISSUED AS FINAL 07/31/2017	Revised: Chkd: Appr:
2		Revised: Chkd: Appr:
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SEAL — STATE OF MARYLAND — JEFF R. KOSCHMANN — 43061 — REGISTERED PROFESSIONAL ENGINEER — 4/6/18 DATE

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HANOVER, MARYLAND

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EMERSON
ST. LOUIS, MISSOURI

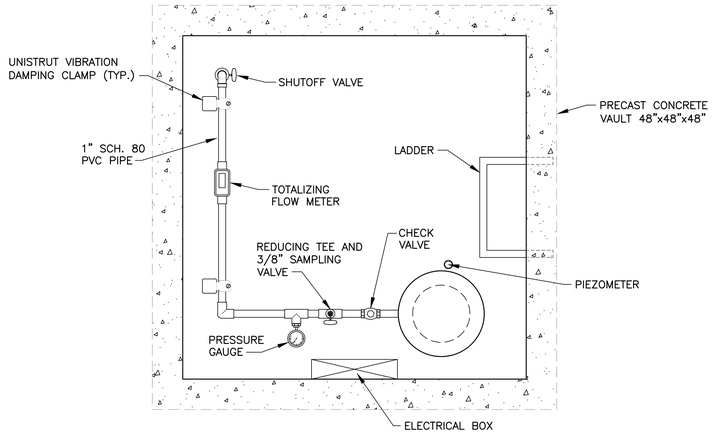
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13530 DULLES TECHNOLOGY DR, SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

SHEET C–102

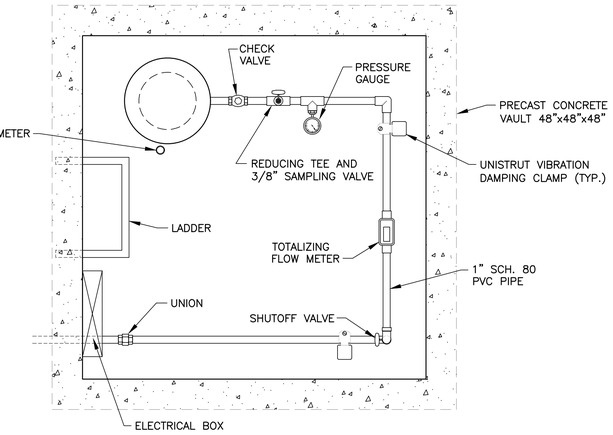
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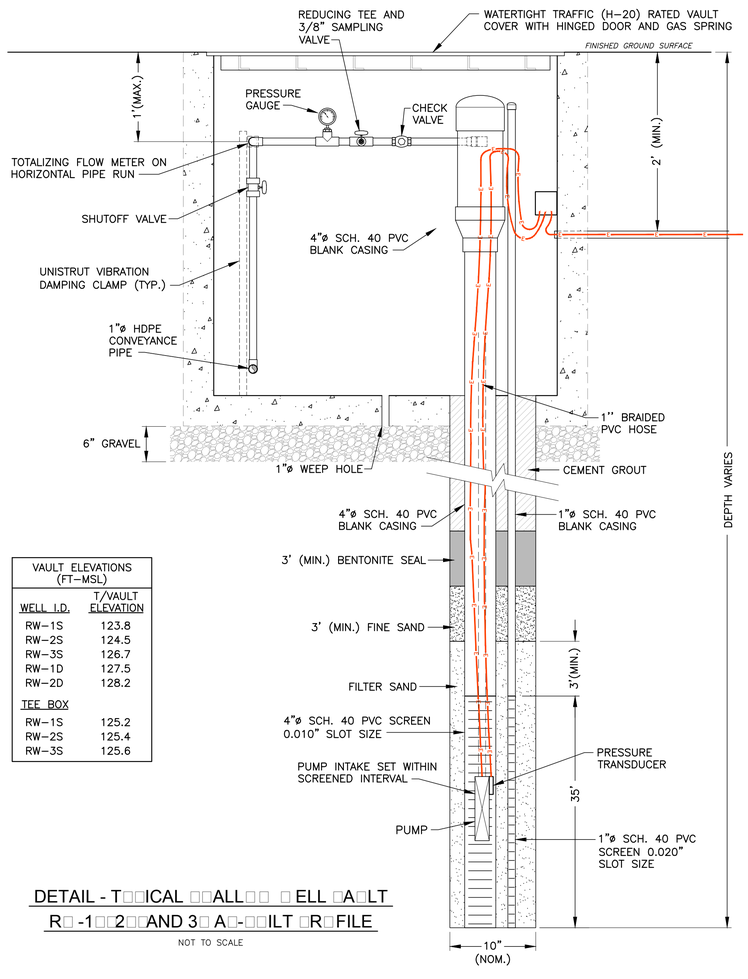
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□ ELL □A□LT R□ -1□ □LAN □IE□



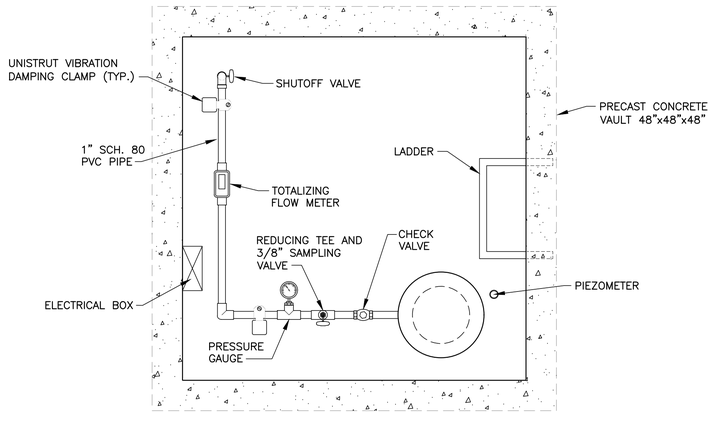
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VAULT ELEVATIONS (FT–MSL)	
WELL I.D.	T/VAULT ELEVATION
RW–1S	123.8
RW–2S	124.5
RW–3S	126.7
RW–1D	127.5
RW–2D	128.2
TEE BOX	
RW–1S	125.2
RW–2S	125.4
RW–3S	125.6

DETAIL - T□□ICAL □□ALL□□ □ ELL □A□LT R□ -1□□2□□AND 3□ A□-□□ILT □R□FILE

NOT TO SCALE



□ ELL □A□LT R□ -3□ □LAN □IE□

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REVISIONS

REV	DESCRIPTION		
1	ISSUED AS FINAL 07/31/2017	Drawn: RJC Checked: RJC Approved:	Appr.:
2	Revised:	Drawn: Checked:	Appr.:
3	Revised:	Drawn: Checked:	Appr.:
4	Revised:	Drawn: Checked:	Appr.:

SEAL

STATE OF MARYLAND STEPHEN HERB ROSTOMILY 43292 PROFESSIONAL ENGINEER

DATE 4/6/18

DRAWN BY RJC 04/05/2017

CHECKED

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PUMP INSTALLATION, PIPING, WELL VAULT, AND MISCELLANEOUS DETAILS

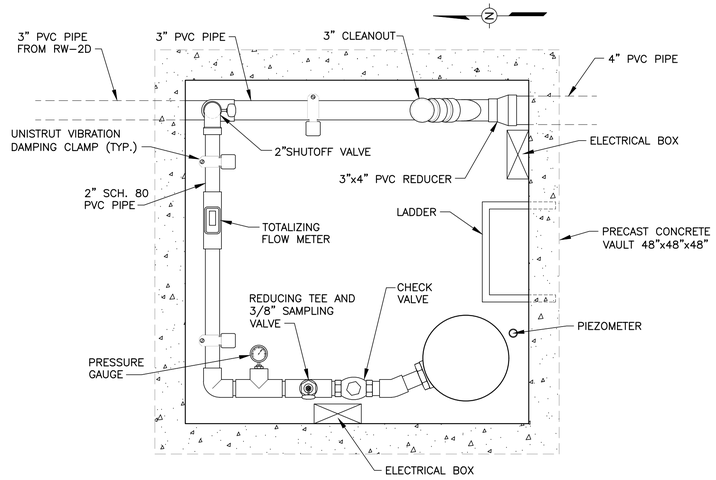
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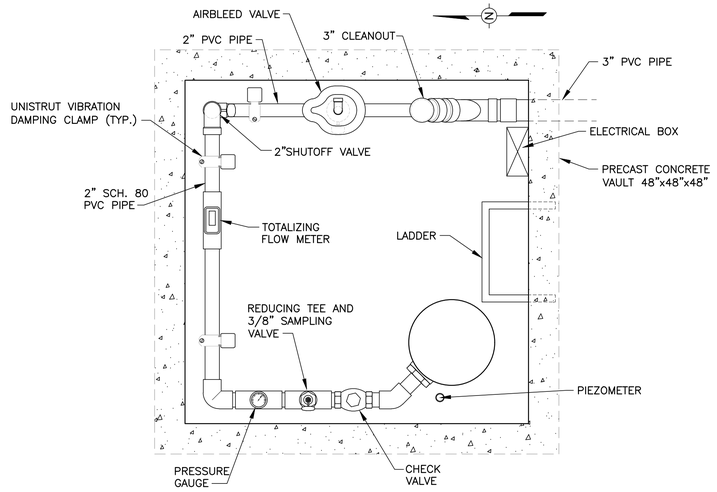
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SHEET C–103A

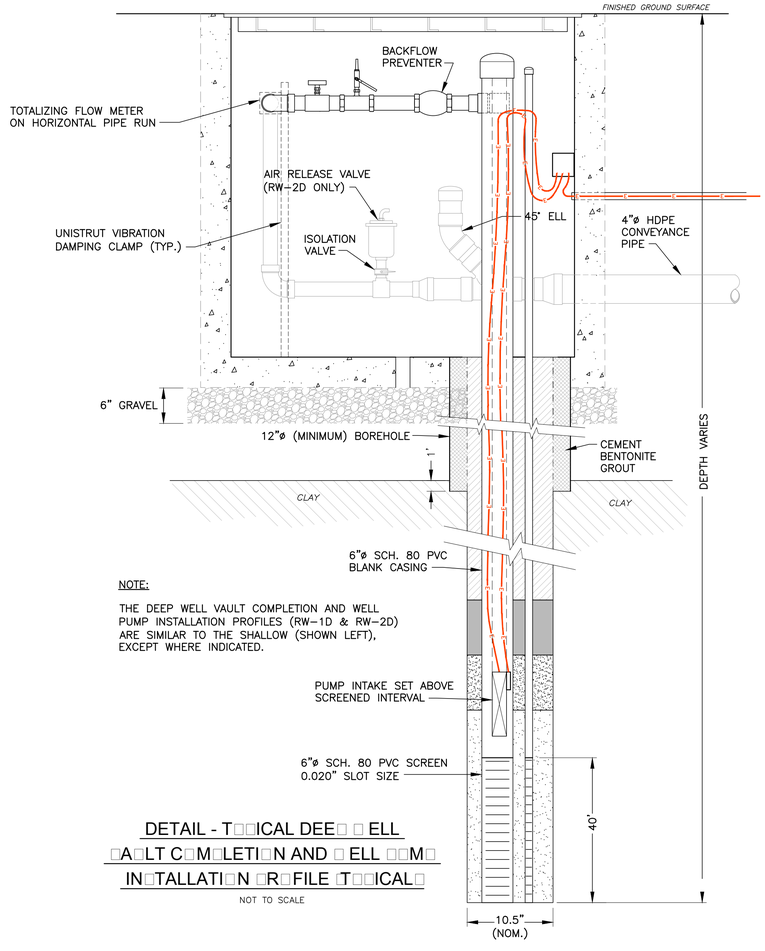
Drawing Number
314P0390–D19



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□ ELL □A□LT R□ -2D □LAN □IE□



DETAIL - T□□ICAL DEE□ □ ELL □A□LT C□M□LETI□N AND □ ELL □□M□ IN□TALLATI□N □R□FILE □T□□ICAL□

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1	ISSUED AS FINAL 07/31/2017	Chkd:	Appr.:
2	Revised:	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:

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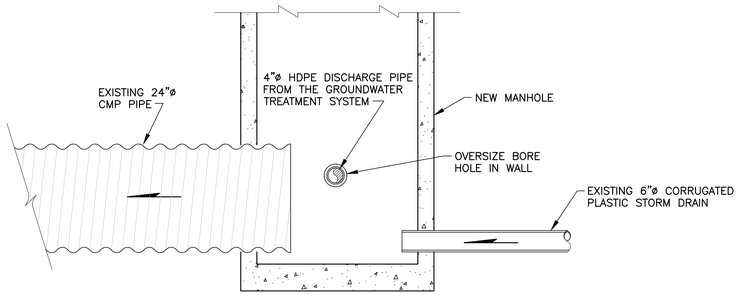
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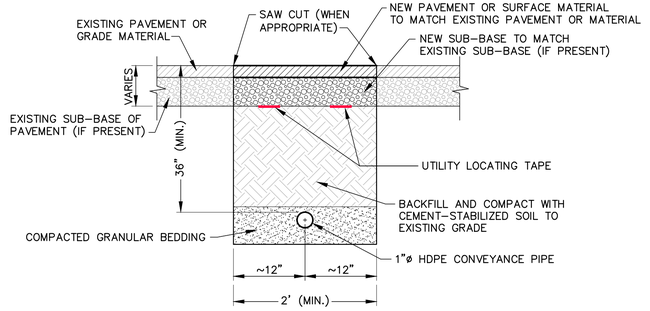
SHEET C-103B

Drawing Number
314P0390-D19



DETAIL - DISCHARGE MANHOLE SECTION C-C

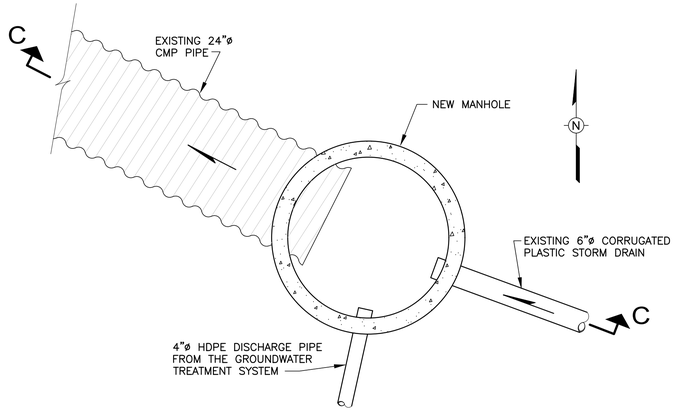
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SECTION A-A

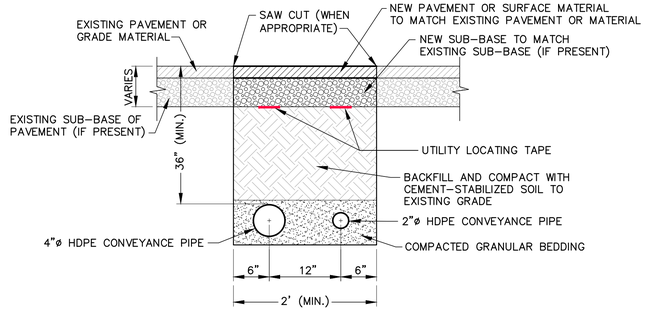
NOT TO SCALE

(WATER CONVEYANCE PIPE)



DISCHARGE MANHOLE PLAN VIEW

NOT TO SCALE



SECTION B-B

NOT TO SCALE

(WATER CONVEYANCE PIPES)

NOTE:

FOR LOCATION OF CROSS SECTIONS
A–A AND B–B, SEE SHEET C–101.

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REVISIONS

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1	ISSUED AS FINAL 07/31/2017	Revised:	Appr.:
2		Revised:	Appr.:
3		Revised:	Appr.:

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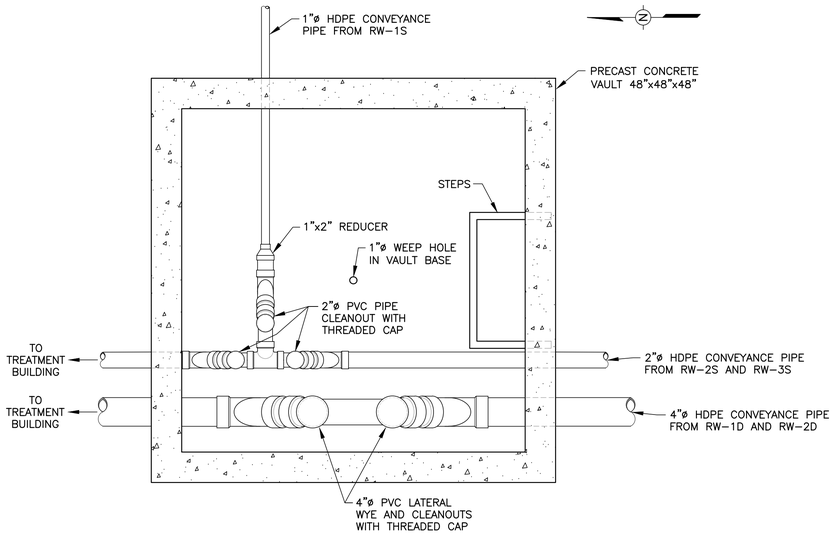
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SHEET C–104A

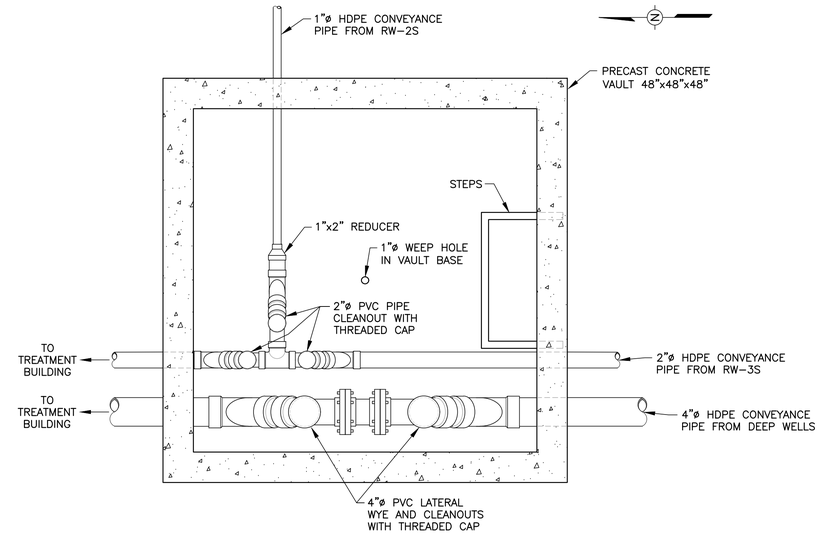
Drawing Number

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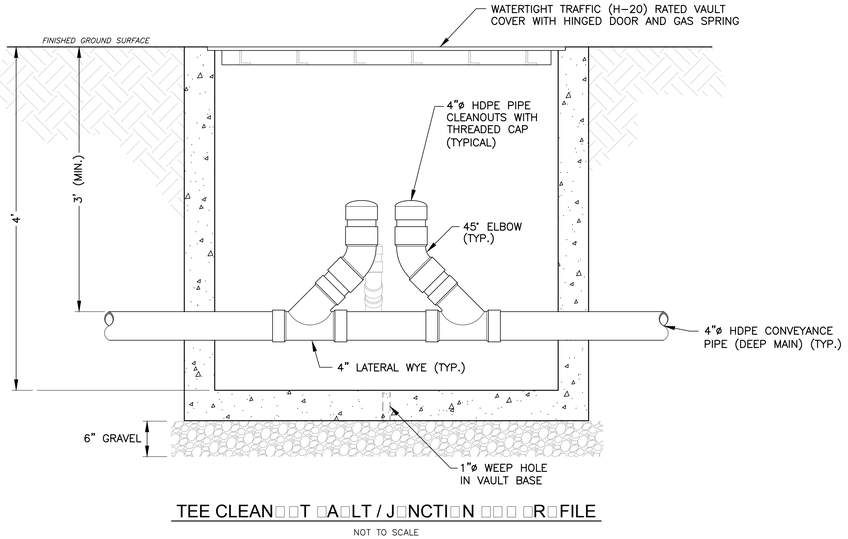
TEE □A□LT T-1

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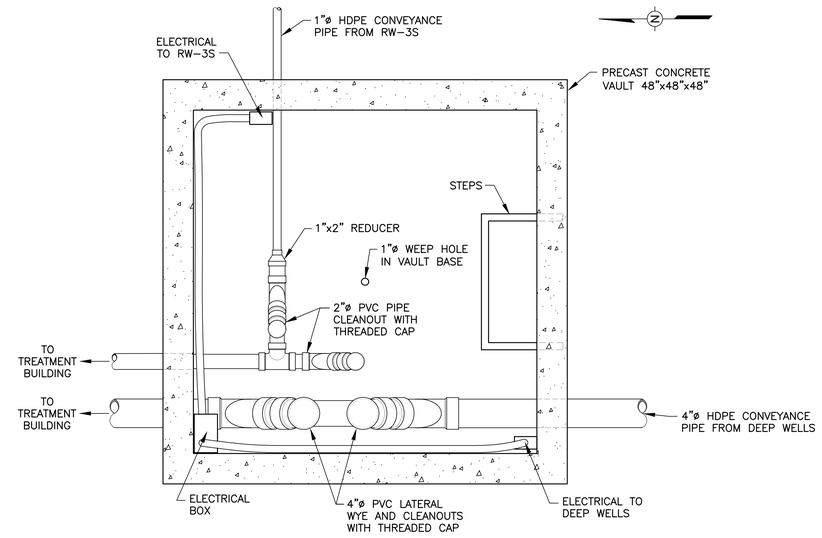
TEE □A□LT T-2

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TEE □A□LT T-3

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REVISIONS

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2	Revised:	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:
4	Revised:	Chkd:	Appr.:

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STATE OF MARYLAND STEPHEN H. RICHTSMEIER 15261 REGISTERED PROFESSIONAL ENGINEER

DATE 7/31/17

DRAWN BY

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TEE VAULTS T–1, T–2, AND T–3 DETAILS

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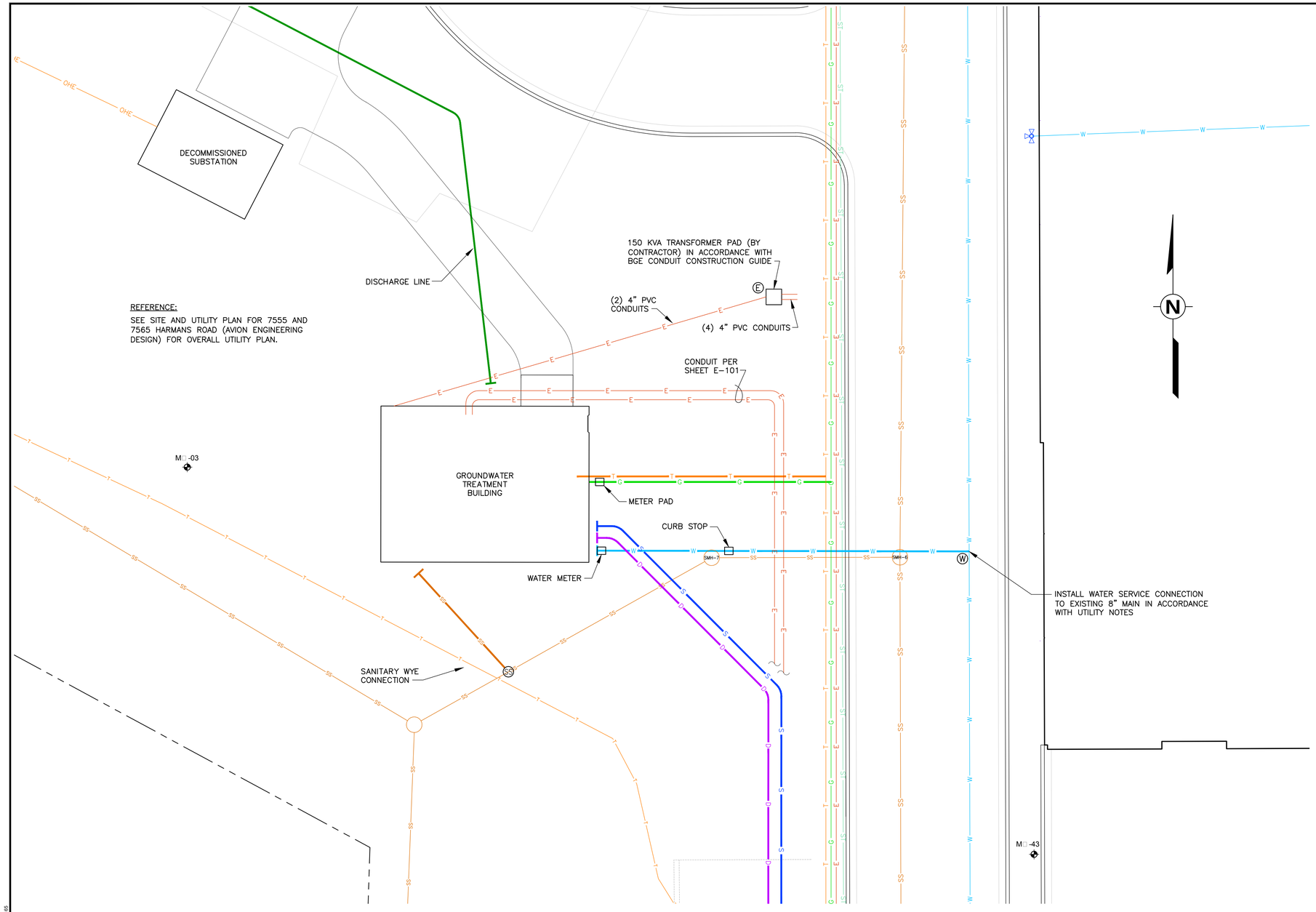
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HERNDON, VA 20171
TEL: +1 703.709.6500

SHEET C–104B

Drawing Number

314P0390–D20



REFERENCE:

SEE SITE AND UTILITY PLAN FOR 7555 AND 7565 HARMANS ROAD (AVION ENGINEERING DESIGN) FOR OVERALL UTILITY PLAN.

GENERAL NOTES:

1. CONTRACTOR SHALL LOCATE WATER, SEWER, TELEPHONE, STORM DRAIN, AND ALL OTHER UTILITIES PRIOR TO WORK. UTILITIES MUST BE CLEARLY MARKED IN ADVANCE OF BGE'S ELECTRIC AND GAS INSTALLATION SERVICES.
2. WATER AND SEWER CONDUIT STUBS WERE INSTALLED BY OTHERS UNDER THE TREATMENT BUILDING TO 5 FEET OUTSIDE THE TREATMENT BUILDING. CONTRACTOR WILL BE RESPONSIBLE FOR UTILITY CONNECTIONS.
3. ALL UTILITY TIE-INS MUST BE PERFORMED IN ACCORDANCE WITH STATE, FEDERAL, AND LOCAL REGULATIONS. CONTACT ANNE ARUNDEL COUNTY FOR LICENSING REQUIREMENTS FOR UTILITY TIE-INS TO SANITARY LINE.

ELECTRICAL SERVICE INSTALLATION:

1. CONTRACTOR TO INSTALL TRANSFORMER PAD AND PRIMARY AND SECONDARY DUCTS IN ACCORDANCE WITH BGE'S "NATURAL GAS AND ELECTRIC SERVICE GUIDE FOR COMMERCIAL, INDUSTRIAL, AND RESIDENTIAL CUSTOMERS", AVAILABLE ONLINE AT BGE.COM.
2. CONTRACTOR TO INSTALL FOUR PRIMARY 4-INCH DIAMETER PVC ELECTRICAL DUCTS WITH PULL STRINGS FROM TRANSFORMER PAD TO 5 FEET OUTSIDE PAD TOWARDS DRIVEWAY.
3. CONTRACTOR TO INSTALL TWO SECONDARY 4-INCH DIAMETER PVC ELECTRICAL DUCT WITH PULL STRINGS FROM TRANSFORMER PAD TO MINIMUM 5 FEET OUTSIDE PAD TOWARDS TREATMENT BUILDING.
4. A MINIMUM 30 INCHES OF COVER IS REQUIRED ABOVE THE DUCTS.
5. PROVIDE PHOTOGRAPHIC DOCUMENTATION OF TRANSFORMER PAD AND DUCT INSTALLATION.
6. IF COMPLETED AFTER 9/16/2016, CONTACT BGE TO SCHEDULE INSPECTION (REFERENCE ACCOUNT NO. 14059983). CONTRACTOR TO PLUG DUCT ENDS FOLLOWING INSPECTOR APPROVAL.
7. CONTRACTOR TO PROVIDE AND INSTALL DUCTS FROM SECONDARY DUCT ENDS (5 FEET OUTSIDE PAD) TO A CONTRACTOR-SUPPLIED/CONTRACTOR-INSTALLED CURRENT TRANSFORMER (C/T) CABINET ON BUILDING EXTERIOR WALL.
8. EXTERIOR WIRING AND ELECTRIC METER WILL BE PROVIDED AND INSTALLED BY BGE
9. AFTER BUILDING WIRING IS COMPLETE, CONTACT ANNE ARUNDEL COUNTY FOR INSPECTION AND OBTAIN CERTIFICATE REFERENCING ACCOUNT NO. AND SITE ADDRESS (F 7555 HARMANS ROAD).
10. CONTACT BGE TO ENERGIZE.

GAS SERVICE INSTALLATION

1. CONTRACTOR TO INSTALL 1-1/4" GAS SERVICE IN ACCORDANCE WITH BGE WORK ORDER NO. 14059983 PRINT "A" AND BGE'S "NATURAL GAS AND ELECTRIC SERVICE GUIDE FOR COMMERCIAL, INDUSTRIAL, AND RESIDENTIAL CUSTOMERS".
2. GAS MAIN TIE-IN WILL BE PROVIDED BY BGE.
3. GAS METER TO BE PROVIDED AND INSTALLED BY BGE.
4. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF GAS METER PADS.

WATER INSTALLATION:

1. CONTRACTOR TO INSTALL 2-INCH WATER LINE FROM THE WATER CONDUIT STUB AT THE TREATMENT BUILDING TO THE 8-INCH MAIN LOCATED IN THE DRIVEWAY.
2. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE GENERAL NOTES AND SPECIFICATIONS PROVIDED ON SHEET P-100.
3. ALL MATERIALS OUTSIDE OF THE TREATMENT BUILDING SHALL CONFORM TO THE PIPING SCHEDULE PROVIDED ON SHEET P-106.
4. ALL WORK INSIDE TREATMENT BUILDING, INCLUDING METER INSTALLATION, SHALL BE PERFORMED IN ACCORDANCE WITH SHEET P-101.

SANITARY INSTALLATION:

1. CONTRACTOR TO INSTALL THE SANITARY DISCHARGE LINE FROM THE SEWER CONDUIT STUB TO THE EXISTING 8-INCH DUCTILE IRON SANITARY LINE.
2. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE GENERAL NOTES AND SPECIFICATIONS PROVIDED ON SHEET P-100.
3. ALL MATERIALS SHALL CONFORM TO THE PIPING SCHEDULE PROVIDED ON SHEET P-106.

TELEPHONE INSTALLATION:

1. CONTRACTOR TO INSTALL FIBER OPTIC CABLE FROM THE TIE-IN LOCATION SHOWN TO A FIBER OPTIC CONVERTER BOX LOCATED IN THE TREATMENT BUILDING.
2. CONTRACTOR TO INSTALL COAXIAL CABLE FROM FIBER OPTIC CONVERTER BOX TO MODEM AT PLC-ECT.
3. SERVICE CONNECTION, FIBER OPTIC CONVERTER BOX, AND MODEM WILL BE PROVIDED BY SELECTED SERVICE PROVIDER (COMCAST).
4. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SELECTED SERVICE PROVIDER (COMCAST).

LEGEND

- M□-04 — SHALLOW MONITORING WELL
- STORM SEWER INLET/GRATE
- FIRE HYDRANT/VALVE PER NFPA24, DPW/DU SPECIFICATIONS
- S — SHALLOW WELL DISCHARGE/POWER SUPPLY TRENCH
- D — DEEP WELL DISCHARGE/POWER SUPPLY TRENCH
- TREATED WATER EFFLUENT DISCHARGE
- PROPERTY LINE
- STREAM/EDGE OF WATER
- SS — SANITARY SEWER
- ST — STORM SEWER
- W — WATER LINE
- E — ELECTRIC LINE
- T — TELEPHONE/FIBER OPTIC CABLE
- G — GAS LINE
- OHE — OVERHEAD ELECTRIC LINE
- (E) ELECTRICAL TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (W) WATER TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (G) GAS TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (SS) SANITARY TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (T) TELEPHONE TIE-IN LOCATION FOR GROUNDWATER SYSTEM

REFERENCE:

PLANNED PROPERTY LAYOUT IS BASED ON DEVELOPMENT PLANS PROVIDED BY AXIOM ENGINEERING, INC. ON MARCH 18, 2015.

10 0 10 20
SCALE, FEET

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REVISIONS

REV	DESCRIPTION		
1	ISSUED AS FINAL 07/31/2017	Chkd:	Appr:
1	Revised: 10/27/2017	Chkd:	Appr:
2	Revised:	Chkd:	Appr:
3	Revised:	Chkd:	Appr:

SEAL

STATE OF MARYLAND — JAMES TOBIN HOFFMAN — 21663 — REGISTERED PROFESSIONAL ENGINEER

DATE

DRAWN BY: AMC 08/2017
CHECKED:
APPROVED:

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GROUNDWATER TREATMENT SYSTEM UTILITY PLAN

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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SHEET C-105

Drawing Number
314P0390-D22

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□EATIN□ AND AIR C□NDITI□NIN□ □□M□□L□ LE□END

- SOUND ATTENUATOR
- FLEXIBLE CONNECTION
- SPLITTER DAMPER
- VOLUME DAMPER
- MITERED ELBOW WITH TURNING VANES (U.N.O.)
- TRANSITION PIECE
- RADIUS ELBOW
- FRP DUCT (U.N.O.)
- RETURN/EXHAUST AIR DUCT
- SUPPLY AIR DUCT
- INCLINED DROP IN THE DIRECTION OF AIR FLOW
- INCLINED RISE IN THE DIRECTION OF AIR FLOW
- SD – SMOKE DAMPER
  FD – FIRE DAMPER
  FSD– FIRE/SMOKE DAMPER
- MOTORIZED DAMPER
- FLEXIBLE DUCT, SINGLE LINE
- SIDEWALL AIR DEVICE DUCT SIZE DESIGNATION:
- RECTANGULAR DUCT SIZE (1st FIGURE SIDE SHOWN.)
- ROUND DUCT DIAMETER
- ROOF PIPE SUPPORT
- NEW
- EXISTING
- SUPPLY AIR DEVICE
- RETURN/RELIEF/EXHAUST AIR DEVICE
- AIR DEVICE DESIGNATION
  - SCHEDULE TYPE (SEE AIR DEVICE SCHEDULE)
  - AIR QUANTITY (CFM)
  - NECK SIZE (INCHES)

- DIRECTION OF SUPPLY AIR
- DIRECTION OF RETURN/EXHAUST AIR
- HUMIDISTAT
- TEMPERATURE SENSOR
- THERMOSTAT
- DUCT STATIC PRESSURE SENSOR
- BUILDING STATIC PRESSURE SENSOR
- DUCT SMOKE DETECTOR
- DIFFERENTIAL PRESSURE TRANSDUCER
- CARBON MONOXIDE SENSOR
- NITROGEN DIOXIDE SENSOR
- LWS — LOOP WATER SUPPLY
- LWR — LOOP WATER RETURN
- SANITARY SEWER (BELOW GRADE)
- SANITARY SEWER (ABOVE GRADE)
- PLUMBING VENT LINE
- MU — MAKE–UP WATER LINE
- D — CONDENSATE DRAIN LINE
- V — VENT LINE (OTHER THAN PLUMBING)
- RHG — REFRIGERANT HOT GAS
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION
- G — GAS
- CA — COMPRESSED AIR
- CPD — CONDENSATE PUMP DISCHARGE
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER RETURN
- ST — STORM DRAIN ABOVE GRADE
- ST — STORM DRAIN BELOW GRADE
- EQUIPMENT OR PLUMBING FIXTURE DESIGNATION
- (RISER INDICATION =PLUMBING) (K =KITCHEN, A =ACID) RISER DESIGNATION
- ACCESS PANEL
- CONNECT NEW TO EXISTING
- DISCONNECT FROM EXISTING

A□□RE□IATI□N□

AC	AIR CONDITIONER
ACC	AIR COOLED CONDENSER
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
BOD	BASIS OF DESIGN
CAP	CAPACITY
CFH	CUBIC FOOT PER HOUR
CFM	CUBIC FEET PER MINUTE
CP	CONDENSATE PUMP
CO	CLEAN OUT
CRAC	COMPUTER ROOM AIR CONDITIONER
CU	CONDENSING UNIT
CW	COLD WATER MAKEUP
DB	DRY BULB
DN	DOWN
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EXIST.	EXISTING
F	FAHRENHEIT
FD	FIRE DAMPER
FPM	FEET PER MINUTE
FRP	FIBER GLASS REINFORCED
FT	FEET
G	GAS
GPM	GALLONS PER MINUTES
GRV	GRAVITY ROOF VENTIALTOR
HP	HORSE POWER
HW	DOMESTIC HOT WATER
IN	INCHES
IH	INFRARED HEATER
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LPR	LOW PRESSURE RETURN
LWS	LOOP WATER SUPPLY
LWR	LOOP WATER RETURN
MAU	MAKE–UP AIR UNIT
MBH	1,000 BRITISH THERMAL UNITS
MFTR	MANUFACTURER
MP	MECHANICAL PUMP
MW	MAKE–UP WATER
NIC	NOT IN CONTRACT
OA	OUTSIDE AIR
P	PUMP
PSIG	POUNDS PER SQUARE INCH GUAGE
RF	RETURN FAN
SENS	SENSIBLE
SF	SQUARE FEET
SF	SUPPLY FAN
TBR	TO BE REMOVED
TEMP	TEMPERATURE
U	UNION
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
VD	VOLUME DAMPER
WB	WET BULB
WC	WATER COLUMN
WH	WATER HEATER
WT	WEIGHT

□ENERAL N□TE□

1. LOCATE MECHANICAL EQUIPMENT SO AS TO PROVIDE ADEQUATE MAINTENANCE ACCESS SPACE PER MANUFACTURER'S RECOMMENDATIONS.
2. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH CURRENT ACCEPTABLE INDUSTRY STANDARDS AND ALL APPLICABLE CODES, ORDINANCES AND REGULATIONS. ALL MECHANICAL WORK SHALL BE IN ACCORDANCE WITH 2012 INTERNATIONAL MECHANICAL CODE.
3. COORDINATE WITH OTHER TRADES THE LOCATION OF ALL PIPING AND EQUIPMENT TO AVOID INTERFERENCES.
4. OUTSIDE AIR INTAKE AND EXHAUST OPENINGS SHALL BE PROTECTED AGAINST WEATHER AND ENTRY OF SNOW AND WATER.
5. MANUFACTURER'S MODEL NUMBERS SHOWN ON THE DRAWINGS ARE SUBJECT TO CHANGE. EQUIPMENT OR COMPONENT SPECIFICATIONS AND DRAWING DESCRIPTIONS SHALL GOVERN. THE EQUIPMENT LISTED IS THE BASIS OF DESIGN.

DRA□ IN□ C□N□ENTI□N

- NORTH ARROW
- GRAPHIC SCALE (4 0 4 8 12 16 20)
- PLAN, DETAIL OR ELEVATION TITLE (DETAIL NUMBER 1, TITLE, □CALE:)
- ENLARGED DETAIL (DETAIL NUMBER, REF. SHEET NUMBER)
- COLUMN GRID LINES (A, 1)
- DETAIL SECTION CUT (DETAIL NUMBER, REF. SHEET NUMBER)
- ELEVATION NOTATION (DETAIL NUMBER, REF. SHEET NUMBER)

□I□IN□ □□M□□L□ LE□END

- ISOLATION VALVE
- CHECK VALVE
- GLOBE VALVE
- GLOBE ANGLE VALVE
- BALL VALVE
- STRAINER
- UNION
- CALIBRATED BALANCING VALVE
- SOLENOID VALVE
- BUTTERFLY VALVE
- TEMPERATURE AND PRESSURE RELIEF VALVE
- PRESSURE GAUGE
- THERMOMETER
- PRESSURE REDUCING VALVE
- DIRECTION OF FLOW
- ANCHORS
- PIPE GUIDES
- 2–WAY MOTORIZED VALVE
- HOSE END VALVE
- 3–WAY VALVE
- PETES PLUG
- FLEXIBLE PIPE CONNECTION
- MAV — AIR VENT (MANUAL)
- AAV — AIR VENT (AUTOMATIC)

- EXPANSION JOINT
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- TEE (SIDE OUTLET UP)
- TEE (SIDE OUTLET DOWN)
- ELBOW (TURNED UP)
- ELBOW (TURNED DOWN)
- CAP
- F — FLOW MEASURING DEVICE
- FS — FLOW SWITCH
- SINGLE GAS JET NOZZLE
- DOUBLE GAS JET NOZZLE

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REVISIONS

REV	DESCRIPTION	DRAWN	Appr.
1	ISSUED AS FINAL 07/31/2017	Reviewed	
2		Reviewed	
3		Reviewed	
4		Reviewed	

SEAL

DATE

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CHECKED	KEW	1/1/2017
APPROVED	DL	

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HVAC SYMBOLS, ABBREVIATIONS, & GENERAL NOTES
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP–FLEX FACILITY

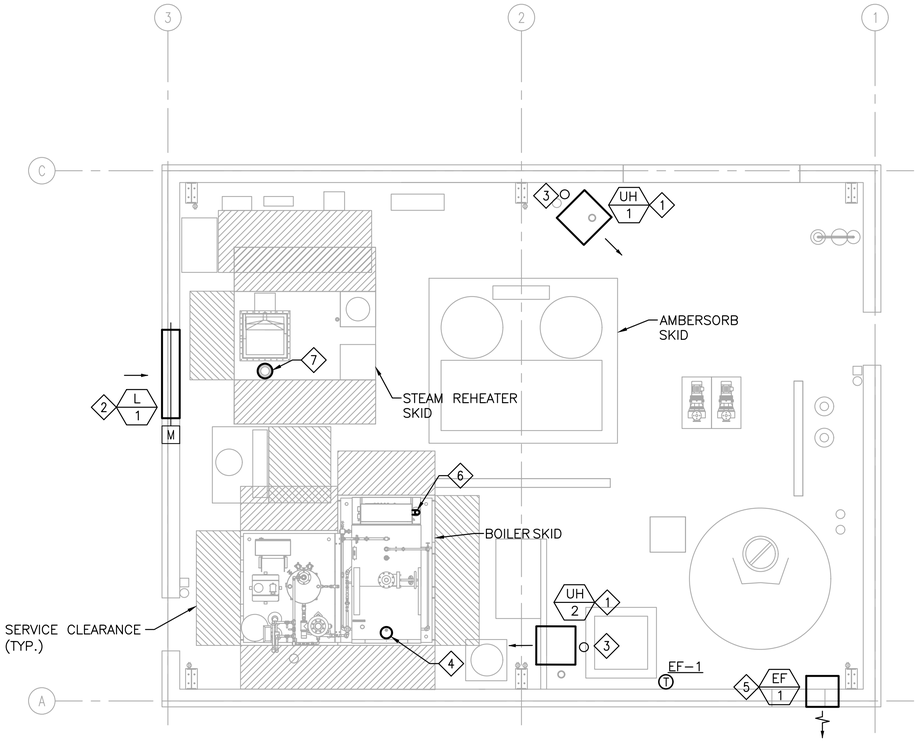
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SHEET 1

Drawing Number
31400390–M–100



FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

2 0 2 4

N

GENERAL NOTE

1. INSTALL THERMOSTATS AT 5'-0" AFF.

SHEET KEYNOTE

1. INSTALL BOTTOM OF UNIT HEATER AT 9 FEET ABOVE FINISHED FLOOR. CONNECT GAS PIPING TO UNIT HEATER. SEE GAS DETAIL ON SHEET 3705–P–105.
2. SEE ARCHITECTURAL/STRUCTURAL DRAWINGS FOR DIMENSIONED LOUVER LOCATIONS.
3. CONCENTRIC FLUE UP THROUGH ROOF. SEE DETAIL 1 ON SHEET 3705–M–102.
4. PROVIDE BOILER STACK; SEE DETAIL 3 ON SHEET 3705–M–102. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. SEE DETAIL 2 ON SHEET 3705–M–102.
6. PROVIDE COMBUSTION AIR DIRECT VENT KIT. PROVIDE 6" DIAMETER PVC COMBUSTION AIR DUCT UP THRU ROOF AND TERMINATE WITH GOOSENECK. SEE DETAIL 3 ON SHEET 3705–M–102. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
7. PROVIDE 10" STEAM REHEATER STACK. SEE DETAIL 3 ON SHEET 3705–M–102. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

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1	ISSUED AS FINAL 07/31/2017		
2	Revised:		
3	Revised:		
4	Revised:		

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HVAC FLOOR PLAN
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP–FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
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ST. LOUIS, MISSOURI

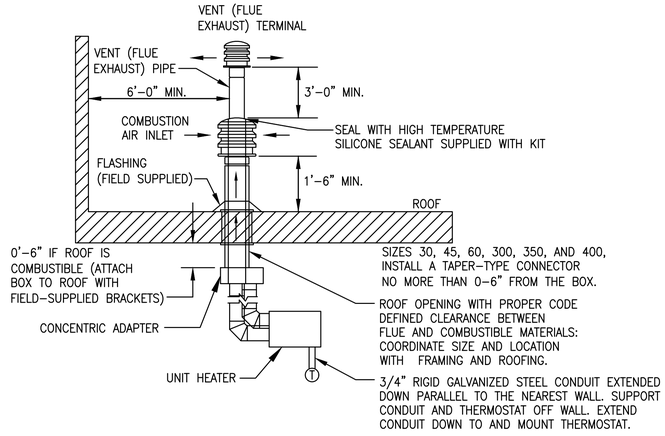
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SHEET 2

Drawing Number
31400390–M–101

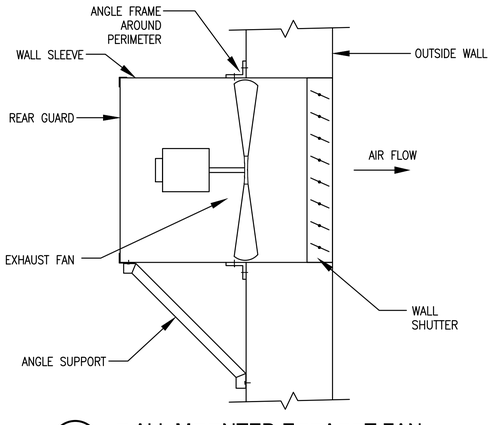
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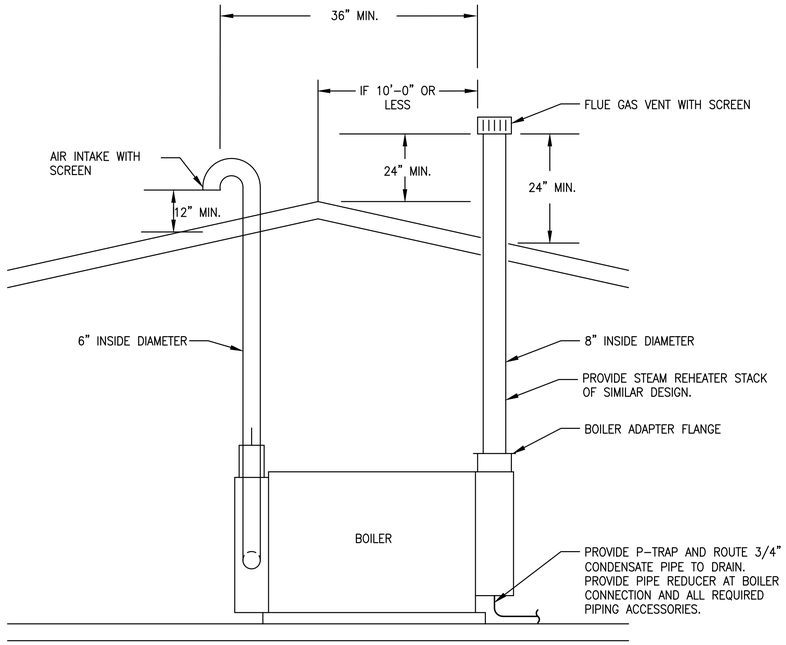
1 UNIT HEATER VERTICAL AIR KIT

SCALE: NONE



2 WALL MOUNTED EXHAUST FAN

SCALE: NONE



NOTES:

1. BOILER AND STEAM REHEATER STACK SHALL BE MODEL MW GAS VENT, MANUFACTURER VAN-PACKER CO.
2. INSULATE BOILER STACK WITH 1" MINERAL WOOL WITH ALUMINUM JACKETING.
3. INSULATE STEAM REHEATER STACK WITH 2" MINERAL WOOL WITH ALUMINUM JACKETING.

3 BOILER STACK AND INTAKE DETAIL

SCALE: NONE

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3		Revised:	

SEAL

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CHECKED: KEW 1/1/2017
APPROVED: DL

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HVAC DETAILS
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FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
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SHEET 3

Drawing Number
31400390-M-102

LOUVER SCHEDULE

MARK	SERVICE/USE	MFTR.	MODEL	SIZE (WxH)	PERFORMANCE			NOTES
					AIRFLOW (CFM)	MIN. FREE AREA	APD ("WC)	
L-1	VENTILATION AIR INTAKE	RUSKIN	ELF6375DX	3'-0" x 5'-0"	1500	54%	0.1	1, 2, 3, 4

NOTES:
1. PROVIDE WITH BIRDSCREEN.
2. LOUVER SHALL HAVE FACTORY APPLIED COLOR FINISH WITH COLOR APPROVED BY THE ARCHITECT.
3. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS.
4. PROVIDE WITH MOTORIZED CONTROL DAMPER WITH END SWITCH.
   L-1 MOTORIZED DAMPER: INTERLOCK WITH EF-1 TO OPEN WITH FAN OPERATION.

GAS FIRED UNIT HEATER SCHEDULE

MARK	MFTR	MODEL	FUEL TYPE	CAPACITY		VENT CONNECTION (IN-Ø)	NOM. CFM	MOTOR HP	VOLTS/PHASE	COMBUSTION AIR INLET (IN-Ø)	WEIGHT (LBS)	ACCESSORIES	NOTES
				INPUT (MBH)	OUTPUT (MBH)								
UH-1, 2	REZNOR	UDAS 45	NATURAL GAS	45.00	37.35	4	629	0.06	115/1	4	83	1, 2, 3, 4, 5	1, 2, 3, 4

NOTES:
1. SEE DETAIL 1 ON DRAWING 3705-M-102.
2. PROVIDE GAS-FIRED SEPARATED COMBUSTION UNIT HEATER.
3. SUSPEND UNIT HEATER FROM STRUCTURE ABOVE WITH THREADED ROD.
4. UNIT HEATERS SHALL OPERATE WHEN SPACE TEMPERATURE DROPS BELOW 55°F (ADJ).

ACCESSORIES:
1. DISCONNECT SWITCH
2. VERTICAL COMBUSTION AIR/VENT KIT WITH CONCENTRIC ADAPTER.
3. THERMOSTAT
4. STAINLESS STEEL HEAT EXCHANGER
5. TOTALLY ENCLOSED FAN MOTOR

FAN SCHEDULE

MARK	SERVING	MFTR	MODEL	TYPE	CFM	S.P. (IN.W.C.)	FAN RPM	DRIVE	MOTOR HP	ELECTRICAL V/PH	OPER WT (LBS)	ACCESSORIES	NOTES
EF-1	EXHAUST	COOK	XPHD 14	PROPELLER	1500	0.3	1725	DIRECT	1/3	115/1	83	1	1, 2

NOTES:
1. SEE DETAIL 2 ON DRAWING 3705-M-102.
2. PROVIDE PACKAGED WALL FAN WITH ENCLOSURE, WALL SHUTTER, BIRD SCREEN, INLET GUARD, DIRECT DRIVE MOTOR, REMOTE WALL THERMOSTAT CONTROL. FAN SHALL OPERATE WHEN SPACE TEMPERATURE RISES ABOVE 80°F (ADJ) AND WHEN L-1 MOTORIZED DAMPER IS PROVEN OPEN.

ACCESSORIES:
1. DISCONNECT SWITCH

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GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP-FLEX FACILITY

HANOVER, MARYLAND

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SHEET 4

Drawing Number
31400390-M-103

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PLAN NORTH
MAGNETIC NORTH

GRAPHIC SCALE

PLAN, DETAIL
OR ELEVATION TITLE

ENLARGED DETAIL

COLUMN GRID LINES

DETAIL SECTION CUT

REVISIONS CLOUD
AND NUMBER

KEYNOTE

BREAK LINE

OUTLINE OF HIDDEN OBJECTS, NIC
ITEMS, REMOVED MATERIALS

CENTER LINE OR
FLOOR LINE

□L□M□IN□ □□M□□L□ LE□END

---SAN---	SANITARY SEWER (BELOW GRADE)
———	SANITARY SEWER (ABOVE GRADE)
------ V ------	PLUMBING VENT LINE (BELOW GRADE)
——— V ———	PLUMBING VENT LINE (ABOVE GRADE)
---PW---	PROCESSED WASTE
——— G ———	GAS
------ G ------	GAS PIPING UNDERGROUND
—·—·—·—	DOMESTIC COLD WATER
—··—··—··—	DOMESTIC HOT WATER

EQUIPMENT OR PLUMBING
FIXTURE DESIGNATION

(RISER INDICATION =PLUMBING)
(K =KITCHEN, A =ACID)
RISER DESIGNATION
(RISER NUMBER)

ACCESS PANEL

A□□RE□IATI□N□

AFF	ABOVE FINISHED FLOOR
CI	CAST IRON
DCI	DUCTILE CAST IRON
DSN	DOWNSPOUT NOZZLE
CW	COLD WATER
EL	ELEVATION
EWC	ELECTRIC WATER COOLER
CO	FLOOR CLEANOUT
FD	FLOOR DRAIN
HA	HAMMER ARRESTOR
HB	HOSE BIBB
HW	HOT WATER
IE	INVERT ELEVATION
INV	INVERT
IPC	INTERNATIONAL PLUMBING CODE
LAV	LAVATORY
MB	MOP BASIN
MH	MANHOLE
MIN	MINIMUM
PRV	PRESSURE REDUCING VALVE
PVC	POLYVINYL CHLORIDE
PW	PROCESSED WASTE
RD	ROOF DRAIN
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
SAN	SANITARY
SD	SUMP DRAIN
SS	SERVICE SINK
STM	STORM
TD	TRENCH DRAIN
TW	TEMPERED WATER
TYP	TYPICAL
UR	URINAL
V	VENT
VB	VACUUM BREAKER
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WH	WATER HEATER

□ENERAL N□TE□ AND □□ECIFICATI□N□

1. THE CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THE DRAWINGS PRIOR TO BIDDING.
2. RENDER ANY PASSAGE OF PIPING THROUGH OUTSIDE WALLS AND ROOF PERMANENTLY WATERTIGHT.
3. LOCATE PLUMBING AND MECHANICAL EQUIPMENT SO AS TO PROVIDE ADEQUATE REMOVAL AND MAINTENANCE ACCESS SPACE.
4. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND IN ACCORDANCE WITH CURRENT ACCEPTABLE INDUSTRY STANDARDS AND ALL APPLICABLE CODES, ORDINANCES AND REGULATIONS.
5. COORDINATE WITH OTHER TRADES THE LOCATION OF ALL PIPING AND EQUIPMENT TO AVOID INTERFERENCES.
6. CONFORM TO APPLICABLE CODES FOR SAFETY OF STRUCTURE, DUST CONTROL AND ENVIRONMENTAL COMPLIANCE.
7. DO NOT INTERFERE WITH THE USE OF ADJACENT BUILDINGS. MAINTAIN FREE AND SAFE PASSAGE AROUND ADJACENT BUILDINGS.
8. TAKE PRECAUTIONS TO MAINTAIN CLEANLINESS ON ROADWAYS AND OTHER PUBLIC AREAS USED BY EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR IMMEDIATE REMOVAL OF ALL SPILLAGE ON THESE PAVINGS.
9. PROVIDE ALL NECESSARY OFFSETS IN PIPING TO AVOID STRUCTURE.
10. SERVICE VALVES SHALL BE INSTALLED ON EACH RISER AND FIXTURES IN ACCORDANCE WITH CODE REQUIREMENTS.
11. PROVIDE CLEANOUTS IN ACCORDANCE WITH LOCAL CODES AND REGULATIONS.
12. QUANTITIES NOTED ARE FOR REFERENCE ONLY. PLAN COUNT SHALL GOVERN.
13. ROUTE VENTS FROM FIXTURE UP THROUGH ROOF. TERMINATE ABOVE ROOF WITH BIRD RESISTANT WEATHER CAP.
14. CONTRACTOR SHALL COORDINATE ALL PIPING PENETRATIONS WITH OTHER CONTRACTORS TO AVOID INTERFERENCES.
15. ALL VALVES SHALL BE ACCESSIBLE.
16. CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS AND PLUMBING FIXTURE LAYOUTS AND LOCATIONS.
17. EQUIPMENT SCHEDULES AND DRAWING DESCRIPTIONS SHALL GOVERN.
18. PROVIDE FLASHING VENT PER LOCAL CODE AND REGULATIONS.
19. PROTECT INTERIOR OF THE BUILDING FROM ELEMENTS OF WEATHER DURING CONSTRUCTION.
20. PROVIDE PREPRINTED, COLOR-CODED PIPE LABELS, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION. PROVIDE IDENTIFICATION FOR PLUMBING PIPING, VALVES AND EQUIPMENT COMPLYING WITH ASME A13.1 ON EACH PIPING SYSTEM.
21. EXPANSION JOINTS FOR COPPER TUBING NPS 2 AND SMALLER: COPPER-ALLOY FITTINGS WITH SOLDER-JOINT END CONNECTIONS. BRONZE HOSES AND SINGLE-BRAID BRONZE SHEATHS WITH 450 PSIG AT 70°F AND 340 PSIG AT 450°F RATINGS.
22. PROVIDE ROOF VENT FLASHING MANUFACTURED ASSEMBLY MADE OF 6.0-LB/SQ. FT. THICK, LEAD FLASHING COLLAR AND SKIRT EXTENDING AT LEAST 10 INCHES FROM PIPE, WITH GALVANIZED-STEEL BOOT REINFORCEMENT AND COUNTERFLASHING FITTING.

□I□IN□ □□M□□L□ LE□END

ISOLATION VALVE
CHECK VALVE
BACK WATER VALVE
GLOBE VALVE
GLOBE ANGLE VALVE
BALL VALVE
STRAINER
UNION
CALIBRATED BALANCING VALVE
SOLENOID VALVE
BUTTERFLY VALVE
TEMPERATURE AND
PRESSURE RELIEF VALVE
PRESSURE GAUGE
THERMOMETER
PRESSURE REDUCING VALVE
DIRECTION OF FLOW
ANCHORS
PIPE GUIDES

2-WAY MIXING VALVE
HOSE END VALVE
3-WAY VALVE
PETES PLUG
FLEXIBLE PIPE CONNECTION OR EXPANSION JOINTS
CONCENTRIC REDUCER
ECCENTRIC REDUCER
TEE (SIDE OUTLET UP)
TEE (SIDE OUTLET DOWN)
ELBOW (TURNED UP)
ELBOW (TURNED DOWN)
CAP
FLOW MEASURING DEVICE
FLOW SWITCH
REDUCED PRESSURE
BACKFLOW PREVENTER
SHOWER HEAD

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REVISIONS

REV	DESCRIPTION	DRAWN	APPR'D
1	ISSUED AS FINAL 07/31/2017		
2			
3			
4			

Revised:

SEAL

DATE

DRAWN BY	VLD	1/1/2017
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APPROVED	MJD	

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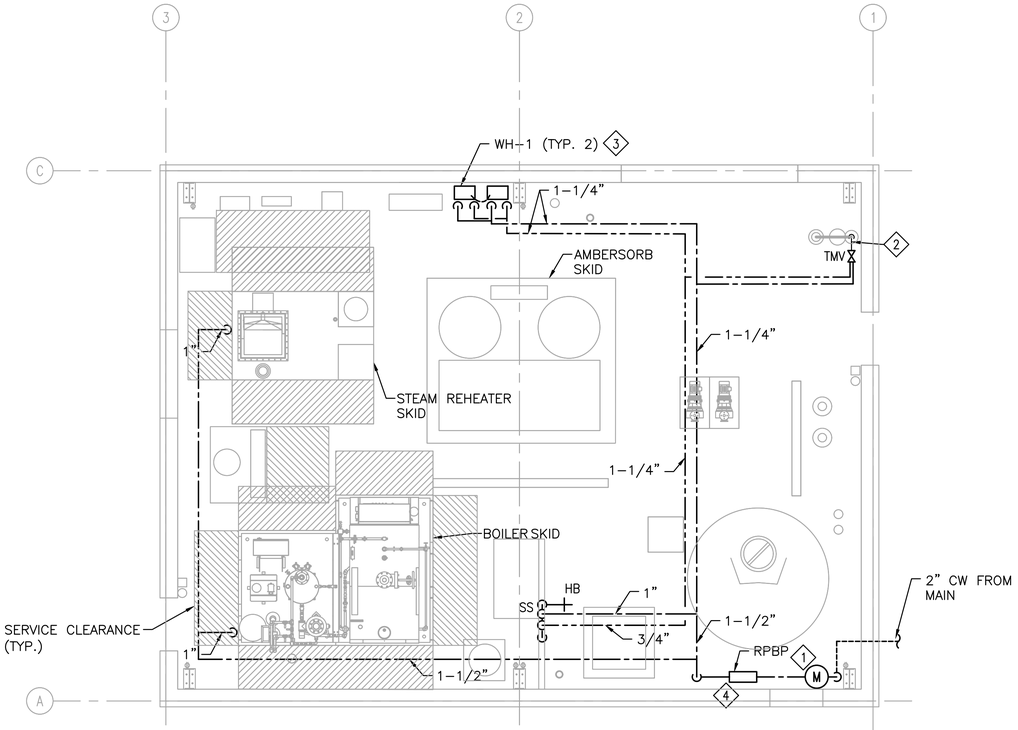
PLUMBING SYMBOLS, ABBREVIATIONS & GENERAL NOTES
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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

SHEET 1

Drawing Number
31400390-P-100



DOMESTIC WATER PLAN

SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. INSTALL PLUMBING PER IPC 2012.
2. PROVIDE SHUT-OFF VALVES FOR EVERY BRANCH TAKE-OFF AND EVERY PLUMBING FIXTURE.
3. COORDINATE WATER PIPING WITH OTHER TRADES. DO NOT ROUTE OVER ELECTRICAL PANELS AND EQUIPMENT.
4. FOR BRANCH PIPING SIZES NOT SHOWN, SEE RISER DIAGRAM ON SHEET 3507-P-104.

SHEET KEYNOTES

1. WATER METER WITH REMOTE READER.
2. 1-1/4" TEMPERED WATER DOWN. SEE DETAIL 1 ON SHEET 3507-P-105 FOR THERMOSTATIC MIXING VALVE.
3. TANKLESS WATER HEATERS, GAS FIRED, WALL MOUNTED. CONNECT WATER HEATERS PER MANUFACTURER'S INSTRUCTIONS. SEE DETAIL 6 ON SHEET 3507-P-105. PROVIDE VERTICAL CONCENTRIC VENTING SYSTEM AND INSTALL PER MANUFACTURER'S INSTRUCTIONS.
4. ROUTE RPBP DISCHARGE PIPING INDIRECT TO NEAREST FD.

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1	ISSUED AS FINAL 07/31/2017	Revised:	
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DOMESTIC WATER PLAN
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP-FLEX FACILITY

HANOVER, MARYLAND

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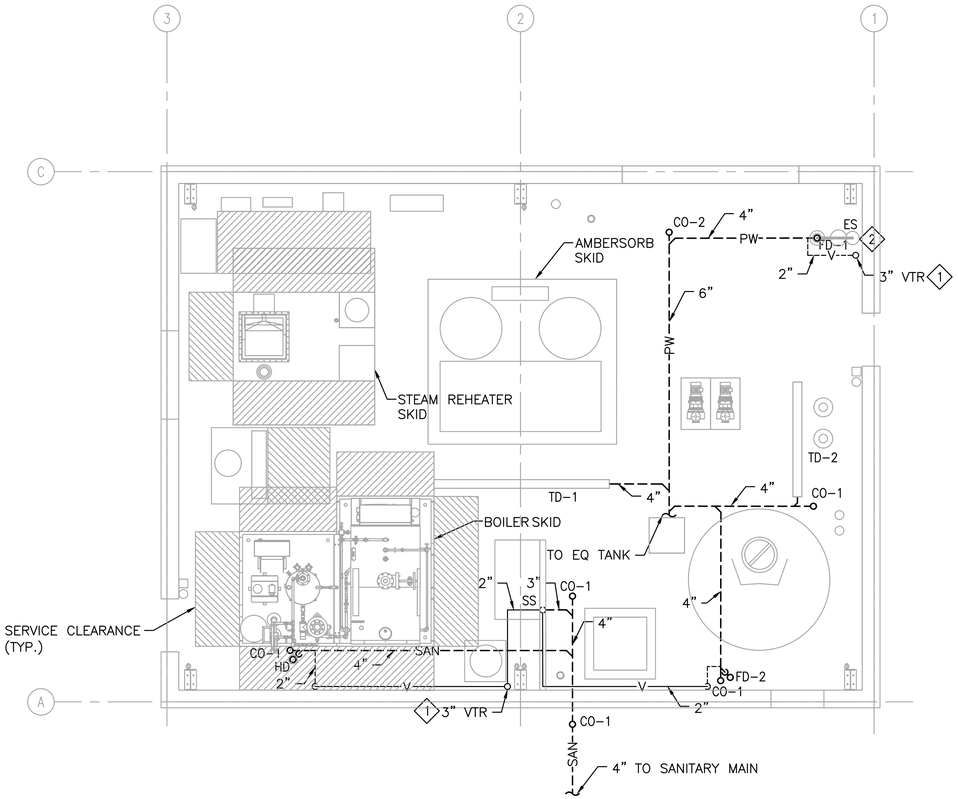
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SHEET 2

Drawing Number
31400390-P-101

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SANITARY AND PROCESSED WASTE PLAN
SCALE: 1/4" = 1'-0"

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GENERAL NOTES

1. INSTALL PLUMBING PER IPC 2012.
2. FOR BRANCH PIPING SIZES NOT SHOWN, SEE RISER DIAGRAM ON SHEET 3507-P-104.

SHEET KEYNOTES

1. 2" VENT PIPING UP THE WALL. TRANSITION TO 3" VTR.
2. SEE DETAIL 2 ON SHEET 3507-P105.

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1	ISSUED AS FINAL 07/31/2017	Revised:	
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FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

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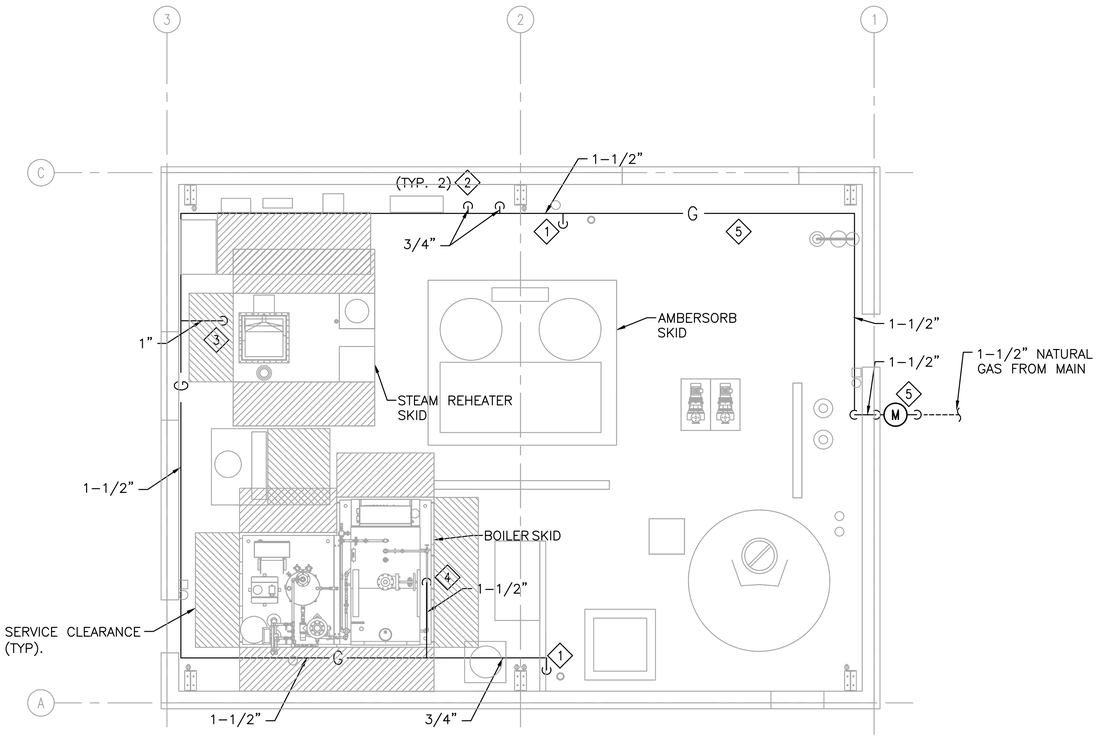
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SHEET 3

Drawing Number
31400390-P-102

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NATURAL GAS PIPING PLAN

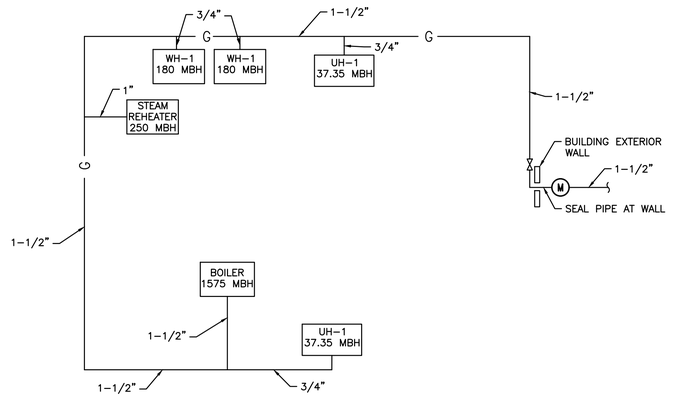
SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. INSTALL PLUMBING PER IPC 2012.
2. PIPE SIZING BASED ON 2012 INTERNATIONAL FUEL GAS CODE TABLE 402.4(5) INLET PRESSURE 2.0 PSIG. PRESSURE DROP OF 1.0 PSI. NOTIFY ENGINEER IF DELIVERY GAS PRESSURE IS LESS THAN 2.0 PSIG.
3. MAINTAIN SERVICE CLEARANCES PER MANUFACTURER'S REQUIREMENTS AND PER CODE.
4. PROVIDE REGULATOR AT EACH PIECE OF EQUIPMENT AS REQUIRED. COORDINATE REQUIRED INLET PRESSURE WITH EQUIPMENT MANUFACTURER.

SHEET KEYNOTES

1. CONNECT 3/4" GAS PIPING DOWN TO UNIT HEATER. FOR GAS CONNECTION SEE DETAIL #5 ON SHEET 3507-P-105.
2. 3/4" GAS PIPING DOWN TO CONNECT TO WATER HEATERS. FOR GAS CONNECTION SEE DETAIL #5 ON SHEET 3507- P-105.
3. 1" GAS PIPING DOWN TO CONNECT TO STEAM FURNACE.
4. 1-1/2" GAS PIPING DOWN TO CONNECT TO BOILER.
5. PROVIDE SHUT-OFF VALVE PRIOR TO GAS METER.



NATURAL GAS PIPING DIAGRAM

SCALE: NONE

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NATURAL GAS PLAN
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HANOVER, MARYLAND

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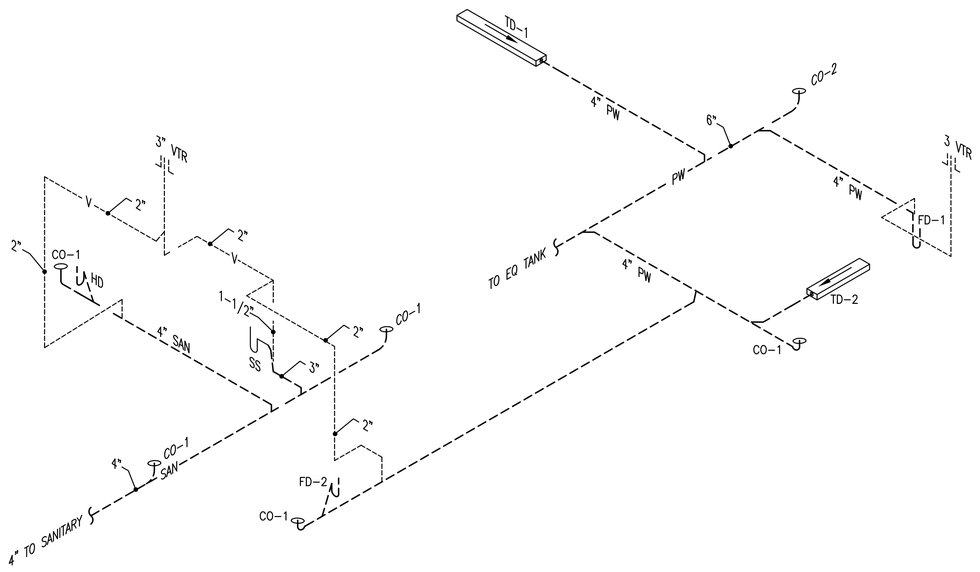
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SHEET 4

Drawing Number
31400390-P-103

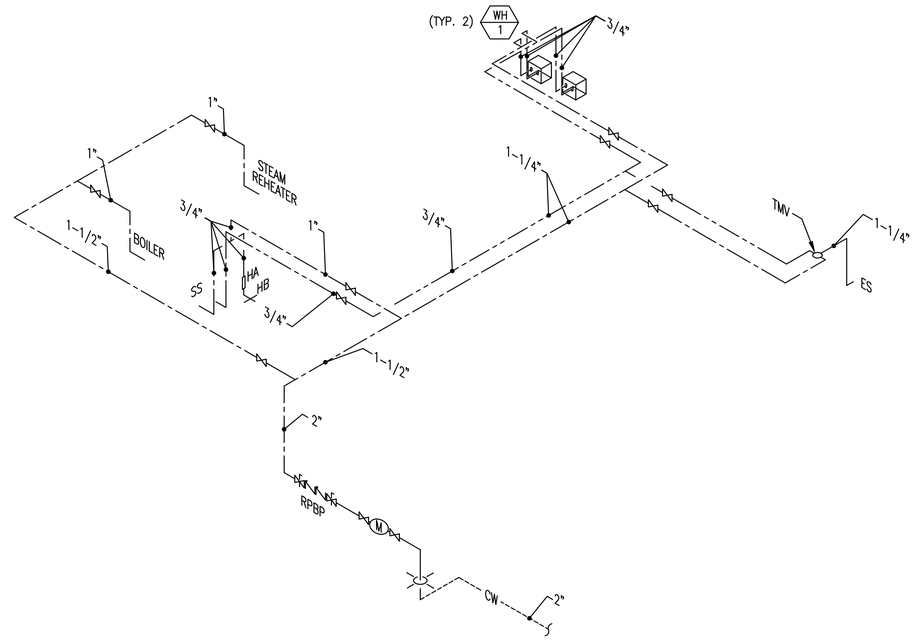
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PLUMBING RISER DIAGRAMS
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP-FLEX FACILITY

HANOVER, MARYLAND

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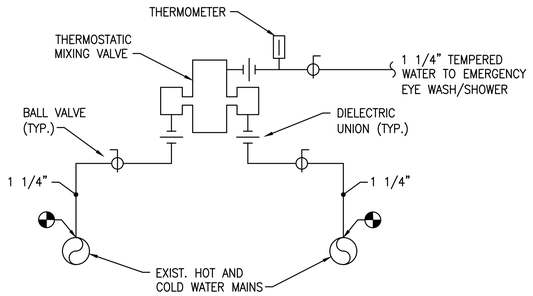
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SHEET 5

Drawing Number
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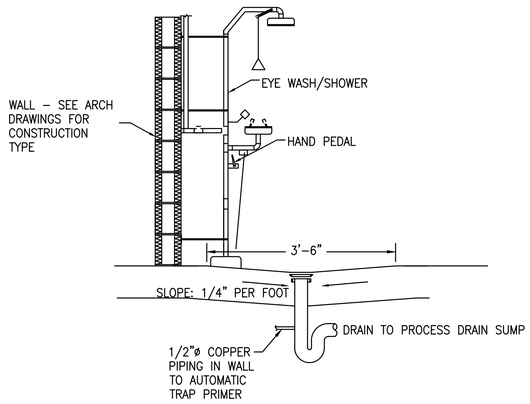
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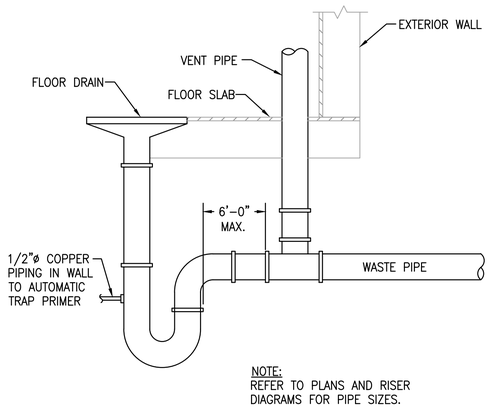
1 THERMOSTATIC MIXING VALVE DETAIL

SCALE: NONE



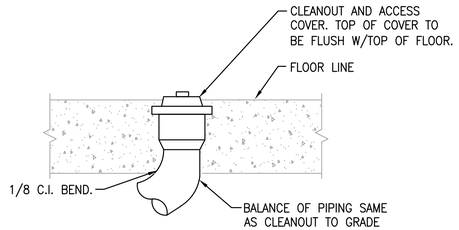
2 EMERGENCY SHOWER

SCALE: NONE



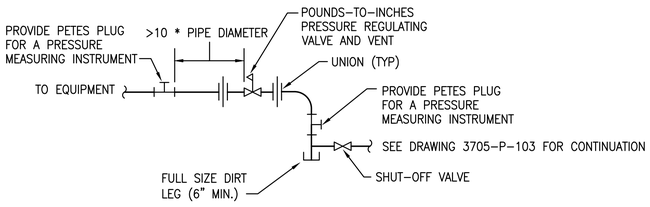
3 FLOOR DRAIN DETAIL

SCALE: NONE



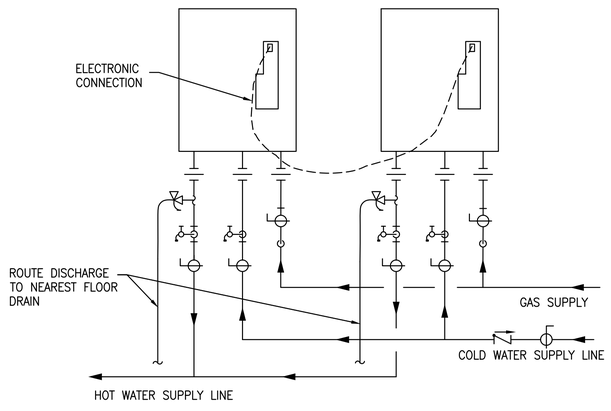
4 CLEANOUT DETAIL

SCALE: NONE



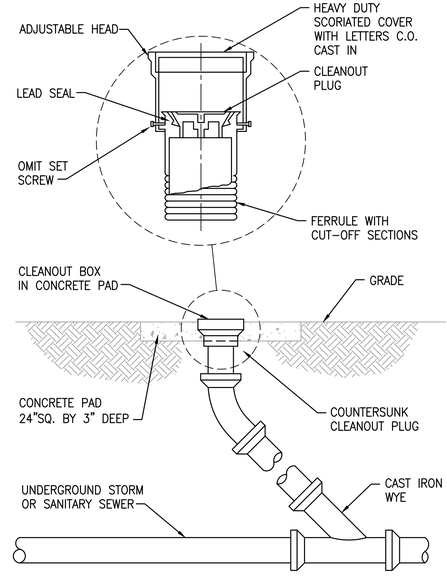
5 PRESSURE REGULATOR DETAIL

SCALE: NONE



6 WATER HEATER UNIT

SCALE: NONE



7 OUTSIDE CLEANOUT DETAIL

SCALE: NONE

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PLUMBING DETAILS
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FORMER KOP-FLEX FACILITY
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SHEET 6

Drawing Number
31400390-P-105

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PIPING SCHEDULE

PIPE USE	PIPE MATERIAL	FITTING TYPE	JOINT TYPE	VALVE TYPE	COUPLINGS	INSULATION/COATING	
DOMESTIC WATER (CW,HW,TW), ABOVE GROUND	ASTM B88 TYPE L HARD COPPER TUBE OR ASTM F 441/F 441M SCHEDULE 80 CPVC	WROUGHT-COPPER, SOLDER-JOINT OR THREADED ENDS.	THREADED JOINTS: ASME B1.20.1. SOLDERED JOINTS: ASTM B 828	BALL VALVES: TWO PIECE, FULL PORT, BRONZE WITH BRONZE TRIM. SOLDER-JOINT ENDS OR THREADED ENDS.		MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: CW: 1 INCH THICK, HW & TW 1-1/2" THICK.	INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: NPS 3/4 AND SMALLER: 60 INCHES WITH 3/8-INCH ROD NPS 1 AND NPS 1-1/4: 72 INCHES WITH 3/8-INCH ROD NPS 1-1/2 AND NPS 2: 96 INCHES WITH 3/8-INCH ROD NPS 2-1/2: 108 INCHES WITH 1/2-INCH ROD. INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET .
		ASTM F 439 SOCKET OR ASTM F 437 THREADED FITTINGS. CPVC PIPING SYSTEM: ASTM D 2846/D 28446M, SDR 11, PIPE AND SOCKET FITTINGS.	SOLVENT CEMENT: ASTM F 493	BALL VALVES: TWO PIECE, FULL PORT, CPVC. SOLDER-JOINT ENDS OR THREADED ENDS WITH EPDM VALVE SEAT.		MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: CW: 1 INCH THICK, HW & TW 1-1/2" THICK.	INSTALL VINYL-COATED HANGERS FOR CPVC PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: NPS 1 AND SMALLER: 36 INCHES WITH 3/8-INCH ROD. NPS 1-1/4 TO NPS 2: 48 INCHES WITH 3/8-INCH ROD. NPS 2-1/2 TO NPS 3-1/2: 48 INCHES WITH 1/2-INCH ROD. INSTALL SUPPORTS FOR VERTICAL CPVC PIPING EVERY 60 INCHES FOR NPS 1 AND SMALLER, AND EVERY 72 INCHES FOR NPS 1-1/4 AND LARGER.
DOMESTIC WATER, BELOW GROUND	ASTM B 88 TYPE K SOFT COPPER TUBE	WROUGHT-COPPER, SOLDER-JOINT OR THREADED ENDS.	THREADED JOINTS: ASME B1.20.1. SOLDERED JOINTS: ASTM B 828				
NATURAL GAS, ABOVE GROUND	ASTM A 53/A 53M BLACK STEEL, SCHEDULE 40, TYPE E OR S, GRADE B	ASME B16.39, CLASS 150, STANDARD PATTERN MALLEABLE-IRON THREADED FITTINGS ASTM A 234/A 234M WROUGHT-STEEL WELDING FOR BUTT WELDING AND SOCKET WELDING	ASME B16.39, CLASS 150 UNIONS, MALLEABLE IRON WITH BRASS-TO-IRON SEAT, GROUND JOINT, AND THREADED ENDS ASME B16.5, MINIMUM CLASS 150, FORGED STEEL FLANGES AND FLANGED FITTINGS	ASME B16.33 MANUAL GAS SHUTOFF VALVE, 125 PSIG, THREADED ENDS			INSTALL HANGERS FOR HORIZONTAL STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES: NPS 1 AND SMALLER: MAXIMUM SPAN, 96 INCHES; MINIMUM ROD SIZE, 3/8 INCH. NPS 1-1/4: MAXIMUM SPAN, 108 INCHES; MINIMUM ROD SIZE, 3/8 INCH. NPS 1-1/2 AND NPS 2: MAXIMUM SPAN, 108 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
NATURAL GAS, BELOW GROUND, OUTDOOR	POLYETHYLENE PLASTIC	FITTINGS JOINED BY HEAT FUSION, OR MECHANICAL COUPLINGS			MECHANICAL: STAINLESS-STEEL FLANGES AND TUBE WITH EPOXY FINISH EQUIPPED WITH ANODE.	EPOXY PAINT, ADHESIVE, AND HEAT-SHRINK PE SLEEVES	
SANITARY/PROCESSED WASTE	ASTM D 2665 SOLID-WALL PVC	PVC SOCKET MADE TO ASTM D 3311	ADHESIVE PRIMER: ASTM F 656. SOLVENT CEMENT: ASTM D 2564.				INSTALL HANGERS FOR PVC PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: NPS 1-1/2 AND NPS 2: 48 INCHES WITH 3/8-INCH ROD. NPS 3: 48 INCHES WITH 1/2-INCH ROD. NPS 4 AND NPS 5: 48 INCHES WITH 5/8-INCH ROD. INSTALL SUPPORTS FOR VERTICAL PVC PIPING EVERY 48 INCHES.
SANITARY VENT	ASTM D 2665 SOLID-WALL PVC	PVC SOCKET MADE TO ASTM D 3311	ADHESIVE PRIMER: ASTM F 656. SOLVENT CEMENT: ASTM D 2564.				INSTALL HANGERS FOR PVC PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: NPS 1-1/2 AND NPS 2: 48 INCHES WITH 3/8-INCH ROD. NPS 3: 48 INCHES WITH 1/2-INCH ROD. NPS 4 AND NPS 5: 48 INCHES WITH 5/8-INCH ROD. INSTALL SUPPORTS FOR VERTICAL PVC PIPING EVERY 48 INCHES.

PLUMBING FIXTURE SCHEDULE

KEY	DESCRIPTION	BASIS OF DESIGN OR APPROVED EQUIVALENT	FINISH/COLOR/MATERIAL	LOCATION	NOTES (PROVIDE PER MANUFACTURER'S RECOMMENDATIONS)	WASTE (INCH)	VENT (INCH)	COLD WATER (INCH)	HOT WATER (INCH)	GAS (INCH)	NOTES
CO-1	CLEANOUT	WATTS, CO-200-RX, CLEANOUT WITH ROUND TOP	EPOXY COATED DCI	SEE PLANS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	4"	-	-	-	-	1
CO-2	CLEANOUT	WATTS, CO-260-6, FLOOR CLEANOUT WITH ROUND TOP	EPOXY COATED DCI	SEE PLANS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	6"	-	-	-	-	1
FD-1	FLOOR DRAIN	JR SMITH MODEL 2210	DCI WITH CAST IRON GRATE AND SEDIMENT BUCKET	EMERGENCY SHOWER	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	4"	2"	-	-	-	1
FD-2	FLOOR DRAIN	JR SMITH 2005-A.P.T.	DUCTILE CAST IRON	SEE PLANS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	4"	2"	-	-	-	1
HD	HUB DRAIN	WATTS FD-100-DD	CAST IRON	SEE PLANS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	4"	2"	-	-	-	1
ES	EMERGENCY SHOWER/EYEWASH	GUARDIAN G1902	YELLOW PAINTED GALVANIZED STEEL WITH SS EYEWASH BOWL WITH BOWL DUST COVER	SEE PLANS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	1-1/4"	-	1-1/4"	1-1/4"	-	1, 2
HA	HAMMER ARRESTOR	WATTS REGULATOR - SERIES LF05 SEE SIZING TABLE ON SHEET P5.01	PRE-CHARGED	PROVIDE FOR HB	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	-	-	-	-	-	1
HB	HOSE BIBB	WOODFORD MODEL75, SURFACE MOUNTED WITH ANTI SIPHON VACUUM BREAKER	ROUGH BRASS	INDOORS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	-	-	3/4"	-	-	1
SS	SERVICE SINK	ADVANCE TABCO FE-2-2424-X WITH ELKAY LK393A FAUCET, 3" DRAIN GASKET AND STRAINER.	304 STAINLESS STEEL	SEE PLANS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	3"	1-1/2"	1/2"	1/2"	-	1, 2
WH-1	TANKLESS WATER HEATER	RINNAI MODEL RL75i, NATURAL GAS, SET HOT WATER DISCHARGE TO 120°F	GALVANIZED STEEL	SEE PLANS	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS.	-	-	3/4"	3/4"	3/4"	1
RPBP	REDUCED PRESSURE BACKFLOW ASSEMBLY	WATTS, MODEL 007-LEAD FREE WITH BRONZE STRAINER	BRONZE	SEE PLANS	PROVIDE PER 2012 IPC	-	-	2"	-	-	1, 2
TMV	THERMOSTATIC MIXING VALVE	HAWS 9201E, SET TEMPERED WATER DISCHARGE TO 80°F	BRASS	EMERGENCY SHOWER	PROVIDE MATERIALS AND CARRIER TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	-	-	1-1/4"	1-1/4"	-	1, 2
TD-1	TRENCH DRAIN	ZURN Z886-10 WITH NO-HUB END OUTLET	BLACK ACID RESISTANT EPOXY COATED DCI GRATE	SEE PLANS	PROVIDE MATERIALS AND CARRIER TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	4"	-	-	-	-	1
TD-2	TRENCH DRAIN	ZURN Z886-6 WITH NO-HUB END OUTLET	BLACK ACID RESISTANT EPOXY COATED DCI GRATE	SEE PLANS	PROVIDE MATERIALS AND CARRIER TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS	4"	-	-	-	-	1
TP	AUTOMATIC TRAP PRIMER	JAY R. SMITH MODEL 2699-1	BRONZE	FD-1, FD-2, AND HD	PROVIDE MATERIALS TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS, PROVIDE PIPING TO FLOOR DRAIN	-	-	1/2"	-	-	1

NOTES:
1. INSTALL PLUMBING PER 2012 IPC.
2. PROVIDE SUPPORTS, CLAMPS, CONNECTORS TO DRAINS, TRAPS AND FITTINGS.

WATER HAMMER ARRESTOR
SIZING TABLE PER PDI "PPP" IS THE BASIS OF DESIGN OR EQUAL

□I□E □I□E	FI□T□RE □NIT□	CR□□□□ REF. □DI
1/2"	1-11	A
3/4"	12-32	□
1"	33-60	C
1-1/4"	61-113	D
1-1/2"	114-156	E
2"	155-300	F

REVISIONS

REV	DESCRIPTION	DRAWN	APPR.
1	ISSUED AS FINAL 07/31/2017	Revised:	
2		Revised:	
3		Revised:	

SEAL

DATE

DRAWN BY	VLD	1/1/2017
CHECKED	KEW	1/1/2017
APPROVED	MJD	

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PLUMBING SCHEDULES
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

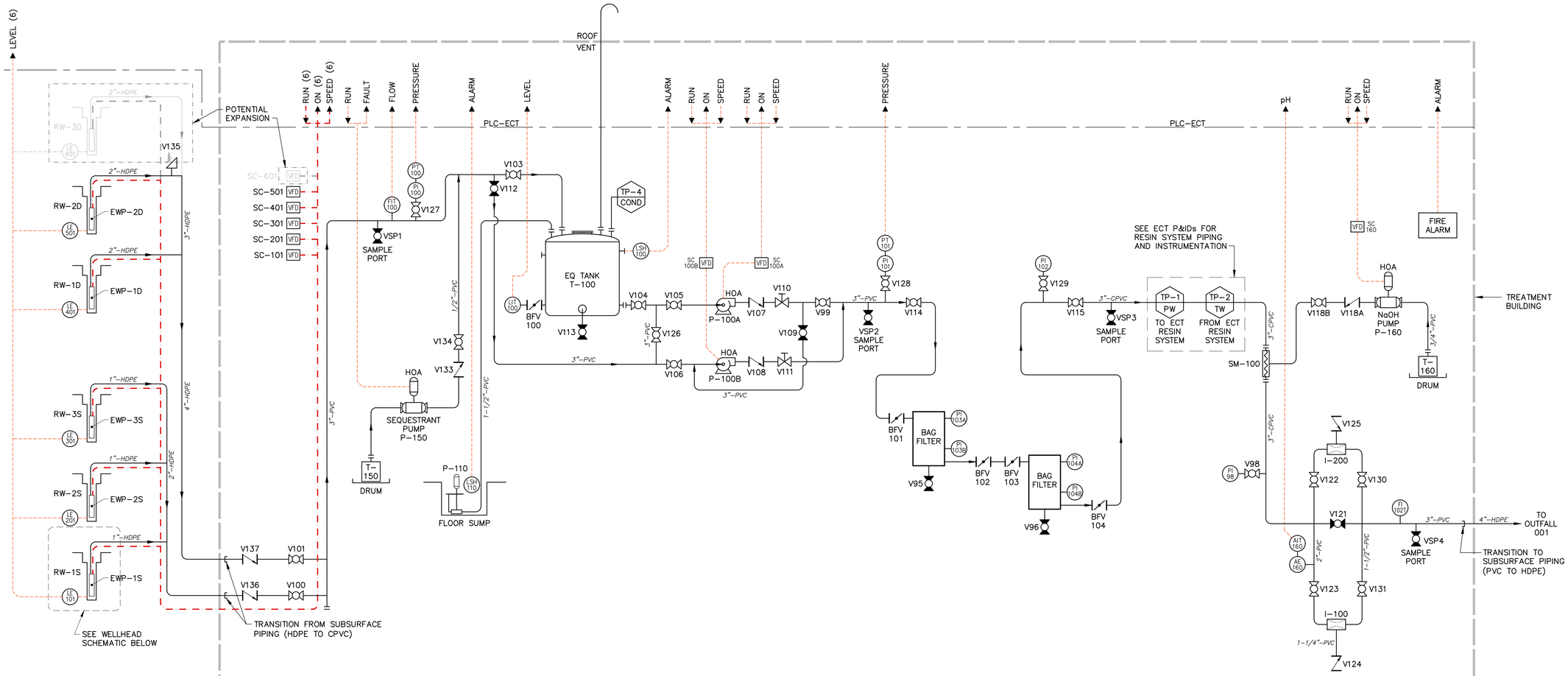
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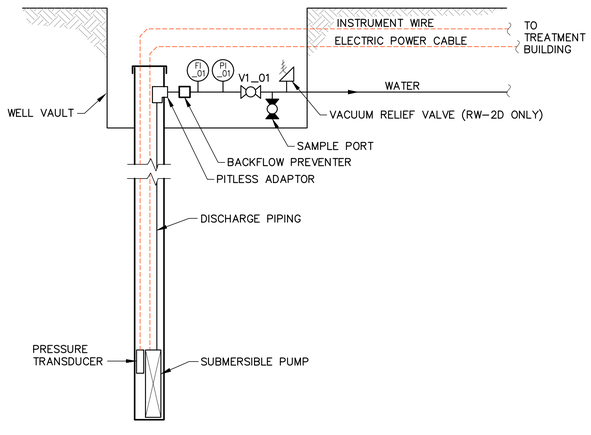
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NOT TO SCALE

LEGEND

AIT	ANALYZER INDICATOR TRANSMITTER (pH)
CS	CARBON STEEL
CPVC	CHLORINATE POLYVINYL CHLORIDE
FI	FLOW INDICATOR (TOTALIZING)
FIT	FLOW INDICATOR TRANSMITTER
HDPE	HIGH DENSITY POLYETHYLENE
HOA	HAND/OFF/AUTOMATIC
LE	LEVEL ELEMENT
LIT	LEVEL INDICATOR TRANSMITTER
LSH	LEVEL SWITCH HIGH (ALARM)
PI	PRESSURE INDICATOR
PIT	PRESSURE INDICATOR TRANSMITTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PW	PROCESS WATER
TW	TREATED WATER
VFD	VARIABLE FREQUENCY DRIVE
———	WATER LINE
- - - -	ELECTRIC SERVICE/SIGNAL
— — —	ELECTRIC CONDUITS AND CABLES

LEGEND

	GATE VALVE (NORMALLY OPEN)
	GATE VALVE (NORMALLY CLOSED)
	BALL VALVE (NORMALLY OPEN)
	BALL VALVE (NORMALLY CLOSED)
	CHECK VALVE
	BUTTERFLY VALVE (BFV)
	VACUUM RELIEF VALVE
	CENTRIFUGAL PUMP
	METERING PUMP
	STATIC MIXER
	AIR INJECTOR
T-160	55 GALLON DRUM WITH CONTAINMENT
	BAG FILTER HOUSING
TP-1 PW	TIE POINT

REVISIONS

REV	DESCRIPTION		
1	ISSUED AS FINAL 07/31/2017	Chkd: RJC Appr.: RJC	07/31/2017
2	Revised:	Chkd: Appr.:	
3	Revised:	Chkd: Appr.:	
4	Revised:	Chkd: Appr.:	

SEAL — 7/31/17 DATE

DRAWN: BY RJC 08/03/17
CHECKED
APPROVED

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ANCILLARY EQUIPMENT PROCESS AND INSTRUMENTATION DIAGRAM

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

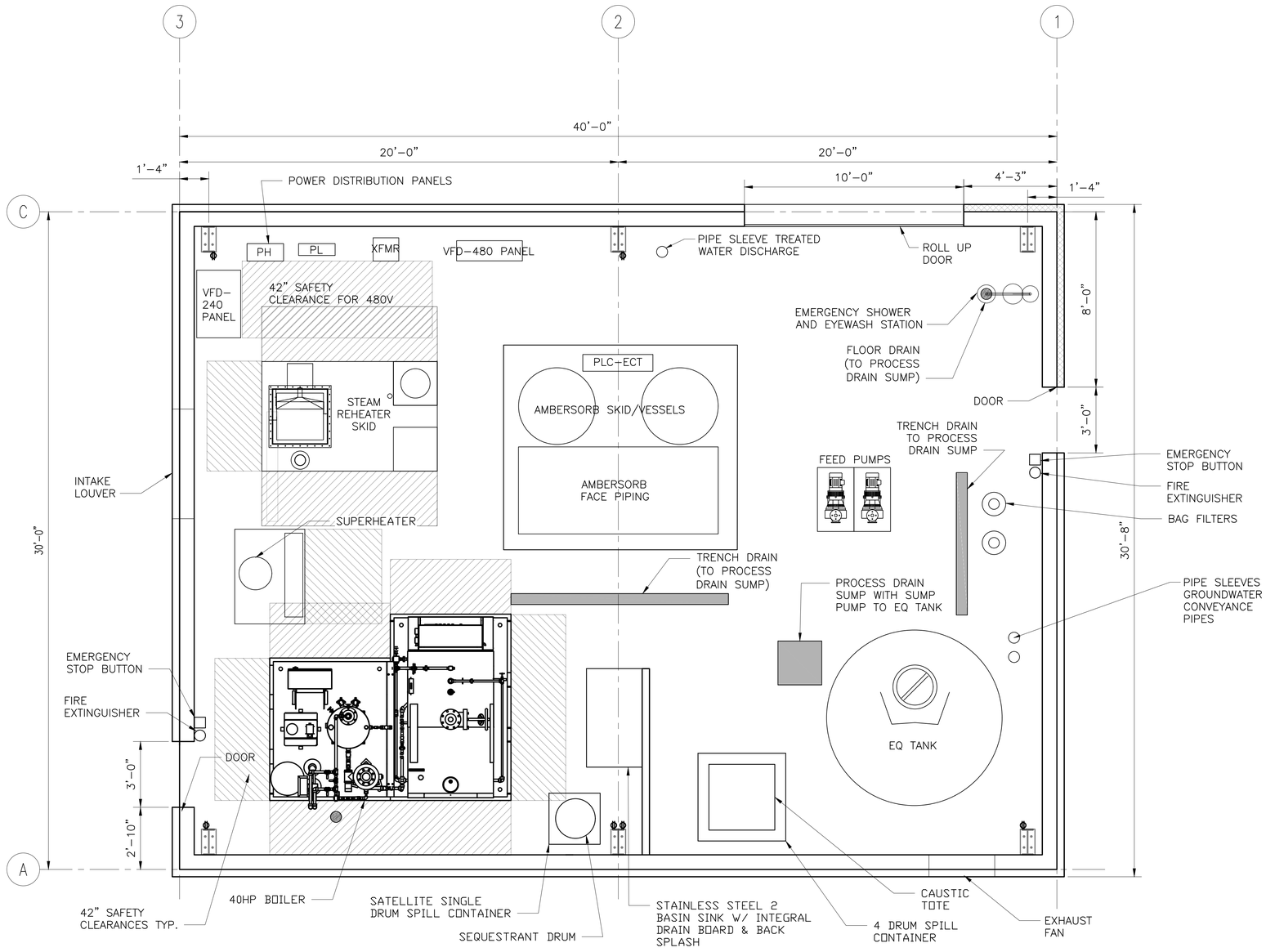
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SHEET PP-100

Drawing Number
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FLOOR PLAN

SCALE: 3/8"=1'-0"

NOTES:

1. DRAWING PROVIDED FOR INFORMATION AND COORDINATION OF EQUIPMENT, PAD LOCATIONS AND DRAINS ONLY. (INFORMATION/SYSTEMS ARE NOT OUR DESIGN.)

D

REVISIONS

REV	DESCRIPTION	Date	Appr.
1	ISSUE FOR BID. DATE: 04/01/2016	Revised:	
2	ISSUED AS FINAL 07/31/2017	Revised:	
3	T.McGANN	Revised:	

SEAL

STATE OF MARYLAND — STEPHEN T. McGOHAN — 43395 — PROFESSIONAL ENGINEER

DATE

DRAWN BY	L. BURASHNKOVA
CHECKED	J. FONZI
APPROVED	D. LANG

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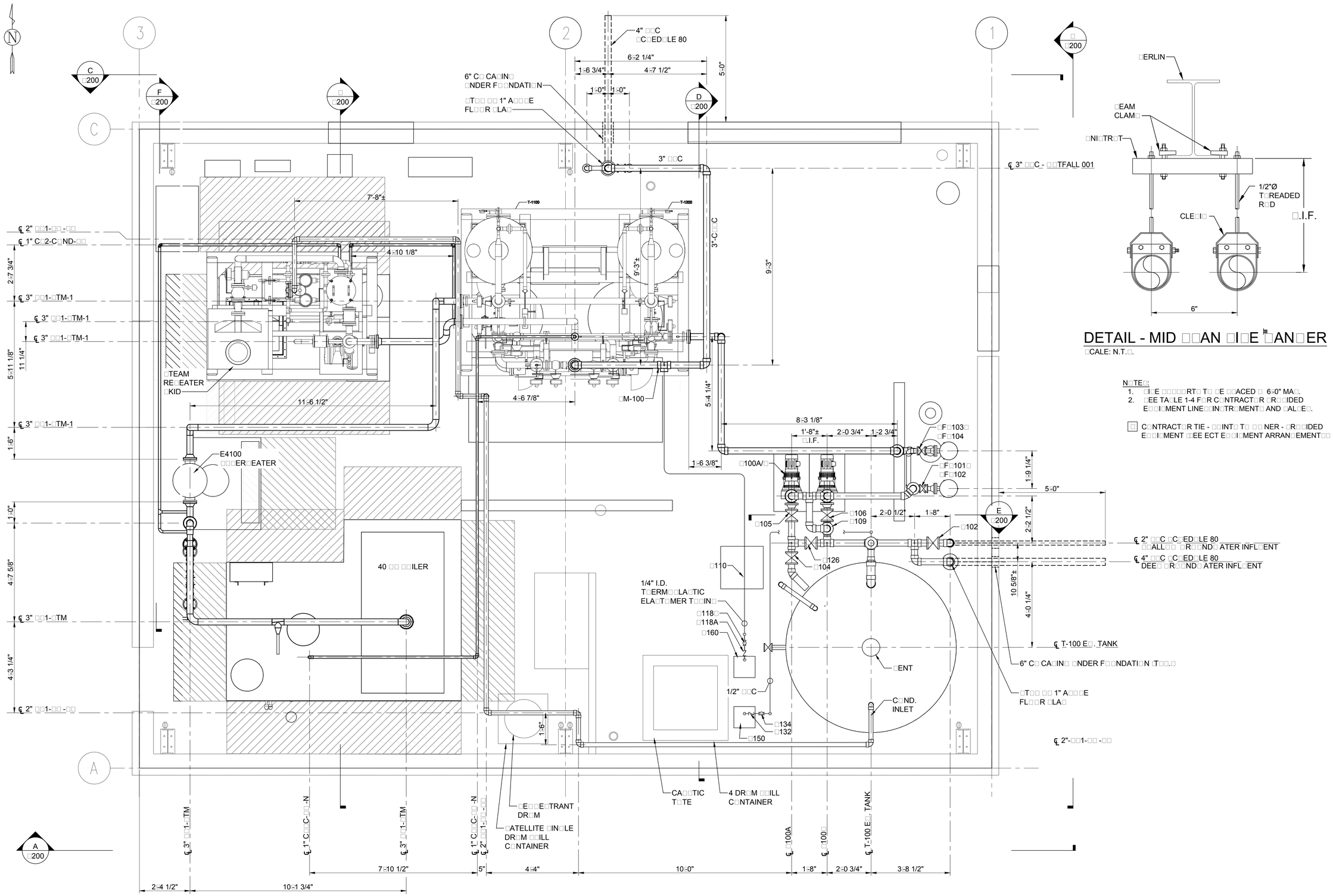
AS-BUILT FIRST FLOOR PLAN
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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SHEET 1

Drawing Number
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□CALE: 1/2"□1'-0"

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2	I□□□ED A□ FINAL 07/31/2017	Revised: T.Mc□ANN	Appr.:
3		Revised:	Appr.:

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DATE

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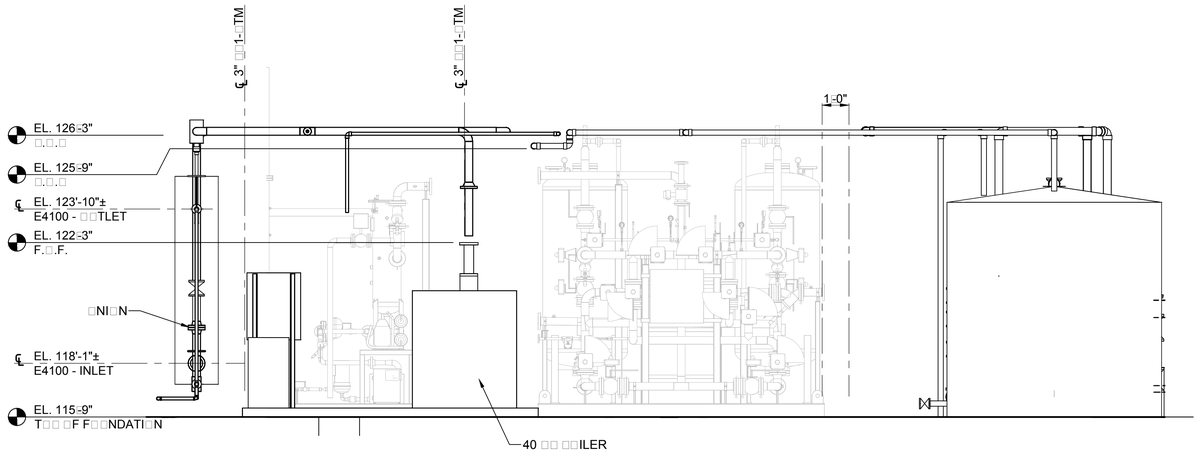
GROUNDWATER COLLECTION AND TREATMENT SYSTEM
AS-BUILT PROCESS PIPING PLAN
FORMER KOP-FLEX FACILITY
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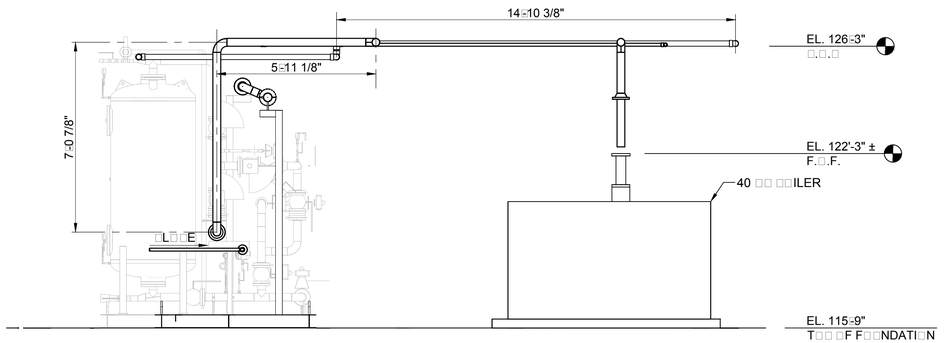
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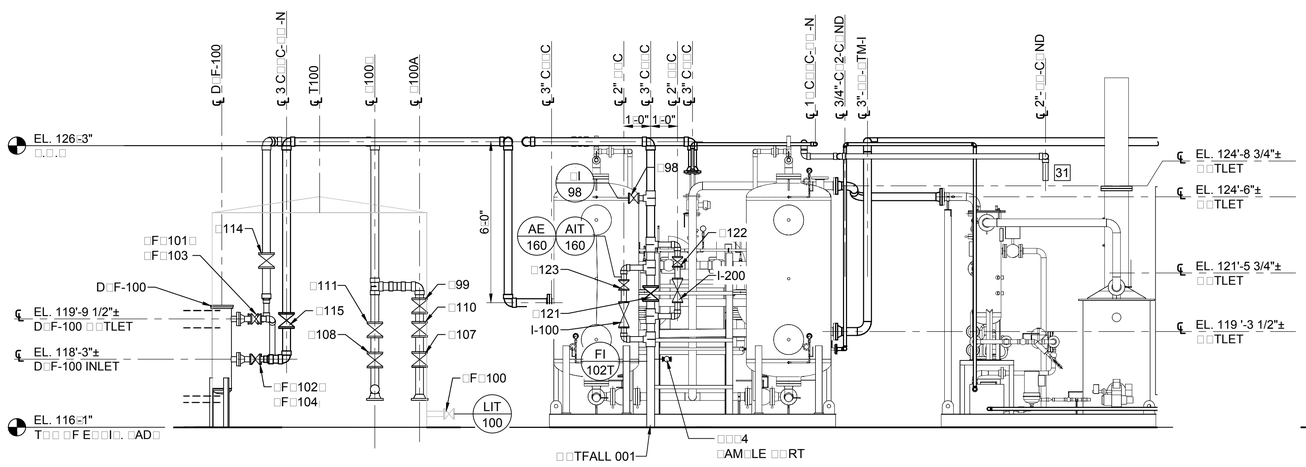




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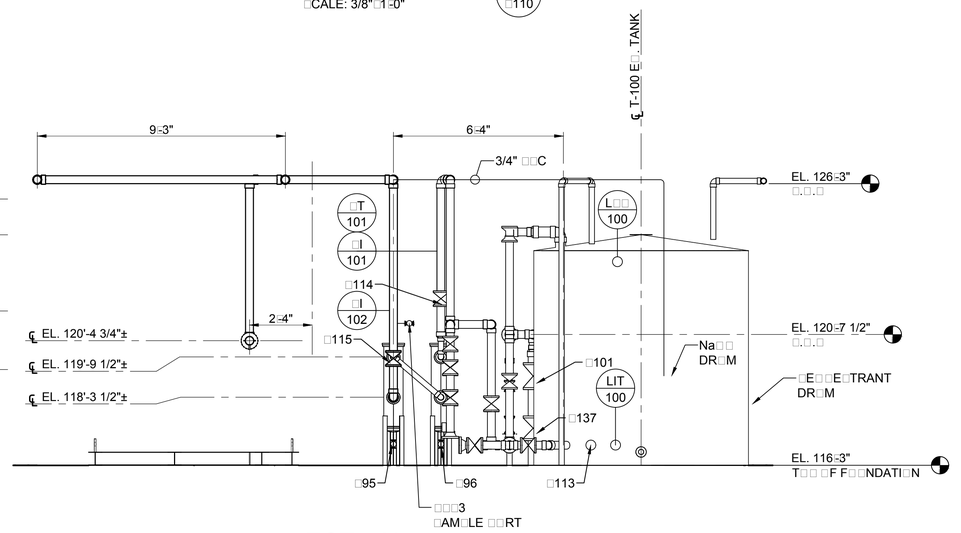
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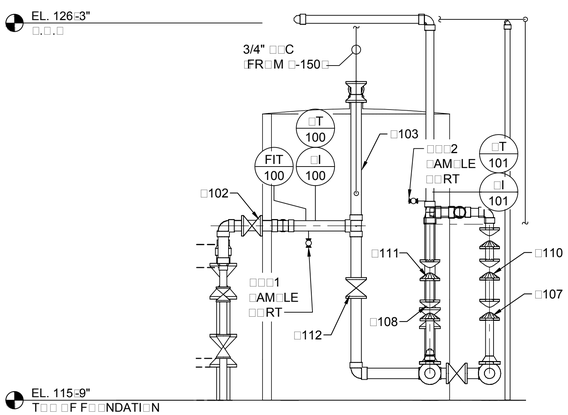
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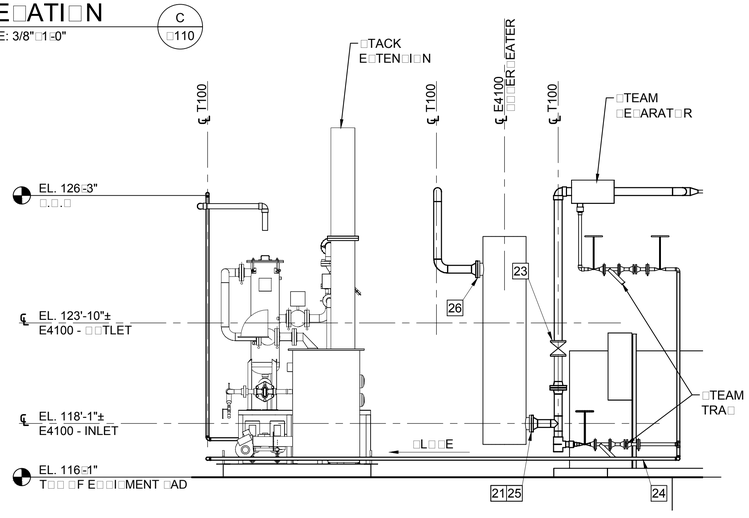
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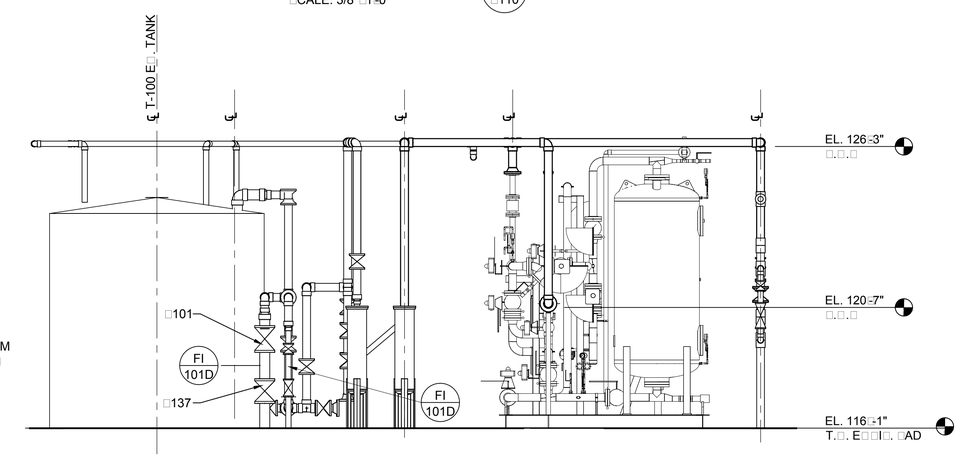
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REV	DESCRIPTION		
1	A□ □□ILT - ADDED □95 □96 □98 □99 □F□ 100-104 Revised: T.Mc□ANN	Chkd:	Appr.:
2	I□□□ED A□ FINAL 07/31/2017 Revised: T.Mc□ANN	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:

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STATE OF MARYLAND · JAMES GREGORY TESCHNER · 43951 · REGISTERED PROFESSIONAL ENGINEER

4/6/16 DATE

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GROUNDWATER COLLECTION AND TREATMENT SYSTEM
AS-BUILT SECTIONS
FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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SHEET PP-102

Drawing Number
31400390-P-200

WIRING NOTES

PRODUCTS

2.01 WIRES AND CABLES

A. GENERAL

1. CONDUCTORS SHALL CONFORM TO A.S.T.M. AND I.P.C.E.A. STANDARDS, AND BE UL LISTED AND LABELED.
2. CONDUCTORS SHALL HAVE 600 VOLTS INSULATION AND SHALL BE OF SOFT–ANNEALED–UNCOATED COPPER OF 98% CONDUCTIVITY. COPPER CLAD CONDUCTORS ARE NOT ACCEPTABLE.
3. ALL CONDUCTORS SHALL HAVE IDENTIFIABLE LETTERING ON THE INSULATOR JACKET AS TO VOLTAGE RATING, WIRE TYPE, A.W.G. SIZE, INSULATION, AND MANUFACTURER I.D.

B. WIRE DESCRIPTION

1. TYPE THHN/THWN: 75OC, THHN: 90°C SHALL HAVE A THERMO–PLASTIC POLYVINYL CHLORIDE INSULATION WITH NYLON JACKET FOR 600 VOLTS, AND SHALL COMPLY WITH ASTM, IPCEA S–61–402 (LATEST EDITION) AND NEMA WC5 (LATEST EDITION).

2.02 SPLICES AND TERMINATIONS

A. GENERAL

1. ALL MATERIALS FOR MAKING SPLICES AND TERMINATIONS SHALL BE SPECIFICALLY DESIGNED FOR USE WITH THE TYPE OF WIRE, THE CABLE INSULATION, THE INSTALLATION AND THE OPERATING CONDITIONS OF THE SPECIFIC APPLICATION AND BE UL LISTED.
2. GROUNDING CONDUCTORS AND BONDING JUMPERS SHALL BE CONNECTED BY EXOTHERMIC WELDING, LISTED PRESSURE CONNECTORS, LISTED CLAMPS, OR OTHER LISTED MEANS.

CONDUIT NOTES

PRODUCTS

2.01 RACEWAYS

A. RIGID GALVANIZED CONDUIT (RGC)

STEEL CONDUIT, HOT DIPPED GALVANIZED, WITH UNDERWRITERS LABORATORIES LABEL STAMPED ON EACH LENGTH.

B. POLYVINYL CHLORIDE (PVC)

PVC, SCHEDULE 40, WITH UNDERWRITERS LABORATORIES LABEL STAMPED ON EACH LENGTH.

2.02 SUPPORTING DEVICES

A. HANGERS

1. SEPARATE HANGERS SHALL BE INSTALLED FOR SUPPORTING CONDUITS. WHEREVER POSSIBLE, HANGERS SHALL BE SUPPORTED FROM CONCRETE SLAB BY INSERTS.
2. HANGERS AND PIPING INSTALLED BY OTHER TRADES SHALL NOT BE USED FOR SUPPORTING ELECTRIC CONDUITS.
2. INDIVIDUAL AND MULTIPLE PIPE HANGERS AND RISER CLAMPS INCLUDING ALL PARTS AND HARDWARE SHALL BE HOT–DIPPED GALVANIZED THROUGHOUT. ALL U–BOLTS, CLAMPS, ATTACHMENTS AND HARDWARE FOR HANGER ASSEMBLY AND CONDUITS SHALL BE PROVIDED. EACH MULTIPLE HANGER SHALL BE DESIGNED TO SUPPORT A LOAD EQUAL TO OR GREATER THAN THE SUM OF THE WEIGHTS OF THE CONDUITS, WIRES AND HANGER ITSELF, PLUS 200 POUNDS.

B. USE PIPE STRAPS AND SPECIFIED METHOD OF ATTACHMENT WHERE CONDUIT IS INSTALLED PROXIMATE TO SURFACE OF STEEL STUD OR MASONRY CONSTRUCTION.

1. USE HANGERS SECURED TO SURFACE WITH SPECIFIED METHOD OF ATTACHMENT WHERE CONDUIT IS SUSPENDED FROM THE SURFACES.

D. USE "C" BEAM CLAMPS AND HANGERS WHERE CONDUIT IS SUPPORTED FROM STEEL BEAMS.

E. USE DECK CLAMPS AND HANGERS TO SUPPORT CONDUITS FROM STEEL DECKING HAVING HANGER TABS. ONE CONDUIT PER TAB IS PERMITTED.

1. WHERE CONDUIT IS SUPPORTED FROM STEEL DECKING WHICH DOES NOT HAVE HANGER TABS, USE CLAMPS AND HANGERS SECURED TO DECKING, UTILIZING SPECIFIED METHOD OF ATTACHMENT.

F. USE CHANNEL SUPPORT SYSTEM SUPPORTED FROM STRUCTURAL STEEL FOR MULTIPLE PARALLEL CONDUIT RUNS.

G. WHERE CONDUITS ARE INSTALLED ABOVE CEILING, DO NOT REST CONDUIT DIRECTLY ON RUNNERS BARS, T–BARS, ETC.

1. CONDUIT SIZES 2½" AND SMALLER: SUPPORT CONDUIT FROM NON–LIGHTWEIGHT CEILING SUPPORTS OR FROM CONSTRUCTION ABOVE CEILING SUCH AS BEAMS, JOISTS, SLABS, OR TRUSSES.
2. CONDUIT SIZES OVER 2½" AND WHERE CEILING SYSTEM IS OF LIGHTWEIGHT CONSTRUCTION (E.G. GAT SYSTEM): SUPPORT CONDUIT FROM BEAMS, JOIST, OR TRUSSES ABOVE CEILING.

H. CONDUITS SHALL BE SUPPORTED WITHIN THREE (3) FEET OF ANY KIND OF FITTING AND AT EVERY OUTLET OR JUNCTION BOX, PANEL, ETC. THIS SHALL APPLY TO BOTH HORIZONTAL AND VERTICAL RUNS.

2.03 BOXES AND ENCLOSURES

A. THE CONTRACTOR SHALL PROVIDE OUTLET BOXES AND ENCLOSURES APPROPRIATE FOR THE PURPOSE AT ALL LOCATIONS WHERE THE DRAWINGS REQUIRE THE INSTALLATION OF ELECTRICAL DEVICES OR ELECTRICAL EQUIPMENT. FOR EXPOSED CONDUIT SYSTEMS, THE CONTRACTOR SHALL USE CAST OUTLET BOXES IN ALL LOCATIONS BELOW 8'–0" WITH NUMBER OF THREADED HUBS EQUAL TO THE NUMBER OF CONDUITS, EXCEPT WHEN INSTALLING SURFACE METAL RACEWAY CONTRACTOR SHALL PROVIDE BOXES FROM THE SAME MANUFACTURER OF THE SURFACE METAL RACEWAY.

B. WHERE THE CONTRACTOR SELECTS AND INSTALLS AN ITEM OF EQUIPMENT THAT REQUIRES ADDITIONAL BOXES, FITTINGS, ETC., OR A MODIFICATION OF THE CONDUIT SYSTEM INDICATED ON THE DRAWINGS, SUCH ADDITIONAL BOXES, FITTINGS, ETC. SHALL BE FURNISHED AND INSTALLED AND SUCH MODIFICATIONS SHALL BE PERFORMED BY THE CONTRACTOR AS PART OF THIS CONTRACT, WITHOUT EXTRA COMPENSATION FROM THE AUTHORITY.

2.04 FITTINGS AND ACCESSORIES

A. ALL FITTINGS AND ACCESSORIES MUST BE UL LISTED AND COMPATIBLE WITH SELECTED RACEWAYS AND SUITABLE FOR USE LOCATION.

2.05 CONDUIT SIZES

A. WHERE CONDUIT IS REQUIRED TO BE INSTALLED, ITS NOMINAL DIAMETER SHALL BE NOT LESS THAN 3/4 INCH.

B. FOR CONDUIT PLACED IN METAL DECK SLABS, THE MAXIMUM SIZE IS 1".

C. FOR CONDUIT PLACED IN FORMED SLABS, THE MAXIMUM SIZE IS 3/4" FOR 4" SLABS AND 1" FOR SLABS GREATER THAN 4".

2.06 SLEEVES FOR CONDUIT

A. PROVIDE SLEEVES, SCHEDULE 40, GALVANIZED STEEL, FOR ALL ELECTRICAL CONDUITS AND WIRING PASSING THROUGH FOUNDATION WALLS.

B. PROVIDE SLEEVES, SCHEDULE 10, GALVANIZED STEEL, FOR ALL ELECTRICAL CONDUITS AND WIRING PASSING THROUGH PARTITIONS AND SLABS. PROPRIETARY SLEEVES THAT ARE PART OF AN NYC APPROVED FIRE STOPPING ASSEMBLY ARE ALSO ACCEPTABLE.

PANELBOARD NOTES

PRODUCTS

2.01 PANELBOARDS – CIRCUIT BREAKER TYPE

A. EQUIPMENT MANUFACTURED BY GENERAL ELECTRIC CO., SIEMENS, SQUARE D CO., EATON/CUTLER–HAMMER, ALL–CITY SWITCHBOARD CORP, AND ELECTROTECH SERVICE EQUIPMENT CORPORATION HAVING:

1. BUS BARS AND LUGS SHALL NOT BE LESS THAN 98% CONDUCTIVITY, HARD DRAWN COPPER. ALL COPPER BUS CONNECTIONS SHALL BE BOLTED WITH LOCK WASHERS AND JOINTS SHALL BE SILVER PLATED.
2. FULL CAPACITY COPPER NEUTRAL BUS IN PANELBOARDS WHERE NEUTRALS ARE REQUIRED.
3. COPPER EQUIPMENT GROUNDING BUS IN PANELBOARDS WHERE EQUIPMENT GROUNDING CONDUCTORS ARE REQUIRED.
4. SECTION DESIGNATED "SPACE" OR "PROVISION FOR FUTURE BREAKER' EQUIPPED TO ACCEPT FUTURE CIRCUIT BREAKERS.
5. MOLDED–CASE CIRCUIT BREAKERS; INVERSE TIME–CURRENT ELEMENT FOR LOW–LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS.
   CIRCUIT BREAKERS SHALL BE BOLT ON. PLUG–IN TYPE BREAKERS ARE NOT ACCEPTABLE.
6. GFCI (30MA TYPE) CIRCUIT BREAKERS SHALL BE PROVIDED FOR DESIGNATED CIRCUITS.

B. PANELBOARD CABINETS

1. FLUSH AND SURFACE MOUNTED CABINETS. NEMA PB 1, TYPE 1, TO MEET ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.
2. DELETE ITEMS BELOW IF NOT APPLICABLE. ADD OTHER PROJECT–SPECIFIC REQUIREMENTS.
3. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE–MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH–MOUNTED FRONTS, OVERLAP BOX.
4. RETAIN PARAGRAPH ABOVE OR BELOW.
5. HINGED FRONT COVER: ENTIRE FRONT TRIM HINGED TO BOX AND WITH STANDARD DOOR WITHIN HINGED TRIM COVER.
6. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH OVER CORROSION–RESISTANT TREATMENT OR PRIMER COAT.

D. LOCKS

PROVIDE LOCKS FOR PANELBOARD CABINETS LOCATED OUTSIDE ELECTRICAL ROOMS/CLOSETS. LOCKS SHALL BE OF APPROVED CYLINDER, PARACENTRIC TYPE, YALE NO. 511S, KEY CHANGE NO. 47. TWO KEYS SHALL BE SUPPLIED WITH EACH LOCK.

2.02 NAMEPLATES

A. EACH UNIT OF EQUIPMENT SHALL BE PROVIDED WITH A RIVETED PHENOLIC NAMEPLATE, IDENTIFYING THE EQUIPMENT AND ITS RATING.

B. ON EACH CIRCUIT BREAKER AND FUSED SWITCH: AMPERE RATING, FUSES SIZE AND FUSES TYPE (OR CIRCUIT BREAKER TYPE AND SETTING) AND CIRCUIT DESIGNATION.

C. ON PANELBOARD: AMPERE RATING, NOMINAL VOLTAGE, PHASES AND PANELBOARD DESIGNATION.

DISCONNECT SWITCH NOTES

PRODUCTS

2.01 ENCLOSED SWITCHES

A. APPROVED MANUFACTURERS:

B. CHALLENGER, EATON/CUTLER–HAMMER, GENERAL ELECTRIC, SIEMENS, SQUARE D.

C. VOLTAGE RATINGS

D. 250V RATING FOR 120V, 208V, OR 240V, CIRCUITS.

E. SOLID NEUTRAL BAR WHEN NEUTRAL CONDUCTOR IS INCLUDED WITH CIRCUIT.

F. NONFUSIBLE SWITCH: NEMA KS 1, TYPE HD, WITH LOCKABLE HANDLE.

2.02 ENCLOSURES

A. NEMA AB 1 AND NEMA KS1 TO MEET ENVIRONMENTAL CONDITIONS OF INSTALLED LOCATION.

1. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R.
2. WET OR DAMP LOCATIONS: NEMA 250, TYPE 4.

2.04 FACTORY FINISHES

A. FINISH: MANUFACTURER'S STANDARD PAINT APPLIED TO FACTORY–ASSEMBLED AND TESTED ENCLOSURES BEFORE SHIPPING.

2.05 NAMEPLATES

A. GENERAL

PRECISION ENGRAVE LETTERS AND NUMBERS WITH UNIFORMS MARGINS, CHARACTER SIZE MINIMUM 3/16" HIGH.

1. PHENOLIC: TWO COLOR LAMINATED ENGRAVERS STOCK, 1/16" MINIMUM THICKNESS, MACHINE ENGRAVED TO EXPOSE INNER CORE COLOR (WHITE).
2. MATERIALS FOR OUTDOOR APPLICATIONS: AS RECOMMENDED BY NAMEPLATE MANUFACTURER TO SUIT ENVIRONMENTAL CONDITIONS.

WIRING DEVICES NOTES

PRODUCTS

2.01 LIGHT SWITCHES

A. APPROVED MANUFACTURERS:

HUBBELL INCORPORATED, LEVITON MFG. COMPANY INC., PASS & SEYMOUR/LEGRAND

B. TOGGLE SINGLE POLE:

15A, 120/277V AC:
CS115 FROM HUBBELL INC.
CS115–2 FROM LEVITON MFG

2.02 RECEPTACLE DEVICES

A. STRAIGHT–BLADE–TYPE; COMMERCIAL SPECIFICATION GRADE MINIUM, COMPLIANCE WITH NEMA WD 1, DSCC WC 596, AND UL 498 AND UL 943 2006 CODES

1. SINGLE RECEPTACLE, NEMA 5–20R (20A, 125V, 2P, 3W) LEVITON 5891 OR PASS & SEYMOUR / LEGRAND PS5351
2. DUPLEX RECEPTACLE, NEMA 5–20R (20A, 125V, 2P, 3W) HUBBELL INC. HBL5362, LEVITON BR20 OR PASS & SEYMOUR / LEGRAND PS5362
3. GROUND–FAULT CIRCUIT INTERRUPTER GFCI; DUPLEX (20A, 125V, 2P, 3W) HUBBELL INC GF5352SL, LEVITON 6899, PASS & SEYMOUR/LEGRAND PS2095

B. WEATHERPROOF RECEPTACLE ENCLOSURE – FOR USE IN WET LOCATIONS EQUAL TO PASS & SEYMOUR / LEGRAND WIUC10–G.

2.02 WALL PLATE

A. PROVIDE WALL PLATE FOR WIRING DEVICES. MATERIAL SHALL BE 0.035 INCH THICK SATIN–FINISHED STAINLESS STEEL. METAL SCREW HEADS TO MATCH PLATE FINISH.

LIGHTING NOTES

PRODUCTS

2.01 DAMP LOCATION RATED LED LUMINAIRE

A. HIGHLIGHTS:

1. VAPORTIGHT DESIGN
2. HIGH–IMPACT RESISTANT, REINFORCED FIBERGLASS HOUSING.
3. LENS SECURED TO HOUSING WITH (8) POLYCARBONATE LATCHES, OPTIONAL STAINLESS STEEL LATCHES ARE SECURELY SPRING CLIPPED TO THE HOUSING, ELIMINATING LATCH FALL OFF DURING SERVICING.
4. FIXTURE DESIGN TO BE INSTALLED WITHOUT OPENING, SAVING VALUABLE INSTALLATION TIME.
5. GASKET IS A CONTINUOUSLY OURED NON–TOXIC, FIRE RESITANT, UNIFORM WIDTH AND THICKNESS FOR A TIGHT SEAL.

B. EXPECTED LIFE – PROJECTED LIFE OF AT LEAST 60,000 HOURS.

C. LEDS – USE OF CLOSELY–SPACED MEDIUM–POWER, HIGH–BRIGHTNESS CHIPS MINIMIZES PIXILATION AND PROVIDES UNIFORM LENS LUMINANCE. COOL WHITE (5000K), COLOR TEMPERATURE CRI >=80.

D. LEDS – INNER TRAY OF .06" THICK ALUMINIUM. OUTER HOUSING MOLDED OF HIGH–IMPACT, POLYESTER / UL5VA FIBERGLASS WITH INNER LIP BONDED WITH CONTINUOUS, COMPRESSIBLE, CLOSED CELL NEOPRENE GASKETING.

E. MOUNTING – (2) STAINLESS STEEL MOUNTING BRACKETS ARE FURNISHED WITH EACH FIXTURE, AND CAN BE MOUNTED TO SURFACE WHERE REQUIRED.

F. ELECTRICAL – UNIVERSAL VOLTAGE (120–277VAC) INPUT, 60HZ, POWER FACTOR >0.9, THD < 20%.

G. DRIVER – HIGH PERFORMANCE ISOLATED DRIVER FEATURE OVER–VOLTAGE, OVER–CURRENT, AND SHORT CIRCUIT (WITH AUTO–RECOVERY) PROTECTION. DRIVER MODULE IS SEALED TO IP66 PROTECTION LEVELS WITH CLASS A SOUND RATING.

H. OPERATING TEMPERATURE – –20DEGC – 35 DEGC.

I. FINISH – ALL METAL PARTS PAINTED AFTER FABRICATION FOLLOWING TREATMENT WITH PHOSPHATE RUST INHIBITOR. FINISH COATING OF HOUSING REFLECTING SURFACES IS WITH HIGH–REFLECTANCE (MINIMUM 92%) POLYESTER POWDER.

J. LIGHT OUTPUT 7146 LUMENS @ 60 WATTS.

K. LISTING – LISTED TO UL 1598 AND UL8750. SUITABLE FOR WET LOCATIONS. CERTIFIED NSF (ANSI STANDARD 2) IP65, IP66, IP67, NEMA 4X, HIGH PRESSURE HOSE DOWN (1500 PSI).

2.02 EXIT LIGHTING

A. HOUSING – INJECTION MOLDED UL924 VO FLAME RATED THERMOPLASTIC, SNAP TOGETHER DESIGN, UNIVERSAL FACE DESIGN, DAMP LOCATION RATED

B. ILLUMINATION – FULLY ILLUMINATED 6" LETTERS WITH ¾" STROKE, LOW ENERGY CONSUMPTION WITH 2 WATT RED LEDS

C. ELECTRONICS – 120/277 DUAL VOLTAGE, OVERLOAD & SHORT CIRCUIT PROTECTION, VOLTAGE SURGE & BROWN–OUT PROTECTION, SOLID–STATE CONSTANT CURRENT CHARGER

D. BATTERY – 6 VOLT NI–CAD BATTERY, ALL BATTERY OPTIONS CONTAINED WITHIN THE FIXTURE

E. MOUNTING – UNIVERSAL MOUNT WITH CANOPY, UNIVERSAL J–BOX MOUNTING PATTERN

2.03 EXTERIOR LIGHTING CONTROL SYSTEM

A. THE SYSTEM CLOCK SHALL PROVIDE TIME–BASED CONTROL WITH EIGHT YEAR TIME BACK–UP, NON–VOLATILE MEMORY PROGRAM STORAGE, AUTOMATIC DAYLIGHT SAVINGS ADJUSTMENT, SELECTABLE 12/24 HOUR TIME FORMATS AND SELECTABLE DATE FORMATS. ALL CLOCK AND SYSTEM CONFIGURATION PROGRAMMING SHALL BE ACCESSIBLE FROM THE CLOCK FRONT DISPLAY/KEYPAD.

B. FEATURES

1. CONTROL OF LIGHTING CIRCUITS SHALL BE AVAILABLE ON THE LIGHTING CONTROL PANEL CLOCK/DISPLAY. PROVIDE STATUS AND MANUAL ON/OFF CONTROL OF EACH CHANNEL FROM THE FRONT DISPLAY AND KEYPAD.
2. THE CLOCK SHALL HAVE CONTROL INPUTS, WHICH CAN BE USED TO CONNECT EXTERNAL DEVICES SUCH AS PHOTOCELLS. EACH OF THESE INPUTS CAN BE CONFIGURED TO OPERATE WITH A PHOTOCELL, AN ON/AUTO SWITCH, AS A MAINTAINED ON/OFF SWITCH, OR AS A MOMENTARY ON/OFF SWITCH.
3. FOLLOWING A POWER OUTAGE, THE SYSTEM CLOCK SHALL RUN A START–UP PROCESS THAT EXECUTES SCHEDULES THAT WOULD HAVE BEEN MISSED DURING THE POWER OUTAGE.

SYMBOLS

- LIGHT LINE INDICATES EXISTING
- HEAVY LINE INDICATES NEW WORK
- G — G — 'G' INDICATES GROUNDING CABLE
- (NN) MOTOR; 'NN' INDICATES MOTOR HORSE POWER (HP) RATING
- WP GFI PL–nn POWER RECEPTACLE; 'WP' INDICATES WEATHERPROOF; 'GFI' INDICATES GROUND FAULT INTERRUPTER; 'PL–nn' INDICATES PANEL AND CIRCUIT
- 1'x4' LIGHTING FIXTURE (REFER TO DRAWING E–103 FOR LUMINAIRE LEGEND)
- EX EXIT LIGHTING
- $A LIGHTING SWITCH

ABBREVIATIONS

AWG	AMERICAN WIRE GAUGE
ELEC	ELECTRICAL
EX	EXIT
EXIST.	EXISTING
GFI	GROUND FAULT INTERRUPTER
GR	GROUND ROD
LP	LIGHTNING PROTECTION
LPAT	LIGHTNING PROTECTION AIR TERMINAL
LTG	LIGHTING
PNL	PANEL
V	VOLTS
W	WIRE
WP	WEATHERPROOF

REVISIONS

REV	DESCRIPTION		
1	ISSUED AS FINAL 07/31/2017	Chkd: T.McGANN	Appr.:
2	Revised:	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:

SEAL — STATE OF MARYLAND — STEVEN R. SCHECHMAN — 43951 — REGISTERED PROFESSIONAL ENGINEER — 4/9/18 — DATE

DRAWN BY S. BAKAR
CHECKED
APPROVED

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ELECTRICAL SYMBOLS, ABBREVIATIONS AND NOTES AS–BUILTS

FORMER KOP–FLEX FACILITY

PROJECT NUMBER E0003705.000

PREPARED FOR EMERSON ST. LOUIS MISSOURI

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Sheet E–001

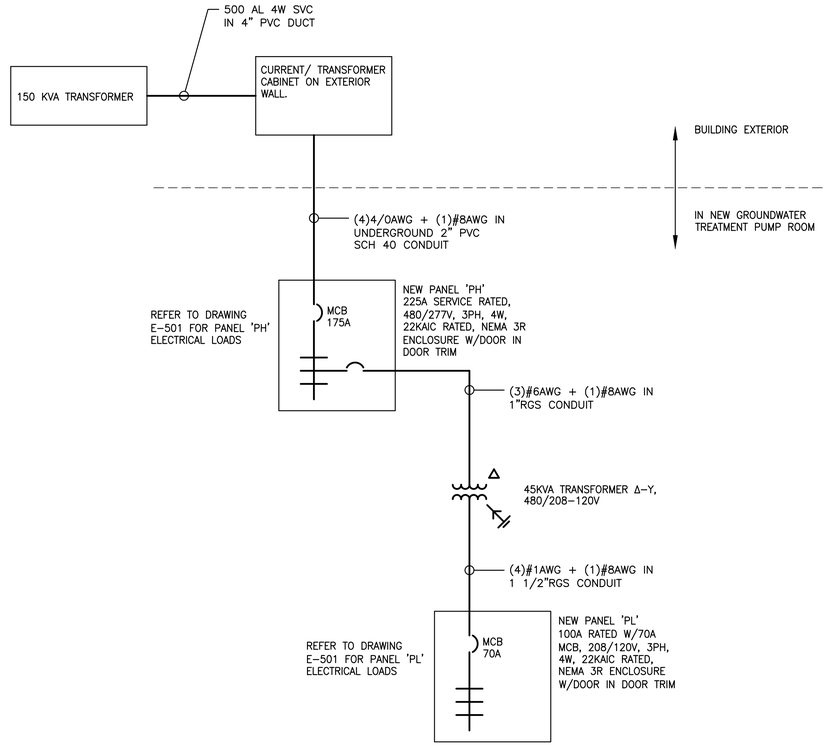
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GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC), THE NEW YORK CITY ELECTRICAL CODE AMENDMENTS, THE APPLICABLE SECTIONS OF THE NFPA, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. PROVIDE A COMPLETE OPERABLE SYSTEM IN A WORKMANLIKE MANNER. OUTLINE DESCRIPTION AND EQUIPMENT DO NOT LIMIT CONTRACTOR'S LIABILITY FOR THE INSTALLATION OF A COMPLETE OPERABLE SYSTEM.
3. VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK, NO ADDITIONAL COMPENSATION WILL BE DUE TO FAILURE TO DO SO.
4. OBTAIN ALL ELECTRICAL PERMITS, TEST REPORTS AND CERTIFICATIONS.
5. MINIMUM SIZE OF CONDUITS SHALL BE 3/4"C, UNLESS OTHERWISE NOTED.
6. NO CONDUIT SHALL BE RUN IN ANY FLOOR IN CONTACT WITH THE EARTH UNLESS OTHERWISE DIRECTED ON THE PLANS.
7. CONDUIT RUNS IN CORRIDORS SHALL CLEAR ALL ARCHITECTURAL FEATURES (DOORS, WINDOWS, ETC) AND SHALL BE COORDINATED WITH EXISTING OR NEW EQUIPMENT, PIPING AND DUCT WORK CORRESPONDING TO ALL TRADES INCLUDING BUT NOT LIMITED TO MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL TRADES. NOTIFY THE ENGINEER OF ANY OBSTRUCTION BEFORE INSTALLATION. FAILURE TO COMPLY WITH THIS REQUIREMENT WILL NOT BE CONSIDERED ADDITIONAL WORK AND SHALL BE CORRECTED AT NO ADDITIONAL COST TO THE OWNER.
8. IN UNFINISHED PORTIONS OF BUILDING SUCH AS BOILER ROOM, FAN ROOMS, PIPE SPACES, ETC., LOCATIONS OF CONDUIT AND SYSTEM DEVICES ARE APPROXIMATE AND SHALL CLEAR PIPING AND ALL OTHER CONSTRUCTION. ALL SYSTEM DEVICES MUST BE UNOBSTRUCTED AND SHALL CLEAR ANY INTERFERENCE WITH FIXTURES, PIPING EQUIPMENT, ETC.
9. RACEWAY INSTALLED EXPOSED ON THE SURFACE OF CEILINGS OR SIDEWALLS SHALL BE SUPPORTED FROM STRUCTURAL COMPONENTS OF THE BUILDING.
10. ALL RACEWAYS AND CABINETS SHALL BE GROUNDED WITH AN INSULATED GROUND CONDUCTOR NOT SMALLER THAN #10 AWG U.O.N.
11. UNLESS OTHERWISE NOTED, PULL BOXES, JUNCTION BOXES, AND ELECTRICAL EQUIPMENT INCLUDING BUT NOT LIMITED TO RECEPTACLES, SWITCHES, PANELS, LOW VOLTAGE SYSTEMS DEVICES, ETC WHERE INDICATED ON DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVIDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS.
12. RACEWAYS INSTALLATIONS SHALL BE MADE TO AVOID INTERFERENCE WITH PIPES, DUCTS, STRUCTURAL MEMBERS OR OTHER EQUIPMENT. SHALL ANY OF THIS ELEMENTS PREVENT THE INSTALLATION OF RACEWAY AS DELINEATED ON THIS DRAWING, DEVIATION MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. ANY VARIATION DUE TO FIELD CONDITIONS SHALL NOT REPRESENT AN ADDITIONAL COST TO OWNER.
13. ALL OPENINGS BETWEEN FLOORS, THROUGH RATED FIRE AND SMOKE WALLS, CREATED BY THE CONTRACTOR FOR CABLE OR CONDUIT PASS THROUGH SHALL BE SEALED WITH A FIRE STOPPING MATERIAL. FIRE STOPPING MATERIAL AND ITS APPLICATION SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT IS ACCEPTABLE TO THE LOCAL FIRE AND BUILDING AUTHORITIES HAVING JURISDICTION OVER THIS WORK. ANY OPENINGS CREATED BY OR FOR THE CONTRACTOR AND LEFT UNUSED SHALL ALSO BE SEALED AS PART OF THIS WORK.
14. CONTRACTOR TO BE RESPONSIBLE FOR ALL RESTORATIONS, SEALING, WATERPROOFING, PENETRATIONS, CORE DRILLING CUTTING, PATCHING, AND PAINTING FOR THE COMPLETE CONTRACT WORK INDICATED. ALL RESTORATION WORK PERFORMED BY CONTRACTOR SHALL RESTORE DISTURBED SURFACES TO THEIR ORIGINAL CONDITION.
15. ARCHITECTURAL FEATURES AS WELL AS OTHER TRADES EQUIPMENT SHOWN ON ELECTRICAL DRAWINGS ARE FOR BACKGROUND INFORMATION ONLY.
16. ALL EXPOSED NONCURRENT-CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT AND RACEWAYS SHALL BE GROUNDED. FOR FEEDERS AND/OR BRANCH CIRCUITS WHERE GROUNDING CONDUCTOR IS NOT PROVIDED, METAL RACEWAYS AND METAL ENCLOSURES FOR CONDUCTORS SHALL BE TIGHTLY JOINED TO CREATE A CONTINUOUS ELECTRIC CIRCUIT AND SO ASSURE A PROPERLY GROUNDED SYSTEM. FITTINGS FOR JOINTS AND TERMINATIONS SHALL BE LISTED FOR GROUNDING INSTALLATION. PROVIDE BONDING JUMPERS WITH APPROVED FITTINGS OF SIZE REQUIRED FOR EQUIPMENT GROUNDING. THE CONTRACTOR SHALL ENSURE CONTINUITY OF THE GROUNDING CIRCUIT FROM THE SUPPLYING PANELBOARD GROUNDING BUS TO THE LOAD GROUND TERMINAL.
17. ALL DEVICES AND ACCESSORIES INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE WEATHER PROOF ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINTIGHT INSTALLATION.
18. UNLESS OTHERWISE NOTED, CONDUCTORS FOR POWER CIRCUITS SHALL BE OF TYPE THHN/THWN AND MINIMUM SIZE SHALL BE #12 AWG.
19. FOR ALL BRANCH CIRCUIT RATED AT 120V, 20A THAT RUNS ARE GREATER THAN 80'-0" BUT LESS THAN 135'-0", #10 AWG WIRE SIZE SHALL BE USED TO COMPENSATE FOR VOLTAGE DROP.
20. REMOVE ALL DEBRIS RESULTING FROM ELECTRICAL WORK FROM THE PREMISES.
21. ANY EXISTING WORK DAMAGED AS A RESULT OF PERFORMING THE WORK OF THIS CONTRACT SHALL BE REPAIRED OR REPLACED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER. MATERIAL AND FINISH TO MATCH EXISTING TO THE SATISFACTION OF OWNER.
22. ALL EQUIPMENT SPECIFIED OR REQUIRED SHALL HAVE COPPER CURRENT CARRYING PARTS INCLUDING GROUND BUS AND TERMINALS.
23. PAINT ALL NEW EXPOSED CONDUITS TO MATCH COLOR OF THE WALL OR CEILING.
24. FOR AN EXPLANATION OF THE SYMBOLS AND ABBREVIATIONS USED ON THESE DRAWINGS, SEE THE SYMBOLS LIST AND ABBREVIATION LIST ON THIS SHEET.
25. THE CONTRACTOR SHALL CHECK WITH THE HVAC TRADE CONCERNING THE LOCATION OF STEEL PLATE FIRE STOPS IN CORRIDORS AND HUNG CEILINGS AND SHALL FURNISH THE HVAC TRADE WITH SIZES AND LOCATIONS OF OPENINGS NECESSARY TO ACCOMMODATE THE ELECTRICAL CONDUITS PIERCING THE FIRE STOPS.
26. SYSTEM CONDUITS, SUCH AS FOR LIGHTING AND POWER FEEDERS, LOW VOLTAGE, FIRE SIGNAL, ETC., SHALL NOT BE RUN OVER BOILERS.



PANEL PH AND PANEL PL POWER SUPPLY SINGLE LINE DIAGRAM

SCALE: N.T.S

REVISIONS			
REV	DESCRIPTION		
1	ISSUED AS FINAL 07/31/2017	Revised: T.McGANN	Chkd: Appr.:
2	Revised:	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:

SEAL — STATE OF MARYLAND — STEPHEN T. BISCHMAN — 43551 — PROFESSIONAL ENGINEER — 4/9/18 — DATE

DRAWN BY C.P.
CHECKED
APPROVED

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AS-BUILT ELECTRICAL GENERAL NOTES AND SINGLE LINE DIAGRAM

FORMER KOP-FLEX FACILITY

PROJECT NUMBER E0003705.000

PREPARED FOR
EMERSON
ST. LOUIS MISSOURI

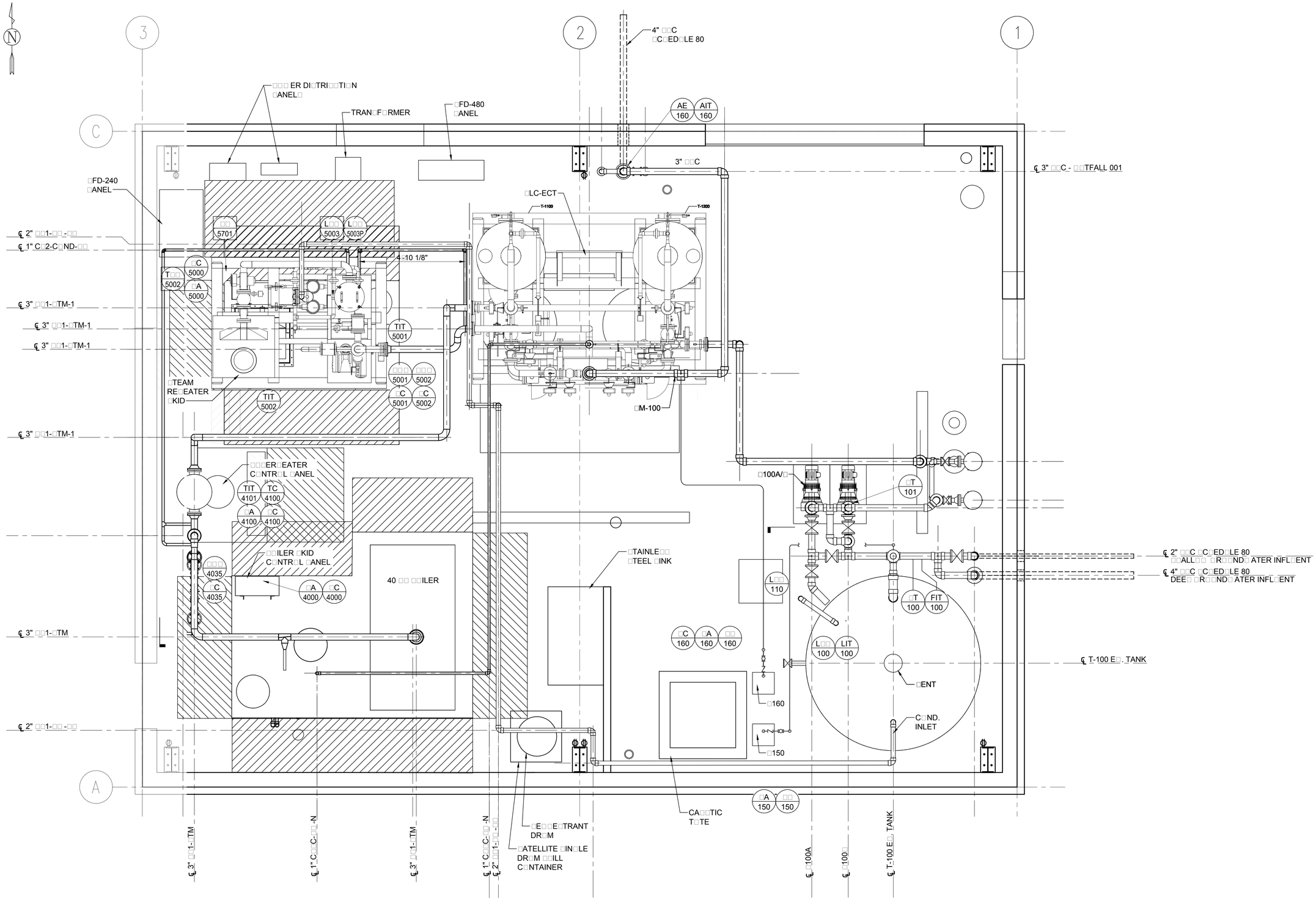
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SHEET E-002

Drawing Number
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REVISIONS

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2	I□□□ED A□ FINAL 07/31/2017 Revised: T.Mc□ANN	Chkd:		Appr.:
3	Revised:	Chkd:		Appr.:

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STEPHEN THEISCHMAN
STATE OF MARYLAND
PROFESSIONAL ENGINEER
4/6/18
DATE

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GROUNDWATER COLLECTION AND TREATMENT SYSTEM
AS-BUILT ELECTRICAL INSTRUMENT LAYOUT
FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

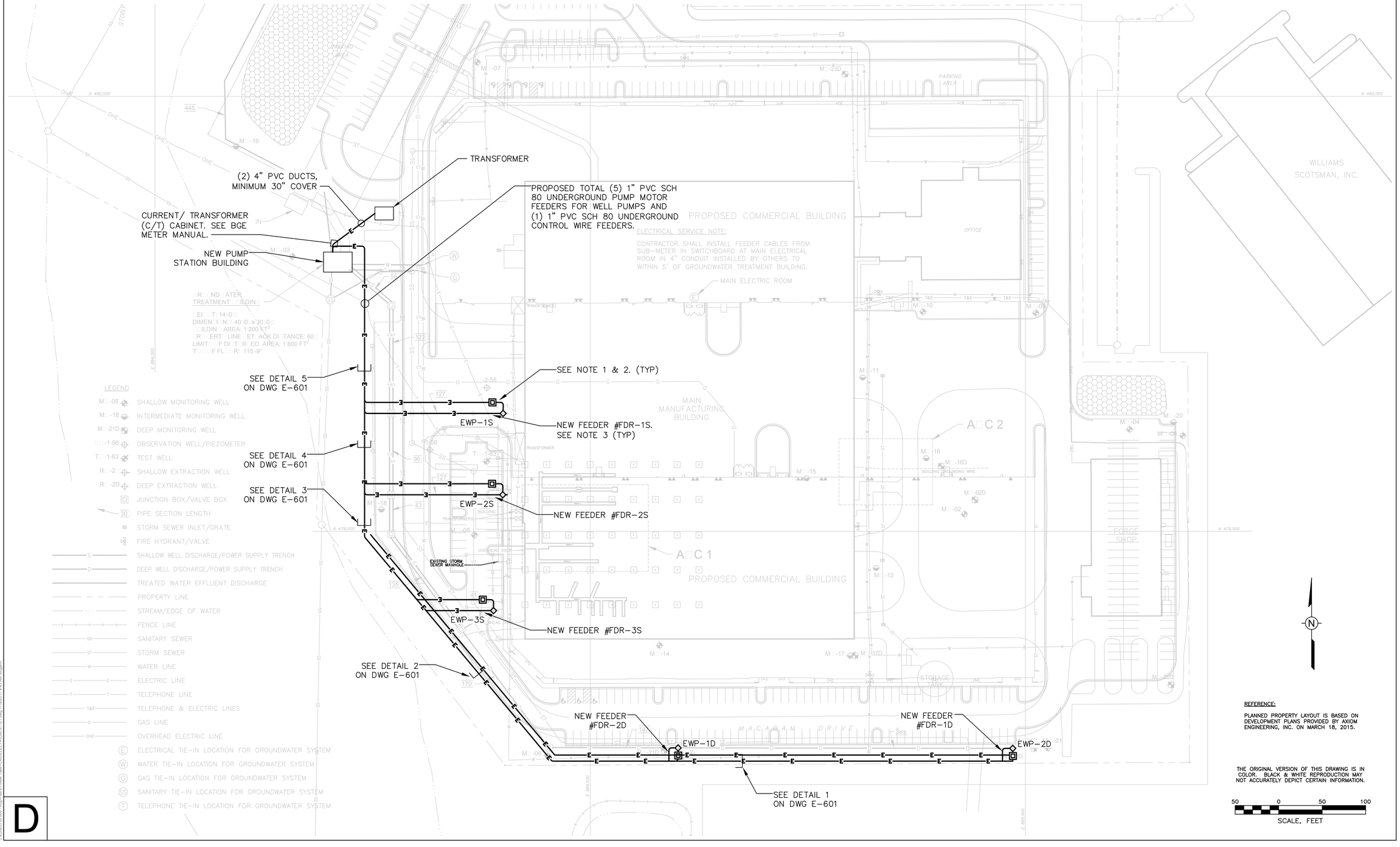
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SHEET E-100

Drawing Number
31400390-E-100

GENERAL NOTE

1. NEW 1" EMPTY PVC SCH 40 CONDUIT SHALL CONNECT TO NEW PULLBOX FOR LOW VOLTAGE WIRING.
2. ALL NEW PULL BOXES ARE INDICATED ON DRAWING C-103.
3. FOR ELECTRICAL AND FEEDER SCHEDULES REFER TO DWG E-501.



LEGEND

- M-05 SHALLOW MONITORING WELL
- M-18 INTERMEDIATE MONITORING WELL
- M-21D DEEP MONITORING WELL
- -1-56 OBSERVATION WELL/PIEZOMETER
- T-1-63 TEST WELL
- R-2 SHALLOW EXTRACTION WELL
- R-2D DEEP EXTRACTION WELL
- JUNCTION BOX/VALVE BOX
- 30 PIPE SECTION LENGTH
- STORM SEWER INLET/GRATE
- FIRE HYDRANT/VALVE
- S SHALLOW WELL DISCHARGE/POWER SUPPLY TRENCH
- D DEEP WELL DISCHARGE/POWER SUPPLY TRENCH
- TREATED WATER EFFLUENT DISCHARGE
- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SS SANITARY SEWER
- ST STORM SEWER
- W WATER LINE
- E ELECTRIC LINE
- T TELEPHONE LINE
- T&E TELEPHONE & ELECTRIC LINES
- G GAS LINE
- OHE OVERHEAD ELECTRIC LINE
- (E) ELECTRICAL TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (W) WATER TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (G) GAS TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (SS) SANITARY TIE-IN LOCATION FOR GROUNDWATER SYSTEM
- (T) TELEPHONE TIE-IN LOCATION FOR GROUNDWATER SYSTEM

REFERENCE:

PLANNED PROPERTY LAYOUT IS BASED ON DEVELOPMENT PLANS PROVIDED BY AXIOM ENGINEERING, INC. ON MARCH 18, 2015.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

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REVISIONS

REV	DESCRIPTION	Appr.
1	ISSUED AS FINAL 07/31/2017 T.McGANN	Appr:
2	Revision	Appr:
3	Revision	Appr:

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STATE OF MARYLAND — JAMES STEPHEN REGECHMAN — 43561 — PROFESSIONAL ENGINEER — 4/9/18 DATE

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UNDERGROUND ELECTRICAL CONDUIT AS-BUILT SITE PLAN

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

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

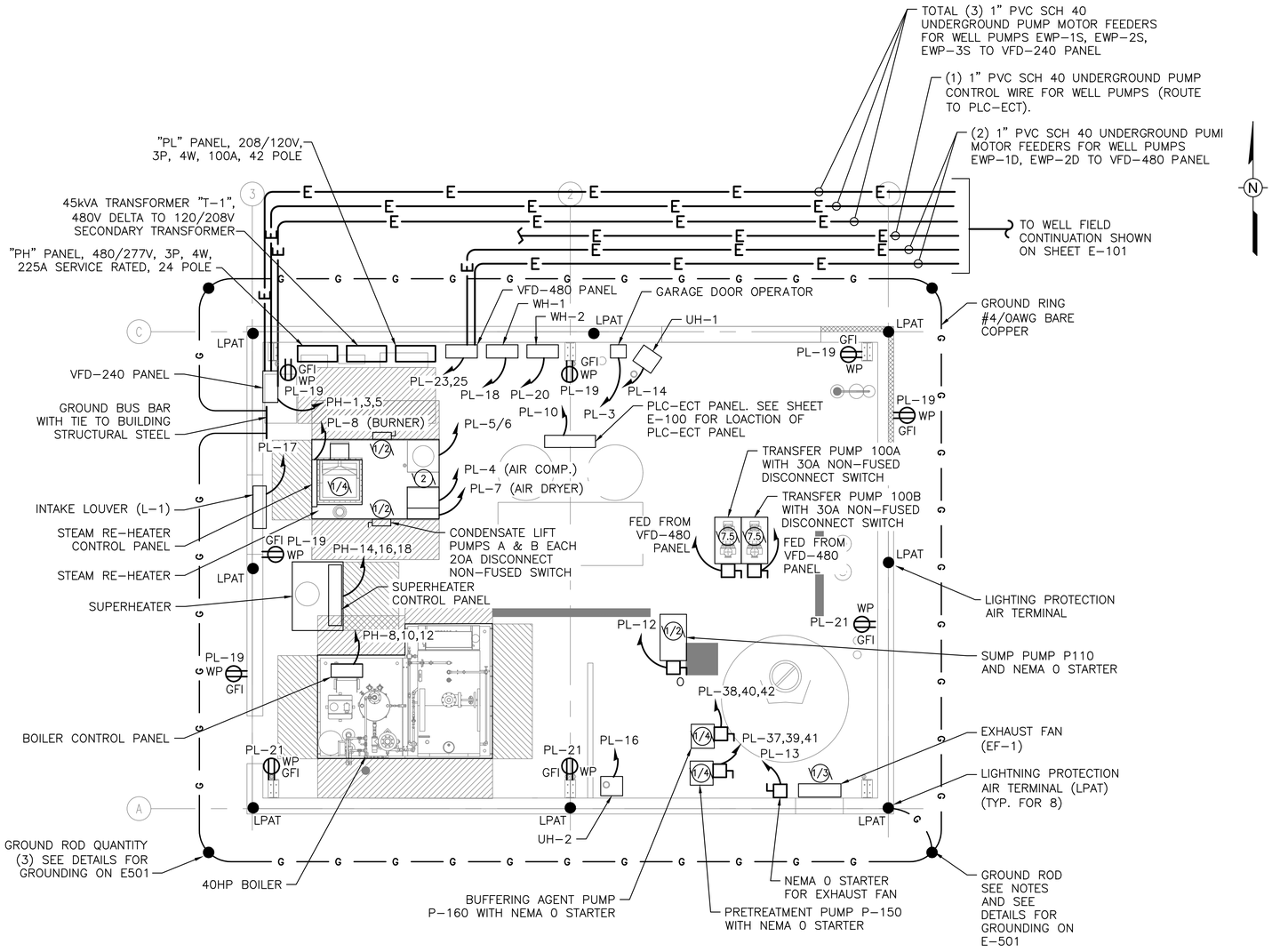
SHEET E-101

Drawing Number
31400390-E-101

GENERAL NOTE

1. CONTRACTOR SHALL STUB-UP THE UNDERGROUND CONDUITS INTO THE PANELBOARDS LOCATED WITHIN THE ROOM.

2. CONDUITS FOR GROUNDWATER TREATMENT BUILDINGS SHALL BE STUBBED UP OUTSIDE OF BUILDING PRIOR TO CONSTRUCTION OF CONDUITS INTO BUILDING. SEE DETAILS ON DRAWING E-601 FOR CONDUIT TRANSITION INTO BUILDING.



FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

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SCALE IN FEET 0 4 8

REVISIONS

REV	DESCRIPTION	Appr:
1	ISSUED FOR BID. DATE: 04/01/2016	Chkd:
2	ISSUED AS FINAL 07/31/2017 T.McGANN	Chkd:
3		Chkd:

SEAL

DRAWN BY S. BAKAR
CHECKED
APPROVED

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NEW PUMP STATION BUILDING
FIRST FLOOR AS- BUILT ELECTRICAL PLAN
FORMER KOP-FLEX FACILITY
PROJECT NUMBER E0003705.000
PREPARED FOR EMERSON ST. LOUIS MISSOURI

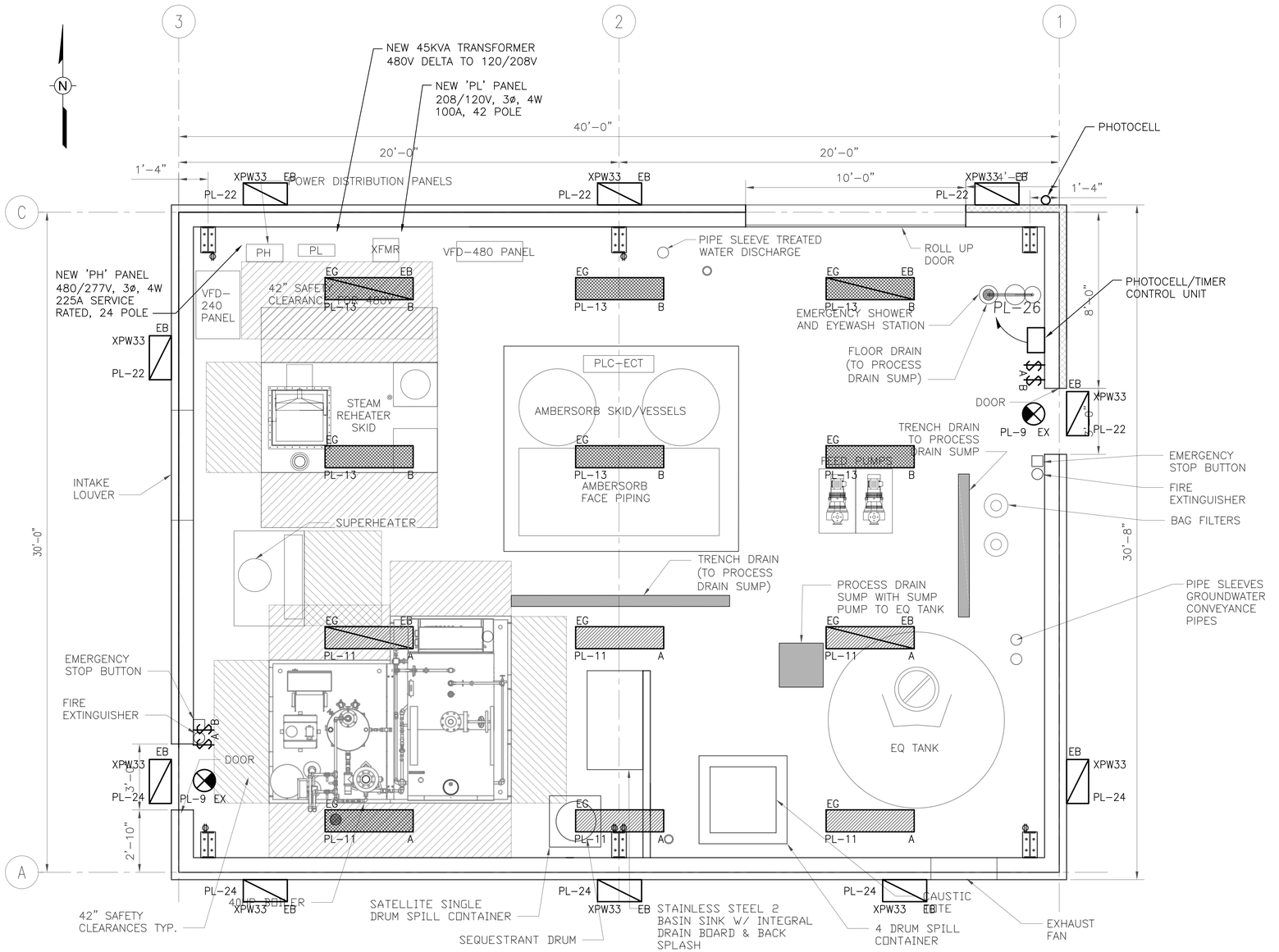
WSP USA Inc.
13530 DULLES TECHNOLOGY DR, SUITE 300
HERNDON, VA 20171
(703) 709-6500
www.wspgroup.com/usa

SHEET E-102

Drawing Number
31400390-E-102

D

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LIGHTING LAYOUT PLAN

SCALE: 3/8"=1'-0"

LUMINAIRES LEGEND

THREE TYPES OF LUMINAIRES

EG / EB, PL-11 / A	SWITCH A CIRCUIT PL-11 EMERGENCY BACKUP BATTERY
EG, PL-11 / A	SWITCH A CIRCUIT PL-11
EG, PL-13 / B	SWITCH B CIRCUIT PL-13
EG / EB, PL-13 / B	SWITCH B CIRCUIT PL-13 EMERGENCY BACKUP BATTERY
PL-9 EX	SWITCH B CIRCUIT PL-9 EMERGENCY BACKUP BATTERY
XPW33 EB, PL-xx	SWITCH BY PHOTOCELL/TIMER EMERGENCY BACKUP BATTERY 'PL-XX' INDICATES CIRCUIT ON PANEL 'PL'

SCALE IN FEET 0 3 6

REVISIONS

REV	DESCRIPTION		
1 Revised	ISSUED AS FINAL 07/31/2017	T.McGANN	Chkd: / Appr.:
2 Revised			Chkd: / Appr.:
3 Revised			Chkd: / Appr.:

SEAL — STATE OF MARYLAND — STEPHEN YIOTSCHMAN — 23535 — REGISTERED PROFESSIONAL ENGINEER

DATE 4/6/16

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CHECKED
APPROVED

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AS-BUILT FLOOR PLAN
WATER COLLECTION AND TREATMENT SYSTEM
FORMER KOP-FLEX FACILITY
PROJECT NUMBER E0003705.000
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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

SHEET E-103

Drawing Number
31400390-E-103

J:\E0003705.000 - Kop-Flex\01 New Task\CAD\ELECTRICAL\E-103.dwg 7/18/2017 9:42 AM Mcgann

D

DESIGNATION: PANEL PL

TYPE: CIRCUIT BREAKER
SERVICE: 120/208 VOLTS, 3-PHASE, 4-WIRE
MAIN BUS: 100 AMPS
MAINS: 70 AMPS CB

ENCLOSURE: NEMA-3R
ACCESSORIES: DOOR-IN-DOOR TRIM
LOCATION: Pump Station Building
REF. DWG. NO. E-102
INTER. RATING (KAIC): 22

SERVICE	VOLT-AMPERES Ph-A	Ph-B	Ph-C	TRIP	CKT No.		CKT No.	TRIP	VOLT-AMPERES Ph-A	Ph-B	Ph-C	SERVICE
SPARE				40	1		2	20				SPARE
GARAGE DOOR OPERATOR		1,127		20	3		4	20		1,840		REHEATER AIR COMPRESSOR
CONDENSATE FEED PUMP A (CFP-A)			1,150	20	5		6	20			1,150	CONDENSATE FEED PUMP B (CFP-B)
REHEATER AIR DRYER	336			15	7		8	15	696			REHEATER BURNER
EXIT LIGHTING		5		15	9		10	20		1,200		CONTROL PANEL PLC-ECT
LIGHTING			360	15	11		12	20			1,127	SUMP PUMP (P-110)
LIGHTING	360			15	13		14	15	276			UNIT HEATER (UH-1)
EXHAUST FAN (EF-1)		828		15	15		16	15		276		UNIT HEATER (UH-2)
INTAKE LOUVER (L-1)			828	15	17		18	15			198	WATER HEATER (WH-1)
RECEPTACLES	900			15	19		20	15	198			WATER HEATER (WH-2)
RECEPTACLES		720		15	21		22	20		220		EXTERIOR LIGHTING
VFD-240 PANEL			2,352	40	23		24	20			176	EXTERIOR LIGHTING
	2,352				25		26	20	180			PHOTOCELL / TIMER
SPARE				20	27		28	20				SPARE
SPARE				20	29		30	20				SPARE
SPARE					31		32	20				SPARE
SPARE				45	33		34	20				SPARE
SPARE					35		36	20				SPARE
	292				37		38		292			
PRETREATMENT PUMP (P-150)		292		20	39		40	20		292		BUFFERING AGENT PUMP (P-160)
			292		41		42				292	
SUB-TOTAL CONNECTED LOAD	4,240	2,972	4,982						1,642	3,828	2,943	SUB-TOTAL CONNECTED LOAD
				CONNECTED kVA		20.6						
				CONNECTED AMPS		57.3						
SUB-TOTAL DEMAND LOAD												SUB-TOTAL DEMAND LOAD

DESIGNATION: PANEL PH (SERVICE RATED)

TYPE: CIRCUIT BREAKER
SERVICE: 480/277 VOLTS, 3-PHASE, 4-WIRE
MAIN BUS: 225 AMPS
MAINS: 175 AMPS CB

MOUNTING: NEMA-3R
ACCESSORIES: DOOR-IN-DOOR TRIM
LOCATION: Pump Station Building
REF. DWG. NO. E-102
INTER. RATING (KAIC): 35

SERVICE	VOLT-AMPERES Ph-A	Ph-B	Ph-C	TRIP	CKT No.		CKT No.	TRIP	VOLT-AMPERES Ph-A	Ph-B	Ph-C	SERVICE
	8,922				1		2					
VFD-480 PANEL		8,922		70	3		4	30				SPARE
			8,922		5		6					
	5,882				7		8		4,156			
TR-1, 45kVA TRANSFORMER		6,800		70	9		10	20		4,156		STEAM BOILER
			7,925		11		12				4,156	
SPACE					13		14		18,333			
SPACE					15		16	90		18,333		SUPERHEATER
SPACE					17		18				18,333	
SPACE					19		20					SPACE
SPACE					21		22					SPACE
SPACE					23		24					SPACE
SUB-TOTAL CONNECTED LOAD	14,804	15,722	16,847						22,489	22,489	22,489	SUB-TOTAL CONNECTED LOAD
				CONNECTED kVA		114.8						
				CONNECTED AMPS		138.3						
SUB-TOTAL DEMAND LOAD												SUB-TOTAL DEMAND LOAD

TRAN□F□RMER □C□ED□LE

TRAN□F□RMER	L□CATI□N	□FMR RATIN□ □K□A□	□RIMAR□ □□LTA□E □□□LT□□	□EC□NDAR□ □□LTA□E □□□LT□□	□□A□E	REMARK□
TR-1	□□M□ □TATI□N □□ILDIN□	45 K□A	480	120/208□	3	DR□ T□□E□ NEMA 3R ENCL□□□RE □□TD□□R RATED

LI□□TIN□ □C□ED□LE

L□MINAIRE ID	L□CATI□N	□□ANTIT□	□□LTA□E□ □□A□E	T□□E	M□□NTIN□ □EI□□T A.F.F. □FEET□	□R□D□CT	REMARK□
E□3	□□M□ □TATI□N □□ILDIN□	12	120V, 1Ø	LED □A□□RTI□□T	10□	E63 4 □ LED □□ C□ □E EM	□ATTER□ □ACK□□ F□R 4 L□MINAIRE□ □A□□R TI□□T
E□	□□M□ □TATI□N □□ILDIN□	2	120V, 1Ø	LED DAM□ RATED	8□	L□□R □ □ □ □ □ □ DL	□ATTER□ □ACK□□ DAM□ RATED
□□□33	□□M□ □TATI□N □□ILDIN□	10	120V, 1Ø	E□TERI□R LED	8□	□□□33 □ □ LED 28 450 C□ □E □LK C□ □□	□A□□R TI□□T□C□LD □ EAT□ER □ATTER□ □ACK□□

Components	P&ID Numbers	Manufacturer	Model No.	Number	HP	V	Phase	Comments
Deep Well Submersible Pump (a)	EWP-1D	Grundfos	45S20-5	1	2	460	3	830 LF Panel to well head, 90 feet downwell
Deep Well Submersible Pump (a)	EWP-2D	Grundfos	45S20-5	1	2	460	3	1220 LF panel to well head, 90 feet downwell
Shallow Well Submersible Pump (b)	EWP-1S	Grundfos	5SQE05-90	1	1	200-240	1	375 LF panel to well head, 50 feet downwell
Shallow Well Submersible Pump (b)	EWP-2S	Grundfos	5SQE05-90	1	1	200-240	1	465 LF panel to well head, 50 feet downwell
Shallow Well Submersible Pump (b)	EWP-3S	Grundfos	5SQE05-90	1	1	200-240	1	560 LF panel to well head, 50 feet downwell

FEEDER □C□ED□LE

FEEDER TA□	□□LTA□E	C□ND□IT	CA□LE/□ IRE/T□□E	□R□□ND □ IRE	CIRC□IT □	REMARK□
□□-TR1	480□	1" R□□	□3□□6 A□ □	□1□□8 A□ □	□□-7□9□11	FR□M NE□ □ANEL "□□" T□ NE□ TRAN□F□RMER TR-1
TR1- □L	208□	1 1/2" R□□	□4□□1 A□ □	□1□□8 A□ □	-	FR□M NE□ □ TRAN□F□RMER TR-1 T□ NE□ □ANEL "□L"
FDR-1□	208□	1"C □□C □C□ED□LE 80	2□10 A□ □	1□12 A□ □	240 □FD C□ 1	FR□M □ANEL □FD-240 T□ E□ □-1□
FDR-2□	208□	1"C □□C □C□ED□LE 80	2□10 A□ □	1□12 A□ □	240 □FD C□ 2	FR□M □ANEL □FD-240 T□ E□ □-2□
FDR-3□	208□	1"C □□C □C□ED□LE 80	2□8 A□ □	1□12 A□ □	240 □FD C□ 3	FR□M □ANEL □FD-240 T□ E□ □-3□
FDR-1D	460□	1"C □□C □C□ED□LE 80	3□12 A□ □	1□12 A□ □	480 □FD C□ 1	FR□M □ANEL □FD-480 T□ E□ □-1D
FDR-2D	460□	1"C □□C □C□ED□LE 80	3□12 A□ □	1□12 A□ □	480 □FD C□ 2	FR□M □ANEL □FD-480 T□ E□ □-2D
□L-RAC	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-4	T□ RE□EATER AIR C□M□RE□□□R
□L-RAD	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-7	T□ RE□EATER AIR DR□ER
□L-R□	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-8	T□ RE□EATER □□RNER
□L-C□	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-10	T□ □LC-ECT
□L-EF-1	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-13	T□ EF-1
□L-L-1	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-17	T□ L-1
□L-□□-1	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-14	T□ □□-1
□L-□□-2	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-16	T□ □□-2
□L-□ □-1	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-18	T□ □ □-1
□L-□ □-2	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-20	T□ □ □-2
□L-□-110	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-12	T□ □-110
□□-□-100A	480□	3/4" R□□	3□□12 A□ □	□1□□12 A□ □	480 □FD C□ 4	FR□M □ANEL □FD-480 T□ □-100 A
□□-□-100□	480□	3/4" R□□	3□□12 A□ □	□1□□12 A□ □	480 □FD C□ 5	FR□M □ANEL □FD-480 T□ □-100 □
□L-□-150	208□	3/4" R□□	3□□10 A□ □	□1□□12 A□ □	□L-37□39□41	T□ □-150
□L-□-160	208□	3/4" R□□	3□□12 A□ □	□1□□12 A□ □	□L-38□40□42	T□ □-160
□L-5500-A	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-5	T□ □-5500-A
□L-5500-□	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-6	T□ □-5500-□
□L-E□IT	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-9	□ACK□□
□□-□	480□	3/4" R□□	4□□12 A□ □	□1□□12 A□ □	□□-8□10□12	□□ILER
□□-□□	480□	1 1/4" R□□	4□□4 A□ □	□1□□8 A□ □	□□-14□16□18	□□□ER□EATER
□L-□D	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-3	□ARA□E D□□R
□L-TIMER	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-26	□□□T□CELL/TIMER
□□-480	480□	3/4" R□□	3□□3 A□ □	□1□□8 A□ □	□□-1□3□5	FR□M □ANEL □□ T□ □ANEL □FD-480
□L-240	240□	3/4" R□□	2□□8 A□ □	□1□□10 A□ □	□L-23□25	FR□M □ANEL □L T□ □ANEL □FD-240
□RI-CAL	480□	□□ □T□ER□	4□4/0 A□ □	□1□□3 A□ □		FR□M MAIN ELECTRICAL R□□M IN □R□□□□ED C□MMERCIAL □□ILDIN□ T□ □ANEL □□
FDR-L□T1	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-11	INTERI□R LI□□TIN□
FDR-L□T2	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-13	INTERI□R LI□□TIN□
FDR-REC□1	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-19	RECE□TACLE
FDR-REC□2	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-21	RECE□TACLE
FDR-L□TE□T1	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-22	E□TERI□R LI□□TIN□
FDR-L□TE□T2	120□	3/4" R□□	2□□12 A□ □	□1□□12 A□ □	□L-24	E□TERI□R LI□□TIN□

□ENERAL N□TE□

1. REFER TO DWG E-101 AND E-102 FOR MORE INFORMATION RELATING TO THE ELECTRICAL SCHEDULES SHOWN BELOW.

REVISIONS

REV	DESCRIPTION		
1	ISSUED AS FINAL 07/31/2017	T.McGANN	
2	Revision	Check:	Appr.:
3	Revision	Check:	Appr.:
4	Revision	Check:	Appr.:

SEAL — STATE OF MARYLAND — STEPHEN A. GOSSELMAN — 43657 — REGISTERED PROFESSIONAL ENGINEER — DATE

DRAWN BY: S. BAKAR
CHECKED
APPROVED

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AS-BUILT ELECTRICAL SCHEDULES
FORMER KOP-FLEX FACILITY
PROJECT NUMBER E0003705.000
PREPARED FOR EMERSON ST. LOUIS, MISSOURI

WSP USA Inc.
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TEL: +1 703.709.6500

SHEET E-501

Drawing Number
31400390-E-501

D

Field Installation - Instrument and Control Wiring

Identifier Tag	Description	Power/ Signal	Wiring	Conduit	IO Ty	Wired From	Wired To
XA-4000	Boiler Fault	NC contacts; 24V DC input	(2) #14 THHN	3/4" RGS	DI	CP-4001	PLC-ECT
XC-4000	Run command for E-4000 steam boiler	PLC Relay output: 24VDC sourced from Boiler	(2) #14 THHN		DO	CP-4001	PLC-ECT
TC-4100	Superheater Temperature Setpoint	24V DC from PLC, 4-20 mA output	TWSP #18	3/4" RGS	AO	CP-4100	PLC-ECT
TIT-4101	Superheater Outlet Temperature Retransmit	24V DC Loop Powered, 4-20 mA input	TWSP #18		AI	CP-4100	PLC-ECT
XA-4100	Superheater Fault	NC contacts; 24V DC input	(2) #14 THHN		DI	CP-4100	PLC-ECT
XC-4100	Run command for E-4100 steam superheater	PLC Relay output: 120VAC sourced from Superheater	(2) #14 THHN		DO	CP-4100	PLC-ECT
TSH-5002A	High Temperature at Steam Reheater Stack Outlet	NC mechanical switch; 24V DC input	(2) #14 THHN	3/4" RGS	DI	CP-5000	PLC-ECT
XA-5000A	Steam Reheater Fault	NC contacts; 24V DC input	(2) #14 THHN		DI	CP-5000	PLC-ECT
XC-5000A	Run command for E-5000 steam reheater	PLC Relay output: 120VAC sourced from Steam Reheater	(2) #14 THHN		DO	CP-5000	PLC-ECT
SOV-4035	Open command for FCV-4035 (Boiler shutoff)	24V DC to solenoid coil: 0.05 amps (sourced from PLC panel)	(2) #14 THHN	3/4" RGS	DO	FCV-4035	PLC-ECT
ZC-4035	FCV-4035 (Boiler Shutoff) closed status	NO contacts of closed cam; 24V DC input	(2) #14 THHN	3/4" RGS	DI	FCV-4035	PLC-ECT
LSH-5003	High Level in E-5003 Moisture Separator	NC mechanical switch; 24V DC input	(2) #14 THHN	3/4" RGS	DI	LSH-5003	PLC-ECT
LSH-5003P	LSH-5003 power	24VDC sourced from PLC	(2) #14 +Gnd	3/4" RGS	N/A	LSH-5003	PLC-ECT
SOV-5001	Open command for FCV-5001 (Steam Inlet to Moisture Separator)	24V DC to solenoid coil: 0.05 amps (sourced from PLC panel)	(2) #14 THHN	3/4" RGS	DO	FCV-5001	PLC-ECT
SOV-5002	Open command for FCV-5002 (Drain/Rinse Recycle)	24V DC to solenoid coil: 0.05 amps (sourced from PLC panel)	(2) #14 THHN	3/4" RGS	DO	FCV-5002	PLC-ECT
SV-5701	Open command for SV-5701 (City Water Tempering)	120V AC to solenoid coil: 0.05 amps (sourced from PLC panel)	(2) #14 THHN	3/4" RGS	DO	SV-5701	PLC-ECT
TIT-5001	AMBERSORB Steam Outlet Temperature	24V DC Loop Powered, 4-20 mA input	TWSP #18	3/4" RGS	AI	TIT-5001	PLC-ECT
TIT-5002	Steam Reheater Stack Outlet Temperature	24V DC Loop Powered, 4-20 mA input	TWSP #18	3/4" RGS	AI	TIT-5002	PLC-ECT
ZC-5001	FCV-5001 (Steam Inlet to Moisture Separator) closed status	NO contacts of closed cam; 24V DC input	(2) #14 THHN	3/4" RGS	DI	FCV-5001	PLC-ECT
ZC-5002	FCV-5002 (Drain/Rinse Recycle) closed status	NO contacts of closed cam; 24V DC input	(2) #14 THHN	3/4" RGS	DI	FCV-5002	PLC-ECT
SC-101	Recovery Well "1S" VFD Speed Command	PLC 24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AO	VFD-240	PLC-ECT
XS-101	Recovery Well "1S" Pump Run Command	24V, NO contacts	(2) #14 THHN		DO	VFD-240	PLC-ECT
XA-101	Recovery Well "1S" Pump Running confirmation	24V, NO contacts	(2) #14 THHN		DI	VFD-240	PLC-ECT
SC-201	Recovery Well "2S" VFD Speed Command	PLC 24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AO	VFD-240	PLC-ECT
XS-201	Recovery Well "2S" Pump Run Command	24V, NO contacts	(2) #14 THHN		DO	VFD-240	PLC-ECT
XA-201	Recovery Well "2S" Pump Running confirmation	24V, NO contacts	(2) #14 THHN		DI	VFD-240	PLC-ECT
SC-301	Recovery Well "3S" VFD Speed Command	PLC 24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AO	VFD-240	PLC-ECT
XS-301	Recovery Well "3S" Pump Run Command	24V, NO contacts	(2) #14 THHN		DO	VFD-240	PLC-ECT
XA-301	Recovery Well "3S" Pump Running confirmation	24V, NO contacts	(2) #14 THHN		DI	VFD-240	PLC-ECT
SC-401	Recovery Well "1D" VFD Speed Command	PLC 24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AO	VFD-480	PLC-ECT
XS-401	Recovery Well "1D" Pump Run Command	24V, NO contacts	(2) #14 THHN		DO	VFD-480	PLC-ECT
XA-401	Recovery Well "1D" Pump Running confirmation	24V, NO contacts	(2) #14 THHN		DI	VFD-480	PLC-ECT
SC-501	Recovery Well "2D" VFD Speed Command	PLC 24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AO	VFD-480	PLC-ECT
XS-501	Recovery Well "2D" Pump Run Command	24V, NO contacts	(2) #14 THHN		DO	VFD-480	PLC-ECT
XA-501	Recovery Well "2D" Pump Running confirmation	24V, NO contacts	(2) #14 THHN		DI	VFD-480	PLC-ECT
XS-100A	Feed Pump P-100A Run Command	24V, NO contacts	(2) #14 THHN	3/4" RGS	DO	VFD-480	PLC-ECT
SC-100A	Feed Pump P-100A VFD Speed Command	PLC 24V Loop powered, 4-20 mA	TWSP #18		AO	VFD-480	PLC-ECT
XA-100A	Feed Pump P-100A Running confirmation	24V, NO contacts	(2) #14 THHN		DI	VFD-480	PLC-ECT
XS-100B	Feed Pump P-100B Run Command	24V, NO contacts	(2) #14 THHN	3/4" RGS	DO	VFD-480	PLC-ECT
SC-100B	Feed Pump P-100B VFD Speed Command	PLC 24V Loop powered, 4-20 mA	TWSP #18		AO	VFD-480	PLC-ECT
XA-100B	Feed Pump P-100B Running confirmation	24V, NO contacts	(2) #14 THHN		DI	VFD-480	PLC-ECT
LE-101	RW-1S Level Transducer	24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	RW-1S	PLC-ECT
LE-201	RW-2S Level Transducer	24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	RW-2S	PLC-ECT
LE-301	RW-3S Level Transducer	24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	RW-3S	PLC-ECT
LE-401	RW-4D Level Transducer	24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	RW-4D	PLC-ECT
LE-501	RW-5D Level Transducer	24V Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	RW-5D	PLC-ECT
LIT-100	EQ Tank Level Indicator	24V DC Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	EQ Tank	PLC-ECT
LSH-100	EQ Tank High Level Switch	24V, NC contacts	(2) #14 THHN [redacted]	3/4" RGS [redacted]	DI	EQ Tank	PLC-ECT
LSH-110	Sump High Level Switch	24V, NC contacts	(2) #14 THHN [redacted]	3/4" RGS	DI	Floor Sump	PLC-ECT
FIT-100	Total GW Flow Transmitter	24V DC Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	Influent Line	PLC-ECT
PT-100	Total GW Pressure Transmitter	24V DC Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	Influent Line	PLC-ECT
PT-101	Feed Pump Pressure Transmitter	24V DC Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	P-100A/B	PLC-ECT
AE-160	pH sensor	24V DC Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	Effluent Line	AIT-160
AIT-160	pH transmitter	24V DC Loop powered, 4-20 mA	TWSP #18	3/4" RGS	AI	Effluent Line	PLC-ECT
XA-150	Sequestrant Pump Running confirmation	24V, NC contacts	(2) #14 THHN	3/4" RGS	AI	P-150	PLC-ECT
XA-160	Caustic Pump Running confirmation	24V, TBD contacts	(2) #14 THHN	3/4" RGS	DI	P-160	PLC-ECT
XS-150	Sequestrant Pump Run Command	24V, NO contacts	(2) #14 THHN	3/4" RGS	DI	P-150	PLC-ECT
XS-160	Caustic Pump Run Command	24V, NO contacts	(2) #14 THHN	3/4" RGS	DO	P-160	PLC-ECT
SC-160	Caustic Pump Speed Command	24V DC Loop powered, 4-20 mA	TWSP #18	3/4" RGS	DO	P-160	PLC-ECT

Equipment Name	Tag	Nameplate HP	Nameplate KW	Motor Nameplate Full Load Amps	Expected Draw Duty	Voltage
ECT Control Panel	PLC-ECT			10.00	75%	120
Steam Boiler	E-4000			15	100%	480
Superheater (electric resistance)	E-4100		55		100%	460
Air Compressor	C-5601	2		15	100%	115
Air Dryer	E-5602		0.22	2.8	100%	115
Condensate Lift Pump A	P-5500A	0.5		10	100%	115
Condensate Lift Pump B	P-5500B	0.5		10	100%	115
Steam Reheater Burner	E-4000	0.25		4.4	100%	120

GENERAL NOTE

1. REFER TO DRAWINGS E-101 AND E-102 FOR MORE INFORMATION RELATING TO THE ELECTRICAL SCHEDULES SHOWN BELOW.
2. REFER TO DRAWINGS E-001 AND E-002 FOR ELECTRICAL SYMBOLS, ABBREVIATIONS AND NOTES.
3. REFER TO DRAWING E-100 FOR INSTRUMENT LOCATION PLAN.
4. CONTROL WIRING FOR A SINGLE EQUIPMENT ITEM SHALL BE INSTALLED BETWEEN CONTROL PANEL AND EQUIPMENT ITEM IN THE SAME CONDUIT ACCORDING TO THE CHART – INSTRUMENT AND CONTROL WIRING FOR ECT EQUIPMENT

REVISIONS

REV	DESCRIPTION	Appr.	Revised	Chkd
1	ISSUED AS FINAL 07/31/2017	T.McGANN		
2				
3				

SEAL — STATE OF MARYLAND — STEPHEN GEORGE SHOMAN — 42365 — REGISTERED PROFESSIONAL ENGINEER — DATE 7/31/17

DRAWN BY: S. BAKAR
CHECKED:
APPROVED:

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AS-BUILT ELECTRICAL SCHEDULES

FORMER KOP-FLEX FACILITY

PROJECT NUMBER E0003705.000

PREPARED FOR
EMERSON
ST. LOUIS MISSOURI

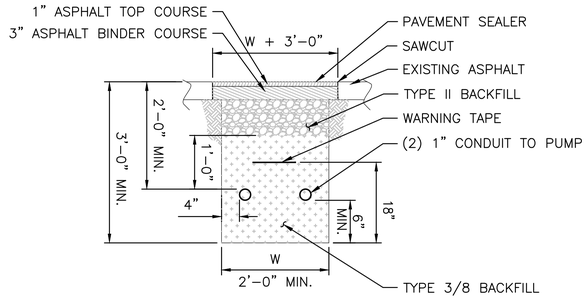
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13530 DULLES TECHNOLOGY DR, SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

SHEET E-502

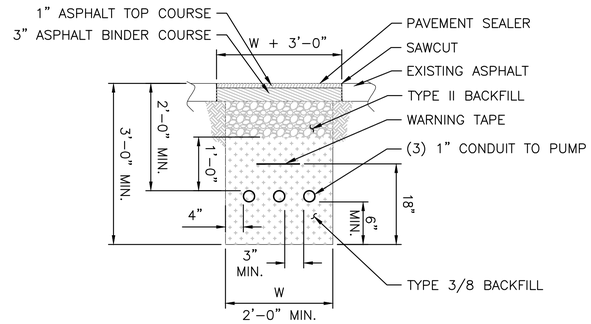
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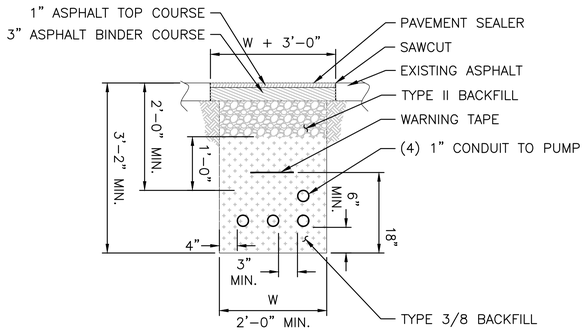


1 2 CONDUIT ASPHALT TRENCH DETAIL
Scale: N.T.S.

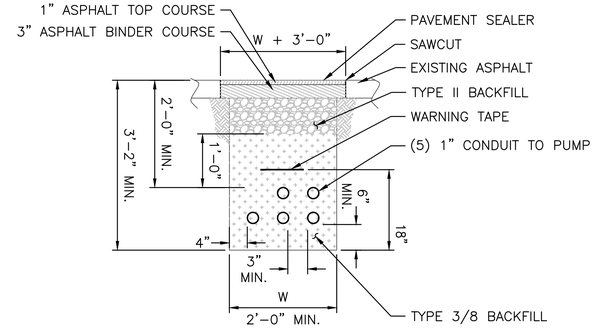


2 3 CONDUIT ASPHALT TRENCH DETAIL
Scale: N.T.S.

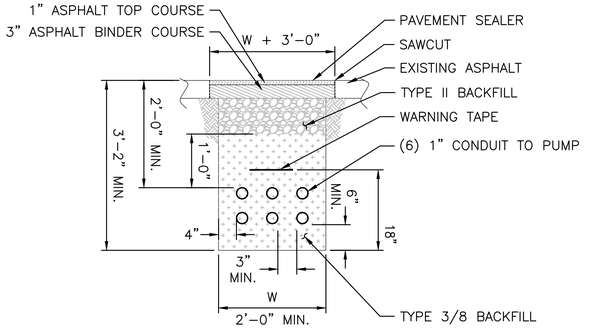
NOTE: ASPHALT TOP COURSE, BINDER COURSE, AND SEALER BY OTHERS (TYPICAL)



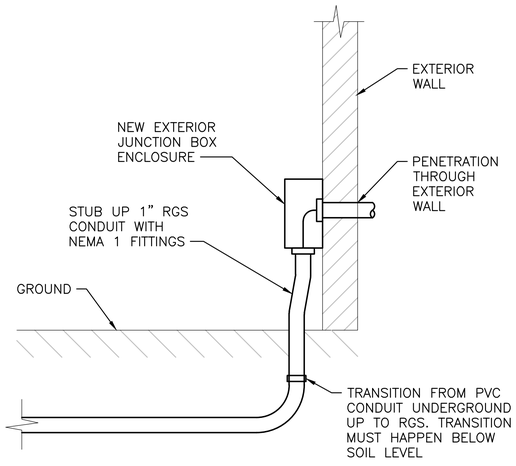
3 4 CONDUIT ASPHALT TRENCH DETAIL
Scale: N.T.S.



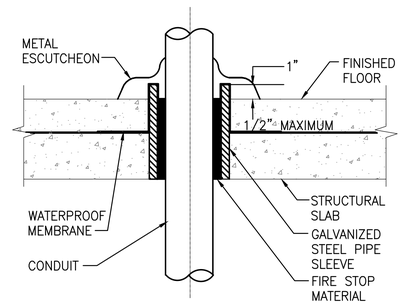
4 5 CONDUIT ASPHALT TRENCH DETAIL
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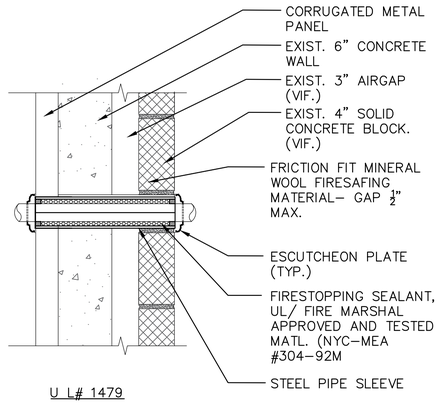
5 6 CONDUIT ASPHALT TRENCH DETAIL
Scale: N.T.S.



6 STUB UP CONDUIT DETAIL
Scale: N.T.S.



CONDUIT PENETRATION DETAIL THROUGH WATERPROOF SLAB
7
Scale: N.T.S.



ELECTRICAL OPENING THROUGH WALL PENETRATION FIRE STOPPING DETAIL AT EXTERIOR WALL
8
Scale: N.T.S.

D

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REVISIONS

REV	DESCRIPTION		Appr.
1	ISSUED AS FINAL 07/31/2017	Chkd: T.McGANN	Appr:
2	Revised:	Chkd:	Appr:
3	Revised:	Chkd:	Appr:

SEAL

STATE OF MARYLAND — STEPHEN E. GOEGLEIN — 43651 — REGISTERED PROFESSIONAL ENGINEER

DATE

DRAWN BY S. BAKAR
CHECKED
APPROVED

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AS–BUILT ELECTRICAL DETAILS

FORMER KOP–FLEX FACILITY

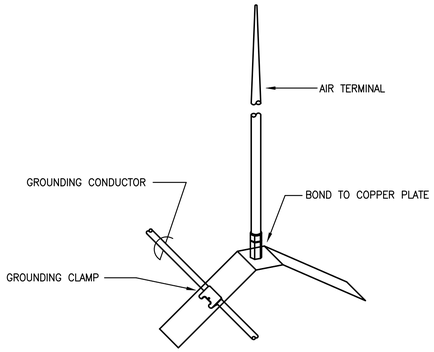
PROJECT NUMBER E0003705.000

PREPARED FOR EMERSON ST. LOUIS MISSOURI

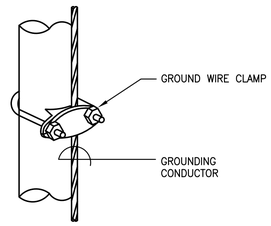
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SHEET E–601

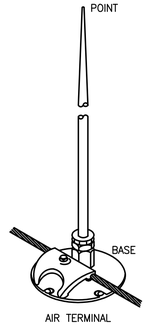
Drawing Number
31400390–E–601



LIGHTNING PROTECTION
TYPICAL RIDGE AIR TERMINAL
NOT TO SCALE



LIGHTNING PROTECTION
TYPICAL BONDING DETAIL
NOT TO SCALE



LIGHTNING PROTECTION
TYPICAL AIR TERMINAL
NOT TO SCALE

LIGHTNING PROTECTION NOTES

1. INSTALL LIGHTNING PROTECTION AIR TERMINALS ON THE ROOF OF THE BUILDING AT THE NORTHEAST AND SOUTHWEST CORNERS.

2. AIR TERMINALS
   a. AIR TERMINALS SHALL BE PROVIDED SO AS TO ENCLOSE THE ENTIRE BUILDING WITHIN A ZONE OF PROTECTION. AIR TERMINALS SHALL PROJECT A MINIMUM OF TEN INCHES ABOVE THE AREA PROTECTED AND SHALL BE LOCATED AT INTERVALS NOT EXCEEDING 20'–0" ALONG RIDGES AND AROUND THE PERIMETER OF FLAT OR GENTLY SLOPING ROOFS. AIR TERMINALS SHALL BE LOCATED WITHIN 18 INCHES OF ROOF EDGES AND OUTSIDE CORNERS OF PROTECTED AREAS.
   b. AIR TERMINALS SHALL BE INSTALLED FOR STACKS, FLUES, MECHANICAL EQUIPMENT, AND OTHER OBJECTS NOT LOCATED WITHIN A ZONE OF PROTECTION. NON–METALLIC OBJECTS OR METAL OBJECTS HAVING A METAL THICKNESS OF LESS THAN 3/16" REQUIRE THE INSTALLATION OF AIR TERMINALS AND REQUIRED CONDUCTORS. OBJECTS HAVING A METAL THICKNESS 3/16" OR GREATER SHALL BE CONNECTED TO THE LIGHTNING PROTECTION SYSTEM PER STANDARD REQUIREMENTS USING MAIN SIZE CONDUCTOR AND CONNECTOR FITTINGS HAVING 8 SQUARE INCHES OF SURFACE CONTACT AREA.
   c. AIR TERMINAL MOUNTING BASES SHALL BE OF CAST CONSTRUCTION AND SECURELY FASTENED TO THE STRUCTURE IN ACCORDANCE WITH STANDARD REQUIREMENTS.

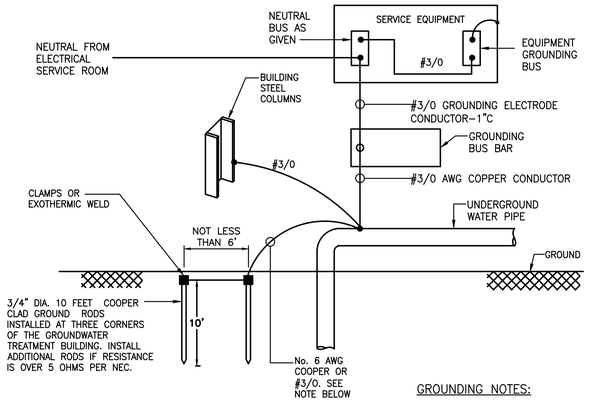
3. CONDUCTORS
   a. MAIN CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE MATERIAL REQUIREMENTS ABOVE AND SHALL PROVIDE A TWO–WAY PATH FROM EACH AIR TERMINAL HORIZONTALLY OR DOWNWARD TO CONNECTIONS WITH GROUND TERMINALS. CONDUCTORS SHALL BE FREE OF EXCESSIVE SPLICES AND SHARP BENDS. NO BEND OF A CONDUCTOR SHALL FORM AN INCLUDED ANGLE OF LESS THAN 90 NOR HAVE A RADIUS OF BEND OF LESS THAN 8". CONDUCTORS SHALL BE SECURED TO THE STRUCTURE AT INTERVALS NOT EXCEEDING 3'–0".
   b. IN THE CASE OF STRUCTURAL STEEL FRAME CONSTRUCTION, DOWN CONDUCTORS SHALL BE OMITTED AND ROOF CONDUCTORS SHALL BE CONNECTED TO THE STRUCTURAL STEEL FRAME AT INTERVALS AVERAGING NOT MORE THAN 60' AROUND THE PERIMETER OF THE STRUCTURE. CONNECTIONS TO THE STEEL FRAME SHALL BE MADE WITH BONDING PLATES HAVING 8 SQUARE INCHES OF CONTACT OR BY EXOTHERMIC WELD CONNECTIONS AT BOTH THE TOP AND BOTTOM OF THE COLUMN.

4. ROOF PENETRATIONS
   a. ROOF PENETRATIONS REQUIRED FOR DOWN CONDUCTORS OR FOR CONNECTIONS TO STRUCTURAL STEEL FRAMEWORK SHALL BE MADE USING THRU–ROOF ASSEMBLIES VIA 1" PVC CONDUIT SLEEVES THAT ARE RATED FOR EXTERIOR USE, WITH SOLID BARS AND APPROPRIATE ROOF FLASHINGS. CONDUCTORS SHALL NOT PASS DIRECTLY THROUGH THE ROOF. ROOF FLASHINGS COMPATIBLE WITH THE ROOFING SYSTEM SHALL BE PROVIDED BY THE ROOFING CONTRACTOR.

5. COMMON GROUNDING
   a. COMMON GROUNDING OF ALL GROUND MEDIUMS WITHIN THE BUILDING SHALL BE ENSURED BY INTERCONNECTING THE LIGHTNING PROTECTION SYSTEM WITH MAIN SIZE CONDUCTORS AND FITTINGS TO THE COLD WATER GROUND.
   b. METAL BODIES LOCATED WITHIN 6' OF THE LIGHTNING PROTECTION SYSTEM SHALL BE BONDED TO THE SYSTEM AS PER UL 96A STANDARD.

6. GROUND TERMINATIONS
   a. GROUND TERMINATIONS SHALL BE PROVIDED FOR EACH DOWN CONDUCTOR AND SHALL CONSIST OF 3/4"X 10'–0" (MINIMUM) COPPER–CLAD GROUND ROD. THE DOWN CONDUCTOR SHALL BE CONNECTED TO THE GROUND ROD USING A BRONZE GROUND ROD CLAMP HAVING AT LEAST
   1½" OF CONTACT BETWEEN THE ROD AND THE CONDUCTOR, MEASURED PARALLEL TO THE AXIS OF THE ROD, OR BY AN EXOTHERMIC WELD CONNECTION. GROUND RODS SHALL BE LOCATED 2'–6" BELOW GRADE, 2' FROM THE FOUNDATION WALL AND SHALL EXTEND A MINIMUM OF 10' VERTICALLY INTO THE EARTH.
   b. CONDUCTORS FROM THE GROUNDED CONNECTIONS TO THE GROUND TERMINATION SHALL BE CLASS II COPPER LIGHTNING CONDUCTORS.

7. SURGE PROTECTION – SECONDARY SURGE PROTECTION DEVICES MEETING UL 1449 REQUIREMENTS FOR MASTER LABEL LIGHTING SYSTEMS SHALL BE PROVIDED ON EACH ELECTRIC SERVICE ENTRANCE.



GROUNDING NOTES:

1. BUILD STEEL COLUMNS SHALL BE BONDED TO EACH OTHER.
2. #3/0 COPPER IF THE GROUNDING ELECTRODE CONDUCTOR FROM THE SERVICE EQUIPMENT WERE RUN TO THE GROUND ROD FIRST AND TO THE METAL WATER PIPE.

ELECTRICAL SYSTEM GROUNDING DETAIL
NOT TO SCALE

TYPICAL GROUNDING ROD DETAIL
NOT TO SCALE

REV	DESCRIPTION		Appr.
1	ISSUED AS FINAL 07/31/2017	Chkd: T.McGANN	Appr:
2	Revision	Chkd:	Appr:
3	Revision	Chkd:	Appr:

REVISIONS

SEAL

DRAWN BY: S. BAKAR
CHECKED:
APPROVED:

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AS–BUILT ELECTRICAL DETAILS

FORMER KOP–FLEX FACILITY

PROJECT NUMBER E0003705.000

PREPARED FOR
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ST. LOUIS MISSOURI

WSP USA Inc.
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SHEET E–602

Drawing Number
31400390–E–602

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B BORING LOGS AND WELL INSTALLATION LOGS

Boring Log: RW-1D

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 9, 2016

Surface Elevation (feet AMSL*): 126.9

TOC Elevation (feet AMSL*): 126.6

Total Depth (feet): 126

Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
						Poorly-Graded Sand with Clay (SP-SC) Fill from current construction/ Yellow 10YR-7/6 fine sand with some clay, loose, dry	
10						***Poorly-Graded Sand with Clay (SP-SC)*** Reddish yellow 7.5YR-7/8 fine sand with some clay, loose moist.	
						Poorly-Graded Sand with Clay (SP-SC) Pink fine sand with abundant clay, loose, moist.	
20						***Well-Graded Sand with Clay (SW-SC)*** Reddish yellow 7.5YR-7/6 reddish yellow fine to medium sand with some clay, wet, loose.	
						Poorly-Graded Sand with Clay (SP-SC) Very pale brown 10YR-8/3 fine sand with abundant clay, moist, loose.	
30							
40							

Geologist(s): Rob Wallace

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-1D

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 9, 2016

Surface Elevation (feet AMSL*): 126.9

TOC Elevation (feet AMSL*): 126.6

Total Depth (feet): 126

Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Lean Clay with Sand (CL) Pink 7.5YR-7/3 clay with abundant fine sand, stiff, moist. *(continued)*	
						Lean Clay with Sand (CL) Very pale brown 10YR-8/2 clay with trace fine sand, stiff, dry, mottled light red 2.5YR-6/6.	
50						***Lean Clay with Sand (CL)*** Very pale brown 10YR-8/2 clay with abundant sand, stiff, moist.	
60						***Lean Clay (CL)*** Light Red 2.5YR-6/6 clay, stiff, dry.	
						Lean Clay (CL) Red 2.5YR-4/6 clay, stiff, dry, mottled pinkish white 2.5YR-8/2.	
70						***Lean Clay (CL)*** Pinkish white 2.5YR-8/2 clay. stiff. dry.	
80							

Geologist(s): Rob Wallace

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-1D

Project: Kop-Flex
Project No.: 31400389
Location: Hanover, MD
Completion Date: September 9, 2016

Surface Elevation (feet AMSL*): 126.9
TOC Elevation (feet AMSL*): 126.6
Total Depth (feet): 126
Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Lean Clay with Sand (CL) Pinkish white 2.5YR-8/2 clay with trace sand, dry, stiff, mottled red 2.5YR-4/6. *(continued)*	
90						***Poorly-Graded Sand with Gravel (SP)*** Very pale brown 10YR-8/2 fine sand with trace gravel, trace clay, wet, loose.	
100						***Poorly-Graded Gravel (GP)*** Reddish yellow 5YR-7/6 well sorted gravel with fine sand, traces lean clay, loose, wet.	
						Poorly-Graded Sand with Clay and Gravel (SP-SC) Pale red 2.5YR-7/2 fine sand with trave gravel and clay, loose, moist.	
						Sandy Lean Clay (CL) Pale red 2.5YR-7/2 sandy lean clay with trace gravel, stiff, dense.	
110						***Lean Clay with Sand (CL)*** Gray 10YR-5/1 lean clay with fine to medium sand. Very hard and stiff, wet from 108-111. Heavy brownish yellow 10YR-6/8 mottling from 114-117.	
120							

Geologist(s): Rob Wallace
Subcontractor: Cascade Drilling
Driller/Operator: Tommy Ardito
Method: Rotosonic

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Boring Log: RW-1D

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 9, 2016

Surface Elevation (feet AMSL*): 126.9

TOC Elevation (feet AMSL*): 126.6

Total Depth (feet): 126

Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Sandy Lean Clay with Gravel (CL) Pinkish white 2.5YR-8/2 lean clay with fine sand and trace gravel. Hard, very dense, wet. Red 2.5YR-6/8 mottling. *(continued)*	
						Well-Graded Sand with Gravel (SW) Gray 5YR-5/5 fine to coarse sand with trace gravel, Loose, moist, red 2.5YR-4/8 mottling.	
						Bottom of Boring at 126 feet	
130							
140							
150							
160							

Geologist(s): Rob Wallace

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-1S

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 12, 2017

Surface Elevation (feet AMSL*): 122.9

TOC Elevation (feet AMSL*): 122.4

Total Depth (feet): 62

Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
						Well-Graded Sand with Gravel (SW) Strong brown 7.5YR-5/6 fine to medium sand with rounded, well sorted gravel. Loose, dry	
5						***Lean Clay with Sand (CL)*** Red 10R-4/8 Lean clay with traces of coarse sand and rounded gravel. Hard, dense, dry.	
10							
15							
20						***Lean Clay with Sand (CL)*** Dark yellowish red 5YR-6/8 Lean to medium clay with fine sand and traces of subrounded gravel. Stiff, wet, medium density, red 2.5 YR-5/8 mottling	
25							

Geologist(s): Chris Cresci

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-1S

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 12, 2017

Surface Elevation (feet AMSL*): 122.9

TOC Elevation (feet AMSL*): 122.4

Total Depth (feet): 62

Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Lean Clay with Sand (CL) Dark yellowish red 5YR-6/8 Lean to medium clay with fine sand and traces of subrounded gravel. Stiff, wet, medium density, red 2.5 YR-5/8 mottling *(continued)*	
30						***Clayey Sand with Gravel (SC)*** Red 2.5YR-4/8 clayey fine sand with traces of subrounded gravel. Loose, soft, moist, low density.	
						Poorly-Graded Sand with Clay (SP-SC) Reddish brown 5YR-5/4 Fine to medium sand with traces of lean clay. Soft, loose, moist, low density.	
35							
40							
45						***Sandy Lean Clay (CL)*** Light pinkish gray 5YR-6/2 Fine sandy lean clay with traces of small rounded gravel. Stiff, dry, slight red mottling 2.5YR-5/8.	
50							

Geologist(s): Chris Cresci

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-1S

Project: Kop-Flex
Project No.: 31400389
Location: Hanover, MD
Completion Date: September 12, 2017

Surface Elevation (feet AMSL*): 122.9
TOC Elevation (feet AMSL*): 122.4
Total Depth (feet): 62
Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
55						***Clayey Sand (SC)*** Light reddish gray 2.5YR-7/1 clayey fine to medium sand. Clay is lean. Loose, moist, medium density. *(continued)*	
60						***Poorly-Graded Sand with Gravel (SP)*** Reddish yellow 7.5YR-6/8 fine to medium well sorted sand with rounded, poorly sorted gravel. Loose, moist, medium density.	
65						***Lean Clay with Sand (CL)*** Light reddish gray 2.5YR-6/1 lean to medium clay with small traces of fine sand. Very stiff, very dense, dry. Dark red 2.5YR-3/6 mottling. Bottom of Boring at 62 feet	
70							
75							

Geologist(s): Chris Cresci
Subcontractor: Cascade Drilling
Driller/Operator: Tommy Ardito
Method: Rotosonic

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Boring Log: RW-2D

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: August 31, 2016

Surface Elevation (feet AMSL*): 127.4

TOC Elevation (feet AMSL*): 127.2

Total Depth (feet): 147

Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
						Well-Graded Sand with Clay (SW-SC) Light brown 7.5 YR-6/4 fine to medium sand with trace clay, loose, dry	
						Poorly-Graded Sand with Clay (SP-SC) Very pale brown 10 YR-8/3 fine sand with some clay, loose, dry, coarsening downward	
10							
						Poorly-Graded Sand with Clay and Gravel (SP-SC) Reddish yellow 7.5 YR-7/8 medium to coarse sand with some small subrounded gravel and some clay, loose, moist	
20						***Poorly-Graded Gravel with Clay and Sand (GP-GC)*** Reddish yellow 7.5 YR-7/8 medium, subrounded gravel with some coarse sand and abundant clay, tight, wet	
						Well-Graded Sand with Gravel (SW) Reddish yellow 7.5 YR-7/8 medium sand with abundant medium subrounded gravel, tight, wet	
30						***Sandy Lean Clay (CL)*** Pink 735 YR-7/8 clay with trace fine sand, stiff, moist	
						Well-Graded Sand with Clay (SW-SC) Reddish yellow 7.5 YR-7/8 fine to medium sand with some clay, loose, dry	
						Poorly-Graded Sand with Clay (SP-SC) Very pale brown 10 YR-8/3 fine sand with trace clay, loose, dry	
40						***Poorly-Graded Sand (SP)***	

Geologist(s): Rob Wallace

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-2D

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: August 31, 2016

Surface Elevation (feet AMSL*): 127.4

TOC Elevation (feet AMSL*): 127.2

Total Depth (feet): 147

Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Very pale brown 10 YR-8/3 fine sand, loose, moist	
						Well-Graded Sand with Clay (SW-SC) Yellowish red 5 YR-5/8 fine to medium sand, some clay, moose, moist	
						Lean Clay with Sand (CL) Very pale brown 10 YR-8/2 clay with some fine sand, dry, stiff, mottled reddish yellow 7.5 YR-7/8 and red 10 R-5/8	
50						***Sandy Lean Clay (CL)*** Very pale brown 10 YR-8/2 clay with trace fine sand, dry, stiff, mottled reddish yellow 7.5 YR-7/8 *(continued)*	
						Sandy Lean Clay (CL) Very pale brown 10 YR-8/2 clay with trace fine sand, stiff, dry	
						Lean Clay (CL) Red 10 R-4/6 clay, very stiff, dry	
60							
70							
						Lean Clay (CL) Dark yellowish brown 10 YR-4/6 clay, stiff, dry	
80							

Geologist(s): Rob Wallace

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-2D

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: August 31, 2016

Surface Elevation (feet AMSL*): 127.4

TOC Elevation (feet AMSL*): 127.2

Total Depth (feet): 147

Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Sandy Lean Clay (CL) Gray N5 clay with trace fine sand, stiff, dry *(continued)*	
						Lean Clay (CL) Very dark gray N3 clay, stiff, dry	
90							
100							
						Poorly-Graded Gravel with Clay and Sand (GP-GC) Pinkish white 7.5 YR-8/2 fine to coarse, subrounded, flat gravel with abundant fine to coarse sand and abundant clay, loose, wet	
110						***Lean Clay with Sand (CL)*** Pinkish white 7.5 YR-8/2 clay with some fine sand, stiff, dry	
						Poorly-Graded Sand with Clay (SP-SC) Pinkish white 7.5 YR-8/2 fine sand with some clay, loose, wet	
						Lean Clay with Sand (CL) Pinkish white 7.5 YR-8/2 clay with some fine sand, stiff, dry	
120							

Geologist(s): Rob Wallace

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-2D

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: August 31, 2016

Surface Elevation (feet AMSL*): 127.4

TOC Elevation (feet AMSL*): 127.2

Total Depth (feet): 147

Borehole Diameter (inches): 10.5

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Poorly-Graded Sand with Clay (SP-SC) Pinkish white 7.5 YR-8/2 fine sand with some clay, dense, wet *(continued)*	
						Lean Clay with Sand (CL) Pinkish white 7.5 YR-8/2 clay with some fine sand, stiff, dry	
130						***Lean Clay with Sand (CL)*** White 10 YR-8/1 clay with some fine sand, stiff, dry	
140						***Clayey Sand (SC)*** Light red 10 R-6/6 coarse sand with trace clay, loose, wet	
150						Bottom of Boring at 147 feet	
160							

Geologist(s): Rob Wallace

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-2S

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 11, 2016

Surface Elevation (feet AMSL*): 123.5

TOC Elevation (feet AMSL*): 123.2

Total Depth (feet): 60.5

Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
						Poorly-Graded Sand with Gravel (SP) Brown 5 YR-5/6 Medium to coarse sand with rounded, well sorted gravel. Loose and dry	
5						***Lean Clay with Sand (CL)*** Red 2.5 YR-4/8 lean clay with trace coarse sand and gravel. Hard, very dense, dry, white mottling	
10							
15							
20						***Fat Clay with Sand (CH)*** Gray 5 YR-5/1 fat clay with traces of fine sand. Hard, moist, medium density. Slight red mottling.	
25							

Geologist(s): Chris Cresci

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-2S

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 11, 2016

Surface Elevation (feet AMSL*): 123.5

TOC Elevation (feet AMSL*): 123.2

Total Depth (feet): 60.5

Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Lean Clay (CL) Red 10R-4/8 lean clay. Low to medium plasticity, stiff, moist, medium density.	
30						***Sandy Lean Clay (CL)*** Light gray 2.5YR-5/1 sandy lean clay with rounded to sub rounded gravel. Sand is fine to medium. Stiff, wet, low density.	
35						***Clayey Sand with Gravel (SC)*** Reddish gray 5YR-5/2 clayey sand with rounded to subrounded gravel. Clay is lean, sands are fine. Firm, wet.	
40						***Poorly-Graded Sand with Clay (SP-SC)*** Reddish yellow 7.5YR-6/6 fine sand with lean clay and small traces of gravel. Soft, moist to wet.	
45							
50							

Geologist(s): Chris Cresci

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-2S

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 11, 2016

Surface Elevation (feet AMSL*): 123.5

TOC Elevation (feet AMSL*): 123.2

Total Depth (feet): 60.5

Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
55						***Poorly-Graded Sand with Clay (SP-SC)*** Reddish yellow 7.5YR-6/6 fine sand with lean clay and small traces of gravel. Soft, moist to wet. *(continued)*	
60						***Poorly-Graded Sand with Clay and Gravel (SP-SC)*** Reddish yellow 7.5YR-6/6 fine to medium sand with lean clay and trace gravel. Soft, wet, low density.	
65						Bottom of Boring at 60.5 feet	
70							
75							

Geologist(s): Chris Cresci

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-3S

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 11, 2016

Surface Elevation (feet AMSL*): 125.4

TOC Elevation (feet AMSL*): 125.1

Total Depth (feet): 62

Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
5						***Poorly-Graded Sand with Clay and Gravel (SP-SC)*** Light to medium brown 7.5 YR-5/3 poorly graded sand with traces of rounded gravel and lean clay. Soft, dry, low density.	
10						***Lean Clay with Sand (CL)*** Dark gray 10 YR-4/1 lean clay with coarse sand (trace fines) and trace rounded to sub rounded gravel. Stiff, moist	
15						***Sandy Lean Clay (CL)*** Light reddish brown 2.5 YR-6/3 clay with fine sand. Very hard, dense, dry, red mottling	
20							
25							

Geologist(s): Chris Cresci

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Boring Log: RW-3S

Project: Kop-Flex
Project No.: 31400389
Location: Hanover, MD
Completion Date: September 11, 2016

Surface Elevation (feet AMSL*): 125.4
TOC Elevation (feet AMSL*): 125.1
Total Depth (feet): 62
Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Sandy Lean Clay (CL) Light reddish brown 2.5 YR-6/3 clay with fine sand. Very hard, dense, dry, red mottling *(continued)*	
30						***Fat Clay with Sand (CH)*** Reddish yellow 5 YR-6/8 fat clay with fine sand and traces of rounded gravel. Stiff, very dense, wet, red mottling.	
35						***Lean Clay with Sand (CL)*** Light reddish gray 5 YR-5/2 lean clay with trace fine sand. Stiff, low density, dry.	
40						***Fat Clay (CH)*** Red 10Y-4/8 fat clay, traces of fine sand. Stiff, wet, very dense.	
45						***Clayey Sand (SC)*** Pale reddish gray 2.5 YR-6/2 clayey fine to medium sand. Moist, soft.	
50							

Geologist(s): Chris Cresci
Subcontractor: Cascade Drilling
Driller/Operator: Tommy Ardito
Method: Rotosonic

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Boring Log: RW-3S

Project: Kop-Flex

Project No.: 31400389

Location: Hanover, MD

Completion Date: September 11, 2016

Surface Elevation (feet AMSL*): 125.4

TOC Elevation (feet AMSL*): 125.1

Total Depth (feet): 62

Borehole Diameter (inches): 8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
55						***Poorly-Graded Sand with Clay (SP-SC)*** Light reddish brown 5 YR-6/3 fine sand with trace lean clay. Stiff, moist	
60							
65						Bottom of Boring at 62 feet	
70							
75							

Geologist(s): Chris Cresci

Subcontractor: Cascade Drilling

Driller/Operator: Tommy Ardito

Method: Rotosonic

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-38R*
Drilled By: Cascade Drilling/Tommy Ardito	Drill Start Date: 9/12/2016	Drill End Date: 9/13/2016	Drill Method: Rotosonic
Logged By: Chris Cresci	Total Depth (ft): 32	Bore Diameter (in): 6	Ground Surface (ft): 125.7

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
					Ground Surface	
2	124				***Poorly-Graded Sand with Gravel (SP)*** Reddish brown 5YR-5/6 medium to coarse well sorted sand with traces of sub rounded gravel. Loose, Dry.	
4	122				4	
6	120				***Lean Clay with Gravel (CL)*** Red 2.5YR-4/8 lean clay with traces of gravel. Hard, very dense and dry. Slight white 2.5YR-8/1 mottling.	
8	118					
10	116				10.5	
12	114				***Lean Clay with Sand (CL)*** Very dark gray 5YR-3/1 lean to medium clay with small traces of fine sand. Very hard, very dense, dry.	
14	112					
16	110					
18	108				18	
					Poorly-Graded Sand with Clay (SP-SC) Red 2.5YR-4/6 Coarse (some fines) well sorted sand with lean clay. Medium density, loose, wet.	

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-38R*

Notes:

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description	Well
					20	
					Lean Clay with Sand (CL) Reddish gray 5YR-5/2 lean to medium clay with trace fine sand. Hard, very dense and dry. Red 2.5YR-4/8 mottling.	
22	104					
24	102					
26	100					
					27	
					Well-Graded Gravel with Clay (GW-GC) Red to brown 2.5YR-4/6 Rounded to subrounded poorly sorted gravel with fine sand and trace lean clay. Loose, wet.	
28	98					
30	96				30	
					Lean Clay with Sand (CL) Light reddish gray 2.5YR-6/1 lean clay with fine sand. Stiff, medium density, moist. Red 2.5YR-4/8 mottling.	
32	94				Bottom of Boring at 32 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.	
34	92					
36	90					
38	88					
40	86					

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Project Name: Kop-Flex	**Client:** Emerson	**Location:** Hanover, Maryland	**Boring Log:** *MW-40D*
Drilled By: Cascade Drilling/Tommy Ardito	**Drill Start Date:** 9/20/2016	**Drill End Date:** 9/21/2016	**Drill Method:** Rotosonic
Logged By: Rob Wallace	**Total Depth (ft):** 87	**Bore Diameter (in):** 6	**Ground Surface (ft):** 124.5

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
					Ground Surface	
5	120				***Poorly-Graded Sand with Clay (SP-SC)*** Brown 7.5 YR-4/4 fine to medium sand with some clay, trace angular gravel, loose, dry	
10	115					
15	110				16.5 ***Sandy Lean Clay (CL)*** Light gray 10 YR-7/2 clay with abundant fine sand, stiff, moist	
20	105					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-40D*

Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
					26
					Well-Graded Sand with Clay (SW-SC) Very pale brown 10 YR-8/4 fine sand with some clay, loose, wet
30	95				30
					Poorly-Graded Sand with Clay (SP-SC) Pink 7.5 YR-8/4 fine to medium sand with trace clay, loose, wet
35	90				
					37.5
					Lean Clay with Sand (CL) Very pale brown 10 YR-8/2 clay with trace fine sand, stiff, dry
40	85				40
					Poorly-Graded Sand with Clay (SP-SC) Pink 7.5 YR-8/4 fine to medium sand with trace clay, loose, wet
					42
					Lean Clay with Sand (CL) Very pale brown 10 YR-8/2 clay with trace fine sand, stiff, dry
45	80				45
					Clayey Sand (SC) Very pale brown 10 YR-8/2 fine sand with abundant clay, dense, dry
50	75				
					51

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-40D*

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
55	70				***Poorly-Graded Sand with Clay (SP-SC)*** Pink 7.5 YR-8/4 medium sand with trace clay, loose, wet *(continued)*	
60	65				60 ***Lean Clay with Sand (CL)*** Very pale brown 10 YR-8/2 clay with trace sand, stiff, dry	
65	60				66 ***Poorly-Graded Sand with Clay (SP-SC)*** Very pale brown 10 YR-8/4 medium sand with some clay, loose, wet	
					68 ***Poorly-Graded Sand (SP)*** Weak red 10 R-5/4 medium sand, loose, wet	
70	55				70 ***Well-Graded Sand with Clay and Gravel (SW-SC)*** Pink 7.5 YR-7/4 fine to coarse sand with abundant subrounded gravel and some clay, loose, moist	
75	50					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-40D*

Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
80	45				***Well-Graded Sand with Clay and Gravel (SW-SC)*** Pink 7.5 YR-7/4 fine to coarse sand with abundant subrounded gravel and some clay, loose, moist *(continued)*
85	40				85 ***Gravelly Lean Clay with Sand (CL)*** Very pale brown 10 YR-8/2 clay with abundant gravel with some fine to coarse sand, stiff, moist
90	35				87 ***Well-Graded Gravel (GW)*** Very pale brown 10 YR-8/4 smal to large subrounded gravel, loose, wet 91 ***Poorly-Graded Sand with Clay and Gravel (SP-SC)*** Yellow 10 YR-7/6 medium sand with some clay and trace gravel, loose, wet
95	30				97 ***Lean Clay with Sand (CL)*** Very pale brown 10 YR-8/3 clay with trace sand, stiff, dry
100	25				99 ***Poorly-Graded Sand with Clay (SP-SC)*** Very pale brown 10 YR-8/2 fine sand with trace clay, dense, moist

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-40D*

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
					105	
					Poorly-Graded Sand with Clay (SP-SC) Reddish yelow 7.5 YR-7/5 fine sand with trace clay, loose, dry *(continued)*	
110	15				110	
					Poorly-Graded Sand (SP) Light red 2.5 YR-6/6 medium sand, loose, moist	
					113	
					Poorly-Graded Sand (SP) Reddish yellow 7.5 YR-6/8 medium sand, loose, wet	
115	10					
					Bottom of Boring at 87 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.	
120	5					
125	-1					
130	-6					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-41D*
Drilled By: Cascade Drilling/Tommy Ardito	Drill Start Date: 9/21/2016	Drill End Date: 9/23/2016	Drill Method: Rotosonic
Logged By: Rob Wallace	Total Depth (ft): 167	Bore Diameter (in): 6	Ground Surface (ft): 127.6

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
					Ground Surface	
					Well-Graded Sand with Clay (SW-SC) Yellowish brown 10 YR-5/4 fine to medium sand with some clay, loose, dry	
5	123					
					7	
					Well-Graded Sand with Clay and Gravel (SW-SC) Reddish yellow 7.5 YR-7/8 medium to coarse sand with abundant clay and fine gravel, dense, moist	
10	118				10	
					Lean Clay (CL) Very pale brown 10 YR-8/3 clay, stiff, dry	
15	113				17	
					Lean Clay with Sand (CL) Brown 7.5 YR-5/2 clay with trace fine sand, stiff, dry	
20	108					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-41D*

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
30	98				***Lean Clay with Sand (CL)*** Brown 7.5 YR-5/2 clay with trace fine sand, stiff, dry *(continued)*	
					32	
35	93				***Lean Clay (CL)*** Red 2.5 YR-5/6 clay, stiff, dry	
40	88					
					44	
45	83				***Poorly-Graded Sand with Clay (SP-SC)*** Very pale brown 10 YR-7/4 medium sand with trace clay, loose, moist	
50	78					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-41D*

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
					Poorly-Graded Sand with Clay (SP-SC) Very pale brown 10 YR-7/4 medium sand with trace clay, loose, moist *(continued)*	
					53	
					Lean Clay (CL) Red 2.5 YR-5/6 clay, stiff, dry	
55	73					
60	68					
					61	
					Sandy Lean Clay (CL) Light brown 7.5 YR-6/3 clay with abundant fine sand, stiff, moist	
65	63					
70	58					
75	53				75	
					Lean Clay with Sand (CL) Dark red 2.5 YR-3/6 clay with trace fine sand, stiff, dry	

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-41D*

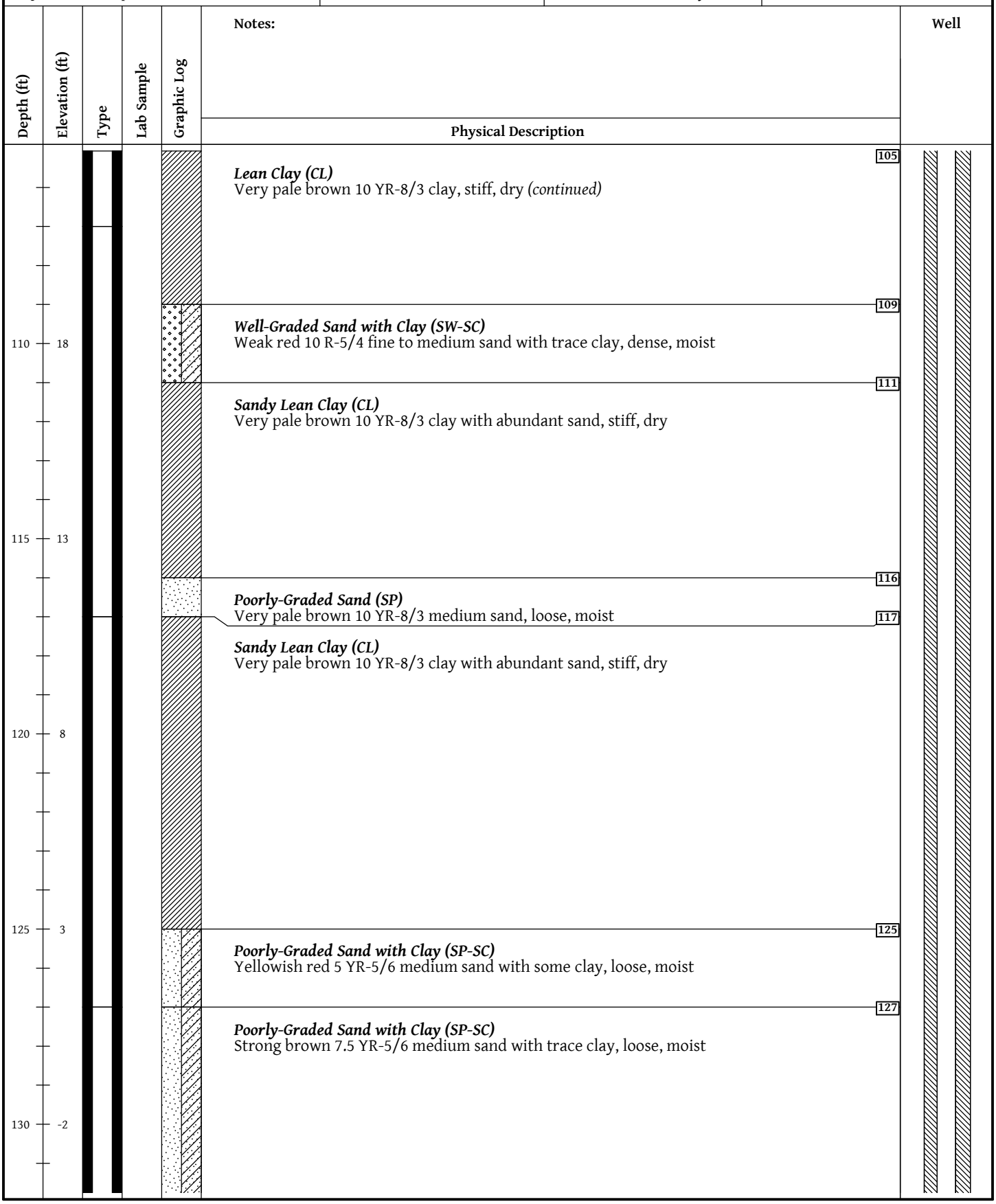
Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
80	48				***Lean Clay with Sand (CL)*** Dark red 2.5 YR-3/6 clay with trace fine sand, stiff, dry *(continued)*
85	43				86 ***Well-Graded Sand with Gravel (SW)*** Very pale brown 10 YR-8/4 fine to coarse sand with abundant subrounded gravel, loose, wet
90	38				90 ***Well-Graded Sand (SW)*** Very pale brown 10 YR-7/4 fine to medium sand, loose, wet
95	33				97 ***Well-Graded Gravel with Clay and Sand (GW-GC)*** Very pale brown 10 YR-8/3 fine to medium gravel with abundant clay and some fine to coarse sand, loose, wet
100	28				101 ***Poorly-Graded Sand with Clay (SP-SC)*** Very pale brown 10 YR-8/3 fine sand with some clay, loose, wet

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-41D*



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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-41D*

Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
135	-7				***Poorly-Graded Sand with Clay (SP-SC)*** Strong brown 7.5 YR-5/6 medium sand with trace clay, loose, moist *(continued)*
					135
					Poorly-Graded Sand (SP) Very pale brown 10 YR-8/4 coarse sand, loose, wet
140	-12				
					141
					Sandy Lean Clay (CL) Very pale brown 10 YR-8/4 clay with abundant fine to medium sand, dry, stiff
145	-17				
					147
					Poorly-Graded Sand (SP) Very pale brown 10 YR-8/3 medium sand, loose, wet
150	-22				
155	-27				

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-41D*

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
160	-32				***Poorly-Graded Sand (SP)*** Very pale brown 10 YR-8/3 medium sand, loose, wet *(continued)*	
					162	
165	-37				***Lean Clay with Sand (CL)*** Red 2.5 YR-5/6 clay with abundant sand, stiff, dry	
					Bottom of Boring at 167 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.	
170	-42					
175	-47					
180	-52					
185	-57					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-42*
Drilled By: Cascade Drilling/Tommy Ardito	Drill Start Date: 9/13/2016	Drill End Date: 9/13/2016	Drill Method: Rotosonic
Logged By: Chris Cresci	Total Depth (ft): 30	Bore Diameter (in): 6	Ground Surface (ft): 126.1

Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
					Ground Surface
2	124				***Poorly-Graded Sand with Silt and Gravel (SP-SM)*** Strong yellowish brown 7.5YR-5/8 Silty sand with rounded gravel. Loose, low density, dry.
4	122				
6	120				6
8	118				***Lean Clay with Sand (CL)*** Red 2.5YR-4/8 lean clay with fine sand. Hard, dense and dry. Gray 5YR-6/1 mottling.
10	116				10
12	114				***Lean Clay with Sand (CL)*** Dark Gray 7.5YR-4/1 lean clay with silt and trace fine sand. Stiff, very dense and dry. Yellowish red 5YR-5/8 mottling.
14	112				
16	110				
18	108				

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-42*

Notes:

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description	Well
22	104				***Lean Clay with Sand (CL)*** Dark Gray 7.5YR-4/1 lean clay with silt and trace fine sand. Stiff, very dense and dry. Yellowish red 5YR-5/8 mottling. *(continued)*	
					22	
24	102				***Lean Clay (CL)*** Red 2.5YR-5/8 lean to medium plasticity clay with traces of silt and fine sand. Stiff, medium density, moist. Reddish yellow 7.5YR-6/8 mottling.	
26	100					
28	98					
30	96				Bottom of Boring at 30 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.	
32	94					
34	92					
36	90					
38	88					
40	86					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-43*
Drilled By: Cascade Drilling/Tommy Ardito	Drill Start Date: 9/14/2016	Drill End Date: 9/14/2016	Drill Method: Rotosonic
Logged By: Chris Cresci	Total Depth (ft): 46	Bore Diameter (in): 6	Ground Surface (ft): 123.2

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Notes: / Physical Description	Well
					Ground Surface	
					Silty Sand with Gravel (SM) Strong brown 7.5YR-4/6 silty sand with trace rounded gravel. Sand is medium to coarse and poorly sorted. Loose, low density, dry.	
5	118				5	
					Lean Clay with Sand (CL) Red 2.5YR-4/8 lean clay with trace fine sand. Stiff, very dense, moist. Heavy white 7.5YR-7/1 mottling.	
10	113				11	
					Lean Clay with Sand (CL) Light gray 5YR-6/1 lean to medium plasticity clay with trace fine sand and silt. Stiff, medium density, moist, slightly mottled.	
15	108				19	
					Sandy Lean Clay (CL) Grey 5YR-5/1 sandy clay. Clay is lean, sand is fine and well sorted. Stiff, medium density, moist from 19-21.5, dry to 24'. Yellowish brown 7.5YR-6/8 mottling.	
20	103				24	

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-43*

Notes:

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description	Well
30	93				***Lean Clay (CL)*** Red 2.5YR-4/8 lean clay. Very hard, dense, dry. White 2.5YR-8/1 mottling. *(continued)*	
					31	
					Sandy Lean Clay (CL) Pinkish gray 7.5YR-8/2 sandy lean clay. Sand is fine and poorly sorted. Stiff, medium density, moist. Brown 7.5YR-6/8 mottling.	
35	88					
					37	
					Clayey Sand (SC) Light brown 7.5YR-6/3 clayey fine to medium, well graded sand. Stiff, low density, wet.	
40	83					
					41	
					Well-Graded Sand (SW) Pinkish brown 7.5YR-7/4 poorly graded fine to medium sand. Loose, low density, wet. Light reddish yellow 5YR-7/6 mottling.	
					44	
45	78				***Lean Clay with Sand (CL)*** Pinkish gray 7.5YR-6/2 lean clay with medium sand. Stiff, low density, wet. Slight brown 7.5YR-5/8 mottling.	
					Bottom of Boring at 46 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.	
50	73					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-44*
Drilled By: Cascade Drilling/Tommy Ardito	Drill Start Date: 9/14/2016	Drill End Date: 9/15/2016	Drill Method: Rotosonic
Logged By: Chris Cresci	Total Depth (ft): 42	Bore Diameter (in): 6	Ground Surface (ft): 127.5

Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
					Ground Surface
					Well-Graded Sand with Gravel (SW) Strong brown 7.5YR-5/8 gravelly medium to coarse sand. Gravel rounded to subangular and poorly sorted. Loose, dense, wet.
					3
					Well-Graded Sand with Silt and Gravel (SW-SM) Yellowish brown 10YR-6/8 fine sand with silt and poorly sorted angular gravel. Loose, low density, wet.
5	123				
10	118				
					12
					Poorly-Graded Sand with Clay (SP-SC) Pinkish gray 7.5YR-7/2 fine sand with lean clay. Loose, low density, moist.
15	113				
					19
					Clayey Sand (SC) Light brownish gray 10YR-6/2 lean clayey fine to medium well sorted sand. Loose, moist. Slight dark brown 7.5YR-5/8 mottling.
20	108				
					23
					Sandy Lean Clay (CL) White to light gray 7.5YR-7/1 fine to medium sandy lean clay. Stiff, medium density, moist. Some yellowish red 5YR-7/8 mottling.

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-44*

Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
30	98				***Sandy Lean Clay (CL)*** White to light gray 7.5YR-7/1 fine to medium sandy lean clay. Stiff, medium density, moist. Some yellowish red 5YR-7/8 mottling. *(continued)*
					30
					Lean Clay with Sand (CL) Gray 7.5YR-5/1 Lean clay with fine sand. Very hard and dense, dry.
					32
35	93				***Poorly-Graded Sand with Clay (SP-SC)*** White to light gray 7.5YR-7/1 fine sand with lean to medium plasticity clay. Loose, low density, wet. Dark brown 7.5YR-4/8 mottling. Sandy clay layer at 35.5-36'.
					38
40	88				***Well-Graded Sand with Clay (SW-SC)*** Reddish yellow 7.5YR-6/6 fine to medium well graded sand with traces of lean clay. Loose, moist to wet.
45	83				Bottom of Boring at 42 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.
50	78				

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-45*
Drilled By: Cascade Drilling/Larry Hunsberger	Drill Start Date: 3/11/2017	Drill End Date: 3/12/2017	Drill Method: Rotosonic
Logged By: Rob Wallace	Total Depth (ft): 60	Bore Diameter (in): 6	Ground Surface (ft): 126.97

Notes:

Depth (ft)	Elevation (ft)	Type	Lab Sample	PID (PPM)	Graphic Log	Physical Description	Well
						Ground Surface	
						Asphalt Asphalt with gravel base layer — 0.5	
						Poorly-Graded Sand with Clay (SP-SC) Very pale brown (10 YR 8/2) fine sand with some clay, mottled medium gray, dry, loose, no odor	
5	122						
10	117			0.0			
				0.0			
15	112			0.0		15.5	
				0.0		***Poorly-Graded Sand with Clay (SP-SC)*** Very pale brown (10 YR 8/2) fine sand with some thin clay lenses, wet, loose, no odor	
				0.0			
20	107					20	
				0.0		***Well-Graded Gravel (GW)*** Very pale brown (10 YR 8/2) well-rounded to sub-rounded fine to medium gravel with some clay, wet, loose, no odor — 21	
				0.0		***Poorly-Graded Sand with Clay (SP-SC)*** Light yellowish brown (10 YR 6/4) fine to medium sand with some clay, wet, loose, no odor	

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-45*

Depth (ft)	Elevation (ft)	Type	Lab Sample	PID (PPM)	Graphic Log	Notes: / Physical Description	Well
30	97			0.1		***Poorly-Graded Sand with Clay (SP-SC)*** Light yellowish brown (10 YR 6/4) fine to medium sand with some clay, wet, loose, no odor *(continued)*	
				0.2			
				0.8			
				0.0			
				0.0			
35	92			0.0			
				0.0			
				0.0		38.5 ***Lean Clay (CL)*** Red (5 R 4/8) clay, stiff, dry, no odor	
40	87					40 ***Lean Clay (CL)*** Dark grey (N3) clay, stiff, dry, no odor	
45	82						
50	77						

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-45*

Depth (ft)	Elevation (ft)	Type	Lab Sample	PID (PPM)	Graphic Log	Notes: / Physical Description	Well
						Lean Clay (CL) Dark grey (N3) clay, stiff, dry, no odor *(continued)*	
						53	
						Lean Clay (CL) Very dusky red (5 R 2.5/2) clay, stiff, dry, no odor	
55	72						
60	67					Bottom of Boring at 60 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.	
65	62						
70	57						
75	52						

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Project Name: Kop-Flex	**Client:** Emerson	**Location:** Hanover, Maryland	**Boring Log:** *MW-5R*
Drilled By: Cascade Drilling/Tommy Ardito	**Drill Start Date:** 9/13/2016	**Drill End Date:** 9/13/2016	**Drill Method:** Rotosonic
Logged By: Chris Cresci	**Total Depth (ft):** 30	**Bore Diameter (in):** 6	**Ground Surface (ft):** 123.8

Notes:

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description	Well
					Ground Surface	
2	122				***Poorly-Graded Sand with Gravel (SP)*** Reddish yellow 7.5YR-6/8 medium to fine sand with trace rounded gravel. Soft, loose, dry.	
3						
4	120				***Well-Graded Sand with Gravel (SW)*** Darker reddish yellow 7.5YR-6/6 medium to coarse well sorted sand with rounded to subrounded gravel. Loose, moist.	
6	118					
8	116					
8					***Clayey Sand (SC)*** Light reddish brown 5YR-6/4 clayey fine to medium sand . Medium density, soft to firm down the core, wet.	
10	114					
12	112					
14	110					
15						
16	108				***Lean Clay with Sand (CL)*** Light gray 5YR-6/1 lean to medium plasticity clay with fine sand and traces of silt. Firm, dense, moist. Reddish yellow 5YR-6/6 mottling.	
18	106					

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Project Name: Kop-Flex	Client: Emerson	Location: Hanover, Maryland	Boring Log: *MW-5R*

Notes:

Well

Depth (ft)	Elevation (ft)	Type	Lab Sample	Graphic Log	Physical Description
22	102				21 ***Lean Clay with Sand (CL)*** Dark gray 5YR-4/1 lean clay with trace fine to medium sand. Stiff, very dense, moist. Dark yellowish red 5YR-5/8 mottling.
24	100				
26	98				
28	96				
30	94				29 ***Lean Clay with Sand (CL)*** White to light gray 5YR-7/1 lean to medium plasticity clay with fine sand. Stiff, dense, moist. Bottom of Boring at 30 feet. All soil classification based on visual descriptions made during the installation of the boring, unless noted otherwise.
32	92				
34	90				
36	88				
38	86				
40	84				

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Maryland
Department of the Environment

ENVIRONMENTAL AFFAIRS
OCT 03 2016

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Governor
Boyd Rutherford
Lieutenant Governor
Ben Grumbles
Secretary

SEP 27 2016

CERTIFIED MAIL

Steve Clarke, Vice President Environmental Affairs
Emerson Electric Co.
8000 West Florissant Avenue
Saint Louis, MO 63136

Re: State Discharge Permit No. 15DP3442, NPDES Permit MD0069094

Dear Mr. Clarke,

Enclosed is the issued discharge permit referenced above with the effective date indicated on the cover page. The permittee is responsible for complying with all permit conditions. You are therefore advised to read the permit carefully and become thoroughly familiar with the requirements.

The U.S. Environmental Protection Agency (EPA) recently promulgated a final rule to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system (see 40 CFR 127.16). This final rule requires all National Pollution Discharge Elimination System (NPDES) regulated entities to electronically report Discharge Monitoring Reports (DMRs) **starting on December 21, 2016**.

The Maryland Department of the Environment offers NetDMR for filing your required NPDES DMRs. NetDMR is a freely available Web based tool that allows NPDES permittees to electronically sign and submit their DMRs to EPA via a secure internet connection. NetDMR is designed to improve data quality, reduce reporting liabilities, save paper, and provide cost savings. It allows participants to discontinue mailing in hard copy forms under 40 CFR 122.41 and 403.12. For more information go to the EPA website (www.epa.gov/netdmr) or call the MDE Water Management Administration, Compliance Program, at 410-537-3510 and ask to speak to a NetDMR coordinator.

As indicated in Condition II.A.2 of your permit, before you can submit official DMRs using NetDMR you must attend a training Webinar and successfully set-up and submit test monitoring results electronically. If you do not attend the required training in a timely manner, you will be at risk of violating the new U.S. EPA NPDES electronic reporting rule. While paper DMR reporting is being phased out, those who are unable to use the NetDMR system before December 21, 2016 may continue to submit paper copies. Enclosed are (EPA No. 3320-1) Discharge Monitoring Report (DMR) forms, which, unless you are already using NetDMR, must be completed for each reporting period and submitted to the Department in accordance with the requirements of the permit. Copies of these forms can also be downloaded from the Department's website (bit.ly/MDE-New-DMR). Using the latest version of Adobe Acrobat Reader, the DMR form can be completed from a keyboard and printed for mailing to the Department.

Enclosed is also a copy of the Federal Register, Part 136 - "Guidelines Establishing Test Procedures for Analysis of Pollutants". Unless otherwise specified, these guidelines are to be used for the analyses required by this permit. The most current version of 40 C.F.R. Part 136 can be found online at EPA's website (www.epa.gov/epahome/cfr40.htm). Finally you'll find enclosed a brochure for NetDMRs.

Please direct all future correspondence regarding permit compliance to the following address:

Attention: Discharge Monitoring Reports
Water Management Administration – Compliance Program
Maryland Department of the Environment
1800 Washington Boulevard, Suite 425
Baltimore, Maryland 21230-1708

If you have any other questions, please do not hesitate to call Marjorie Mewbourn, Industrial and General Permits Division, at 410-537-3323.

Sincerely,

Virginia P Kearney/ for

Lynn Buhl, Director
Water Management Administration

LB:aw

Enclosures (4)

Cc: William Lee (delivered electronically)
WMA-Compliance, Central Division Chief

STATE DISCHARGE PERMIT NUMBER	15-DP-3442	NPDES PERMIT NUMBER	MD0069094
EFFECTIVE DATE	November 1, 2016	EXPIRATION DATE	October 31, 2021
MODIFICATION DATE:	N/A	REAPPLICATION DATE	October 31, 2020

Pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder, and the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq. and implementing regulations 40 CFR Parts 122, 123, 124, and 125, the Department of the Environment, hereinafter referred to as the "Department," hereby authorizes

Emersub 16, LLC
8000 West Florissant Avenue
St. Louis, MO 63136

TO DISCHARGE FROM

a groundwater remediation system

LOCATED AT

7565 Harmans Road, Hanover, Anne Arundel County, Maryland 21076

VIA OUTFALL

001, as identified and described below

TO

Stoney Run, a designated Use I water body under COMAR 26.08.02.02 protected for water contact recreation, fishing, aquatic life and wildlife in accordance with the following special and general conditions and map made a part hereof.

I. SPECIAL CONDITIONS

A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the effective period of this permit, the permittee is authorized to discharge treated groundwater via Outfall 001 (Maryland Coordinates 1397.0 E and 540.4 N).

Discharges authorized from this outfall shall be limited and monitored by the permittee at Monitoring Point 101, a sampling tap at the treatment system, as specified in the table below:

PARAMETER	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				FREQUENCY OF ANALYSIS	SAMPLE TYPE	NOTES
	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS			
Flow	Report	Report	gpd					1/Month	Measured	(1) (9)
Total Purgeable Organics (TPO)						100	µg/L	1/Month	Grab	(2) (9)
BOD_5					30	45	mg/L	1/Month	Grab	(9)
Dissolved Oxygen				5			mg/L	1/Month	Grab	(9)
pH				6.5		8.5	s.u.	1/Month	Grab	(9)
Total Suspended Solids (TSS)					30	45	mg/L	1/Month	Grab	(9)
Total Suspended Solids (TSS)	Report (lbs/month)	2031 (lbs/year)	As noted					1/Month	Calculated	(3) (4)
Total Zinc					120	120	µg/L	1/Month	Grab	(5) (9) (10)
Dissolved Zinc						Report	µg/L	1/Month	Grab	(5) (9)

I. SPECIAL CONDITIONS

A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS – Continued from previous page

PARAMETER	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				FREQUENCY OF ANALYSIS	SAMPLE TYPE	NOTES
	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS			
Total Copper					9	13	µg/L	1/Month	Grab	(5) (9) (10)
Dissolved Copper						Report	µg/L	1/Month	Grab	(5) (9)
Total Nickel						470	µg/L	1/Month	Grab	(5) (9)
Dissolved Nickel						Report	µg/L	1/Month	Grab	(5) (9)
Total Lead						65	µg/L	1/Month	Grab	(5) (9)
Dissolved Lead						Report	µg/L	1/Month	Grab	(5) (9)
Hardness (as CaCO3)						Report	mg/L	1/Month	Grab	
Nitrogen, Total	Report (lbs/quarter)	Report (lbs/year)	As noted			Report	mg/L	1/Quarter	Calculated	(7) (8)
Ammonia (as N)						Report	mg/L	1/Quarter	Grab	(6)
Nitrate-Nitrite (as N)						Report	mg/L	1/Quarter	Grab	(6)
Organic Nitrogen (as N)						Report	mg/L	1/Quarter	Grab	(6)

There shall be no discharge of floating solids or persistent foam in other than trace amounts. Persistent foam is foam that does not dissipate within one half-hour from the point of discharge.

I. SPECIAL CONDITIONS

A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS – Continued from previous page

The permittee shall alert the Department when its annual average flow exceeds 120,000 gallons per day (gpd). The permittee shall evaluate any change in annual average flow each year and, in accordance with General Condition B.1, notify the Department by May 1 if the annual average flow is expected to exceed this level. This requirement is not a flow limit.

(1) The flow to be measured is that from groundwater remediation only.

(2) Total purgeable organics is defined as the sum of all volatile organic compounds (VOCs) which can be detected using EPA Test Method 624 (Purgeables - *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*.). The permittee shall include the total sum concentration of detected constituents in the quarterly discharge monitoring reports (DMRs). The permittee shall also submit the laboratory report with the corresponding DMR through NetDMR. The permittee shall maintain a complete record of all reports.

(3) Monthly Loading Rate (lbs/month) is calculated using the following equation with the values for the month for which the Monthly Loading Rate is to be determined:

Monthly Loading (lbs/month) = Monthly Average Concentration (mg/l) x Monthly Average Flow (MGD) x 8.34 x (the number of days in the month that discharges occurred.)

(4) Annual Maximum Loading Rate (lbs/year) – Annual maximum loading is reported in units of pounds per year for TSS. It is calculated by summing the monthly loading values from January through December for the current calendar year. At the end of each calendar year the permittee shall report compliance with the annual maximum load limit for TSS to the Department. Results of the required annual calculations shall be submitted to the Water Management Administration Compliance Program with the Discharge Monitoring Report for the 4th calendar quarter.

(5) The permittee shall use EPA Methods 200.7 or 200.8 for testing. An alternate test method may be substituted as long as the Department concurs that its detection level is less than the applicable Toxic Substance Criteria in COMAR 26.08.02.03 or the permittee demonstrates to the satisfaction of the Department that a lower detection level is not practically achievable for this wastewater. Sample preservation procedures, container materials, and maximum allowable holding times must be specified in any application to the Department for the use of an alternate test method. Written approval from the Department must be given before any alternate test method is used. The integrity of all testing shall be ensured by following all sample preservation procedures, container materials, and maximum holding times for the test method specified. If a variance from the prescribed preservation techniques, container materials, and maximum holding times is requested, sufficient data shall be provided in the application to the Department to assure the integrity of the sample.

I. SPECIAL CONDITIONS

A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS – Continued from previous page

(6) All nitrogen parameters shall be measured from the same sample. The permittee may request to stop sampling after four quarters (4 samples) of monitoring has occurred. The request shall be made in writing to the Industrial and General Permits Division and include a spreadsheet of all testing results for the parameters. The Department reserves the right to modify sampling frequency for nitrogen as a minor modification based on the information presented in this request.

(7) Quarterly loads for nitrogen can be calculated by:

Quarterly load in lbs/quarter = (concentration of quarterly calculated total nitrogen in mg/L) x (average flow in MGD for the quarter) x (number of days in the quarter on which a discharge occurred) x 8.34.

(8) The annual maximum loading rate is to be reported quarterly as the cumulative sum of the quarterly loads (up to four quarters.)

(9) Monitoring frequency during the first four (4) weeks of discharge from the new system shall be once per week.

(10) The permittee has 36 months to initiate action and comply with the monthly average (chronic) requirement, as detailed in Special Condition S.

I. SPECIAL CONDITIONS

B. DEFINITIONS

1. "Clean Water Act" means the Federal Water Pollution Control Act Amendments of 1972," 33 U.S.C. 1251, 86 Stat. 866, as amended by the "Clean Water Act of 1977," 91 Stat. 1566, and all other amendments to that act.

2. "CFR" means the Code of Federal Regulations.

3. "COMAR" means the Code of Maryland Regulations.

4. "Department" means the Maryland Department of the Environment (MDE).

5. "National Pollutant Discharge Elimination System (NPDES)" means the national system for issuing permits established under §402 of the Clean Water Act (1972).

6. "Permittee" means an individual or organization holding a discharge permit issued by the Department.

7. "Outfall" means the location where effluent is discharged into receiving waters.

8. "Monitoring Point" means the effluent sampling location in the outfall line(s) downstream from the last addition point or as otherwise specified.

9. "Measured flow" means any method of liquid volume measurement for which accuracy has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

10. "Daily determination of concentration" means an analysis performed on an effluent sample representative of flow for that calendar day, with concentration expressed in mg/L or other appropriate unit of measurement.

11. "Daily maximum effluent concentration" means the highest reading of any daily determination of concentration.

12. "Monthly, quarterly, semi-annual, or annual average effluent concentration" means the value calculated by computing the arithmetic mean of all the daily determinations of concentration made during any respective calendar-month, 3-month, 6-month, or 12-month period.

13. "Grab sample" means an individual sample collected over a period of time not exceeding 15 minutes. Grab samples collected for pH must be analyzed within 15 minutes from the time of collection.

14. "Minimum value" means the lowest value measured during a 24-hour period.

15. "Biochemical Oxygen Demand (BOD)" means the amount of dissolved oxygen required to biologically break down organic material and oxidize inorganic material in an unfiltered environmental sample during a standard BOD_5 test without the use of a nitrification inhibitor.

16. "Total Suspended Solids (TSS)" means the residue from an effluent sample retained on a filter measured in accordance with ASTM D5907-09, *Standard Methods for Filterable and Nonfilterable Matter in Water* (2009), or other approved methods.

17. "Bypass" means the intentional diversion of wastes from any portion of a treatment facility.

18. Upset" means an exceptional incident where unintentional and temporary noncompliance with technology-based permit effluent limitations occurs due to factors beyond the reasonable control of the permittee. An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

19. "Nitrogen, Total" means the sum of organic nitrogen, ammonia and, nitrate plus nitrite. All values shall be reported as nitrogen (as N).

C. TOXIC POLLUTANT REPORTING

The permittee shall notify the Department as soon as it is known or suspected that any toxic pollutants which are not specifically limited by this permit have been discharged in excess of notification levels specified in 40 CFR Part 122.42(a).

D. REMOVED SUBSTANCES

1. Within 30 days after notification, the permittee shall provide the Department with information on the disposal of any removed substances, as defined under General Condition B.7. Requested information may include, but may not be limited to:

   a. A map clearly showing all areas used for disposal of removed substances.

   b. A description of physical, chemical, and biological characteristics of any removed substances as well as their quantities and methods of disposal.

   c. The identity of any contractor or subcontractor, their mailing address and the information specified in a and b above, if disposal is handled by persons other than the permittee.

2. The Department's notification may also require the permittee to provide the above information prior to use of new or additional disposal areas, contractors, or subcontractors.

E. ANALYTICAL LABORATORY

Within 30 days after the effective date of this permit, the permittee shall submit to the Department the name and address of the analytical laboratory (including the permittee's own laboratory) used to perform the monitoring required by this permit.

If the laboratory changes during the effective period of this permit, the permittee shall notify the Department of the new laboratory within 30 days after the change.

F. WASTEWATER OPERATOR CERTIFICATION

As of the effective date of this permit, the permittee's facility shall be operated by an industrial wastewater operator duly certified by the Maryland Board of Waterworks and Waste Systems Operators. Certification shall be for operation of a Class 7 industrial wastewater works, unless the Board determines a different classification is appropriate. At no time during the effective period of the permit shall the treatment facility be operated for more than two months without an onsite assessment by a certified operator.

G. FLOW MONITORING

In lieu of providing measured flow (defined under Special Condition B above) at Outfall 001, the permittee may estimate flows and provide the following information when submitting the initial discharge monitoring report and/or upon any change in methodology:

1. A description of the methodology used to estimate flow at each outfall where flow measurement equipment is not present.

2. Documentation appropriate to the methodology used which provides information to support the validity of the reported flow estimate. If actual measurements or observations are made, a description of typical sampling times, locations, and persons performing the measurements/observations must also be provided.

3. A description of factors (e.g., batch discharges, intermittent operation, etc.) which caused flow at the outfall to fluctuate significantly from the previously provided estimate.

H. FLOW BASIS FOR ANNUAL DISCHARGE PERMIT FEE

The Department will calculate permit fees annually and invoice the permittee based on annual average discharge flow. Permit fees are payable to the Department in advance by July 1 of each fiscal year (July 1 through June 30).

The permittee shall notify the Department's Industrial and General Permits Division by May 1 of each year of a revised annual average discharge flow value for the next billing period, if the flow volume used to calculate the most recent annual permit fee (or application fee if the permit was renewed within the past year) differs significantly from either of the following flow determinations:

1. Average flow data reported on the permittee's discharge monitoring reports for the current fiscal year, or

2. Estimated flow volume for the next billing period based on recent changes at the facility.

The flow revision notification shall include a summary of flow data reported on discharge monitoring reports for the previous year and any other supporting documentation to be used as the basis for the revised flow determination.

I. REAPPLICATION FOR A PERMIT

The Department is implementing a revised schedule for issuance of discharge permits grouped by geographical areas (watersheds). To implement the new watershed-based schedule the Department may revoke and reissue this permit concurrently with other permits in the watershed. Unless the Department grants permission for a later date the permittee shall submit a permit renewal application no later than 12 months prior to the expiration date of the current permit, or notify the Department of their intent to cease discharging by the permit's expiration date.

In the event that a timely and sufficient reapplication has been submitted and through no fault of the permittee the Department is unable to issue a new permit before the expiration date, the terms and conditions of this permit are automatically continued and remain in full force and effect .

J. PERMIT REOPENER FOR TOTAL MAXIMUM DAILY LOAD (TMDL)

This permit may be reopened as a major modification to implement any applicable requirements associated with a Total Maximum Daily Load (TMDL) issued or approved for Patapsco River L N Br, (Basin Code 02130906), including but not limited to: sulfates and chlorides.

This permit is consistent with the terms and conditions of the Chesapeake Bay Total Maximum Daily Load (TMDL) for Sediments, Nitrogen and Phosphorus established December 29. 2010 (76 Fed. Reg.549, January 5, 2011).

Based on facility operations and/or discharge characteristics this permit limits the discharge of total suspended solids and requires monitoring of total phosphorus to prevent water quality degradation of receiving waters and ultimately the Chesapeake Bay, but does not impose limits or monitoring for total nitrogen at this time.

To ensure the Chesapeake Bay and its tributaries are protected from discharges of sediments, nitrogen and phosphorus this permit may be reopened as a major modification to implement any future requirements associated with the Chesapeake Bay TMDL. At that time the permittee may become subject to a Department-issued General Permit for the discharge of such pollutants.

K. BIOMONITORING PROGRAM

1. Within three months of the effective date of the permit, the permittee shall submit to the Department for approval a study plan to evaluate wastewater toxicity at Outfall 001 by using biomonitoring. The study plan should include a discussion of:

    a. wastewater and production variability
    b. sampling & sample handling
    c. source & age of test organisms
    d. source of dilution water
    e. testing procedures/experimental design
    f. data analysis
    g. quality assurance/quality control
    h. report preparation
    i. testing schedule

2. The testing program shall consist of definitive quarterly chronic testing for one year. This testing shall be initiated no later than three months following the Department's acceptance of the study plan

   For Freshwater Receiving Stream

   Testing event shall include the Ceriodaphnia survival and reproduction test and the fathead minnow larval survival and growth test.

   For Estuarine Receiving Stream

   Testing shall include the sheepshead minnow (*Cyprinodon* variegatus)or inland silverside (*Menidia beryllina*) larval survival and growth tests and mysid shrimp (*Americamysis bahia* AKA *Mysidopsis bahia)* survival, growth, and fecundity tests. Testing must include one vertebrate species and one invertebrate species. Test results shall be expressed as NOEC, LOEC, ChV, and IC_{25}.

3. The samples used for biomonitoring shall be collected at the same time and location as the samples analyzed for the effluent limitations and monitoring requirements for this outfall. For chlorinated effluents, samples shall be collected after dechlorination. The permittee shall collect 24-hour flow–proportioned composite samples unless the Department has given prior approval of an alternative sampling type.

4. The following EPA documents discuss the appropriate methods:

   For freshwater receiving stream -
   Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms Fourth Edition, EPA-821-R-02-013, October, 2002

   For estuarine receiving stream -
   Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms Third Edition, EPA-821-R-02-014, October 2002

5. Test results shall be submitted to the Department within one month of completion of each set of tests.

6. Test results shall be reported in accordance with MDE/WMA "Reporting Requirements for Effluent Biomonitoring Data," 3/21/03.

7. As a minimum, the reported chronic results shall be expressed as NOEC, LOEC, ChV, and IC_{25}.

8. If a 50% mortality or greater occurs in one or more effluent concentrations during the first 48 hours of the chronic tests, 48-hour LC50s shall be calculated and reported along with the chronic results.

9. If testing is not performed in accordance with MDE-approved study plan, additional testing may be required by the Department.

10. If the test results of any two consecutive valid toxicity tests show acute or chronic toxicity (LC_{50} equal to or less than 100% for acute tests and an IC_{25} equal to or less than the in-stream waste concentration for chronic tests), the permittee shall repeat the test within 30 days to confirm the findings of acute or

chronic toxicity. Intermittent toxicity or other concerns may require additional testing or limits. If acute and/or chronic toxicity is confirmed, the permittee shall:

a. Eliminate the source of toxicity through operational changes as soon as possible but in any case not longer than within three months, or

b. Perform a TRE. If the permittee repeats the toxicity testing as stated above and the results of the repeat test do not confirm the acute or chronic toxicity, the Department will require the permittee to repeat the toxicity testing as stated above to reconfirm a finding of no acute or chronic toxicity. After reconfirmation, the permittee shall complete any remaining quarterly testing required.

11. If the permittee completes a TRE in accordance with 10.b and unacceptable toxicity is confirmed, a Whole Effluent Toxicity (WET) permit limit and a compliance schedule will be required that shall become discharge permit conditions through a Department-initiated permit modification or through a permit renewal.

12. To address federal NPDES requirements for WET testing and limits, MDE shall implement permit limits through a new or renewal permit or by reopening the current permit when a WET test result shows reasonable potential for toxicity unless it can be demonstrated that the source of toxicity has been eliminated, inappropriate test procedures were utilized, or the source has been controlled via a chemical specific permit limitation. Where reasonable potential has been assumed based on one test result, the permit shall include a WET limit effective within three years unless the effluent shows no toxicity in six follow-up quarterly tests. The permit may be modified to remove the WET limit if the six follow-up quarterly tests show no toxicity.

13. If the facility activities or groundwater treatment processes or operations change so that there is a significant change in the nature of the wastewater, the Department may require the permittee to conduct a new set of tests.

14. Submit all biomonitoring related materials to:

NetDMR
or
Maryland Department of the Environment
Water Management Administration
Compliance Program
1800 Washington Blvd., Suite 420
Baltimore, MD 21230-1708

L. TOXICITY REDUCTION EVALUATION

A Toxicity Reduction Evaluation (TRE) is an investigation conducted to identify the causative agents of effluent toxicity, isolate the source(s), evaluate the effectiveness of control options, implement necessary control measures and confirm the reduction in toxicity. The permittee shall conduct a TRE when a review of toxicity test data by the Department indicates unacceptable, acute, or chronic effluent toxicity.

1. Within 90 days following notification by the Department that a TRE is required, the permittee shall submit a study plan and schedule for conducting the TRE. The permittee shall conduct the TRE in a manner consistent with the plan and schedule submitted to the Department.

2. The plan should follow the framework set forth in *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA/600/2-88/070, April 1989).

3. Beginning 60 days following the date of the Department's acceptance of a TRE study plan and every 60 days thereafter, the permittee shall submit progress reports including all relevant test data to the Department. The permittee shall continue to submit progress reports every 60 days until the toxicity reduction confirmation is completed.

4. Within 60 days following completion of the toxicity identification (source identification) phase of the TRE, the permittee shall submit a plan and schedule to the Department for implementing measures necessary to eliminate acute toxicity and/or reduce chronic toxicity to acceptable levels. Implementation of these measures shall begin immediately upon submission of this plan.

5. Within 60 days after completing the implementation of control measures to eliminate or reduce toxicity, the permittee shall submit a study plan to the Department for approval to confirm the elimination or reduction of toxicity using biomonitoring.

6. If for any reason the implemented measures do not result in compliance with the Department's toxicity limitations the permittee shall continue the TRE.

M. MIXING ZONES AND POLLUTION PREVENTION – [Reserved]

N. PROTECTION OF WATER QUALITY

It is a violation of this permit to discharge any substance not otherwise listed under this permit's "Effluent Limitations and Monitoring Requirements" (Special Condition A) at levels which would cause or contribute to any exceedance of the numerical water quality standards set forth in COMAR 26.08.02.03, unless the level and substance were disclosed in writing in the permit application prior to issuance of the permit. If a discharge regulated by this permit causes or contributes to an exceedance of water quality standards in COMAR 26.08.02.03, including but not limited to general water quality standards, or if the discharge includes a pollutant not disclosed or addressed in the public record for the permit determination, the Department is authorized to modify, suspend or revoke this permit or take enforcement action to address unlawful discharges.

O. INITIATION OF DISCHARGE

1. Within 90 days of initiating the discharge, the permittee shall submit a diagram of the treatment system and photographs of the monitoring point, treatment facility and effluent at the final outfall to the Department's Industrial and General Permits Division. Digital photographs submitted via email will be acceptable to fulfill this requirement.

2. The permittee is required to submit weekly sampling data for flow and limited parameters during the first four weeks of operation of the new remediation system. See note 9 to Special Condition A1.

P. NON-EROSIVE DISCHARGE

The permittee shall convey the discharge from Outfall 001 to Stoney Run in a manner that will not result in soil erosion or entrainment of other contaminants from the drainage path.

Q. RELOCATION OF OUTFALL 001/OUTFALL DESIGN

If Outfall 001 is relocated, the permittee must submit prior to any discharge a written description of the revised or relocated outfall and a map showing its location to the Department's Industrial and General Permits Division. The permittee shall develop and implement a best management practices plan that will minimize the routine or accidental introduction of pollutants to Stoney Run from construction associated with a relocated outfall. The revised/relocated outfall shall be constructed in a manner that will meet Special Condition P and also allow for inspection of the outfall.

R. BOD STUDY

Within six months of initiating discharge, the permittee shall submit to the Department a report evaluating the effects of BOD levels on the receiving stream using water quality models. The study shall present details of modeling methodology and results. The permit may be re-opened and the limitations for BOD and/or dissolved oxygen at Outfall 001 may be revised based on the results of this report.

S. COMPLIANCE SCHEDULE FOR CHRONIC TOTAL COPPER AND ZINC

1. Every six months, the permittee shall submit to the Department a status report detailing current plans for meeting the chronic copper and zinc limits in Special Condition A. This report is due six months after the effective date of the permit and every six months thereafter until the effective date of the permit limits. The plans may include alternative treatment technologies or other discharge options which will result in compliance with the final discharge limitations.

2. If the permittee has not yet met the chronic copper and zinc limits, then no later than 36 months after the effective date of this permit, the permittee may apply for a permit modification to revise or remove the permit limit(s) based on any combination of the following options allowed under COMAR 26.08:

   a. Chemical or Biological Translator: The permittee shall complete all studies supporting use of the translator under COMAR 26.08.04.02-3C, paragraphs (1), (3) and (4) for biological translators or under COMAR 26.08.04.02-4C, paragraphs (1), (3) and (4) for chemical translators and submit the results to the Department as part of the application for a permit modification.

   b. Mixing Zone Study: As part of the application for a permit modification the permittee shall include the proposed dilution calculation and appropriate demonstration using dye studies or simulation models, showing the dilution calculation is applicable during periods of ambient stream conditions, flow rates, and distances specified in COMAR 26.08.02.05

c. Additional Data: As part of the application for a permit modification, the permittee may submit any new or additional data which demonstrates that there is no reasonable potential for violation of applicable water quality standards.

Alternatives for making such a demonstration include, but are not limited to, the following:

i. collection of effluent data using analytical methods which have lower detection levels;

ii. collection of data using techniques designed to minimize the effects of contamination on sample results; and

iii. collection of data utilizing alternate monitoring locations to show compliance with water quality standards.

T. STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY – [Reserved]

II. GENERAL CONDITIONS

A. MONITORING AND REPORTING

1. REPRESENTATIVE SAMPLING

Samples and measurements taken as required herein shall be taken at such times as to be representative of the quantity and quality of the discharges during the specified monitoring periods.

2. REPORTING-MONITORING RESULTS SUBMITTED QUARTERLY

Monitoring results obtained during each calendar quarter shall be summarized and submitted electronically using NetDMR once the permittee is granted access to this tool. For each effluent characteristic monitored at a frequency of less than once per month the results obtained during the reporting period shall be summarized on a single report for each quarter. More frequently monitored effluent characteristics and effluent characteristics limited as a monthly average shall be reported on a separate report for each calendar month of the reporting period. Results shall be submitted to the Department via NetDMR no later than the 28th of the month following the end of the reporting period. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

a. NetDMR is a U.S. EPA tool allowing regulated Clean Water Act permittees to submit monitoring reports electronically via a secure Internet application. At the earliest from the effective date of this permit, the permittee must apply for access to NetDMR at www.epa.gov/netdmr and register for a NetDMR Webinar. Before the permittee can submit official DMRs using NetDMR the permittee must attend a training Webinar and successfully set-up and submit test monitoring results electronically.

b. Hard copies of monitoring results obtained before the permittee is granted access to NetDMR or before December 21, 2016, whichever comes first, shall be submitted postmarked no later than the 28th of the month following the end of the reporting month. Signed copies of the results shall be submitted to the Department at the following address:

Attention: Discharge Monitoring Reports
Water Management Administration
Compliance Program
Maryland Department of the Environment
1800 Washington Boulevard, STE-425
Baltimore, MD 21230-1708

c. The permittee may be eligible for a temporary waiver by MDE from NPDES electronic reporting requirements if the permittee has no current internet access and is physically located in a geographic area (i.e., zip code) that is identified as under-served for broadband internet access in the most recent National Broadband Map from the Federal Communications Commission (FCC); or if the permittee can demonstrate that such electronic reporting of the monitoring data and reports would pose an unreasonable burden or expense to the NPDES-permitted facility. Waiver requests must be submitted in writing to the Department for written approval at least 120 days prior to the date the permittee would be required under this permit to begin using NetDMR. This demonstration shall be valid for one (1) year from the date of the Department approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to the Department unless the permittee submits a renewed waiver request and such request is approved by the Department. All hardcopy DMRs shall be sent to the following address:

Attention: DMRs
Maryland Department of the Environment
WMA – Compliance Program
1800 Washington Blvd., Suite 425
Baltimore, MD 21230

3. SAMPLING AND ANALYSIS METHODS

The analytical and sampling methods used shall conform to procedures for the analysis of pollutants as identified in Title 40 CFR Part 136 - "Guidelines Establishing Test Procedures for the Analysis of Pollutants" unless otherwise specified.

4. DATA RECORDING REQUIREMENTS

For each measurement or sample taken in accordance with the requirements of this permit, the permittee shall record the following information:

a. the exact place, date, and time of sampling or measurement;
b. the person(s) who performed the sampling or measurement;
c. the dates and times the analyses were performed;
d. the person(s) who performed the analyses;
e. the analytical techniques or methods used; and
f. the results of all required analyses.

5. MONITORING EQUIPMENT MAINTENANCE

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation to insure accuracy of measurements.

6. ADDITIONAL MONITORING BY PERMITTEE

If the permittee monitors any pollutant, using approved analytical methods as specified above, at the locations designated herein more frequently than required by this permit, the results of such monitoring, including the increased frequency, shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report form (EPA No. 3320-1).

7. RECORDS RETENTION

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and original recordings from continuous monitoring instrumentation shall be retained for a minimum of three years. This period shall be automatically extended during the course of litigation, or when requested by the Department.

B. MANAGEMENT REQUIREMENTS

1. CHANGE IN DISCHARGE

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit at a level in excess of that authorized shall constitute a violation of the terms and conditions of this permit. The permittee shall report any anticipated facility expansions, production increases or decreases, or process modifications which will result in new, different or an increased discharge of pollutants by submitting a new application at least 180 days prior to the commencement of the changed discharge or if the change only affects a listed pollutant and will not violate the effluent limitations specified in this permit, by providing written notice to the Department's Industrial and General Permits Division. Following such notice, the permit may be modified by the Department to include new effluent limitations on those pollutants.

2. NONCOMPLIANCE WITH EFFLUENT LIMITATIONS

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum or daily minimum effluent limitation specified in this permit, the permittee shall notify the Compliance Program by telephone at (410) 537-3510 within 24 hours of becoming aware of the noncompliance. Within five calendar days, the permittee shall provide the Department with the following information in writing:

a. a description of the non-complying discharge including its impact upon the receiving waters;

b. cause of noncompliance;

c. anticipated time the condition of noncompliance is expected to continue or if such condition has been corrected, the duration of the period of noncompliance;

d. steps taken by the permittee to reduce and eliminate the non-complying discharge;

e. steps to be taken by the permittee to prevent recurrence of the condition of noncompliance; and

f. a description of the accelerated or additional monitoring by the permittee to determine the nature and impact of the noncomplying discharge.

3. FACILITIES OPERATION

All treatment, control and monitoring facilities, or systems installed or used by the permittee, are to be maintained in good working order and operated efficiently.

4. ADVERSE IMPACT

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to waters of the State or to human health resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. BYPASSING

Any bypass of treatment facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited unless:

a. the bypass is unavoidable to prevent loss of life, personal injury or substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources;

b. there are no feasible alternatives;

c. notification is received by the Department within 24 hours (if orally notified, then followed by a written submission within five calendar days of the permittee's becoming aware of the bypass). Where the need for a bypass is known (or should have been known) in advance, this notification shall be submitted to the Department for approval at least ten calendar days before the date of bypass or at the earliest possible date if the period of advance knowledge is less than ten calendar days; and

d. the bypass is allowed under conditions determined by the Department to be necessary to minimize adverse effects.

6. CONDITIONS NECESSARY FOR DEMONSTRATION OF AN UPSET

An upset shall constitute an affirmative defense to an action brought for noncompliance with technology-based effluent limitations only if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

a. an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. the permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;

c. the permittee submitted a 24-hour notification of upset in accordance with the reporting requirements of General Condition II.B.2 above;

d. the permittee submitted, within five (5) calendar days of becoming aware of the upset, documentation to support and justify the upset; and

e. the permittee complied with any remedial measures required to minimize adverse impact.

7. REMOVED SUBSTANCES

Wastes such as solids, sludges, or other pollutants removed from or resulting from treatment or control of wastewaters, or facility operations, shall be disposed of in a manner to prevent any removed substances or runoff from such substances from entering or from being placed in a location where they may enter the waters of the State.

8. POWER FAILURE

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. provide an alternative power source sufficient to operate the wastewater collection and treatment facilities or,

b. halt, reduce or otherwise control production and all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater collection and treatment facilities.

C. RESPONSIBILITIES

1. RIGHT OF ENTRY

The permittee shall permit the Secretary of the Department, the Regional Administrator for the Environmental Protection Agency, or their authorized representatives, upon presentation of credentials to:

a. enter upon the permittee's premises where an effluent source is located or where any records are required to be kept under the terms and conditions of this permit;

b. access and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;

c. inspect, at reasonable times, any monitoring equipment or monitoring method required in this permit;

d. inspect, at reasonable times, any collection, treatment, pollution management, or discharge facilities required under this permit; and

e. sample, at reasonable times, any discharge of pollutants.

2. TRANSFER OF OWNERSHIP OR CONTROL OF FACILITIES

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the permit may be transferred to another person if:

a. the permittee notifies the Department in writing, of the proposed transfer;

b. a written agreement, indicating the specific date of proposed transfer of permit coverage and acknowledging responsibilities of current and new permittees for compliance with the liability for the terms and conditions of this permit, is submitted to the Department; and

c. neither the current permittee nor the new permittee receive notification from the Department, within 30 calendar days, of intent to modify, revoke, reissue or terminate the existing permit.

3. REAPPLICATION FOR A PERMIT –[Reserved]

4. AVAILABILITY OF REPORTS

Except for data determined to be confidential under Section 308 of the Clean Water Act, 33 U.S.C. § 1318, all submitted data shall be available for public inspection at the offices of the Department and the Regional Administrator of the Environmental Protection Agency.

5. PERMIT MODIFICATION

A permit may be modified by the Department upon written request of the permittee and after notice and opportunity for a public hearing in accordance with and for the reasons set forth in 40 CFR § 122.62 and 122.63.

6. PERMIT MODIFICATION, SUSPENSION, OR REVOCATION

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked and reissued in whole or in part during its term, in accordance with the provisions set forth in COMAR 26.08.04.10, for causes including, but not limited to, the following:

a. violation of any terms or conditions of this permit;

b. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;

d. a determination that the permitted discharge poses a threat to human health or welfare or to the environment and can only be regulated to acceptable levels by permit modification or termination; or

7. TOXIC POLLUTANTS

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such toxic effluent standard or prohibition) is established by the U.S. Environmental Protection Agency, or pursuant to Section 9-314 of the Environment Article, Annotated Code of Maryland, for a toxic pollutant which is present in the discharges authorized herein and such standard is more stringent than any limitation upon such pollutant in this permit, this permit shall be revoked and reissued or modified in accordance with the toxic effluent

standard or prohibition and the permittee so notified. Any effluent standard established in this case for a pollutant which is injurious to human health is effective and enforceable by the time set forth in the promulgated standard, even absent permit modification.

8. OIL AND HAZARDOUS SUBSTANCES PROHIBITED

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibility, liability, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act (33. U.S.C. § 1321), or under the Annotated Code of Maryland.

9. CIVIL AND CRIMINAL LIABILITY

Except as provided in permit conditions on "bypassing," "upset," and "power failure," nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from civil or criminal responsibilities and/or penalties for noncompliance with Title 9 of the Environment Article, Annotated Code of Maryland or any federal, local, or other State law or regulation.

10. PROPERTY RIGHTS/COMPLIANCE WITH OTHER REQUIREMENTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations.

11. SEVERABILITY

The provisions of this permit are severable. If any provisions of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this permit to any circumstances is held invalid, its application to other circumstances shall not be affected.

12. WATER CONSTRUCTION AND OBSTRUCTION

This permit does not authorize the construction or placing of physical structures, facilities, or debris, or the undertaking of related activities in any waters of the State.

13. COMPLIANCE WITH WATER POLLUTION ABATEMENT STATUTES

The permittee shall comply at all times with the provisions of the Environment Article, Title 7, Subtitle 2 and Title 9, Subtitle 3 of the Annotated Code of Maryland and the Clean Water Act, 33 U.S.C. § 1251 et seq.

14. ACTION ON VIOLATIONS

The issue or reissue of this permit does not constitute a decision by the State not to proceed in administrative, civil, or criminal action for any violations of State law or regulations occurring before the issue or reissue of this permit, nor a waiver of the State's right to do so.

15. CIVIL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to civil penalties for violations of State water pollution control laws set forth in Section 9-342 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act or in a permit issued under Section 404 of the Act, is subject to a civil penalty not to exceed $37,500 per day for each violation.

16. CRIMINAL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to criminal penalties for violations of State water pollution control laws set forth in Section 9-343 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that:

a. any person who negligently violates Section 301, 302, 306, 307, 308, 318, or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one (1) year, or by both.

b. any person who knowingly violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than three (3) years, or by both.

c. any person who knowingly violates Section 301, 302, 306, 307, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, is subject to a fine of not more $250,000 or imprisonment of not more than 15 years, or both.

d. any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with or renders inaccurate any monitoring device or method required to be maintained under the Act, is subject to a fine of not more than $10,000 or by imprisonment for not more than two (2) years, or by both.

17. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

18. SIGNATORY REQUIREMENTS

All applications, reports, or information submitted to the Director shall be signed and certified as required by 40 CFR 122.22.

19. REOPENER CLAUSE FOR PERMITS

This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301, 304, and 307 of the Clean Water Act [33 USCS §§ 1311, 1314, 1317] if the effluent standard or limitation so issued or approved:

a. contains different conditions or is otherwise more stringent than any effluent limitation in this permit or

b. controls any pollutant not limited in this permit. This permit, as modified or reissued under this paragraph, shall also contain any other requirements of the Act then applicable.

D. AUTHORITY TO ISSUE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS

On September 5, 1974, the Administrator of the U.S. Environmental Protection Agency approved the proposal submitted by the State of Maryland for the operation of a permit program for discharges into navigable waters pursuant to Section 402 of the Clean Water Act, 33 U.S.C. Section 1342.

Pursuant to the aforementioned approval, this discharge permit is both a State of Maryland discharge permit and a NPDES permit.

This permit and the authorization to discharge shall expire at midnight on the expiration date. The permittee shall not discharge after that date unless a new application has been submitted to the Department in accordance with the renewal application provisions of this permit.

Virginia M Kearney/fa

Lynn Buhl, Director
Water Management Administration

Site Map


Access Road
Stoney Run
Outfall 001
Site:
Former
Kop-Flex
Facility
Ridgeview
Old Oakland Rd
Telegraph Rd
Timbe
Ridge
Stony Run
Hickory Cir
Buckingham Blvd
Hughes Rd
David Victory
160
170

What is NetDMR?

NetDMR is a Web-based tool that allows National Pollutant Discharge Elimination System (NPDES) permittees to electronically sign and submit their Discharge Monitoring Reports (DMRs) to the EPA's Integrated Compliance Information System (ICIS-NPDES) via the Environmental Information Exchange Network. NetDMR is designed to reduce the burden on EPA, states, and the regulated community; improve data quality; provide a cost savings; and expand the ability of both states and EPA in targeting their limited resources to meet environmental goals. An essential component of NetDMR is the exchange of data with ICIS-NPDES, which allows permittees to complete a DMR that is specific to their permit limits and outfalls.



NetDMR

WHO MUST REPORT ELECTRONICALLY?

NPDES permittees required to submit DMRs are required to use NetDMR before December 21, 2016. Permittees must receive appropriate training before requesting and receiving permission to use NetDMR. Once approved a facility may begin submitting its DMRs and other reports electronically.

GOOD FOR THE ENVIRONMENT

GOOD FOR YOU

What are the Maryland Department of the Environment plans for NetDMR Implementation?

Be sure to Catch the Wave! The NetDMR program is available for permittees and data providers. NPDES permittees are required to attend the EPA's training that is offered by Webinar. Training is also available through MCET at the Maryland Department of the Environment in Baltimore. Upon completion of NetDMR training, permittees will be able to log onto NetDMR and perform direct DMR entry into the Integrated Compliance Information System (ICIS). After successful training you must submit the signed subscriber agreement to the Maryland Department of the Environment, get approval for signatory and permit administrator authority, and go "live" in time for your future DMR submittals.

NetDMR training conducted by the EPA Headquarters for permittees

April 19, May 17, June 14, July 19, August 16, September 13, October 18, November 15, and December 13

To register for the EPA Webinar monthly training visit https://epawebconferencing.acms.com/netdmrapr2016/event/eventinfo.html

Training is also available through the College of Southern Maryland (CSM), Maryland Center for Environmental Training (MCET), and Maryland Department of the Environment at 1800 Washington Blvd., Baltimore, MD 21230

Training will be held on the following dates:

June 1, & 22, July 13,
August 3, & 24, September 14, October 5, & 26, November 16, and December 7
These classes are scheduled from 8:30 A.M. to 4:30 P.M.

Visit www.mcet.org to register for the NetDMR training provided by the Maryland Department of the Environment.

The EPA's final rule requires permittees to use existing, available information technology to electronically report information and data related to the NPDES permit program in lieu of filing paper-based reports. All authorized programs are required to electronically transmit the federally-required data (identified in appendix A to 40 CFR part 127) to EPA.

Who must report electronically?

NPDES permittees required to submit discharge monitoring reports (DMRs) must submit their DMR electronically using NetDMR by December 21, 2016, after requesting and receiving authorization from the Maryland Department of the Environment. The NetDMR tool enables permittees to complete their DMRs and submit the DMRs to the EPA via secure internet connection. This means that any DMRs due on or after December 21, 2016 must be reported electronically.

Maryland has received notification from EPA that it meets the requirements of the Cross-Media Electronic Reporting Rule (CROMERR). CROMERR specifies standards that govern electronic reporting to allow states under EPA-authorized programs, such as the NPDES program to submit data electronically. The CROMERR standards are designed to provide these electronic submittals with the same level of legal dependability as the corresponding paper submittals.

Maryland
Department of the Environment



We've gone GREEN!

Save a tree,

You MUST submit electronically by December 21, 2016

For more information, go to the EPA website at
www.epa.gov/netdmr

or you can contact our NetDMR Team at the

Maryland Department of the Environment at
mde.netdmr@maryland.gov

or

NetDMR contact:
(410) 537-3520

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)
NAME

ADDRESS

FACILITY
LOCATION

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004

PERMIT NUMBER

DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM				TO			

☐ Check here if No Discharge

NOTE: Read Instructions before completing this form

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
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	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER

TYPED OR PRINTED

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE

AREA CODE	NUMBER

DATE

YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

Paperwork Reduction Act Notice

Public Reporting Burden for this collection information is estimated to vary from a range of 10 hours as an average per response for some minor facilities, to 110 hours as an average per response for some major facilities, with a weighted average for major and minor facilities of 18 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to ICR Coordinator, Office of Wastewater Management (MC4201M), US Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

General Instructions

1. If form has been partially completed by preprinting, disregard instructions directed at entry of that information already preprinted.

2. Enter *"Permittee Name/Mailing Address* (and facility name/location, if different)," *"Permit Number,"* and *"Discharge Number"* where indicated. (A separate form is required for each discharge.)

3. Enter dates beginning and ending *"Monitoring Period"* covered by form where indicated.

4. Enter each *"Parameter"* as specified in monitoring requirements of permit.

5. Enter *"Sample Measurement"* data for each parameter under *"Quantity"* and *"Quality"* in units specified in permit.

6. Enter *"Permit Requirement"* for each parameter under *"Quantity"* and *"Quality"* as specified in permit.

7. Under *"No Ex"* enter number of sample measurements during monitoring period that exceed maximum (and/or minimum or 7-day average as appropriate) permit requirement for each parameter. If none, enter *"0"*.

8. Enter *"Frequency of Analysis"* both as *"Sample Measurement"* (actual sample type used during monitoring period) and as *"Permit Requirement,"* specified in permit. (e.g., Enter *"Cont,"* for continuous monitoring, *"1/7"* for one day per week, *"1/30"* for one day per month, *"1/90"* for one day per quarter, etc.)

9. Enter *"Sample Type"* both as *"Sample Measurement"* (actual sample type used during monitoring period) and as *"Permit Requirement,"* (e.g., Enter *"Grab"* for individual sample, *"24HC"* for 24-hour composite, *"N/A"* for continuous monitoring, etc.)

10. Where violations of permit requirements are reported, attach a brief explanation to describe cause and corrective actions taken, and reference each violation by date.

11. If "no discharge" occurs during monitoring period, enter *"No Discharge"* across form in place of data entry.

12. Enter *"Name/Title of Principal Executive Officer"* with *"Signature of Principal Executive Officer of Authorized Agent," "Telephone Number,"* and *"Date"* at bottom of form.

13. Mail signed Report to Office(s) by date(s) specified in permit. Retain copy for your records.

14. More detailed Instructions for use of this *Discharge Monitoring Report (DMR)* form may be obtained from Office(s) specified in permit.

Legal Notice

This report is required by law (33 U.S.C. 1318; 40 C.F.R. 125.27). Failure to report or failure to report truthfully can result in civil penalties not to exceed $ 10,000 per day of violation; or in criminal penalties not to exceed $25,000 per day of violation, or by imprisonment for not more than one year, or by both.

D LAB REPORTS

GROUNDWATER

BASELINE MONITORING EVENT

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

December 15, 2016

Eric Johnson
WSP Environmental Strategies
11190 Sunrise Valley Dr.
Suite #300
Reston, VA 20191

RE: Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Dear Eric Johnson:
Enclosed are the analytical results for sample(s) received by the laboratory on December 09, 2016. 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,



Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Keith Green, WSP Environmental Strategies

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without the written consent of Pace Analytical Services, LLC.

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

CERTIFICATIONS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

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

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

SAMPLE SUMMARY

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92322711001	**MW-5R**	Water	12/07/16 12:50	12/09/16 10:07
92322711002	**MW-42**	Water	12/07/16 13:20	12/09/16 10:07
92322711003	**MW-18**	Water	12/07/16 13:45	12/09/16 10:07
92322711004	**MW-40D**	Water	12/07/16 14:05	12/09/16 10:07
92322711005	**MW-44**	Water	12/07/16 14:30	12/09/16 10:07
92322711006	**MW-21D**	Water	12/07/16 14:55	12/09/16 10:07
92322711007	**MW-22D**	Water	12/07/16 15:25	12/09/16 10:07
92322711008	**MW-20**	Water	12/07/16 15:50	12/09/16 10:07
92322711009	**MW-04**	Water	12/07/16 16:10	12/09/16 10:07
92322711010	**MW-09**	Water	12/08/16 07:40	12/09/16 10:07
92322711011	**MW-16D**	Water	12/08/16 08:10	12/09/16 10:07
92322711012	**RW-2D-120616**	Water	12/06/16 11:30	12/09/16 10:07
92322711013	**RW-1D-120616**	Water	12/06/16 13:55	12/09/16 10:07
92322711014	**EB-120616**	Water	12/06/16 14:10	12/09/16 10:07
92322711015	**RW-3S-120616**	Water	12/06/16 15:20	12/09/16 10:07
92322711016	**RW-2S-120616**	Water	12/06/16 16:20	12/09/16 10:07
92322711017	**RW-1S-120716**	Water	12/07/16 08:35	12/09/16 10:07
92322711018	**MW-27D-120716**	Water	12/07/16 09:30	12/09/16 10:07
92322711019	**MW-39-120716**	Water	12/07/16 10:00	12/09/16 10:07
92322711020	**MW-43-120716**	Water	12/07/16 10:20	12/09/16 10:07
92322711021	**MW-38R-120716**	Water	12/07/16 10:35	12/09/16 10:07
92322711022	**MW-16-120816**	Water	12/08/16 08:40	12/09/16 10:07
92322711023	**MW-200-120816**	Water	12/08/16 08:00	12/09/16 10:07
92322711024	**MW-03-120816**	Water	12/08/16 09:30	12/09/16 10:07
92322711025	**TRIP BLANKS**	Water	12/07/16 00:00	12/09/16 10:07
92322711026	**MW-100-120616**	Water	12/06/16 12:00	12/09/16 10:07

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SAMPLE ANALYTE COUNT

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92322711001	**MW-5R**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711002	**MW-42**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711003	**MW-18**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711004	**MW-40D**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711005	**MW-44**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711006	**MW-21D**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711007	**MW-22D**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711008	**MW-20**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711009	**MW-04**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711010	**MW-09**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711011	**MW-16D**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711012	**RW-2D-120616**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711013	**RW-1D-120616**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711014	**EB-120616**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711015	**RW-3S-120616**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711016	**RW-2S-120616**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711017	**RW-1S-120716**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711018	**MW-27D-120716**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711019	**MW-39-120716**	EPA 8260	ZDO	64	PASI-C

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SAMPLE ANALYTE COUNT

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8260B Mod.	DLK	3	PASI-C
92322711020	**MW-43-120716**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711021	**MW-38R-120716**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711022	**MW-16-120816**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711023	**MW-200-120816**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711024	**MW-03-120816**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711025	**TRIP BLANKS**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92322711026	**MW-100-120616**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-5R **Lab ID: 92322711001** Collected: 12/07/16 12:50 Received: 12/09/16 10:07 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		12/13/16 07:14	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 07:14	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 07:14	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 07:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 07:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 07:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 07:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 07:14	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 07:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 07:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 07:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 07:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 07:14	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 07:14	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 07:14	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 07:14	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 07:14	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 07:14	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 07:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:14	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 07:14	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/13/16 07:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 07:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:14	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:14	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:14	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:14	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 07:14	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 07:14	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 07:14	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 07:14	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 07:14	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 07:14	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 07:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 07:14	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 07:14	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 07:14	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 07:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 07:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 07:14	79-34-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-5R **Lab ID: 92322711001** Collected: 12/07/16 12:50 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 07:14	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 07:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:14	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:14	120-82-1	
1,1,1-Trichloroethane	**1.4**	ug/L	1.0	1		12/13/16 07:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 07:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 07:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 07:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 07:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 07:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 07:14	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 07:14	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 07:14	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 07:14	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		12/13/16 07:14	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		12/13/16 07:14	17060-07-0	
Toluene-d8 (S)	111	%	70-130	1		12/13/16 07:14	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**16.5**	ug/L	2.0	1		12/12/16 14:27	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		12/12/16 14:27	17060-07-0	
Toluene-d8 (S)	89	%	50-150	1		12/12/16 14:27	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-42 **Lab ID: 92322711002** Collected: 12/07/16 13:20 Received: 12/09/16 10:07 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		12/13/16 06:04	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 06:04	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 06:04	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 06:04	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 06:04	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 06:04	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 06:04	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 06:04	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 06:04	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 06:04	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 06:04	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 06:04	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 06:04	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 06:04	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 06:04	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 06:04	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 06:04	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 06:04	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 06:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:04	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 06:04	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/13/16 06:04	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 06:04	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:04	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:04	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:04	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:04	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:04	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:04	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 06:04	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 06:04	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 06:04	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 06:04	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 06:04	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 06:04	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 06:04	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 06:04	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 06:04	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 06:04	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 06:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 06:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 06:04	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-42 **Lab ID: 92322711002** Collected: 12/07/16 13:20 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 06:04	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 06:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 06:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 06:04	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 06:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 06:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 06:04	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 06:04	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 06:04	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 06:04	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 06:04	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 06:04	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		12/13/16 06:04	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	1		12/13/16 06:04	17060-07-0	
Toluene-d8 (S)	107	%	70-130	1		12/13/16 06:04	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**4.8**	ug/L	2.0	1		12/12/16 14:45	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	50-150	1		12/12/16 14:45	17060-07-0	
Toluene-d8 (S)	90	%	50-150	1		12/12/16 14:45	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-18 **Lab ID: 92322711003** Collected: 12/07/16 13:45 Received: 12/09/16 10:07 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		12/12/16 23:57	67-64-1	
Benzene	ND	ug/L	1.0	1		12/12/16 23:57	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/12/16 23:57	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/12/16 23:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/12/16 23:57	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/12/16 23:57	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/12/16 23:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/12/16 23:57	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/12/16 23:57	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/12/16 23:57	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/12/16 23:57	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/12/16 23:57	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/12/16 23:57	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/12/16 23:57	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/12/16 23:57	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/12/16 23:57	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/12/16 23:57	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/12/16 23:57	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/12/16 23:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:57	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:57	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:57	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/12/16 23:57	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/12/16 23:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/12/16 23:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/12/16 23:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/12/16 23:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/12/16 23:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/12/16 23:57	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/12/16 23:57	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/12/16 23:57	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/12/16 23:57	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/12/16 23:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/12/16 23:57	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/12/16 23:57	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/12/16 23:57	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/12/16 23:57	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/12/16 23:57	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/12/16 23:57	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/12/16 23:57	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/12/16 23:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/12/16 23:57	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/12/16 23:57	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/12/16 23:57	91-20-3	
Styrene	ND	ug/L	1.0	1		12/12/16 23:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/12/16 23:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/12/16 23:57	79-34-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-18 **Lab ID: 92322711003** Collected: 12/07/16 13:45 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/12/16 23:57	127-18-4	
Toluene	ND	ug/L	1.0	1		12/12/16 23:57	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:57	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:57	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/12/16 23:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/12/16 23:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/12/16 23:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/12/16 23:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/12/16 23:57	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/12/16 23:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/12/16 23:57	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/12/16 23:57	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/12/16 23:57	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/12/16 23:57	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		12/12/16 23:57	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	70-130	1		12/12/16 23:57	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		12/12/16 23:57	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		12/12/16 15:04	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	50-150	1		12/12/16 15:04	17060-07-0	
Toluene-d8 (S)	89	%	50-150	1		12/12/16 15:04	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-40D **Lab ID: 92322711004** Collected: 12/07/16 14:05 Received: 12/09/16 10:07 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		12/13/16 07:49	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 07:49	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 07:49	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 07:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 07:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 07:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 07:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 07:49	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 07:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 07:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 07:49	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 07:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 07:49	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 07:49	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 07:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 07:49	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 07:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 07:49	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 07:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:49	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 07:49	75-71-8	
1,1-Dichloroethane	**2.9**	ug/L	1.0	1		12/13/16 07:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 07:49	107-06-2	
1,1-Dichloroethene	**18.1**	ug/L	1.0	1		12/13/16 07:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:49	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 07:49	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 07:49	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 07:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 07:49	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 07:49	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 07:49	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 07:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 07:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 07:49	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 07:49	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 07:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 07:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 07:49	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-40D **Lab ID: 92322711004** Collected: 12/07/16 14:05 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 07:49	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 07:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 07:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 07:49	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 07:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 07:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 07:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 07:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 07:49	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 07:49	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 07:49	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 07:49	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		12/13/16 07:49	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		12/13/16 07:49	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		12/13/16 07:49	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**9.4**	ug/L	2.0	1		12/12/16 15:23	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	50-150	1		12/12/16 15:23	17060-07-0	
Toluene-d8 (S)	91	%	50-150	1		12/12/16 15:23	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-44 **Lab ID: 92322711005** Collected: 12/07/16 14:30 Received: 12/09/16 10:07 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		12/13/16 06:21	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 06:21	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 06:21	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 06:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 06:21	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 06:21	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 06:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 06:21	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 06:21	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 06:21	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 06:21	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 06:21	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 06:21	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 06:21	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 06:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 06:21	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 06:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 06:21	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 06:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:21	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 06:21	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/13/16 06:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 06:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:21	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:21	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:21	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:21	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 06:21	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 06:21	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 06:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 06:21	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 06:21	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 06:21	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 06:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 06:21	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 06:21	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 06:21	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 06:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 06:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 06:21	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-44 **Lab ID: 92322711005** Collected: 12/07/16 14:30 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 06:21	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 06:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 06:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 06:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 06:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 06:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 06:21	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 06:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 06:21	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 06:21	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 06:21	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 06:21	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		12/13/16 06:21	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	1		12/13/16 06:21	17060-07-0	
Toluene-d8 (S)	107	%	70-130	1		12/13/16 06:21	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		12/12/16 15:41	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	50-150	1		12/12/16 15:41	17060-07-0	
Toluene-d8 (S)	89	%	50-150	1		12/12/16 15:41	2037-26-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-21D **Lab ID: 92322711006** Collected: 12/07/16 14:55 Received: 12/09/16 10:07 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		12/13/16 00:14	67-64-1	M1
Benzene	ND	ug/L	1.0	1		12/13/16 00:14	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 00:14	108-86-1	M1
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 00:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 00:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 00:14	75-25-2	M1
Bromomethane	ND	ug/L	2.0	1		12/13/16 00:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 00:14	78-93-3	M1
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 00:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 00:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 00:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 00:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 00:14	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 00:14	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 00:14	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 00:14	96-12-8	M1
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 00:14	124-48-1	M1
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 00:14	106-93-4	M1
Dibromomethane	ND	ug/L	1.0	1		12/13/16 00:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:14	95-50-1	M1
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:14	541-73-1	M1
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:14	106-46-7	M1
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 00:14	75-71-8	
1,1-Dichloroethane	**2.6**	ug/L	1.0	1		12/13/16 00:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 00:14	107-06-2	
1,1-Dichloroethene	**23.4**	ug/L	1.0	1		12/13/16 00:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 00:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 00:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 00:14	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 00:14	142-28-9	M1
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 00:14	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 00:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 00:14	10061-01-5	M1
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 00:14	10061-02-6	M1
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 00:14	108-20-3	M1
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 00:14	123-91-1	L3,M0
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 00:14	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 00:14	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 00:14	591-78-6	M1
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 00:14	99-87-6	M1
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 00:14	75-09-2	M1
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 00:14	108-10-1	M1
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 00:14	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 00:14	91-20-3	M1
Styrene	ND	ug/L	1.0	1		12/13/16 00:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 00:14	630-20-6	M1
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 00:14	79-34-5	M1

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-21D **Lab ID: 92322711006** Collected: 12/07/16 14:55 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 00:14	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 00:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:14	87-61-6	M1
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:14	120-82-1	M1
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 00:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 00:14	79-00-5	M1
Trichloroethene	ND	ug/L	1.0	1		12/13/16 00:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 00:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 00:14	96-18-4	M1
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 00:14	108-05-4	M1
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 00:14	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 00:14	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 00:14	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 00:14	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		12/13/16 00:14	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	70-130	1		12/13/16 00:14	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		12/13/16 00:14	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**18.6**	ug/L	2.0	1		12/12/16 16:00	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	50-150	1		12/12/16 16:00	17060-07-0	
Toluene-d8 (S)	90	%	50-150	1		12/12/16 16:00	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-22D **Lab ID: 92322711007** Collected: 12/07/16 15:25 Received: 12/09/16 10:07 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		12/13/16 03:09	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 03:09	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 03:09	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 03:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 03:09	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 03:09	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 03:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 03:09	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 03:09	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 03:09	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 03:09	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 03:09	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 03:09	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 03:09	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 03:09	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 03:09	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 03:09	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 03:09	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 03:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 03:09	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 03:09	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 03:09	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 03:09	75-71-8	
1,1-Dichloroethane	**2.5**	ug/L	1.0	1		12/13/16 03:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 03:09	107-06-2	
1,1-Dichloroethene	**31.5**	ug/L	1.0	1		12/13/16 03:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 03:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 03:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 03:09	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 03:09	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 03:09	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 03:09	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 03:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 03:09	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 03:09	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 03:09	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 03:09	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 03:09	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 03:09	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 03:09	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 03:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 03:09	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 03:09	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 03:09	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 03:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 03:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 03:09	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-22D **Lab ID: 92322711007** Collected: 12/07/16 15:25 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 03:09	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 03:09	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 03:09	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 03:09	120-82-1	
1,1,1-Trichloroethane	**4.1**	ug/L	1.0	1		12/13/16 03:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 03:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 03:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 03:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 03:09	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 03:09	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 03:09	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 03:09	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 03:09	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 03:09	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		12/13/16 03:09	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	70-130	1		12/13/16 03:09	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		12/13/16 03:09	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**24.5**	ug/L	2.0	1		12/12/16 16:19	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	1		12/12/16 16:19	17060-07-0	
Toluene-d8 (S)	91	%	50-150	1		12/12/16 16:19	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-20 **Lab ID: 92322711008** Collected: 12/07/16 15:50 Received: 12/09/16 10:07 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		12/13/16 04:54	67-64-1	
Benzene	ND	ug/L	2.0	2		12/13/16 04:54	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		12/13/16 04:54	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		12/13/16 04:54	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		12/13/16 04:54	75-27-4	
Bromoform	ND	ug/L	2.0	2		12/13/16 04:54	75-25-2	
Bromomethane	ND	ug/L	4.0	2		12/13/16 04:54	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		12/13/16 04:54	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		12/13/16 04:54	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		12/13/16 04:54	108-90-7	
Chloroethane	ND	ug/L	2.0	2		12/13/16 04:54	75-00-3	
Chloroform	ND	ug/L	2.0	2		12/13/16 04:54	67-66-3	
Chloromethane	ND	ug/L	2.0	2		12/13/16 04:54	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		12/13/16 04:54	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		12/13/16 04:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		12/13/16 04:54	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		12/13/16 04:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		12/13/16 04:54	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		12/13/16 04:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 04:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 04:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 04:54	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		12/13/16 04:54	75-71-8	
1,1-Dichloroethane	**99.7**	ug/L	2.0	2		12/13/16 04:54	75-34-3	
1,2-Dichloroethane	**5.1**	ug/L	2.0	2		12/13/16 04:54	107-06-2	
1,1-Dichloroethene	**173**	ug/L	2.0	2		12/13/16 04:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		12/13/16 04:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		12/13/16 04:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		12/13/16 04:54	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		12/13/16 04:54	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		12/13/16 04:54	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		12/13/16 04:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		12/13/16 04:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		12/13/16 04:54	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		12/13/16 04:54	108-20-3	
1,4-Dioxane (p-Dioxane)	**581**	ug/L	300	2		12/13/16 04:54	123-91-1	L1
Ethylbenzene	ND	ug/L	2.0	2		12/13/16 04:54	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		12/13/16 04:54	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		12/13/16 04:54	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		12/13/16 04:54	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		12/13/16 04:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		12/13/16 04:54	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		12/13/16 04:54	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		12/13/16 04:54	91-20-3	
Styrene	ND	ug/L	2.0	2		12/13/16 04:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		12/13/16 04:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		12/13/16 04:54	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-20 **Lab ID: 92322711008** Collected: 12/07/16 15:50 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	2.0	2		12/13/16 04:54	127-18-4	
Toluene	ND	ug/L	2.0	2		12/13/16 04:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		12/13/16 04:54	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		12/13/16 04:54	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	2		12/13/16 04:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		12/13/16 04:54	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		12/13/16 04:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		12/13/16 04:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		12/13/16 04:54	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		12/13/16 04:54	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		12/13/16 04:54	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		12/13/16 04:54	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		12/13/16 04:54	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		12/13/16 04:54	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	2		12/13/16 04:54	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	70-130	2		12/13/16 04:54	17060-07-0	
Toluene-d8 (S)	109	%	70-130	2		12/13/16 04:54	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**767**	ug/L	20.0	10		12/12/16 16:38	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	10		12/12/16 16:38	17060-07-0	
Toluene-d8 (S)	90	%	50-150	10		12/12/16 16:38	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-04 **Lab ID: 92322711009** Collected: 12/07/16 16:10 Received: 12/09/16 10:07 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	250	10		12/13/16 17:32	67-64-1	
Benzene	ND	ug/L	10.0	10		12/13/16 17:32	71-43-2	
Bromobenzene	ND	ug/L	10.0	10		12/13/16 17:32	108-86-1	
Bromochloromethane	ND	ug/L	10.0	10		12/13/16 17:32	74-97-5	
Bromodichloromethane	ND	ug/L	10.0	10		12/13/16 17:32	75-27-4	
Bromoform	ND	ug/L	10.0	10		12/13/16 17:32	75-25-2	
Bromomethane	ND	ug/L	20.0	10		12/13/16 17:32	74-83-9	
2-Butanone (MEK)	ND	ug/L	50.0	10		12/13/16 17:32	78-93-3	
Carbon tetrachloride	ND	ug/L	10.0	10		12/13/16 17:32	56-23-5	
Chlorobenzene	ND	ug/L	10.0	10		12/13/16 17:32	108-90-7	
Chloroethane	ND	ug/L	10.0	10		12/13/16 17:32	75-00-3	
Chloroform	ND	ug/L	10.0	10		12/13/16 17:32	67-66-3	
Chloromethane	ND	ug/L	10.0	10		12/13/16 17:32	74-87-3	
2-Chlorotoluene	ND	ug/L	10.0	10		12/13/16 17:32	95-49-8	
4-Chlorotoluene	ND	ug/L	10.0	10		12/13/16 17:32	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	20.0	10		12/13/16 17:32	96-12-8	
Dibromochloromethane	ND	ug/L	10.0	10		12/13/16 17:32	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	10.0	10		12/13/16 17:32	106-93-4	
Dibromomethane	ND	ug/L	10.0	10		12/13/16 17:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	10.0	10		12/13/16 17:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	10.0	10		12/13/16 17:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.0	10		12/13/16 17:32	106-46-7	
Dichlorodifluoromethane	ND	ug/L	10.0	10		12/13/16 17:32	75-71-8	
1,1-Dichloroethane	**259**	ug/L	10.0	10		12/13/16 17:32	75-34-3	
1,2-Dichloroethane	ND	ug/L	10.0	10		12/13/16 17:32	107-06-2	
1,1-Dichloroethene	**1020**	ug/L	10.0	10		12/13/16 17:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	10.0	10		12/13/16 17:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	10.0	10		12/13/16 17:32	156-60-5	
1,2-Dichloropropane	ND	ug/L	10.0	10		12/13/16 17:32	78-87-5	
1,3-Dichloropropane	ND	ug/L	10.0	10		12/13/16 17:32	142-28-9	
2,2-Dichloropropane	ND	ug/L	10.0	10		12/13/16 17:32	594-20-7	
1,1-Dichloropropene	ND	ug/L	10.0	10		12/13/16 17:32	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	10.0	10		12/13/16 17:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	10.0	10		12/13/16 17:32	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	10		12/13/16 17:32	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	1500	10		12/13/16 17:32	123-91-1	L1
Ethylbenzene	ND	ug/L	10.0	10		12/13/16 17:32	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	10		12/13/16 17:32	87-68-3	
2-Hexanone	ND	ug/L	50.0	10		12/13/16 17:32	591-78-6	
p-Isopropyltoluene	ND	ug/L	10.0	10		12/13/16 17:32	99-87-6	
Methylene Chloride	ND	ug/L	20.0	10		12/13/16 17:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50.0	10		12/13/16 17:32	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	10		12/13/16 17:32	1634-04-4	
Naphthalene	ND	ug/L	10.0	10		12/13/16 17:32	91-20-3	
Styrene	ND	ug/L	10.0	10		12/13/16 17:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	10.0	10		12/13/16 17:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	10		12/13/16 17:32	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-04 **Lab ID: 92322711009** Collected: 12/07/16 16:10 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	10.0	10		12/13/16 17:32	127-18-4	
Toluene	ND	ug/L	10.0	10		12/13/16 17:32	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	10.0	10		12/13/16 17:32	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	10		12/13/16 17:32	120-82-1	
1,1,1-Trichloroethane	**31.7**	ug/L	10.0	10		12/13/16 17:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	10		12/13/16 17:32	79-00-5	
Trichloroethene	ND	ug/L	10.0	10		12/13/16 17:32	79-01-6	
Trichlorofluoromethane	ND	ug/L	10.0	10		12/13/16 17:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	10.0	10		12/13/16 17:32	96-18-4	
Vinyl acetate	ND	ug/L	20.0	10		12/13/16 17:32	108-05-4	
Vinyl chloride	ND	ug/L	10.0	10		12/13/16 17:32	75-01-4	
Xylene (Total)	ND	ug/L	10.0	10		12/13/16 17:32	1330-20-7	
m&p-Xylene	ND	ug/L	20.0	10		12/13/16 17:32	179601-23-1	
o-Xylene	ND	ug/L	10.0	10		12/13/16 17:32	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	10		12/13/16 17:32	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	10		12/13/16 17:32	17060-07-0	
Toluene-d8 (S)	110	%	70-130	10		12/13/16 17:32	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**576**	ug/L	20.0	10		12/13/16 12:42	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	50-150	1		12/12/16 16:56	17060-07-0	
Toluene-d8 (S)	87	%	50-150	1		12/12/16 16:56	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-09 **Lab ID: 92322711010** Collected: 12/08/16 07:40 Received: 12/09/16 10:07 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		12/13/16 18:07	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 18:07	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 18:07	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 18:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 18:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 18:07	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 18:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 18:07	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 18:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 18:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 18:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 18:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 18:07	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 18:07	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 18:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 18:07	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 18:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 18:07	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 18:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:07	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 18:07	75-71-8	
1,1-Dichloroethane	**4.5**	ug/L	1.0	1		12/13/16 18:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 18:07	107-06-2	
1,1-Dichloroethene	**104**	ug/L	1.0	1		12/13/16 18:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 18:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 18:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 18:07	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 18:07	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 18:07	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 18:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 18:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 18:07	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 18:07	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 18:07	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 18:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 18:07	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 18:07	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 18:07	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 18:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 18:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 18:07	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 18:07	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 18:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 18:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 18:07	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-09 **Lab ID: 92322711010** Collected: 12/08/16 07:40 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 18:07	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 18:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 18:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 18:07	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 18:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 18:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 18:07	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 18:07	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 18:07	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 18:07	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 18:07	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 18:07	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		12/13/16 18:07	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		12/13/16 18:07	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		12/13/16 18:07	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**95.5**	ug/L	5.0	2.5		12/12/16 17:15	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	50-150	2.5		12/12/16 17:15	17060-07-0	
Toluene-d8 (S)	88	%	50-150	2.5		12/12/16 17:15	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-16D **Lab ID: 92322711011** Collected: 12/08/16 08:10 Received: 12/09/16 10:07 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		12/13/16 17:14	67-64-1	
Benzene	ND	ug/L	2.0	2		12/13/16 17:14	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		12/13/16 17:14	108-86-1	M1
Bromochloromethane	ND	ug/L	2.0	2		12/13/16 17:14	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		12/13/16 17:14	75-27-4	
Bromoform	ND	ug/L	2.0	2		12/13/16 17:14	75-25-2	M1
Bromomethane	ND	ug/L	4.0	2		12/13/16 17:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		12/13/16 17:14	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		12/13/16 17:14	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		12/13/16 17:14	108-90-7	
Chloroethane	ND	ug/L	2.0	2		12/13/16 17:14	75-00-3	
Chloroform	ND	ug/L	2.0	2		12/13/16 17:14	67-66-3	
Chloromethane	ND	ug/L	2.0	2		12/13/16 17:14	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		12/13/16 17:14	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		12/13/16 17:14	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		12/13/16 17:14	96-12-8	M1
Dibromochloromethane	ND	ug/L	2.0	2		12/13/16 17:14	124-48-1	M1
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		12/13/16 17:14	106-93-4	M1
Dibromomethane	ND	ug/L	2.0	2		12/13/16 17:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 17:14	95-50-1	M1
1,3-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 17:14	541-73-1	M1
1,4-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 17:14	106-46-7	M1
Dichlorodifluoromethane	ND	ug/L	2.0	2		12/13/16 17:14	75-71-8	
1,1-Dichloroethane	**56.6**	ug/L	2.0	2		12/13/16 17:14	75-34-3	M1
1,2-Dichloroethane	**2.9**	ug/L	2.0	2		12/13/16 17:14	107-06-2	
1,1-Dichloroethene	**254**	ug/L	2.0	2		12/13/16 17:14	75-35-4	M1
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		12/13/16 17:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		12/13/16 17:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		12/13/16 17:14	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		12/13/16 17:14	142-28-9	M1
2,2-Dichloropropane	ND	ug/L	2.0	2		12/13/16 17:14	594-20-7	M1
1,1-Dichloropropene	ND	ug/L	2.0	2		12/13/16 17:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		12/13/16 17:14	10061-01-5	M1
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		12/13/16 17:14	10061-02-6	M1
Diisopropyl ether	ND	ug/L	2.0	2		12/13/16 17:14	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	300	2		12/13/16 17:14	123-91-1	L3,M0
Ethylbenzene	ND	ug/L	2.0	2		12/13/16 17:14	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		12/13/16 17:14	87-68-3	M1
2-Hexanone	ND	ug/L	10.0	2		12/13/16 17:14	591-78-6	M1
p-Isopropyltoluene	ND	ug/L	2.0	2		12/13/16 17:14	99-87-6	M1
Methylene Chloride	ND	ug/L	4.0	2		12/13/16 17:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		12/13/16 17:14	108-10-1	M1
Methyl-tert-butyl ether	ND	ug/L	2.0	2		12/13/16 17:14	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		12/13/16 17:14	91-20-3	M1
Styrene	ND	ug/L	2.0	2		12/13/16 17:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		12/13/16 17:14	630-20-6	M1
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		12/13/16 17:14	79-34-5	M1

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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-16D **Lab ID: 92322711011** Collected: 12/08/16 08:10 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	2.0	2		12/13/16 17:14	127-18-4	
Toluene	ND	ug/L	2.0	2		12/13/16 17:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		12/13/16 17:14	87-61-6	M1
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		12/13/16 17:14	120-82-1	M1
1,1,1-Trichloroethane	**20.7**	ug/L	2.0	2		12/13/16 17:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		12/13/16 17:14	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		12/13/16 17:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		12/13/16 17:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		12/13/16 17:14	96-18-4	M1
Vinyl acetate	ND	ug/L	4.0	2		12/13/16 17:14	108-05-4	M1
Vinyl chloride	ND	ug/L	2.0	2		12/13/16 17:14	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		12/13/16 17:14	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		12/13/16 17:14	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		12/13/16 17:14	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	2		12/13/16 17:14	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	2		12/13/16 17:14	17060-07-0	
Toluene-d8 (S)	107	%	70-130	2		12/13/16 17:14	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**202**	ug/L	10.0	5		12/12/16 17:34	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	5		12/12/16 17:34	17060-07-0	
Toluene-d8 (S)	88	%	50-150	5		12/12/16 17:34	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-2D-120616 **Lab ID: 92322711012** Collected: 12/06/16 11:30 Received: 12/09/16 10:07 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		12/14/16 10:51	67-64-1	
Benzene	ND	ug/L	2.0	2		12/14/16 10:51	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		12/14/16 10:51	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		12/14/16 10:51	74-97-5	M1
Bromodichloromethane	ND	ug/L	2.0	2		12/14/16 10:51	75-27-4	
Bromoform	ND	ug/L	2.0	2		12/14/16 10:51	75-25-2	
Bromomethane	ND	ug/L	4.0	2		12/14/16 10:51	74-83-9	M1
2-Butanone (MEK)	ND	ug/L	10.0	2		12/14/16 10:51	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		12/14/16 10:51	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		12/14/16 10:51	108-90-7	
Chloroethane	ND	ug/L	2.0	2		12/14/16 10:51	75-00-3	M1
Chloroform	ND	ug/L	2.0	2		12/14/16 10:51	67-66-3	
Chloromethane	ND	ug/L	2.0	2		12/14/16 10:51	74-87-3	M1
2-Chlorotoluene	ND	ug/L	2.0	2		12/14/16 10:51	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		12/14/16 10:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		12/14/16 10:51	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		12/14/16 10:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		12/14/16 10:51	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		12/14/16 10:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		12/14/16 10:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		12/14/16 10:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		12/14/16 10:51	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		12/14/16 10:51	75-71-8	
1,1-Dichloroethane	**64.0**	ug/L	2.0	2		12/14/16 10:51	75-34-3	
1,2-Dichloroethane	**3.3**	ug/L	2.0	2		12/14/16 10:51	107-06-2	
1,1-Dichloroethene	**257**	ug/L	2.0	2		12/14/16 10:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		12/14/16 10:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		12/14/16 10:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		12/14/16 10:51	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		12/14/16 10:51	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		12/14/16 10:51	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		12/14/16 10:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		12/14/16 10:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		12/14/16 10:51	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		12/14/16 10:51	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	300	2		12/14/16 10:51	123-91-1	L3,M0, R1
Ethylbenzene	ND	ug/L	2.0	2		12/14/16 10:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		12/14/16 10:51	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		12/14/16 10:51	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		12/14/16 10:51	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		12/14/16 10:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		12/14/16 10:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		12/14/16 10:51	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		12/14/16 10:51	91-20-3	
Styrene	ND	ug/L	2.0	2		12/14/16 10:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		12/14/16 10:51	630-20-6	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-2D-120616 **Lab ID: 92322711012** Collected: 12/06/16 11:30 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		12/14/16 10:51	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		12/14/16 10:51	127-18-4	
Toluene	ND	ug/L	2.0	2		12/14/16 10:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		12/14/16 10:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		12/14/16 10:51	120-82-1	
1,1,1-Trichloroethane	**26.5**	ug/L	2.0	2		12/14/16 10:51	71-55-6	M1
1,1,2-Trichloroethane	ND	ug/L	2.0	2		12/14/16 10:51	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		12/14/16 10:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		12/14/16 10:51	75-69-4	M1
1,2,3-Trichloropropane	ND	ug/L	2.0	2		12/14/16 10:51	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		12/14/16 10:51	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		12/14/16 10:51	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		12/14/16 10:51	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		12/14/16 10:51	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		12/14/16 10:51	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	2		12/14/16 10:51	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	2		12/14/16 10:51	17060-07-0	
Toluene-d8 (S)	107	%	70-130	2		12/14/16 10:51	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**206**	ug/L	5.0	2.5		12/12/16 23:11	123-91-1	M1
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%	50-150	2.5		12/12/16 23:11	17060-07-0	
Toluene-d8 (S)	78	%	50-150	2.5		12/12/16 23:11	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-1D-120616 **Lab ID: 92322711013** Collected: 12/06/16 13:55 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	**172**	ug/L	25.0	1		12/13/16 18:42	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 18:42	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 18:42	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 18:42	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 18:42	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 18:42	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 18:42	74-83-9	
2-Butanone (MEK)	**137**	ug/L	5.0	1		12/13/16 18:42	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 18:42	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 18:42	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 18:42	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 18:42	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 18:42	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 18:42	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 18:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 18:42	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 18:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 18:42	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 18:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:42	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 18:42	75-71-8	
1,1-Dichloroethane	**4.4**	ug/L	1.0	1		12/13/16 18:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 18:42	107-06-2	
1,1-Dichloroethene	**39.3**	ug/L	1.0	1		12/13/16 18:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 18:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 18:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 18:42	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 18:42	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 18:42	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 18:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 18:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 18:42	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 18:42	108-20-3	
1,4-Dioxane (p-Dioxane)	**506**	ug/L	150	1		12/13/16 18:42	123-91-1	L1
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 18:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 18:42	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 18:42	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 18:42	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 18:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 18:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 18:42	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 18:42	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 18:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 18:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 18:42	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-1D-120616 **Lab ID: 92322711013** Collected: 12/06/16 13:55 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 18:42	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 18:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 18:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 18:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 18:42	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 18:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 18:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 18:42	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 18:42	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 18:42	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 18:42	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 18:42	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 18:42	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		12/13/16 18:42	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		12/13/16 18:42	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		12/13/16 18:42	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**34.4**	ug/L	2.0	1		12/13/16 14:53	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	86	%	50-150	1		12/13/16 14:53	17060-07-0	
Toluene-d8 (S)	78	%	50-150	1		12/13/16 14:53	2037-26-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: EB-120616 **Lab ID: 92322711014** Collected: 12/06/16 14:10 Received: 12/09/16 10:07 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		12/12/16 15:14	67-64-1	
Benzene	ND	ug/L	1.0	1		12/12/16 15:14	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/12/16 15:14	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/12/16 15:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/12/16 15:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/12/16 15:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/12/16 15:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/12/16 15:14	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/12/16 15:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/12/16 15:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/12/16 15:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/12/16 15:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/12/16 15:14	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/12/16 15:14	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/12/16 15:14	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/12/16 15:14	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/12/16 15:14	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/12/16 15:14	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/12/16 15:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 15:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 15:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 15:14	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/12/16 15:14	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/12/16 15:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/12/16 15:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/12/16 15:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/12/16 15:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/12/16 15:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/12/16 15:14	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/12/16 15:14	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/12/16 15:14	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/12/16 15:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/12/16 15:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/12/16 15:14	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/12/16 15:14	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/12/16 15:14	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/12/16 15:14	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/12/16 15:14	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/12/16 15:14	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/12/16 15:14	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/12/16 15:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/12/16 15:14	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/12/16 15:14	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/12/16 15:14	91-20-3	
Styrene	ND	ug/L	1.0	1		12/12/16 15:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/12/16 15:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/12/16 15:14	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: EB-120616 **Lab ID: 92322711014** Collected: 12/06/16 14:10 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/12/16 15:14	127-18-4	
Toluene	ND	ug/L	1.0	1		12/12/16 15:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/12/16 15:14	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/12/16 15:14	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/12/16 15:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/12/16 15:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/12/16 15:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/12/16 15:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/12/16 15:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/12/16 15:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/12/16 15:14	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/12/16 15:14	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/12/16 15:14	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/12/16 15:14	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		12/12/16 15:14	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		12/12/16 15:14	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		12/12/16 15:14	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		12/12/16 18:49	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%	50-150	1		12/12/16 18:49	17060-07-0	
Toluene-d8 (S)	86	%	50-150	1		12/12/16 18:49	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-3S-120616 **Lab ID: 92322711015** Collected: 12/06/16 15:20 Received: 12/09/16 10:07 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		12/14/16 10:34	67-64-1	
Benzene	ND	ug/L	1.0	1		12/14/16 10:34	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/14/16 10:34	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/14/16 10:34	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/14/16 10:34	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/14/16 10:34	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/14/16 10:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/14/16 10:34	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/14/16 10:34	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/14/16 10:34	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/14/16 10:34	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/14/16 10:34	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/14/16 10:34	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/14/16 10:34	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/14/16 10:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/14/16 10:34	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/14/16 10:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/14/16 10:34	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/14/16 10:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/14/16 10:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/14/16 10:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/14/16 10:34	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/14/16 10:34	75-71-8	
1,1-Dichloroethane	**4.6**	ug/L	1.0	1		12/14/16 10:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/14/16 10:34	107-06-2	
1,1-Dichloroethene	**7.2**	ug/L	1.0	1		12/14/16 10:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/14/16 10:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/14/16 10:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/14/16 10:34	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/14/16 10:34	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/14/16 10:34	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/14/16 10:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/14/16 10:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/14/16 10:34	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/14/16 10:34	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/14/16 10:34	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/14/16 10:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/14/16 10:34	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/14/16 10:34	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/14/16 10:34	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/14/16 10:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/14/16 10:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/14/16 10:34	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/14/16 10:34	91-20-3	
Styrene	ND	ug/L	1.0	1		12/14/16 10:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/14/16 10:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/14/16 10:34	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-3S-120616 **Lab ID: 92322711015** Collected: 12/06/16 15:20 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/14/16 10:34	127-18-4	
Toluene	ND	ug/L	1.0	1		12/14/16 10:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/14/16 10:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/14/16 10:34	120-82-1	
1,1,1-Trichloroethane	**1.4**	ug/L	1.0	1		12/14/16 10:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/14/16 10:34	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/14/16 10:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/14/16 10:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/14/16 10:34	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/14/16 10:34	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/14/16 10:34	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/14/16 10:34	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/14/16 10:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/14/16 10:34	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		12/14/16 10:34	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		12/14/16 10:34	17060-07-0	
Toluene-d8 (S)	110	%	70-130	1		12/14/16 10:34	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**5.9**	ug/L	2.0	1		12/12/16 19:08	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	50-150	1		12/12/16 19:08	17060-07-0	
Toluene-d8 (S)	85	%	50-150	1		12/12/16 19:08	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-2S-120616 **Lab ID: 92322711016** Collected: 12/06/16 16:20 Received: 12/09/16 10:07 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	125	5		12/14/16 05:10	67-64-1	
Benzene	ND	ug/L	5.0	5		12/14/16 05:10	71-43-2	
Bromobenzene	ND	ug/L	5.0	5		12/14/16 05:10	108-86-1	
Bromochloromethane	ND	ug/L	5.0	5		12/14/16 05:10	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	5		12/14/16 05:10	75-27-4	
Bromoform	ND	ug/L	5.0	5		12/14/16 05:10	75-25-2	
Bromomethane	ND	ug/L	10.0	5		12/14/16 05:10	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	5		12/14/16 05:10	78-93-3	
Carbon tetrachloride	ND	ug/L	5.0	5		12/14/16 05:10	56-23-5	
Chlorobenzene	ND	ug/L	5.0	5		12/14/16 05:10	108-90-7	
Chloroethane	ND	ug/L	5.0	5		12/14/16 05:10	75-00-3	
Chloroform	ND	ug/L	5.0	5		12/14/16 05:10	67-66-3	
Chloromethane	ND	ug/L	5.0	5		12/14/16 05:10	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	5		12/14/16 05:10	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	5		12/14/16 05:10	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	5		12/14/16 05:10	96-12-8	
Dibromochloromethane	ND	ug/L	5.0	5		12/14/16 05:10	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	5		12/14/16 05:10	106-93-4	
Dibromomethane	ND	ug/L	5.0	5		12/14/16 05:10	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	5		12/14/16 05:10	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	5		12/14/16 05:10	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	5		12/14/16 05:10	106-46-7	
Dichlorodifluoromethane	ND	ug/L	5.0	5		12/14/16 05:10	75-71-8	
1,1-Dichloroethane	**198**	ug/L	5.0	5		12/14/16 05:10	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	5		12/14/16 05:10	107-06-2	
1,1-Dichloroethene	**971**	ug/L	5.0	5		12/14/16 05:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	5		12/14/16 05:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	5		12/14/16 05:10	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	5		12/14/16 05:10	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	5		12/14/16 05:10	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	5		12/14/16 05:10	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	5		12/14/16 05:10	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	5		12/14/16 05:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	5		12/14/16 05:10	10061-02-6	
Diisopropyl ether	ND	ug/L	5.0	5		12/14/16 05:10	108-20-3	
1,4-Dioxane (p-Dioxane)	**884**	ug/L	750	5		12/14/16 05:10	123-91-1	L1
Ethylbenzene	ND	ug/L	5.0	5		12/14/16 05:10	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	5		12/14/16 05:10	87-68-3	
2-Hexanone	ND	ug/L	25.0	5		12/14/16 05:10	591-78-6	
p-Isopropyltoluene	ND	ug/L	5.0	5		12/14/16 05:10	99-87-6	
Methylene Chloride	ND	ug/L	10.0	5		12/14/16 05:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	5		12/14/16 05:10	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	5.0	5		12/14/16 05:10	1634-04-4	
Naphthalene	ND	ug/L	5.0	5		12/14/16 05:10	91-20-3	
Styrene	ND	ug/L	5.0	5		12/14/16 05:10	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	5		12/14/16 05:10	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	5		12/14/16 05:10	79-34-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-2S-120616 **Lab ID: 92322711016** Collected: 12/06/16 16:20 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	5.0	5		12/14/16 05:10	127-18-4	
Toluene	ND	ug/L	5.0	5		12/14/16 05:10	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	5		12/14/16 05:10	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	5		12/14/16 05:10	120-82-1	
1,1,1-Trichloroethane	**232**	ug/L	5.0	5		12/14/16 05:10	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	5		12/14/16 05:10	79-00-5	
Trichloroethene	ND	ug/L	5.0	5		12/14/16 05:10	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	5		12/14/16 05:10	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	5		12/14/16 05:10	96-18-4	
Vinyl acetate	ND	ug/L	10.0	5		12/14/16 05:10	108-05-4	
Vinyl chloride	ND	ug/L	5.0	5		12/14/16 05:10	75-01-4	
Xylene (Total)	ND	ug/L	5.0	5		12/14/16 05:10	1330-20-7	
m&p-Xylene	ND	ug/L	10.0	5		12/14/16 05:10	179601-23-1	
o-Xylene	ND	ug/L	5.0	5		12/14/16 05:10	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	5		12/14/16 05:10	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	5		12/14/16 05:10	17060-07-0	
Toluene-d8 (S)	105	%	70-130	5		12/14/16 05:10	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**1190**	ug/L	50.0	25		12/13/16 13:01	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	50-150	1		12/12/16 19:26	17060-07-0	
Toluene-d8 (S)	84	%	50-150	1		12/12/16 19:26	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-1S-120716 **Lab ID: 92322711017** Collected: 12/07/16 08:35 Received: 12/09/16 10:07 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	125	5		12/14/16 17:28	67-64-1	
Benzene	ND	ug/L	5.0	5		12/14/16 17:28	71-43-2	
Bromobenzene	ND	ug/L	5.0	5		12/14/16 17:28	108-86-1	
Bromochloromethane	ND	ug/L	5.0	5		12/14/16 17:28	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	5		12/14/16 17:28	75-27-4	
Bromoform	ND	ug/L	5.0	5		12/14/16 17:28	75-25-2	
Bromomethane	ND	ug/L	10.0	5		12/14/16 17:28	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	5		12/14/16 17:28	78-93-3	
Carbon tetrachloride	ND	ug/L	5.0	5		12/14/16 17:28	56-23-5	
Chlorobenzene	ND	ug/L	5.0	5		12/14/16 17:28	108-90-7	
Chloroethane	ND	ug/L	5.0	5		12/14/16 17:28	75-00-3	
Chloroform	ND	ug/L	5.0	5		12/14/16 17:28	67-66-3	
Chloromethane	ND	ug/L	5.0	5		12/14/16 17:28	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	5		12/14/16 17:28	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	5		12/14/16 17:28	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	5		12/14/16 17:28	96-12-8	
Dibromochloromethane	ND	ug/L	5.0	5		12/14/16 17:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	5		12/14/16 17:28	106-93-4	
Dibromomethane	ND	ug/L	5.0	5		12/14/16 17:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	5		12/14/16 17:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	5		12/14/16 17:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	5		12/14/16 17:28	106-46-7	
Dichlorodifluoromethane	ND	ug/L	5.0	5		12/14/16 17:28	75-71-8	
1,1-Dichloroethane	**468**	ug/L	5.0	5		12/14/16 17:28	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	5		12/14/16 17:28	107-06-2	
1,1-Dichloroethene	**957**	ug/L	5.0	5		12/14/16 17:28	75-35-4	
cis-1,2-Dichloroethene	**6.3**	ug/L	5.0	5		12/14/16 17:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	5		12/14/16 17:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	5		12/14/16 17:28	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	5		12/14/16 17:28	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	5		12/14/16 17:28	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	5		12/14/16 17:28	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	5		12/14/16 17:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	5		12/14/16 17:28	10061-02-6	
Diisopropyl ether	ND	ug/L	5.0	5		12/14/16 17:28	108-20-3	
1,4-Dioxane (p-Dioxane)	**905**	ug/L	750	5		12/14/16 17:28	123-91-1	L1
Ethylbenzene	ND	ug/L	5.0	5		12/14/16 17:28	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	5		12/14/16 17:28	87-68-3	
2-Hexanone	ND	ug/L	25.0	5		12/14/16 17:28	591-78-6	
p-Isopropyltoluene	ND	ug/L	5.0	5		12/14/16 17:28	99-87-6	
Methylene Chloride	ND	ug/L	10.0	5		12/14/16 17:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	5		12/14/16 17:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	5.0	5		12/14/16 17:28	1634-04-4	
Naphthalene	ND	ug/L	5.0	5		12/14/16 17:28	91-20-3	
Styrene	ND	ug/L	5.0	5		12/14/16 17:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	5		12/14/16 17:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	5		12/14/16 17:28	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: RW-1S-120716 **Lab ID: 92322711017** Collected: 12/07/16 08:35 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	5.0	5		12/14/16 17:28	127-18-4	
Toluene	ND	ug/L	5.0	5		12/14/16 17:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	5		12/14/16 17:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	5		12/14/16 17:28	120-82-1	
1,1,1-Trichloroethane	**59.3**	ug/L	5.0	5		12/14/16 17:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	5		12/14/16 17:28	79-00-5	
Trichloroethene	ND	ug/L	5.0	5		12/14/16 17:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	5		12/14/16 17:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	5		12/14/16 17:28	96-18-4	
Vinyl acetate	ND	ug/L	10.0	5		12/14/16 17:28	108-05-4	
Vinyl chloride	ND	ug/L	5.0	5		12/14/16 17:28	75-01-4	
Xylene (Total)	ND	ug/L	5.0	5		12/14/16 17:28	1330-20-7	
m&p-Xylene	ND	ug/L	10.0	5		12/14/16 17:28	179601-23-1	
o-Xylene	ND	ug/L	5.0	5		12/14/16 17:28	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	5		12/14/16 17:28	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	5		12/14/16 17:28	17060-07-0	
Toluene-d8 (S)	105	%	70-130	5		12/14/16 17:28	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**1420**	ug/L	50.0	25		12/13/16 13:20	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		12/12/16 19:45	17060-07-0	
Toluene-d8 (S)	84	%	50-150	1		12/12/16 19:45	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-27D-120716 **Lab ID: 92322711018** Collected: 12/07/16 09:30 Received: 12/09/16 10:07 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		12/13/16 06:39	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 06:39	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 06:39	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 06:39	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 06:39	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 06:39	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 06:39	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 06:39	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 06:39	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 06:39	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 06:39	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 06:39	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 06:39	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 06:39	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 06:39	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 06:39	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 06:39	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 06:39	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 06:39	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:39	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 06:39	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/13/16 06:39	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 06:39	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:39	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 06:39	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:39	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:39	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 06:39	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:39	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 06:39	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 06:39	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 06:39	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 06:39	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 06:39	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 06:39	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 06:39	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 06:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 06:39	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 06:39	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 06:39	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 06:39	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 06:39	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 06:39	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-27D-120716 **Lab ID: 92322711018** Collected: 12/07/16 09:30 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 06:39	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 06:39	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:39	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 06:39	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 06:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 06:39	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 06:39	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 06:39	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 06:39	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 06:39	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 06:39	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 06:39	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 06:39	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 06:39	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		12/13/16 06:39	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	70-130	1		12/13/16 06:39	17060-07-0	
Toluene-d8 (S)	109	%	70-130	1		12/13/16 06:39	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		12/13/16 16:26	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	84	%	50-150	1		12/13/16 16:26	17060-07-0	
Toluene-d8 (S)	78	%	50-150	1		12/13/16 16:26	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-39-120716 **Lab ID: 92322711019** Collected: 12/07/16 10:00 Received: 12/09/16 10:07 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		12/13/16 02:34	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 02:34	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 02:34	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 02:34	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 02:34	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 02:34	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 02:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 02:34	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 02:34	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 02:34	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 02:34	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 02:34	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 02:34	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 02:34	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 02:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 02:34	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 02:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 02:34	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 02:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 02:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 02:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 02:34	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 02:34	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/13/16 02:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 02:34	107-06-2	
1,1-Dichloroethene	**1.7**	ug/L	1.0	1		12/13/16 02:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 02:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 02:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 02:34	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 02:34	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 02:34	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 02:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 02:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 02:34	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 02:34	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 02:34	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 02:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 02:34	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 02:34	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 02:34	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 02:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 02:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 02:34	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 02:34	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 02:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 02:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 02:34	79-34-5	

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

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-39-120716 **Lab ID: 92322711019** Collected: 12/07/16 10:00 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 02:34	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 02:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 02:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 02:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 02:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 02:34	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 02:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 02:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 02:34	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 02:34	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 02:34	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 02:34	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 02:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 02:34	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		12/13/16 02:34	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		12/13/16 02:34	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		12/13/16 02:34	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**2.5**	ug/L	2.0	1		12/13/16 16:45	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%	50-150	1		12/13/16 16:45	17060-07-0	
Toluene-d8 (S)	78	%	50-150	1		12/13/16 16:45	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-43-120716 **Lab ID: 92322711020** Collected: 12/07/16 10:20 Received: 12/09/16 10:07 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		12/13/16 16:57	67-64-1	
Benzene	ND	ug/L	2.0	2		12/13/16 16:57	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		12/13/16 16:57	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		12/13/16 16:57	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		12/13/16 16:57	75-27-4	
Bromoform	ND	ug/L	2.0	2		12/13/16 16:57	75-25-2	
Bromomethane	ND	ug/L	4.0	2		12/13/16 16:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		12/13/16 16:57	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		12/13/16 16:57	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		12/13/16 16:57	108-90-7	
Chloroethane	ND	ug/L	2.0	2		12/13/16 16:57	75-00-3	
Chloroform	ND	ug/L	2.0	2		12/13/16 16:57	67-66-3	
Chloromethane	ND	ug/L	2.0	2		12/13/16 16:57	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		12/13/16 16:57	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		12/13/16 16:57	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		12/13/16 16:57	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		12/13/16 16:57	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		12/13/16 16:57	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		12/13/16 16:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 16:57	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 16:57	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		12/13/16 16:57	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		12/13/16 16:57	75-71-8	
1,1-Dichloroethane	**15.9**	ug/L	2.0	2		12/13/16 16:57	75-34-3	
1,2-Dichloroethane	**2.1**	ug/L	2.0	2		12/13/16 16:57	107-06-2	
1,1-Dichloroethene	**171**	ug/L	2.0	2		12/13/16 16:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		12/13/16 16:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		12/13/16 16:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		12/13/16 16:57	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		12/13/16 16:57	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		12/13/16 16:57	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		12/13/16 16:57	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		12/13/16 16:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		12/13/16 16:57	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		12/13/16 16:57	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	300	2		12/13/16 16:57	123-91-1	L3
Ethylbenzene	ND	ug/L	2.0	2		12/13/16 16:57	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		12/13/16 16:57	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		12/13/16 16:57	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		12/13/16 16:57	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		12/13/16 16:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		12/13/16 16:57	108-10-1	
Methyl-tert-butyl ether	**9.3**	ug/L	2.0	2		12/13/16 16:57	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		12/13/16 16:57	91-20-3	
Styrene	ND	ug/L	2.0	2		12/13/16 16:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		12/13/16 16:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		12/13/16 16:57	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-43-120716 **Lab ID: 92322711020** Collected: 12/07/16 10:20 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	2.0	2		12/13/16 16:57	127-18-4	
Toluene	ND	ug/L	2.0	2		12/13/16 16:57	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		12/13/16 16:57	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		12/13/16 16:57	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	2		12/13/16 16:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		12/13/16 16:57	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		12/13/16 16:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		12/13/16 16:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		12/13/16 16:57	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		12/13/16 16:57	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		12/13/16 16:57	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		12/13/16 16:57	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		12/13/16 16:57	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		12/13/16 16:57	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	2		12/13/16 16:57	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	2		12/13/16 16:57	17060-07-0	
Toluene-d8 (S)	106	%	70-130	2		12/13/16 16:57	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**237**	ug/L	10.0	5		12/13/16 13:38	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	84	%	50-150	1		12/13/16 00:07	17060-07-0	
Toluene-d8 (S)	77	%	50-150	1		12/13/16 00:07	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-38R-120716 **Lab ID: 92322711021** Collected: 12/07/16 10:35 Received: 12/09/16 10:07 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		12/13/16 07:31	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 07:31	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 07:31	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 07:31	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 07:31	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 07:31	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 07:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 07:31	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 07:31	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 07:31	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 07:31	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 07:31	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 07:31	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 07:31	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 07:31	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 07:31	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 07:31	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 07:31	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 07:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:31	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 07:31	75-71-8	
1,1-Dichloroethane	**3.8**	ug/L	1.0	1		12/13/16 07:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 07:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 07:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:31	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:31	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 07:31	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:31	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 07:31	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 07:31	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 07:31	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 07:31	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 07:31	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 07:31	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 07:31	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 07:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 07:31	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 07:31	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 07:31	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 07:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 07:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 07:31	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-38R-120716 **Lab ID: 92322711021** Collected: 12/07/16 10:35 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 07:31	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 07:31	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:31	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 07:31	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 07:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 07:31	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 07:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 07:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 07:31	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 07:31	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 07:31	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 07:31	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 07:31	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 07:31	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		12/13/16 07:31	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		12/13/16 07:31	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		12/13/16 07:31	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**18.3**	ug/L	2.0	1		12/13/16 15:12	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	85	%	50-150	1		12/13/16 15:12	17060-07-0	
Toluene-d8 (S)	78	%	50-150	1		12/13/16 15:12	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-16-120816 **Lab ID: 92322711022** Collected: 12/08/16 08:40 Received: 12/09/16 10:07 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	5000	200		12/13/16 17:49	67-64-1	
Benzene	ND	ug/L	200	200		12/13/16 17:49	71-43-2	
Bromobenzene	ND	ug/L	200	200		12/13/16 17:49	108-86-1	
Bromochloromethane	ND	ug/L	200	200		12/13/16 17:49	74-97-5	
Bromodichloromethane	ND	ug/L	200	200		12/13/16 17:49	75-27-4	
Bromoform	ND	ug/L	200	200		12/13/16 17:49	75-25-2	
Bromomethane	ND	ug/L	400	200		12/13/16 17:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	1000	200		12/13/16 17:49	78-93-3	
Carbon tetrachloride	ND	ug/L	200	200		12/13/16 17:49	56-23-5	
Chlorobenzene	ND	ug/L	200	200		12/13/16 17:49	108-90-7	
Chloroethane	ND	ug/L	200	200		12/13/16 17:49	75-00-3	
Chloroform	ND	ug/L	200	200		12/13/16 17:49	67-66-3	
Chloromethane	ND	ug/L	200	200		12/13/16 17:49	74-87-3	
2-Chlorotoluene	ND	ug/L	200	200		12/13/16 17:49	95-49-8	
4-Chlorotoluene	ND	ug/L	200	200		12/13/16 17:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	400	200		12/13/16 17:49	96-12-8	
Dibromochloromethane	ND	ug/L	200	200		12/13/16 17:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	200	200		12/13/16 17:49	106-93-4	
Dibromomethane	ND	ug/L	200	200		12/13/16 17:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	200	200		12/13/16 17:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	200	200		12/13/16 17:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	200	200		12/13/16 17:49	106-46-7	
Dichlorodifluoromethane	ND	ug/L	200	200		12/13/16 17:49	75-71-8	
1,1-Dichloroethane	**6420**	ug/L	200	200		12/13/16 17:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	200	200		12/13/16 17:49	107-06-2	
1,1-Dichloroethene	**26200**	ug/L	200	200		12/13/16 17:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	200	200		12/13/16 17:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	200	200		12/13/16 17:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	200	200		12/13/16 17:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	200	200		12/13/16 17:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	200	200		12/13/16 17:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	200	200		12/13/16 17:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	200	200		12/13/16 17:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	200	200		12/13/16 17:49	10061-02-6	
Diisopropyl ether	ND	ug/L	200	200		12/13/16 17:49	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	30000	200		12/13/16 17:49	123-91-1	L3
Ethylbenzene	ND	ug/L	200	200		12/13/16 17:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	200	200		12/13/16 17:49	87-68-3	
2-Hexanone	ND	ug/L	1000	200		12/13/16 17:49	591-78-6	
p-Isopropyltoluene	ND	ug/L	200	200		12/13/16 17:49	99-87-6	
Methylene Chloride	ND	ug/L	400	200		12/13/16 17:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	1000	200		12/13/16 17:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	200	200		12/13/16 17:49	1634-04-4	
Naphthalene	ND	ug/L	200	200		12/13/16 17:49	91-20-3	
Styrene	ND	ug/L	200	200		12/13/16 17:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	200	200		12/13/16 17:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	200	200		12/13/16 17:49	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-16-120816 **Lab ID: 92322711022** Collected: 12/08/16 08:40 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	200	200		12/13/16 17:49	127-18-4	
Toluene	ND	ug/L	200	200		12/13/16 17:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	200	200		12/13/16 17:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	200	200		12/13/16 17:49	120-82-1	
1,1,1-Trichloroethane	**4390**	ug/L	200	200		12/13/16 17:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	200	200		12/13/16 17:49	79-00-5	
Trichloroethene	ND	ug/L	200	200		12/13/16 17:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	200	200		12/13/16 17:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	200	200		12/13/16 17:49	96-18-4	
Vinyl acetate	ND	ug/L	400	200		12/13/16 17:49	108-05-4	
Vinyl chloride	ND	ug/L	200	200		12/13/16 17:49	75-01-4	
Xylene (Total)	ND	ug/L	200	200		12/13/16 17:49	1330-20-7	
m&p-Xylene	ND	ug/L	400	200		12/13/16 17:49	179601-23-1	
o-Xylene	ND	ug/L	200	200		12/13/16 17:49	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	200		12/13/16 17:49	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	200		12/13/16 17:49	17060-07-0	
Toluene-d8 (S)	110	%	70-130	200		12/13/16 17:49	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**1450**	ug/L	40.0	20		12/13/16 13:57	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	88	%	50-150	5		12/13/16 00:45	17060-07-0	
Toluene-d8 (S)	77	%	50-150	5		12/13/16 00:45	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-200-120816 **Lab ID: 92322711023** Collected: 12/08/16 08:00 Received: 12/09/16 10:07 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	3120	125		12/13/16 16:40	67-64-1	
Benzene	ND	ug/L	125	125		12/13/16 16:40	71-43-2	
Bromobenzene	ND	ug/L	125	125		12/13/16 16:40	108-86-1	
Bromochloromethane	ND	ug/L	125	125		12/13/16 16:40	74-97-5	
Bromodichloromethane	ND	ug/L	125	125		12/13/16 16:40	75-27-4	
Bromoform	ND	ug/L	125	125		12/13/16 16:40	75-25-2	
Bromomethane	ND	ug/L	250	125		12/13/16 16:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	625	125		12/13/16 16:40	78-93-3	
Carbon tetrachloride	ND	ug/L	125	125		12/13/16 16:40	56-23-5	
Chlorobenzene	ND	ug/L	125	125		12/13/16 16:40	108-90-7	
Chloroethane	ND	ug/L	125	125		12/13/16 16:40	75-00-3	
Chloroform	ND	ug/L	125	125		12/13/16 16:40	67-66-3	
Chloromethane	ND	ug/L	125	125		12/13/16 16:40	74-87-3	
2-Chlorotoluene	ND	ug/L	125	125		12/13/16 16:40	95-49-8	
4-Chlorotoluene	ND	ug/L	125	125		12/13/16 16:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	250	125		12/13/16 16:40	96-12-8	
Dibromochloromethane	ND	ug/L	125	125		12/13/16 16:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	125	125		12/13/16 16:40	106-93-4	
Dibromomethane	ND	ug/L	125	125		12/13/16 16:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	125	125		12/13/16 16:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	125	125		12/13/16 16:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	125	125		12/13/16 16:40	106-46-7	
Dichlorodifluoromethane	ND	ug/L	125	125		12/13/16 16:40	75-71-8	
1,1-Dichloroethane	**6060**	ug/L	125	125		12/13/16 16:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	125	125		12/13/16 16:40	107-06-2	
1,1-Dichloroethene	**24500**	ug/L	125	125		12/13/16 16:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	125	125		12/13/16 16:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	125	125		12/13/16 16:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	125	125		12/13/16 16:40	78-87-5	
1,3-Dichloropropane	ND	ug/L	125	125		12/13/16 16:40	142-28-9	
2,2-Dichloropropane	ND	ug/L	125	125		12/13/16 16:40	594-20-7	
1,1-Dichloropropene	ND	ug/L	125	125		12/13/16 16:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	125	125		12/13/16 16:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	125	125		12/13/16 16:40	10061-02-6	
Diisopropyl ether	ND	ug/L	125	125		12/13/16 16:40	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	18800	125		12/13/16 16:40	123-91-1	L3
Ethylbenzene	ND	ug/L	125	125		12/13/16 16:40	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	125	125		12/13/16 16:40	87-68-3	
2-Hexanone	ND	ug/L	625	125		12/13/16 16:40	591-78-6	
p-Isopropyltoluene	ND	ug/L	125	125		12/13/16 16:40	99-87-6	
Methylene Chloride	ND	ug/L	250	125		12/13/16 16:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	625	125		12/13/16 16:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	125	125		12/13/16 16:40	1634-04-4	
Naphthalene	ND	ug/L	125	125		12/13/16 16:40	91-20-3	
Styrene	ND	ug/L	125	125		12/13/16 16:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	125	125		12/13/16 16:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	125	125		12/13/16 16:40	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-200-120816 **Lab ID: 92322711023** Collected: 12/08/16 08:00 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	125	125		12/13/16 16:40	127-18-4	
Toluene	ND	ug/L	125	125		12/13/16 16:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	125	125		12/13/16 16:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	125	125		12/13/16 16:40	120-82-1	
1,1,1-Trichloroethane	**4330**	ug/L	125	125		12/13/16 16:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	125	125		12/13/16 16:40	79-00-5	
Trichloroethene	ND	ug/L	125	125		12/13/16 16:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	125	125		12/13/16 16:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	125	125		12/13/16 16:40	96-18-4	
Vinyl acetate	ND	ug/L	250	125		12/13/16 16:40	108-05-4	
Vinyl chloride	ND	ug/L	125	125		12/13/16 16:40	75-01-4	
Xylene (Total)	ND	ug/L	125	125		12/13/16 16:40	1330-20-7	
m&p-Xylene	ND	ug/L	250	125		12/13/16 16:40	179601-23-1	
o-Xylene	ND	ug/L	125	125		12/13/16 16:40	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	125		12/13/16 16:40	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	125		12/13/16 16:40	17060-07-0	
Toluene-d8 (S)	104	%	70-130	125		12/13/16 16:40	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**1390**	ug/L	40.0	20		12/13/16 14:16	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	81	%	50-150	10		12/13/16 01:03	17060-07-0	
Toluene-d8 (S)	77	%	50-150	10		12/13/16 01:03	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-03-120816 **Lab ID: 92322711024** Collected: 12/08/16 09:30 Received: 12/09/16 10:07 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		12/13/16 00:32	67-64-1	
Benzene	ND	ug/L	1.0	1		12/13/16 00:32	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/13/16 00:32	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/13/16 00:32	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/16 00:32	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/16 00:32	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/13/16 00:32	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/13/16 00:32	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/16 00:32	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/13/16 00:32	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/13/16 00:32	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/13/16 00:32	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/13/16 00:32	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 00:32	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/13/16 00:32	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/13/16 00:32	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/13/16 00:32	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/13/16 00:32	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/13/16 00:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:32	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/13/16 00:32	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/13/16 00:32	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/16 00:32	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/13/16 00:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 00:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/16 00:32	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 00:32	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/13/16 00:32	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/13/16 00:32	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/13/16 00:32	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 00:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/16 00:32	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/13/16 00:32	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/13/16 00:32	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/13/16 00:32	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/13/16 00:32	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/13/16 00:32	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/13/16 00:32	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/13/16 00:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/13/16 00:32	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/13/16 00:32	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/13/16 00:32	91-20-3	
Styrene	ND	ug/L	1.0	1		12/13/16 00:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 00:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/16 00:32	79-34-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-03-120816 **Lab ID: 92322711024** Collected: 12/08/16 09:30 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/13/16 00:32	127-18-4	
Toluene	ND	ug/L	1.0	1		12/13/16 00:32	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:32	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/13/16 00:32	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/16 00:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/16 00:32	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/13/16 00:32	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/13/16 00:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/13/16 00:32	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/13/16 00:32	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/13/16 00:32	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/13/16 00:32	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/13/16 00:32	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/13/16 00:32	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	1		12/13/16 00:32	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		12/13/16 00:32	17060-07-0	
Toluene-d8 (S)	107	%	70-130	1		12/13/16 00:32	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**4.6**	ug/L	2.0	1		12/13/16 15:30	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	86	%	50-150	1		12/13/16 15:30	17060-07-0	
Toluene-d8 (S)	77	%	50-150	1		12/13/16 15:30	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: TRIP BLANKS **Lab ID: 92322711025** Collected: 12/07/16 00:00 Received: 12/09/16 10:07 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		12/12/16 23:40	67-64-1	
Benzene	ND	ug/L	1.0	1		12/12/16 23:40	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		12/12/16 23:40	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		12/12/16 23:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		12/12/16 23:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/12/16 23:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		12/12/16 23:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		12/12/16 23:40	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		12/12/16 23:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		12/12/16 23:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		12/12/16 23:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		12/12/16 23:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		12/12/16 23:40	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		12/12/16 23:40	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		12/12/16 23:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		12/12/16 23:40	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		12/12/16 23:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		12/12/16 23:40	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		12/12/16 23:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:40	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		12/12/16 23:40	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		12/12/16 23:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		12/12/16 23:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		12/12/16 23:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/12/16 23:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/12/16 23:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		12/12/16 23:40	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		12/12/16 23:40	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		12/12/16 23:40	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		12/12/16 23:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/12/16 23:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/12/16 23:40	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		12/12/16 23:40	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		12/12/16 23:40	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		12/12/16 23:40	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		12/12/16 23:40	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		12/12/16 23:40	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		12/12/16 23:40	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		12/12/16 23:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		12/12/16 23:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		12/12/16 23:40	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		12/12/16 23:40	91-20-3	
Styrene	ND	ug/L	1.0	1		12/12/16 23:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		12/12/16 23:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/12/16 23:40	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: TRIP BLANKS **Lab ID: 92322711025** Collected: 12/07/16 00:00 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		12/12/16 23:40	127-18-4	
Toluene	ND	ug/L	1.0	1		12/12/16 23:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		12/12/16 23:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/12/16 23:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/12/16 23:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		12/12/16 23:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		12/12/16 23:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		12/12/16 23:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		12/12/16 23:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		12/12/16 23:40	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		12/12/16 23:40	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		12/12/16 23:40	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		12/12/16 23:40	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		12/12/16 23:40	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		12/12/16 23:40	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		12/12/16 23:40	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		12/12/16 22:34	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	84	%	50-150	1		12/12/16 22:34	17060-07-0	
Toluene-d8 (S)	78	%	50-150	1		12/12/16 22:34	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-100-120616 **Lab ID: 92322711026** Collected: 12/06/16 12:00 Received: 12/09/16 10:07 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		12/14/16 17:45	67-64-1	
Benzene	ND	ug/L	2.0	2		12/14/16 17:45	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		12/14/16 17:45	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		12/14/16 17:45	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		12/14/16 17:45	75-27-4	
Bromoform	ND	ug/L	2.0	2		12/14/16 17:45	75-25-2	
Bromomethane	ND	ug/L	4.0	2		12/14/16 17:45	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		12/14/16 17:45	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		12/14/16 17:45	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		12/14/16 17:45	108-90-7	
Chloroethane	ND	ug/L	2.0	2		12/14/16 17:45	75-00-3	
Chloroform	ND	ug/L	2.0	2		12/14/16 17:45	67-66-3	
Chloromethane	ND	ug/L	2.0	2		12/14/16 17:45	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		12/14/16 17:45	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		12/14/16 17:45	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		12/14/16 17:45	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		12/14/16 17:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		12/14/16 17:45	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		12/14/16 17:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		12/14/16 17:45	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		12/14/16 17:45	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		12/14/16 17:45	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		12/14/16 17:45	75-71-8	
1,1-Dichloroethane	**66.5**	ug/L	2.0	2		12/14/16 17:45	75-34-3	
1,2-Dichloroethane	**3.3**	ug/L	2.0	2		12/14/16 17:45	107-06-2	
1,1-Dichloroethene	**278**	ug/L	2.0	2		12/14/16 17:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		12/14/16 17:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		12/14/16 17:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		12/14/16 17:45	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		12/14/16 17:45	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		12/14/16 17:45	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		12/14/16 17:45	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		12/14/16 17:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		12/14/16 17:45	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		12/14/16 17:45	108-20-3	
1,4-Dioxane (p-Dioxane)	**661**	ug/L	300	2		12/14/16 17:45	123-91-1	L1
Ethylbenzene	ND	ug/L	2.0	2		12/14/16 17:45	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		12/14/16 17:45	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		12/14/16 17:45	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		12/14/16 17:45	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		12/14/16 17:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		12/14/16 17:45	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		12/14/16 17:45	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		12/14/16 17:45	91-20-3	
Styrene	ND	ug/L	2.0	2		12/14/16 17:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		12/14/16 17:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		12/14/16 17:45	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Sample: MW-100-120616 **Lab ID: 92322711026** Collected: 12/06/16 12:00 Received: 12/09/16 10:07 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	2.0	2		12/14/16 17:45	127-18-4	
Toluene	ND	ug/L	2.0	2		12/14/16 17:45	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		12/14/16 17:45	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		12/14/16 17:45	120-82-1	
1,1,1-Trichloroethane	**28.6**	ug/L	2.0	2		12/14/16 17:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		12/14/16 17:45	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		12/14/16 17:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		12/14/16 17:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		12/14/16 17:45	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		12/14/16 17:45	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		12/14/16 17:45	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		12/14/16 17:45	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		12/14/16 17:45	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		12/14/16 17:45	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	2		12/14/16 17:45	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	2		12/14/16 17:45	17060-07-0	
Toluene-d8 (S)	107	%	70-130	2		12/14/16 17:45	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**220**	ug/L	5.0	2.5		12/13/16 01:41	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	84	%	50-150	2.5		12/13/16 01:41	17060-07-0	
Toluene-d8 (S)	78	%	50-150	2.5		12/13/16 01:41	2037-26-5	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340452 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92322711014

METHOD BLANK: 1888247 Matrix: Water
Associated Lab Samples: 92322711014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/12/16 11:28	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/12/16 11:28	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/12/16 11:28	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/12/16 11:28	
1,1-Dichloroethane	ug/L	ND	1.0	12/12/16 11:28	
1,1-Dichloroethene	ug/L	ND	1.0	12/12/16 11:28	
1,1-Dichloropropene	ug/L	ND	1.0	12/12/16 11:28	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/12/16 11:28	
1,2,3-Trichloropropane	ug/L	ND	1.0	12/12/16 11:28	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/12/16 11:28	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	12/12/16 11:28	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/12/16 11:28	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/12/16 11:28	
1,2-Dichloroethane	ug/L	ND	1.0	12/12/16 11:28	
1,2-Dichloropropane	ug/L	ND	1.0	12/12/16 11:28	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/12/16 11:28	
1,3-Dichloropropane	ug/L	ND	1.0	12/12/16 11:28	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/12/16 11:28	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	12/12/16 11:28	
2,2-Dichloropropane	ug/L	ND	1.0	12/12/16 11:28	
2-Butanone (MEK)	ug/L	ND	5.0	12/12/16 11:28	
2-Chlorotoluene	ug/L	ND	1.0	12/12/16 11:28	
2-Hexanone	ug/L	ND	5.0	12/12/16 11:28	
4-Chlorotoluene	ug/L	ND	1.0	12/12/16 11:28	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/12/16 11:28	
Acetone	ug/L	ND	25.0	12/12/16 11:28	
Benzene	ug/L	ND	1.0	12/12/16 11:28	
Bromobenzene	ug/L	ND	1.0	12/12/16 11:28	
Bromochloromethane	ug/L	ND	1.0	12/12/16 11:28	
Bromodichloromethane	ug/L	ND	1.0	12/12/16 11:28	
Bromoform	ug/L	ND	1.0	12/12/16 11:28	
Bromomethane	ug/L	ND	2.0	12/12/16 11:28	
Carbon tetrachloride	ug/L	ND	1.0	12/12/16 11:28	
Chlorobenzene	ug/L	ND	1.0	12/12/16 11:28	
Chloroethane	ug/L	ND	1.0	12/12/16 11:28	
Chloroform	ug/L	ND	1.0	12/12/16 11:28	
Chloromethane	ug/L	ND	1.0	12/12/16 11:28	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/12/16 11:28	
cis-1,3-Dichloropropene	ug/L	ND	1.0	12/12/16 11:28	
Dibromochloromethane	ug/L	ND	1.0	12/12/16 11:28	
Dibromomethane	ug/L	ND	1.0	12/12/16 11:28	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

METHOD BLANK: 1888247 Matrix: Water
Associated Lab Samples: 92322711014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	12/12/16 11:28	
Diisopropyl ether	ug/L	ND	1.0	12/12/16 11:28	
Ethylbenzene	ug/L	ND	1.0	12/12/16 11:28	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/12/16 11:28	
m&p-Xylene	ug/L	ND	2.0	12/12/16 11:28	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/12/16 11:28	
Methylene Chloride	ug/L	ND	2.0	12/12/16 11:28	
Naphthalene	ug/L	ND	1.0	12/12/16 11:28	
o-Xylene	ug/L	ND	1.0	12/12/16 11:28	
p-Isopropyltoluene	ug/L	ND	1.0	12/12/16 11:28	
Styrene	ug/L	ND	1.0	12/12/16 11:28	
Tetrachloroethene	ug/L	ND	1.0	12/12/16 11:28	
Toluene	ug/L	ND	1.0	12/12/16 11:28	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/12/16 11:28	
trans-1,3-Dichloropropene	ug/L	ND	1.0	12/12/16 11:28	
Trichloroethene	ug/L	ND	1.0	12/12/16 11:28	
Trichlorofluoromethane	ug/L	ND	1.0	12/12/16 11:28	
Vinyl acetate	ug/L	ND	2.0	12/12/16 11:28	
Vinyl chloride	ug/L	ND	1.0	12/12/16 11:28	
Xylene (Total)	ug/L	ND	1.0	12/12/16 11:28	
1,2-Dichloroethane-d4 (S)	%	99	70-130	12/12/16 11:28	
4-Bromofluorobenzene (S)	%	102	70-130	12/12/16 11:28	
Toluene-d8 (S)	%	111	70-130	12/12/16 11:28	

LABORATORY CONTROL SAMPLE: 1888248

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.4	101	70-130	
1,1,1-Trichloroethane	ug/L	50	56.5	113	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.0	98	70-130	
1,1,2-Trichloroethane	ug/L	50	54.5	109	70-130	
1,1-Dichloroethane	ug/L	50	54.1	108	70-130	
1,1-Dichloroethene	ug/L	50	58.6	117	70-132	
1,1-Dichloropropene	ug/L	50	55.4	111	70-130	
1,2,3-Trichlorobenzene	ug/L	50	50.1	100	70-135	
1,2,3-Trichloropropane	ug/L	50	46.4	93	70-130	
1,2,4-Trichlorobenzene	ug/L	50	52.7	105	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	44.8	90	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	51.3	103	70-130	
1,2-Dichlorobenzene	ug/L	50	52.0	104	70-130	
1,2-Dichloroethane	ug/L	50	50.4	101	70-130	
1,2-Dichloropropane	ug/L	50	55.6	111	70-130	
1,3-Dichlorobenzene	ug/L	50	53.3	107	70-130	
1,3-Dichloropropane	ug/L	50	53.8	108	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

LABORATORY CONTROL SAMPLE: 1888248

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	52.5	105	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1260	126	71-125	L0
2,2-Dichloropropane	ug/L	50	56.3	113	58-145	
2-Butanone (MEK)	ug/L	100	90.8	91	70-145	
2-Chlorotoluene	ug/L	50	54.9	110	70-130	
2-Hexanone	ug/L	100	90.4	90	70-144	
4-Chlorotoluene	ug/L	50	53.4	107	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	94.0	94	70-140	
Acetone	ug/L	100	80.0	80	50-175	
Benzene	ug/L	50	58.6	117	70-130	
Bromobenzene	ug/L	50	53.0	106	70-130	
Bromochloromethane	ug/L	50	54.6	109	70-130	
Bromodichloromethane	ug/L	50	55.7	111	70-130	
Bromoform	ug/L	50	45.7	91	70-130	
Bromomethane	ug/L	50	46.8	94	54-130	
Carbon tetrachloride	ug/L	50	51.8	104	70-132	
Chlorobenzene	ug/L	50	55.7	111	70-130	
Chloroethane	ug/L	50	58.3	117	64-134	
Chloroform	ug/L	50	53.7	107	70-130	
Chloromethane	ug/L	50	51.9	104	64-130	
cis-1,2-Dichloroethene	ug/L	50	54.2	108	70-131	
cis-1,3-Dichloropropene	ug/L	50	52.7	105	70-130	
Dibromochloromethane	ug/L	50	49.1	98	70-130	
Dibromomethane	ug/L	50	51.2	102	70-131	
Dichlorodifluoromethane	ug/L	50	52.8	106	56-130	
Diisopropyl ether	ug/L	50	52.5	105	70-130	
Ethylbenzene	ug/L	50	55.6	111	70-130	
Hexachloro-1,3-butadiene	ug/L	50	57.0	114	70-130	
m&p-Xylene	ug/L	100	109	109	70-130	
Methyl-tert-butyl ether	ug/L	50	57.8	116	70-130	
Methylene Chloride	ug/L	50	52.4	105	63-130	
Naphthalene	ug/L	50	50.3	101	70-138	
o-Xylene	ug/L	50	53.5	107	70-130	
p-Isopropyltoluene	ug/L	50	52.8	106	70-130	
Styrene	ug/L	50	54.3	109	70-130	
Tetrachloroethene	ug/L	50	50.6	101	70-130	
Toluene	ug/L	50	55.6	111	70-130	
trans-1,2-Dichloroethene	ug/L	50	55.6	111	70-130	
trans-1,3-Dichloropropene	ug/L	50	56.6	113	70-132	
Trichloroethene	ug/L	50	53.5	107	70-130	
Trichlorofluoromethane	ug/L	50	57.6	115	62-133	
Vinyl acetate	ug/L	100	97.7	98	66-157	
Vinyl chloride	ug/L	50	52.0	104	50-150	
Xylene (Total)	ug/L	150	162	108	70-130	
1,2-Dichloroethane-d4 (S)	%			92	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			98	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE SAMPLE: 1888249

Parameter	Units	92322779004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	18.9	95	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	24.2	121	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.0	95	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.5	108	70-130	
1,1-Dichloroethane	ug/L	ND	20	24.2	121	70-130	
1,1-Dichloroethene	ug/L	ND	20	25.5	128	70-166	
1,1-Dichloropropene	ug/L	ND	20	22.9	115	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	19.3	96	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	18.6	93	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	20.0	100	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	17.2	86	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	21.8	109	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.8	109	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.9	109	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.8	114	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	21.8	109	70-130	
1,3-Dichloropropane	ug/L	ND	20	20.7	103	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.4	107	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	224	56	70-130	M0
2,2-Dichloropropane	ug/L	ND	20	22.2	111	70-130	
2-Butanone (MEK)	ug/L	ND	40	40.1	100	70-130	
2-Chlorotoluene	ug/L	ND	20	23.1	116	70-130	
2-Hexanone	ug/L	ND	40	35.8	89	70-130	
4-Chlorotoluene	ug/L	ND	20	22.4	112	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	37.6	94	70-130	
Acetone	ug/L	ND	40	35.8	85	70-130	
Benzene	ug/L	ND	20	25.8	129	70-148	
Bromobenzene	ug/L	ND	20	21.6	108	70-130	
Bromochloromethane	ug/L	ND	20	25.2	126	70-130	
Bromodichloromethane	ug/L	ND	20	23.5	117	70-130	
Bromoform	ug/L	ND	20	16.7	83	70-130	
Bromomethane	ug/L	ND	20	17.7	89	70-130	
Carbon tetrachloride	ug/L	ND	20	22.4	112	70-130	
Chlorobenzene	ug/L	ND	20	22.8	114	70-146	
Chloroethane	ug/L	ND	20	25.2	126	70-130	
Chloroform	ug/L	ND	20	24.0	120	70-130	
Chloromethane	ug/L	ND	20	23.5	118	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	24.0	120	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.9	100	70-130	
Dibromochloromethane	ug/L	ND	20	19.2	96	70-130	
Dibromomethane	ug/L	ND	20	21.9	109	70-130	
Dichlorodifluoromethane	ug/L	ND	20	24.6	123	70-130	
Diisopropyl ether	ug/L	ND	20	21.7	109	70-130	
Ethylbenzene	ug/L	ND	20	24.0	120	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	21.5	107	70-130	
m&p-Xylene	ug/L	ND	40	48.4	121	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	22.7	113	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE SAMPLE: 1888249

Parameter	Units	92322779004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	ND	20	22.7	114	70-130	
Naphthalene	ug/L	ND	20	18.2	91	70-130	
o-Xylene	ug/L	ND	20	23.4	117	70-130	
p-Isopropyltoluene	ug/L	ND	20	21.6	108	70-130	
Styrene	ug/L	ND	20	23.2	116	70-130	
Tetrachloroethene	ug/L	ND	20	20.4	102	70-130	
Toluene	ug/L	ND	20	24.7	124	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	25.1	126	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.6	98	70-130	
Trichloroethene	ug/L	ND	20	23.1	115	69-151	
Trichlorofluoromethane	ug/L	ND	20	28.2	141	70-130	M1
Vinyl acetate	ug/L	ND	40	35.7	89	70-130	
Vinyl chloride	ug/L	ND	20	23.9	119	70-130	
1,2-Dichloroethane-d4 (S)	%				98	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				99	70-130	

SAMPLE DUPLICATE: 1888250

Parameter	Units	92322842001 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	
1,4-Dioxane (p-Dioxane)	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	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

SAMPLE DUPLICATE: 1888250

Parameter	Units	92322842001 Result	Dup Result	RPD	Max RPD	Qualifiers
Acetone	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
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	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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	97	98	0		
4-Bromofluorobenzene (S)	%	99	102	3		
Toluene-d8 (S)	%	108	109	1		

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340465 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92322711003, 92322711006, 92322711007, 92322711008, 92322711019, 92322711024, 92322711025

METHOD BLANK: 1888305 Matrix: Water
Associated Lab Samples: 92322711003, 92322711006, 92322711007, 92322711008, 92322711019, 92322711024, 92322711025

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/12/16 23:05	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/12/16 23:05	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/12/16 23:05	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/12/16 23:05	
1,1-Dichloroethane	ug/L	ND	1.0	12/12/16 23:05	
1,1-Dichloroethene	ug/L	ND	1.0	12/12/16 23:05	
1,1-Dichloropropene	ug/L	ND	1.0	12/12/16 23:05	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/12/16 23:05	
1,2,3-Trichloropropane	ug/L	ND	1.0	12/12/16 23:05	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/12/16 23:05	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	12/12/16 23:05	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/12/16 23:05	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/12/16 23:05	
1,2-Dichloroethane	ug/L	ND	1.0	12/12/16 23:05	
1,2-Dichloropropane	ug/L	ND	1.0	12/12/16 23:05	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/12/16 23:05	
1,3-Dichloropropane	ug/L	ND	1.0	12/12/16 23:05	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/12/16 23:05	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	12/12/16 23:05	
2,2-Dichloropropane	ug/L	ND	1.0	12/12/16 23:05	
2-Butanone (MEK)	ug/L	ND	5.0	12/12/16 23:05	
2-Chlorotoluene	ug/L	ND	1.0	12/12/16 23:05	
2-Hexanone	ug/L	ND	5.0	12/12/16 23:05	
4-Chlorotoluene	ug/L	ND	1.0	12/12/16 23:05	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/12/16 23:05	
Acetone	ug/L	ND	25.0	12/12/16 23:05	
Benzene	ug/L	ND	1.0	12/12/16 23:05	
Bromobenzene	ug/L	ND	1.0	12/12/16 23:05	
Bromochloromethane	ug/L	ND	1.0	12/12/16 23:05	
Bromodichloromethane	ug/L	ND	1.0	12/12/16 23:05	
Bromoform	ug/L	ND	1.0	12/12/16 23:05	
Bromomethane	ug/L	ND	2.0	12/12/16 23:05	
Carbon tetrachloride	ug/L	ND	1.0	12/12/16 23:05	
Chlorobenzene	ug/L	ND	1.0	12/12/16 23:05	
Chloroethane	ug/L	ND	1.0	12/12/16 23:05	
Chloroform	ug/L	ND	1.0	12/12/16 23:05	
Chloromethane	ug/L	ND	1.0	12/12/16 23:05	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/12/16 23:05	
cis-1,3-Dichloropropene	ug/L	ND	1.0	12/12/16 23:05	
Dibromochloromethane	ug/L	ND	1.0	12/12/16 23:05	
Dibromomethane	ug/L	ND	1.0	12/12/16 23:05	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

METHOD BLANK: 1888305 Matrix: Water
Associated Lab Samples: 92322711003, 92322711006, 92322711007, 92322711008, 92322711019, 92322711024, 92322711025

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	12/12/16 23:05	
Diisopropyl ether	ug/L	ND	1.0	12/12/16 23:05	
Ethylbenzene	ug/L	ND	1.0	12/12/16 23:05	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/12/16 23:05	
m&p-Xylene	ug/L	ND	2.0	12/12/16 23:05	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/12/16 23:05	
Methylene Chloride	ug/L	ND	2.0	12/12/16 23:05	
Naphthalene	ug/L	ND	1.0	12/12/16 23:05	
o-Xylene	ug/L	ND	1.0	12/12/16 23:05	
p-Isopropyltoluene	ug/L	ND	1.0	12/12/16 23:05	
Styrene	ug/L	ND	1.0	12/12/16 23:05	
Tetrachloroethene	ug/L	ND	1.0	12/12/16 23:05	
Toluene	ug/L	ND	1.0	12/12/16 23:05	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/12/16 23:05	
trans-1,3-Dichloropropene	ug/L	ND	1.0	12/12/16 23:05	
Trichloroethene	ug/L	ND	1.0	12/12/16 23:05	
Trichlorofluoromethane	ug/L	ND	1.0	12/12/16 23:05	
Vinyl acetate	ug/L	ND	2.0	12/12/16 23:05	
Vinyl chloride	ug/L	ND	1.0	12/12/16 23:05	
Xylene (Total)	ug/L	ND	1.0	12/12/16 23:05	
1,2-Dichloroethane-d4 (S)	%	93	70-130	12/12/16 23:05	
4-Bromofluorobenzene (S)	%	100	70-130	12/12/16 23:05	
Toluene-d8 (S)	%	105	70-130	12/12/16 23:05	

LABORATORY CONTROL SAMPLE: 1888306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	46.9	94	70-130	
1,1,1-Trichloroethane	ug/L	50	54.0	108	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	47.4	95	70-130	
1,1,2-Trichloroethane	ug/L	50	53.6	107	70-130	
1,1-Dichloroethane	ug/L	50	53.1	106	70-130	
1,1-Dichloroethene	ug/L	50	56.0	112	70-132	
1,1-Dichloropropene	ug/L	50	53.2	106	70-130	
1,2,3-Trichlorobenzene	ug/L	50	49.6	99	70-135	
1,2,3-Trichloropropane	ug/L	50	45.0	90	70-130	
1,2,4-Trichlorobenzene	ug/L	50	51.2	102	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	43.2	86	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	51.4	103	70-130	
1,2-Dichlorobenzene	ug/L	50	50.6	101	70-130	
1,2-Dichloroethane	ug/L	50	50.5	101	70-130	
1,2-Dichloropropane	ug/L	50	55.5	111	70-130	
1,3-Dichlorobenzene	ug/L	50	51.1	102	70-130	
1,3-Dichloropropane	ug/L	50	52.6	105	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

LABORATORY CONTROL SAMPLE: 1888306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	51.0	102	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1360	136	71-125	L0
2,2-Dichloropropane	ug/L	50	52.4	105	58-145	
2-Butanone (MEK)	ug/L	100	94.0	94	70-145	
2-Chlorotoluene	ug/L	50	52.1	104	70-130	
2-Hexanone	ug/L	100	87.1	87	70-144	
4-Chlorotoluene	ug/L	50	51.2	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	91.7	92	70-140	
Acetone	ug/L	100	83.4	83	50-175	
Benzene	ug/L	50	56.7	113	70-130	
Bromobenzene	ug/L	50	50.5	101	70-130	
Bromochloromethane	ug/L	50	54.8	110	70-130	
Bromodichloromethane	ug/L	50	56.2	112	70-130	
Bromoform	ug/L	50	42.4	85	70-130	
Bromomethane	ug/L	50	46.4	93	54-130	
Carbon tetrachloride	ug/L	50	48.8	98	70-132	
Chlorobenzene	ug/L	50	53.5	107	70-130	
Chloroethane	ug/L	50	56.8	114	64-134	
Chloroform	ug/L	50	53.1	106	70-130	
Chloromethane	ug/L	50	53.1	106	64-130	
cis-1,2-Dichloroethene	ug/L	50	54.1	108	70-131	
cis-1,3-Dichloropropene	ug/L	50	51.8	104	70-130	
Dibromochloromethane	ug/L	50	46.9	94	70-130	
Dibromomethane	ug/L	50	51.2	102	70-131	
Dichlorodifluoromethane	ug/L	50	50.2	100	56-130	
Diisopropyl ether	ug/L	50	52.5	105	70-130	
Ethylbenzene	ug/L	50	52.1	104	70-130	
Hexachloro-1,3-butadiene	ug/L	50	52.5	105	70-130	
m&p-Xylene	ug/L	100	104	104	70-130	
Methyl-tert-butyl ether	ug/L	50	57.1	114	70-130	
Methylene Chloride	ug/L	50	52.7	105	63-130	
Naphthalene	ug/L	50	48.1	96	70-138	
o-Xylene	ug/L	50	51.1	102	70-130	
p-Isopropyltoluene	ug/L	50	48.6	97	70-130	
Styrene	ug/L	50	52.0	104	70-130	
Tetrachloroethene	ug/L	50	47.1	94	70-130	
Toluene	ug/L	50	54.8	110	70-130	
trans-1,2-Dichloroethene	ug/L	50	54.7	109	70-130	
trans-1,3-Dichloropropene	ug/L	50	54.6	109	70-132	
Trichloroethene	ug/L	50	52.0	104	70-130	
Trichlorofluoromethane	ug/L	50	55.3	111	62-133	
Vinyl acetate	ug/L	100	94.3	94	66-157	
Vinyl chloride	ug/L	50	50.0	100	50-150	
Xylene (Total)	ug/L	150	155	103	70-130	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			96	70-130	
Toluene-d8 (S)	%			98	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE SAMPLE: 1888880

Parameter	Units	92322711006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	12.7	64	70-130	M1
1,1,1-Trichloroethane	ug/L	ND	20	16.5	82	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	12.2	61	70-130	M1
1,1,2-Trichloroethane	ug/L	ND	20	13.7	68	70-130	M1
1,1-Dichloroethane	ug/L	2.6	20	17.8	76	70-130	
1,1-Dichloroethene	ug/L	23.4	20	38.8	77	70-166	
1,1-Dichloropropene	ug/L	ND	20	14.6	73	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	13.1	65	70-130	M1
1,2,3-Trichloropropane	ug/L	ND	20	12.3	62	70-130	M1
1,2,4-Trichlorobenzene	ug/L	ND	20	13.3	67	70-130	M1
1,2-Dibromo-3-chloropropane	ug/L	ND	20	11.7	59	70-130	M1
1,2-Dibromoethane (EDB)	ug/L	ND	20	13.1	66	70-130	M1
1,2-Dichlorobenzene	ug/L	ND	20	13.9	69	70-130	M1
1,2-Dichloroethane	ug/L	ND	20	14.2	70	70-130	
1,2-Dichloropropane	ug/L	ND	20	14.4	72	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	13.7	68	70-130	M1
1,3-Dichloropropane	ug/L	ND	20	12.8	64	70-130	M1
1,4-Dichlorobenzene	ug/L	ND	20	13.8	69	70-130	M1
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	799	200	70-130	M0
2,2-Dichloropropane	ug/L	ND	20	16.2	81	70-130	
2-Butanone (MEK)	ug/L	ND	40	27.5	69	70-130	M1
2-Chlorotoluene	ug/L	ND	20	14.8	74	70-130	
2-Hexanone	ug/L	ND	40	25.8	65	70-130	M1
4-Chlorotoluene	ug/L	ND	20	14.2	71	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	25.3	63	70-130	M1
Acetone	ug/L	ND	40	25.2	63	70-130	M1
Benzene	ug/L	ND	20	16.0	80	70-148	
Bromobenzene	ug/L	ND	20	13.7	69	70-130	M1
Bromochloromethane	ug/L	ND	20	15.0	75	70-130	
Bromodichloromethane	ug/L	ND	20	15.0	75	70-130	
Bromoform	ug/L	ND	20	11.9	59	70-130	M1
Bromomethane	ug/L	ND	20	16.9	84	70-130	
Carbon tetrachloride	ug/L	ND	20	15.5	77	70-130	
Chlorobenzene	ug/L	ND	20	14.8	74	70-146	
Chloroethane	ug/L	ND	20	16.4	82	70-130	
Chloroform	ug/L	ND	20	14.7	74	70-130	
Chloromethane	ug/L	ND	20	16.2	81	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	15.3	77	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	12.8	64	70-130	M1
Dibromochloromethane	ug/L	ND	20	12.8	64	70-130	M1
Dibromomethane	ug/L	ND	20	14.3	72	70-130	
Dichlorodifluoromethane	ug/L	ND	20	15.7	78	70-130	
Diisopropyl ether	ug/L	ND	20	13.7	69	70-130	M1
Ethylbenzene	ug/L	ND	20	15.2	76	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	15.4	77	70-130	
m&p-Xylene	ug/L	ND	40	30.8	77	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	14.4	72	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE SAMPLE: 1888880

Parameter	Units	92322711006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	ND	20	13.8	69	70-130	M1
Naphthalene	ug/L	ND	20	12.5	62	70-130	M1
o-Xylene	ug/L	ND	20	14.8	74	70-130	
p-Isopropyltoluene	ug/L	ND	20	13.6	68	70-130	M1
Styrene	ug/L	ND	20	14.3	71	70-130	
Tetrachloroethene	ug/L	ND	20	14.1	71	70-130	
Toluene	ug/L	ND	20	16.0	80	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	15.2	76	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	13.0	65	70-130	M1
Trichloroethene	ug/L	ND	20	14.6	73	69-151	
Trichlorofluoromethane	ug/L	ND	20	19.0	95	70-130	
Vinyl acetate	ug/L	ND	40	25.9	65	70-130	M1
Vinyl chloride	ug/L	ND	20	15.6	78	70-130	
1,2-Dichloroethane-d4 (S)	%				95	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1888879

Parameter	Units	92322711003 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	
1,4-Dioxane (p-Dioxane)	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	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

SAMPLE DUPLICATE: 1888879

Parameter	Units	92322711003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acetone	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
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	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	.38J		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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	96	95	0		
4-Bromofluorobenzene (S)	%	103	102	1		
Toluene-d8 (S)	%	108	109	1		

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340466 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92322711001, 92322711002, 92322711004, 92322711005, 92322711018, 92322711021

METHOD BLANK: 1888321 Matrix: Water
Associated Lab Samples: 92322711001, 92322711002, 92322711004, 92322711005, 92322711018, 92322711021

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/12/16 23:22	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/12/16 23:22	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/12/16 23:22	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/12/16 23:22	
1,1-Dichloroethane	ug/L	ND	1.0	12/12/16 23:22	
1,1-Dichloroethene	ug/L	ND	1.0	12/12/16 23:22	
1,1-Dichloropropene	ug/L	ND	1.0	12/12/16 23:22	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/12/16 23:22	
1,2,3-Trichloropropane	ug/L	ND	1.0	12/12/16 23:22	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/12/16 23:22	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	12/12/16 23:22	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/12/16 23:22	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/12/16 23:22	
1,2-Dichloroethane	ug/L	ND	1.0	12/12/16 23:22	
1,2-Dichloropropane	ug/L	ND	1.0	12/12/16 23:22	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/12/16 23:22	
1,3-Dichloropropane	ug/L	ND	1.0	12/12/16 23:22	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/12/16 23:22	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	12/12/16 23:22	
2,2-Dichloropropane	ug/L	ND	1.0	12/12/16 23:22	
2-Butanone (MEK)	ug/L	ND	5.0	12/12/16 23:22	
2-Chlorotoluene	ug/L	ND	1.0	12/12/16 23:22	
2-Hexanone	ug/L	ND	5.0	12/12/16 23:22	
4-Chlorotoluene	ug/L	ND	1.0	12/12/16 23:22	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/12/16 23:22	
Acetone	ug/L	ND	25.0	12/12/16 23:22	
Benzene	ug/L	ND	1.0	12/12/16 23:22	
Bromobenzene	ug/L	ND	1.0	12/12/16 23:22	
Bromochloromethane	ug/L	ND	1.0	12/12/16 23:22	
Bromodichloromethane	ug/L	ND	1.0	12/12/16 23:22	
Bromoform	ug/L	ND	1.0	12/12/16 23:22	
Bromomethane	ug/L	ND	2.0	12/12/16 23:22	
Carbon tetrachloride	ug/L	ND	1.0	12/12/16 23:22	
Chlorobenzene	ug/L	ND	1.0	12/12/16 23:22	
Chloroethane	ug/L	ND	1.0	12/12/16 23:22	
Chloroform	ug/L	ND	1.0	12/12/16 23:22	
Chloromethane	ug/L	ND	1.0	12/12/16 23:22	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/12/16 23:22	
cis-1,3-Dichloropropene	ug/L	ND	1.0	12/12/16 23:22	
Dibromochloromethane	ug/L	ND	1.0	12/12/16 23:22	
Dibromomethane	ug/L	ND	1.0	12/12/16 23:22	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

METHOD BLANK: 1888321 Matrix: Water
Associated Lab Samples: 92322711001, 92322711002, 92322711004, 92322711005, 92322711018, 92322711021

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	12/12/16 23:22	
Diisopropyl ether	ug/L	ND	1.0	12/12/16 23:22	
Ethylbenzene	ug/L	ND	1.0	12/12/16 23:22	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/12/16 23:22	
m&p-Xylene	ug/L	ND	2.0	12/12/16 23:22	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/12/16 23:22	
Methylene Chloride	ug/L	ND	2.0	12/12/16 23:22	
Naphthalene	ug/L	ND	1.0	12/12/16 23:22	
o-Xylene	ug/L	ND	1.0	12/12/16 23:22	
p-Isopropyltoluene	ug/L	ND	1.0	12/12/16 23:22	
Styrene	ug/L	ND	1.0	12/12/16 23:22	
Tetrachloroethene	ug/L	ND	1.0	12/12/16 23:22	
Toluene	ug/L	ND	1.0	12/12/16 23:22	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/12/16 23:22	
trans-1,3-Dichloropropene	ug/L	ND	1.0	12/12/16 23:22	
Trichloroethene	ug/L	ND	1.0	12/12/16 23:22	
Trichlorofluoromethane	ug/L	ND	1.0	12/12/16 23:22	
Vinyl acetate	ug/L	ND	2.0	12/12/16 23:22	
Vinyl chloride	ug/L	ND	1.0	12/12/16 23:22	
Xylene (Total)	ug/L	ND	1.0	12/12/16 23:22	
1,2-Dichloroethane-d4 (S)	%	93	70-130	12/12/16 23:22	
4-Bromofluorobenzene (S)	%	101	70-130	12/12/16 23:22	
Toluene-d8 (S)	%	105	70-130	12/12/16 23:22	

LABORATORY CONTROL SAMPLE: 1888322

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.1	96	70-130	
1,1,1-Trichloroethane	ug/L	50	50.6	101	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	47.4	95	70-130	
1,1,2-Trichloroethane	ug/L	50	54.2	108	70-130	
1,1-Dichloroethane	ug/L	50	50.6	101	70-130	
1,1-Dichloroethene	ug/L	50	51.5	103	70-132	
1,1-Dichloropropene	ug/L	50	49.6	99	70-130	
1,2,3-Trichlorobenzene	ug/L	50	49.2	98	70-135	
1,2,3-Trichloropropane	ug/L	50	45.4	91	70-130	
1,2,4-Trichlorobenzene	ug/L	50	50.1	100	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	42.9	86	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	50.8	102	70-130	
1,2-Dichlorobenzene	ug/L	50	50.0	100	70-130	
1,2-Dichloroethane	ug/L	50	49.2	98	70-130	
1,2-Dichloropropane	ug/L	50	54.6	109	70-130	
1,3-Dichlorobenzene	ug/L	50	50.3	101	70-130	
1,3-Dichloropropane	ug/L	50	51.7	103	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

LABORATORY CONTROL SAMPLE: 1888322

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	49.5	99	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1470	147	71-125	L0
2,2-Dichloropropane	ug/L	50	48.6	97	58-145	
2-Butanone (MEK)	ug/L	100	95.1	95	70-145	
2-Chlorotoluene	ug/L	50	51.9	104	70-130	
2-Hexanone	ug/L	100	92.4	92	70-144	
4-Chlorotoluene	ug/L	50	50.8	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	96.1	96	70-140	
Acetone	ug/L	100	87.8	88	50-175	
Benzene	ug/L	50	55.6	111	70-130	
Bromobenzene	ug/L	50	48.2	96	70-130	
Bromochloromethane	ug/L	50	54.1	108	70-130	
Bromodichloromethane	ug/L	50	55.3	111	70-130	
Bromoform	ug/L	50	42.9	86	70-130	
Bromomethane	ug/L	50	46.5	93	54-130	
Carbon tetrachloride	ug/L	50	46.3	93	70-132	
Chlorobenzene	ug/L	50	53.1	106	70-130	
Chloroethane	ug/L	50	51.8	104	64-134	
Chloroform	ug/L	50	51.1	102	70-130	
Chloromethane	ug/L	50	49.7	99	64-130	
cis-1,2-Dichloroethene	ug/L	50	51.0	102	70-131	
cis-1,3-Dichloropropene	ug/L	50	51.1	102	70-130	
Dibromochloromethane	ug/L	50	46.6	93	70-130	
Dibromomethane	ug/L	50	50.5	101	70-131	
Dichlorodifluoromethane	ug/L	50	45.8	92	56-130	
Diisopropyl ether	ug/L	50	51.5	103	70-130	
Ethylbenzene	ug/L	50	52.0	104	70-130	
Hexachloro-1,3-butadiene	ug/L	50	51.4	103	70-130	
m&p-Xylene	ug/L	100	102	102	70-130	
Methyl-tert-butyl ether	ug/L	50	56.1	112	70-130	
Methylene Chloride	ug/L	50	50.7	101	63-130	
Naphthalene	ug/L	50	48.7	97	70-138	
o-Xylene	ug/L	50	50.9	102	70-130	
p-Isopropyltoluene	ug/L	50	47.2	94	70-130	
Styrene	ug/L	50	51.8	104	70-130	
Tetrachloroethene	ug/L	50	46.9	94	70-130	
Toluene	ug/L	50	53.6	107	70-130	
trans-1,2-Dichloroethene	ug/L	50	51.4	103	70-130	
trans-1,3-Dichloropropene	ug/L	50	54.2	108	70-132	
Trichloroethene	ug/L	50	50.0	100	70-130	
Trichlorofluoromethane	ug/L	50	51.1	102	62-133	
Vinyl acetate	ug/L	100	93.3	93	66-157	
Vinyl chloride	ug/L	50	45.6	91	50-150	
Xylene (Total)	ug/L	150	153	102	70-130	
1,2-Dichloroethane-d4 (S)	%			97	70-130	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			99	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888323 1888324

Parameter	Units	92322858003 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	20	20	18.8	20.4	94	102	70-130	8	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	24.9	25.8	124	129	70-130	4	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	18.6	20.1	93	100	70-130	8	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	21.4	23.0	107	115	70-130	7	30	
1,1-Dichloroethane	ug/L	ND	20	20	24.7	25.0	124	125	70-130	1	30	
1,1-Dichloroethene	ug/L	ND	20	20	26.9	27.9	134	139	70-166	4	30	
1,1-Dichloropropene	ug/L	ND	20	20	23.1	23.5	115	117	70-130	2	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	17.7	19.3	89	96	70-130	9	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	18.3	20.0	92	100	70-130	9	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	18.1	19.6	91	98	70-130	8	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	20	16.3	18.2	82	91	70-130	11	30	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	21.1	21.5	106	108	70-130	2	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	20.4	22.0	102	110	70-130	8	30	
1,2-Dichloroethane	ug/L	ND	20	20	22.1	23.1	110	115	70-130	5	30	
1,2-Dichloropropane	ug/L	ND	20	20	22.5	24.2	112	121	70-130	8	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	20.7	22.0	104	110	70-130	6	30	
1,3-Dichloropropane	ug/L	ND	20	20	20.4	20.7	102	104	70-130	2	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	20.3	21.7	102	109	70-130	7	30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	404	633	101	158	70-130	44	30	M0,R1
2,2-Dichloropropane	ug/L	ND	20	20	18.5	19.9	93	100	70-130	7	30	
2-Butanone (MEK)	ug/L	ND	40	40	43.4	46.2	109	116	70-130	6	30	
2-Chlorotoluene	ug/L	ND	20	20	22.0	23.8	110	119	70-130	8	30	
2-Hexanone	ug/L	ND	40	40	37.0	40.7	92	102	70-130	10	30	
4-Chlorotoluene	ug/L	ND	20	20	21.1	22.6	105	113	70-130	7	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40	38.5	42.1	96	105	70-130	9	30	
Acetone	ug/L	ND	40	40	41.6	43.5	104	109	70-130	4	30	
Benzene	ug/L	4.3	20	20	30.7	31.9	132	138	70-148	4	30	
Bromobenzene	ug/L	ND	20	20	20.1	21.1	100	106	70-130	5	30	
Bromochloromethane	ug/L	ND	20	20	25.2	25.7	126	128	70-130	2	30	
Bromodichloromethane	ug/L	ND	20	20	23.6	24.7	118	124	70-130	5	30	
Bromoform	ug/L	ND	20	20	16.4	17.5	82	88	70-130	7	30	
Bromomethane	ug/L	ND	20	20	20.7	23.7	104	119	70-130	13	30	
Carbon tetrachloride	ug/L	ND	20	20	22.5	25.0	112	125	70-130	11	30	
Chlorobenzene	ug/L	ND	20	20	22.7	23.9	113	119	70-146	5	30	
Chloroethane	ug/L	ND	20	20	25.9	26.8	130	134	70-130	4	30	M1
Chloroform	ug/L	ND	20	20	23.7	25.3	118	126	70-130	7	30	
Chloromethane	ug/L	ND	20	20	26.8	27.4	134	137	70-130	2	30	M1
cis-1,2-Dichloroethene	ug/L	ND	20	20	24.5	25.1	122	126	70-130	3	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	18.5	20.1	92	101	70-130	8	30	
Dibromochloromethane	ug/L	ND	20	20	19.1	19.5	95	98	70-130	2	30	
Dibromomethane	ug/L	ND	20	20	22.2	23.3	111	117	70-130	5	30	
Dichlorodifluoromethane	ug/L	ND	20	20	25.0	25.4	125	127	70-130	2	30	
Diisopropyl ether	ug/L	ND	20	20	21.3	22.5	107	112	70-130	5	30	
Ethylbenzene	ug/L	ND	20	20	23.8	25.0	119	125	70-130	5	30	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888323 1888324

Parameter	Units	92322858003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Hexachloro-1,3-butadiene	ug/L	ND	20	20	17.4	19.9	87	99	70-130	13	30	
m&p-Xylene	ug/L	ND	40	40	48.3	49.7	121	124	70-130	3	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	21.8	22.7	109	113	70-130	4	30	
Methylene Chloride	ug/L	ND	20	20	23.2	24.1	116	121	70-130	4	30	
Naphthalene	ug/L	ND	20	20	16.7	18.3	83	92	70-130	9	30	
o-Xylene	ug/L	ND	20	20	23.2	24.0	116	120	70-130	3	30	
p-Isopropyltoluene	ug/L	ND	20	20	19.4	21.9	97	109	70-130	12	30	
Styrene	ug/L	ND	20	20	22.7	23.5	113	117	70-130	3	30	
Tetrachloroethene	ug/L	ND	20	20	20.6	20.9	103	105	70-130	2	30	
Toluene	ug/L	ND	20	20	24.0	26.0	120	130	70-155	8	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	25.6	26.6	128	133	70-130	4	30	M1
trans-1,3-Dichloropropene	ug/L	ND	20	20	18.6	20.6	93	103	70-130	10	30	
Trichloroethene	ug/L	ND	20	20	22.5	24.3	113	121	69-151	7	30	
Trichlorofluoromethane	ug/L	ND	20	20	29.0	30.0	145	150	70-130	3	30	M1
Vinyl acetate	ug/L	ND	40	40	26.5	28.2	66	71	70-130	6	30	M1
Vinyl chloride	ug/L	ND	20	20	24.9	25.7	125	128	70-130	3	30	
1,2-Dichloroethane-d4 (S)	%						100	96	70-130			
4-Bromofluorobenzene (S)	%						105	100	70-130			
Toluene-d8 (S)	%						99	100	70-130			

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340602 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92322711009, 92322711010, 92322711011, 92322711013, 92322711020, 92322711022, 92322711023

METHOD BLANK: 1888927 Matrix: Water
Associated Lab Samples: 92322711009, 92322711010, 92322711011, 92322711013, 92322711020, 92322711022, 92322711023

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/13/16 12:54	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/13/16 12:54	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/13/16 12:54	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/13/16 12:54	
1,1-Dichloroethane	ug/L	ND	1.0	12/13/16 12:54	
1,1-Dichloroethene	ug/L	ND	1.0	12/13/16 12:54	
1,1-Dichloropropene	ug/L	ND	1.0	12/13/16 12:54	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/13/16 12:54	
1,2,3-Trichloropropane	ug/L	ND	1.0	12/13/16 12:54	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/13/16 12:54	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	12/13/16 12:54	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/13/16 12:54	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/13/16 12:54	
1,2-Dichloroethane	ug/L	ND	1.0	12/13/16 12:54	
1,2-Dichloropropane	ug/L	ND	1.0	12/13/16 12:54	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/13/16 12:54	
1,3-Dichloropropane	ug/L	ND	1.0	12/13/16 12:54	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/13/16 12:54	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	12/13/16 12:54	
2,2-Dichloropropane	ug/L	ND	1.0	12/13/16 12:54	
2-Butanone (MEK)	ug/L	ND	5.0	12/13/16 12:54	
2-Chlorotoluene	ug/L	ND	1.0	12/13/16 12:54	
2-Hexanone	ug/L	ND	5.0	12/13/16 12:54	
4-Chlorotoluene	ug/L	ND	1.0	12/13/16 12:54	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/13/16 12:54	
Acetone	ug/L	ND	25.0	12/13/16 12:54	
Benzene	ug/L	ND	1.0	12/13/16 12:54	
Bromobenzene	ug/L	ND	1.0	12/13/16 12:54	
Bromochloromethane	ug/L	ND	1.0	12/13/16 12:54	
Bromodichloromethane	ug/L	ND	1.0	12/13/16 12:54	
Bromoform	ug/L	ND	1.0	12/13/16 12:54	
Bromomethane	ug/L	ND	2.0	12/13/16 12:54	
Carbon tetrachloride	ug/L	ND	1.0	12/13/16 12:54	
Chlorobenzene	ug/L	ND	1.0	12/13/16 12:54	
Chloroethane	ug/L	ND	1.0	12/13/16 12:54	
Chloroform	ug/L	ND	1.0	12/13/16 12:54	
Chloromethane	ug/L	ND	1.0	12/13/16 12:54	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/13/16 12:54	
cis-1,3-Dichloropropene	ug/L	ND	1.0	12/13/16 12:54	
Dibromochloromethane	ug/L	ND	1.0	12/13/16 12:54	
Dibromomethane	ug/L	ND	1.0	12/13/16 12:54	

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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

METHOD BLANK: 1888927 Matrix: Water
Associated Lab Samples: 92322711009, 92322711010, 92322711011, 92322711013, 92322711020, 92322711022, 92322711023

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	12/13/16 12:54	
Diisopropyl ether	ug/L	ND	1.0	12/13/16 12:54	
Ethylbenzene	ug/L	ND	1.0	12/13/16 12:54	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/13/16 12:54	
m&p-Xylene	ug/L	ND	2.0	12/13/16 12:54	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/13/16 12:54	
Methylene Chloride	ug/L	ND	2.0	12/13/16 12:54	
Naphthalene	ug/L	ND	1.0	12/13/16 12:54	
o-Xylene	ug/L	ND	1.0	12/13/16 12:54	
p-Isopropyltoluene	ug/L	ND	1.0	12/13/16 12:54	
Styrene	ug/L	ND	1.0	12/13/16 12:54	
Tetrachloroethene	ug/L	ND	1.0	12/13/16 12:54	
Toluene	ug/L	ND	1.0	12/13/16 12:54	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/13/16 12:54	
trans-1,3-Dichloropropene	ug/L	ND	1.0	12/13/16 12:54	
Trichloroethene	ug/L	ND	1.0	12/13/16 12:54	
Trichlorofluoromethane	ug/L	ND	1.0	12/13/16 12:54	
Vinyl acetate	ug/L	ND	2.0	12/13/16 12:54	
Vinyl chloride	ug/L	ND	1.0	12/13/16 12:54	
Xylene (Total)	ug/L	ND	1.0	12/13/16 12:54	
1,2-Dichloroethane-d4 (S)	%	96	70-130	12/13/16 12:54	
4-Bromofluorobenzene (S)	%	103	70-130	12/13/16 12:54	
Toluene-d8 (S)	%	106	70-130	12/13/16 12:54	

LABORATORY CONTROL SAMPLE: 1888928

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.5	97	70-130	
1,1,1-Trichloroethane	ug/L	50	58.1	116	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	48.4	97	70-130	
1,1,2-Trichloroethane	ug/L	50	54.0	108	70-130	
1,1-Dichloroethane	ug/L	50	55.6	111	70-130	
1,1-Dichloroethene	ug/L	50	61.2	122	70-132	
1,1-Dichloropropene	ug/L	50	56.3	113	70-130	
1,2,3-Trichlorobenzene	ug/L	50	47.1	94	70-135	
1,2,3-Trichloropropane	ug/L	50	46.4	93	70-130	
1,2,4-Trichlorobenzene	ug/L	50	49.2	98	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	42.7	85	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	52.2	104	70-130	
1,2-Dichlorobenzene	ug/L	50	49.5	99	70-130	
1,2-Dichloroethane	ug/L	50	51.9	104	70-130	
1,2-Dichloropropane	ug/L	50	56.5	113	70-130	
1,3-Dichlorobenzene	ug/L	50	50.4	101	70-130	
1,3-Dichloropropane	ug/L	50	53.6	107	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

LABORATORY CONTROL SAMPLE: 1888928

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	49.7	99	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1510	151	71-125	L0
2,2-Dichloropropane	ug/L	50	58.1	116	58-145	
2-Butanone (MEK)	ug/L	100	107	107	70-145	
2-Chlorotoluene	ug/L	50	51.9	104	70-130	
2-Hexanone	ug/L	100	96.1	96	70-144	
4-Chlorotoluene	ug/L	50	51.0	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	94.4	94	70-140	
Acetone	ug/L	100	97.2	97	50-175	
Benzene	ug/L	50	58.5	117	70-130	
Bromobenzene	ug/L	50	47.8	96	70-130	
Bromochloromethane	ug/L	50	57.5	115	70-130	
Bromodichloromethane	ug/L	50	56.0	112	70-130	
Bromoform	ug/L	50	43.6	87	70-130	
Bromomethane	ug/L	50	54.4	109	54-130	
Carbon tetrachloride	ug/L	50	52.3	105	70-132	
Chlorobenzene	ug/L	50	54.3	109	70-130	
Chloroethane	ug/L	50	58.8	118	64-134	
Chloroform	ug/L	50	55.5	111	70-130	
Chloromethane	ug/L	50	57.7	115	64-130	
cis-1,2-Dichloroethene	ug/L	50	56.3	113	70-131	
cis-1,3-Dichloropropene	ug/L	50	52.7	105	70-130	
Dibromochloromethane	ug/L	50	49.0	98	70-130	
Dibromomethane	ug/L	50	52.1	104	70-131	
Dichlorodifluoromethane	ug/L	50	52.4	105	56-130	
Diisopropyl ether	ug/L	50	54.2	108	70-130	
Ethylbenzene	ug/L	50	54.5	109	70-130	
Hexachloro-1,3-butadiene	ug/L	50	52.6	105	70-130	
m&p-Xylene	ug/L	100	111	111	70-130	
Methyl-tert-butyl ether	ug/L	50	58.2	116	70-130	
Methylene Chloride	ug/L	50	55.1	110	63-130	
Naphthalene	ug/L	50	46.0	92	70-138	
o-Xylene	ug/L	50	54.3	109	70-130	
p-Isopropyltoluene	ug/L	50	48.2	96	70-130	
Styrene	ug/L	50	55.8	112	70-130	
Tetrachloroethene	ug/L	50	49.7	99	70-130	
Toluene	ug/L	50	54.2	108	70-130	
trans-1,2-Dichloroethene	ug/L	50	59.0	118	70-130	
trans-1,3-Dichloropropene	ug/L	50	55.6	111	70-132	
Trichloroethene	ug/L	50	53.6	107	70-130	
Trichlorofluoromethane	ug/L	50	59.7	119	62-133	
Vinyl acetate	ug/L	100	101	101	66-157	
Vinyl chloride	ug/L	50	53.1	106	50-150	
Xylene (Total)	ug/L	150	165	110	70-130	
1,2-Dichloroethane-d4 (S)	%			103	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			98	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888929 1888930

Parameter	Units	92322711011 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	25.8	27.3	65	68	70-130	5	30	M1
1,1,1-Trichloroethane	ug/L	20.7	40	40	53.3	54.4	81	84	70-130	2	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	24.6	26.4	62	66	70-130	7	30	M1
1,1,2-Trichloroethane	ug/L	ND	40	40	29.0	31.1	73	78	70-130	7	30	
1,1-Dichloroethane	ug/L	56.6	40	40	82.0	84.1	64	69	70-130	3	30	M1
1,1-Dichloroethene	ug/L	254	40	40	248	257	-16	6	70-166	4	30	M1
1,1-Dichloropropene	ug/L	ND	40	40	30.8	31.2	77	78	70-130	1	30	
1,2,3-Trichlorobenzene	ug/L	ND	40	40	25.1	25.4	63	64	70-130	1	30	M1
1,2,3-Trichloropropane	ug/L	ND	40	40	24.5	25.2	61	63	70-130	3	30	M1
1,2,4-Trichlorobenzene	ug/L	ND	40	40	26.2	26.0	65	65	70-130	1	30	M1
1,2-Dibromo-3-chloropropane	ug/L	ND	40	40	23.0	23.5	57	59	70-130	2	30	M1
1,2-Dibromoethane (EDB)	ug/L	ND	40	40	26.9	27.8	67	69	70-130	3	30	M1
1,2-Dichlorobenzene	ug/L	ND	40	40	27.4	27.7	69	69	70-130	1	30	M1
1,2-Dichloroethane	ug/L	2.9	40	40	30.9	31.4	70	71	70-130	2	30	
1,2-Dichloropropane	ug/L	ND	40	40	30.6	31.6	77	79	70-130	3	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	27.7	28.7	69	72	70-130	3	30	M1
1,3-Dichloropropane	ug/L	ND	40	40	27.3	28.8	68	72	70-130	5	30	M1
1,4-Dichlorobenzene	ug/L	ND	40	40	27.5	28.0	69	70	70-130	2	30	M1
1,4-Dioxane (p-Dioxane)	ug/L	ND	800	800	1150	1360	144	170	70-130	17	30	M0
2,2-Dichloropropane	ug/L	ND	40	40	27.5	27.7	69	69	70-130	1	30	M1
2-Butanone (MEK)	ug/L	ND	80	80	58.1	60.8	73	76	70-130	4	30	
2-Chlorotoluene	ug/L	ND	40	40	30.2	30.3	75	76	70-130	0	30	
2-Hexanone	ug/L	ND	80	80	50.6	52.5	63	66	70-130	4	30	M1
4-Chlorotoluene	ug/L	ND	40	40	28.9	29.1	72	73	70-130	1	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	80	80	52.9	55.0	66	69	70-130	4	30	M1
Acetone	ug/L	ND	80	80	59.0	60.3	74	75	70-130	2	30	
Benzene	ug/L	ND	40	40	32.4	34.3	81	86	70-148	6	30	
Bromobenzene	ug/L	ND	40	40	26.6	26.9	66	67	70-130	1	30	M1
Bromochloromethane	ug/L	ND	40	40	32.5	33.2	81	83	70-130	2	30	
Bromodichloromethane	ug/L	ND	40	40	29.9	31.6	75	79	70-130	6	30	
Bromoform	ug/L	ND	40	40	24.1	25.3	60	63	70-130	5	30	M1
Bromomethane	ug/L	ND	40	40	30.1	30.6	75	76	70-130	2	30	
Carbon tetrachloride	ug/L	ND	40	40	29.5	31.4	74	78	70-130	6	30	
Chlorobenzene	ug/L	ND	40	40	30.3	31.2	76	78	70-146	3	30	
Chloroethane	ug/L	ND	40	40	33.5	34.4	84	86	70-130	3	30	
Chloroform	ug/L	ND	40	40	29.7	31.9	74	80	70-130	7	30	
Chloromethane	ug/L	ND	40	40	35.8	36.7	89	92	70-130	2	30	
cis-1,2-Dichloroethene	ug/L	ND	40	40	31.4	32.1	78	80	70-130	2	30	
cis-1,3-Dichloropropene	ug/L	ND	40	40	25.4	26.8	63	67	70-130	5	30	M1
Dibromochloromethane	ug/L	ND	40	40	25.1	26.5	63	66	70-130	5	30	M1
Dibromomethane	ug/L	ND	40	40	28.1	31.4	70	78	70-130	11	30	
Dichlorodifluoromethane	ug/L	ND	40	40	32.7	33.7	82	84	70-130	3	30	
Diisopropyl ether	ug/L	ND	40	40	28.4	28.6	71	72	70-130	1	30	
Ethylbenzene	ug/L	ND	40	40	31.4	31.9	78	80	70-130	2	30	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888929 1888930

Parameter	Units	92322711011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Hexachloro-1,3-butadiene	ug/L	ND	40	40	27.6	29.6	69	74	70-130	7	30	M1
m&p-Xylene	ug/L	ND	80	80	62.6	65.4	78	82	70-130	4	30	
Methyl-tert-butyl ether	ug/L	ND	40	40	30.2	29.7	74	73	70-130	2	30	
Methylene Chloride	ug/L	ND	40	40	32.6	33.1	79	81	70-130	2	30	
Naphthalene	ug/L	ND	40	40	24.3	24.8	61	62	70-130	2	30	M1
o-Xylene	ug/L	ND	40	40	30.2	31.6	75	79	70-130	5	30	
p-Isopropyltoluene	ug/L	ND	40	40	26.0	26.5	65	66	70-130	2	30	M1
Styrene	ug/L	ND	40	40	29.1	29.8	73	75	70-130	2	30	
Tetrachloroethene	ug/L	ND	40	40	29.0	28.5	72	71	70-130	2	30	
Toluene	ug/L	ND	40	40	31.7	33.1	79	83	70-155	4	30	
trans-1,2-Dichloroethene	ug/L	ND	40	40	32.6	33.9	81	85	70-130	4	30	
trans-1,3-Dichloropropene	ug/L	ND	40	40	25.9	27.1	65	68	70-130	4	30	M1
Trichloroethene	ug/L	ND	40	40	31.2	31.9	78	80	69-151	2	30	
Trichlorofluoromethane	ug/L	ND	40	40	37.4	38.8	94	97	70-130	3	30	
Vinyl acetate	ug/L	ND	80	80	45.6	47.4	57	59	70-130	4	30	M1
Vinyl chloride	ug/L	ND	40	40	30.5	30.5	76	76	70-130	0	30	
1,2-Dichloroethane-d4 (S)	%						96	98	70-130			
4-Bromofluorobenzene (S)	%						104	104	70-130			
Toluene-d8 (S)	%						100	100	70-130			

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340638 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92322711012, 92322711015, 92322711016

METHOD BLANK: 1889287 Matrix: Water
Associated Lab Samples: 92322711012, 92322711015, 92322711016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/14/16 01:05	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/14/16 01:05	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/14/16 01:05	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/14/16 01:05	
1,1-Dichloroethane	ug/L	ND	1.0	12/14/16 01:05	
1,1-Dichloroethene	ug/L	ND	1.0	12/14/16 01:05	
1,1-Dichloropropene	ug/L	ND	1.0	12/14/16 01:05	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/14/16 01:05	
1,2,3-Trichloropropane	ug/L	ND	1.0	12/14/16 01:05	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/14/16 01:05	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	12/14/16 01:05	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/14/16 01:05	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/14/16 01:05	
1,2-Dichloroethane	ug/L	ND	1.0	12/14/16 01:05	
1,2-Dichloropropane	ug/L	ND	1.0	12/14/16 01:05	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/14/16 01:05	
1,3-Dichloropropane	ug/L	ND	1.0	12/14/16 01:05	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/14/16 01:05	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	12/14/16 01:05	
2,2-Dichloropropane	ug/L	ND	1.0	12/14/16 01:05	
2-Butanone (MEK)	ug/L	ND	5.0	12/14/16 01:05	
2-Chlorotoluene	ug/L	ND	1.0	12/14/16 01:05	
2-Hexanone	ug/L	ND	5.0	12/14/16 01:05	
4-Chlorotoluene	ug/L	ND	1.0	12/14/16 01:05	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/14/16 01:05	
Acetone	ug/L	ND	25.0	12/14/16 01:05	
Benzene	ug/L	ND	1.0	12/14/16 01:05	
Bromobenzene	ug/L	ND	1.0	12/14/16 01:05	
Bromochloromethane	ug/L	ND	1.0	12/14/16 01:05	
Bromodichloromethane	ug/L	ND	1.0	12/14/16 01:05	
Bromoform	ug/L	ND	1.0	12/14/16 01:05	
Bromomethane	ug/L	ND	2.0	12/14/16 01:05	
Carbon tetrachloride	ug/L	ND	1.0	12/14/16 01:05	
Chlorobenzene	ug/L	ND	1.0	12/14/16 01:05	
Chloroethane	ug/L	ND	1.0	12/14/16 01:05	
Chloroform	ug/L	ND	1.0	12/14/16 01:05	
Chloromethane	ug/L	ND	1.0	12/14/16 01:05	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/14/16 01:05	
cis-1,3-Dichloropropene	ug/L	ND	1.0	12/14/16 01:05	
Dibromochloromethane	ug/L	ND	1.0	12/14/16 01:05	
Dibromomethane	ug/L	ND	1.0	12/14/16 01:05	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

METHOD BLANK: 1889287 Matrix: Water
Associated Lab Samples: 92322711012, 92322711015, 92322711016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	12/14/16 01:05	
Diisopropyl ether	ug/L	ND	1.0	12/14/16 01:05	
Ethylbenzene	ug/L	ND	1.0	12/14/16 01:05	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/14/16 01:05	
m&p-Xylene	ug/L	ND	2.0	12/14/16 01:05	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/14/16 01:05	
Methylene Chloride	ug/L	ND	2.0	12/14/16 01:05	
Naphthalene	ug/L	ND	1.0	12/14/16 01:05	
o-Xylene	ug/L	ND	1.0	12/14/16 01:05	
p-Isopropyltoluene	ug/L	ND	1.0	12/14/16 01:05	
Styrene	ug/L	ND	1.0	12/14/16 01:05	
Tetrachloroethene	ug/L	ND	1.0	12/14/16 01:05	
Toluene	ug/L	ND	1.0	12/14/16 01:05	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/14/16 01:05	
trans-1,3-Dichloropropene	ug/L	ND	1.0	12/14/16 01:05	
Trichloroethene	ug/L	ND	1.0	12/14/16 01:05	
Trichlorofluoromethane	ug/L	ND	1.0	12/14/16 01:05	
Vinyl acetate	ug/L	ND	2.0	12/14/16 01:05	
Vinyl chloride	ug/L	ND	1.0	12/14/16 01:05	
Xylene (Total)	ug/L	ND	1.0	12/14/16 01:05	
1,2-Dichloroethane-d4 (S)	%	94	70-130	12/14/16 01:05	
4-Bromofluorobenzene (S)	%	102	70-130	12/14/16 01:05	
Toluene-d8 (S)	%	109	70-130	12/14/16 01:05	

LABORATORY CONTROL SAMPLE: 1889288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.9	98	70-130	
1,1,1-Trichloroethane	ug/L	50	56.3	113	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.4	99	70-130	
1,1,2-Trichloroethane	ug/L	50	56.1	112	70-130	
1,1-Dichloroethane	ug/L	50	55.7	111	70-130	
1,1-Dichloroethene	ug/L	50	58.5	117	70-132	
1,1-Dichloropropene	ug/L	50	55.0	110	70-130	
1,2,3-Trichlorobenzene	ug/L	50	47.6	95	70-135	
1,2,3-Trichloropropane	ug/L	50	48.2	96	70-130	
1,2,4-Trichlorobenzene	ug/L	50	49.2	98	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	45.9	92	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	52.2	104	70-130	
1,2-Dichlorobenzene	ug/L	50	50.3	101	70-130	
1,2-Dichloroethane	ug/L	50	53.7	107	70-130	
1,2-Dichloropropane	ug/L	50	56.3	113	70-130	
1,3-Dichlorobenzene	ug/L	50	50.1	100	70-130	
1,3-Dichloropropane	ug/L	50	54.2	108	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

LABORATORY CONTROL SAMPLE: 1889288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	50.4	101	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1330	133	71-125	L0
2,2-Dichloropropane	ug/L	50	51.6	103	58-145	
2-Butanone (MEK)	ug/L	100	119	119	70-145	
2-Chlorotoluene	ug/L	50	51.4	103	70-130	
2-Hexanone	ug/L	100	103	103	70-144	
4-Chlorotoluene	ug/L	50	50.9	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	105	70-140	
Acetone	ug/L	100	108	108	50-175	
Benzene	ug/L	50	57.7	115	70-130	
Bromobenzene	ug/L	50	47.3	95	70-130	
Bromochloromethane	ug/L	50	57.9	116	70-130	
Bromodichloromethane	ug/L	50	57.3	115	70-130	
Bromoform	ug/L	50	44.2	88	70-130	
Bromomethane	ug/L	50	55.8	112	54-130	
Carbon tetrachloride	ug/L	50	50.8	102	70-132	
Chlorobenzene	ug/L	50	54.3	109	70-130	
Chloroethane	ug/L	50	59.0	118	64-134	
Chloroform	ug/L	50	55.0	110	70-130	
Chloromethane	ug/L	50	62.9	126	64-130	
cis-1,2-Dichloroethene	ug/L	50	56.1	112	70-131	
cis-1,3-Dichloropropene	ug/L	50	51.3	103	70-130	
Dibromochloromethane	ug/L	50	48.6	97	70-130	
Dibromomethane	ug/L	50	52.9	106	70-131	
Dichlorodifluoromethane	ug/L	50	57.0	114	56-130	
Diisopropyl ether	ug/L	50	55.1	110	70-130	
Ethylbenzene	ug/L	50	53.2	106	70-130	
Hexachloro-1,3-butadiene	ug/L	50	50.8	102	70-130	
m&p-Xylene	ug/L	100	108	108	70-130	
Methyl-tert-butyl ether	ug/L	50	59.9	120	70-130	
Methylene Chloride	ug/L	50	55.8	112	63-130	
Naphthalene	ug/L	50	48.5	97	70-138	
o-Xylene	ug/L	50	53.5	107	70-130	
p-Isopropyltoluene	ug/L	50	47.4	95	70-130	
Styrene	ug/L	50	53.9	108	70-130	
Tetrachloroethene	ug/L	50	49.7	99	70-130	
Toluene	ug/L	50	55.6	111	70-130	
trans-1,2-Dichloroethene	ug/L	50	57.5	115	70-130	
trans-1,3-Dichloropropene	ug/L	50	54.9	110	70-132	
Trichloroethene	ug/L	50	54.2	108	70-130	
Trichlorofluoromethane	ug/L	50	59.8	120	62-133	
Vinyl acetate	ug/L	100	102	102	66-157	
Vinyl chloride	ug/L	50	53.1	106	50-150	
Xylene (Total)	ug/L	150	161	107	70-130	
1,2-Dichloroethane-d4 (S)	%			97	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			97	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1889289 1889290

Parameter	Units	92322711012 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	39.9	40.8	100	102	70-130	2	30	
1,1,1-Trichloroethane	ug/L	26.5	40	40	76.9	80.6	126	135	70-130	5	30	M1
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	40.0	40.8	100	102	70-130	2	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	47.2	47.4	118	119	70-130	0	30	
1,1-Dichloroethane	ug/L	64.0	40	40	112	114	121	125	70-130	1	30	
1,1-Dichloroethene	ug/L	257	40	40	292	296	87	96	70-166	1	30	
1,1-Dichloropropene	ug/L	ND	40	40	50.1	51.4	125	129	70-130	3	30	
1,2,3-Trichlorobenzene	ug/L	ND	40	40	36.3	35.7	91	89	70-130	2	30	
1,2,3-Trichloropropane	ug/L	ND	40	40	39.2	39.8	98	100	70-130	1	30	
1,2,4-Trichlorobenzene	ug/L	ND	40	40	38.6	38.7	97	97	70-130	0	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	40	40	34.6	33.6	86	84	70-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	ND	40	40	41.9	43.6	105	109	70-130	4	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	41.3	42.0	103	105	70-130	2	30	
1,2-Dichloroethane	ug/L	3.3	40	40	48.1	49.9	112	116	70-130	4	30	
1,2-Dichloropropane	ug/L	ND	40	40	49.8	50.7	125	127	70-130	2	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	43.6	42.2	109	106	70-130	3	30	
1,3-Dichloropropane	ug/L	ND	40	40	43.6	45.5	109	114	70-130	4	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	42.3	42.6	106	106	70-130	1	30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	800	800	1010	1450	126	181	70-130	36	30	M0,R1
2,2-Dichloropropane	ug/L	ND	40	40	48.2	48.6	120	122	70-130	1	30	
2-Butanone (MEK)	ug/L	ND	80	80	95.0	96.1	119	120	70-130	1	30	
2-Chlorotoluene	ug/L	ND	40	40	45.8	45.3	115	113	70-130	1	30	
2-Hexanone	ug/L	ND	80	80	76.9	80.7	96	101	70-130	5	30	
4-Chlorotoluene	ug/L	ND	40	40	44.8	43.9	112	110	70-130	2	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	80	80	85.0	82.8	106	103	70-130	3	30	
Acetone	ug/L	ND	80	80	90.7	86.1	97	91	70-130	5	30	
Benzene	ug/L	ND	40	40	52.6	52.4	131	131	70-148	0	30	
Bromobenzene	ug/L	ND	40	40	41.4	40.8	103	102	70-130	1	30	
Bromochloromethane	ug/L	ND	40	40	51.0	52.6	127	131	70-130	3	30	M1
Bromodichloromethane	ug/L	ND	40	40	48.3	47.9	121	120	70-130	1	30	
Bromoform	ug/L	ND	40	40	35.7	37.5	89	94	70-130	5	30	
Bromomethane	ug/L	ND	40	40	46.6	52.4	117	131	70-130	12	30	M1
Carbon tetrachloride	ug/L	ND	40	40	43.7	43.7	109	109	70-130	0	30	
Chlorobenzene	ug/L	ND	40	40	46.5	47.4	116	118	70-146	2	30	
Chloroethane	ug/L	ND	40	40	54.9	56.5	137	141	70-130	3	30	M1
Chloroform	ug/L	ND	40	40	48.3	49.6	121	124	70-130	3	30	
Chloromethane	ug/L	ND	40	40	54.3	56.4	136	141	70-130	4	30	M1
cis-1,2-Dichloroethene	ug/L	ND	40	40	49.7	50.5	123	125	70-130	1	30	
cis-1,3-Dichloropropene	ug/L	ND	40	40	44.1	44.2	110	111	70-130	0	30	
Dibromochloromethane	ug/L	ND	40	40	38.5	41.0	96	103	70-130	6	30	
Dibromomethane	ug/L	ND	40	40	44.5	44.6	111	112	70-130	0	30	
Dichlorodifluoromethane	ug/L	ND	40	40	48.9	48.5	122	121	70-130	1	30	
Diisopropyl ether	ug/L	ND	40	40	44.4	46.8	111	117	70-130	5	30	
Ethylbenzene	ug/L	ND	40	40	46.9	48.4	117	121	70-130	3	30	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1889289 1889290

Parameter	Units	92322711012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Hexachloro-1,3-butadiene	ug/L	ND	40	40	40.9	41.4	102	104	70-130	1	30	
m&p-Xylene	ug/L	ND	80	80	93.9	97.3	117	122	70-130	4	30	
Methyl-tert-butyl ether	ug/L	ND	40	40	47.0	51.8	117	130	70-130	10	30	
Methylene Chloride	ug/L	ND	40	40	48.5	51.7	121	129	70-130	6	30	
Naphthalene	ug/L	ND	40	40	36.4	36.4	91	91	70-130	0	30	
o-Xylene	ug/L	ND	40	40	45.7	47.7	114	119	70-130	4	30	
p-Isopropyltoluene	ug/L	ND	40	40	41.3	40.2	103	101	70-130	3	30	
Styrene	ug/L	ND	40	40	46.0	47.8	115	120	70-130	4	30	
Tetrachloroethene	ug/L	ND	40	40	43.7	44.2	109	110	70-130	1	30	
Toluene	ug/L	ND	40	40	50.6	49.4	126	123	70-155	2	30	
trans-1,2-Dichloroethene	ug/L	ND	40	40	49.4	52.1	124	130	70-130	5	30	
trans-1,3-Dichloropropene	ug/L	ND	40	40	44.4	45.8	111	114	70-130	3	30	
Trichloroethene	ug/L	ND	40	40	48.0	48.8	120	122	69-151	2	30	
Trichlorofluoromethane	ug/L	ND	40	40	56.1	58.2	140	146	70-130	4	30	M1
Vinyl acetate	ug/L	ND	80	80	78.1	84.7	98	106	70-130	8	30	
Vinyl chloride	ug/L	ND	40	40	47.6	48.5	119	121	70-130	2	30	
1,2-Dichloroethane-d4 (S)	%						92	99	70-130			
4-Bromofluorobenzene (S)	%						98	104	70-130			
Toluene-d8 (S)	%						101	99	70-130			

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340826 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92322711017, 92322711026

METHOD BLANK: 1890542 Matrix: Water
Associated Lab Samples: 92322711017, 92322711026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	12/14/16 13:57	
1,1,1-Trichloroethane	ug/L	ND	1.0	12/14/16 13:57	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/14/16 13:57	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/14/16 13:57	
1,1-Dichloroethane	ug/L	ND	1.0	12/14/16 13:57	
1,1-Dichloroethene	ug/L	ND	1.0	12/14/16 13:57	
1,1-Dichloropropene	ug/L	ND	1.0	12/14/16 13:57	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	12/14/16 13:57	
1,2,3-Trichloropropane	ug/L	ND	1.0	12/14/16 13:57	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	12/14/16 13:57	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	12/14/16 13:57	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	12/14/16 13:57	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/14/16 13:57	
1,2-Dichloroethane	ug/L	ND	1.0	12/14/16 13:57	
1,2-Dichloropropane	ug/L	ND	1.0	12/14/16 13:57	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/14/16 13:57	
1,3-Dichloropropane	ug/L	ND	1.0	12/14/16 13:57	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/14/16 13:57	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	12/14/16 13:57	
2,2-Dichloropropane	ug/L	ND	1.0	12/14/16 13:57	
2-Butanone (MEK)	ug/L	ND	5.0	12/14/16 13:57	
2-Chlorotoluene	ug/L	ND	1.0	12/14/16 13:57	
2-Hexanone	ug/L	ND	5.0	12/14/16 13:57	
4-Chlorotoluene	ug/L	ND	1.0	12/14/16 13:57	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	12/14/16 13:57	
Acetone	ug/L	ND	25.0	12/14/16 13:57	
Benzene	ug/L	ND	1.0	12/14/16 13:57	
Bromobenzene	ug/L	ND	1.0	12/14/16 13:57	
Bromochloromethane	ug/L	ND	1.0	12/14/16 13:57	
Bromodichloromethane	ug/L	ND	1.0	12/14/16 13:57	
Bromoform	ug/L	ND	1.0	12/14/16 13:57	
Bromomethane	ug/L	ND	2.0	12/14/16 13:57	
Carbon tetrachloride	ug/L	ND	1.0	12/14/16 13:57	
Chlorobenzene	ug/L	ND	1.0	12/14/16 13:57	
Chloroethane	ug/L	ND	1.0	12/14/16 13:57	
Chloroform	ug/L	ND	1.0	12/14/16 13:57	
Chloromethane	ug/L	ND	1.0	12/14/16 13:57	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/14/16 13:57	
cis-1,3-Dichloropropene	ug/L	ND	1.0	12/14/16 13:57	
Dibromochloromethane	ug/L	ND	1.0	12/14/16 13:57	
Dibromomethane	ug/L	ND	1.0	12/14/16 13:57	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

METHOD BLANK: 1890542 Matrix: Water
Associated Lab Samples: 92322711017, 92322711026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	12/14/16 13:57	
Diisopropyl ether	ug/L	ND	1.0	12/14/16 13:57	
Ethylbenzene	ug/L	ND	1.0	12/14/16 13:57	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	12/14/16 13:57	
m&p-Xylene	ug/L	ND	2.0	12/14/16 13:57	
Methyl-tert-butyl ether	ug/L	ND	1.0	12/14/16 13:57	
Methylene Chloride	ug/L	ND	2.0	12/14/16 13:57	
Naphthalene	ug/L	ND	1.0	12/14/16 13:57	
o-Xylene	ug/L	ND	1.0	12/14/16 13:57	
p-Isopropyltoluene	ug/L	ND	1.0	12/14/16 13:57	
Styrene	ug/L	ND	1.0	12/14/16 13:57	
Tetrachloroethene	ug/L	ND	1.0	12/14/16 13:57	
Toluene	ug/L	ND	1.0	12/14/16 13:57	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/14/16 13:57	
trans-1,3-Dichloropropene	ug/L	ND	1.0	12/14/16 13:57	
Trichloroethene	ug/L	ND	1.0	12/14/16 13:57	
Trichlorofluoromethane	ug/L	ND	1.0	12/14/16 13:57	
Vinyl acetate	ug/L	ND	2.0	12/14/16 13:57	
Vinyl chloride	ug/L	ND	1.0	12/14/16 13:57	
Xylene (Total)	ug/L	ND	1.0	12/14/16 13:57	
1,2-Dichloroethane-d4 (S)	%	92	70-130	12/14/16 13:57	
4-Bromofluorobenzene (S)	%	101	70-130	12/14/16 13:57	
Toluene-d8 (S)	%	102	70-130	12/14/16 13:57	

LABORATORY CONTROL SAMPLE: 1890543

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	47.9	96	70-130	
1,1,1-Trichloroethane	ug/L	50	54.3	109	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.6	99	70-130	
1,1,2-Trichloroethane	ug/L	50	55.3	111	70-130	
1,1-Dichloroethane	ug/L	50	53.7	107	70-130	
1,1-Dichloroethene	ug/L	50	56.2	112	70-132	
1,1-Dichloropropene	ug/L	50	54.1	108	70-130	
1,2,3-Trichlorobenzene	ug/L	50	45.8	92	70-135	
1,2,3-Trichloropropane	ug/L	50	47.7	95	70-130	
1,2,4-Trichlorobenzene	ug/L	50	47.9	96	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	43.3	87	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	51.6	103	70-130	
1,2-Dichlorobenzene	ug/L	50	50.2	100	70-130	
1,2-Dichloroethane	ug/L	50	49.9	100	70-130	
1,2-Dichloropropane	ug/L	50	55.8	112	70-130	
1,3-Dichlorobenzene	ug/L	50	50.2	100	70-130	
1,3-Dichloropropane	ug/L	50	52.9	106	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

LABORATORY CONTROL SAMPLE: 1890543

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	50.2	100	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1550	155	71-125	L0
2,2-Dichloropropane	ug/L	50	54.9	110	58-145	
2-Butanone (MEK)	ug/L	100	105	105	70-145	
2-Chlorotoluene	ug/L	50	52.3	105	70-130	
2-Hexanone	ug/L	100	98.0	98	70-144	
4-Chlorotoluene	ug/L	50	51.2	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	103	70-140	
Acetone	ug/L	100	92.2	92	50-175	
Benzene	ug/L	50	58.4	117	70-130	
Bromobenzene	ug/L	50	50.9	102	70-130	
Bromochloromethane	ug/L	50	54.9	110	70-130	
Bromodichloromethane	ug/L	50	55.7	111	70-130	
Bromoform	ug/L	50	45.0	90	70-130	
Bromomethane	ug/L	50	55.1	110	54-130	
Carbon tetrachloride	ug/L	50	49.1	98	70-132	
Chlorobenzene	ug/L	50	53.9	108	70-130	
Chloroethane	ug/L	50	57.5	115	64-134	
Chloroform	ug/L	50	53.2	106	70-130	
Chloromethane	ug/L	50	60.4	121	64-130	
cis-1,2-Dichloroethene	ug/L	50	54.0	108	70-131	
cis-1,3-Dichloropropene	ug/L	50	52.7	105	70-130	
Dibromochloromethane	ug/L	50	47.5	95	70-130	
Dibromomethane	ug/L	50	52.5	105	70-131	
Dichlorodifluoromethane	ug/L	50	53.2	106	56-130	
Diisopropyl ether	ug/L	50	53.5	107	70-130	
Ethylbenzene	ug/L	50	53.3	107	70-130	
Hexachloro-1,3-butadiene	ug/L	50	50.4	101	70-130	
m&p-Xylene	ug/L	100	104	104	70-130	
Methyl-tert-butyl ether	ug/L	50	59.6	119	70-130	
Methylene Chloride	ug/L	50	52.1	104	63-130	
Naphthalene	ug/L	50	46.4	93	70-138	
o-Xylene	ug/L	50	50.9	102	70-130	
p-Isopropyltoluene	ug/L	50	48.7	97	70-130	
Styrene	ug/L	50	52.2	104	70-130	
Tetrachloroethene	ug/L	50	49.0	98	70-130	
Toluene	ug/L	50	56.0	112	70-130	
trans-1,2-Dichloroethene	ug/L	50	55.4	111	70-130	
trans-1,3-Dichloropropene	ug/L	50	56.5	113	70-132	
Trichloroethene	ug/L	50	53.7	107	70-130	
Trichlorofluoromethane	ug/L	50	56.4	113	62-133	
Vinyl acetate	ug/L	100	99.6	100	66-157	
Vinyl chloride	ug/L	50	51.2	102	50-150	
Xylene (Total)	ug/L	150	155	103	70-130	
1,2-Dichloroethane-d4 (S)	%			90	70-130	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			100	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE SAMPLE: 1890544

Parameter	Units	92323179003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	23.0	115	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.0	115	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.6	108	70-130	
1,1-Dichloroethane	ug/L	ND	20	21.5	108	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.6	108	70-166	
1,1-Dichloropropene	ug/L	ND	20	20.8	104	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	19.2	96	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	21.7	109	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	19.7	99	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	20.8	104	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	21.7	108	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.7	108	70-130	
1,2-Dichloroethane	ug/L	ND	20	22.5	112	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.9	110	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	21.4	107	70-130	
1,3-Dichloropropane	ug/L	ND	20	22.0	110	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.1	105	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	621	155	70-130	M0
2,2-Dichloropropane	ug/L	ND	20	19.0	95	70-130	
2-Butanone (MEK)	ug/L	ND	40	38.9	97	70-130	
2-Chlorotoluene	ug/L	ND	20	22.4	112	70-130	
2-Hexanone	ug/L	ND	40	44.7	112	70-130	
4-Chlorotoluene	ug/L	ND	20	21.7	109	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	43.7	109	70-130	
Acetone	ug/L	ND	40	52.6	96	70-130	
Benzene	ug/L	ND	20	23.6	114	70-148	
Bromobenzene	ug/L	ND	20	22.1	110	70-130	
Bromochloromethane	ug/L	ND	20	21.7	109	70-130	
Bromodichloromethane	ug/L	ND	20	23.3	116	70-130	
Bromoform	ug/L	ND	20	20.6	103	70-130	
Bromomethane	ug/L	ND	20	18.6	93	70-130	
Carbon tetrachloride	ug/L	ND	20	23.5	117	70-130	
Chlorobenzene	ug/L	ND	20	22.4	112	70-146	
Chloroethane	ug/L	ND	20	24.4	122	70-130	
Chloroform	ug/L	ND	20	21.8	109	70-130	
Chloromethane	ug/L	ND	20	20.5	102	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	22.1	110	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.4	97	70-130	
Dibromochloromethane	ug/L	ND	20	20.0	100	70-130	
Dibromomethane	ug/L	ND	20	21.6	108	70-130	
Dichlorodifluoromethane	ug/L	ND	20	21.3	106	70-130	
Diisopropyl ether	ug/L	ND	20	20.3	98	70-130	
Ethylbenzene	ug/L	4.9	20	28.3	117	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	17.1	86	70-130	
m&p-Xylene	ug/L	14.0	40	61.5	119	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	18.8	94	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

MATRIX SPIKE SAMPLE: 1890544

Parameter	Units	92323179003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	ND	20	17.3	87	70-130	
Naphthalene	ug/L	ND	20	21.8	107	70-130	
o-Xylene	ug/L	1.4	20	23.8	112	70-130	
p-Isopropyltoluene	ug/L	ND	20	21.2	106	70-130	
Styrene	ug/L	ND	20	22.1	110	70-130	
Tetrachloroethene	ug/L	ND	20	21.5	108	70-130	
Toluene	ug/L	ND	20	22.6	112	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	20.9	104	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	20.7	104	70-130	
Trichloroethene	ug/L	ND	20	22.2	111	69-151	
Trichlorofluoromethane	ug/L	ND	20	25.6	128	70-130	
Vinyl acetate	ug/L	ND	40	34.9	87	70-130	
Vinyl chloride	ug/L	ND	20	19.2	96	70-130	
1,2-Dichloroethane-d4 (S)	%				101	70-130	
4-Bromofluorobenzene (S)	%				99	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1891696

Parameter	Units	92323191005 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	
1,4-Dioxane (p-Dioxane)	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	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

SAMPLE DUPLICATE: 1891696

Parameter	Units	92323191005 Result	Dup Result	RPD	Max RPD	Qualifiers
Acetone	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
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	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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	91	113	21		
4-Bromofluorobenzene (S)	%	102	93	9		
Toluene-d8 (S)	%	106	101	5		

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340426 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92322711001, 92322711002, 92322711003, 92322711004, 92322711005, 92322711006, 92322711007, 92322711008, 92322711009, 92322711010, 92322711011, 92322711014, 92322711015, 92322711016, 92322711017

METHOD BLANK: 1888170 Matrix: Water
Associated Lab Samples: 92322711001, 92322711002, 92322711003, 92322711004, 92322711005, 92322711006, 92322711007, 92322711008, 92322711009, 92322711010, 92322711011, 92322711014, 92322711015, 92322711016, 92322711017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	12/12/16 13:30	
1,2-Dichloroethane-d4 (S)	%	97	50-150	12/12/16 13:30	
Toluene-d8 (S)	%	88	50-150	12/12/16 13:30	

LABORATORY CONTROL SAMPLE: 1888171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	20.3	101	71-125	
1,2-Dichloroethane-d4 (S)	%			96	50-150	
Toluene-d8 (S)	%			88	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888172 1888173

Parameter	Units	92322711011 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	202	100	100	296	295	94	93	50-150	0	30	
1,2-Dichloroethane-d4 (S)	%						96	101	50-150		150	
Toluene-d8 (S)	%						87	88	50-150		150	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340459 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92322711012, 92322711020, 92322711022, 92322711023, 92322711025, 92322711026

METHOD BLANK: 1888274 Matrix: Water
Associated Lab Samples: 92322711012, 92322711020, 92322711022, 92322711023, 92322711025, 92322711026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	12/12/16 22:15	
1,2-Dichloroethane-d4 (S)	%	85	50-150	12/12/16 22:15	
Toluene-d8 (S)	%	78	50-150	12/12/16 22:15	

LABORATORY CONTROL SAMPLE: 1888275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	21.0	105	71-125	
1,2-Dichloroethane-d4 (S)	%			85	50-150	
Toluene-d8 (S)	%			80	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888276 1888277

Parameter	Units	92322711012 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	206	50	50	271	283	129	153	50-150	4	30	E,M1
1,2-Dichloroethane-d4 (S)	%						89	84	50-150		150	
Toluene-d8 (S)	%						79	77	50-150		150	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

QC Batch: 340600 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92322711013, 92322711018, 92322711019, 92322711021, 92322711024

METHOD BLANK: 1888923 Matrix: Water
Associated Lab Samples: 92322711013, 92322711018, 92322711019, 92322711021, 92322711024

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	12/13/16 12:23	
1,2-Dichloroethane-d4 (S)	%	83	50-150	12/13/16 12:23	
Toluene-d8 (S)	%	77	50-150	12/13/16 12:23	

LABORATORY CONTROL SAMPLE & LCSD: 1888924 1888925

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	19.0	19.1	95	95	71-125	0	30	
1,2-Dichloroethane-d4 (S)	%				82	88	50-150		150	
Toluene-d8 (S)	%				78	79	50-150		150	

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QUALIFIERS

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

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.

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.

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TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92322711001	**MW-5R**	EPA 8260	340466		
92322711002	**MW-42**	EPA 8260	340466		
92322711003	**MW-18**	EPA 8260	340465		
92322711004	**MW-40D**	EPA 8260	340466		
92322711005	**MW-44**	EPA 8260	340466		
92322711006	**MW-21D**	EPA 8260	340465		
92322711007	**MW-22D**	EPA 8260	340465		
92322711008	**MW-20**	EPA 8260	340465		
92322711009	**MW-04**	EPA 8260	340602		
92322711010	**MW-09**	EPA 8260	340602		
92322711011	**MW-16D**	EPA 8260	340602		
92322711012	**RW-2D-120616**	EPA 8260	340638		
92322711013	**RW-1D-120616**	EPA 8260	340602		
92322711014	**EB-120616**	EPA 8260	340452		
92322711015	**RW-3S-120616**	EPA 8260	340638		
92322711016	**RW-2S-120616**	EPA 8260	340638		
92322711017	**RW-1S-120716**	EPA 8260	340826		
92322711018	**MW-27D-120716**	EPA 8260	340466		
92322711019	**MW-39-120716**	EPA 8260	340465		
92322711020	**MW-43-120716**	EPA 8260	340602		
92322711021	**MW-38R-120716**	EPA 8260	340466		
92322711022	**MW-16-120816**	EPA 8260	340602		
92322711023	**MW-200-120816**	EPA 8260	340602		
92322711024	**MW-03-120816**	EPA 8260	340465		
92322711025	**TRIP BLANKS**	EPA 8260	340465		
92322711026	**MW-100-120616**	EPA 8260	340826		
92322711001	**MW-5R**	EPA 8260B Mod.	340426		
92322711002	**MW-42**	EPA 8260B Mod.	340426		
92322711003	**MW-18**	EPA 8260B Mod.	340426		
92322711004	**MW-40D**	EPA 8260B Mod.	340426		
92322711005	**MW-44**	EPA 8260B Mod.	340426		
92322711006	**MW-21D**	EPA 8260B Mod.	340426		
92322711007	**MW-22D**	EPA 8260B Mod.	340426		
92322711008	**MW-20**	EPA 8260B Mod.	340426		
92322711009	**MW-04**	EPA 8260B Mod.	340426		
92322711010	**MW-09**	EPA 8260B Mod.	340426		
92322711011	**MW-16D**	EPA 8260B Mod.	340426		
92322711012	**RW-2D-120616**	EPA 8260B Mod.	340459		
92322711013	**RW-1D-120616**	EPA 8260B Mod.	340600		

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: FORMER KOP-FLEX ONSITE
Pace Project No.: 92322711

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92322711014	**EB-120616**	EPA 8260B Mod.	340426		
92322711015	**RW-3S-120616**	EPA 8260B Mod.	340426		
92322711016	**RW-2S-120616**	EPA 8260B Mod.	340426		
92322711017	**RW-1S-120716**	EPA 8260B Mod.	340426		
92322711018	**MW-27D-120716**	EPA 8260B Mod.	340600		
92322711019	**MW-39-120716**	EPA 8260B Mod.	340600		
92322711020	**MW-43-120716**	EPA 8260B Mod.	340459		
92322711021	**MW-38R-120716**	EPA 8260B Mod.	340600		
92322711022	**MW-16-120816**	EPA 8260B Mod.	340459		
92322711023	**MW-200-120816**	EPA 8260B Mod.	340459		
92322711024	**MW-03-120816**	EPA 8260B Mod.	340600		
92322711025	**TRIP BLANKS**	EPA 8260B Mod.	340459		
92322711026	**MW-100-120616**	EPA 8260B Mod.	340459		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: **F-CAR-CS-033-Rev.01**	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐ **Eden** ☐ **Greenwood** ☐ **Huntersville** ☐ **Raleigh** ☐ **Mechanicsville** ☐

Sample Condition Upon Receipt

Client Name: WSP Parsons Brinckerhoff **Project #:**

WO# : 92322711

92322711

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

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

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

Date/Initials Person Examining Contents: 12/9/16

Thermometer: ☐ IR Gun ID: T1603

Type of Ice: ☐ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 2.8

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

Temp should be above freezing to 6°C

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.
Samples Field Filtered?	☐ Yes	☐ No	☐ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☐ Yes	☐ No	☐ N/A	9. ~~RW100 not present~~ RW100 RB 12/9/16 ~~6 extra vials RW20 RB0116~~
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☐ N/A	10. 12/6/16 12:00
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: _____

Project Manager SCURF Review: JY **Date:** 12/5/16

Project Manager SRF Review: JY **Date:** 12/9/16

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#: 92322711

PM: KRG Due Date: 12/16/16

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																6												
4																6												
5																5												
6																6												
7																6												
8																6												
9																6												
10																6												
11																6												
12																5												

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 #

11.10

*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 #

pg2

WO# : 92322711

PM: KRG Due Date: 12/16/16

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																												
3																12												
4																5												
5																6												
6																6												
7																6												
8																5												
9																6												
10																6												
11																6												
12																6												

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 #

11.2

*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

pg3

Project # **WO# : 92322711**

PM: KRG Due Date: 12/16/16

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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)	SPST-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																6												
4																6												
5																												
6																												
7 Extra																6												
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.

1 3

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WSP / Parsons Brickerhoff	Report To:	Wallace, Robert	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:		Company Name:	
Suite 300, Herndon, VA 20171				Address:	
Email:		Purchase Order #:	3/4603 90	Pace Quote:	
Phone:	Fax	Project Name:	Former Kop-Flex Onsite	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	4362-1

Regulatory Agency
State / Location
MD

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

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	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: 8260	8260 SIM 1,4-Dioxane	8260 Trip Blank	8260 SIM 1,4 D Trip Blank	Residual Chlorine (Y/N)	9232711
1	MW-5R	Aq	G	12/8/16	1250				6				X						X	X				001
2	MW-42	Aq	G	12/7/16	1320				6				X						X	X				002
3	MW-18	Aq	G	12/7/16	1345				6				X						X	X				003
4	MW-40D	Aq	G	12/7/16	1405				6				X						X	X				004
5	MW-44	Aq	G	12/7/16	1430				5				X						X	X				005
6	MW-21D	Aq	G	12/7/16	1455				6				X						X	X				006
7	MW-22D	Aq	G	12/7/16	1525				6				X						X	X				007
8	MW-20	Aq	G	12/7/16	1550				6				X						X	X				008
9	MW-04	Aq	G	12/7/16	1610				6				X						X	X				009
10	MW-09	Aq	G	12/8/16	0740				6				X						X	X				010
11	MW-16D	Aq	G	12/8/16	0805				6				X						X	X				011
12	MS/MSD-120816	Aq	G	12/8/16	0810				5				X						X	X				MS/MSD of MW-16D 011

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
		12/8/16	1430		12/9/16	1007	2.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER: [signature] DATE Signed: 12/8/16

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

2 3

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WSP / Parsons Brickerhoff	Report To:	Wallace, Robert	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:		Company Name:	
Suite 300, Herndon, VA 20171				Address:	
Email:		Purchase Order #:	31400340	Pace Quote:	
Phone:	Fax	Project Name:	Former Kop-Flex Onsite	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	4362-1

Regulatory Agency
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	8260	8260 SIM 1,4-Dioxane	8260 Trip Blank	8260 SIM 1,4 D Trip Blank	Residual Chlorine (Y/N)	9232711
1	RW-2D-120616	AQ	G	12/6/16	1130				6				X						X	X				012
2	MW-10D	AQ	G	12/6/16	1200				6				X						X	X				026
3	MS/MSD-120616	AQ	G	12/6/16	1130				12				X						X	X				MS/MSD of RW-2D 012-120616
4	RW-1D-120616	AQ	G	12/6/16	1355				5				X						X	X				013
5	EB-120616	AQ	G	12/6/16	1410				6				X						X	X				014
6	RW-3S-120616	AQ	G	12/6/16	1520				6				X						X	X				035
7	RW-2S-120616	AQ	G	12/6/16	1520				6				X						X	X				016
8	RW-1S-120616	AQ	G	12/6/16	0835				5				X						X	X				017
9	MW-27D	AQ	G	12/7/16	0930				6				X						X	X				018
10	MW-39	AQ	G	12/7/16	1000				6				X						X	X				019
11	MW-43	AQ	G	12/7/16	1020				6				X						X	X				020
12	MW-38R	AQ	G	12/7/16	1035				6				X						X	X				021

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		12/8/16	1830	Pace FTL	12/9/16	1007	2.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER: DATE Signed: 12/8/16

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

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

3 3

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WSP / Parsons Brickerhoff	Report To:	Wallace, Robert	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:		Company Name:	
Suite 300, Herndon, VA 20171				Address:	
Email:		Purchase Order #:		Pace Quote:	
Phone:	Fax	Project Name:	Former Kop-Flex Onsite	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	4362-1

Regulatory Agency
State / Location
MD

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM #	SAMPLE ID	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	8260	8260 SIM 1,4-Dioxane	8260 Trip Blank	8260 SIM 1,4 D Trip Blank	Residual Chlorine (Y/N)	
																		Requested Analysis Filtered (Y/N)						9632711
1	MW-16	Ag	G	12/8/16	0840				6				X						X	X					022
2	MW-200	Ag	G	12/8/16	0800				6				X						X	X					023
3	MW-03	Ag	G	12/8/16	0930				6				X						X	X					024
4	Trip Blanks	—	Lab Provided	—					4				X								X	X			025
5																									~~026 extra~~ RG 12/9/16
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		12/8/16	1830	by Pace RVL	12/9/16	1007	2.8 Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER: [signature]

DATE Signed: 12/8/16

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

Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: **F-CAR-CS-033-Rev.01**	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐ **Eden** ☐ **Greenwood** ☐ **Huntersville** ☐ **Raleigh** ☐ **Mechanicsville** ☐

Sample Condition Upon Receipt

Client Name: WSP Parsons Brinckerhoff

Project #:

WO#: 92322711

92322711

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

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

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

Date/Initials Person Examining Contents: 12/9/16

Thermometer: ☐ IR Gun ID: T1603

Type of Ice: ☐ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 2.8

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

Temp should be above freezing to 6°C

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.
Samples Field Filtered?	☐ Yes	☐ No	☐ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☐ Yes	☐ No	☐ N/A	9. ~~MW-100 not present~~ RL 12/9/16 ~~6 extra vials BW 12/9/16~~
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☐ N/A	10. 12/6/16 12:00
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: _____

Project Manager SCURF Review: JY **Date:** 12/9/16

Project Manager SRF Review: JY **Date:** 12/9/16

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#: 92322711

PM: KRG Due Date: 12/16/16

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																6													
4																6													
5																5													
6																6													
7																6													
8																6													
9																6													
10																6													
11																6													
12																5													

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 #

11.10

*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 #

pg2

WO# : 92322711

PM: KRG Due Date: 12/16/16

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																												
3																12												
4																5												
5																6												
6																6												
7																6												
8																5												
9																6												
10																6												
11																6												
12																6												

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 #

11.2

*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

pg3

Project # **WO# : 92322711**

PM: KRG Due Date: 12/16/16

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																6												
4																8												
5																												
6																												
7 Extra																6												
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. 1 3

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WSP / Parsons Brickerhoff	Report To:	Wallace, Robert	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:		Company Name:	
Suite 300, Herndon, VA 20171				Address:	
Email:		Purchase Order #:	2/460390	Pace Quote:	
Phone:	Fax	Project Name:	Former Kop-Flex Onsite	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	4362-1

Regulatory Agency	
State / Location	MD

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM #	SAMPLE ID	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	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: 8260	8260 SIM 1,4-Dioxane	8260 Trip Blank	8260 SIM 1,4 D Trip Blank	Residual Chlorine (Y/N)	9232711
1	MW-5R	Aq	G	12/8/16	1250				6				X						X	X				001
2	MW-42	Aq	G	12/7/16	1320				6				X						X	X				002
3	MW-18	Aq	G	12/7/16	1345				6				X						X	X				003
4	MW-40D	Aq	G	12/7/16	1405				6				X						X	X				004
5	MW-44	Aq	G	12/7/16	1430				5				X						X	X				005
6	MW-21D	Aq	G	12/7/16	1455				6				X						X	X				006
7	MW-22D	Aq	G	12/7/16	1525				6				X						X	X				007
8	MW-20	Aq	G	12/7/16	1550				6				X						X	X				008
9	MW-04	Aq	G	12/7/16	1610				6				X						X	X				009
10	MW-09	Aq	G	12/8/16	0740				6				X						X	X				010
11	MW-16D	Aq	G	12/8/16	0805				6				X						X	X				011
12	MS/MSD-120816	Aq	G	12/8/16	0810				5				X						X	X				MS/MSD of MW-16D 011

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		12/8/16	1830		12/9/16	1007	2.8 Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER:

DATE Signed: 12/8/16

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

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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2 3

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WSP / Parsons Brickerhoff	Report To:	Wallace, Robert	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:		Company Name:	
Suite 300, Herndon, VA 20171				Address:	
Email:		Purchase Order #:	31400390	Pace Quote:	
Phone:	Fax	Project Name:	Former Kop-Flex Onsite	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	4362-1

Regulatory Agency	
State / Location	MD

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM #	SAMPLE ID	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	8260	8260 SIM 1,4-Dioxane	8260 Trip Blank	8260 SIM 1,4 D Trip Blank	Residual Chlorine (Y/N)	9232711
1	RW-2D-120616	Aq	G	12/6/16	1130				6				X					X	X						012
2	~~RW~~ MW-10D	Aq	G	12/6/16	1200				6				X					X	X						026
3	MS/MSD-120616	Aq	G	12/6/16	1130				12				X					X	X						MS/MSD of RW-2D 012-120616
4	RW-1D-120616	Aq	G	12/6/16	1355				5				X					X	X						013
5	EB-120616	Aq	G	12/6/16	1410				6				X					X	X						014
6	RW-3S-120616	Aq	G	12/6/16	1520				6				X					X	X						015
7	RW-2S-120616	Aq	G	12/6/16	1520				6				X					X	X						016
8	RW-1S-120616	Aq	G	12/6/16	0835				5				X					X	X						017
9	MW-27D	Aq	G	12/7/16	0930				6				X					X	X						018
10	MW-39	Aq	G	12/7/16	1000				6				X					X	X						019
11	MW-43	Aq	G	12/7/16	1020				6				X					X	X						020
12	MW-38R	Aq	G	12/7/16	1035				6				X					X	X						021

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
		12/8/16	1830	PACE ITL	12/9/16	1007

SAMPLE CONDITIONS			
TEMP in C	2.8		
Received on Ice (Y/N)	Y		
Custody Sealed Cooler (Y/N)	Y		
Samples Intact (Y/N)	Y		

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER:

DATE Signed: 12/8/16

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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3 3

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:	
Company:	WSP / Parsons Brickerhoff	Report To: Wallace, Robert	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:	Company Name:	Regulatory Agency
Suite 300, Herndon, VA 20171			Address:	
Email:		Purchase Order #:	Pace Quote:	
Phone:	Fax	Project Name: Former Kop-Flex Onsite	Pace Project Manager: kevin.godwin@pacelabs.com,	State / Location
Requested Due Date:		Project #:	Pace Profile #: 4362-1	MD

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM #	SAMPLE ID	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	8260	8260 SIM 1,4-Dioxane	8260 Trip Blank	8260 SIM 1,4 D Trip Blank	Residual Chlorine (Y/N)	9132711
1	MW-16	AQ	G	12/8/16	0840				6				X						X	X				022
2	MW-200	AQ	G	12/8/16	0800				6				X						X	X				023
3	MW-03	AQ	G	12/8/16	0930				6				X						X	X				024
4	Trip Blanks	—	Lab Provided	—					4				X								X	X		025
5																								026 extra JG 12/9/16
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
		12/8/16	1830	Pace MVL	12/9/16	1007	2.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER:

DATE Signed: 12/8/16

WSP | PARSONS BRINCKERHOFF

13530 Dulles Technology Drive
Suite 300
Herndon, VA 20171
Main: 703-709-6500
wsp-pb.com/usa

Laboratory Task Order

Date: 12/01/16

Laboratory Name: Pace Analytical

WSP Project Name: Former Kop-Flex Onsite

WSP Project Manager Contact Information: Eric Johnson, 703-709-6500, eric.johnson@wspgroup.com

WSP Project & Task Numbers: 31400390/04

Terms & Conditions/Cost Reference:
Master Services Agreement (MSA) between WSP USA Corp., its affiliates and subsidiaries including WSP Services, Inc., WSP USA, LLC, and Parsons Brinckerhoff, Inc. (collectively "WSP") and Laboratory (executed on 7/26/16). Note: this Task Order incorporates all terms and conditions agreed to in the executed MSA. This Task Order assumes that work will be completed using standard rates agreed to in the MSA. If non-standard rates are required, Laboratory must communicate the proposed costs in writing prior to initiating work.

Task Description:
The following work is to be completed under this Task Order: Twenty-eight aqueous samples for VOCs using EPA Method 8260 and 1,4-Dioxane using EPA Method 8260 with SIM, plus MS/MSD, trip blanks, field blanks, and duplicates.

The Laboratory will provide sampling containers and supplies including ☒ two coolers, ☒sample containers and preservatives (as required by the method), ☒ two trip blanks, ☒chain-of-custody forms, ☒ one liters deionized water, ☒temperature blanks, ☒custody seals, ☒return labels for the following analysis method(s) and number of samples:

Number of Samples	Media	Analysis Method(s)
28	Aqueous	VOCs (8260), 1,4-Dioxane (8260 w/SIM)
2	Aqueous	MS/MSD
2	Aqueous	Trip Blanks for VOCs (8260), 1,4-Dioxane(8260 w/SIM)
1	Aqueous	Field Blank for VOCs (8260), 1,4-Dioxane (8260 w/SIM)

Special Instructions:
Samples will be collected via HydraSleeve, so MS/MSD will be three 40 mL VOAs each.

The following are project-specific details to be followed:

- The Laboratory will deliver the containers and supplies to the following address by Monday, December 5th:
  Robert Wallace
  WSP | Parsons Brinckerhoff
  13530 Dulles Technology Drive, Suite 300
  Herndon, VA 20171
  703-709-6500
- Acceptable reporting limits must equal Maryland Cleanup Standard for Soil and Groundwater. Compounds that are not detected should be reported to the lowest detectable limit.
- Sampling will commence on Tuesday, December 6th.
- A standard turn-around time of ten business days is requested.

- An Electronic Data Deliverable (EDD) in ERIMS format and a final LEVEL II report in Portable Document Format (PDF) are requested. In accordance with the MSA, penalties will be assessed if the complete and correct data deliverables are not in compliance with the MSA and this Task Order.
- The final EDD and PDF reports should be provided via electronic mail addressed to eric.johnson@wspgroup.com and robert.wallace@wspgroup.com.

Note: if the Laboratory discovers that it is unable to meet the sample container arrival deadline for any reason, WSP is to be notified a minimum of 24 hours before the deadline and the Laboratory must provide an alternate deadline, which cannot exceed 24 to 48 hours beyond the original deadline.

If required, project-specific certificates of insurance and any additional documents noted above must be submitted via e-mail to: WSPEEUSA-Contracts@WSPGroup.com before commencing work under this Task Order.

Task Invoicing:
Laboratory is to submit invoices to WSP USA Corp., Attention: **Environment Accounts Payable**, and submit them via email to: AccountsPayable@WSPGroup.com or via regular mail to: **WSP, Environmental Accounts Payable**, 13530 Dulles Technology Drive, Suite 300, Herndon, VA 20171. **All invoices must reference the WSP project number and laboratory project identification number.**

A copy of the final invoice should also be e-mailed to eric.johnson@wspgroup.com.

The work described in this Task Order is authorized by:

WSP Signature: Robert E. Johnson

Printed Name: Robert E. Johnson

Title: Senior Technical Manager

Date: December 1, 2016

The work described in this Task Order is accepted by:

Laboratory Signature: _____

Printed Name: _____

Title: _____

Date: _____

Please sign and return the original of this Task Order to Rob Wallace at robert.wallace@wspgroup.com.

REV. 06/01/2016

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

January 12, 2017

Eric Johnson
WSP Environmental Strategies
11190 Sunrise Valley Dr.
Suite #300
Reston, VA 20191

RE: Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Dear Eric Johnson:
Enclosed are the analytical results for sample(s) received by the laboratory on January 04, 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,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Keith Green, WSP Environmental Strategies

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without the written consent of Pace Analytical Services, LLC.

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

CERTIFICATIONS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

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

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

SAMPLE SUMMARY

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92325191001	**MW-23-010217**	Water	01/02/17 08:05	01/04/17 11:35
92325191002	**MW-41D-010217**	Water	01/02/17 12:10	01/04/17 11:35
92325191003	**MW-1D-010217**	Water	01/02/17 12:50	01/04/17 11:35
92325191004	**TRIP BLANK**	Water	01/02/17 00:00	01/04/17 11:35

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92325191001	**MW-23-010217**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92325191002	**MW-41D-010217**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92325191003	**MW-1D-010217**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92325191004	**TRIP BLANK**	EPA 8260	ZDO	64	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C

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

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: MW-23-010217 **Lab ID: 92325191001** Collected: 01/02/17 08:05 Received: 01/04/17 11:35 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		01/12/17 00:02	67-64-1	
Benzene	ND	ug/L	2.0	2		01/12/17 00:02	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		01/12/17 00:02	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		01/12/17 00:02	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		01/12/17 00:02	75-27-4	
Bromoform	ND	ug/L	2.0	2		01/12/17 00:02	75-25-2	
Bromomethane	ND	ug/L	4.0	2		01/12/17 00:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		01/12/17 00:02	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		01/12/17 00:02	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		01/12/17 00:02	108-90-7	
Chloroethane	ND	ug/L	2.0	2		01/12/17 00:02	75-00-3	
Chloroform	ND	ug/L	2.0	2		01/12/17 00:02	67-66-3	
Chloromethane	ND	ug/L	2.0	2		01/12/17 00:02	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		01/12/17 00:02	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		01/12/17 00:02	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		01/12/17 00:02	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		01/12/17 00:02	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		01/12/17 00:02	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		01/12/17 00:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		01/12/17 00:02	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		01/12/17 00:02	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		01/12/17 00:02	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		01/12/17 00:02	75-71-8	
1,1-Dichloroethane	**26.4**	ug/L	2.0	2		01/12/17 00:02	75-34-3	
1,2-Dichloroethane	ND	ug/L	2.0	2		01/12/17 00:02	107-06-2	
1,1-Dichloroethene	**140**	ug/L	2.0	2		01/12/17 00:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		01/12/17 00:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		01/12/17 00:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		01/12/17 00:02	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		01/12/17 00:02	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		01/12/17 00:02	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		01/12/17 00:02	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		01/12/17 00:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		01/12/17 00:02	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		01/12/17 00:02	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	300	2		01/12/17 00:02	123-91-1	L3
Ethylbenzene	ND	ug/L	2.0	2		01/12/17 00:02	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		01/12/17 00:02	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		01/12/17 00:02	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		01/12/17 00:02	99-87-6	
Methylene Chloride	**8.3**	ug/L	4.0	2		01/12/17 00:02	75-09-2	C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		01/12/17 00:02	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		01/12/17 00:02	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		01/12/17 00:02	91-20-3	
Styrene	ND	ug/L	2.0	2		01/12/17 00:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		01/12/17 00:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		01/12/17 00:02	79-34-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: MW-23-010217 **Lab ID: 92325191001** Collected: 01/02/17 08:05 Received: 01/04/17 11:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	2.0	2		01/12/17 00:02	127-18-4	
Toluene	ND	ug/L	2.0	2		01/12/17 00:02	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		01/12/17 00:02	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		01/12/17 00:02	120-82-1	
1,1,1-Trichloroethane	**17.0**	ug/L	2.0	2		01/12/17 00:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		01/12/17 00:02	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		01/12/17 00:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		01/12/17 00:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		01/12/17 00:02	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		01/12/17 00:02	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		01/12/17 00:02	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		01/12/17 00:02	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		01/12/17 00:02	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		01/12/17 00:02	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	2		01/12/17 00:02	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	2		01/12/17 00:02	17060-07-0	
Toluene-d8 (S)	105	%	70-130	2		01/12/17 00:02	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**151**	ug/L	10.0	5		01/05/17 13:07	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	50-150	1		01/05/17 12:48	17060-07-0	
Toluene-d8 (S)	106	%	50-150	1		01/05/17 12:48	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: MW-41D-010217 **Lab ID: 92325191002** Collected: 01/02/17 12:10 Received: 01/04/17 11:35 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		01/05/17 17:14	67-64-1	
Benzene	ND	ug/L	1.0	1		01/05/17 17:14	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/05/17 17:14	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/05/17 17:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/05/17 17:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/05/17 17:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/05/17 17:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/05/17 17:14	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		01/05/17 17:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/05/17 17:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/05/17 17:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/05/17 17:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/05/17 17:14	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		01/05/17 17:14	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		01/05/17 17:14	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		01/05/17 17:14	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		01/05/17 17:14	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		01/05/17 17:14	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		01/05/17 17:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/05/17 17:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		01/05/17 17:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/05/17 17:14	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		01/05/17 17:14	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/05/17 17:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/05/17 17:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/05/17 17:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/05/17 17:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/05/17 17:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/05/17 17:14	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		01/05/17 17:14	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		01/05/17 17:14	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		01/05/17 17:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/05/17 17:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/05/17 17:14	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		01/05/17 17:14	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		01/05/17 17:14	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		01/05/17 17:14	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/05/17 17:14	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		01/05/17 17:14	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		01/05/17 17:14	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		01/05/17 17:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/05/17 17:14	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/05/17 17:14	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		01/05/17 17:14	91-20-3	
Styrene	ND	ug/L	1.0	1		01/05/17 17:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/05/17 17:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/05/17 17:14	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: MW-41D-010217 **Lab ID: 92325191002** Collected: 01/02/17 12:10 Received: 01/04/17 11:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		01/05/17 17:14	127-18-4	
Toluene	ND	ug/L	1.0	1		01/05/17 17:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/05/17 17:14	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/05/17 17:14	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/05/17 17:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/05/17 17:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/05/17 17:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/05/17 17:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/05/17 17:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/05/17 17:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/05/17 17:14	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/05/17 17:14	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		01/05/17 17:14	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		01/05/17 17:14	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		01/05/17 17:14	460-00-4	
1,2-Dichloroethane-d4 (S)	111	%	70-130	1		01/05/17 17:14	17060-07-0	
Toluene-d8 (S)	90	%	70-130	1		01/05/17 17:14	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**2.8**	ug/L	2.0	1		01/05/17 13:25	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		01/05/17 13:25	17060-07-0	
Toluene-d8 (S)	106	%	50-150	1		01/05/17 13:25	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: MW-1D-010217 **Lab ID: 92325191003** Collected: 01/02/17 12:50 Received: 01/04/17 11:35 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		01/05/17 16:40	67-64-1	
Benzene	ND	ug/L	2.0	2		01/05/17 16:40	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		01/05/17 16:40	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		01/05/17 16:40	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		01/05/17 16:40	75-27-4	
Bromoform	ND	ug/L	2.0	2		01/05/17 16:40	75-25-2	
Bromomethane	ND	ug/L	4.0	2		01/05/17 16:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		01/05/17 16:40	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		01/05/17 16:40	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		01/05/17 16:40	108-90-7	
Chloroethane	ND	ug/L	2.0	2		01/05/17 16:40	75-00-3	
Chloroform	ND	ug/L	2.0	2		01/05/17 16:40	67-66-3	
Chloromethane	ND	ug/L	2.0	2		01/05/17 16:40	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		01/05/17 16:40	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		01/05/17 16:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		01/05/17 16:40	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		01/05/17 16:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		01/05/17 16:40	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		01/05/17 16:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		01/05/17 16:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		01/05/17 16:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		01/05/17 16:40	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		01/05/17 16:40	75-71-8	
1,1-Dichloroethane	**72.0**	ug/L	2.0	2		01/05/17 16:40	75-34-3	
1,2-Dichloroethane	**4.7**	ug/L	2.0	2		01/05/17 16:40	107-06-2	
1,1-Dichloroethene	**375**	ug/L	2.0	2		01/05/17 16:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		01/05/17 16:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		01/05/17 16:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		01/05/17 16:40	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		01/05/17 16:40	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		01/05/17 16:40	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		01/05/17 16:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		01/05/17 16:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		01/05/17 16:40	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		01/05/17 16:40	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	300	2		01/05/17 16:40	123-91-1	L3
Ethylbenzene	ND	ug/L	2.0	2		01/05/17 16:40	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		01/05/17 16:40	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		01/05/17 16:40	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		01/05/17 16:40	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		01/05/17 16:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		01/05/17 16:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		01/05/17 16:40	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		01/05/17 16:40	91-20-3	
Styrene	ND	ug/L	2.0	2		01/05/17 16:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		01/05/17 16:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		01/05/17 16:40	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: MW-1D-010217 **Lab ID: 92325191003** Collected: 01/02/17 12:50 Received: 01/04/17 11:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	2.0	2		01/05/17 16:40	127-18-4	
Toluene	ND	ug/L	2.0	2		01/05/17 16:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		01/05/17 16:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		01/05/17 16:40	120-82-1	
1,1,1-Trichloroethane	**37.5**	ug/L	2.0	2		01/05/17 16:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		01/05/17 16:40	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		01/05/17 16:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		01/05/17 16:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		01/05/17 16:40	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		01/05/17 16:40	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		01/05/17 16:40	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		01/05/17 16:40	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		01/05/17 16:40	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		01/05/17 16:40	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	2		01/05/17 16:40	460-00-4	
1,2-Dichloroethane-d4 (S)	113	%	70-130	2		01/05/17 16:40	17060-07-0	
Toluene-d8 (S)	106	%	70-130	2		01/05/17 16:40	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**236**	ug/L	5.0	2.5		01/05/17 14:22	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	50-150	1		01/05/17 14:03	17060-07-0	
Toluene-d8 (S)	107	%	50-150	1		01/05/17 14:03	2037-26-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: TRIP BLANK **Lab ID: 92325191004** Collected: 01/02/17 00:00 Received: 01/04/17 11:35 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		01/05/17 14:55	67-64-1	
Benzene	ND	ug/L	1.0	1		01/05/17 14:55	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/05/17 14:55	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/05/17 14:55	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/05/17 14:55	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/05/17 14:55	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/05/17 14:55	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/05/17 14:55	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		01/05/17 14:55	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/05/17 14:55	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/05/17 14:55	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/05/17 14:55	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/05/17 14:55	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		01/05/17 14:55	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		01/05/17 14:55	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		01/05/17 14:55	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		01/05/17 14:55	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		01/05/17 14:55	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		01/05/17 14:55	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/05/17 14:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		01/05/17 14:55	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/05/17 14:55	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		01/05/17 14:55	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/05/17 14:55	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/05/17 14:55	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/05/17 14:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/05/17 14:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/05/17 14:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/05/17 14:55	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		01/05/17 14:55	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		01/05/17 14:55	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		01/05/17 14:55	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/05/17 14:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/05/17 14:55	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		01/05/17 14:55	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	1		01/05/17 14:55	123-91-1	L3
Ethylbenzene	ND	ug/L	1.0	1		01/05/17 14:55	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/05/17 14:55	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		01/05/17 14:55	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		01/05/17 14:55	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		01/05/17 14:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/05/17 14:55	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/05/17 14:55	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		01/05/17 14:55	91-20-3	
Styrene	ND	ug/L	1.0	1		01/05/17 14:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/05/17 14:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/05/17 14:55	79-34-5	

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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Sample: TRIP BLANK **Lab ID: 92325191004** Collected: 01/02/17 00:00 Received: 01/04/17 11:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Tetrachloroethene	ND	ug/L	1.0	1		01/05/17 14:55	127-18-4	
Toluene	ND	ug/L	1.0	1		01/05/17 14:55	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/05/17 14:55	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/05/17 14:55	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/05/17 14:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/05/17 14:55	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/05/17 14:55	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/05/17 14:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/05/17 14:55	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/05/17 14:55	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/05/17 14:55	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/05/17 14:55	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		01/05/17 14:55	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		01/05/17 14:55	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		01/05/17 14:55	460-00-4	
1,2-Dichloroethane-d4 (S)	115	%	70-130	1		01/05/17 14:55	17060-07-0	
Toluene-d8 (S)	134	%	70-130	1		01/05/17 14:55	2037-26-5	S3
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		01/05/17 12:30	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%	50-150	1		01/05/17 12:30	17060-07-0	
Toluene-d8 (S)	106	%	50-150	1		01/05/17 12:30	2037-26-5	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

QC Batch: 343500 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92325191002, 92325191003, 92325191004

METHOD BLANK: 1905315 Matrix: Water
Associated Lab Samples: 92325191002, 92325191003, 92325191004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/05/17 13:46	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/05/17 13:46	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/05/17 13:46	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/05/17 13:46	
1,1-Dichloroethane	ug/L	ND	1.0	01/05/17 13:46	
1,1-Dichloroethene	ug/L	ND	1.0	01/05/17 13:46	
1,1-Dichloropropene	ug/L	ND	1.0	01/05/17 13:46	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	01/05/17 13:46	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/05/17 13:46	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	01/05/17 13:46	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	01/05/17 13:46	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	01/05/17 13:46	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/05/17 13:46	
1,2-Dichloroethane	ug/L	ND	1.0	01/05/17 13:46	
1,2-Dichloropropane	ug/L	ND	1.0	01/05/17 13:46	
1,3-Dichlorobenzene	ug/L	ND	1.0	01/05/17 13:46	
1,3-Dichloropropane	ug/L	ND	1.0	01/05/17 13:46	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/05/17 13:46	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	01/05/17 13:46	
2,2-Dichloropropane	ug/L	ND	1.0	01/05/17 13:46	
2-Butanone (MEK)	ug/L	ND	5.0	01/05/17 13:46	
2-Chlorotoluene	ug/L	ND	1.0	01/05/17 13:46	
2-Hexanone	ug/L	ND	5.0	01/05/17 13:46	
4-Chlorotoluene	ug/L	ND	1.0	01/05/17 13:46	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/05/17 13:46	
Acetone	ug/L	ND	25.0	01/05/17 13:46	
Benzene	ug/L	ND	1.0	01/05/17 13:46	
Bromobenzene	ug/L	ND	1.0	01/05/17 13:46	
Bromochloromethane	ug/L	ND	1.0	01/05/17 13:46	
Bromodichloromethane	ug/L	ND	1.0	01/05/17 13:46	
Bromoform	ug/L	ND	1.0	01/05/17 13:46	
Bromomethane	ug/L	ND	2.0	01/05/17 13:46	
Carbon tetrachloride	ug/L	ND	1.0	01/05/17 13:46	
Chlorobenzene	ug/L	ND	1.0	01/05/17 13:46	
Chloroethane	ug/L	ND	1.0	01/05/17 13:46	
Chloroform	ug/L	ND	1.0	01/05/17 13:46	
Chloromethane	ug/L	ND	1.0	01/05/17 13:46	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/05/17 13:46	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/05/17 13:46	
Dibromochloromethane	ug/L	ND	1.0	01/05/17 13:46	
Dibromomethane	ug/L	ND	1.0	01/05/17 13:46	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

METHOD BLANK: 1905315 Matrix: Water
Associated Lab Samples: 92325191002, 92325191003, 92325191004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	01/05/17 13:46	
Diisopropyl ether	ug/L	ND	1.0	01/05/17 13:46	
Ethylbenzene	ug/L	ND	1.0	01/05/17 13:46	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	01/05/17 13:46	
m&p-Xylene	ug/L	ND	2.0	01/05/17 13:46	
Methyl-tert-butyl ether	ug/L	ND	1.0	01/05/17 13:46	
Methylene Chloride	ug/L	ND	2.0	01/05/17 13:46	
Naphthalene	ug/L	ND	1.0	01/05/17 13:46	
o-Xylene	ug/L	ND	1.0	01/05/17 13:46	
p-Isopropyltoluene	ug/L	ND	1.0	01/05/17 13:46	
Styrene	ug/L	ND	1.0	01/05/17 13:46	
Tetrachloroethene	ug/L	ND	1.0	01/05/17 13:46	
Toluene	ug/L	ND	1.0	01/05/17 13:46	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/05/17 13:46	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/05/17 13:46	
Trichloroethene	ug/L	ND	1.0	01/05/17 13:46	
Trichlorofluoromethane	ug/L	ND	1.0	01/05/17 13:46	
Vinyl acetate	ug/L	ND	2.0	01/05/17 13:46	
Vinyl chloride	ug/L	ND	1.0	01/05/17 13:46	
Xylene (Total)	ug/L	ND	1.0	01/05/17 13:46	
1,2-Dichloroethane-d4 (S)	%	115	70-130	01/05/17 13:46	
4-Bromofluorobenzene (S)	%	100	70-130	01/05/17 13:46	
Toluene-d8 (S)	%	107	70-130	01/05/17 13:46	

LABORATORY CONTROL SAMPLE: 1905316

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	56.9	114	70-130	
1,1,1-Trichloroethane	ug/L	50	53.5	107	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	54.4	109	70-130	
1,1,2-Trichloroethane	ug/L	50	53.0	106	70-130	
1,1-Dichloroethane	ug/L	50	56.2	112	70-130	
1,1-Dichloroethene	ug/L	50	55.0	110	70-132	
1,1-Dichloropropene	ug/L	50	54.4	109	70-130	
1,2,3-Trichlorobenzene	ug/L	50	52.9	106	70-135	
1,2,3-Trichloropropane	ug/L	50	53.8	108	70-130	
1,2,4-Trichlorobenzene	ug/L	50	50.2	100	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	58.8	118	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	55.8	112	70-130	
1,2-Dichlorobenzene	ug/L	50	52.6	105	70-130	
1,2-Dichloroethane	ug/L	50	53.8	108	70-130	
1,2-Dichloropropane	ug/L	50	52.1	104	70-130	
1,3-Dichlorobenzene	ug/L	50	52.1	104	70-130	
1,3-Dichloropropane	ug/L	50	58.8	118	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

LABORATORY CONTROL SAMPLE: 1905316

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	50.6	101	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1600	160	71-125	L0
2,2-Dichloropropane	ug/L	50	55.6	111	58-145	
2-Butanone (MEK)	ug/L	100	119	119	70-145	
2-Chlorotoluene	ug/L	50	53.4	107	70-130	
2-Hexanone	ug/L	100	124	124	70-144	
4-Chlorotoluene	ug/L	50	53.1	106	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	110	70-140	
Acetone	ug/L	100	136	136	50-175	
Benzene	ug/L	50	52.9	106	70-130	
Bromobenzene	ug/L	50	53.3	107	70-130	
Bromochloromethane	ug/L	50	48.3	97	70-130	
Bromodichloromethane	ug/L	50	55.9	112	70-130	
Bromoform	ug/L	50	49.2	98	70-130	
Bromomethane	ug/L	50	52.5	105	54-130	
Carbon tetrachloride	ug/L	50	52.0	104	70-132	
Chlorobenzene	ug/L	50	51.7	103	70-130	
Chloroethane	ug/L	50	55.6	111	64-134	
Chloroform	ug/L	50	50.1	100	70-130	
Chloromethane	ug/L	50	53.6	107	64-130	
cis-1,2-Dichloroethene	ug/L	50	49.8	100	70-131	
cis-1,3-Dichloropropene	ug/L	50	56.7	113	70-130	
Dibromochloromethane	ug/L	50	52.1	104	70-130	
Dibromomethane	ug/L	50	47.5	95	70-131	
Dichlorodifluoromethane	ug/L	50	49.8	100	56-130	
Diisopropyl ether	ug/L	50	65.1	130	70-130	
Ethylbenzene	ug/L	50	52.4	105	70-130	
Hexachloro-1,3-butadiene	ug/L	50	54.3	109	70-130	
m&p-Xylene	ug/L	100	107	107	70-130	
Methyl-tert-butyl ether	ug/L	50	63.6	127	70-130	
Methylene Chloride	ug/L	50	61.1	122	63-130	
Naphthalene	ug/L	50	55.4	111	70-138	
o-Xylene	ug/L	50	53.7	107	70-130	
p-Isopropyltoluene	ug/L	50	50.2	100	70-130	
Styrene	ug/L	50	53.7	107	70-130	
Tetrachloroethene	ug/L	50	48.3	97	70-130	
Toluene	ug/L	50	49.2	98	70-130	
trans-1,2-Dichloroethene	ug/L	50	59.2	118	70-130	
trans-1,3-Dichloropropene	ug/L	50	59.4	119	70-132	
Trichloroethene	ug/L	50	48.5	97	70-130	
Trichlorofluoromethane	ug/L	50	58.7	117	62-133	
Vinyl acetate	ug/L	100	106	106	66-157	
Vinyl chloride	ug/L	50	42.5	85	50-150	
Xylene (Total)	ug/L	150	161	107	70-130	
1,2-Dichloroethane-d4 (S)	%			116	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			97	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

MATRIX SPIKE SAMPLE: 1905317

Parameter	Units	92325182003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.7	109	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.2	116	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	24.7	124	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	25.6	128	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.8	114	70-130	
1,1-Dichloroethene	ug/L	ND	20	26.7	133	70-166	
1,1-Dichloropropene	ug/L	ND	20	24.7	123	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	18.5	93	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	24.8	124	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	20.1	101	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	21.4	107	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	22.1	111	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	22.0	110	70-130	
1,2-Dichloroethane	ug/L	ND	20	23.2	115	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.9	114	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	22.8	114	70-130	
1,3-Dichloropropane	ug/L	ND	20	23.8	119	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	22.1	111	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	450	112	70-130	
2,2-Dichloropropane	ug/L	ND	20	23.3	116	70-130	
2-Butanone (MEK)	ug/L	ND	40	48.7	122	70-130	
2-Chlorotoluene	ug/L	ND	20	23.7	118	70-130	
2-Hexanone	ug/L	ND	40	47.4	119	70-130	
4-Chlorotoluene	ug/L	ND	20	23.6	118	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	51.6	129	70-130	
Acetone	ug/L	ND	40	56.8	138	70-130	M1
Benzene	ug/L	ND	20	24.2	121	70-148	
Bromobenzene	ug/L	ND	20	23.2	116	70-130	
Bromochloromethane	ug/L	ND	20	22.0	110	70-130	
Bromodichloromethane	ug/L	ND	20	24.7	123	70-130	
Bromoform	ug/L	ND	20	21.1	106	70-130	
Bromomethane	ug/L	ND	20	19.1	95	70-130	
Carbon tetrachloride	ug/L	ND	20	23.7	119	70-130	
Chlorobenzene	ug/L	ND	20	22.6	113	70-146	
Chloroethane	ug/L	ND	20	28.5	142	70-130	M1
Chloroform	ug/L	ND	20	22.4	112	70-130	
Chloromethane	ug/L	ND	20	28.2	139	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	20	22.9	111	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	23.1	116	70-130	
Dibromochloromethane	ug/L	ND	20	21.3	106	70-130	
Dibromomethane	ug/L	ND	20	21.2	106	70-130	
Dichlorodifluoromethane	ug/L	ND	20	24.3	122	70-130	
Diisopropyl ether	ug/L	ND	20	24.8	124	70-130	
Ethylbenzene	ug/L	ND	20	23.0	115	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	21.8	109	70-130	
m&p-Xylene	ug/L	ND	40	49.6	124	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	25.4	127	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

MATRIX SPIKE SAMPLE: 1905317

Parameter	Units	92325182003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	ND	20	26.0	130	70-130	
Naphthalene	ug/L	ND	20	19.3	96	70-130	
o-Xylene	ug/L	ND	20	25.7	128	70-130	
p-Isopropyltoluene	ug/L	ND	20	22.0	110	70-130	
Styrene	ug/L	ND	20	26.2	131	70-130	M1
Tetrachloroethene	ug/L	ND	20	22.0	110	70-130	
Toluene	ug/L	ND	20	22.7	114	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	28.0	140	70-130	M1
trans-1,3-Dichloropropene	ug/L	ND	20	25.1	125	70-130	
Trichloroethene	ug/L	1.2	20	23.0	109	69-151	
Trichlorofluoromethane	ug/L	ND	20	29.3	146	70-130	M1
Vinyl acetate	ug/L	ND	40	40.6	102	70-130	
Vinyl chloride	ug/L	ND	20	22.8	114	70-130	
1,2-Dichloroethane-d4 (S)	%				114	70-130	
4-Bromofluorobenzene (S)	%				114	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1905318

Parameter	Units	92325328004 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	
1,4-Dioxane (p-Dioxane)	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	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

SAMPLE DUPLICATE: 1905318

Parameter	Units	92325328004 Result	Dup Result	RPD	Max RPD	Qualifiers
Acetone	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
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	.31J		30	
cis-1,2-Dichloroethene	ug/L	ND	.74J		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	.93J		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	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	1.0	1.3	22	30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	115	116	1		
4-Bromofluorobenzene (S)	%	96	99	2		
Toluene-d8 (S)	%	111	116	4		

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

QC Batch: 343975 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92325191001

METHOD BLANK: 1908104 Matrix: Water
Associated Lab Samples: 92325191001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/11/17 19:06	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/11/17 19:06	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/11/17 19:06	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/11/17 19:06	
1,1-Dichloroethane	ug/L	ND	1.0	01/11/17 19:06	
1,1-Dichloroethene	ug/L	ND	1.0	01/11/17 19:06	
1,1-Dichloropropene	ug/L	ND	1.0	01/11/17 19:06	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	01/11/17 19:06	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/11/17 19:06	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	01/11/17 19:06	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	01/11/17 19:06	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	01/11/17 19:06	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/11/17 19:06	
1,2-Dichloroethane	ug/L	ND	1.0	01/11/17 19:06	
1,2-Dichloropropane	ug/L	ND	1.0	01/11/17 19:06	
1,3-Dichlorobenzene	ug/L	ND	1.0	01/11/17 19:06	
1,3-Dichloropropane	ug/L	ND	1.0	01/11/17 19:06	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/11/17 19:06	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	01/11/17 19:06	
2,2-Dichloropropane	ug/L	ND	1.0	01/11/17 19:06	
2-Butanone (MEK)	ug/L	ND	5.0	01/11/17 19:06	
2-Chlorotoluene	ug/L	ND	1.0	01/11/17 19:06	
2-Hexanone	ug/L	ND	5.0	01/11/17 19:06	
4-Chlorotoluene	ug/L	ND	1.0	01/11/17 19:06	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/11/17 19:06	
Acetone	ug/L	ND	25.0	01/11/17 19:06	
Benzene	ug/L	ND	1.0	01/11/17 19:06	
Bromobenzene	ug/L	ND	1.0	01/11/17 19:06	
Bromochloromethane	ug/L	ND	1.0	01/11/17 19:06	
Bromodichloromethane	ug/L	ND	1.0	01/11/17 19:06	
Bromoform	ug/L	ND	1.0	01/11/17 19:06	
Bromomethane	ug/L	ND	2.0	01/11/17 19:06	
Carbon tetrachloride	ug/L	ND	1.0	01/11/17 19:06	
Chlorobenzene	ug/L	ND	1.0	01/11/17 19:06	
Chloroethane	ug/L	ND	1.0	01/11/17 19:06	
Chloroform	ug/L	ND	1.0	01/11/17 19:06	
Chloromethane	ug/L	ND	1.0	01/11/17 19:06	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/11/17 19:06	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/11/17 19:06	
Dibromochloromethane	ug/L	ND	1.0	01/11/17 19:06	
Dibromomethane	ug/L	ND	1.0	01/11/17 19:06	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

METHOD BLANK: 1908104 Matrix: Water
Associated Lab Samples: 92325191001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	01/11/17 19:06	
Diisopropyl ether	ug/L	ND	1.0	01/11/17 19:06	
Ethylbenzene	ug/L	ND	1.0	01/11/17 19:06	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	01/11/17 19:06	
m&p-Xylene	ug/L	ND	2.0	01/11/17 19:06	
Methyl-tert-butyl ether	ug/L	ND	1.0	01/11/17 19:06	
Methylene Chloride	ug/L	ND	2.0	01/11/17 19:06	
Naphthalene	ug/L	ND	1.0	01/11/17 19:06	
o-Xylene	ug/L	ND	1.0	01/11/17 19:06	
p-Isopropyltoluene	ug/L	ND	1.0	01/11/17 19:06	
Styrene	ug/L	ND	1.0	01/11/17 19:06	
Tetrachloroethene	ug/L	ND	1.0	01/11/17 19:06	
Toluene	ug/L	ND	1.0	01/11/17 19:06	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/11/17 19:06	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/11/17 19:06	
Trichloroethene	ug/L	ND	1.0	01/11/17 19:06	
Trichlorofluoromethane	ug/L	ND	1.0	01/11/17 19:06	
Vinyl acetate	ug/L	ND	2.0	01/11/17 19:06	
Vinyl chloride	ug/L	ND	1.0	01/11/17 19:06	
Xylene (Total)	ug/L	ND	1.0	01/11/17 19:06	
1,2-Dichloroethane-d4 (S)	%	95	70-130	01/11/17 19:06	
4-Bromofluorobenzene (S)	%	102	70-130	01/11/17 19:06	
Toluene-d8 (S)	%	104	70-130	01/11/17 19:06	

LABORATORY CONTROL SAMPLE: 1908105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	52.3	105	70-130	
1,1,1-Trichloroethane	ug/L	50	48.4	97	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.8	100	70-130	
1,1,2-Trichloroethane	ug/L	50	50.1	100	70-130	
1,1-Dichloroethane	ug/L	50	46.4	93	70-130	
1,1-Dichloroethene	ug/L	50	50.4	101	70-132	
1,1-Dichloropropene	ug/L	50	51.9	104	70-130	
1,2,3-Trichlorobenzene	ug/L	50	49.9	100	70-135	
1,2,3-Trichloropropane	ug/L	50	50.7	101	70-130	
1,2,4-Trichlorobenzene	ug/L	50	48.5	97	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	48.3	97	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	50.8	102	70-130	
1,2-Dichlorobenzene	ug/L	50	49.6	99	70-130	
1,2-Dichloroethane	ug/L	50	47.4	95	70-130	
1,2-Dichloropropane	ug/L	50	47.5	95	70-130	
1,3-Dichlorobenzene	ug/L	50	49.2	98	70-130	
1,3-Dichloropropane	ug/L	50	52.5	105	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

LABORATORY CONTROL SAMPLE: 1908105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	50	48.0	96	70-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1300	130	71-125	L0
2,2-Dichloropropane	ug/L	50	45.7	91	58-145	
2-Butanone (MEK)	ug/L	100	101	101	70-145	
2-Chlorotoluene	ug/L	50	47.8	96	70-130	
2-Hexanone	ug/L	100	96.5	96	70-144	
4-Chlorotoluene	ug/L	50	48.7	97	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	93.6	94	70-140	
Acetone	ug/L	100	91.6	92	50-175	
Benzene	ug/L	50	49.3	99	70-130	
Bromobenzene	ug/L	50	49.4	99	70-130	
Bromochloromethane	ug/L	50	47.6	95	70-130	
Bromodichloromethane	ug/L	50	48.6	97	70-130	
Bromoform	ug/L	50	49.8	100	70-130	
Bromomethane	ug/L	50	52.0	104	54-130	
Carbon tetrachloride	ug/L	50	49.9	100	70-132	
Chlorobenzene	ug/L	50	50.7	101	70-130	
Chloroethane	ug/L	50	46.3	93	64-134	
Chloroform	ug/L	50	45.8	92	70-130	
Chloromethane	ug/L	50	48.7	97	64-130	
cis-1,2-Dichloroethene	ug/L	50	46.0	92	70-131	
cis-1,3-Dichloropropene	ug/L	50	50.7	101	70-130	
Dibromochloromethane	ug/L	50	52.9	106	70-130	
Dibromomethane	ug/L	50	48.1	96	70-131	
Dichlorodifluoromethane	ug/L	50	47.2	94	56-130	
Diisopropyl ether	ug/L	50	50.5	101	70-130	
Ethylbenzene	ug/L	50	50.2	100	70-130	
Hexachloro-1,3-butadiene	ug/L	50	51.7	103	70-130	
m&p-Xylene	ug/L	100	99.5	99	70-130	
Methyl-tert-butyl ether	ug/L	50	51.2	102	70-130	
Methylene Chloride	ug/L	50	51.2	102	63-130	
Naphthalene	ug/L	50	49.5	99	70-138	
o-Xylene	ug/L	50	49.4	99	70-130	
p-Isopropyltoluene	ug/L	50	46.9	94	70-130	
Styrene	ug/L	50	50.8	102	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	49.3	99	70-130	
trans-1,3-Dichloropropene	ug/L	50	50.5	101	70-132	
Trichloroethene	ug/L	50	49.8	100	70-130	
Trichlorofluoromethane	ug/L	50	51.1	102	62-133	
Vinyl acetate	ug/L	100	94.2	94	66-157	
Vinyl chloride	ug/L	50	42.0	84	50-150	
Xylene (Total)	ug/L	150	149	99	70-130	
1,2-Dichloroethane-d4 (S)	%			105	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			98	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1908106 1908107

Parameter	Units	92325610002 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	20	20	19.8	20.5	99	103	70-130	4	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	22.3	22.9	112	114	70-130	2	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	18.9	18.9	94	94	70-130	0	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	20.0	20.4	100	102	70-130	2	30	
1,1-Dichloroethane	ug/L	ND	20	20	21.7	21.4	108	107	70-130	2	30	
1,1-Dichloroethene	ug/L	ND	20	20	24.3	24.3	122	122	70-166	0	30	
1,1-Dichloropropene	ug/L	ND	20	20	24.0	24.0	120	120	70-130	0	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	19.4	19.7	97	98	70-130	1	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	19.3	20.1	96	100	70-130	4	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	19.8	19.6	99	98	70-130	1	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	20	18.4	18.2	92	91	70-130	1	30	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	19.8	19.4	99	97	70-130	2	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	20.5	20.3	103	102	70-130	1	30	
1,2-Dichloroethane	ug/L	ND	20	20	19.9	20.0	100	100	70-130	0	30	
1,2-Dichloropropane	ug/L	ND	20	20	20.9	21.4	105	107	70-130	3	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	20.5	20.4	102	102	70-130	1	30	
1,3-Dichloropropane	ug/L	ND	20	20	20.0	20.1	100	101	70-130	1	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	20.5	20.1	102	101	70-130	2	30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	238	433	60	108	70-130	58	30	M0,R1
2,2-Dichloropropane	ug/L	ND	20	20	21.0	20.4	105	102	70-130	3	30	
2-Butanone (MEK)	ug/L	ND	40	40	39.5	40.2	99	101	70-130	2	30	
2-Chlorotoluene	ug/L	ND	20	20	20.6	21.0	103	105	70-130	2	30	
2-Hexanone	ug/L	ND	40	40	37.0	38.6	92	97	70-130	4	30	
4-Chlorotoluene	ug/L	ND	20	20	20.6	21.1	103	105	70-130	2	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40	38.4	38.0	96	95	70-130	1	30	
Acetone	ug/L	ND	40	40	38.9	39.2	97	98	70-130	1	30	
Benzene	ug/L	ND	20	20	23.0	22.7	115	114	70-148	1	30	
Bromobenzene	ug/L	ND	20	20	20.9	20.5	105	103	70-130	2	30	
Bromochloromethane	ug/L	ND	20	20	19.6	20.3	98	102	70-130	4	30	
Bromodichloromethane	ug/L	ND	20	20	20.8	21.2	104	106	70-130	2	30	
Bromoform	ug/L	ND	20	20	17.4	17.5	87	87	70-130	1	30	
Bromomethane	ug/L	ND	20	20	21.6	22.5	108	113	70-130	4	30	
Carbon tetrachloride	ug/L	ND	20	20	24.5	23.7	122	119	70-130	3	30	
Chlorobenzene	ug/L	ND	20	20	21.7	22.0	109	110	70-146	1	30	
Chloroethane	ug/L	ND	20	20	22.6	21.8	113	109	70-130	3	30	
Chloroform	ug/L	ND	20	20	20.7	20.7	104	104	70-130	0	30	
Chloromethane	ug/L	ND	20	20	23.0	22.7	115	113	70-130	1	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	20.7	21.2	104	106	70-130	2	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	20.6	20.9	103	105	70-130	2	30	
Dibromochloromethane	ug/L	ND	20	20	19.0	20.0	95	100	70-130	5	30	
Dibromomethane	ug/L	ND	20	20	20.5	20.7	103	104	70-130	1	30	
Dichlorodifluoromethane	ug/L	ND	20	20	21.7	21.4	108	107	70-130	1	30	
Diisopropyl ether	ug/L	ND	20	20	19.7	20.3	99	101	70-130	3	30	
Ethylbenzene	ug/L	ND	20	20	22.0	22.1	110	110	70-130	0	30	

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

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

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1908106 1908107

Parameter	Units	92325610002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Hexachloro-1,3-butadiene	ug/L	ND	20	20	22.1	22.9	111	114	70-130	3	30	
m&p-Xylene	ug/L	ND	40	40	43.8	44.6	110	112	70-130	2	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	20.0	20.2	100	101	70-130	1	30	
Methylene Chloride	ug/L	1.4J	20	20	23.0	22.7	108	107	70-130	1	30	
Naphthalene	ug/L	ND	20	20	19.1	19.3	95	97	70-130	1	30	
o-Xylene	ug/L	ND	20	20	21.1	21.6	106	108	70-130	2	30	
p-Isopropyltoluene	ug/L	ND	20	20	20.7	20.7	104	104	70-130	0	30	
Styrene	ug/L	ND	20	20	21.1	21.4	105	107	70-130	1	30	
Tetrachloroethene	ug/L	ND	20	20	20.1	20.3	100	102	70-130	1	30	
Toluene	ug/L	ND	20	20	22.0	22.1	110	111	70-155	1	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	23.2	23.2	116	116	70-130	0	30	
trans-1,3-Dichloropropene	ug/L	ND	20	20	20.3	20.8	102	104	70-130	2	30	
Trichloroethene	ug/L	0.70J	20	20	23.5	23.4	114	113	69-151	0	30	
Trichlorofluoromethane	ug/L	ND	20	20	25.0	25.1	125	125	70-130	0	30	
Vinyl acetate	ug/L	ND	40	40	28.4	28.7	71	72	70-130	1	30	
Vinyl chloride	ug/L	ND	20	20	20.2	20.1	101	101	70-130	0	30	
1,2-Dichloroethane-d4 (S)	%						100	101	70-130			
4-Bromofluorobenzene (S)	%						101	103	70-130			
Toluene-d8 (S)	%						100	100	70-130			

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

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

QC Batch: 343356 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92325191001, 92325191002, 92325191003, 92325191004

METHOD BLANK: 1904454 Matrix: Water
Associated Lab Samples: 92325191001, 92325191002, 92325191003, 92325191004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	01/05/17 10:56	
1,2-Dichloroethane-d4 (S)	%	101	50-150	01/05/17 10:56	
Toluene-d8 (S)	%	104	50-150	01/05/17 10:56	

LABORATORY CONTROL SAMPLE & LCSD: 1904455 1904456

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	17.6	20.1	88	101	71-125	13	30	
1,2-Dichloroethane-d4 (S)	%				105	97	50-150		150	
Toluene-d8 (S)	%				106	105	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

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

QUALIFIERS

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

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.

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

C9	Common Laboratory Contaminant.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: FORMER KOP-FLEX-OFFSITE
Pace Project No.: 92325191

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92325191001	**MW-23-010217**	EPA 8260	343975		
92325191002	**MW-41D-010217**	EPA 8260	343500		
92325191003	**MW-1D-010217**	EPA 8260	343500		
92325191004	**TRIP BLANK**	EPA 8260	343500		
92325191001	**MW-23-010217**	EPA 8260B Mod.	343356		
92325191002	**MW-41D-010217**	EPA 8260B Mod.	343356		
92325191003	**MW-1D-010217**	EPA 8260B Mod.	343356		
92325191004	**TRIP BLANK**	EPA 8260B Mod.	343356		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: **F-CAR-CS-033-Rev.01**	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐ **Eden** ☐ **Greenwood** ☐ **Huntersville** ☑ **Raleigh** ☐ **Mechanicsville** ☐

Sample Condition Upon Receipt

Client Name: WSP

Project # WO#: 92325191

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

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

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

Date/Initials Person Examining Contents: JM 1.4.17

Thermometer: ☑ IR Gun ID: T1603 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 3.4 **Biological Tissue Frozen?** ☐ Yes ☑ No ☐ N/A

Temp should be above freezing to 6°C

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.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
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: _____

Project Manager SCURF Review: JY **Date:** 1/5/17

Project Manager SRF Review: JY **Date:** 1/5/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

***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**

Proj

WO#: 92325191

PM: KRG Due Date: 01/11/17

CLIENT: 92-WSP

128

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																5													
4																4													
5																													
6																													
7																													
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 / Parsons Brickerhoff	Report To:	Wallace, Robert	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:		Company Name:	
Suite 300, Herndon, VA 20171				Address:	
Email:		Purchase Order #:		Pace Quote:	
Phone:	Fax	Project Name:	Former Kop-Flex Offsite	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	4362-1

Regulatory Agency	
State / Location	MD

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	Requested Analysis Filtered (Y/N)	Analyses Test	8260	8260 SIM 1,4-Dioxane	8260 Trip Blank	8260 SIM 1,4 D Trip Blank	Residual Chlorine (Y/N)	42325191
1	MW-23-010217			1/2/17	0805				6				X							X	X				001
2	MW-41D-010217			1/2/17	1210				6				X							X	X				002
3	MW-1D-010317			1/2/17	1250				5				X							X	X				003
4	Trip Blank								4				X									X	X		004
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		1/3/17	1800	PACE HVL	1-4-17	1135	3.4	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER:

DATE Signed: 1/3/17

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

RW SAMPLES – JANUARY 2017

Water Systems Engineering, Inc.

Date: January 25, 2017

Lab Report No. 20770

Eric Johnson
WSP
1350 Dulles Technology Drive, Suite 300
Herndon, VA 20171

Project Description: RW-2D Pre-start-up sample
Special Analysis; sample received 1/24/2017

Testing Procedures:

All laboratory testing procedures are performed according to the guidelines set forth in *Standard Methods for the Examination of Water and Wastewater* as established by the American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF). Corrosion analyses are performed in accordance with the guidelines as set forth by the National Association of Corrosion Engineers (NACE). In general, these methods are approved by both the Environmental Protection Agency (EPA) and AWWA for the reporting of water and/or wastewater data.

Sample collection and shipment is the responsibility of the customer, performed according to protocol and procedures defined by the laboratory in advance of the sampling event with regards to the specific project and nature of the problem.

Disclaimer:

The data and interpretations presented are based on an evaluation of the samples and submitted data. Conclusions reached in this report are based upon the data available at the time of submittal and the accuracy of the report depends upon the validity of information submitted. Any recommendations presented are based on laboratory and field evaluations of similar fouling occurrences within potable water systems. Further investigative efforts, such as efficiency testing, site inspection, video survey, or other evaluation methods may offer additional insight into the system's condition and the degree of fouling present.

Client: WSP
Date: January 25, 2017
Lab Report No. 20770

Re: RW-2D Pre-start-up sample
Special Analysis; sample received 1/24/2017

ND - Not Detected NA - Not Applicable	**Startup** mg/l	**Detection Limits**
Tannin/Lignin	ND	0.1 mg/l

Note:

Tannin and Lignin are organic compounds similar to humic substances. Tannin is a complex organic compound found naturally in soil and in certain tree barks. Lignin is a compound common in woody plants and trees. Humic substances, tannin, and lignin are most common in surface water and shallow groundwater hydraulically connected to surface waters or wetlands. These organic substances may occasionally be found in well water, particularly if aquifer receives rapid recharge from the shallow subsurface or if the well is not properly constructed.

There are currently no primary or secondary water quality standards for the presence of tannin or lignin in produced water. When present in elevated concentrations, tannin and lignin can impart a yellow or light brown color, butter taste, and “earthy” odor in water.

Although there are currently no treatments certified specifically for the reduction of humic substances, tannin, or lignin, effective treatment methods for reducing the levels in drinking water include activated carbon, anion exchange, and chlorination/filtration.

Should you have any questions or require additional information, please contact our office.

Michael Schnieders, PG, PH-GW
Hydrogeologist

Water Systems Engineering, Inc.

Date: February 3, 2017

Lab Report No. 20772

Eric Johnson
WSP
1350 Dulles Technology Drive, Suite 300
Herndon, VA 20171

Project Description: RW-1D, RW-1S, RW-2S, RW-3S
Special Analysis; samples received 1/25/2017

Testing Procedures:

All laboratory testing procedures are performed according to the guidelines set forth in *Standard Methods for the Examination of Water and Wastewater* as established by the American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF). Corrosion analyses are performed in accordance with the guidelines as set forth by the National Association of Corrosion Engineers (NACE). In general, these methods are approved by both the Environmental Protection Agency (EPA) and AWWA for the reporting of water and/or wastewater data.

Sample collection and shipment is the responsibility of the customer, performed according to protocol and procedures defined by the laboratory in advance of the sampling event with regards to the specific project and nature of the problem.

Disclaimer:

The data and interpretations presented are based on an evaluation of the samples and submitted data. Conclusions reached in this report are based upon the data available at the time of submittal and the accuracy of the report depends upon the validity of information submitted. Any recommendations presented are based on laboratory and field evaluations of similar fouling occurrences within potable water systems. Further investigative efforts, such as efficiency testing, site inspection, video survey, or other evaluation methods may offer additional insight into the system's condition and the degree of fouling present.

Client: WSP
Date: February 3, 2017
Lab Report No. 20770

Re: RW-1D, RW-15, RW-25, RW-35
Special Analysis; samples received 1/25/2017

ND - Not Detected NA - Not Applicable	**RW-1D** mg/l	**RW-1S** mg/l	**RW-2S** mg/l	**RW-3S** mg/l	**Detection Limits**
Tannin/Lignin	ND	0.1	0.2	ND	0.1 mg/l

Note:

Tannin and Lignin are organic compounds similar to humic substances. Tannin is a complex organic compound found naturally in soil and in certain tree barks. Lignin is a compound common in woody plants and trees. Humic substances, tannin, and lignin are most common in surface water and shallow groundwater hydraulically connected to surface waters or wetlands. These organic substances may occasionally be found in well water, particularly if aquifer receives rapid recharge from the shallow subsurface or if the well is not properly constructed.

There are currently no primary or secondary water quality standards for the presence of tannin or lignin in produced water. When present in elevated concentrations, tannin and lignin can impart a yellow or light brown color, butter taste, and “earthy” odor in water.

Although there are currently no treatments certified specifically for the reduction of humic substances, tannin, or lignin, effective treatment methods for reducing the levels in drinking water include activated carbon, anion exchange, and chlorination/filtration.

Should you have any questions or require additional information, please contact our office.

Michael Schnieders, PG, PH-GW
Hydrogeologist

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17012320

Project Manager: Eric Johnson
Project Name : Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID : 31400390 - 5

January 30, 2017

Phase Separation Science, Inc.
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PHASE SEPARATION SCIENCE, INC.

January 30, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17012320**
Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID.: 31400390 - 5

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 **17012320**.

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 February 27, 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

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Former KopFlex Facility Site

Work Order Number(s): 17012320

Project ID: 31400390 - 5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/23/2017 at 04:30 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17012320-001	EB - 01232017	WATER	01/23/17 10:00
17012320-002	RW-2D	WATER	01/23/17 12:25
17012320-003	Trip Blank	WATER	01/23/17 16:30

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: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: EB - 01232017 **Date/Time Sampled: 01/23/2017 10:00** **PSS Sample ID: 17012320-001**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

Total Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Organic Carbon	ND	mg/L	0.50		01/25/17	01/25/17 11:01	4001

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/L	0.11		1	01/24/17	01/26/17 21:14	1045

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/L	100		1	01/24/17	01/24/17 11:41	1035

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CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: EB - 01232017 **Date/Time Sampled: 01/23/2017 10:00** **PSS Sample ID: 17012320-001**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

VCP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
gamma-BHC (Lindane)	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
beta-BHC	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
delta-BHC	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Heptachlor	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Aldrin	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Heptachlor epoxide	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
gamma-Chlordane	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
alpha-Chlordane	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
4,4-DDE	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Endosulfan I	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Dieldrin	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Endrin	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
4,4-DDD	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Endosulfan II	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
4,4-DDT	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Endrin aldehyde	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Methoxychlor	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Endosulfan sulfate	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Endrin ketone	ND	ug/L	0.040		1	01/24/17	01/24/17 15:45	1029
Toxaphene	ND	ug/L	1.0		1	01/24/17	01/24/17 15:45	1029

VCP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dalapon	ND	ug/L	4.6		10	01/26/17	01/27/17 11:24	1029
2,4-D	ND	ug/L	1.9		10	01/26/17	01/27/17 11:24	1029
2,4,5-TP (Silvex)	ND	ug/L	0.19		10	01/26/17	01/27/17 11:24	1029
Dinoseb	ND	ug/L	0.95		10	01/26/17	01/27/17 11:24	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: EB - 01232017 **Date/Time Sampled: 01/23/2017 10:00** **PSS Sample ID: 17012320-001**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

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

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 13:38	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 13:38	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 13:38	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 13:38	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 13:38	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 13:38	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: EB - 01232017 **Date/Time Sampled: 01/23/2017 10:00** **PSS Sample ID: 17012320-001**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

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

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Trichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 13:38	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:38	1011

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January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: EB - 01232017 **Date/Time Sampled: 01/23/2017 10:00** **PSS Sample ID: 17012320-001**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

VCP Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Acenaphthylene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Anthracene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Benzo(a)anthracene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Benzo(a)pyrene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Benzo(b)fluoranthene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Benzo(g,h,i)perylene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Benzo(k)fluoranthene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
bis(2-chloroethyl) ether	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
bis(2-chloroisopropyl) ether	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
bis(2-ethylhexyl) phthalate	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Di-n-butyl phthalate	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Carbazole	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
4-Chloroaniline	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2-Chloronaphthalene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2-Chlorophenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Chrysene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Dibenz(a,h)anthracene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Dibenzofuran	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
1,2'-Dichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
1,3'-Dichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
1,4-Dichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
3,3-Dichlorobenzidine	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2,4-Dichlorophenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Diethyl phthalate	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2,4-Dimethylphenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2,4-Dinitrophenol	ND	ug/L	10		1	01/24/17	01/24/17 23:39	1055
2,4-Dinitrotoluene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2,6-Dinitrotoluene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Fluoranthene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055

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CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: EB - 01232017 **Date/Time Sampled: 01/23/2017 10:00** **PSS Sample ID: 17012320-001**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

VCP Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluorene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Hexachlorobenzene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Hexachlorobutadiene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Hexachlorocyclopentadiene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Hexachloroethane	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Isophorone	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2-Methylnaphthalene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
2-Methylphenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
3&4-Methylphenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Naphthalene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Nitrobenzene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
N-Nitrosodi-n-propyl amine	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
N-Nitrosodiphenylamine	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Pentachlorophenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Phenanthrene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
Phenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Pyrene	ND	ug/L	0.50		1	01/24/17	01/24/17 23:39	1055
1,2,4-Trichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2,4,5-Trichlorophenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
2,4,6-Trichlorophenol	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055
Bis(2-ethylhexyl)adipate	ND	ug/L	5.0		1	01/24/17	01/24/17 23:39	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: RW-2D **Date/Time Sampled: 01/23/2017 12:25** **PSS Sample ID: 17012320-002**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

Dissolved Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Dissolved Organic Carbon	**0.84**	mg/L	0.50		01/24/17	01/24/17 11:20	4001

Total Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Organic Carbon	**0.67**	mg/L	0.50		01/26/17	01/26/17 11:55	4001

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/L	0.11		1	01/24/17	01/26/17 21:39	1045

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	**100**	ug/L	100		1	01/24/17	01/24/17 12:07	1035

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CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: RW-2D **Date/Time Sampled: 01/23/2017 12:25** **PSS Sample ID: 17012320-002**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

VCP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
gamma-BHC (Lindane)	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
beta-BHC	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
delta-BHC	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Heptachlor	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Aldrin	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Heptachlor epoxide	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
gamma-Chlordane	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
alpha-Chlordane	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
4,4-DDE	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Endosulfan I	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Dieldrin	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Endrin	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
4,4-DDD	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Endosulfan II	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
4,4-DDT	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Endrin aldehyde	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Methoxychlor	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Endosulfan sulfate	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Endrin ketone	ND	ug/L	0.040		1	01/24/17	01/24/17 16:13	1029
Toxaphene	ND	ug/L	1.0		1	01/24/17	01/24/17 16:13	1029

VCP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dalapon	ND	ug/L	4.6		10	01/26/17	01/27/17 11:58	1029
2,4-D	ND	ug/L	1.9		10	01/26/17	01/27/17 11:58	1029
2,4,5-TP (Silvex)	ND	ug/L	0.19		10	01/26/17	01/27/17 11:58	1029
Dinoseb	ND	ug/L	0.95		10	01/26/17	01/27/17 11:58	1029

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CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: RW-2D **Date/Time Sampled: 01/23/2017 12:25** **PSS Sample ID: 17012320-002**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

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

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 14:00	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 14:00	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 14:00	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 14:00	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 14:00	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,1-Dichloroethane	**80**	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,2-Dichloroethane	**4.6**	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,1-Dichloroethene	**250**	ug/L	5.0		5	01/26/17	01/27/17 14:20	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 14:00	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011

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CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: RW-2D **Date/Time Sampled: 01/23/2017 12:25** **PSS Sample ID: 17012320-002**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

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

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,1,1-Trichloroethane	**31**	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Trichloroethene	**1.5**	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 14:00	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 14:00	1011

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WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: RW-2D **Date/Time Sampled: 01/23/2017 12:25** **PSS Sample ID: 17012320-002**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

VCP Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Acenaphthylene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Anthracene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Benzo(a)anthracene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Benzo(a)pyrene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Benzo(b)fluoranthene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Benzo(g,h,i)perylene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Benzo(k)fluoranthene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
bis(2-chloroethyl) ether	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
bis(2-chloroisopropyl) ether	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
bis(2-ethylhexyl) phthalate	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Di-n-butyl phthalate	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Carbazole	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
4-Chloroaniline	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2-Chloronaphthalene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2-Chlorophenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Chrysene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Dibenz(a,h)anthracene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Dibenzofuran	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
1,2'-Dichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
1,3'-Dichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
1,4-Dichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
3,3-Dichlorobenzidine	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2,4-Dichlorophenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Diethyl phthalate	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2,4-Dimethylphenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2,4-Dinitrophenol	ND	ug/L	10		1	01/24/17	01/25/17 00:10	1055
2,4-Dinitrotoluene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2,6-Dinitrotoluene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Fluoranthene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055

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CERTIFICATE OF ANALYSIS

No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: RW-2D **Date/Time Sampled: 01/23/2017 12:25** **PSS Sample ID: 17012320-002**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

VCP Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluorene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Hexachlorobenzene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Hexachlorobutadiene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Hexachlorocyclopentadiene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Hexachloroethane	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Isophorone	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2-Methylnaphthalene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
2-Methylphenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
3&4-Methylphenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Naphthalene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Nitrobenzene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
N-Nitrosodi-n-propyl amine	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
N-Nitrosodiphenylamine	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Pentachlorophenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Phenanthrene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
Phenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Pyrene	ND	ug/L	0.50		1	01/24/17	01/25/17 00:10	1055
1,2,4-Trichlorobenzene	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2,4,5-Trichlorophenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
2,4,6-Trichlorophenol	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055
Bis(2-ethylhexyl)adipate	ND	ug/L	5.0		1	01/24/17	01/25/17 00:10	1055

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No: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: Trip Blank **Date/Time Sampled: 01/23/2017 16:30** **PSS Sample ID: 17012320-003**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

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

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 13:16	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 13:16	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 13:16	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 13:16	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 13:16	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 13:16	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011

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: 17012320

WSP Environment & Energy - Herndon, Herndon, VA

January 30, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390 - 5

Sample ID: Trip Blank **Date/Time Sampled: 01/23/2017 16:30** **PSS Sample ID: 17012320-003**
Matrix: WATER **Date/Time Received: 01/23/2017 16:30**

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

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Trichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 13:16	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 13:16	1011

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

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www.microbac.com

COVER LETTER

Lynn Jackson
Phase Separation
6630 Baltimore National Pike, Suite 103
Baltimore, MD 21228

RE: General Wet Chem Analysis

January 30, 2017
Report No.: 17A1224

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 01/24/2017 09:55.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Certifications/Notes and Definitions
- Cooler Receipt Log
- Chain of Custody



Final report reviewed by:	Coretta S. Davis For Melanie C. Duszynski/Project Manager	1/30/2017 Report issue date

All samples received in proper condition and results conform to ISO 17025 and TNI NELAC standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Coretta S. Davis For Melanie C. Duszynski/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1224
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5	Reported: 01/30/2017 16:43
Baltimore, MD 21228	Project Manager: Lynn Jackson	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
17012320-001 - EB-01232017	17A1224-01	Water	Grab	01/23/2017 10:00	01/24/2017 09:55
17012320-002 - RW-2D	17A1224-02	Water	Grab	01/23/2017 12:25	01/24/2017 09:55



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1224
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5	Reported: 01/30/2017 16:43
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17012320-001 - EB-01232017

17A1224-01 (Water) Sampled: 01/23/2017 10:00; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	**0.14**	0.020	mg LAS/L (MW 320)		012417 1216	012517 0708	LCR	SM 5540 C-11	



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1224
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5	Reported: 01/30/2017 16:43
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17012320-002 - RW-2D

17A1224-02 (Water) Sampled: 01/23/2017 12:25; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	**0.045**	0.020	mg LAS/L (MW 320)		012417 1216	012517 0708	LCR	SM 5540 C-11	

Microbac Laboratories, Inc. - Baltimore



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Coretta S. Davis For Melanie C. Duszynski, Project Manager

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1224
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5	Reported: 01/30/2017 16:43
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Project Requested Certification(s):

A2LA (Environmental)

Analyte Certification Exception Summary

No certification exceptions

All analysis performed were analyzed under the required certification unless otherwise noted in the above summary.

Certification List

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

Code	Description	Certification Number	Expires
Microbac Laboratories, Inc. - Baltimore			
A2LA1	A2LA (Biology)	410.02	04/30/2017
A2LA2	A2LA (Environmental)	410.01	04/30/2017
VA-B	Commonwealth of Virginia (NELAC) - Baltimore	460285	03/14/2017
CPSC	CPSC Testing of Childrens Products and Jewelry	1115	04/30/2017
Pb	Environmental Lead (ELLAP)	410.01	04/30/2017
MD	State of Maryland (Drinking Water)	109	06/30/2017
WV	West Virginia	054	08/31/2017
Microbac Laboratories, Inc. - Richmond			
VA-R	Commonwealth of Virginia (NELAC) - Richmond	460022	06/14/2017

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1224
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5	Reported: 01/30/2017 16:43
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Qualifiers/Notes and Definitions

General Definitions:

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Baltimore Division

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Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** 4.00°C **Work Order:** 17A1224

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Chain of Custody Form for Subcontracted Analyses

Phase Separation Science, Inc
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

For Questions or issues please contact: Amber Confer

W.O. No. : **17012320**
P.O. No. :
Project Number : 31400390 - 5
Report To LOD : No

Report Due On :01/30/17 05:00

Samples Transferred To:
Microbac - Baltimore
2101 Van Deman Street
Baltimore, MD 21224

Contacts : sales - Mike Arbaugh / PMs (when we d
Phone : 410-633-1800

Lab Sample ID	Field Sample ID	Date Sampled	Time Sampled	Matrix	Analyses Required	Method	Type of Container	Preservative
17012320-001	EB - 01232017	01/23/17	10:00	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL
17012320-002	RW-2D	01/23/17	12:25	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL

Data Deliverables Required: COA

Perform Q.C. on Sample :

Send Report Attn : reporting@phaseonline.com

Send InvoiceAttn : invoicing@phaseonline.com

Airbill No.:

Carrier : ~~FE~~ FE(RUSH)

Condition Upon Receipt :

Comments : **Results are for Maryland VCP site.** 4.0°c Rec'd on ice

Samples Relinquished By : Date : 01/24/17 Time: 9:15 Samples Received By : #2035

Samples Relinquished By: Date : 01/24/17 Time : 0955 Samples Received By: /1000:11:00

Samples Relinquished By: Date: Time: Samples Received By:

17A1224

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Microbac Laboratories, Inc., Baltimore Division
Control # 606-03
Effective Date: 11/30/2016
Page 1 of 1

Number of Coolers Received: 1
Client: Phase Separation
Form Completed By: HD Dillinger
Shipper: HDD
Receipt Date / Time: 01/24/17 0955
Work Order # 17A1224

Custody Tape Intact:	☐ Microbac ☒ Client ☐ UPS ☐ FedEx
Containers Intact:	YES / NO / NA
Sample Received on Ice or refrigerated:	YES / NO
	YES / NO / NA
	Infrared (IR) Temperature: 4.0 °C
Chain of Custody Present with shipment:	YES / NO
Sample Bottle IDs agree with COC:	YES / NO
Preservation requirements met:	YES / NO / Not Checked
Correct Number of Containers / Sample Volume:	YES / NO (If No, contact client immediately)
Headspace in container:	YES / NO / NA
Type of Sample:	Water Soil Wipes Oil Filter Solid Sludge Food Swab Other

Container Type / Quantity:

A -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid:	If preserved pH <2___, pH >10___
B -	2 Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
C -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
D -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
E -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
H -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
K -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
L -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
M-	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
P -	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
W-	___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
V -	___ Unpreserved	___ HCl	___ HCl / Ascorbic Acid	___ HCl / NaTHIO **(Checked at time of Analysis)**			
F -	___ Unpreserved	___ NaTHIO **(Checked at time of Analysis)**					
S -	___ Unpreserved	___ NaTHIO **(Checked at time of Analysis)**					
SN-	___ Unpreserved	___NaTHIO	___NaTHIO/EDTA **(Checked at time of Analysis)**				

___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___
___ Unpreserved	___ H2SO4	___ HNO3	___ HCl	___ NaOH	___ NaOH/Ascorbic Acid	If preserved pH <2___, pH >10___

Describe preservation requirements not met:

All Acid preserved <2 pH *NaOH preserved >12 pH* *All others >2 and <10 (usually 4-8)*

Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added

H_2SO_4 – Sulfuric Acid, HNO_3 – Nitric Acid, NaOH – Sodium Hydroxide, ASC – Ascorbic Acid, NaTHIO – Sodium Thiosulfate

Describe Anomalies:_____

Contact information / Summary of Actions:

Date / Time:_____ Contact:_____ Contact By:_____
Comments:_____

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Former KopFlex Facility Site

Work Order Number(s): 17012320

Project ID: 31400390 - 5

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:

Trip blank received in cooler with equipment blank sample.

17012320: Analyses associated with analyst code 4001 were performed by ALS Group USA, Corp. - PA - PA 22-00293 VA 460157

Analytical:

Total Organic Carbon

Batch: 139420

For sample 002; the result reported for the DOC analysis is higher than the result reported for the TOC analysis. The results reported are within the precision limits associated with the methods.

VCP Chlorinated Herbicides

Batch: 139433

Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form. Exceedances meet marginal exceedance criteria.
Surrogate exceedances identified; see surrogate summary form.

VCP Semivolatile Organic Compounds (w/ TICs)

Batch: 139322

Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form.

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

Analytical Data Package Information Summary

Work Order(s): 17012320
Report Prepared For: WSP Environment & Energy - Herndon, Hern
Project Name: Recovery Well Sampling
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM20 5310B	EB - 01232017	Initial	17012320-001	4001	W	139420	139420	01/23/2017	01/25/2017 11:01	01/25/2017 11:01
	RW-2D	Initial	17012320-002	4001	W	139420	139420	01/23/2017	01/26/2017 11:55	01/26/2017 11:55
SM20 5310B	RW-2D	Initial	17012320-002	4001	W	139420	139420	01/23/2017	01/24/2017 11:20	01/24/2017 11:20
SW-846 8015 C	EB - 01232017	Initial	17012320-001	1045	W	64522	139386	01/23/2017	01/24/2017 10:38	01/26/2017 21:14
	RW-2D	Initial	17012320-002	1045	W	64522	139386	01/23/2017	01/24/2017 10:38	01/26/2017 21:39
	64522-1-BKS	BKS	64522-1-BKS	1045	W	64522	139386	--------	01/24/2017 10:38	01/26/2017 19:10
	64522-1-BLK	BLK	64522-1-BLK	1045	W	64522	139386	--------	01/24/2017 10:38	01/26/2017 18:46
	64522-1-BSD	BSD	64522-1-BSD	1045	W	64522	139386	--------	01/24/2017 10:38	01/26/2017 19:35
SW-846 8015C	EB - 01232017	Initial	17012320-001	1035	W	64527	139297	01/23/2017	01/24/2017 09:23	01/24/2017 11:41
	RW-2D	Initial	17012320-002	1035	W	64527	139297	01/23/2017	01/24/2017 09:23	01/24/2017 12:07
	64527-2-BKS	BKS	64527-2-BKS	1035	W	64527	139297	--------	01/24/2017 09:23	01/24/2017 12:33
	64527-2-BLK	BLK	64527-2-BLK	1035	W	64527	139297	--------	01/24/2017 09:23	01/24/2017 11:16
	64527-2-BSD	BSD	64527-2-BSD	1035	W	64527	139297	--------	01/24/2017 09:23	01/24/2017 12:58
SW-846 8081 B	EB - 01232017	Initial	17012320-001	1029	W	64519	139343	01/23/2017	01/24/2017 09:47	01/24/2017 15:45
	RW-2D	Initial	17012320-002	1029	W	64519	139343	01/23/2017	01/24/2017 09:47	01/24/2017 16:13
	64519-1-BKS	BKS	64519-1-BKS	1029	W	64519	139343	--------	01/24/2017 09:47	01/24/2017 19:01
	64519-1-BLK	BLK	64519-1-BLK	1029	W	64519	139343	--------	01/24/2017 09:47	01/24/2017 18:33
	64519-1-BSD	BSD	64519-1-BSD	1029	W	64519	139343	--------	01/24/2017 09:47	01/24/2017 19:29
SW-846 8151 A	EB - 01232017	Initial	17012320-001	1029	W	64555	139433	01/23/2017	01/26/2017 11:11	01/27/2017 11:24
	RW-2D	Initial	17012320-002	1029	W	64555	139433	01/23/2017	01/26/2017 11:11	01/27/2017 11:58
	64555-1-BKS	BKS	64555-1-BKS	1029	W	64555	139433	--------	01/26/2017 11:11	01/27/2017 10:18
	64555-1-BLK	BLK	64555-1-BLK	1029	W	64555	139433	--------	01/26/2017 11:11	01/27/2017 09:45
	64555-1-BSD	BSD	64555-1-BSD	1029	W	64555	139433	--------	01/26/2017 11:11	01/27/2017 10:51
SW-846 8260 B	EB - 01232017	Initial	17012320-001	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 13:38
	RW-2D	Initial	17012320-002	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 14:00
	Trip Blank	Initial	17012320-003	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 13:16

Analytical Data Package Information Summary

Work Order(s): **17012320**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
Project Name: Recovery Well Sampling
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	64570-1-BKS	BKS	64570-1-BKS	1011	W	64570	139388	--------	01/26/2017 08:33	01/26/2017 09:47
	64570-1-BLK	BLK	64570-1-BLK	1011	W	64570	139388	--------	01/26/2017 08:33	01/26/2017 10:42
	RW-2D S	MS	17012320-002 S	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 14:46
	RW-2D S	Reanalysis	17012320-002 S	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 14:46
	RW-2 SD	MSD	17012320-002 SD	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 15:07
	RW-2 SD	Reanalysis	17012320-002 SD	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 15:07
	64589-1-BKS	BKS	64589-1-BKS	1011	W	64589	139421	--------	01/27/2017 08:48	01/27/2017 10:02
	64589-1-BLK	BLK	64589-1-BLK	1011	W	64589	139421	--------	01/27/2017 08:48	01/27/2017 10:57
	MW-1 S	MS	17012601-001 S	1011	W	64589	139421	01/25/2017	01/27/2017 08:48	01/27/2017 13:11
	MW-1 SD	MSD	17012601-001 SD	1011	W	64589	139421	01/25/2017	01/27/2017 08:48	01/27/2017 13:34
	RW-2D	Reanalysis	17012320-002	1011	W	64570	139421	01/23/2017	01/26/2017 08:33	01/27/2017 14:20
SW-846 8270 C	EB - 01232017	Initial	17012320-001	1055	W	64510	139322	01/23/2017	01/24/2017 09:19	01/24/2017 23:39
	RW-2D	Initial	17012320-002	1055	W	64510	139322	01/23/2017	01/24/2017 09:19	01/25/2017 00:10
	64510-1-BKS	BKS	64510-1-BKS	1055	W	64510	139322	--------	01/24/2017 09:19	01/24/2017 21:38
	64510-1-BLK	BLK	64510-1-BLK	1055	W	64510	139322	--------	01/24/2017 09:19	01/24/2017 21:07
	64510-1-BSD	BSD	64510-1-BSD	1055	W	64510	139322	--------	01/24/2017 09:19	01/25/2017 05:33

PHASE SEPARATION SCIENCE, INC.

QC Summary 17012320

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

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 17012320

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

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

CHAIN-OF-CUSTODY RECORD 17012320

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Dr. Suite 300 Herndon, VA 20171

No. 004509 — WSP | PARSONS BRINCKERHOFF

Project Name: Former Kopfley Farley Site	WSP | Parsons Brinckerhoff Contact Name: Eric Johnson
Project Location: Hanover MD	WSP | Parsons Brinckerhoff Contact E-mail: Eric.Johnson @wspgroup.com
Project Number & Task: 31400390-5	WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500
Sampler(s) Name(s): Matt Richardson, Marcia Hayden, Rob Wallace	Sampler(s) Signature(s):

Laboratory Name & Location: PHASE, Baltimore MD

Laboratory Project Manager: Amber Confer

Requested Turn-Around-Time: ☐ Standard ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ ___ HR — 5 DAY

Requested Analyses & Preservatives

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	VOCs 8260B	SVOCs 8270C	MBAS Surfactants 5540C	TPH-GRO 8015C	TPH-DRO 8015C	Pesticides 8081B	Herbicides 8151A	TOC 5310B	DOC 5310B	Sample Comments
EB-01232017	Ag	1/23	1000			13	X	X	X	X	X	X	X	X		Bladder pump Equipment Blank
RW-2D	Ag	1/23	1225			15	X	X	X	X	X	X	X	X	X	
Trip Blank	Ag					2	X									Las Prepared

# of Coolers: 2
Custody Seal: ABS
Ice Present: PRES Temp: 6°-10°C
Shipping Carrier: Client

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	1/23/17	1630				Delivery by WSP	—
Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Number of Packages	Custody Seal Number(s)
						2	—

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17012320	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	01/23/2017 04:30:00 PM
Project Name	Former KopFlex Facility Site	**Delivered By**	Client
Project Number	31400390 - 5	**Tracking No**	Not Applicable
Disposal Date	02/27/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 2

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	MR/MK/RW
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 30

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)	Yes
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.

Trip blank received in cooler with equipment blank sample.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 01/23/2017

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 01/30/2017

Lynn Jackson

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17012529

Project Manager: Eric Johnson

Project Name : Former KopFlex Facility Site

Project Location: Hanover, MD

Project ID : 31400390-5

February 2, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

February 2, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17012529**
Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17012529**.

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 March 1, 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 Environment & Energy - Herndon

Project Name: Former KopFlex Facility Site

Work Order Number(s): 17012529

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/25/2017 at 05:00 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17012529-001	RW-1D	WATER	01/25/17 09:40
17012529-002	RW-3S	WATER	01/25/17 10:41
17012529-003	RW-2S	WATER	01/25/17 13:35
17012529-004	RW-1S	WATER	01/25/17 14:15
17012529-005	RW-1D Trip Blanks	WATER	01/25/17 14:15
17012529-006	RW-2S Trip Blanks	WATER	01/25/17 14:15
17012529-007	RW-1S Trip Blanks	WATER	01/25/17 14:15

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: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D **Date/Time Sampled: 01/25/2017 09:40** **PSS Sample ID: 17012529-001**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

Dissolved Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Dissolved Organic Carbon	**0.95**	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Organic Carbon	ND	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/L	0.11		1	01/26/17	01/27/17 14:04	1045

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/L	100		1	01/30/17	01/31/17 14:24	1035

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D **Date/Time Sampled: 01/25/2017 09:40** **PSS Sample ID: 17012529-001**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
gamma-BHC (Lindane)	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
beta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
delta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Heptachlor	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Aldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Heptachlor epoxide	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
gamma-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
alpha-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
4,4-DDE	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Endosulfan I	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Dieldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Endrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
4,4-DDD	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Endosulfan II	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
4,4-DDT	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Endrin aldehyde	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Methoxychlor	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Endosulfan sulfate	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Endrin ketone	ND	ug/L	0.040		1	01/27/17	01/30/17 20:57	1029
Toxaphene	ND	ug/L	1.0		1	01/27/17	01/30/17 20:57	1029

VCP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dalapon	ND	ug/L	4.6		10	01/26/17	01/27/17 12:31	1029
2,4-D	ND	ug/L	1.9		10	01/26/17	01/27/17 12:31	1029
2,4,5-TP (Silvex)	ND	ug/L	0.19		10	01/26/17	01/27/17 12:31	1029
Dinoseb	ND	ug/L	0.95		10	01/26/17	01/27/17 12:31	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D **Date/Time Sampled: 01/25/2017 09:40** **PSS Sample ID: 17012529-001**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 16:54	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 16:54	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 16:54	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 16:54	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 16:54	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,1-Dichloroethane	**4.8**	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,1-Dichloroethene	**37**	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 16:54	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D **Date/Time Sampled: 01/25/2017 09:40** **PSS Sample ID: 17012529-001**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Trichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 16:54	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:54	1011

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D **Date/Time Sampled: 01/25/2017 09:40** **PSS Sample ID: 17012529-001**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Acenaphthylene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Benzo(a)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Benzo(a)pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Benzo(b)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Benzo(g,h,i)perylene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Benzo(k)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
bis(2-chloroethyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
bis(2-chloroisopropyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
bis(2-ethylhexyl) phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Di-n-butyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Carbazole	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
4-Chloroaniline	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2-Chloronaphthalene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2-Chlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Chrysene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Dibenz(a,h)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Dibenzofuran	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
1,2'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
1,3'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
1,4-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
3,3-Dichlorobenzidine	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2,4-Dichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Diethyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2,4-Dimethylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2,4-Dinitrophenol	ND	ug/L	10		1	01/26/17	01/26/17 18:10	1055
2,4-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2,6-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D **Date/Time Sampled: 01/25/2017 09:40** **PSS Sample ID: 17012529-001**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Fluorene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Hexachlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Hexachlorobutadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Hexachlorocyclopentadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Hexachloroethane	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Isophorone	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2-Methylnaphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
2-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
3&4-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Naphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Nitrobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
N-Nitrosodi-n-propyl amine	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
N-Nitrosodiphenylamine	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Pentachlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Phenanthrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
Phenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:10	1055
1,2,4-Trichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2,4,5-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
2,4,6-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Bis(2-ethylhexyl)adipate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055
Squalene (TIC)	**5.1**	ug/L	5.0		1	01/26/17	01/26/17 18:10	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-3S **Date/Time Sampled: 01/25/2017 10:41** **PSS Sample ID: 17012529-002**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

Dissolved Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Dissolved Organic Carbon	**1.3**	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Organic Carbon	**0.83**	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/L	0.10		1	01/26/17	01/27/17 14:04	1045

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/L	100		1	01/30/17	01/31/17 14:51	1035

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-3S **Date/Time Sampled: 01/25/2017 10:41** **PSS Sample ID: 17012529-002**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
gamma-BHC (Lindane)	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
beta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
delta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Heptachlor	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Aldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Heptachlor epoxide	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
gamma-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
alpha-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
4,4-DDE	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Endosulfan I	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Dieldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Endrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
4,4-DDD	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Endosulfan II	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
4,4-DDT	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Endrin aldehyde	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Methoxychlor	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Endosulfan sulfate	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Endrin ketone	ND	ug/L	0.040		1	01/27/17	01/30/17 20:29	1029
Toxaphene	ND	ug/L	1.0		1	01/27/17	01/30/17 20:29	1029

VCP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dalapon	ND	ug/L	4.6		10	01/26/17	01/27/17 13:04	1029
2,4-D	ND	ug/L	1.9		10	01/26/17	01/27/17 13:04	1029
2,4,5-TP (Silvex)	ND	ug/L	0.19		10	01/26/17	01/27/17 13:04	1029
Dinoseb	ND	ug/L	0.95		10	01/26/17	01/27/17 13:04	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-3S **Date/Time Sampled: 01/25/2017 10:41** **PSS Sample ID: 17012529-002**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 17:14	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 17:14	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 17:14	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 17:14	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 17:14	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,1-Dichloroethane	**9.7**	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,1-Dichloroethene	**10**	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 17:14	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-3S **Date/Time Sampled: 01/25/2017 10:41** **PSS Sample ID: 17012529-002**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Toluene	**2.6**	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,1,1-Trichloroethane	**1.9**	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Trichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 17:14	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:14	1011

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-3S **Date/Time Sampled: 01/25/2017 10:41** **PSS Sample ID: 17012529-002**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Acenaphthylene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Benzo(a)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Benzo(a)pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Benzo(b)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Benzo(g,h,i)perylene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Benzo(k)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
bis(2-chloroethyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
bis(2-chloroisopropyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
bis(2-ethylhexyl) phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Di-n-butyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Carbazole	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
4-Chloroaniline	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2-Chloronaphthalene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2-Chlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Chrysene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Dibenz(a,h)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Dibenzofuran	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
1,2'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
1,3'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
1,4-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
3,3-Dichlorobenzidine	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2,4-Dichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Diethyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2,4-Dimethylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2,4-Dinitrophenol	ND	ug/L	10		1	01/26/17	01/26/17 18:38	1055
2,4-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2,6-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-3S **Date/Time Sampled: 01/25/2017 10:41** **PSS Sample ID: 17012529-002**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Fluorene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Hexachlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Hexachlorobutadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Hexachlorocyclopentadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Hexachloroethane	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Isophorone	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2-Methylnaphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
2-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
3&4-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Naphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Nitrobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
N-Nitrosodi-n-propyl amine	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
N-Nitrosodiphenylamine	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Pentachlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Phenanthrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
Phenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 18:38	1055
1,2,4-Trichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2,4,5-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
2,4,6-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
Bis(2-ethylhexyl)adipate	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055
No TICs Found	ND	ug/L	5.0		1	01/26/17	01/26/17 18:38	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S **Date/Time Sampled: 01/25/2017 13:35** **PSS Sample ID: 17012529-003**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

Dissolved Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Dissolved Organic Carbon	**2.7**	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Organic Carbon	**2.7**	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/L	0.11		1	01/26/17	01/27/17 14:29	1045

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	**970**	ug/L	100		1	01/30/17	01/31/17 15:18	1035

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S **Date/Time Sampled: 01/25/2017 13:35** **PSS Sample ID: 17012529-003**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
gamma-BHC (Lindane)	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
beta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
delta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Heptachlor	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Aldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Heptachlor epoxide	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
gamma-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
alpha-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
4,4-DDE	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Endosulfan I	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Dieldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Endrin	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
4,4-DDD	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Endosulfan II	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
4,4-DDT	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Endrin aldehyde	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Methoxychlor	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Endosulfan sulfate	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Endrin ketone	ND	ug/L	0.040		1	01/27/17	01/30/17 20:01	1029
Toxaphene	ND	ug/L	1.0		1	01/27/17	01/30/17 20:01	1029

VCP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dalapon	ND	ug/L	4.6		10	01/26/17	01/27/17 14:11	1029
2,4-D	ND	ug/L	1.9		10	01/26/17	01/27/17 14:11	1029
2,4,5-TP (Silvex)	ND	ug/L	0.19		10	01/26/17	01/27/17 14:11	1029
Dinoseb	ND	ug/L	0.95		10	01/26/17	01/27/17 14:11	1029

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S **Date/Time Sampled: 01/25/2017 13:35** **PSS Sample ID: 17012529-003**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 17:35	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 17:35	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 17:35	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 17:35	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Chloroform	**1.0**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 17:35	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,1-Dichloroethane	**220**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,2-Dichloroethane	**4.6**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,1-Dichloroethene	**1,300**	ug/L	50		50	01/26/17	01/27/17 14:41	1011
cis-1,2-Dichloroethene	**1.6**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Methylene chloride	**9.0**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 17:35	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S **Date/Time Sampled: 01/25/2017 13:35** **PSS Sample ID: 17012529-003**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Toluene	**1.5**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,1,1-Trichloroethane	**1,300**	ug/L	50		50	01/26/17	01/27/17 14:41	1011
1,1,2-Trichloroethane	**1.5**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Trichloroethene	**13**	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 17:35	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:35	1011

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WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S **Date/Time Sampled: 01/25/2017 13:35** **PSS Sample ID: 17012529-003**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Acenaphthylene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Benzo(a)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Benzo(a)pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Benzo(b)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Benzo(g,h,i)perylene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Benzo(k)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
bis(2-chloroethyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
bis(2-chloroisopropyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
bis(2-ethylhexyl) phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Di-n-butyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Carbazole	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
4-Chloroaniline	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2-Chloronaphthalene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2-Chlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Chrysene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Dibenz(a,h)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Dibenzofuran	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
1,2'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
1,3'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
1,4-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
3,3-Dichlorobenzidine	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2,4-Dichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Diethyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2,4-Dimethylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2,4-Dinitrophenol	ND	ug/L	10		1	01/26/17	01/26/17 19:06	1055
2,4-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2,6-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S **Date/Time Sampled: 01/25/2017 13:35** **PSS Sample ID: 17012529-003**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Fluorene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Hexachlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Hexachlorobutadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Hexachlorocyclopentadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Hexachloroethane	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Isophorone	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2-Methylnaphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
2-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
3&4-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Naphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Nitrobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
N-Nitrosodi-n-propyl amine	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
N-Nitrosodiphenylamine	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Pentachlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Phenanthrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
Phenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:06	1055
1,2,4-Trichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2,4,5-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
2,4,6-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Bis(2-ethylhexyl)adipate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055
Squalene (TIC)	**5.4**	ug/L	5.0		1	01/26/17	01/26/17 19:06	1055

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-004**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

Dissolved Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Dissolved Organic Carbon	**2.3**	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Organic Carbon — Analytical Method: SM20 5310B

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Organic Carbon	**1.9**	mg/L	0.50		01/30/17	01/30/17 10:39	4001

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/L	0.11		1	01/26/17	01/27/17 14:29	1045

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	**710**	ug/L	100		1	01/30/17	01/31/17 15:45	1035

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No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-004**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
gamma-BHC (Lindane)	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
beta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
delta-BHC	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Heptachlor	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Aldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Heptachlor epoxide	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
gamma-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
alpha-Chlordane	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
4,4-DDE	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Endosulfan I	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Dieldrin	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Endrin	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
4,4-DDD	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Endosulfan II	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
4,4-DDT	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Endrin aldehyde	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Methoxychlor	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Endosulfan sulfate	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Endrin ketone	ND	ug/L	0.040		1	01/27/17	01/30/17 19:33	1029
Toxaphene	ND	ug/L	1.0		1	01/27/17	01/30/17 19:33	1029

VCP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dalapon	ND	ug/L	4.6		10	01/26/17	01/27/17 13:37	1029
2,4-D	ND	ug/L	1.9		10	01/26/17	01/27/17 13:37	1029
2,4,5-TP (Silvex)	ND	ug/L	0.19		10	01/26/17	01/27/17 13:37	1029
Dinoseb	ND	ug/L	0.95		10	01/26/17	01/27/17 13:37	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-004**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 17:56	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 17:56	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 17:56	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 17:56	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Chloroethane	**10**	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 17:56	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,1-Dichloroethane	**690**	ug/L	50		50	01/26/17	01/27/17 15:02	1011
1,2-Dichloroethane	**6.3**	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
cis-1,2-Dichloroethene	**8.0**	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,1-Dichloroethene	**1,000**	ug/L	50		50	01/26/17	01/27/17 15:02	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Methylene chloride	**3.9**	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 17:56	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-004**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,1,1-Trichloroethane	**59**	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Trichloroethene	**7.0**	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
Vinyl chloride	**1.3**	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 17:56	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 17:56	1011

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February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-004**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Acenaphthylene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Benzo(a)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Benzo(a)pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Benzo(b)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Benzo(g,h,i)perylene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Benzo(k)fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
bis(2-chloroethyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
bis(2-chloroisopropyl) ether	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
bis(2-ethylhexyl) phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Di-n-butyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Carbazole	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
4-Chloroaniline	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2-Chloronaphthalene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2-Chlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Chrysene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Dibenz(a,h)anthracene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Dibenzofuran	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
1,2'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
1,3'-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
1,4-Dichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
3,3-Dichlorobenzidine	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2,4-Dichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Diethyl phthalate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2,4-Dimethylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2,4-Dinitrophenol	ND	ug/L	10		1	01/26/17	01/26/17 19:35	1055
2,4-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2,6-Dinitrotoluene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-004**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Semivolatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8270 C Preparation Method: 3510C

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluoranthene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Fluorene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Hexachlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Hexachlorobutadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Hexachlorocyclopentadiene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Hexachloroethane	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Isophorone	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2-Methylnaphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
2-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
3&4-Methylphenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Naphthalene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Nitrobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
N-Nitrosodi-n-propyl amine	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
N-Nitrosodiphenylamine	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Pentachlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Phenanthrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
Phenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Pyrene	ND	ug/L	0.50		1	01/26/17	01/26/17 19:35	1055
1,2,4-Trichlorobenzene	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2,4,5-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
2,4,6-Trichlorophenol	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Bis(2-ethylhexyl)adipate	ND	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055
Squalene (TIC)	**5.0**	ug/L	5.0		1	01/26/17	01/26/17 19:35	1055

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D Trip Blanks **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-005**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 15:51	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 15:51	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 15:51	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 15:51	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 15:51	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 15:51	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011

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CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1D Trip Blanks **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-005**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Trichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 15:51	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 15:51	1011

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Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S Trip Blanks **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-006**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 16:12	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 16:12	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 16:12	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 16:12	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 16:12	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 16:12	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011

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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-2S Trip Blanks **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-006**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Trichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 16:12	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:12	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S Trip Blanks **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-007**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	01/26/17	01/26/17 16:33	1011
Benzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Bromodichloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Bromoform	ND	ug/L	5.0		1	01/26/17	01/26/17 16:33	1011
Bromomethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
2-Butanone (MEK)	ND	ug/L	10		1	01/26/17	01/26/17 16:33	1011
n-Butylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Carbon Disulfide	ND	ug/L	10		1	01/26/17	01/26/17 16:33	1011
Carbon tetrachloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Chlorobenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Chloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Chloroform	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Chloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	10		1	01/26/17	01/26/17 16:33	1011
Dibromochloromethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Ethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Isopropylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Methylene chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	01/26/17	01/26/17 16:33	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
n-Propylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17012529

WSP Environment & Energy - Herndon, Herndon, VA

February 2, 2017

Project Name: Former KopFlex Facility Site
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: RW-1S Trip Blanks **Date/Time Sampled: 01/25/2017 14:15** **PSS Sample ID: 17012529-007**
Matrix: WATER **Date/Time Received: 01/25/2017 17:00**

VCP Volatile Organic Compounds (w/ TICs) Analytical Method: SW-846 8260 B Preparation Method: 5030B

Library search was performed and TICs (if any) are listed below, values of TICs are estimated

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Styrene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Tetrachloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Toluene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Trichloroethene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,2,4-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
1,3,5-Trimethylbenzene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
Vinyl chloride	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011
m&p-Xylene	ND	ug/L	2.0		1	01/26/17	01/26/17 16:33	1011
o-Xylene	ND	ug/L	1.0		1	01/26/17	01/26/17 16:33	1011

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COVER LETTER

Lynn Jackson
Phase Separation
6630 Baltimore National Pike, Suite 103
Baltimore, MD 21228

RE: General Wet Chem Analysis

February 02, 2017
Report No.: 17A1375

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 01/26/2017 11:10.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Certifications/Notes and Definitions
- Cooler Receipt Log
- Chain of Custody



Final report reviewed by:	Coretta S. Davis For Melanie C. Duszynski/Project Manager	2/2/2017 Report issue date

All samples received in proper condition and results conform to ISO 17025 and TNI NELAC standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Coretta S. Davis For Melanie C. Duszynski/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1375
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5, WO # 17012529	Reported: 02/02/2017 10:06
Baltimore, MD 21228	Project Manager: Lynn Jackson	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
17012529-001 - RW-1D	17A1375-01	Water	Grab	01/25/2017 09:40	01/26/2017 11:10
17012529-002 - RW-3S	17A1375-02	Water	Grab	01/25/2017 10:41	01/26/2017 11:10
17012529-003 - RW-2S	17A1375-03	Water	Grab	01/25/2017 13:35	01/26/2017 11:10
17012529-004 - RW-1S	17A1375-04	Water	Grab	01/25/2017 14:15	01/26/2017 11:10

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1375
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5, WO # 17012529	Reported: 02/02/2017 10:06
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17012529-001 - RW-1D

17A1375-01 (Water) Sampled: 01/25/2017 09:40; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	ND	0.020	mg LAS/L (MW 320)		012717 0515	012717 0835	VAS	SM 5540 C-11	

Microbac Laboratories, Inc. - Baltimore



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1375
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5, WO # 17012529	Reported: 02/02/2017 10:06
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17012529-002 - RW-3S

17A1375-02 (Water) Sampled: 01/25/2017 10:41; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	**0.023**	0.020	mg LAS/L (MW 320)		012717 0515	012717 0835	VAS	SM 5540 C-11	

Microbac Laboratories, Inc. - Baltimore



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Coretta S. Davis For Melanie C. Duszynski, Project Manager

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1375
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5, WO # 17012529	Reported: 02/02/2017 10:06
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17012529-003 - RW-2S

17A1375-03 (Water) Sampled: 01/25/2017 13:35; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	**0.045**	0.020	mg LAS/L (MW 320)		012717 0515	012717 0835	VAS	SM 5540 C-11	

Microbac Laboratories, Inc. - Baltimore



Coretta S. Davis For Melanie C. Duszynski, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1375
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5, WO # 17012529	Reported: 02/02/2017 10:06
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17012529-004 - RW-1S

17A1375-04 (Water) Sampled: 01/25/2017 14:15; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	ND	0.020	mg LAS/L (MW 320)		012717 0515	012717 0835	VAS	SM 5540 C-11	



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1375
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5, WO # 17012529	Reported: 02/02/2017 10:06
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Project Requested Certification(s):

A2LA (Environmental)

Analyte Certification Exception Summary

No certification exceptions

All analysis performed were analyzed under the required certification unless otherwise noted in the above summary.

Certification List

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

Code	Description	Certification Number	Expires
Microbac Laboratories, Inc. - Baltimore			
A2LA1	A2LA (Biology)	410.02	04/30/2017
A2LA2	A2LA (Environmental)	410.01	04/30/2017
VA-B	Commonwealth of Virginia (NELAC) - Baltimore	460285	03/14/2017
CPSC	CPSC Testing of Childrens Products and Jewelry	1115	04/30/2017
Pb	Environmental Lead (ELLAP)	410.01	04/30/2017
MD	State of Maryland (Drinking Water)	109	06/30/2017
WV	West Virginia	054	08/31/2017
Microbac Laboratories, Inc. - Richmond			
VA-R	Commonwealth of Virginia (NELAC) - Richmond	460022	06/14/2017

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Wet Chem Analysis	Report: 17A1375
6630 Baltimore National Pike, Suite 103	Project Number: 31400390-5, WO # 17012529	Reported: 02/02/2017 10:06
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Qualifiers/Notes and Definitions

General Definitions:

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** 2.00°C **Work Order:** 17A1375

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Chain of Custody Form for Subcontracted Analyses

Phase Separation Science, Inc
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

For Questions or issues please contact: Amber Confer

W.O. No. : **17012529**
P.O. No. :
Project Number : 31400390-5
Report To LOD : No

Report Due On :02/01/17 05:00

Samples Transferred To:
Microbac - Baltimore
2101 Van Deman Street
Baltimore, MD 21224
Contacts : sales - Mike Arbaugh / PMs (when we d
Phone : 410-633-1800

Lab Sample ID	Field Sample ID	Date Sampled	Time Sampled	Matrix	Analyses Required	Method	Type of Container	Preservative
17012529-001	RW-1D	01/25/17	09:40	Water	MBAS Surfactants	SM5540C	500 ml HDPE	COOL
17012529-002	RW-3S	01/25/17	10:41	Water	MBAS Surfactants	SM5540C	500 ml HDPE	COOL
17012529-003	RW-2S	01/25/17	13:35	Water	MBAS Surfactants	SM5540C	500 ml HDPE	COOL
17012529-004	RW-1S	01/25/17	14:15	Water	MBAS Surfactants	SM5540C	500 ml HDPE	COOL

Data Deliverables Required: COA

Perform Q.C. on Sample :

Send Report Attn : reporting@phaseonline.com

Send InvoiceAttn : invoicing@phaseonline.com

Airbill No.: _____ Carrier : Microbac Courier

Condition Upon Receipt : _____

Comments : **Results are for Maryland VCP site.**

Samples Relinquished By : Barb Weber Date : 1/26/17 Time: 8:45 Samples Received By : _____

Samples Relinquished By: _____ Date : 1/26/17 Time 1410 Samples Received By: _____

Samples Relinquished By: _____ Date: _____ Time: _____ Samples Received By: _____

Received on ICE 2.0

17A1375

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Number of Coolers Received: 1
Client: Phase Separation
Form Completed By: [illegible]
Shipper: [illegible]

Receipt Date / Time: 01/26/17 1110
Work Order # 17A1375

☒ Microbac ☐ Client ☐ UPS ☐ FedEx

Custody Tape Intact:	YES / NO / NA
Containers Intact:	YES / NO
Sample Received on Ice or refrigerated:	YES / NO / NA
	Infrared (IR) Temperature: 2.0 °C
Chain of Custody Present with shipment:	YES / NO
Sample Bottle IDs agree with COC:	YES / NO
Preservation requirements met:	YES / NO / Not Checked
Correct Number of Containers / Sample Volume:	YES / NO (If No, contact client immediately)
Headspace in container:	YES / NO / NA
Type of Sample:	Water Soil Wipes Oil Filter Solid Sludge Food Swab Other_____

***Container Type / Quantity*:**

A - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid: If preserved pH <2___, pH >10___
B - 4 Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
C - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
D - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
E - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
H - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
K - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
L - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
M- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
P - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
W- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
V - ___ Unpreserved ___ HCl ___ HCl / Ascorbic Acid ___ HCl / NaTHIO **(Checked at time of Analysis)**
F - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
S - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
SN- ___ Unpreserved ___NaTHIO ___NaTHIO/EDTA **(Checked at time of Analysis)**

___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___

Describe preservation requirements not met:

All Acid preserved <2 pH *NaOH preserved >12 pH* *All others >2 and <10 (usually 4-8)*

Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added

H_2SO_4 – Sulfuric Acid, HNO_3 – Nitric Acid, NaOH – Sodium Hydroxide, ASC – Ascorbic Acid, NaTHIO – Sodium Thiosulfate

Describe Anomalies:_____

Contact information / Summary of Actions:

Date / Time:_____ Contact:_____ Contact By:_____
Comments:_____

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Former KopFlex Facility Site

Work Order Number(s): 17012529
Project ID: 31400390-5

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:

Received 3 sets of trip blanks in coolers with samples RW-1D, RW-2S, and RW-1S. Sample RW-3S received in a cooler without a trip blank.

17012529: Analyses associated with analyst code 4001 were performed by ALS Group USA, Corp. - PA - PA 22-00293 VA 460157

Analytical:

Total Organic Carbon

Batch: 139575
For samples 001, 002, 003, and 004; the result reported for the DOC analysis is higher than the result reported for the TOC analysis. The results reported are within the precision limits associated with the methods.

VCP Chlorinated Herbicides

Batch: 139433
Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form. Exceedances meet marginal exceedance criteria.

VCP Semivolatile Organic Compounds (w/ TICs)

Batch: 139394
Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form.

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

Analytical Data Package Information Summary

Work Order(s): 17012529
Report Prepared For: WSP Environment & Energy - Herndon, Hern
Project Name: Recovery Well Sampling
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM20 5310B	RW-1D	Initial	17012529-001	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
	RW-3S	Initial	17012529-002	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
	RW-2S	Initial	17012529-003	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
	RW-1S	Initial	17012529-004	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
SM20 5310B	RW-1D	Initial	17012529-001	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
	RW-3S	Initial	17012529-002	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
	RW-2S	Initial	17012529-003	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
	RW-1S	Initial	17012529-004	4001	W	139575	139575	01/25/2017	01/30/2017 10:39	01/30/2017 10:39
SW-846 8015 C	RW-1D	Initial	17012529-001	1045	W	64543	139417	01/25/2017	01/26/2017 08:07	01/27/2017 14:04
	RW-3S	Initial	17012529-002	1045	W	64543	139417	01/25/2017	01/26/2017 08:07	01/27/2017 14:04
	RW-2S	Initial	17012529-003	1045	W	64543	139417	01/25/2017	01/26/2017 08:07	01/27/2017 14:29
	RW-1S	Initial	17012529-004	1045	W	64543	139417	01/25/2017	01/26/2017 08:07	01/27/2017 14:29
	64543-1-BKS	BKS	64543-1-BKS	1045	W	64543	139417	--------	01/26/2017 08:07	01/27/2017 11:10
	64543-1-BLK	BLK	64543-1-BLK	1045	W	64543	139417	--------	01/26/2017 08:07	01/27/2017 10:45
	64543-1-BSD	BSD	64543-1-BSD	1045	W	64543	139417	--------	01/26/2017 08:07	01/27/2017 11:34
	OF-015 S	MS	17012401-002 S	1045	W	64543	139417	01/23/2017	01/26/2017 08:07	01/27/2017 11:10
	OF-015 SD	MSD	17012401-002 SD	1045	W	64543	139417	01/23/2017	01/26/2017 08:07	01/27/2017 11:34
SW-846 8015C	RW-1D	Initial	17012529-001	1035	W	64613	139461	01/25/2017	01/30/2017 14:22	01/31/2017 14:24
	RW-3S	Initial	17012529-002	1035	W	64613	139461	01/25/2017	01/30/2017 14:22	01/31/2017 14:51
	RW-2S	Initial	17012529-003	1035	W	64613	139461	01/25/2017	01/30/2017 14:22	01/31/2017 15:18
	RW-1S	Initial	17012529-004	1035	W	64613	139461	01/25/2017	01/30/2017 14:22	01/31/2017 15:45
	64613-2-BKS	BKS	64613-2-BKS	1035	W	64613	139461	--------	01/30/2017 14:22	01/31/2017 17:59
	64613-2-BLK	BLK	64613-2-BLK	1035	W	64613	139461	--------	01/30/2017 14:22	01/30/2017 16:19
	MW-1 S	MS	17012601-001 S	1035	W	64613	139461	01/25/2017	01/30/2017 14:22	01/31/2017 16:12
	MW-1 SD	MSD	17012601-001 SD	1035	W	64613	139461	01/25/2017	01/30/2017 14:22	01/31/2017 16:38
SW-846 8081 B	RW-1D	Initial	17012529-001	1029	W	64572	139470	01/25/2017	01/27/2017 10:57	01/30/2017 20:57
	RW-3S	Initial	17012529-002	1029	W	64572	139470	01/25/2017	01/27/2017 10:57	01/30/2017 20:29

Analytical Data Package Information Summary

Work Order(s): 17012529
Report Prepared For: WSP Environment & Energy - Herndon, Hern
Project Name: Recovery Well Sampling
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8081 B	RW-2S	Initial	17012529-003	1029	W	64572	139470	01/25/2017	01/27/2017 10:57	01/30/2017 20:01
	RW-1S	Initial	17012529-004	1029	W	64572	139470	01/25/2017	01/27/2017 10:57	01/30/2017 19:33
	64572-1-BKS	BKS	64572-1-BKS	1029	W	64572	139470	--------	01/27/2017 10:57	01/30/2017 12:59
	64572-1-BLK	BLK	64572-1-BLK	1029	W	64572	139470	--------	01/27/2017 10:57	01/30/2017 12:32
	64572-1-BSD	BSD	64572-1-BSD	1029	W	64572	139470	--------	01/27/2017 10:57	01/30/2017 13:27
SW-846 8151 A	RW-1D	Initial	17012529-001	1029	W	64555	139433	01/25/2017	01/26/2017 11:11	01/27/2017 12:31
	RW-3S	Initial	17012529-002	1029	W	64555	139433	01/25/2017	01/26/2017 11:11	01/27/2017 13:04
	RW-2S	Initial	17012529-003	1029	W	64555	139433	01/25/2017	01/26/2017 11:11	01/27/2017 14:11
	RW-1S	Initial	17012529-004	1029	W	64555	139433	01/25/2017	01/26/2017 11:11	01/27/2017 13:37
	64555-1-BKS	BKS	64555-1-BKS	1029	W	64555	139433	--------	01/26/2017 11:11	01/27/2017 10:18
	64555-1-BLK	BLK	64555-1-BLK	1029	W	64555	139433	--------	01/26/2017 11:11	01/27/2017 09:45
	64555-1-BSD	BSD	64555-1-BSD	1029	W	64555	139433	--------	01/26/2017 11:11	01/27/2017 10:51
SW-846 8260 B	RW-1D	Initial	17012529-001	1011	W	64570	139388	01/25/2017	01/26/2017 08:33	01/26/2017 16:54
	RW-3S	Initial	17012529-002	1011	W	64570	139388	01/25/2017	01/26/2017 08:33	01/26/2017 17:14
	RW-2S	Initial	17012529-003	1011	W	64570	139388	01/25/2017	01/26/2017 08:33	01/26/2017 17:35
	RW-1S	Initial	17012529-004	1011	W	64570	139388	01/25/2017	01/26/2017 08:33	01/26/2017 17:56
	RW-1D Trip Blanks	Initial	17012529-005	1011	W	64570	139388	01/25/2017	01/26/2017 08:33	01/26/2017 15:51
	RW-2S Trip Blanks	Initial	17012529-006	1011	W	64570	139388	01/25/2017	01/26/2017 08:33	01/26/2017 16:12
	RW-1S Trip Blanks	Initial	17012529-007	1011	W	64570	139388	01/25/2017	01/26/2017 08:33	01/26/2017 16:33
	64570-1-BKS	BKS	64570-1-BKS	1011	W	64570	139388	--------	01/26/2017 08:33	01/26/2017 09:47
	64570-1-BLK	BLK	64570-1-BLK	1011	W	64570	139388	--------	01/26/2017 08:33	01/26/2017 10:42
	RW-2D S	MS	17012320-002 S	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 14:46
	RW-2 SD	MSD	17012320-002 SD	1011	W	64570	139388	01/23/2017	01/26/2017 08:33	01/26/2017 15:07
	64589-1-BKS	BKS	64589-1-BKS	1011	W	64589	139421	--------	01/27/2017 08:48	01/27/2017 10:02
	64589-1-BLK	BLK	64589-1-BLK	1011	W	64589	139421	--------	01/27/2017 08:48	01/27/2017 10:57
	MW-1 S	MS	17012601-001 S	1011	W	64589	139421	01/25/2017	01/27/2017 08:48	01/27/2017 13:11
	MW-1 SD	MSD	17012601-001 SD	1011	W	64589	139421	01/25/2017	01/27/2017 08:48	01/27/2017 13:34
	RW-2S	Reanalysis	17012529-003	1011	W	64570	139421	01/25/2017	01/26/2017 08:33	01/27/2017 14:41

Analytical Data Package Information Summary

Work Order(s): **17012529**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
Project Name: Recovery Well Sampling
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	RW-1S	Reanalysis	17012529-004	1011	W	64570	139421	01/25/2017	01/26/2017 08:33	01/27/2017 15:02
SW-846 8270 C	RW-1D	Initial	17012529-001	1055	W	64558	139394	01/25/2017	01/26/2017 13:17	01/26/2017 18:10
	RW-3S	Initial	17012529-002	1055	W	64558	139394	01/25/2017	01/26/2017 13:17	01/26/2017 18:38
	RW-2S	Initial	17012529-003	1055	W	64558	139394	01/25/2017	01/26/2017 13:17	01/26/2017 19:06
	RW-1S	Initial	17012529-004	1055	W	64558	139394	01/25/2017	01/26/2017 13:17	01/26/2017 19:35
	64558-1-BKS	BKS	64558-1-BKS	1055	W	64558	139394	--------	01/26/2017 13:17	01/26/2017 15:22
	64558-1-BLK	BLK	64558-1-BLK	1055	W	64558	139394	--------	01/26/2017 13:17	01/26/2017 14:54
	64558-1-BSD	BSD	64558-1-BSD	1055	W	64558	139394	--------	01/26/2017 13:17	01/26/2017 15:50

PHASE SEPARATION SCIENCE, INC.

QC Summary 17012529

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP
Seq Number: 139433 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	65		64-126	%	01/27/17 12:31

Analytical Method: SW-846 8081 B Prep Method: SW3510C
Seq Number: 139470 Matrix: Water Date Prep: 01/27/2017
PSS Sample ID: 17012529-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	99		43-150	%	01/30/17 20:57
Tetrachloro-m-xylene	53		40-126	%	01/30/17 20:57

Analytical Method: SW-846 8270 C Prep Method: SW3510C
Seq Number: 139394 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	90		35-107	%	01/26/17 18:10
2-Fluorophenol	73		32-106	%	01/26/17 18:10
Nitrobenzene-d5	78		34-123	%	01/26/17 18:10
Phenol-d6	72		36-111	%	01/26/17 18:10
Terphenyl-D14	107		43-143	%	01/26/17 18:10
2,4,6-Tribromophenol	94		26-122	%	01/26/17 18:10

Analytical Method: SW-846 8015 C Prep Method: SW3510C
Seq Number: 139417 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	86		46-111	%	01/27/17 14:04

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 139388 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	01/26/17 16:54
Dibromofluoromethane	104		91-119	%	01/26/17 16:54
Toluene-D8	99		90-117	%	01/26/17 16:54

PHASE SEPARATION SCIENCE, INC.

QC Summary 17012529

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

Analytical Method: SW-846 8015C Prep Method: SW5030B
Seq Number: 139461 Matrix: Water Date Prep: 01/30/2017
PSS Sample ID: 17012529-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	80		55-114	%	01/31/17 14:24

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP
Seq Number: 139433 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	87		64-126	%	01/27/17 13:04

Analytical Method: SW-846 8081 B Prep Method: SW3510C
Seq Number: 139470 Matrix: Water Date Prep: 01/27/2017
PSS Sample ID: 17012529-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	101		43-150	%	01/30/17 20:29
Tetrachloro-m-xylene	59		40-126	%	01/30/17 20:29

Analytical Method: SW-846 8270 C Prep Method: SW3510C
Seq Number: 139394 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	94		35-107	%	01/26/17 18:38
2-Fluorophenol	76		32-106	%	01/26/17 18:38
Nitrobenzene-d5	78		34-123	%	01/26/17 18:38
Phenol-d6	75		36-111	%	01/26/17 18:38
Terphenyl-D14	107		43-143	%	01/26/17 18:38
2,4,6-Tribromophenol	98		26-122	%	01/26/17 18:38

Analytical Method: SW-846 8015 C Prep Method: SW3510C
Seq Number: 139417 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	86		46-111	%	01/27/17 14:04

PHASE SEPARATION SCIENCE, INC.

QC Summary 17012529

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 139388 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	01/26/17 17:14
Dibromofluoromethane	105		91-119	%	01/26/17 17:14
Toluene-D8	99		90-117	%	01/26/17 17:14

Analytical Method: SW-846 8015C Prep Method: SW5030B
Seq Number: 139461 Matrix: Water Date Prep: 01/30/2017
PSS Sample ID: 17012529-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	78		55-114	%	01/31/17 14:51

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP
Seq Number: 139433 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	92		64-126	%	01/27/17 14:11

Analytical Method: SW-846 8081 B Prep Method: SW3510C
Seq Number: 139470 Matrix: Water Date Prep: 01/27/2017
PSS Sample ID: 17012529-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	125		43-150	%	01/30/17 20:01
Tetrachloro-m-xylene	114		40-126	%	01/30/17 20:01

Analytical Method: SW-846 8270 C Prep Method: SW3510C
Seq Number: 139394 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	101		35-107	%	01/26/17 19:06
2-Fluorophenol	82		32-106	%	01/26/17 19:06
Nitrobenzene-d5	83		34-123	%	01/26/17 19:06
Phenol-d6	80		36-111	%	01/26/17 19:06
Terphenyl-D14	114		43-143	%	01/26/17 19:06
2,4,6-Tribromophenol	109		26-122	%	01/26/17 19:06

PHASE SEPARATION SCIENCE, INC.

QC Summary 17012529

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

Analytical Method: SW-846 8015 C Prep Method: SW3510C
Seq Number: 139417 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	82		46-111	%	01/27/17 14:29

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 139388 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	01/26/17 17:35
Dibromofluoromethane	107		91-119	%	01/26/17 17:35
Toluene-D8	98		90-117	%	01/26/17 17:35

Analytical Method: SW-846 8015C Prep Method: SW5030B
Seq Number: 139461 Matrix: Water Date Prep: 01/30/2017
PSS Sample ID: 17012529-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	92		55-114	%	01/31/17 15:18

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP
Seq Number: 139433 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	75		64-126	%	01/27/17 13:37

Analytical Method: SW-846 8081 B Prep Method: SW3510C
Seq Number: 139470 Matrix: Water Date Prep: 01/27/2017
PSS Sample ID: 17012529-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	141		43-150	%	01/30/17 19:33
Tetrachloro-m-xylene	81		40-126	%	01/30/17 19:33

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

Analytical Method: SW-846 8270 C Prep Method: SW3510C
Seq Number: 139394 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	92		35-107	%	01/26/17 19:35
2-Fluorophenol	73		32-106	%	01/26/17 19:35
Nitrobenzene-d5	77		34-123	%	01/26/17 19:35
Phenol-d6	73		36-111	%	01/26/17 19:35
Terphenyl-D14	109		43-143	%	01/26/17 19:35
2,4,6-Tribromophenol	101		26-122	%	01/26/17 19:35

Analytical Method: SW-846 8015 C Prep Method: SW3510C
Seq Number: 139417 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	86		46-111	%	01/27/17 14:29

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 139388 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	01/26/17 17:56
Dibromofluoromethane	102		91-119	%	01/26/17 17:56
Toluene-D8	99		90-117	%	01/26/17 17:56

Analytical Method: SW-846 8015C Prep Method: SW5030B
Seq Number: 139461 Matrix: Water Date Prep: 01/30/2017
PSS Sample ID: 17012529-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	90		55-114	%	01/31/17 15:45

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 139388 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	01/26/17 15:51
Dibromofluoromethane	109		91-119	%	01/26/17 15:51
Toluene-D8	102		90-117	%	01/26/17 15:51

PHASE SEPARATION SCIENCE, INC.

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Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 139388 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-006

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	01/26/17 16:12
Dibromofluoromethane	104		91-119	%	01/26/17 16:12
Toluene-D8	99		90-117	%	01/26/17 16:12

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 139388 Matrix: Water Date Prep: 01/26/2017
PSS Sample ID: 17012529-007

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	01/26/17 16:33
Dibromofluoromethane	102		91-119	%	01/26/17 16:33
Toluene-D8	98		90-117	%	01/26/17 16:33

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 17012529

WSP Environment & Energy - Herndon
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Analytical Method: SW-846 8081 B Prep Method: SW3510C
Seq Number: 139470 Matrix: Water Date Prep: 01/27/17
MB Sample Id: 64572-1-BLK LCS Sample Id: 64572-1-BKS LCSD Sample Id: 64572-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
alpha-BHC	<0.04000	0.2000	0.1778	89	0.1662	83	57-118	7	20	ug/L	01/30/17 12:59	
gamma-BHC (Lindane)	<0.04000	0.2000	0.1820	91	0.1701	85	57-120	7	20	ug/L	01/30/17 12:59	
beta-BHC	<0.04000	0.2000	0.1795	90	0.1675	84	56-113	7	20	ug/L	01/30/17 12:59	
delta-BHC	<0.04000	0.2000	0.1789	89	0.1682	84	48-125	6	20	ug/L	01/30/17 12:59	
Heptachlor	<0.04000	0.2000	0.1925	96	0.1657	83	49-127	15	20	ug/L	01/30/17 12:59	
Aldrin	<0.04000	0.2000	0.1860	93	0.1746	87	57-119	6	20	ug/L	01/30/17 12:59	
Heptachlor epoxide	<0.04000	0.2000	0.1950	98	0.1814	91	62-116	7	20	ug/L	01/30/17 12:59	
gamma-Chlordane	<0.04000	0.2000	0.1975	99	0.1849	92	59-116	7	20	ug/L	01/30/17 12:59	
alpha-Chlordane	<0.04000	0.2000	0.1972	99	0.1846	92	68-109	7	20	ug/L	01/30/17 12:59	
4,4-DDE	<0.04000	0.2000	0.2067	103	0.1936	97	49-122	7	20	ug/L	01/30/17 12:59	
Endosulfan I	<0.04000	0.2000	0.1993	100	0.1871	94	71-108	6	20	ug/L	01/30/17 12:59	
Dieldrin	<0.04000	0.2000	0.2023	101	0.1881	94	60-117	7	20	ug/L	01/30/17 12:59	
Endrin	<0.04000	0.2000	0.1762	88	0.1609	80	48-132	9	20	ug/L	01/30/17 12:59	
4,4-DDD	<0.04000	0.2000	0.2079	104	0.1997	100	48-128	4	20	ug/L	01/30/17 12:59	
Endosulfan II	<0.04000	0.2000	0.2207	110	0.2091	105	59-118	5	20	ug/L	01/30/17 12:59	
4,4-DDT	<0.04000	0.2000	0.2397	120	0.2020	101	29-147	17	20	ug/L	01/30/17 12:59	
Endrin aldehyde	<0.04000	0.2000	0.2233	112	0.2100	105	54-122	6	20	ug/L	01/30/17 12:59	
Methoxychlor	<0.04000	0.2000	0.2511	126	0.2129	106	26-156	16	20	ug/L	01/30/17 12:59	
Endosulfan sulfate	<0.04000	0.2000	0.2123	106	0.1979	99	57-130	7	20	ug/L	01/30/17 12:59	
Endrin ketone	<0.04000	0.2000	0.2245	112	0.2121	106	55-123	6	20	ug/L	01/30/17 12:59	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	113		137		133		43-150	%	01/30/17 12:59
Tetrachloro-m-xylene	70		79		78		40-126	%	01/30/17 12:59

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP
Seq Number: 139433 Matrix: Water Date Prep: 01/26/17
MB Sample Id: 64555-1-BLK LCS Sample Id: 64555-1-BKS LCSD Sample Id: 64555-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Dalapon	<4.550	13.65	8.859	65	8.066	59	33-127	9	20	ug/L	01/27/17 10:18	
2,4-D	<1.880	5.640	5.360	95	6.295	112	70-104	16	20	ug/L	01/27/17 10:18	H
2,4,5-TP (Silvex)	<0.1900	0.5700	0.5225	92	0.6071	107	59-122	15	20	ug/L	01/27/17 10:18	
Dinoseb	<0.9500	2.850	2.252	79	2.504	88	48-110	11	20	ug/L	01/27/17 10:18	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	97		92		95		64-126	%	01/27/17 10:18

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Analytical Method: SW-846 8015 C Prep Method: SW3510C
Seq Number: 139417 Matrix: Water Date Prep: 01/26/17
MB Sample Id: 64543-1-BLK LCS Sample Id: 64543-1-BKS LCSD Sample Id: 64543-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<0.1000	1.000	0.7392	74	0.7797	78	41-123	5	20	mg/L	01/27/17 11:10	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	80		69		72		46-111	%	01/27/17 11:10

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QC Summary 17012529

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

Analytical Method: SW-846 8270 C Prep Method: SW3510C
Seq Number: 139394 Matrix: Water Date Prep: 01/26/17
MB Sample Id: 64558-1-BLK LCS Sample Id: 64558-1-BKS LCSD Sample Id: 64558-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acenaphthene	<0.5000	40.00	41.17	103	44.03	110	67-110	7	20	ug/L	01/26/17 15:22	
Acenaphthylene	<0.5000	40.00	41.22	103	44.07	110	69-106	7	20	ug/L	01/26/17 15:22	H
Anthracene	<0.5000	40.00	37.74	94	40.96	102	79-108	8	20	ug/L	01/26/17 15:22	
Benzo(a)anthracene	<0.5000	40.00	38.28	96	41.19	103	76-109	7	20	ug/L	01/26/17 15:22	
Benzo(a)pyrene	<0.5000	40.00	35.01	88	38.05	95	76-114	8	20	ug/L	01/26/17 15:22	
Benzo(b)fluoranthene	<0.5000	40.00	34.39	86	36.85	92	67-121	7	20	ug/L	01/26/17 15:22	
Benzo(g,h,i)perylene	<0.5000	40.00	34.42	86	39.33	98	75-107	13	20	ug/L	01/26/17 15:22	
Benzo(k)fluoranthene	<0.5000	40.00	35.51	89	38.00	95	62-132	7	20	ug/L	01/26/17 15:22	
bis(2-chloroethyl) ether	<5.000	40.00	30.20	76	32.51	81	62-103	7	20	ug/L	01/26/17 15:22	
bis(2-chloroisopropyl) ether	<5.000	40.00	32.93	82	34.57	86	50-103	5	20	ug/L	01/26/17 15:22	
bis(2-ethylhexyl) phthalate	<5.000	40.00	40.48	101	43.43	109	78-114	7	20	ug/L	01/26/17 15:22	
Di-n-butyl phthalate	<5.000	40.00	39.62	99	43.60	109	71-115	10	20	ug/L	01/26/17 15:22	
Carbazole	<5.000	40.00	40.02	100	42.97	107	52-134	7	20	ug/L	01/26/17 15:22	
4-Chloroaniline	<5.000	40.00	30.89	77	33.49	84	54-103	8	20	ug/L	01/26/17 15:22	
2-Chloronaphthalene	<5.000	40.00	43.47	109	45.31	113	66-105	4	20	ug/L	01/26/17 15:22	H
2-Chlorophenol	<5.000	40.00	31.83	80	33.48	84	63-109	5	20	ug/L	01/26/17 15:22	
Chrysene	<0.5000	40.00	38.66	97	41.00	103	78-111	6	20	ug/L	01/26/17 15:22	
Dibenz(a,h)anthracene	<0.5000	40.00	36.54	91	41.41	104	76-106	12	20	ug/L	01/26/17 15:22	
Dibenzofuran	<5.000	40.00	40.99	102	43.13	108	70-111	5	20	ug/L	01/26/17 15:22	
1,2'-Dichlorobenzene	<5.000	40.00	33.99	85	36.30	91	64-108	7	20	ug/L	01/26/17 15:22	
1,3'-Dichlorobenzene	<5.000	40.00	33.43	84	35.28	88	62-104	5	20	ug/L	01/26/17 15:22	
1,4-Dichlorobenzene	<5.000	40.00	33.41	84	34.94	87	63-108	4	20	ug/L	01/26/17 15:22	
3,3-Dichlorobenzidine	<5.000	40.00	50.11	125	54.43	136	79-132	8	20	ug/L	01/26/17 15:22	H
2,4-Dichlorophenol	<5.000	40.00	32.17	80	33.97	85	65-118	5	20	ug/L	01/26/17 15:22	
Diethyl phthalate	<5.000	40.00	45.05	113	47.77	119	60-114	6	20	ug/L	01/26/17 15:22	H
2,4-Dimethylphenol	<5.000	40.00	35.02	88	37.36	93	60-119	6	20	ug/L	01/26/17 15:22	
2,4-Dinitrophenol	<10.00	40.00	38.77	97	42.65	107	36-136	10	20	ug/L	01/26/17 15:22	
2,4-Dinitrotoluene	<5.000	40.00	43.36	108	46.48	116	70-119	7	20	ug/L	01/26/17 15:22	
2,6-Dinitrotoluene	<5.000	40.00	40.90	102	44.57	111	68-117	9	20	ug/L	01/26/17 15:22	
Fluoranthene	<0.5000	40.00	40.47	101	43.99	110	79-112	8	20	ug/L	01/26/17 15:22	
Fluorene	<0.5000	40.00	41.80	105	43.93	110	71-109	5	20	ug/L	01/26/17 15:22	H
Hexachlorobenzene	<5.000	40.00	40.61	102	43.76	109	76-110	7	20	ug/L	01/26/17 15:22	
Hexachlorobutadiene	<5.000	40.00	37.45	94	39.71	99	64-113	6	20	ug/L	01/26/17 15:22	
Hexachlorocyclopentadiene	<5.000	40.00	60.52	151	63.07	158	49-124	4	20	ug/L	01/26/17 15:22	H
Hexachloroethane	<5.000	40.00	34.49	86	36.96	92	62-105	7	20	ug/L	01/26/17 15:22	
Indeno(1,2,3-c,d)Pyrene	<0.5000	40.00	36.61	92	41.37	103	69-120	12	20	ug/L	01/26/17 15:22	
Isophorone	<5.000	40.00	33.65	84	36.90	92	68-108	9	20	ug/L	01/26/17 15:22	
2-Methylnaphthalene	<0.5000	40.00	32.62	82	34.79	87	64-117	6	20	ug/L	01/26/17 15:22	
2-Methylphenol	<5.000	40.00	31.05	78	33.14	83	67-111	7	20	ug/L	01/26/17 15:22	
3&4-Methylphenol	<5.000	40.00	31.17	78	33.57	84	67-107	7	20	ug/L	01/26/17 15:22	
Naphthalene	<0.5000	40.00	32.49	81	34.46	86	65-103	6	20	ug/L	01/26/17 15:22	
Nitrobenzene	<5.000	40.00	32.42	81	34.04	85	60-107	5	20	ug/L	01/26/17 15:22	
N-Nitrosodi-n-propyl amine	<5.000	40.00	32.04	80	35.21	88	60-98	9	20	ug/L	01/26/17 15:22	
N-Nitrosodiphenylamine	<5.000	40.00	35.56	89	38.62	97	68-106	8	20	ug/L	01/26/17 15:22	
Pentachlorophenol	<5.000	40.00	38.73	97	42.36	106	63-119	9	20	ug/L	01/26/17 15:22	
Phenanthrene	<0.5000	40.00	36.67	92	40.04	100	73-109	9	20	ug/L	01/26/17 15:22	
Phenol	<5.000	40.00	30.40	76	32.51	81	65-110	7	20	ug/L	01/26/17 15:22	
Pyrene	<0.5000	40.00	35.09	88	37.52	94	78-111	7	20	ug/L	01/26/17 15:22	
1,2,4-Trichlorobenzene	<5.000	40.00	33.01	83	34.61	87	67-108	5	20	ug/L	01/26/17 15:22	
2,4,5-Trichlorophenol	<5.000	40.00	39.90	100	42.86	107	69-114	7	20	ug/L	01/26/17 15:22	
2,4,6-Trichlorophenol	<5.000	40.00	38.92	97	40.84	102	68-118	5	20	ug/L	01/26/17 15:22	

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Analytical Method: SW-846 8270 C Prep Method: SW3510C
Seq Number: 139394 Matrix: Water Date Prep: 01/26/17
MB Sample Id: 64558-1-BLK LCS Sample Id: 64558-1-BKS LCSD Sample Id: 64558-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Bis(2-ethylhexyl)adipate	<5.000	40.00	35.53	89	38.15	95	78-116	7	20	ug/L	01/26/17 15:22	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	105		102		101		35-107	%	01/26/17 15:22
2-Fluorophenol	92		85		83		32-106	%	01/26/17 15:22
Nitrobenzene-d5	89		86		85		34-123	%	01/26/17 15:22
Phenol-d6	86		84		83		36-111	%	01/26/17 15:22
Terphenyl-D14	114		107		108		43-143	%	01/26/17 15:22
2,4,6-Tribromophenol	97		122		119		26-122	%	01/26/17 15:22

Analytical Method: SW-846 8015C Prep Method: SW5030B
Seq Number: 139461 Matrix: Water Date Prep: 01/30/17
MB Sample Id: 64613-2-BLK LCS Sample Id: 64613-2-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
TPH-GRO (Gasoline Range Organics	<100	5000	5177	104	74-132	ug/L	01/31/17 17:59	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	78		89		55-114	%	01/31/17 17:59

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QC Summary 17012529

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

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

Seq Number: 139388 Matrix: Water Date Prep: 01/26/17

MB Sample Id: 64570-1-BLK LCS Sample Id: 64570-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	52.75	106	29-149	ug/L	01/26/17 09:47	
Benzene	<1.000	50.00	50.70	101	85-123	ug/L	01/26/17 09:47	
Bromodichloromethane	<1.000	50.00	54.77	110	88-133	ug/L	01/26/17 09:47	
Bromoform	<5.000	50.00	47.69	95	80-126	ug/L	01/26/17 09:47	
Bromomethane	<1.000	50.00	56.58	113	64-139	ug/L	01/26/17 09:47	
2-Butanone (MEK)	<10.00	50.00	50.98	102	39-135	ug/L	01/26/17 09:47	
n-Butylbenzene	<1.000	50.00	52.44	105	68-133	ug/L	01/26/17 09:47	
Carbon Disulfide	<10.00	50.00	51.39	103	85-124	ug/L	01/26/17 09:47	
Carbon tetrachloride	<1.000	50.00	52.62	105	81-138	ug/L	01/26/17 09:47	
Chlorobenzene	<1.000	50.00	51.16	102	85-120	ug/L	01/26/17 09:47	
Chloroethane	<1.000	50.00	53.77	108	75-129	ug/L	01/26/17 09:47	
Chloroform	<1.000	50.00	51.64	103	85-128	ug/L	01/26/17 09:47	
Chloromethane	<1.000	50.00	52.87	106	60-139	ug/L	01/26/17 09:47	
1,2-Dibromo-3-chloropropane	<10.00	50.00	44.72	89	69-127	ug/L	01/26/17 09:47	
Dibromochloromethane	<1.000	50.00	51.57	103	82-127	ug/L	01/26/17 09:47	
1,2-Dibromoethane	<1.000	50.00	53.31	107	82-121	ug/L	01/26/17 09:47	
1,1-Dichloroethane	<1.000	50.00	55.33	111	83-123	ug/L	01/26/17 09:47	
1,2-Dichloroethane	<1.000	50.00	57.62	115	86-138	ug/L	01/26/17 09:47	
1,1-Dichloroethene	<1.000	50.00	55.03	110	85-127	ug/L	01/26/17 09:47	
cis-1,2-Dichloroethene	<1.000	50.00	52.28	105	87-127	ug/L	01/26/17 09:47	
1,2-Dichloropropane	<1.000	50.00	53.74	107	79-125	ug/L	01/26/17 09:47	
cis-1,3-Dichloropropene	<1.000	50.00	52.02	104	79-131	ug/L	01/26/17 09:47	
trans-1,3-Dichloropropene	<1.000	50.00	52.05	104	82-133	ug/L	01/26/17 09:47	
trans-1,2-Dichloroethene	<1.000	50.00	54.18	108	85-125	ug/L	01/26/17 09:47	
Ethylbenzene	<1.000	50.00	49.34	99	83-123	ug/L	01/26/17 09:47	
Isopropylbenzene	<1.000	50.00	50.62	101	70-131	ug/L	01/26/17 09:47	
Methylene chloride	<1.000	50.00	53.78	108	86-124	ug/L	01/26/17 09:47	
4-Methyl-2-Pentanone (MIBK)	<5.000	50.00	52.78	106	39-143	ug/L	01/26/17 09:47	
Methyl-t-Butyl Ether	<1.000	50.00	51.44	103	75-134	ug/L	01/26/17 09:47	
n-Propylbenzene	<1.000	50.00	51.31	103	78-127	ug/L	01/26/17 09:47	
Styrene	<1.000	50.00	50.83	102	80-120	ug/L	01/26/17 09:47	
1,1,2,2-Tetrachloroethane	<1.000	50.00	51.76	104	64-125	ug/L	01/26/17 09:47	
Tetrachloroethene	<1.000	50.00	52.23	104	83-138	ug/L	01/26/17 09:47	
Toluene	<1.000	50.00	52.17	104	88-126	ug/L	01/26/17 09:47	
1,1,1-Trichloroethane	<1.000	50.00	53.62	107	68-146	ug/L	01/26/17 09:47	
1,1,2-Trichloroethane	<1.000	50.00	55.06	110	85-124	ug/L	01/26/17 09:47	
Trichloroethene	<1.000	50.00	53.75	108	87-127	ug/L	01/26/17 09:47	
1,2,4-Trimethylbenzene	<1.000	50.00	51.54	103	73-130	ug/L	01/26/17 09:47	
1,3,5-Trimethylbenzene	<1.000	50.00	50.57	101	72-131	ug/L	01/26/17 09:47	
Vinyl chloride	<1.000	50.00	66.25	133	74-138	ug/L	01/26/17 09:47	
m&p-Xylene	<2.000	100	102.7	103	84-124	ug/L	01/26/17 09:47	
o-Xylene	<1.000	50.00	50.83	102	79-126	ug/L	01/26/17 09:47	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		104		86-111	%	01/26/17 09:47
Dibromofluoromethane	102		108		91-119	%	01/26/17 09:47
Toluene-D8	98		102		90-117	%	01/26/17 09:47

PHASE SEPARATION SCIENCE, INC.

QC Summary 17012529

WSP Environment & Energy - Herndon
Former KopFlex Facility Site

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

Seq Number: 139421 Matrix: Water Date Prep: 01/27/17

MB Sample Id: 64589-1-BLK LCS Sample Id: 64589-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
1,1-Dichloroethane	<1.000	50.00	48.58	97	83-123	ug/L	01/27/17 10:02	
1,1-Dichloroethene	<1.000	50.00	48.32	97	85-127	ug/L	01/27/17 10:02	
1,1,1-Trichloroethane	<1.000	50.00	47.19	94	68-146	ug/L	01/27/17 10:02	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		103		86-111	%	01/27/17 10:02
Dibromofluoromethane	107		108		91-119	%	01/27/17 10:02
Toluene-D8	97		100		90-117	%	01/27/17 10:02

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

CHAIN-OF-CUSTODY RECORD 17612529

No. 004510 WSP | PARSONS BRINCKERHOFF

WSP | Parsons Brinckerhoff Office Address	13530 Dulles Technology Dr. Suite 300 Herndon, VA 20171
Project Name	Former Kuflex Faulby Site
WSP | Parsons Brinckerhoff Contact Name	Eric Johnson
Project Location	Hanover, MD
WSP | Parsons Brinckerhoff Contact E-mail	Eric.Johnson@wspgroup.com
Project Number & Task	31400390-5
WSP | Parsons Brinckerhoff Contact Phone	703-709-6500
Sampler(s) Name(s)	Matt Richardson, Rob Wallace
Sampler(s) Signature(s)	
Laboratory Name & Location	PHASE, Baltimore MD
Laboratory Project Manager	Amber Confer
Requested Turn-Around-Time	☐ Standard ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ ___ HR 5 DAY

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	VOCs 8260B	SVOCs 8270C	MBAS Surfactants 5540C	TPH-GRO 8015C	TPH-DRO 8015C	Pesticides 8081B	Herbicides 8151A	TOC 5310B	Field Filtered DOC 5310B	Sample Comments
RW-1D	Ag	1/25	0940			15	X	X	X	X	X	X	X	X	X	
RW-3S	Ag	1/25	1041			15	X	X	X	X	X	X	X	X	X	
RW-2S	Ag	1/25	1335			15	X	X	X	X	X	X	X	X	X	
RW-1S	Ag	1/25	1415			15	X	X	X	X	X	X	X	X	X	
Trip Blank	Ag					3	X									Lab Prepared

# of Coolers: 4
Custody Seal: ABS
Ice Present: PRES Temp: 1-6°C
Shipping Carrier: Client

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	1/25/17	1700				WSP Delivery	—
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
						4	—

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17012529	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	01/25/2017 05:00:00 PM
Project Name	Former KopFlex Facility Site	**Delivered By**	Client
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	03/01/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 4

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	6
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	M. Richardson/R. W
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 7 Total No. of Containers Received 66

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)	Yes
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.

Received 3 sets of trip blanks in coolers with samples RW-1D, RW-2S, and RW-1S. Sample RW-3S received in a cooler without a trip blank.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 01/25/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 01/26/2017

Amber Confer

MW-45

GROUNDWATER PROFILING

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031303

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400389

March 20, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 20, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031303**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400389

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 **17031303**.

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 April 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031303

Project ID: 31400389

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 12:30 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031303-001	MW-45 (30)	WATER	03/11/17 09:55
17031303-002	MW-45 (40)	WATER	03/11/17 11:05
17031303-003	031217 - IDW A	WATER	03/12/17 09:35
17031303-004	031217 - DW - S	SOIL	03/12/17 07:50
17031303-005	Trip Blanks	WATER	03/13/17 12:30

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: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: MW-45 (30) **Date/Time Sampled: 03/11/2017 09:55** **PSS Sample ID: 17031303-001**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 22:40	1011
Benzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Bromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Bromoform	ND	ug/L	5.0		1	03/13/17	03/13/17 22:40	1011
Bromomethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/13/17	03/13/17 22:40	1011
Carbon Disulfide	ND	ug/L	10		1	03/13/17	03/13/17 22:40	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Chlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Chloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Chloroform	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Chloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Cyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 22:40	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/13/17	03/13/17 22:40	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,1-Dichloroethane	**1.9**	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,1-Dichloroethene	**4.2**	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Ethylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: MW-45 (30) **Date/Time Sampled: 03/11/2017 09:55** **PSS Sample ID: 17031303-001**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 22:40	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Methyl Acetate	ND	ug/L	10		1	03/13/17	03/13/17 22:40	1011
Methylcyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 22:40	1011
Methylene Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/13/17	03/13/17 22:40	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Naphthalene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Styrene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Toluene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Trichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 22:40	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/13/17	03/13/17 22:40	1011
o-Xylene	ND	ug/L	1.0		1	03/13/17	03/13/17 22:40	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: MW-45 (40) **Date/Time Sampled: 03/11/2017 11:05** **PSS Sample ID: 17031303-002**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 23:02	1011
Benzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Bromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Bromoform	ND	ug/L	5.0		1	03/13/17	03/13/17 23:02	1011
Bromomethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/13/17	03/13/17 23:02	1011
Carbon Disulfide	ND	ug/L	10		1	03/13/17	03/13/17 23:02	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Chlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Chloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Chloroform	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Chloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Cyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 23:02	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/13/17	03/13/17 23:02	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Ethylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: MW-45 (40) **Date/Time Sampled: 03/11/2017 11:05** **PSS Sample ID: 17031303-002**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 23:02	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Methyl Acetate	ND	ug/L	10		1	03/13/17	03/13/17 23:02	1011
Methylcyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 23:02	1011
Methylene Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/13/17	03/13/17 23:02	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Naphthalene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Styrene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Toluene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Trichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 23:02	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/13/17	03/13/17 23:02	1011
o-Xylene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:02	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: 031217 - IDW A **Date/Time Sampled: 03/12/2017 09:35** **PSS Sample ID: 17031303-003**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 23:24	1011
Benzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Bromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Bromoform	ND	ug/L	5.0		1	03/13/17	03/13/17 23:24	1011
Bromomethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/13/17	03/13/17 23:24	1011
Carbon Disulfide	ND	ug/L	10		1	03/13/17	03/13/17 23:24	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Chlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Chloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Chloroform	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Chloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Cyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 23:24	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/13/17	03/13/17 23:24	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Ethylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: 031217 - IDW A **Date/Time Sampled: 03/12/2017 09:35** **PSS Sample ID: 17031303-003**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 23:24	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Methyl Acetate	ND	ug/L	10		1	03/13/17	03/13/17 23:24	1011
Methylcyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 23:24	1011
Methylene Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/13/17	03/13/17 23:24	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Naphthalene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Styrene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Toluene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Trichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 23:24	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/13/17	03/13/17 23:24	1011
o-Xylene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:24	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: 031217 - DW - S | **Date/Time Sampled: 03/12/2017 07:50** | **PSS Sample ID: 17031303-004**
Matrix: SOIL | **Date/Time Received: 03/13/2017 12:30** | **% Solids: 89**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5035A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	22		1	03/13/17	03/13/17 16:05	1011
Benzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Bromochloromethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Bromodichloromethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Bromoform	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Bromomethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
2-Butanone (MEK)	ND	ug/kg	22		1	03/13/17	03/13/17 16:05	1011
Carbon Disulfide	ND	ug/kg	11		1	03/13/17	03/13/17 16:05	1011
Carbon Tetrachloride	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Chlorobenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Chloroethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Chloroform	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Chloromethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Cyclohexane	ND	ug/kg	22		1	03/13/17	03/13/17 16:05	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	43		1	03/13/17	03/13/17 16:05	1011
Dibromochloromethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,2-Dichlorobenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,3-Dichlorobenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,4-Dichlorobenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Dichlorodifluoromethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,1-Dichloroethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,2-Dichloroethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,1-Dichloroethene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,2-Dichloropropane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
trans-1,3-Dichloropropene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Ethylbenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: 031217 - DW - S **Date/Time Sampled: 03/12/2017 07:50** **PSS Sample ID: 17031303-004**
Matrix: SOIL **Date/Time Received: 03/13/2017 12:30** **% Solids: 89**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5035A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/kg	22		1	03/13/17	03/13/17 16:05	1011
Isopropylbenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Methyl Acetate	ND	ug/kg	22		1	03/13/17	03/13/17 16:05	1011
Methylcyclohexane	ND	ug/kg	22		1	03/13/17	03/13/17 16:05	1011
Methylene Chloride	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
4-Methyl-2-Pentanone	ND	ug/kg	22		1	03/13/17	03/13/17 16:05	1011
Methyl-t-butyl ether	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Naphthalene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Styrene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Tetrachloroethene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Toluene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,1,1-Trichloroethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,1,2-Trichloroethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Trichloroethene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Trichlorofluoromethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
Vinyl Chloride	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011
m,p-Xylenes	ND	ug/kg	11		1	03/13/17	03/13/17 16:05	1011
o-Xylene	ND	ug/kg	5.4		1	03/13/17	03/13/17 16:05	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: Trip Blanks **Date/Time Sampled: 03/13/2017 12:30** **PSS Sample ID: 17031303-005**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 23:46	1011
Benzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Bromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Bromoform	ND	ug/L	5.0		1	03/13/17	03/13/17 23:46	1011
Bromomethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/13/17	03/13/17 23:46	1011
Carbon Disulfide	ND	ug/L	10		1	03/13/17	03/13/17 23:46	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Chlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Chloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Chloroform	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Chloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Cyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 23:46	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/13/17	03/13/17 23:46	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Ethylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031303

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400389

Sample ID: Trip Blanks **Date/Time Sampled: 03/13/2017 12:30** **PSS Sample ID: 17031303-005**
Matrix: WATER **Date/Time Received: 03/13/2017 12:30**

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	03/13/17	03/13/17 23:46	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Methyl Acetate	ND	ug/L	10		1	03/13/17	03/13/17 23:46	1011
Methylcyclohexane	ND	ug/L	10		1	03/13/17	03/13/17 23:46	1011
Methylene Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/13/17	03/13/17 23:46	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Naphthalene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Styrene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Toluene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Trichloroethene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 23:46	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/13/17	03/13/17 23:46	1011
o-Xylene	ND	ug/L	1.0		1	03/13/17	03/13/17 23:46	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031303
Project ID: 31400389

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:

Received trip blanks that were not listed on the COC. Per client, logged in for 8260.

Analytical:

TCL Volatile Organic Compounds

Batch: 140797

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.

Analytical Data Package Information Summary

Work Order(s): **17031303**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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
SM2540G	031217 - DW - S	Initial	17031303-004	1062	S	140774	140774	03/12/2017	03/13/2017 14:40	03/13/2017 14:40
SW-846 8260 B	MW-45 (30)	Initial	17031303-001	1011	W	65261	140784	03/11/2017	03/13/2017 14:03	03/13/2017 22:40
	MW-45 (40)	Initial	17031303-002	1011	W	65261	140784	03/11/2017	03/13/2017 14:03	03/13/2017 23:02
	031217 - IDW A	Initial	17031303-003	1011	W	65261	140784	03/12/2017	03/13/2017 14:03	03/13/2017 23:24
	Trip Blanks	Initial	17031303-005	1011	W	65261	140784	03/13/2017	03/13/2017 14:03	03/13/2017 23:46
	65261-1-BKS	BKS	65261-1-BKS	1011	W	65261	140784	--------	03/13/2017 14:03	03/13/2017 15:14
	65261-1-BLK	BLK	65261-1-BLK	1011	W	65261	140784	--------	03/13/2017 14:03	03/13/2017 16:09
	GW-1 S	MS	17031301-001 S	1011	W	65261	140784	03/10/2017	03/13/2017 14:03	03/13/2017 16:52
	GW-1 SD	MSD	17031301-001 SD	1011	W	65261	140784	03/10/2017	03/13/2017 14:03	03/13/2017 17:17
	031217 - DW - S	Initial	17031303-004	1011	S	65269	140797	03/12/2017	03/13/2017 10:48	03/13/2017 16:05
	65269-1-BKS	BKS	65269-1-BKS	1011	S	65269	140797	--------	03/13/2017 10:48	03/13/2017 14:06
	65269-1-BLK	BLK	65269-1-BLK	1011	S	65269	140797	--------	03/13/2017 10:48	03/13/2017 15:25
	65269-1-BSD	BSD	65269-1-BSD	1011	S	65269	140797	--------	03/13/2017 10:48	03/13/2017 14:46

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031303

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140784 Matrix: Water Date Prep: 03/13/2017
PSS Sample ID: 17031303-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/13/17 22:40
Dibromofluoromethane	100		91-119	%	03/13/17 22:40
Toluene-D8	102		90-117	%	03/13/17 22:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140784 Matrix: Water Date Prep: 03/13/2017
PSS Sample ID: 17031303-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/13/17 23:02
Dibromofluoromethane	98		91-119	%	03/13/17 23:02
Toluene-D8	101		90-117	%	03/13/17 23:02

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140784 Matrix: Water Date Prep: 03/13/2017
PSS Sample ID: 17031303-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/13/17 23:24
Dibromofluoromethane	97		91-119	%	03/13/17 23:24
Toluene-D8	99		90-117	%	03/13/17 23:24

Analytical Method: SW-846 8260 B Prep Method: SW5035
Seq Number: 140797 Matrix: Soil Date Prep: 03/13/2017
PSS Sample ID: 17031303-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	127	*	82-126	%	03/13/17 16:05
Dibromofluoromethane	102		92-113	%	03/13/17 16:05
Toluene-D8	97		94-105	%	03/13/17 16:05

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031303

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140784 Matrix: Water Date Prep: 03/13/2017
PSS Sample ID: 17031303-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/13/17 23:46
Dibromofluoromethane	101		91-119	%	03/13/17 23:46
Toluene-D8	103		90-117	%	03/13/17 23:46

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 17031303

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030

Seq Number: 140797 Matrix: Solid Date Prep: 03/13/17

MB Sample Id: 65269-1-BLK LCS Sample Id: 65269-1-BKS LCSD Sample Id: 65269-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<20.00	60.00	42.20	70	43.77	73	46-127	4	25	ug/kg	03/13/17 14:06	
Benzene	<5.000	60.00	46.76	78	59.64	99	70-127	24	25	ug/kg	03/13/17 14:06	
Bromochloromethane	<5.000	60.00	50.25	84	62.92	105	68-122	22	25	ug/kg	03/13/17 14:06	
Bromodichloromethane	<5.000	60.00	51.95	87	62.85	105	68-122	19	25	ug/kg	03/13/17 14:06	
Bromoform	<5.000	60.00	53.60	89	67.39	112	57-127	23	25	ug/kg	03/13/17 14:06	
Bromomethane	<5.000	60.00	48.64	81	57.57	96	68-123	17	25	ug/kg	03/13/17 14:06	
2-Butanone (MEK)	<20.00	60.00	48.53	81	52.04	87	41-136	7	25	ug/kg	03/13/17 14:06	
Carbon Disulfide	<10.00	60.00	46.37	77	59.38	99	66-135	25	25	ug/kg	03/13/17 14:06	
Carbon Tetrachloride	<5.000	60.00	50.18	84	64.94	108	64-147	26	25	ug/kg	03/13/17 14:06	F
Chlorobenzene	<5.000	60.00	50.88	85	63.05	105	70-121	21	25	ug/kg	03/13/17 14:06	
Chloroethane	<5.000	60.00	46.86	78	57.46	96	66-142	20	25	ug/kg	03/13/17 14:06	
Chloroform	<5.000	60.00	48.04	80	61.54	103	68-123	25	25	ug/kg	03/13/17 14:06	
Chloromethane	<5.000	60.00	49.99	83	58.36	97	65-136	15	25	ug/kg	03/13/17 14:06	
Cyclohexane	<20.00	60.00	46.27	77	61.44	102	62-138	28	25	ug/kg	03/13/17 14:06	F
1,2-Dibromo-3-Chloropropane	<40.00	60.00	49.50	83	62.48	104	55-122	23	25	ug/kg	03/13/17 14:06	
Dibromochloromethane	<5.000	60.00	53.88	90	66.56	111	61-122	21	25	ug/kg	03/13/17 14:06	
1,2-Dibromoethane (EDB)	<5.000	60.00	51.08	85	62.79	105	63-119	21	25	ug/kg	03/13/17 14:06	
1,2-Dichlorobenzene	<5.000	60.00	55.17	92	69.20	115	65-121	23	25	ug/kg	03/13/17 14:06	
1,3-Dichlorobenzene	<5.000	60.00	56.10	94	67.66	113	69-121	19	25	ug/kg	03/13/17 14:06	
1,4-Dichlorobenzene	<5.000	60.00	56.41	94	68.29	114	69-118	19	25	ug/kg	03/13/17 14:06	
Dichlorodifluoromethane	<5.000	60.00	54.70	91	65.91	110	53-162	19	25	ug/kg	03/13/17 14:06	
1,1-Dichloroethane	<5.000	60.00	47.76	80	61.89	103	70-127	26	25	ug/kg	03/13/17 14:06	F
1,2-Dichloroethane	<5.000	60.00	52.30	87	63.59	106	68-118	19	25	ug/kg	03/13/17 14:06	
1,1-Dichloroethene	<5.000	60.00	48.17	80	59.12	99	69-133	20	25	ug/kg	03/13/17 14:06	
1,2-Dichloropropane	<5.000	60.00	47.45	79	59.88	100	70-122	23	25	ug/kg	03/13/17 14:06	
cis-1,2-Dichloroethene	<5.000	60.00	47.99	80	59.97	100	68-126	22	25	ug/kg	03/13/17 14:06	
cis-1,3-Dichloropropene	<5.000	60.00	50.45	84	60.31	101	68-121	18	25	ug/kg	03/13/17 14:06	
trans-1,2-Dichloroethene	<5.000	60.00	48.61	81	64.11	107	70-132	28	25	ug/kg	03/13/17 14:06	F
trans-1,3-Dichloropropene	<5.000	60.00	52.38	87	60.78	101	67-115	15	25	ug/kg	03/13/17 14:06	
Ethylbenzene	<5.000	60.00	52.26	87	64.96	108	70-125	22	25	ug/kg	03/13/17 14:06	
2-Hexanone	<20.00	60.00	46.20	77	48.02	80	40-121	4	25	ug/kg	03/13/17 14:06	
Isopropylbenzene	<5.000	60.00	55.09	92	66.74	111	68-130	19	25	ug/kg	03/13/17 14:06	
Methyl Acetate	<20.00	60.00	58.39	97	73.44	122	60-125	23	25	ug/kg	03/13/17 14:06	
Methylcyclohexane	<20.00	60.00	47.80	80	62.76	105	62-150	27	25	ug/kg	03/13/17 14:06	F
Methylene Chloride	<5.000	60.00	46.88	78	59.20	99	67-121	23	25	ug/kg	03/13/17 14:06	
4-Methyl-2-Pentanone	<20.00	60.00	49.02	82	50.29	84	48-117	3	25	ug/kg	03/13/17 14:06	
Methyl-t-butyl ether	<5.000	60.00	48.45	81	61.21	102	66-119	23	25	ug/kg	03/13/17 14:06	
Naphthalene	<5.000	60.00	37.67	63	51.29	85	54-115	31	25	ug/kg	03/13/17 14:06	F
Styrene	<5.000	60.00	49.10	82	60.49	101	71-120	21	25	ug/kg	03/13/17 14:06	
1,1,2,2-Tetrachloroethane	<5.000	60.00	55.22	92	68.53	114	59-122	22	25	ug/kg	03/13/17 14:06	
Tetrachloroethene	<5.000	60.00	52.41	87	64.65	108	65-145	21	25	ug/kg	03/13/17 14:06	
Toluene	<5.000	60.00	49.28	82	60.84	101	69-129	21	25	ug/kg	03/13/17 14:06	
1,2,3-Trichlorobenzene	<5.000	60.00	44.76	75	60.22	100	60-114	29	25	ug/kg	03/13/17 14:06	F
1,2,4-Trichlorobenzene	<5.000	60.00	45.20	75	60.86	101	64-115	30	25	ug/kg	03/13/17 14:06	F
1,1,1-Trichloroethane	<5.000	60.00	50.44	84	66.39	111	65-139	27	25	ug/kg	03/13/17 14:06	F
1,1,2-Trichloroethane	<5.000	60.00	53.24	89	61.85	103	64-125	15	25	ug/kg	03/13/17 14:06	
Trichloroethene	<5.000	60.00	49.83	83	62.17	104	69-133	22	25	ug/kg	03/13/17 14:06	
Trichlorofluoromethane	<5.000	60.00	46.25	77	56.46	94	59-153	20	25	ug/kg	03/13/17 14:06	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<5.000	60.00	50.42	84	63.16	105	62-139	22	25	ug/kg	03/13/17 14:06	
Vinyl Chloride	<5.000	60.00	51.47	86	65.66	109	69-142	24	25	ug/kg	03/13/17 14:06	
m,p-Xylenes	<10.00	120	104.3	87	128.9	107	71-124	21	25	ug/kg	03/13/17 14:06	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031303

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030

Seq Number: 140797 Matrix: Solid Date Prep: 03/13/17

MB Sample Id: 65269-1-BLK LCS Sample Id: 65269-1-BKS LCSD Sample Id: 65269-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<5.000	60.00	49.22	82	60.93	102	72-123	21	25	ug/kg	03/13/17 14:06	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	148	*	100		95		82-126	%	03/13/17 14:06
Dibromofluoromethane	102		99		101		92-113	%	03/13/17 14:06
Toluene-D8	99		100		100		94-105	%	03/13/17 14:06

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031303

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140784 Matrix: Water Date Prep: 03/13/17

MB Sample Id: 65261-1-BLK LCS Sample Id: 65261-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	41.38	83	29-149	ug/L	03/13/17 15:14	
Benzene	<1.000	50.00	50.41	101	85-123	ug/L	03/13/17 15:14	
Bromochloromethane	<1.000	50.00	49.57	99	82-136	ug/L	03/13/17 15:14	
Bromodichloromethane	<1.000	50.00	51.47	103	88-133	ug/L	03/13/17 15:14	
Bromoform	<5.000	50.00	51.78	104	80-126	ug/L	03/13/17 15:14	
Bromomethane	<1.000	50.00	30.76	62	64-139	ug/L	03/13/17 15:14	L
2-Butanone (MEK)	<10.00	50.00	45.75	92	39-135	ug/L	03/13/17 15:14	
Carbon Disulfide	<10.00	50.00	50.65	101	85-124	ug/L	03/13/17 15:14	
Carbon Tetrachloride	<1.000	50.00	46.61	93	81-138	ug/L	03/13/17 15:14	
Chlorobenzene	<1.000	50.00	50.93	102	85-120	ug/L	03/13/17 15:14	
Chloroethane	<1.000	50.00	45.53	91	75-129	ug/L	03/13/17 15:14	
Chloroform	<1.000	50.00	47.97	96	85-128	ug/L	03/13/17 15:14	
Chloromethane	<1.000	50.00	39.58	79	60-139	ug/L	03/13/17 15:14	
Cyclohexane	<10.00	50.00	49.44	99	55-131	ug/L	03/13/17 15:14	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	44.33	89	69-127	ug/L	03/13/17 15:14	
Dibromochloromethane	<1.000	50.00	46.19	92	82-127	ug/L	03/13/17 15:14	
1,2-Dibromoethane (EDB)	<1.000	50.00	46.19	92	82-121	ug/L	03/13/17 15:14	
1,2-Dichlorobenzene	<1.000	50.00	54.29	109	82-123	ug/L	03/13/17 15:14	
1,3-Dichlorobenzene	<1.000	50.00	53.32	107	81-123	ug/L	03/13/17 15:14	
1,4-Dichlorobenzene	<1.000	50.00	50.60	101	81-121	ug/L	03/13/17 15:14	
Dichlorodifluoromethane	<1.000	50.00	48.77	98	69-147	ug/L	03/13/17 15:14	
1,1-Dichloroethane	<1.000	50.00	50.45	101	83-123	ug/L	03/13/17 15:14	
1,2-Dichloroethane	<1.000	50.00	49.06	98	86-138	ug/L	03/13/17 15:14	
1,1-Dichloroethene	<1.000	50.00	48.36	97	85-127	ug/L	03/13/17 15:14	
cis-1,2-Dichloroethene	<1.000	50.00	49.80	100	87-127	ug/L	03/13/17 15:14	
1,2-Dichloropropane	<1.000	50.00	45.62	91	79-125	ug/L	03/13/17 15:14	
cis-1,3-Dichloropropene	<1.000	50.00	47.32	95	79-131	ug/L	03/13/17 15:14	
trans-1,3-Dichloropropene	<1.000	50.00	47.51	95	82-133	ug/L	03/13/17 15:14	
trans-1,2-Dichloroethene	<1.000	50.00	48.41	97	85-125	ug/L	03/13/17 15:14	
Ethylbenzene	<1.000	50.00	52.23	104	83-123	ug/L	03/13/17 15:14	
2-Hexanone	<5.000	50.00	41.57	83	37-137	ug/L	03/13/17 15:14	
Isopropylbenzene	<1.000	50.00	53.65	107	70-131	ug/L	03/13/17 15:14	
Methyl Acetate	<10.00	50.00	57.68	115	69-127	ug/L	03/13/17 15:14	
Methylcyclohexane	<10.00	50.00	53.93	108	75-129	ug/L	03/13/17 15:14	
Methylene Chloride	<1.000	50.00	51.93	104	86-124	ug/L	03/13/17 15:14	
4-Methyl-2-Pentanone	<5.000	50.00	41.56	83	39-143	ug/L	03/13/17 15:14	
Methyl-t-butyl ether	<1.000	50.00	48.87	98	75-134	ug/L	03/13/17 15:14	
Naphthalene	<1.000	50.00	46.44	93	61-118	ug/L	03/13/17 15:14	
Styrene	<1.000	50.00	47.63	95	80-120	ug/L	03/13/17 15:14	
1,1,2,2-Tetrachloroethane	<1.000	50.00	45.38	91	64-125	ug/L	03/13/17 15:14	
Tetrachloroethene	<1.000	50.00	52.92	106	83-138	ug/L	03/13/17 15:14	
Toluene	<1.000	50.00	53.15	106	88-126	ug/L	03/13/17 15:14	
1,2,3-Trichlorobenzene	<1.000	50.00	47.98	96	75-124	ug/L	03/13/17 15:14	
1,2,4-Trichlorobenzene	<1.000	50.00	49.02	98	77-131	ug/L	03/13/17 15:14	
1,1,1-Trichloroethane	<1.000	50.00	49.85	100	68-146	ug/L	03/13/17 15:14	
1,1,2-Trichloroethane	<1.000	50.00	45.68	91	85-124	ug/L	03/13/17 15:14	
Trichloroethene	<1.000	50.00	45.84	92	87-127	ug/L	03/13/17 15:14	
Trichlorofluoromethane	<5.000	50.00	43.05	86	77-147	ug/L	03/13/17 15:14	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	49.04	98	68-135	ug/L	03/13/17 15:14	
Vinyl Chloride	<1.000	50.00	56.50	113	74-138	ug/L	03/13/17 15:14	
m,p-Xylenes	<2.000	100	105.3	105	84-124	ug/L	03/13/17 15:14	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031303

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140784 Matrix: Water Date Prep: 03/13/17

MB Sample Id: 65261-1-BLK LCS Sample Id: 65261-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	53.73	107	79-126	ug/L	03/13/17 15:14	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		99		86-111	%	03/13/17 15:14
Dibromofluoromethane	99		95		91-119	%	03/13/17 15:14
Toluene-D8	98		99		90-117	%	03/13/17 15:14

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.

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

(1) *CLIENT: WSP *OFFICE LOC. Herndon
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500
EMAIL: Eric.Johnson@wsp group.com FAX NO.: ( )
*PROJECT NAME: Kop Flex PROJECT NO.: 31400349
SITE LOCATION: Hanover, MD P.O. NO.: New Number
SAMPLER(S): Rob Wallace DW CERT NO.:

PSS Work Order #: 17031303 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	(3) * Analysis/ Method Required: VOCs (8260)	REMARKS
1	MW-45 (30)	3/11/17	0955	Aq	3	G		X	
2	MW-45 (40)	3/11/17	1105	Aq	3	G		X	
3	031217-IDW A	3/12/17	0935	Aq	3	G		X	
4	031217-IDW-S	3/12/17	0750	S	4	G		X	

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/13/17	0910	
Relinquished By: (2)	Date	Time	Received By:
Gana	3/13/17	1230	
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
Custody Seal: ABS
Ice Present: PRES Temp: 1°-2°C
Shipping Carrier: FTE

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE: Excel
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER None

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031303	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 12:30:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400389	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Robert Wallace
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 5 Total No. of Containers Received 15

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

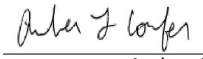
Comments: (Any "No" response must be detailed in the comments section below.)

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.

Received trip blanks that were not listed on the COC. Per client, logged in for 8260.

Samples Inspected/Checklist Completed By:  Date: 03/13/2017

Thomas Wingate

PM Review and Approval:  Date: 03/13/2017

Amber Confer

WELL SAMPLING

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

April 03, 2017

Eric Johnson
WSP Environmental Strategies
11190 Sunrise Valley Dr.
Suite #300
Reston, VA 20191

RE: Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Dear Eric Johnson:
Enclosed are the analytical results for sample(s) received by the laboratory on March 25, 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,

Kevin Godwin
kevin.godwin@pacelabs.com
1(704)875-9092
Project Manager

Enclosures

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CERTIFICATIONS

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

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

REPORT OF LABORATORY ANALYSIS

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Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92334701001	**MW-45-032417**	Water	03/24/17 10:55	03/25/17 09:15
92334701003	**TRIP BLANK**	Water	03/24/17 00:00	03/25/17 09:15

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SAMPLE ANALYTE COUNT

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92334701001	**MW-45-032417**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92334701003	**TRIP BLANK**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C

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ANALYTICAL RESULTS

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Sample: MW-45-032417 **Lab ID: 92334701001** Collected: 03/24/17 10:55 Received: 03/25/17 09:15 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		03/30/17 13:17	67-64-1	
Benzene	ND	ug/L	1.0	1		03/30/17 13:17	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		03/30/17 13:17	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		03/30/17 13:17	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		03/30/17 13:17	75-27-4	
Bromoform	ND	ug/L	1.0	1		03/30/17 13:17	75-25-2	
Bromomethane	ND	ug/L	2.0	1		03/30/17 13:17	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		03/30/17 13:17	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		03/30/17 13:17	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		03/30/17 13:17	108-90-7	
Chloroethane	ND	ug/L	1.0	1		03/30/17 13:17	75-00-3	
Chloroform	ND	ug/L	1.0	1		03/30/17 13:17	67-66-3	
Chloromethane	ND	ug/L	1.0	1		03/30/17 13:17	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		03/30/17 13:17	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		03/30/17 13:17	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		03/30/17 13:17	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		03/30/17 13:17	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		03/30/17 13:17	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		03/30/17 13:17	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		03/30/17 13:17	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		03/30/17 13:17	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		03/30/17 13:17	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		03/30/17 13:17	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		03/30/17 13:17	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		03/30/17 13:17	107-06-2	
1,1-Dichloroethene	**1.9**	ug/L	1.0	1		03/30/17 13:17	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		03/30/17 13:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		03/30/17 13:17	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		03/30/17 13:17	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		03/30/17 13:17	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		03/30/17 13:17	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		03/30/17 13:17	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		03/30/17 13:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		03/30/17 13:17	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		03/30/17 13:17	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		03/30/17 13:17	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		03/30/17 13:17	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		03/30/17 13:17	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		03/30/17 13:17	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		03/30/17 13:17	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		03/30/17 13:17	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/30/17 13:17	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		03/30/17 13:17	91-20-3	
Styrene	ND	ug/L	1.0	1		03/30/17 13:17	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		03/30/17 13:17	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		03/30/17 13:17	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		03/30/17 13:17	127-18-4	

REPORT OF LABORATORY ANALYSIS

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Sample: MW-45-032417 **Lab ID: 92334701001** Collected: 03/24/17 10:55 Received: 03/25/17 09:15 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		03/30/17 13:17	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		03/30/17 13:17	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		03/30/17 13:17	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		03/30/17 13:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		03/30/17 13:17	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		03/30/17 13:17	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		03/30/17 13:17	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		03/30/17 13:17	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		03/30/17 13:17	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		03/30/17 13:17	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		03/30/17 13:17	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		03/30/17 13:17	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		03/30/17 13:17	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		03/30/17 13:17	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	70-130	1		03/30/17 13:17	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		03/30/17 13:17	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**2.3**	ug/L	2.0	1		03/31/17 14:52	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	50-150	1		03/31/17 14:52	17060-07-0	
Toluene-d8 (S)	89	%	50-150	1		03/31/17 14:52	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Sample: TRIP BLANK **Lab ID: 92334701003** Collected: 03/24/17 00:00 Received: 03/25/17 09:15 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		03/29/17 15:28	67-64-1	
Benzene	ND	ug/L	1.0	1		03/29/17 15:28	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		03/29/17 15:28	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		03/29/17 15:28	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		03/29/17 15:28	75-27-4	
Bromoform	ND	ug/L	1.0	1		03/29/17 15:28	75-25-2	
Bromomethane	ND	ug/L	2.0	1		03/29/17 15:28	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		03/29/17 15:28	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		03/29/17 15:28	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		03/29/17 15:28	108-90-7	
Chloroethane	ND	ug/L	1.0	1		03/29/17 15:28	75-00-3	
Chloroform	ND	ug/L	1.0	1		03/29/17 15:28	67-66-3	
Chloromethane	ND	ug/L	1.0	1		03/29/17 15:28	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		03/29/17 15:28	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		03/29/17 15:28	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		03/29/17 15:28	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		03/29/17 15:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		03/29/17 15:28	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		03/29/17 15:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		03/29/17 15:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		03/29/17 15:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		03/29/17 15:28	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		03/29/17 15:28	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		03/29/17 15:28	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		03/29/17 15:28	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		03/29/17 15:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		03/29/17 15:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		03/29/17 15:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		03/29/17 15:28	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		03/29/17 15:28	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		03/29/17 15:28	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		03/29/17 15:28	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		03/29/17 15:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		03/29/17 15:28	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		03/29/17 15:28	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		03/29/17 15:28	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		03/29/17 15:28	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		03/29/17 15:28	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		03/29/17 15:28	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		03/29/17 15:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		03/29/17 15:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/29/17 15:28	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		03/29/17 15:28	91-20-3	
Styrene	ND	ug/L	1.0	1		03/29/17 15:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		03/29/17 15:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		03/29/17 15:28	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		03/29/17 15:28	127-18-4	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Sample: TRIP BLANK **Lab ID: 92334701003** Collected: 03/24/17 00:00 Received: 03/25/17 09:15 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		03/29/17 15:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		03/29/17 15:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		03/29/17 15:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		03/29/17 15:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		03/29/17 15:28	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		03/29/17 15:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		03/29/17 15:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		03/29/17 15:28	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		03/29/17 15:28	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		03/29/17 15:28	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		03/29/17 15:28	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		03/29/17 15:28	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		03/29/17 15:28	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		03/29/17 15:28	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	70-130	1		03/29/17 15:28	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		03/29/17 15:28	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		03/31/17 15:48	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	119	%	50-150	1		03/31/17 15:48	17060-07-0	
Toluene-d8 (S)	113	%	50-150	1		03/31/17 15:48	2037-26-5	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

QC Batch: 354264 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92334701003

METHOD BLANK: 1965024 Matrix: Water
Associated Lab Samples: 92334701003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	03/29/17 12:51	
1,1,1-Trichloroethane	ug/L	ND	1.0	03/29/17 12:51	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	03/29/17 12:51	
1,1,2-Trichloroethane	ug/L	ND	1.0	03/29/17 12:51	
1,1-Dichloroethane	ug/L	ND	1.0	03/29/17 12:51	
1,1-Dichloroethene	ug/L	ND	1.0	03/29/17 12:51	
1,1-Dichloropropene	ug/L	ND	1.0	03/29/17 12:51	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	03/29/17 12:51	
1,2,3-Trichloropropane	ug/L	ND	1.0	03/29/17 12:51	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	03/29/17 12:51	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	03/29/17 12:51	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	03/29/17 12:51	
1,2-Dichlorobenzene	ug/L	ND	1.0	03/29/17 12:51	
1,2-Dichloroethane	ug/L	ND	1.0	03/29/17 12:51	
1,2-Dichloropropane	ug/L	ND	1.0	03/29/17 12:51	
1,3-Dichlorobenzene	ug/L	ND	1.0	03/29/17 12:51	
1,3-Dichloropropane	ug/L	ND	1.0	03/29/17 12:51	
1,4-Dichlorobenzene	ug/L	ND	1.0	03/29/17 12:51	
2,2-Dichloropropane	ug/L	ND	1.0	03/29/17 12:51	
2-Butanone (MEK)	ug/L	ND	5.0	03/29/17 12:51	
2-Chlorotoluene	ug/L	ND	1.0	03/29/17 12:51	
2-Hexanone	ug/L	ND	5.0	03/29/17 12:51	
4-Chlorotoluene	ug/L	ND	1.0	03/29/17 12:51	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	03/29/17 12:51	
Acetone	ug/L	ND	25.0	03/29/17 12:51	
Benzene	ug/L	ND	1.0	03/29/17 12:51	
Bromobenzene	ug/L	ND	1.0	03/29/17 12:51	
Bromochloromethane	ug/L	ND	1.0	03/29/17 12:51	
Bromodichloromethane	ug/L	ND	1.0	03/29/17 12:51	
Bromoform	ug/L	ND	1.0	03/29/17 12:51	
Bromomethane	ug/L	ND	2.0	03/29/17 12:51	
Carbon tetrachloride	ug/L	ND	1.0	03/29/17 12:51	
Chlorobenzene	ug/L	ND	1.0	03/29/17 12:51	
Chloroethane	ug/L	ND	1.0	03/29/17 12:51	
Chloroform	ug/L	ND	1.0	03/29/17 12:51	
Chloromethane	ug/L	ND	1.0	03/29/17 12:51	
cis-1,2-Dichloroethene	ug/L	ND	1.0	03/29/17 12:51	
cis-1,3-Dichloropropene	ug/L	ND	1.0	03/29/17 12:51	
Dibromochloromethane	ug/L	ND	1.0	03/29/17 12:51	
Dibromomethane	ug/L	ND	1.0	03/29/17 12:51	
Dichlorodifluoromethane	ug/L	ND	1.0	03/29/17 12:51	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

METHOD BLANK: 1965024 Matrix: Water
Associated Lab Samples: 92334701003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	03/29/17 12:51	
Ethylbenzene	ug/L	ND	1.0	03/29/17 12:51	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	03/29/17 12:51	
m&p-Xylene	ug/L	ND	2.0	03/29/17 12:51	
Methyl-tert-butyl ether	ug/L	ND	1.0	03/29/17 12:51	
Methylene Chloride	ug/L	ND	2.0	03/29/17 12:51	
Naphthalene	ug/L	ND	1.0	03/29/17 12:51	
o-Xylene	ug/L	ND	1.0	03/29/17 12:51	
p-Isopropyltoluene	ug/L	ND	1.0	03/29/17 12:51	
Styrene	ug/L	ND	1.0	03/29/17 12:51	
Tetrachloroethene	ug/L	ND	1.0	03/29/17 12:51	
Toluene	ug/L	ND	1.0	03/29/17 12:51	
trans-1,2-Dichloroethene	ug/L	ND	1.0	03/29/17 12:51	
trans-1,3-Dichloropropene	ug/L	ND	1.0	03/29/17 12:51	
Trichloroethene	ug/L	ND	1.0	03/29/17 12:51	
Trichlorofluoromethane	ug/L	ND	1.0	03/29/17 12:51	
Vinyl acetate	ug/L	ND	2.0	03/29/17 12:51	
Vinyl chloride	ug/L	ND	1.0	03/29/17 12:51	
Xylene (Total)	ug/L	ND	1.0	03/29/17 12:51	
1,2-Dichloroethane-d4 (S)	%	88	70-130	03/29/17 12:51	
4-Bromofluorobenzene (S)	%	101	70-130	03/29/17 12:51	
Toluene-d8 (S)	%	101	70-130	03/29/17 12:51	

LABORATORY CONTROL SAMPLE: 1965025

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.9	98	70-130	
1,1,1-Trichloroethane	ug/L	50	47.1	94	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	50.6	101	70-130	
1,1,2-Trichloroethane	ug/L	50	50.4	101	70-130	
1,1-Dichloroethane	ug/L	50	45.8	92	70-130	
1,1-Dichloroethene	ug/L	50	49.2	98	70-132	
1,1-Dichloropropene	ug/L	50	49.3	99	70-130	
1,2,3-Trichlorobenzene	ug/L	50	53.3	107	70-135	
1,2,3-Trichloropropane	ug/L	50	49.0	98	70-130	
1,2,4-Trichlorobenzene	ug/L	50	52.5	105	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	48.7	97	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	52.3	105	70-130	
1,2-Dichlorobenzene	ug/L	50	52.8	106	70-130	
1,2-Dichloroethane	ug/L	50	42.6	85	70-130	
1,2-Dichloropropane	ug/L	50	50.3	101	70-130	
1,3-Dichlorobenzene	ug/L	50	52.3	105	70-130	
1,3-Dichloropropane	ug/L	50	52.8	106	70-130	
1,4-Dichlorobenzene	ug/L	50	50.3	101	70-130	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

LABORATORY CONTROL SAMPLE: 1965025

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	47.3	95	58-145	
2-Butanone (MEK)	ug/L	100	93.2	93	70-145	
2-Chlorotoluene	ug/L	50	51.9	104	70-130	
2-Hexanone	ug/L	100	101	101	70-144	
4-Chlorotoluene	ug/L	50	51.8	104	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	95.1	95	70-140	
Acetone	ug/L	100	99.0	99	50-175	
Benzene	ug/L	50	51.2	102	70-130	
Bromobenzene	ug/L	50	50.8	102	70-130	
Bromochloromethane	ug/L	50	47.9	96	70-130	
Bromodichloromethane	ug/L	50	53.0	106	70-130	
Bromoform	ug/L	50	43.9	88	70-130	
Bromomethane	ug/L	50	51.8	104	54-130	
Carbon tetrachloride	ug/L	50	52.0	104	70-132	
Chlorobenzene	ug/L	50	52.1	104	70-130	
Chloroethane	ug/L	50	42.6	85	64-134	
Chloroform	ug/L	50	45.5	91	70-130	
Chloromethane	ug/L	50	49.9	100	64-130	
cis-1,2-Dichloroethene	ug/L	50	45.0	90	70-131	
cis-1,3-Dichloropropene	ug/L	50	52.2	104	70-130	
Dibromochloromethane	ug/L	50	47.6	95	70-130	
Dibromomethane	ug/L	50	48.9	98	70-131	
Dichlorodifluoromethane	ug/L	50	46.1	92	56-130	
Diisopropyl ether	ug/L	50	48.0	96	70-130	
Ethylbenzene	ug/L	50	50.2	100	70-130	
Hexachloro-1,3-butadiene	ug/L	50	55.3	111	70-130	
m&p-Xylene	ug/L	100	102	102	70-130	
Methyl-tert-butyl ether	ug/L	50	47.8	96	70-130	
Methylene Chloride	ug/L	50	45.6	91	63-130	
Naphthalene	ug/L	50	51.2	102	70-138	
o-Xylene	ug/L	50	50.4	101	70-130	
p-Isopropyltoluene	ug/L	50	50.9	102	70-130	
Styrene	ug/L	50	51.4	103	70-130	
Tetrachloroethene	ug/L	50	50.2	100	70-130	
Toluene	ug/L	50	49.1	98	70-130	
trans-1,2-Dichloroethene	ug/L	50	47.7	95	70-130	
trans-1,3-Dichloropropene	ug/L	50	51.1	102	70-132	
Trichloroethene	ug/L	50	51.2	102	70-130	
Trichlorofluoromethane	ug/L	50	48.7	97	62-133	
Vinyl acetate	ug/L	100	99.9	100	66-157	
Vinyl chloride	ug/L	50	40.3	81	50-150	
Xylene (Total)	ug/L	150	153	102	70-130	
1,2-Dichloroethane-d4 (S)	%			94	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			97	70-130	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

MATRIX SPIKE SAMPLE: 1966603

Parameter	Units	92334544005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.1	101	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.4	107	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.2	101	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.3	106	70-130	
1,1-Dichloroethane	ug/L	ND	20	19.8	99	70-130	
1,1-Dichloroethene	ug/L	ND	20	23.0	115	70-166	
1,1-Dichloropropene	ug/L	ND	20	22.2	111	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	21.7	108	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	21.1	106	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	22.0	110	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	18.8	94	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	21.4	107	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	22.0	110	70-130	
1,2-Dichloroethane	ug/L	ND	20	17.8	88	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.7	109	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	22.0	110	70-130	
1,3-Dichloropropane	ug/L	ND	20	21.3	107	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.9	109	70-130	
2,2-Dichloropropane	ug/L	ND	20	18.5	93	70-130	
2-Butanone (MEK)	ug/L	ND	40	41.6	104	70-130	
2-Chlorotoluene	ug/L	ND	20	22.5	113	70-130	
2-Hexanone	ug/L	ND	40	45.7	114	70-130	
4-Chlorotoluene	ug/L	ND	20	22.2	111	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	42.3	106	70-130	
Acetone	ug/L	ND	40	44.6	96	70-130	
Benzene	ug/L	ND	20	22.9	115	70-148	
Bromobenzene	ug/L	ND	20	22.1	110	70-130	
Bromochloromethane	ug/L	ND	20	19.8	99	70-130	
Bromodichloromethane	ug/L	ND	20	22.4	112	70-130	
Bromoform	ug/L	ND	20	17.9	90	70-130	
Bromomethane	ug/L	ND	20	22.2	111	70-130	
Carbon tetrachloride	ug/L	ND	20	24.7	123	70-130	
Chlorobenzene	ug/L	ND	20	22.4	112	70-146	
Chloroethane	ug/L	ND	20	19.3	97	70-130	
Chloroform	ug/L	ND	20	19.7	98	70-130	
Chloromethane	ug/L	ND	20	22.4	112	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.2	99	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.6	98	70-130	
Dibromochloromethane	ug/L	ND	20	19.3	97	70-130	
Dibromomethane	ug/L	ND	20	21.6	108	70-130	
Dichlorodifluoromethane	ug/L	ND	20	20.7	104	70-130	
Diisopropyl ether	ug/L	ND	20	20.2	101	70-130	
Ethylbenzene	ug/L	ND	20	22.1	110	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	21.6	108	70-130	
m&p-Xylene	ug/L	ND	40	43.9	110	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	18.7	93	70-130	
Methylene Chloride	ug/L	ND	20	19.7	98	70-130	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

MATRIX SPIKE SAMPLE: 1966603

Parameter	Units	92334544005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	20	21.1	105	70-130	
o-Xylene	ug/L	ND	20	21.8	109	70-130	
p-Isopropyltoluene	ug/L	ND	20	20.7	103	70-130	
Styrene	ug/L	ND	20	21.1	105	70-130	
Tetrachloroethene	ug/L	1.6	20	23.7	110	70-130	
Toluene	ug/L	ND	20	22.5	112	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.1	105	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	20.0	100	70-130	
Trichloroethene	ug/L	ND	20	22.5	112	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.7	114	70-130	
Vinyl acetate	ug/L	ND	40	32.3	81	70-130	
Vinyl chloride	ug/L	ND	20	18.9	94	70-130	
1,2-Dichloroethane-d4 (S)	%				90	70-130	
4-Bromofluorobenzene (S)	%				99	70-130	
Toluene-d8 (S)	%				99	70-130	

SAMPLE DUPLICATE: 1966121

Parameter	Units	92334544016 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	ND	ND		30	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

SAMPLE DUPLICATE: 1966121

Parameter	Units	92334544016 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	5.5J		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	144	144	0	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	1260	1320	4	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	37.2	39.2	5	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)	%	85	86	0		
4-Bromofluorobenzene (S)	%	98	100	2		
Toluene-d8 (S)	%	101	101	0		

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REPORT OF LABORATORY ANALYSIS

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(704)875-9092

QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

QC Batch: 354437 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92334701001

METHOD BLANK: 1966122 Matrix: Water
Associated Lab Samples: 92334701001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	03/30/17 12:43	
1,1,1-Trichloroethane	ug/L	ND	1.0	03/30/17 12:43	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	03/30/17 12:43	
1,1,2-Trichloroethane	ug/L	ND	1.0	03/30/17 12:43	
1,1-Dichloroethane	ug/L	ND	1.0	03/30/17 12:43	
1,1-Dichloroethene	ug/L	ND	1.0	03/30/17 12:43	
1,1-Dichloropropene	ug/L	ND	1.0	03/30/17 12:43	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	03/30/17 12:43	
1,2,3-Trichloropropane	ug/L	ND	1.0	03/30/17 12:43	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	03/30/17 12:43	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	03/30/17 12:43	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	03/30/17 12:43	
1,2-Dichlorobenzene	ug/L	ND	1.0	03/30/17 12:43	
1,2-Dichloroethane	ug/L	ND	1.0	03/30/17 12:43	
1,2-Dichloropropane	ug/L	ND	1.0	03/30/17 12:43	
1,3-Dichlorobenzene	ug/L	ND	1.0	03/30/17 12:43	
1,3-Dichloropropane	ug/L	ND	1.0	03/30/17 12:43	
1,4-Dichlorobenzene	ug/L	ND	1.0	03/30/17 12:43	
2,2-Dichloropropane	ug/L	ND	1.0	03/30/17 12:43	
2-Butanone (MEK)	ug/L	ND	5.0	03/30/17 12:43	
2-Chlorotoluene	ug/L	ND	1.0	03/30/17 12:43	
2-Hexanone	ug/L	ND	5.0	03/30/17 12:43	
4-Chlorotoluene	ug/L	ND	1.0	03/30/17 12:43	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	03/30/17 12:43	
Acetone	ug/L	ND	25.0	03/30/17 12:43	
Benzene	ug/L	ND	1.0	03/30/17 12:43	
Bromobenzene	ug/L	ND	1.0	03/30/17 12:43	
Bromochloromethane	ug/L	ND	1.0	03/30/17 12:43	
Bromodichloromethane	ug/L	ND	1.0	03/30/17 12:43	
Bromoform	ug/L	ND	1.0	03/30/17 12:43	
Bromomethane	ug/L	ND	2.0	03/30/17 12:43	
Carbon tetrachloride	ug/L	ND	1.0	03/30/17 12:43	
Chlorobenzene	ug/L	ND	1.0	03/30/17 12:43	
Chloroethane	ug/L	ND	1.0	03/30/17 12:43	
Chloroform	ug/L	ND	1.0	03/30/17 12:43	
Chloromethane	ug/L	ND	1.0	03/30/17 12:43	
cis-1,2-Dichloroethene	ug/L	ND	1.0	03/30/17 12:43	
cis-1,3-Dichloropropene	ug/L	ND	1.0	03/30/17 12:43	
Dibromochloromethane	ug/L	ND	1.0	03/30/17 12:43	
Dibromomethane	ug/L	ND	1.0	03/30/17 12:43	
Dichlorodifluoromethane	ug/L	ND	1.0	03/30/17 12:43	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

METHOD BLANK: 1966122 Matrix: Water
Associated Lab Samples: 92334701001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	03/30/17 12:43	
Ethylbenzene	ug/L	ND	1.0	03/30/17 12:43	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	03/30/17 12:43	
m&p-Xylene	ug/L	ND	2.0	03/30/17 12:43	
Methyl-tert-butyl ether	ug/L	ND	1.0	03/30/17 12:43	
Methylene Chloride	ug/L	ND	2.0	03/30/17 12:43	
Naphthalene	ug/L	ND	1.0	03/30/17 12:43	
o-Xylene	ug/L	ND	1.0	03/30/17 12:43	
p-Isopropyltoluene	ug/L	ND	1.0	03/30/17 12:43	
Styrene	ug/L	ND	1.0	03/30/17 12:43	
Tetrachloroethene	ug/L	ND	1.0	03/30/17 12:43	
Toluene	ug/L	ND	1.0	03/30/17 12:43	
trans-1,2-Dichloroethene	ug/L	ND	1.0	03/30/17 12:43	
trans-1,3-Dichloropropene	ug/L	ND	1.0	03/30/17 12:43	
Trichloroethene	ug/L	ND	1.0	03/30/17 12:43	
Trichlorofluoromethane	ug/L	ND	1.0	03/30/17 12:43	
Vinyl acetate	ug/L	ND	2.0	03/30/17 12:43	
Vinyl chloride	ug/L	ND	1.0	03/30/17 12:43	
Xylene (Total)	ug/L	ND	1.0	03/30/17 12:43	
1,2-Dichloroethane-d4 (S)	%	91	70-130	03/30/17 12:43	
4-Bromofluorobenzene (S)	%	99	70-130	03/30/17 12:43	
Toluene-d8 (S)	%	102	70-130	03/30/17 12:43	

LABORATORY CONTROL SAMPLE: 1966123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.7	97	70-130	
1,1,1-Trichloroethane	ug/L	50	46.7	93	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.1	98	70-130	
1,1,2-Trichloroethane	ug/L	50	50.0	100	70-130	
1,1-Dichloroethane	ug/L	50	45.3	91	70-130	
1,1-Dichloroethene	ug/L	50	50.0	100	70-132	
1,1-Dichloropropene	ug/L	50	49.0	98	70-130	
1,2,3-Trichlorobenzene	ug/L	50	50.8	102	70-135	
1,2,3-Trichloropropane	ug/L	50	49.8	100	70-130	
1,2,4-Trichlorobenzene	ug/L	50	51.2	102	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	49.0	98	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	52.8	106	70-130	
1,2-Dichlorobenzene	ug/L	50	51.9	104	70-130	
1,2-Dichloroethane	ug/L	50	42.9	86	70-130	
1,2-Dichloropropane	ug/L	50	50.6	101	70-130	
1,3-Dichlorobenzene	ug/L	50	51.7	103	70-130	
1,3-Dichloropropane	ug/L	50	52.8	106	70-130	
1,4-Dichlorobenzene	ug/L	50	50.8	102	70-130	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

LABORATORY CONTROL SAMPLE: 1966123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	47.1	94	58-145	
2-Butanone (MEK)	ug/L	100	97.7	98	70-145	
2-Chlorotoluene	ug/L	50	51.9	104	70-130	
2-Hexanone	ug/L	100	106	106	70-144	
4-Chlorotoluene	ug/L	50	50.8	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.0	98	70-140	
Acetone	ug/L	100	105	105	50-175	
Benzene	ug/L	50	51.6	103	70-130	
Bromobenzene	ug/L	50	50.1	100	70-130	
Bromochloromethane	ug/L	50	46.1	92	70-130	
Bromodichloromethane	ug/L	50	52.7	105	70-130	
Bromoform	ug/L	50	42.9	86	70-130	
Bromomethane	ug/L	50	45.1	90	54-130	
Carbon tetrachloride	ug/L	50	53.1	106	70-132	
Chlorobenzene	ug/L	50	52.3	105	70-130	
Chloroethane	ug/L	50	42.0	84	64-134	
Chloroform	ug/L	50	44.6	89	70-130	
Chloromethane	ug/L	50	48.7	97	64-130	
cis-1,2-Dichloroethene	ug/L	50	44.9	90	70-131	
cis-1,3-Dichloropropene	ug/L	50	50.0	100	70-130	
Dibromochloromethane	ug/L	50	46.8	94	70-130	
Dibromomethane	ug/L	50	49.3	99	70-131	
Dichlorodifluoromethane	ug/L	50	46.8	94	56-130	
Diisopropyl ether	ug/L	50	48.1	96	70-130	
Ethylbenzene	ug/L	50	51.2	102	70-130	
Hexachloro-1,3-butadiene	ug/L	50	52.8	106	70-130	
m&p-Xylene	ug/L	100	101	101	70-130	
Methyl-tert-butyl ether	ug/L	50	46.9	94	70-130	
Methylene Chloride	ug/L	50	45.7	91	63-130	
Naphthalene	ug/L	50	50.1	100	70-138	
o-Xylene	ug/L	50	50.4	101	70-130	
p-Isopropyltoluene	ug/L	50	49.6	99	70-130	
Styrene	ug/L	50	51.1	102	70-130	
Tetrachloroethene	ug/L	50	51.4	103	70-130	
Toluene	ug/L	50	49.2	98	70-130	
trans-1,2-Dichloroethene	ug/L	50	47.4	95	70-130	
trans-1,3-Dichloropropene	ug/L	50	48.6	97	70-132	
Trichloroethene	ug/L	50	52.4	105	70-130	
Trichlorofluoromethane	ug/L	50	48.4	97	62-133	
Vinyl acetate	ug/L	100	98.0	98	66-157	
Vinyl chloride	ug/L	50	40.4	81	50-150	
Xylene (Total)	ug/L	150	151	101	70-130	
1,2-Dichloroethane-d4 (S)	%			93	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			97	70-130	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1966124 1966125

Parameter	Units	92334701001 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	20	20	22.0	19.9	110	99	70-130	10	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	23.2	21.1	116	106	70-130	9	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	22.4	19.9	112	99	70-130	12	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	22.8	21.1	114	105	70-130	8	30	
1,1-Dichloroethane	ug/L	ND	20	20	22.3	21.3	109	104	70-130	5	30	
1,1-Dichloroethene	ug/L	1.9	20	20	26.0	24.5	120	113	70-166	6	30	
1,1-Dichloropropene	ug/L	ND	20	20	23.1	21.2	116	106	70-130	8	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	20.9	19.8	104	99	70-130	5	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	23.4	20.3	117	101	70-130	14	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	21.4	20.6	107	103	70-130	4	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	20	20.5	19.3	103	96	70-130	6	30	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	23.3	20.9	117	105	70-130	11	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	22.6	21.1	113	106	70-130	7	30	
1,2-Dichloroethane	ug/L	ND	20	20	19.7	18.6	98	92	70-130	6	30	
1,2-Dichloropropane	ug/L	ND	20	20	23.5	22.1	117	110	70-130	6	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	22.0	20.7	110	103	70-130	6	30	
1,3-Dichloropropane	ug/L	ND	20	20	23.5	21.8	118	109	70-130	8	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	21.8	20.4	109	102	70-130	7	30	
2,2-Dichloropropane	ug/L	ND	20	20	19.0	18.1	95	91	70-130	5	30	
2-Butanone (MEK)	ug/L	ND	40	40	47.9	40.6	120	102	70-130	16	30	
2-Chlorotoluene	ug/L	ND	20	20	23.2	22.1	116	111	70-130	5	30	
2-Hexanone	ug/L	ND	40	40	49.6	43.5	124	109	70-130	13	30	
4-Chlorotoluene	ug/L	ND	20	20	23.0	21.0	115	105	70-130	9	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40	47.5	41.0	119	103	70-130	15	30	
Acetone	ug/L	ND	40	40	45.6	44.7	104	102	70-130	2	30	
Benzene	ug/L	ND	20	20	24.5	22.8	123	114	70-148	7	30	
Bromobenzene	ug/L	ND	20	20	22.6	20.9	113	105	70-130	8	30	
Bromochloromethane	ug/L	ND	20	20	21.0	20.9	105	104	70-130	0	30	
Bromodichloromethane	ug/L	ND	20	20	24.1	22.6	121	113	70-130	7	30	
Bromoform	ug/L	ND	20	20	19.4	17.9	97	90	70-130	8	30	
Bromomethane	ug/L	ND	20	20	18.9	18.1	95	91	70-130	4	30	
Carbon tetrachloride	ug/L	ND	20	20	25.3	24.3	127	122	70-130	4	30	
Chlorobenzene	ug/L	ND	20	20	23.5	22.0	117	110	70-146	7	30	
Chloroethane	ug/L	ND	20	20	21.8	20.5	109	102	70-130	6	30	
Chloroform	ug/L	ND	20	20	21.7	19.8	108	99	70-130	9	30	
Chloromethane	ug/L	ND	20	20	23.3	22.4	116	112	70-130	4	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	21.1	19.9	106	99	70-130	6	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	21.0	20.3	105	102	70-130	3	30	
Dibromochloromethane	ug/L	ND	20	20	20.8	19.1	104	96	70-130	8	30	
Dibromomethane	ug/L	ND	20	20	23.6	21.8	118	109	70-130	8	30	
Dichlorodifluoromethane	ug/L	ND	20	20	22.1	20.3	111	102	70-130	9	30	
Diisopropyl ether	ug/L	ND	20	20	22.3	20.3	111	102	70-130	9	30	
Ethylbenzene	ug/L	ND	20	20	23.6	22.2	118	111	70-130	6	30	
Hexachloro-1,3-butadiene	ug/L	ND	20	20	23.2	21.4	116	107	70-130	8	30	

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1966124 1966125

Parameter	Units	92334701001 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	40	40	45.7	43.6	114	109	70-130	5	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	20.7	19.1	104	96	70-130	8	30	
Methylene Chloride	ug/L	ND	20	20	21.4	20.4	107	102	70-130	5	30	
Naphthalene	ug/L	ND	20	20	21.0	19.5	105	97	70-130	8	30	
o-Xylene	ug/L	ND	20	20	22.5	21.5	112	108	70-130	4	30	
p-Isopropyltoluene	ug/L	ND	20	20	21.4	19.8	107	99	70-130	8	30	
Styrene	ug/L	ND	20	20	22.8	21.9	114	110	70-130	4	30	
Tetrachloroethene	ug/L	ND	20	20	23.3	21.5	117	108	70-130	8	30	
Toluene	ug/L	ND	20	20	23.2	21.7	116	108	70-155	7	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	22.6	21.1	113	105	70-130	7	30	
trans-1,3-Dichloropropene	ug/L	ND	20	20	20.5	19.3	103	96	70-130	6	30	
Trichloroethene	ug/L	ND	20	20	24.8	22.7	124	113	69-151	9	30	
Trichlorofluoromethane	ug/L	ND	20	20	24.4	23.1	122	115	70-130	5	30	
Vinyl acetate	ug/L	ND	40	40	35.6	33.6	89	84	70-130	6	30	
Vinyl chloride	ug/L	ND	20	20	19.0	18.2	95	91	70-130	4	30	
1,2-Dichloroethane-d4 (S)	%						92	93	70-130			
4-Bromofluorobenzene (S)	%						102	103	70-130			
Toluene-d8 (S)	%						99	97	70-130			

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QUALITY CONTROL DATA

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

QC Batch: 354652 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92334701001, 92334701003

METHOD BLANK: 1967414 Matrix: Water
Associated Lab Samples: 92334701001, 92334701003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	03/31/17 14:33	
1,2-Dichloroethane-d4 (S)	%	96	50-150	03/31/17 14:33	
Toluene-d8 (S)	%	92	50-150	03/31/17 14:33	

LABORATORY CONTROL SAMPLE: 1967415

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)	%			97	50-150	
Toluene-d8 (S)	%			94	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1967416 1967417

Parameter	Units	92334701001 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	2.3	20	20	21.5	22.8	96	102	50-150	6	30	
1,2-Dichloroethane-d4 (S)	%						97	94	50-150		150	
Toluene-d8 (S)	%						94	90	50-150		150	

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QUALIFIERS

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

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.

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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31400389-02 FORMER KOP-FLEX
Pace Project No.: 92334701

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92334701001	**MW-45-032417**	EPA 8260	354437		
92334701003	**TRIP BLANK**	EPA 8260	354264		
92334701001	**MW-45-032417**	EPA 8260B Mod.	354652		
92334701003	**TRIP BLANK**	EPA 8260B Mod.	354652		

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Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: WSP

Project: WO# : 92334701

92334701

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

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

Date/Initials Person Examining Contents: JM 3/27

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

Thermometer: ☐ IR Gun ID: T1603 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 3 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

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.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
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: _____

Project Manager SCURF Review: JD **Date:** 3/28/17

Project Manager SRF Review: JD **Date:** 3/28/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92334701

PM: KRG Due Date: 04/03/17

CLIENT: 92-WSP

*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 #

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																2												
3																4												
4																												
5																												
6																												
7																												
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 Environmental Strategies		Report To: Johnson, Eric	Attention:	Regulatory Agency
Address: 11190 Sunrise Valley Dr		Copy To:	Company Name:	
Suite 300, Reston, VA 20191			Address:	State / Location
Email:		Purchase Order #:	Pace Quote:	VA
Phone:	Fax	Project Name: 31400389-02 Former Kop-FLex	Pace Project Manager: kevin.godwin@pacelabs.com,	
Requested Due Date:		Project #:	Pace Profile #: 4362-1	

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)	92334701
1	MW-45-032417	WT	G	3/24/17	1055			13°C	6				X							X	X		001
2	MS/MSD	WT	G	3/24/17	1055			13°C	12				X							X	X		002 ~~002~~ 003 ~~003=002~~ KG 3/28/17
3	Trip Blank	WT	Lab Provided						4				X						X				
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	WSP	3/24/17	1330	FedEx	3/25/17	9:15

SAMPLE CONDITIONS

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rob Wallace

SIGNATURE of SAMPLER: [signature]

DATE Signed: 3/24/17

SEMI-ANNUAL MONITORING EVENT – MAY 2017

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

May 10, 2017

Eric Johnson
WSP Environmental Strategies
11190 Sunrise Valley Dr.
Suite #300
Reston, VA 20191

RE: Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Dear Eric Johnson:
Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 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,

Kevin Godwin
kevin.godwin@pacelabs.com
1(704)875-9092
Project Manager

Enclosures

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CERTIFICATIONS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92339162001	**MW-23D-050117**	Water	05/01/17 08:35	05/03/17 09:30
92339162002	**MW-27D-050117**	Water	05/01/17 09:00	05/03/17 09:30
92339162003	**MW-03-050117**	Water	05/01/17 09:20	05/03/17 09:30
92339162004	**MW-43-050117**	Water	05/01/17 09:35	05/03/17 09:30
92339162005	**MW-38R-050117**	Water	05/01/17 09:50	05/03/17 09:30
92339162006	**MW-39-050117**	Water	05/01/17 10:10	05/03/17 09:30
92339162007	**MW-42-050117**	Water	05/01/17 10:30	05/03/17 09:30
92339162008	**MW-18-050117**	Water	05/01/17 10:45	05/03/17 09:30
92339162009	**MW-40D-050117**	Water	05/01/17 11:05	05/03/17 09:30
92339162010	**MW-5R-050117**	Water	05/01/17 11:20	05/03/17 09:30
92339162011	**RW-1S-050117**	Water	05/01/17 13:25	05/03/17 09:30
92339162012	**RW-2S-050117**	Water	05/01/17 13:40	05/03/17 09:30
92339162013	**RW-3S-050117**	Water	05/01/17 14:00	05/03/17 09:30
92339162014	**MW-44-050117**	Water	05/01/17 14:20	05/03/17 09:30
92339162015	**MW-21D-050117**	Water	05/01/17 14:35	05/03/17 09:30
92339162016	**RW-1D-050117**	Water	05/01/17 14:50	05/03/17 09:30
92339162017	**MW-41D-050117**	Water	05/01/17 15:05	05/03/17 09:30
92339162018	**RW-2D-050117**	Water	05/01/17 15:30	05/03/17 09:30
92339162019	**MW-1D-050117**	Water	05/01/17 15:40	05/03/17 09:30
92339162020	**MW-22-050217**	Water	05/02/17 07:45	05/03/17 11:26
92339162021	**MW-20-050217**	Water	05/02/17 08:05	05/03/17 11:26
92339162022	**MW-04-050217**	Water	05/02/17 08:15	05/03/17 11:26
92339162023	**MW-09-050217**	Water	05/02/17 08:30	05/03/17 11:26
92339162024	**MW-16D-050217**	Water	05/02/17 08:50	05/03/17 11:26
92339162025	**MW-100-050217**	Water	05/02/17 08:00	05/03/17 11:26
92339162026	**MW-16-050217**	Water	05/02/17 09:10	05/03/17 11:26
92339162027	**MW-200-050217**	Water	05/02/17 09:00	05/03/17 11:26
92339162028	**TRIP BLANK**	Water	05/01/17 00:00	05/03/17 11:26

REPORT OF LABORATORY ANALYSIS

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(704)875-9092

SAMPLE ANALYTE COUNT

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92339162001	**MW-23D-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162002	**MW-27D-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162003	**MW-03-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162004	**MW-43-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162005	**MW-38R-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162006	**MW-39-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162007	**MW-42-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162008	**MW-18-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162009	**MW-40D-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162010	**MW-5R-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162011	**RW-1S-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162012	**RW-2S-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162013	**RW-3S-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162014	**MW-44-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162015	**MW-21D-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162016	**RW-1D-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162017	**MW-41D-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162018	**RW-2D-050117**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162019	**MW-1D-050117**	EPA 8260	ZDO	63	PASI-C

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Huntersville, NC 28078
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SAMPLE ANALYTE COUNT

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8260B Mod.	DLK	3	PASI-C
92339162020	**MW-22-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162021	**MW-20-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162022	**MW-04-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162023	**MW-09-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162024	**MW-16D-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162025	**MW-100-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162026	**MW-16-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162027	**MW-200-050217**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92339162028	**TRIP BLANK**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C

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Huntersville, NC 28078
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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-23D-050117 **Lab ID: 92339162001** Collected: 05/01/17 08:35 Received: 05/03/17 09:30 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		05/08/17 18:27	67-64-1	
Benzene	ND	ug/L	2.0	2		05/08/17 18:27	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		05/08/17 18:27	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		05/08/17 18:27	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		05/08/17 18:27	75-27-4	
Bromoform	ND	ug/L	2.0	2		05/08/17 18:27	75-25-2	
Bromomethane	ND	ug/L	4.0	2		05/08/17 18:27	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		05/08/17 18:27	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		05/08/17 18:27	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		05/08/17 18:27	108-90-7	
Chloroethane	ND	ug/L	2.0	2		05/08/17 18:27	75-00-3	
Chloroform	ND	ug/L	2.0	2		05/08/17 18:27	67-66-3	
Chloromethane	ND	ug/L	2.0	2		05/08/17 18:27	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 18:27	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 18:27	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		05/08/17 18:27	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		05/08/17 18:27	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		05/08/17 18:27	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		05/08/17 18:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:27	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:27	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:27	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		05/08/17 18:27	75-71-8	
1,1-Dichloroethane	**39.1**	ug/L	2.0	2		05/08/17 18:27	75-34-3	
1,2-Dichloroethane	**2.4**	ug/L	2.0	2		05/08/17 18:27	107-06-2	
1,1-Dichloroethene	**208**	ug/L	2.0	2		05/08/17 18:27	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 18:27	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 18:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 18:27	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		05/08/17 18:27	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 18:27	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		05/08/17 18:27	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 18:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 18:27	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		05/08/17 18:27	108-20-3	
Ethylbenzene	ND	ug/L	2.0	2		05/08/17 18:27	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		05/08/17 18:27	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		05/08/17 18:27	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		05/08/17 18:27	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		05/08/17 18:27	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		05/08/17 18:27	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		05/08/17 18:27	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		05/08/17 18:27	91-20-3	
Styrene	ND	ug/L	2.0	2		05/08/17 18:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 18:27	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 18:27	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		05/08/17 18:27	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-23D-050117 **Lab ID: 92339162001** Collected: 05/01/17 08:35 Received: 05/03/17 09:30 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		05/08/17 18:27	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:27	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:27	120-82-1	
1,1,1-Trichloroethane	**19.9**	ug/L	2.0	2		05/08/17 18:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		05/08/17 18:27	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		05/08/17 18:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		05/08/17 18:27	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		05/08/17 18:27	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		05/08/17 18:27	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		05/08/17 18:27	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		05/08/17 18:27	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		05/08/17 18:27	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		05/08/17 18:27	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	2		05/08/17 18:27	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	2		05/08/17 18:27	17060-07-0	
Toluene-d8 (S)	109	%	70-130	2		05/08/17 18:27	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**177**	ug/L	5.0	2.5		05/04/17 15:05	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	2.5		05/04/17 15:05	17060-07-0	
Toluene-d8 (S)	104	%	50-150	2.5		05/04/17 15:05	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-27D-050117 **Lab ID: 92339162002** Collected: 05/01/17 09:00 Received: 05/03/17 09:30 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		05/05/17 00:46	67-64-1	M1
Benzene	ND	ug/L	1.0	1		05/05/17 00:46	71-43-2	M1
Bromobenzene	ND	ug/L	1.0	1		05/05/17 00:46	108-86-1	M1
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 00:46	74-97-5	M1
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 00:46	75-27-4	M1
Bromoform	ND	ug/L	1.0	1		05/05/17 00:46	75-25-2	M1
Bromomethane	ND	ug/L	2.0	1		05/05/17 00:46	74-83-9	M1
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 00:46	78-93-3	M1
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 00:46	56-23-5	M1
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 00:46	108-90-7	M1
Chloroethane	ND	ug/L	1.0	1		05/05/17 00:46	75-00-3	M1
Chloroform	ND	ug/L	1.0	1		05/05/17 00:46	67-66-3	M1
Chloromethane	ND	ug/L	1.0	1		05/05/17 00:46	74-87-3	M1
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 00:46	95-49-8	M1
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 00:46	106-43-4	M1
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 00:46	96-12-8	M1
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 00:46	124-48-1	M1
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 00:46	106-93-4	M1
Dibromomethane	ND	ug/L	1.0	1		05/05/17 00:46	74-95-3	M1
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 00:46	95-50-1	M1
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 00:46	541-73-1	M1
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 00:46	106-46-7	M1
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 00:46	75-71-8	M1
1,1-Dichloroethane	ND	ug/L	1.0	1		05/05/17 00:46	75-34-3	M1
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 00:46	107-06-2	M1
1,1-Dichloroethene	ND	ug/L	1.0	1		05/05/17 00:46	75-35-4	M1
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 00:46	156-59-2	M1
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 00:46	156-60-5	M1
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 00:46	78-87-5	M1
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 00:46	142-28-9	M1
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 00:46	594-20-7	M1
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 00:46	563-58-6	M1
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 00:46	10061-01-5	M1
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 00:46	10061-02-6	M1
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 00:46	108-20-3	M1
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 00:46	100-41-4	M1
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 00:46	87-68-3	M1
2-Hexanone	ND	ug/L	5.0	1		05/05/17 00:46	591-78-6	M1
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 00:46	99-87-6	M1
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 00:46	75-09-2	M1
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 00:46	108-10-1	M1
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 00:46	1634-04-4	M1
Naphthalene	ND	ug/L	1.0	1		05/05/17 00:46	91-20-3	M1
Styrene	ND	ug/L	1.0	1		05/05/17 00:46	100-42-5	M1
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 00:46	630-20-6	M1
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 00:46	79-34-5	M1
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 00:46	127-18-4	M1

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-27D-050117 **Lab ID: 92339162002** Collected: 05/01/17 09:00 Received: 05/03/17 09:30 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		05/05/17 00:46	108-88-3	M1
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 00:46	87-61-6	M1
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 00:46	120-82-1	M1
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/05/17 00:46	71-55-6	M1
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 00:46	79-00-5	M1
Trichloroethene	ND	ug/L	1.0	1		05/05/17 00:46	79-01-6	M1
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 00:46	75-69-4	M1
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 00:46	96-18-4	M1
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 00:46	108-05-4	M1
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 00:46	75-01-4	M1
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 00:46	1330-20-7	MS
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 00:46	179601-23-1	M1
o-Xylene	ND	ug/L	1.0	1		05/05/17 00:46	95-47-6	M1
Surrogates								
4-Bromofluorobenzene (S)	95	%	70-130	1		05/05/17 00:46	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		05/05/17 00:46	17060-07-0	
Toluene-d8 (S)	110	%	70-130	1		05/05/17 00:46	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**3.6**	ug/L	2.0	1		05/04/17 15:24	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		05/04/17 15:24	17060-07-0	
Toluene-d8 (S)	102	%	50-150	1		05/04/17 15:24	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-03-050117 **Lab ID: 92339162003** Collected: 05/01/17 09:20 Received: 05/03/17 09:30 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		05/05/17 01:02	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 01:02	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 01:02	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 01:02	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 01:02	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 01:02	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 01:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 01:02	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 01:02	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 01:02	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 01:02	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 01:02	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 01:02	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:02	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:02	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 01:02	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 01:02	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 01:02	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 01:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:02	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:02	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:02	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 01:02	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/05/17 01:02	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 01:02	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:02	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:02	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:02	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:02	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:02	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 01:02	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 01:02	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 01:02	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 01:02	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 01:02	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 01:02	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 01:02	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 01:02	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 01:02	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 01:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:02	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 01:02	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-03-050117 **Lab ID: 92339162003** Collected: 05/01/17 09:20 Received: 05/03/17 09:30 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		05/05/17 01:02	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:02	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:02	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:02	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 01:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 01:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 01:02	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 01:02	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 01:02	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 01:02	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 01:02	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 01:02	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		05/05/17 01:02	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		05/05/17 01:02	17060-07-0	
Toluene-d8 (S)	112	%	70-130	1		05/05/17 01:02	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		05/04/17 15:44	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		05/04/17 15:44	17060-07-0	
Toluene-d8 (S)	102	%	50-150	1		05/04/17 15:44	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-43-050117 **Lab ID: 92339162004** Collected: 05/01/17 09:35 Received: 05/03/17 09:30 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		05/08/17 18:44	67-64-1	
Benzene	ND	ug/L	2.0	2		05/08/17 18:44	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		05/08/17 18:44	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		05/08/17 18:44	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		05/08/17 18:44	75-27-4	
Bromoform	ND	ug/L	2.0	2		05/08/17 18:44	75-25-2	
Bromomethane	ND	ug/L	4.0	2		05/08/17 18:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		05/08/17 18:44	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		05/08/17 18:44	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		05/08/17 18:44	108-90-7	
Chloroethane	ND	ug/L	2.0	2		05/08/17 18:44	75-00-3	
Chloroform	ND	ug/L	2.0	2		05/08/17 18:44	67-66-3	
Chloromethane	ND	ug/L	2.0	2		05/08/17 18:44	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 18:44	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 18:44	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		05/08/17 18:44	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		05/08/17 18:44	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		05/08/17 18:44	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		05/08/17 18:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:44	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:44	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:44	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		05/08/17 18:44	75-71-8	
1,1-Dichloroethane	**21.3**	ug/L	2.0	2		05/08/17 18:44	75-34-3	
1,2-Dichloroethane	**2.1**	ug/L	2.0	2		05/08/17 18:44	107-06-2	
1,1-Dichloroethene	**177**	ug/L	2.0	2		05/08/17 18:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 18:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 18:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 18:44	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		05/08/17 18:44	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 18:44	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		05/08/17 18:44	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 18:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 18:44	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		05/08/17 18:44	108-20-3	
Ethylbenzene	ND	ug/L	2.0	2		05/08/17 18:44	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		05/08/17 18:44	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		05/08/17 18:44	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		05/08/17 18:44	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		05/08/17 18:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		05/08/17 18:44	108-10-1	
Methyl-tert-butyl ether	**6.3**	ug/L	2.0	2		05/08/17 18:44	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		05/08/17 18:44	91-20-3	
Styrene	ND	ug/L	2.0	2		05/08/17 18:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 18:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 18:44	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		05/08/17 18:44	127-18-4	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-43-050117 **Lab ID: 92339162004** Collected: 05/01/17 09:35 Received: 05/03/17 09:30 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		05/08/17 18:44	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:44	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 18:44	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	2		05/08/17 18:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		05/08/17 18:44	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		05/08/17 18:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		05/08/17 18:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		05/08/17 18:44	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		05/08/17 18:44	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		05/08/17 18:44	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		05/08/17 18:44	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		05/08/17 18:44	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		05/08/17 18:44	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	2		05/08/17 18:44	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	2		05/08/17 18:44	17060-07-0	
Toluene-d8 (S)	110	%	70-130	2		05/08/17 18:44	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**206**	ug/L	10.0	5		05/04/17 16:40	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	50-150	5		05/04/17 16:40	17060-07-0	
Toluene-d8 (S)	102	%	50-150	5		05/04/17 16:40	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-38R-050117 **Lab ID: 92339162005** Collected: 05/01/17 09:50 Received: 05/03/17 09:30 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		05/05/17 01:18	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 01:18	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 01:18	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 01:18	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 01:18	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 01:18	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 01:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 01:18	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 01:18	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 01:18	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 01:18	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 01:18	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 01:18	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:18	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:18	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 01:18	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 01:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 01:18	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 01:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:18	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 01:18	75-71-8	
1,1-Dichloroethane	**6.0**	ug/L	1.0	1		05/05/17 01:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 01:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:18	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:18	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:18	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:18	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 01:18	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 01:18	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 01:18	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 01:18	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 01:18	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 01:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 01:18	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 01:18	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 01:18	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 01:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:18	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 01:18	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-38R-050117 **Lab ID: 92339162005** Collected: 05/01/17 09:50 Received: 05/03/17 09:30 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		05/05/17 01:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:18	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 01:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 01:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 01:18	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 01:18	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 01:18	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 01:18	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 01:18	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 01:18	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	95	%	70-130	1		05/05/17 01:18	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	70-130	1		05/05/17 01:18	17060-07-0	
Toluene-d8 (S)	110	%	70-130	1		05/05/17 01:18	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**42.6**	ug/L	2.0	1		05/04/17 16:59	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	50-150	1		05/04/17 16:59	17060-07-0	
Toluene-d8 (S)	103	%	50-150	1		05/04/17 16:59	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-39-050117 **Lab ID: 92339162006** Collected: 05/01/17 10:10 Received: 05/03/17 09:30 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		05/05/17 01:34	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 01:34	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 01:34	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 01:34	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 01:34	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 01:34	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 01:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 01:34	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 01:34	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 01:34	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 01:34	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 01:34	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 01:34	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:34	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 01:34	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 01:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 01:34	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 01:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:34	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 01:34	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/05/17 01:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 01:34	107-06-2	
1,1-Dichloroethene	**1.1**	ug/L	1.0	1		05/05/17 01:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:34	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:34	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:34	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:34	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 01:34	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 01:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 01:34	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 01:34	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 01:34	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 01:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 01:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 01:34	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 01:34	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 01:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:34	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 01:34	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-39-050117 **Lab ID: 92339162006** Collected: 05/01/17 10:10 Received: 05/03/17 09:30 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		05/05/17 01:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:34	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 01:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 01:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 01:34	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 01:34	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 01:34	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 01:34	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 01:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 01:34	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	93	%	70-130	1		05/05/17 01:34	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		05/05/17 01:34	17060-07-0	
Toluene-d8 (S)	110	%	70-130	1		05/05/17 01:34	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**3.0**	ug/L	2.0	1		05/04/17 17:18	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	50-150	1		05/04/17 17:18	17060-07-0	
Toluene-d8 (S)	104	%	50-150	1		05/04/17 17:18	2037-26-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-42-050117 **Lab ID: 92339162007** Collected: 05/01/17 10:30 Received: 05/03/17 09:30 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		05/07/17 06:46	67-64-1	
Benzene	ND	ug/L	1.0	1		05/07/17 06:46	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/07/17 06:46	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/07/17 06:46	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/07/17 06:46	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/07/17 06:46	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/07/17 06:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/07/17 06:46	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/07/17 06:46	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/07/17 06:46	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/07/17 06:46	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/07/17 06:46	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/07/17 06:46	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/07/17 06:46	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/07/17 06:46	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/07/17 06:46	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/07/17 06:46	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/07/17 06:46	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/07/17 06:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/07/17 06:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/07/17 06:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/07/17 06:46	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/07/17 06:46	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/07/17 06:46	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/07/17 06:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/07/17 06:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/07/17 06:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/07/17 06:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/07/17 06:46	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/07/17 06:46	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/07/17 06:46	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/07/17 06:46	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/07/17 06:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/07/17 06:46	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/07/17 06:46	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/07/17 06:46	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/07/17 06:46	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/07/17 06:46	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/07/17 06:46	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/07/17 06:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/07/17 06:46	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/07/17 06:46	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/07/17 06:46	91-20-3	
Styrene	ND	ug/L	1.0	1		05/07/17 06:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/07/17 06:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/07/17 06:46	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/07/17 06:46	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-42-050117 **Lab ID: 92339162007** Collected: 05/01/17 10:30 Received: 05/03/17 09:30 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		05/07/17 06:46	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/07/17 06:46	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/07/17 06:46	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/07/17 06:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/07/17 06:46	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/07/17 06:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/07/17 06:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/07/17 06:46	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/07/17 06:46	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/07/17 06:46	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/07/17 06:46	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/07/17 06:46	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/07/17 06:46	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		05/07/17 06:46	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		05/07/17 06:46	17060-07-0	
Toluene-d8 (S)	107	%	70-130	1		05/07/17 06:46	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**8.0**	ug/L	2.0	1		05/04/17 17:37	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	1		05/04/17 17:37	17060-07-0	
Toluene-d8 (S)	103	%	50-150	1		05/04/17 17:37	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-18-050117 **Lab ID: 92339162008** Collected: 05/01/17 10:45 Received: 05/03/17 09:30 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		05/05/17 01:50	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 01:50	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 01:50	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 01:50	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 01:50	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 01:50	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 01:50	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 01:50	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 01:50	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 01:50	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 01:50	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 01:50	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 01:50	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:50	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 01:50	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 01:50	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 01:50	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 01:50	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 01:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:50	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 01:50	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/05/17 01:50	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 01:50	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 01:50	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:50	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:50	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 01:50	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:50	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 01:50	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 01:50	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 01:50	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 01:50	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 01:50	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 01:50	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 01:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 01:50	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 01:50	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 01:50	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 01:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 01:50	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 01:50	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-18-050117 **Lab ID: 92339162008** Collected: 05/01/17 10:45 Received: 05/03/17 09:30 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		05/05/17 01:50	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:50	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 01:50	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 01:50	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 01:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 01:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 01:50	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 01:50	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 01:50	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 01:50	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 01:50	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 01:50	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	90	%	70-130	1		05/05/17 01:50	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	70-130	1		05/05/17 01:50	17060-07-0	
Toluene-d8 (S)	107	%	70-130	1		05/05/17 01:50	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		05/04/17 17:56	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	50-150	1		05/04/17 17:56	17060-07-0	
Toluene-d8 (S)	103	%	50-150	1		05/04/17 17:56	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-40D-050117 **Lab ID: 92339162009** Collected: 05/01/17 11:05 Received: 05/03/17 09:30 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		05/05/17 02:06	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 02:06	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 02:06	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 02:06	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 02:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 02:06	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 02:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 02:06	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 02:06	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 02:06	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 02:06	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 02:06	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 02:06	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:06	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 02:06	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 02:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 02:06	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 02:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:06	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 02:06	75-71-8	
1,1-Dichloroethane	**3.1**	ug/L	1.0	1		05/05/17 02:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 02:06	107-06-2	
1,1-Dichloroethene	**17.4**	ug/L	1.0	1		05/05/17 02:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:06	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:06	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:06	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:06	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 02:06	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 02:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 02:06	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 02:06	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 02:06	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 02:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 02:06	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 02:06	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 02:06	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 02:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:06	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 02:06	127-18-4	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-40D-050117 **Lab ID: 92339162009** Collected: 05/01/17 11:05 Received: 05/03/17 09:30 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		05/05/17 02:06	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:06	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/05/17 02:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 02:06	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 02:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 02:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 02:06	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 02:06	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 02:06	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 02:06	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 02:06	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 02:06	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		05/05/17 02:06	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130	1		05/05/17 02:06	17060-07-0	
Toluene-d8 (S)	109	%	70-130	1		05/05/17 02:06	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**8.5**	ug/L	2.0	1		05/04/17 18:15	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	50-150	1		05/04/17 18:15	17060-07-0	
Toluene-d8 (S)	105	%	50-150	1		05/04/17 18:15	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-5R-050117 **Lab ID: 92339162010** Collected: 05/01/17 11:20 Received: 05/03/17 09:30 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		05/05/17 02:22	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 02:22	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 02:22	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 02:22	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 02:22	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 02:22	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 02:22	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 02:22	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 02:22	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 02:22	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 02:22	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 02:22	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 02:22	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:22	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:22	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 02:22	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 02:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 02:22	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 02:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:22	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 02:22	75-71-8	
1,1-Dichloroethane	**1.4**	ug/L	1.0	1		05/05/17 02:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 02:22	107-06-2	
1,1-Dichloroethene	**1.4**	ug/L	1.0	1		05/05/17 02:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:22	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:22	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:22	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:22	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:22	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 02:22	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 02:22	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 02:22	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 02:22	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 02:22	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 02:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 02:22	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 02:22	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 02:22	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 02:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:22	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 02:22	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-5R-050117 **Lab ID: 92339162010** Collected: 05/01/17 11:20 Received: 05/03/17 09:30 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		05/05/17 02:22	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:22	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:22	120-82-1	
1,1,1-Trichloroethane	**2.7**	ug/L	1.0	1		05/05/17 02:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 02:22	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 02:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 02:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 02:22	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 02:22	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 02:22	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 02:22	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 02:22	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 02:22	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		05/05/17 02:22	460-00-4	
1,2-Dichloroethane-d4 (S)	111	%	70-130	1		05/05/17 02:22	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		05/05/17 02:22	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**78.2**	ug/L	2.0	1		05/04/17 18:34	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		05/04/17 18:34	17060-07-0	
Toluene-d8 (S)	104	%	50-150	1		05/04/17 18:34	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-1S-050117 **Lab ID: 92339162011** Collected: 05/01/17 13:25 Received: 05/03/17 09:30 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	250	10		05/05/17 20:45	67-64-1	
Benzene	ND	ug/L	10.0	10		05/05/17 20:45	71-43-2	
Bromobenzene	ND	ug/L	10.0	10		05/05/17 20:45	108-86-1	
Bromochloromethane	ND	ug/L	10.0	10		05/05/17 20:45	74-97-5	
Bromodichloromethane	ND	ug/L	10.0	10		05/05/17 20:45	75-27-4	
Bromoform	ND	ug/L	10.0	10		05/05/17 20:45	75-25-2	
Bromomethane	ND	ug/L	20.0	10		05/05/17 20:45	74-83-9	L1
2-Butanone (MEK)	ND	ug/L	50.0	10		05/05/17 20:45	78-93-3	
Carbon tetrachloride	ND	ug/L	10.0	10		05/05/17 20:45	56-23-5	
Chlorobenzene	ND	ug/L	10.0	10		05/05/17 20:45	108-90-7	
Chloroethane	**25.5**	ug/L	10.0	10		05/05/17 20:45	75-00-3	
Chloroform	ND	ug/L	10.0	10		05/05/17 20:45	67-66-3	
Chloromethane	ND	ug/L	10.0	10		05/05/17 20:45	74-87-3	
2-Chlorotoluene	ND	ug/L	10.0	10		05/05/17 20:45	95-49-8	
4-Chlorotoluene	ND	ug/L	10.0	10		05/05/17 20:45	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	20.0	10		05/05/17 20:45	96-12-8	
Dibromochloromethane	ND	ug/L	10.0	10		05/05/17 20:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	10.0	10		05/05/17 20:45	106-93-4	
Dibromomethane	ND	ug/L	10.0	10		05/05/17 20:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	10.0	10		05/05/17 20:45	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	10.0	10		05/05/17 20:45	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.0	10		05/05/17 20:45	106-46-7	
Dichlorodifluoromethane	ND	ug/L	10.0	10		05/05/17 20:45	75-71-8	
1,1-Dichloroethane	**711**	ug/L	10.0	10		05/05/17 20:45	75-34-3	
1,2-Dichloroethane	ND	ug/L	10.0	10		05/05/17 20:45	107-06-2	
1,1-Dichloroethene	**1210**	ug/L	10.0	10		05/05/17 20:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	10.0	10		05/05/17 20:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	10.0	10		05/05/17 20:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	10.0	10		05/05/17 20:45	78-87-5	
1,3-Dichloropropane	ND	ug/L	10.0	10		05/05/17 20:45	142-28-9	
2,2-Dichloropropane	ND	ug/L	10.0	10		05/05/17 20:45	594-20-7	
1,1-Dichloropropene	ND	ug/L	10.0	10		05/05/17 20:45	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	10.0	10		05/05/17 20:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	10.0	10		05/05/17 20:45	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	10		05/05/17 20:45	108-20-3	
Ethylbenzene	ND	ug/L	10.0	10		05/05/17 20:45	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	10		05/05/17 20:45	87-68-3	
2-Hexanone	ND	ug/L	50.0	10		05/05/17 20:45	591-78-6	
p-Isopropyltoluene	ND	ug/L	10.0	10		05/05/17 20:45	99-87-6	
Methylene Chloride	ND	ug/L	20.0	10		05/05/17 20:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50.0	10		05/05/17 20:45	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	10		05/05/17 20:45	1634-04-4	
Naphthalene	ND	ug/L	10.0	10		05/05/17 20:45	91-20-3	
Styrene	ND	ug/L	10.0	10		05/05/17 20:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	10.0	10		05/05/17 20:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	10		05/05/17 20:45	79-34-5	
Tetrachloroethene	ND	ug/L	10.0	10		05/05/17 20:45	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-1S-050117 **Lab ID: 92339162011** Collected: 05/01/17 13:25 Received: 05/03/17 09:30 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	10.0	10		05/05/17 20:45	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	10.0	10		05/05/17 20:45	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	10		05/05/17 20:45	120-82-1	
1,1,1-Trichloroethane	**35.5**	ug/L	10.0	10		05/05/17 20:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	10		05/05/17 20:45	79-00-5	
Trichloroethene	ND	ug/L	10.0	10		05/05/17 20:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	10.0	10		05/05/17 20:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	10.0	10		05/05/17 20:45	96-18-4	
Vinyl acetate	ND	ug/L	20.0	10		05/05/17 20:45	108-05-4	
Vinyl chloride	ND	ug/L	10.0	10		05/05/17 20:45	75-01-4	
Xylene (Total)	ND	ug/L	10.0	10		05/05/17 20:45	1330-20-7	
m&p-Xylene	ND	ug/L	20.0	10		05/05/17 20:45	179601-23-1	
o-Xylene	ND	ug/L	10.0	10		05/05/17 20:45	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	10		05/05/17 20:45	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	10		05/05/17 20:45	17060-07-0	
Toluene-d8 (S)	105	%	70-130	10		05/05/17 20:45	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**1370**	ug/L	50.0	25		05/04/17 18:53	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	50-150	25		05/04/17 18:53	17060-07-0	
Toluene-d8 (S)	104	%	50-150	25		05/04/17 18:53	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-2S-050117 **Lab ID: 92339162012** Collected: 05/01/17 13:40 Received: 05/03/17 09:30 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	125	5		05/05/17 19:54	67-64-1	
Benzene	ND	ug/L	5.0	5		05/05/17 19:54	71-43-2	
Bromobenzene	ND	ug/L	5.0	5		05/05/17 19:54	108-86-1	
Bromochloromethane	ND	ug/L	5.0	5		05/05/17 19:54	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	5		05/05/17 19:54	75-27-4	
Bromoform	ND	ug/L	5.0	5		05/05/17 19:54	75-25-2	
Bromomethane	ND	ug/L	10.0	5		05/05/17 19:54	74-83-9	L1
2-Butanone (MEK)	ND	ug/L	25.0	5		05/05/17 19:54	78-93-3	
Carbon tetrachloride	ND	ug/L	5.0	5		05/05/17 19:54	56-23-5	
Chlorobenzene	ND	ug/L	5.0	5		05/05/17 19:54	108-90-7	
Chloroethane	ND	ug/L	5.0	5		05/05/17 19:54	75-00-3	
Chloroform	ND	ug/L	5.0	5		05/05/17 19:54	67-66-3	
Chloromethane	ND	ug/L	5.0	5		05/05/17 19:54	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	5		05/05/17 19:54	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	5		05/05/17 19:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	5		05/05/17 19:54	96-12-8	
Dibromochloromethane	ND	ug/L	5.0	5		05/05/17 19:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	5		05/05/17 19:54	106-93-4	
Dibromomethane	ND	ug/L	5.0	5		05/05/17 19:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	5		05/05/17 19:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	5		05/05/17 19:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	5		05/05/17 19:54	106-46-7	
Dichlorodifluoromethane	ND	ug/L	5.0	5		05/05/17 19:54	75-71-8	
1,1-Dichloroethane	**95.7**	ug/L	5.0	5		05/05/17 19:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	5		05/05/17 19:54	107-06-2	
1,1-Dichloroethene	**622**	ug/L	5.0	5		05/05/17 19:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	5		05/05/17 19:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	5		05/05/17 19:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	5		05/05/17 19:54	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	5		05/05/17 19:54	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	5		05/05/17 19:54	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	5		05/05/17 19:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	5		05/05/17 19:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	5		05/05/17 19:54	10061-02-6	
Diisopropyl ether	ND	ug/L	5.0	5		05/05/17 19:54	108-20-3	
Ethylbenzene	ND	ug/L	5.0	5		05/05/17 19:54	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	5		05/05/17 19:54	87-68-3	
2-Hexanone	ND	ug/L	25.0	5		05/05/17 19:54	591-78-6	
p-Isopropyltoluene	ND	ug/L	5.0	5		05/05/17 19:54	99-87-6	
Methylene Chloride	ND	ug/L	10.0	5		05/05/17 19:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	5		05/05/17 19:54	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	5.0	5		05/05/17 19:54	1634-04-4	
Naphthalene	ND	ug/L	5.0	5		05/05/17 19:54	91-20-3	
Styrene	ND	ug/L	5.0	5		05/05/17 19:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	5		05/05/17 19:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	5		05/05/17 19:54	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	5		05/05/17 19:54	127-18-4	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-2S-050117 **Lab ID: 92339162012** Collected: 05/01/17 13:40 Received: 05/03/17 09:30 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	5.0	5		05/05/17 19:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	5		05/05/17 19:54	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	5		05/05/17 19:54	120-82-1	
1,1,1-Trichloroethane	**426**	ug/L	5.0	5		05/05/17 19:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	5		05/05/17 19:54	79-00-5	
Trichloroethene	**5.3**	ug/L	5.0	5		05/05/17 19:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	5		05/05/17 19:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	5		05/05/17 19:54	96-18-4	
Vinyl acetate	ND	ug/L	10.0	5		05/05/17 19:54	108-05-4	
Vinyl chloride	ND	ug/L	5.0	5		05/05/17 19:54	75-01-4	
Xylene (Total)	ND	ug/L	5.0	5		05/05/17 19:54	1330-20-7	
m&p-Xylene	ND	ug/L	10.0	5		05/05/17 19:54	179601-23-1	
o-Xylene	ND	ug/L	5.0	5		05/05/17 19:54	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	5		05/05/17 19:54	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	5		05/05/17 19:54	17060-07-0	
Toluene-d8 (S)	108	%	70-130	5		05/05/17 19:54	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**949**	ug/L	20.0	10		05/04/17 19:12	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	10		05/04/17 19:12	17060-07-0	
Toluene-d8 (S)	104	%	50-150	10		05/04/17 19:12	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-3S-050117 **Lab ID: 92339162013** Collected: 05/01/17 14:00 Received: 05/03/17 09:30 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		05/05/17 02:38	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 02:38	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 02:38	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 02:38	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 02:38	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 02:38	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 02:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 02:38	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 02:38	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 02:38	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 02:38	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 02:38	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 02:38	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:38	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:38	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 02:38	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 02:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 02:38	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 02:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:38	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 02:38	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/05/17 02:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 02:38	107-06-2	
1,1-Dichloroethene	**1.2**	ug/L	1.0	1		05/05/17 02:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:38	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:38	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:38	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:38	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 02:38	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 02:38	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 02:38	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 02:38	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 02:38	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 02:38	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 02:38	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 02:38	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 02:38	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 02:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:38	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 02:38	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-3S-050117 **Lab ID: 92339162013** Collected: 05/01/17 14:00 Received: 05/03/17 09:30 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		05/05/17 02:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/05/17 02:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 02:38	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 02:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 02:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 02:38	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 02:38	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 02:38	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 02:38	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 02:38	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 02:38	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	95	%	70-130	1		05/05/17 02:38	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		05/05/17 02:38	17060-07-0	
Toluene-d8 (S)	109	%	70-130	1		05/05/17 02:38	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**3.8**	ug/L	2.0	1		05/04/17 19:31	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		05/04/17 19:31	17060-07-0	
Toluene-d8 (S)	105	%	50-150	1		05/04/17 19:31	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-44-050117 **Lab ID: 92339162014** Collected: 05/01/17 14:20 Received: 05/03/17 09:30 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		05/05/17 02:54	67-64-1	
Benzene	ND	ug/L	1.0	1		05/05/17 02:54	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/05/17 02:54	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/05/17 02:54	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/05/17 02:54	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/05/17 02:54	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/05/17 02:54	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/05/17 02:54	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/05/17 02:54	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/05/17 02:54	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/05/17 02:54	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/05/17 02:54	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/05/17 02:54	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:54	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/05/17 02:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/05/17 02:54	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/05/17 02:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/05/17 02:54	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/05/17 02:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:54	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/05/17 02:54	75-71-8	
1,1-Dichloroethane	**6.6**	ug/L	1.0	1		05/05/17 02:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/05/17 02:54	107-06-2	
1,1-Dichloroethene	**5.9**	ug/L	1.0	1		05/05/17 02:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/05/17 02:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:54	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:54	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/05/17 02:54	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/05/17 02:54	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/05/17 02:54	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/05/17 02:54	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/05/17 02:54	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/05/17 02:54	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/05/17 02:54	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/05/17 02:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/05/17 02:54	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/05/17 02:54	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/05/17 02:54	91-20-3	
Styrene	ND	ug/L	1.0	1		05/05/17 02:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/05/17 02:54	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/05/17 02:54	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-44-050117 **Lab ID: 92339162014** Collected: 05/01/17 14:20 Received: 05/03/17 09:30 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		05/05/17 02:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:54	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/05/17 02:54	120-82-1	
1,1,1-Trichloroethane	**27.7**	ug/L	1.0	1		05/05/17 02:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/05/17 02:54	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/05/17 02:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/05/17 02:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/05/17 02:54	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/05/17 02:54	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/05/17 02:54	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/05/17 02:54	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/05/17 02:54	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/05/17 02:54	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		05/05/17 02:54	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	70-130	1		05/05/17 02:54	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		05/05/17 02:54	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**49.1**	ug/L	2.0	1		05/04/17 19:50	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	50-150	1		05/04/17 19:50	17060-07-0	
Toluene-d8 (S)	105	%	50-150	1		05/04/17 19:50	2037-26-5	

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

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-21D-050117 **Lab ID: 92339162015** Collected: 05/01/17 14:35 Received: 05/03/17 09:30 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		05/09/17 13:56	67-64-1	
Benzene	ND	ug/L	1.0	1		05/09/17 13:56	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/09/17 13:56	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/09/17 13:56	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/09/17 13:56	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/09/17 13:56	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/09/17 13:56	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/09/17 13:56	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/09/17 13:56	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/09/17 13:56	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/09/17 13:56	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/09/17 13:56	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/09/17 13:56	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/09/17 13:56	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/09/17 13:56	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/09/17 13:56	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/09/17 13:56	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/09/17 13:56	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/09/17 13:56	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/09/17 13:56	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/09/17 13:56	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/09/17 13:56	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/09/17 13:56	75-71-8	
1,1-Dichloroethane	**6.9**	ug/L	1.0	1		05/09/17 13:56	75-34-3	
1,2-Dichloroethane	**1.4**	ug/L	1.0	1		05/09/17 13:56	107-06-2	
1,1-Dichloroethene	**111**	ug/L	1.0	1		05/09/17 13:56	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/09/17 13:56	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/09/17 13:56	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/09/17 13:56	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/09/17 13:56	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/09/17 13:56	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/09/17 13:56	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/09/17 13:56	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/09/17 13:56	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/09/17 13:56	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/09/17 13:56	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/09/17 13:56	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/09/17 13:56	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/09/17 13:56	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/09/17 13:56	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/09/17 13:56	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/09/17 13:56	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/09/17 13:56	91-20-3	
Styrene	ND	ug/L	1.0	1		05/09/17 13:56	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/09/17 13:56	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/09/17 13:56	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/09/17 13:56	127-18-4	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-21D-050117 **Lab ID: 92339162015** Collected: 05/01/17 14:35 Received: 05/03/17 09:30 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		05/09/17 13:56	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/09/17 13:56	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/09/17 13:56	120-82-1	
1,1,1-Trichloroethane	**2.3**	ug/L	1.0	1		05/09/17 13:56	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/09/17 13:56	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/09/17 13:56	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/09/17 13:56	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/09/17 13:56	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/09/17 13:56	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/09/17 13:56	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/09/17 13:56	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/09/17 13:56	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/09/17 13:56	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		05/09/17 13:56	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		05/09/17 13:56	17060-07-0	
Toluene-d8 (S)	111	%	70-130	1		05/09/17 13:56	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**57.5**	ug/L	2.0	1		05/04/17 20:09	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	1		05/04/17 20:09	17060-07-0	
Toluene-d8 (S)	105	%	50-150	1		05/04/17 20:09	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-1D-050117 **Lab ID: 92339162016** Collected: 05/01/17 14:50 Received: 05/03/17 09:30 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		05/08/17 17:01	67-64-1	M1
Benzene	ND	ug/L	1.0	1		05/08/17 17:01	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/08/17 17:01	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/08/17 17:01	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/08/17 17:01	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/08/17 17:01	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/08/17 17:01	74-83-9	M1
2-Butanone (MEK)	ND	ug/L	5.0	1		05/08/17 17:01	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/08/17 17:01	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/08/17 17:01	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/08/17 17:01	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/08/17 17:01	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/08/17 17:01	74-87-3	M1
2-Chlorotoluene	ND	ug/L	1.0	1		05/08/17 17:01	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/08/17 17:01	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/08/17 17:01	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/08/17 17:01	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/08/17 17:01	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/08/17 17:01	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/08/17 17:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/08/17 17:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/08/17 17:01	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/08/17 17:01	75-71-8	M1
1,1-Dichloroethane	**10.4**	ug/L	1.0	1		05/08/17 17:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/08/17 17:01	107-06-2	
1,1-Dichloroethene	**88.9**	ug/L	1.0	1		05/08/17 17:01	75-35-4	M1
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/08/17 17:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/08/17 17:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/08/17 17:01	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/08/17 17:01	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/08/17 17:01	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/08/17 17:01	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/08/17 17:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/08/17 17:01	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/08/17 17:01	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/08/17 17:01	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/08/17 17:01	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/08/17 17:01	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/08/17 17:01	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/08/17 17:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/08/17 17:01	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/08/17 17:01	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/08/17 17:01	91-20-3	
Styrene	ND	ug/L	1.0	1		05/08/17 17:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/08/17 17:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/08/17 17:01	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/08/17 17:01	127-18-4	

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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-1D-050117 **Lab ID: 92339162016** Collected: 05/01/17 14:50 Received: 05/03/17 09:30 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		05/08/17 17:01	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/08/17 17:01	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/08/17 17:01	120-82-1	
1,1,1-Trichloroethane	**1.0**	ug/L	1.0	1		05/08/17 17:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/08/17 17:01	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/08/17 17:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/08/17 17:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/08/17 17:01	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/08/17 17:01	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/08/17 17:01	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/08/17 17:01	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/08/17 17:01	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/08/17 17:01	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		05/08/17 17:01	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		05/08/17 17:01	17060-07-0	
Toluene-d8 (S)	111	%	70-130	1		05/08/17 17:01	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**51.9**	ug/L	2.0	1		05/04/17 20:28	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	50-150	1		05/04/17 20:28	17060-07-0	
Toluene-d8 (S)	104	%	50-150	1		05/04/17 20:28	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-41D-050117 **Lab ID: 92339162017** Collected: 05/01/17 15:05 Received: 05/03/17 09:30 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		05/06/17 05:59	67-64-1	
Benzene	ND	ug/L	1.0	1		05/06/17 05:59	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/06/17 05:59	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/06/17 05:59	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/06/17 05:59	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/06/17 05:59	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/06/17 05:59	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/06/17 05:59	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/06/17 05:59	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/06/17 05:59	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/06/17 05:59	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/06/17 05:59	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/06/17 05:59	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 05:59	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 05:59	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/06/17 05:59	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/06/17 05:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/06/17 05:59	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/06/17 05:59	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 05:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 05:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 05:59	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/06/17 05:59	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/06/17 05:59	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/06/17 05:59	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/06/17 05:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 05:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 05:59	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 05:59	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/06/17 05:59	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 05:59	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/06/17 05:59	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 05:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 05:59	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/06/17 05:59	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/06/17 05:59	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/06/17 05:59	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/06/17 05:59	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/06/17 05:59	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/06/17 05:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/06/17 05:59	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/06/17 05:59	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/06/17 05:59	91-20-3	
Styrene	ND	ug/L	1.0	1		05/06/17 05:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 05:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 05:59	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/06/17 05:59	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-41D-050117 **Lab ID: 92339162017** Collected: 05/01/17 15:05 Received: 05/03/17 09:30 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		05/06/17 05:59	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 05:59	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 05:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/06/17 05:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/06/17 05:59	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/06/17 05:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/06/17 05:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/06/17 05:59	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/06/17 05:59	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/06/17 05:59	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/06/17 05:59	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/06/17 05:59	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/06/17 05:59	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		05/06/17 05:59	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		05/06/17 05:59	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		05/06/17 05:59	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**2.4**	ug/L	2.0	1		05/04/17 20:47	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		05/04/17 20:47	17060-07-0	
Toluene-d8 (S)	103	%	50-150	1		05/04/17 20:47	2037-26-5	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-2D-050117 **Lab ID: 92339162018** Collected: 05/01/17 15:30 Received: 05/03/17 09:30 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		05/08/17 19:19	67-64-1	
Benzene	ND	ug/L	4.0	4		05/08/17 19:19	71-43-2	
Bromobenzene	ND	ug/L	4.0	4		05/08/17 19:19	108-86-1	
Bromochloromethane	ND	ug/L	4.0	4		05/08/17 19:19	74-97-5	
Bromodichloromethane	ND	ug/L	4.0	4		05/08/17 19:19	75-27-4	
Bromoform	ND	ug/L	4.0	4		05/08/17 19:19	75-25-2	
Bromomethane	ND	ug/L	8.0	4		05/08/17 19:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	20.0	4		05/08/17 19:19	78-93-3	
Carbon tetrachloride	ND	ug/L	4.0	4		05/08/17 19:19	56-23-5	
Chlorobenzene	ND	ug/L	4.0	4		05/08/17 19:19	108-90-7	
Chloroethane	ND	ug/L	4.0	4		05/08/17 19:19	75-00-3	
Chloroform	ND	ug/L	4.0	4		05/08/17 19:19	67-66-3	
Chloromethane	ND	ug/L	4.0	4		05/08/17 19:19	74-87-3	
2-Chlorotoluene	ND	ug/L	4.0	4		05/08/17 19:19	95-49-8	
4-Chlorotoluene	ND	ug/L	4.0	4		05/08/17 19:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	8.0	4		05/08/17 19:19	96-12-8	
Dibromochloromethane	ND	ug/L	4.0	4		05/08/17 19:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	4.0	4		05/08/17 19:19	106-93-4	
Dibromomethane	ND	ug/L	4.0	4		05/08/17 19:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:19	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	4		05/08/17 19:19	75-71-8	
1,1-Dichloroethane	**56.6**	ug/L	4.0	4		05/08/17 19:19	75-34-3	
1,2-Dichloroethane	**4.5**	ug/L	4.0	4		05/08/17 19:19	107-06-2	
1,1-Dichloroethene	**486**	ug/L	4.0	4		05/08/17 19:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	4.0	4		05/08/17 19:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	4.0	4		05/08/17 19:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	4.0	4		05/08/17 19:19	78-87-5	
1,3-Dichloropropane	ND	ug/L	4.0	4		05/08/17 19:19	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	4		05/08/17 19:19	594-20-7	
1,1-Dichloropropene	ND	ug/L	4.0	4		05/08/17 19:19	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	4		05/08/17 19:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	4		05/08/17 19:19	10061-02-6	
Diisopropyl ether	ND	ug/L	4.0	4		05/08/17 19:19	108-20-3	
Ethylbenzene	ND	ug/L	4.0	4		05/08/17 19:19	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	4.0	4		05/08/17 19:19	87-68-3	
2-Hexanone	ND	ug/L	20.0	4		05/08/17 19:19	591-78-6	
p-Isopropyltoluene	ND	ug/L	4.0	4		05/08/17 19:19	99-87-6	
Methylene Chloride	ND	ug/L	8.0	4		05/08/17 19:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20.0	4		05/08/17 19:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	4		05/08/17 19:19	1634-04-4	
Naphthalene	ND	ug/L	4.0	4		05/08/17 19:19	91-20-3	
Styrene	ND	ug/L	4.0	4		05/08/17 19:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	4.0	4		05/08/17 19:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	4.0	4		05/08/17 19:19	79-34-5	
Tetrachloroethene	ND	ug/L	4.0	4		05/08/17 19:19	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: RW-2D-050117 **Lab ID: 92339162018** Collected: 05/01/17 15:30 Received: 05/03/17 09:30 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		05/08/17 19:19	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:19	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:19	120-82-1	
1,1,1-Trichloroethane	**14.7**	ug/L	4.0	4		05/08/17 19:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	4.0	4		05/08/17 19:19	79-00-5	
Trichloroethene	ND	ug/L	4.0	4		05/08/17 19:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	4.0	4		05/08/17 19:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	4		05/08/17 19:19	96-18-4	
Vinyl acetate	ND	ug/L	8.0	4		05/08/17 19:19	108-05-4	
Vinyl chloride	ND	ug/L	4.0	4		05/08/17 19:19	75-01-4	
Xylene (Total)	ND	ug/L	4.0	4		05/08/17 19:19	1330-20-7	
m&p-Xylene	ND	ug/L	8.0	4		05/08/17 19:19	179601-23-1	
o-Xylene	ND	ug/L	4.0	4		05/08/17 19:19	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	4		05/08/17 19:19	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	4		05/08/17 19:19	17060-07-0	
Toluene-d8 (S)	110	%	70-130	4		05/08/17 19:19	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**214**	ug/L	5.0	2.5		05/04/17 21:06	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%	50-150	2.5		05/04/17 21:06	17060-07-0	
Toluene-d8 (S)	104	%	50-150	2.5		05/04/17 21:06	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-1D-050117 **Lab ID: 92339162019** Collected: 05/01/17 15:40 Received: 05/03/17 09:30 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	62.5	2.5		05/06/17 09:44	67-64-1	
Benzene	ND	ug/L	2.5	2.5		05/06/17 09:44	71-43-2	
Bromobenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	108-86-1	
Bromochloromethane	ND	ug/L	2.5	2.5		05/06/17 09:44	74-97-5	
Bromodichloromethane	ND	ug/L	2.5	2.5		05/06/17 09:44	75-27-4	
Bromoform	ND	ug/L	2.5	2.5		05/06/17 09:44	75-25-2	
Bromomethane	ND	ug/L	5.0	2.5		05/06/17 09:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	12.5	2.5		05/06/17 09:44	78-93-3	
Carbon tetrachloride	ND	ug/L	2.5	2.5		05/06/17 09:44	56-23-5	
Chlorobenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	108-90-7	
Chloroethane	ND	ug/L	2.5	2.5		05/06/17 09:44	75-00-3	
Chloroform	ND	ug/L	2.5	2.5		05/06/17 09:44	67-66-3	
Chloromethane	ND	ug/L	2.5	2.5		05/06/17 09:44	74-87-3	
2-Chlorotoluene	ND	ug/L	2.5	2.5		05/06/17 09:44	95-49-8	
4-Chlorotoluene	ND	ug/L	2.5	2.5		05/06/17 09:44	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	5.0	2.5		05/06/17 09:44	96-12-8	
Dibromochloromethane	ND	ug/L	2.5	2.5		05/06/17 09:44	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.5	2.5		05/06/17 09:44	106-93-4	
Dibromomethane	ND	ug/L	2.5	2.5		05/06/17 09:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.5	2.5		05/06/17 09:44	75-71-8	
1,1-Dichloroethane	**105**	ug/L	2.5	2.5		05/06/17 09:44	75-34-3	
1,2-Dichloroethane	**5.7**	ug/L	2.5	2.5		05/06/17 09:44	107-06-2	
1,1-Dichloroethene	**407**	ug/L	2.5	2.5		05/06/17 09:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.5	2.5		05/06/17 09:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.5	2.5		05/06/17 09:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.5	2.5		05/06/17 09:44	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.5	2.5		05/06/17 09:44	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.5	2.5		05/06/17 09:44	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.5	2.5		05/06/17 09:44	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.5	2.5		05/06/17 09:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.5	2.5		05/06/17 09:44	10061-02-6	
Diisopropyl ether	ND	ug/L	2.5	2.5		05/06/17 09:44	108-20-3	
Ethylbenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.5	2.5		05/06/17 09:44	87-68-3	
2-Hexanone	ND	ug/L	12.5	2.5		05/06/17 09:44	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.5	2.5		05/06/17 09:44	99-87-6	
Methylene Chloride	ND	ug/L	5.0	2.5		05/06/17 09:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	12.5	2.5		05/06/17 09:44	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.5	2.5		05/06/17 09:44	1634-04-4	
Naphthalene	ND	ug/L	2.5	2.5		05/06/17 09:44	91-20-3	
Styrene	ND	ug/L	2.5	2.5		05/06/17 09:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.5	2.5		05/06/17 09:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.5	2.5		05/06/17 09:44	79-34-5	
Tetrachloroethene	ND	ug/L	2.5	2.5		05/06/17 09:44	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-1D-050117 **Lab ID: 92339162019** Collected: 05/01/17 15:40 Received: 05/03/17 09:30 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	2.5	2.5		05/06/17 09:44	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.5	2.5		05/06/17 09:44	120-82-1	
1,1,1-Trichloroethane	**37.1**	ug/L	2.5	2.5		05/06/17 09:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.5	2.5		05/06/17 09:44	79-00-5	
Trichloroethene	ND	ug/L	2.5	2.5		05/06/17 09:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.5	2.5		05/06/17 09:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.5	2.5		05/06/17 09:44	96-18-4	
Vinyl acetate	ND	ug/L	5.0	2.5		05/06/17 09:44	108-05-4	
Vinyl chloride	ND	ug/L	2.5	2.5		05/06/17 09:44	75-01-4	
Xylene (Total)	ND	ug/L	2.5	2.5		05/06/17 09:44	1330-20-7	
m&p-Xylene	ND	ug/L	5.0	2.5		05/06/17 09:44	179601-23-1	
o-Xylene	ND	ug/L	2.5	2.5		05/06/17 09:44	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	2.5		05/06/17 09:44	460-00-4	
1,2-Dichloroethane-d4 (S)	111	%	70-130	2.5		05/06/17 09:44	17060-07-0	
Toluene-d8 (S)	109	%	70-130	2.5		05/06/17 09:44	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**329**	ug/L	10.0	5		05/05/17 18:00	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	2.5		05/04/17 21:25	17060-07-0	
Toluene-d8 (S)	104	%	50-150	2.5		05/04/17 21:25	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-22-050217 **Lab ID: 92339162020** Collected: 05/02/17 07:45 Received: 05/03/17 11:26 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		05/06/17 06:34	67-64-1	
Benzene	ND	ug/L	1.0	1		05/06/17 06:34	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/06/17 06:34	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/06/17 06:34	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/06/17 06:34	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/06/17 06:34	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/06/17 06:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/06/17 06:34	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/06/17 06:34	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/06/17 06:34	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/06/17 06:34	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/06/17 06:34	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/06/17 06:34	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 06:34	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 06:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/06/17 06:34	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/06/17 06:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/06/17 06:34	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/06/17 06:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 06:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 06:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 06:34	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/06/17 06:34	75-71-8	
1,1-Dichloroethane	**2.5**	ug/L	1.0	1		05/06/17 06:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/06/17 06:34	107-06-2	
1,1-Dichloroethene	**36.9**	ug/L	1.0	1		05/06/17 06:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 06:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 06:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 06:34	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/06/17 06:34	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 06:34	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/06/17 06:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 06:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 06:34	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/06/17 06:34	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/06/17 06:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/06/17 06:34	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/06/17 06:34	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/06/17 06:34	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/06/17 06:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/06/17 06:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/06/17 06:34	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/06/17 06:34	91-20-3	
Styrene	ND	ug/L	1.0	1		05/06/17 06:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 06:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 06:34	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/06/17 06:34	127-18-4	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-22-050217 **Lab ID: 92339162020** Collected: 05/02/17 07:45 Received: 05/03/17 11:26 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		05/06/17 06:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 06:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 06:34	120-82-1	
1,1,1-Trichloroethane	**3.7**	ug/L	1.0	1		05/06/17 06:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/06/17 06:34	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/06/17 06:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/06/17 06:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/06/17 06:34	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/06/17 06:34	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/06/17 06:34	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/06/17 06:34	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/06/17 06:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/06/17 06:34	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		05/06/17 06:34	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		05/06/17 06:34	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		05/06/17 06:34	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**24.6**	ug/L	2.0	1		05/05/17 17:22	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%	50-150	1		05/05/17 17:22	17060-07-0	
Toluene-d8 (S)	111	%	50-150	1		05/05/17 17:22	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-20-050217 **Lab ID: 92339162021** Collected: 05/02/17 08:05 Received: 05/03/17 11:26 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		05/08/17 19:36	67-64-1	
Benzene	ND	ug/L	2.0	2		05/08/17 19:36	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		05/08/17 19:36	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		05/08/17 19:36	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		05/08/17 19:36	75-27-4	
Bromoform	ND	ug/L	2.0	2		05/08/17 19:36	75-25-2	
Bromomethane	ND	ug/L	4.0	2		05/08/17 19:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		05/08/17 19:36	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		05/08/17 19:36	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		05/08/17 19:36	108-90-7	
Chloroethane	ND	ug/L	2.0	2		05/08/17 19:36	75-00-3	
Chloroform	ND	ug/L	2.0	2		05/08/17 19:36	67-66-3	
Chloromethane	ND	ug/L	2.0	2		05/08/17 19:36	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 19:36	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 19:36	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		05/08/17 19:36	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		05/08/17 19:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		05/08/17 19:36	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		05/08/17 19:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 19:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 19:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 19:36	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		05/08/17 19:36	75-71-8	
1,1-Dichloroethane	**161**	ug/L	2.0	2		05/08/17 19:36	75-34-3	
1,2-Dichloroethane	**7.3**	ug/L	2.0	2		05/08/17 19:36	107-06-2	
1,1-Dichloroethene	**286**	ug/L	2.0	2		05/08/17 19:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 19:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 19:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 19:36	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		05/08/17 19:36	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 19:36	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		05/08/17 19:36	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 19:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 19:36	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		05/08/17 19:36	108-20-3	
Ethylbenzene	ND	ug/L	2.0	2		05/08/17 19:36	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		05/08/17 19:36	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		05/08/17 19:36	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		05/08/17 19:36	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		05/08/17 19:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		05/08/17 19:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		05/08/17 19:36	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		05/08/17 19:36	91-20-3	
Styrene	ND	ug/L	2.0	2		05/08/17 19:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 19:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 19:36	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		05/08/17 19:36	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-20-050217 **Lab ID: 92339162021** Collected: 05/02/17 08:05 Received: 05/03/17 11:26 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		05/08/17 19:36	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 19:36	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 19:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	2		05/08/17 19:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		05/08/17 19:36	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		05/08/17 19:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		05/08/17 19:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		05/08/17 19:36	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		05/08/17 19:36	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		05/08/17 19:36	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		05/08/17 19:36	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		05/08/17 19:36	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		05/08/17 19:36	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	2		05/08/17 19:36	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	2		05/08/17 19:36	17060-07-0	
Toluene-d8 (S)	112	%	70-130	2		05/08/17 19:36	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**967**	ug/L	20.0	10		05/04/17 22:02	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	50-150	10		05/04/17 22:02	17060-07-0	
Toluene-d8 (S)	104	%	50-150	10		05/04/17 22:02	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-04-050217 **Lab ID: 92339162022** Collected: 05/02/17 08:15 Received: 05/03/17 11:26 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		05/08/17 19:53	67-64-1	
Benzene	ND	ug/L	4.0	4		05/08/17 19:53	71-43-2	
Bromobenzene	ND	ug/L	4.0	4		05/08/17 19:53	108-86-1	
Bromochloromethane	ND	ug/L	4.0	4		05/08/17 19:53	74-97-5	
Bromodichloromethane	ND	ug/L	4.0	4		05/08/17 19:53	75-27-4	
Bromoform	ND	ug/L	4.0	4		05/08/17 19:53	75-25-2	
Bromomethane	ND	ug/L	8.0	4		05/08/17 19:53	74-83-9	
2-Butanone (MEK)	ND	ug/L	20.0	4		05/08/17 19:53	78-93-3	
Carbon tetrachloride	ND	ug/L	4.0	4		05/08/17 19:53	56-23-5	
Chlorobenzene	ND	ug/L	4.0	4		05/08/17 19:53	108-90-7	
Chloroethane	ND	ug/L	4.0	4		05/08/17 19:53	75-00-3	
Chloroform	ND	ug/L	4.0	4		05/08/17 19:53	67-66-3	
Chloromethane	ND	ug/L	4.0	4		05/08/17 19:53	74-87-3	
2-Chlorotoluene	ND	ug/L	4.0	4		05/08/17 19:53	95-49-8	
4-Chlorotoluene	ND	ug/L	4.0	4		05/08/17 19:53	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	8.0	4		05/08/17 19:53	96-12-8	
Dibromochloromethane	ND	ug/L	4.0	4		05/08/17 19:53	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	4.0	4		05/08/17 19:53	106-93-4	
Dibromomethane	ND	ug/L	4.0	4		05/08/17 19:53	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:53	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:53	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:53	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	4		05/08/17 19:53	75-71-8	
1,1-Dichloroethane	**103**	ug/L	4.0	4		05/08/17 19:53	75-34-3	
1,2-Dichloroethane	ND	ug/L	4.0	4		05/08/17 19:53	107-06-2	
1,1-Dichloroethene	**459**	ug/L	4.0	4		05/08/17 19:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	4.0	4		05/08/17 19:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	4.0	4		05/08/17 19:53	156-60-5	
1,2-Dichloropropane	ND	ug/L	4.0	4		05/08/17 19:53	78-87-5	
1,3-Dichloropropane	ND	ug/L	4.0	4		05/08/17 19:53	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	4		05/08/17 19:53	594-20-7	
1,1-Dichloropropene	ND	ug/L	4.0	4		05/08/17 19:53	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	4		05/08/17 19:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	4		05/08/17 19:53	10061-02-6	
Diisopropyl ether	ND	ug/L	4.0	4		05/08/17 19:53	108-20-3	
Ethylbenzene	ND	ug/L	4.0	4		05/08/17 19:53	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	4.0	4		05/08/17 19:53	87-68-3	
2-Hexanone	ND	ug/L	20.0	4		05/08/17 19:53	591-78-6	
p-Isopropyltoluene	ND	ug/L	4.0	4		05/08/17 19:53	99-87-6	
Methylene Chloride	ND	ug/L	8.0	4		05/08/17 19:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20.0	4		05/08/17 19:53	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	4		05/08/17 19:53	1634-04-4	
Naphthalene	ND	ug/L	4.0	4		05/08/17 19:53	91-20-3	
Styrene	ND	ug/L	4.0	4		05/08/17 19:53	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	4.0	4		05/08/17 19:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	4.0	4		05/08/17 19:53	79-34-5	
Tetrachloroethene	ND	ug/L	4.0	4		05/08/17 19:53	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-04-050217 **Lab ID: 92339162022** Collected: 05/02/17 08:15 Received: 05/03/17 11:26 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		05/08/17 19:53	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:53	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	4.0	4		05/08/17 19:53	120-82-1	
1,1,1-Trichloroethane	**13.0**	ug/L	4.0	4		05/08/17 19:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	4.0	4		05/08/17 19:53	79-00-5	
Trichloroethene	ND	ug/L	4.0	4		05/08/17 19:53	79-01-6	
Trichlorofluoromethane	ND	ug/L	4.0	4		05/08/17 19:53	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	4		05/08/17 19:53	96-18-4	
Vinyl acetate	ND	ug/L	8.0	4		05/08/17 19:53	108-05-4	
Vinyl chloride	ND	ug/L	4.0	4		05/08/17 19:53	75-01-4	
Xylene (Total)	ND	ug/L	4.0	4		05/08/17 19:53	1330-20-7	
m&p-Xylene	ND	ug/L	8.0	4		05/08/17 19:53	179601-23-1	
o-Xylene	ND	ug/L	4.0	4		05/08/17 19:53	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	4		05/08/17 19:53	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	4		05/08/17 19:53	17060-07-0	
Toluene-d8 (S)	109	%	70-130	4		05/08/17 19:53	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**252**	ug/L	20.0	10		05/04/17 22:21	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	10		05/04/17 22:21	17060-07-0	
Toluene-d8 (S)	106	%	50-150	10		05/04/17 22:21	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-09-050217 **Lab ID: 92339162023** Collected: 05/02/17 08:30 Received: 05/03/17 11:26 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		05/06/17 04:32	67-64-1	
Benzene	ND	ug/L	1.0	1		05/06/17 04:32	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/06/17 04:32	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/06/17 04:32	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/06/17 04:32	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/06/17 04:32	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/06/17 04:32	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/06/17 04:32	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/06/17 04:32	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/06/17 04:32	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/06/17 04:32	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/06/17 04:32	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/06/17 04:32	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 04:32	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 04:32	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/06/17 04:32	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/06/17 04:32	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/06/17 04:32	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/06/17 04:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 04:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 04:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 04:32	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/06/17 04:32	75-71-8	
1,1-Dichloroethane	**2.9**	ug/L	1.0	1		05/06/17 04:32	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/06/17 04:32	107-06-2	
1,1-Dichloroethene	**63.8**	ug/L	1.0	1		05/06/17 04:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 04:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 04:32	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 04:32	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/06/17 04:32	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 04:32	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/06/17 04:32	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 04:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 04:32	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/06/17 04:32	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/06/17 04:32	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/06/17 04:32	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/06/17 04:32	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/06/17 04:32	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/06/17 04:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/06/17 04:32	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/06/17 04:32	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/06/17 04:32	91-20-3	
Styrene	ND	ug/L	1.0	1		05/06/17 04:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 04:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 04:32	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/06/17 04:32	127-18-4	

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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-09-050217 **Lab ID: 92339162023** Collected: 05/02/17 08:30 Received: 05/03/17 11:26 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		05/06/17 04:32	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 04:32	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 04:32	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/06/17 04:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/06/17 04:32	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/06/17 04:32	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/06/17 04:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/06/17 04:32	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/06/17 04:32	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/06/17 04:32	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/06/17 04:32	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/06/17 04:32	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/06/17 04:32	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		05/06/17 04:32	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	70-130	1		05/06/17 04:32	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		05/06/17 04:32	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**20.8**	ug/L	2.0	1		05/04/17 22:40	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	50-150	1		05/04/17 22:40	17060-07-0	
Toluene-d8 (S)	106	%	50-150	1		05/04/17 22:40	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-16D-050217 **Lab ID: 92339162024** Collected: 05/02/17 08:50 Received: 05/03/17 11:26 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		05/08/17 20:10	67-64-1	
Benzene	ND	ug/L	2.0	2		05/08/17 20:10	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		05/08/17 20:10	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		05/08/17 20:10	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		05/08/17 20:10	75-27-4	
Bromoform	ND	ug/L	2.0	2		05/08/17 20:10	75-25-2	
Bromomethane	ND	ug/L	4.0	2		05/08/17 20:10	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		05/08/17 20:10	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		05/08/17 20:10	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		05/08/17 20:10	108-90-7	
Chloroethane	ND	ug/L	2.0	2		05/08/17 20:10	75-00-3	
Chloroform	ND	ug/L	2.0	2		05/08/17 20:10	67-66-3	
Chloromethane	ND	ug/L	2.0	2		05/08/17 20:10	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 20:10	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 20:10	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		05/08/17 20:10	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		05/08/17 20:10	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		05/08/17 20:10	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		05/08/17 20:10	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:10	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:10	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:10	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		05/08/17 20:10	75-71-8	
1,1-Dichloroethane	**43.7**	ug/L	2.0	2		05/08/17 20:10	75-34-3	
1,2-Dichloroethane	**2.9**	ug/L	2.0	2		05/08/17 20:10	107-06-2	
1,1-Dichloroethene	**235**	ug/L	2.0	2		05/08/17 20:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 20:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 20:10	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 20:10	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		05/08/17 20:10	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 20:10	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		05/08/17 20:10	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 20:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 20:10	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		05/08/17 20:10	108-20-3	
Ethylbenzene	ND	ug/L	2.0	2		05/08/17 20:10	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		05/08/17 20:10	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		05/08/17 20:10	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		05/08/17 20:10	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		05/08/17 20:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		05/08/17 20:10	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		05/08/17 20:10	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		05/08/17 20:10	91-20-3	
Styrene	ND	ug/L	2.0	2		05/08/17 20:10	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 20:10	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 20:10	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		05/08/17 20:10	127-18-4	

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(704)875-9092

ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-16D-050217 **Lab ID: 92339162024** Collected: 05/02/17 08:50 Received: 05/03/17 11:26 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		05/08/17 20:10	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:10	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:10	120-82-1	
1,1,1-Trichloroethane	**16.4**	ug/L	2.0	2		05/08/17 20:10	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		05/08/17 20:10	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		05/08/17 20:10	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		05/08/17 20:10	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		05/08/17 20:10	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		05/08/17 20:10	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		05/08/17 20:10	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		05/08/17 20:10	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		05/08/17 20:10	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		05/08/17 20:10	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	2		05/08/17 20:10	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	70-130	2		05/08/17 20:10	17060-07-0	
Toluene-d8 (S)	109	%	70-130	2		05/08/17 20:10	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**182**	ug/L	5.0	2.5		05/04/17 23:37	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	50-150	2.5		05/04/17 23:37	17060-07-0	
Toluene-d8 (S)	106	%	50-150	2.5		05/04/17 23:37	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-100-050217 **Lab ID: 92339162025** Collected: 05/02/17 08:00 Received: 05/03/17 11:26 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		05/08/17 20:28	67-64-1	
Benzene	ND	ug/L	2.0	2		05/08/17 20:28	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		05/08/17 20:28	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		05/08/17 20:28	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		05/08/17 20:28	75-27-4	
Bromoform	ND	ug/L	2.0	2		05/08/17 20:28	75-25-2	
Bromomethane	ND	ug/L	4.0	2		05/08/17 20:28	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		05/08/17 20:28	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		05/08/17 20:28	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		05/08/17 20:28	108-90-7	
Chloroethane	ND	ug/L	2.0	2		05/08/17 20:28	75-00-3	
Chloroform	ND	ug/L	2.0	2		05/08/17 20:28	67-66-3	
Chloromethane	ND	ug/L	2.0	2		05/08/17 20:28	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 20:28	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		05/08/17 20:28	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		05/08/17 20:28	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		05/08/17 20:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		05/08/17 20:28	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		05/08/17 20:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:28	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		05/08/17 20:28	75-71-8	
1,1-Dichloroethane	**46.5**	ug/L	2.0	2		05/08/17 20:28	75-34-3	
1,2-Dichloroethane	**2.8**	ug/L	2.0	2		05/08/17 20:28	107-06-2	
1,1-Dichloroethene	**246**	ug/L	2.0	2		05/08/17 20:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 20:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		05/08/17 20:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 20:28	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		05/08/17 20:28	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		05/08/17 20:28	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		05/08/17 20:28	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 20:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		05/08/17 20:28	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		05/08/17 20:28	108-20-3	
Ethylbenzene	ND	ug/L	2.0	2		05/08/17 20:28	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		05/08/17 20:28	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		05/08/17 20:28	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		05/08/17 20:28	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		05/08/17 20:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		05/08/17 20:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		05/08/17 20:28	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		05/08/17 20:28	91-20-3	
Styrene	ND	ug/L	2.0	2		05/08/17 20:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 20:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		05/08/17 20:28	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		05/08/17 20:28	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-100-050217 **Lab ID: 92339162025** Collected: 05/02/17 08:00 Received: 05/03/17 11:26 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		05/08/17 20:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		05/08/17 20:28	120-82-1	
1,1,1-Trichloroethane	**17.3**	ug/L	2.0	2		05/08/17 20:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		05/08/17 20:28	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		05/08/17 20:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		05/08/17 20:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		05/08/17 20:28	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		05/08/17 20:28	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		05/08/17 20:28	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		05/08/17 20:28	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		05/08/17 20:28	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		05/08/17 20:28	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	2		05/08/17 20:28	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	2		05/08/17 20:28	17060-07-0	
Toluene-d8 (S)	109	%	70-130	2		05/08/17 20:28	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**202**	ug/L	5.0	2.5		05/04/17 23:56	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%	50-150	2.5		05/04/17 23:56	17060-07-0	
Toluene-d8 (S)	106	%	50-150	2.5		05/04/17 23:56	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-16-050217 **Lab ID: 92339162026** Collected: 05/02/17 09:10 Received: 05/03/17 11:26 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	2500	100		05/10/17 12:23	67-64-1	
Benzene	ND	ug/L	100	100		05/10/17 12:23	71-43-2	
Bromobenzene	ND	ug/L	100	100		05/10/17 12:23	108-86-1	
Bromochloromethane	ND	ug/L	100	100		05/10/17 12:23	74-97-5	
Bromodichloromethane	ND	ug/L	100	100		05/10/17 12:23	75-27-4	
Bromoform	ND	ug/L	100	100		05/10/17 12:23	75-25-2	
Bromomethane	ND	ug/L	200	100		05/10/17 12:23	74-83-9	
2-Butanone (MEK)	ND	ug/L	500	100		05/10/17 12:23	78-93-3	
Carbon tetrachloride	ND	ug/L	100	100		05/10/17 12:23	56-23-5	
Chlorobenzene	ND	ug/L	100	100		05/10/17 12:23	108-90-7	
Chloroethane	**225**	ug/L	100	100		05/10/17 12:23	75-00-3	
Chloroform	ND	ug/L	100	100		05/10/17 12:23	67-66-3	
Chloromethane	ND	ug/L	100	100		05/10/17 12:23	74-87-3	
2-Chlorotoluene	ND	ug/L	100	100		05/10/17 12:23	95-49-8	
4-Chlorotoluene	ND	ug/L	100	100		05/10/17 12:23	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	200	100		05/10/17 12:23	96-12-8	
Dibromochloromethane	ND	ug/L	100	100		05/10/17 12:23	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	100	100		05/10/17 12:23	106-93-4	
Dibromomethane	ND	ug/L	100	100		05/10/17 12:23	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	100	100		05/10/17 12:23	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	100	100		05/10/17 12:23	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	100	100		05/10/17 12:23	106-46-7	
Dichlorodifluoromethane	ND	ug/L	100	100		05/10/17 12:23	75-71-8	
1,1-Dichloroethane	**7910**	ug/L	100	100		05/10/17 12:23	75-34-3	
1,2-Dichloroethane	ND	ug/L	100	100		05/10/17 12:23	107-06-2	
1,1-Dichloroethene	**10500**	ug/L	100	100		05/10/17 12:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	100	100		05/10/17 12:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	100		05/10/17 12:23	156-60-5	
1,2-Dichloropropane	ND	ug/L	100	100		05/10/17 12:23	78-87-5	
1,3-Dichloropropane	ND	ug/L	100	100		05/10/17 12:23	142-28-9	
2,2-Dichloropropane	ND	ug/L	100	100		05/10/17 12:23	594-20-7	
1,1-Dichloropropene	ND	ug/L	100	100		05/10/17 12:23	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	100	100		05/10/17 12:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	100	100		05/10/17 12:23	10061-02-6	
Diisopropyl ether	ND	ug/L	100	100		05/10/17 12:23	108-20-3	
Ethylbenzene	ND	ug/L	100	100		05/10/17 12:23	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	100	100		05/10/17 12:23	87-68-3	
2-Hexanone	ND	ug/L	500	100		05/10/17 12:23	591-78-6	
p-Isopropyltoluene	ND	ug/L	100	100		05/10/17 12:23	99-87-6	
Methylene Chloride	ND	ug/L	200	100		05/10/17 12:23	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	500	100		05/10/17 12:23	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	100	100		05/10/17 12:23	1634-04-4	
Naphthalene	ND	ug/L	100	100		05/10/17 12:23	91-20-3	
Styrene	ND	ug/L	100	100		05/10/17 12:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	100	100		05/10/17 12:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	100	100		05/10/17 12:23	79-34-5	
Tetrachloroethene	ND	ug/L	100	100		05/10/17 12:23	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-16-050217 **Lab ID: 92339162026** Collected: 05/02/17 09:10 Received: 05/03/17 11:26 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	100	100		05/10/17 12:23	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	100	100		05/10/17 12:23	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	100	100		05/10/17 12:23	120-82-1	
1,1,1-Trichloroethane	**8930**	ug/L	100	100		05/10/17 12:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	100	100		05/10/17 12:23	79-00-5	
Trichloroethene	ND	ug/L	100	100		05/10/17 12:23	79-01-6	
Trichlorofluoromethane	ND	ug/L	100	100		05/10/17 12:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	100	100		05/10/17 12:23	96-18-4	
Vinyl acetate	ND	ug/L	200	100		05/10/17 12:23	108-05-4	
Vinyl chloride	ND	ug/L	100	100		05/10/17 12:23	75-01-4	
Xylene (Total)	ND	ug/L	100	100		05/10/17 12:23	1330-20-7	
m&p-Xylene	ND	ug/L	200	100		05/10/17 12:23	179601-23-1	
o-Xylene	ND	ug/L	100	100		05/10/17 12:23	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	100		05/10/17 12:23	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	100		05/10/17 12:23	17060-07-0	
Toluene-d8 (S)	106	%	70-130	100		05/10/17 12:23	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**971**	ug/L	40.0	20		05/05/17 00:15	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%	50-150	20		05/05/17 00:15	17060-07-0	
Toluene-d8 (S)	105	%	50-150	20		05/05/17 00:15	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-200-050217 **Lab ID: 92339162027** Collected: 05/02/17 09:00 Received: 05/03/17 11:26 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	250	10		05/08/17 20:45	67-64-1	
Benzene	ND	ug/L	10.0	10		05/08/17 20:45	71-43-2	
Bromobenzene	ND	ug/L	10.0	10		05/08/17 20:45	108-86-1	
Bromochloromethane	ND	ug/L	10.0	10		05/08/17 20:45	74-97-5	
Bromodichloromethane	ND	ug/L	10.0	10		05/08/17 20:45	75-27-4	
Bromoform	ND	ug/L	10.0	10		05/08/17 20:45	75-25-2	
Bromomethane	ND	ug/L	20.0	10		05/08/17 20:45	74-83-9	
2-Butanone (MEK)	ND	ug/L	50.0	10		05/08/17 20:45	78-93-3	
Carbon tetrachloride	ND	ug/L	10.0	10		05/08/17 20:45	56-23-5	
Chlorobenzene	ND	ug/L	10.0	10		05/08/17 20:45	108-90-7	
Chloroethane	**24.6**	ug/L	10.0	10		05/08/17 20:45	75-00-3	
Chloroform	ND	ug/L	10.0	10		05/08/17 20:45	67-66-3	
Chloromethane	ND	ug/L	10.0	10		05/08/17 20:45	74-87-3	
2-Chlorotoluene	ND	ug/L	10.0	10		05/08/17 20:45	95-49-8	
4-Chlorotoluene	ND	ug/L	10.0	10		05/08/17 20:45	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	20.0	10		05/08/17 20:45	96-12-8	
Dibromochloromethane	ND	ug/L	10.0	10		05/08/17 20:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	10.0	10		05/08/17 20:45	106-93-4	
Dibromomethane	ND	ug/L	10.0	10		05/08/17 20:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	10.0	10		05/08/17 20:45	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	10.0	10		05/08/17 20:45	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.0	10		05/08/17 20:45	106-46-7	
Dichlorodifluoromethane	ND	ug/L	10.0	10		05/08/17 20:45	75-71-8	
1,1-Dichloroethane	**741**	ug/L	10.0	10		05/08/17 20:45	75-34-3	
1,2-Dichloroethane	ND	ug/L	10.0	10		05/08/17 20:45	107-06-2	
1,1-Dichloroethene	**1320**	ug/L	10.0	10		05/08/17 20:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	10.0	10		05/08/17 20:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	10.0	10		05/08/17 20:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	10.0	10		05/08/17 20:45	78-87-5	
1,3-Dichloropropane	ND	ug/L	10.0	10		05/08/17 20:45	142-28-9	
2,2-Dichloropropane	ND	ug/L	10.0	10		05/08/17 20:45	594-20-7	
1,1-Dichloropropene	ND	ug/L	10.0	10		05/08/17 20:45	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	10.0	10		05/08/17 20:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	10.0	10		05/08/17 20:45	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	10		05/08/17 20:45	108-20-3	
Ethylbenzene	ND	ug/L	10.0	10		05/08/17 20:45	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	10		05/08/17 20:45	87-68-3	
2-Hexanone	ND	ug/L	50.0	10		05/08/17 20:45	591-78-6	
p-Isopropyltoluene	ND	ug/L	10.0	10		05/08/17 20:45	99-87-6	
Methylene Chloride	ND	ug/L	20.0	10		05/08/17 20:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50.0	10		05/08/17 20:45	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	10		05/08/17 20:45	1634-04-4	
Naphthalene	ND	ug/L	10.0	10		05/08/17 20:45	91-20-3	
Styrene	ND	ug/L	10.0	10		05/08/17 20:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	10.0	10		05/08/17 20:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	10		05/08/17 20:45	79-34-5	
Tetrachloroethene	ND	ug/L	10.0	10		05/08/17 20:45	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: MW-200-050217 **Lab ID: 92339162027** Collected: 05/02/17 09:00 Received: 05/03/17 11:26 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	10.0	10		05/08/17 20:45	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	10.0	10		05/08/17 20:45	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	10		05/08/17 20:45	120-82-1	
1,1,1-Trichloroethane	**31.3**	ug/L	10.0	10		05/08/17 20:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	10		05/08/17 20:45	79-00-5	
Trichloroethene	ND	ug/L	10.0	10		05/08/17 20:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	10.0	10		05/08/17 20:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	10.0	10		05/08/17 20:45	96-18-4	
Vinyl acetate	ND	ug/L	20.0	10		05/08/17 20:45	108-05-4	
Vinyl chloride	ND	ug/L	10.0	10		05/08/17 20:45	75-01-4	
Xylene (Total)	ND	ug/L	10.0	10		05/08/17 20:45	1330-20-7	
m&p-Xylene	ND	ug/L	20.0	10		05/08/17 20:45	179601-23-1	
o-Xylene	ND	ug/L	10.0	10		05/08/17 20:45	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	10		05/08/17 20:45	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130	10		05/08/17 20:45	17060-07-0	
Toluene-d8 (S)	109	%	70-130	10		05/08/17 20:45	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**1000**	ug/L	40.0	20		05/05/17 00:34	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	50-150	20		05/05/17 00:34	17060-07-0	
Toluene-d8 (S)	107	%	50-150	20		05/05/17 00:34	2037-26-5	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: TRIP BLANK **Lab ID: 92339162028** Collected: 05/01/17 00:00 Received: 05/03/17 11:26 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		05/06/17 02:31	67-64-1	
Benzene	ND	ug/L	1.0	1		05/06/17 02:31	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		05/06/17 02:31	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		05/06/17 02:31	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/06/17 02:31	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/06/17 02:31	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/06/17 02:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/06/17 02:31	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		05/06/17 02:31	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/06/17 02:31	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/06/17 02:31	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/06/17 02:31	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/06/17 02:31	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 02:31	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		05/06/17 02:31	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		05/06/17 02:31	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		05/06/17 02:31	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		05/06/17 02:31	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		05/06/17 02:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 02:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 02:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/06/17 02:31	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		05/06/17 02:31	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/06/17 02:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/06/17 02:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/06/17 02:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 02:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/06/17 02:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 02:31	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		05/06/17 02:31	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		05/06/17 02:31	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		05/06/17 02:31	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 02:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/06/17 02:31	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		05/06/17 02:31	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		05/06/17 02:31	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		05/06/17 02:31	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		05/06/17 02:31	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		05/06/17 02:31	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		05/06/17 02:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/06/17 02:31	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		05/06/17 02:31	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		05/06/17 02:31	91-20-3	
Styrene	ND	ug/L	1.0	1		05/06/17 02:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 02:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/06/17 02:31	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/06/17 02:31	127-18-4	

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ANALYTICAL RESULTS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Sample: TRIP BLANK **Lab ID: 92339162028** Collected: 05/01/17 00:00 Received: 05/03/17 11:26 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		05/06/17 02:31	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 02:31	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		05/06/17 02:31	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/06/17 02:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/06/17 02:31	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/06/17 02:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/06/17 02:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/06/17 02:31	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/06/17 02:31	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/06/17 02:31	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		05/06/17 02:31	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		05/06/17 02:31	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		05/06/17 02:31	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		05/06/17 02:31	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		05/06/17 02:31	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		05/06/17 02:31	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		05/05/17 17:41	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	50-150	1		05/05/17 17:41	17060-07-0	
Toluene-d8 (S)	109	%	50-150	1		05/05/17 17:41	2037-26-5	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359283 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162002, 92339162003, 92339162005, 92339162006, 92339162008, 92339162009, 92339162010, 92339162013, 92339162014

METHOD BLANK: 1992723 Matrix: Water
Associated Lab Samples: 92339162002, 92339162003, 92339162005, 92339162006, 92339162008, 92339162009, 92339162010, 92339162013, 92339162014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/04/17 18:53	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/04/17 18:53	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/04/17 18:53	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/04/17 18:53	
1,1-Dichloroethane	ug/L	ND	1.0	05/04/17 18:53	
1,1-Dichloroethene	ug/L	ND	1.0	05/04/17 18:53	
1,1-Dichloropropene	ug/L	ND	1.0	05/04/17 18:53	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/04/17 18:53	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/04/17 18:53	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/04/17 18:53	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/04/17 18:53	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/04/17 18:53	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/04/17 18:53	
1,2-Dichloroethane	ug/L	ND	1.0	05/04/17 18:53	
1,2-Dichloropropane	ug/L	ND	1.0	05/04/17 18:53	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/04/17 18:53	
1,3-Dichloropropane	ug/L	ND	1.0	05/04/17 18:53	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/04/17 18:53	
2,2-Dichloropropane	ug/L	ND	1.0	05/04/17 18:53	
2-Butanone (MEK)	ug/L	ND	5.0	05/04/17 18:53	
2-Chlorotoluene	ug/L	ND	1.0	05/04/17 18:53	
2-Hexanone	ug/L	ND	5.0	05/04/17 18:53	
4-Chlorotoluene	ug/L	ND	1.0	05/04/17 18:53	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/04/17 18:53	
Acetone	ug/L	ND	25.0	05/04/17 18:53	
Benzene	ug/L	ND	1.0	05/04/17 18:53	
Bromobenzene	ug/L	ND	1.0	05/04/17 18:53	
Bromochloromethane	ug/L	ND	1.0	05/04/17 18:53	
Bromodichloromethane	ug/L	ND	1.0	05/04/17 18:53	
Bromoform	ug/L	ND	1.0	05/04/17 18:53	
Bromomethane	ug/L	ND	2.0	05/04/17 18:53	
Carbon tetrachloride	ug/L	ND	1.0	05/04/17 18:53	
Chlorobenzene	ug/L	ND	1.0	05/04/17 18:53	
Chloroethane	ug/L	ND	1.0	05/04/17 18:53	
Chloroform	ug/L	ND	1.0	05/04/17 18:53	
Chloromethane	ug/L	ND	1.0	05/04/17 18:53	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/04/17 18:53	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/04/17 18:53	
Dibromochloromethane	ug/L	ND	1.0	05/04/17 18:53	
Dibromomethane	ug/L	ND	1.0	05/04/17 18:53	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1992723 Matrix: Water
Associated Lab Samples: 92339162002, 92339162003, 92339162005, 92339162006, 92339162008, 92339162009, 92339162010, 92339162013, 92339162014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	05/04/17 18:53	
Diisopropyl ether	ug/L	ND	1.0	05/04/17 18:53	
Ethylbenzene	ug/L	ND	1.0	05/04/17 18:53	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/04/17 18:53	
m&p-Xylene	ug/L	ND	2.0	05/04/17 18:53	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/04/17 18:53	
Methylene Chloride	ug/L	ND	2.0	05/04/17 18:53	
Naphthalene	ug/L	ND	1.0	05/04/17 18:53	
o-Xylene	ug/L	ND	1.0	05/04/17 18:53	
p-Isopropyltoluene	ug/L	ND	1.0	05/04/17 18:53	
Styrene	ug/L	ND	1.0	05/04/17 18:53	
Tetrachloroethene	ug/L	ND	1.0	05/04/17 18:53	
Toluene	ug/L	ND	1.0	05/04/17 18:53	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/04/17 18:53	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/04/17 18:53	
Trichloroethene	ug/L	ND	1.0	05/04/17 18:53	
Trichlorofluoromethane	ug/L	ND	1.0	05/04/17 18:53	
Vinyl acetate	ug/L	ND	2.0	05/04/17 18:53	
Vinyl chloride	ug/L	ND	1.0	05/04/17 18:53	
Xylene (Total)	ug/L	ND	1.0	05/04/17 18:53	
1,2-Dichloroethane-d4 (S)	%	101	70-130	05/04/17 18:53	
4-Bromofluorobenzene (S)	%	95	70-130	05/04/17 18:53	
Toluene-d8 (S)	%	106	70-130	05/04/17 18:53	

LABORATORY CONTROL SAMPLE: 1992724

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	52.3	105	70-130	
1,1,1-Trichloroethane	ug/L	50	50.1	100	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	47.9	96	70-130	
1,1,2-Trichloroethane	ug/L	50	48.9	98	70-130	
1,1-Dichloroethane	ug/L	50	48.7	97	70-130	
1,1-Dichloroethene	ug/L	50	52.3	105	70-132	
1,1-Dichloropropene	ug/L	50	57.5	115	70-130	
1,2,3-Trichlorobenzene	ug/L	50	47.8	96	70-135	
1,2,3-Trichloropropane	ug/L	50	47.7	95	70-130	
1,2,4-Trichlorobenzene	ug/L	50	45.8	92	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	48.6	97	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	53.4	107	70-130	
1,2-Dichlorobenzene	ug/L	50	47.8	96	70-130	
1,2-Dichloroethane	ug/L	50	48.6	97	70-130	
1,2-Dichloropropane	ug/L	50	48.4	97	70-130	
1,3-Dichlorobenzene	ug/L	50	47.8	96	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1992724

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,3-Dichloropropane	ug/L	50	54.3	109	70-130	
1,4-Dichlorobenzene	ug/L	50	48.8	98	70-130	
2,2-Dichloropropane	ug/L	50	50.9	102	58-145	
2-Butanone (MEK)	ug/L	100	126	126	70-145	
2-Chlorotoluene	ug/L	50	48.8	98	70-130	
2-Hexanone	ug/L	100	104	104	70-144	
4-Chlorotoluene	ug/L	50	48.3	97	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	93.8	94	70-140	
Acetone	ug/L	100	148	148	50-175	
Benzene	ug/L	50	49.0	98	70-130	
Bromobenzene	ug/L	50	48.6	97	70-130	
Bromochloromethane	ug/L	50	51.7	103	70-130	
Bromodichloromethane	ug/L	50	47.4	95	70-130	
Bromoform	ug/L	50	46.3	93	70-130	
Bromomethane	ug/L	50	59.1	118	54-130	
Carbon tetrachloride	ug/L	50	48.0	96	70-132	
Chlorobenzene	ug/L	50	48.9	98	70-130	
Chloroethane	ug/L	50	49.7	99	64-134	
Chloroform	ug/L	50	49.0	98	70-130	
Chloromethane	ug/L	50	63.8	128	64-130	
cis-1,2-Dichloroethene	ug/L	50	49.6	99	70-131	
cis-1,3-Dichloropropene	ug/L	50	53.7	107	70-130	
Dibromochloromethane	ug/L	50	55.0	110	70-130	
Dibromomethane	ug/L	50	42.2	84	70-131	
Dichlorodifluoromethane	ug/L	50	60.6	121	56-130	
Diisopropyl ether	ug/L	50	55.6	111	70-130	
Ethylbenzene	ug/L	50	48.7	97	70-130	
Hexachloro-1,3-butadiene	ug/L	50	45.6	91	70-130	
m&p-Xylene	ug/L	100	99.2	99	70-130	
Methyl-tert-butyl ether	ug/L	50	57.3	115	70-130	
Methylene Chloride	ug/L	50	52.5	105	63-130	
Naphthalene	ug/L	50	52.3	105	70-138	
o-Xylene	ug/L	50	48.4	97	70-130	
p-Isopropyltoluene	ug/L	50	50.4	101	70-130	
Styrene	ug/L	50	49.9	100	70-130	
Tetrachloroethene	ug/L	50	45.2	90	70-130	
Toluene	ug/L	50	45.6	91	70-130	
trans-1,2-Dichloroethene	ug/L	50	49.9	100	70-130	
trans-1,3-Dichloropropene	ug/L	50	52.8	106	70-132	
Trichloroethene	ug/L	50	50.6	101	70-130	
Trichlorofluoromethane	ug/L	50	53.3	107	62-133	
Vinyl acetate	ug/L	100	99.9	100	66-157	
Vinyl chloride	ug/L	50	51.3	103	50-150	
Xylene (Total)	ug/L	150	148	98	70-130	
1,2-Dichloroethane-d4 (S)	%			104	70-130	
4-Bromofluorobenzene (S)	%			95	70-130	
Toluene-d8 (S)	%			95	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1993636

Parameter	Units	92339162002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	3.4	17	70-130	M1
1,1,1-Trichloroethane	ug/L	ND	20	3.9	20	70-130	M1
1,1,2,2-Tetrachloroethane	ug/L	ND	20	3.5	18	70-130	M1
1,1,2-Trichloroethane	ug/L	ND	20	3.9	20	70-130	M1
1,1-Dichloroethane	ug/L	ND	20	4.1	20	70-130	M1
1,1-Dichloroethene	ug/L	ND	20	4.9	23	70-166	M1
1,1-Dichloropropene	ug/L	ND	20	3.8	19	70-130	M1
1,2,3-Trichlorobenzene	ug/L	ND	20	4.2	21	70-130	M1
1,2,3-Trichloropropane	ug/L	ND	20	4.3	22	70-130	M1
1,2,4-Trichlorobenzene	ug/L	ND	20	3.7	18	70-130	M1
1,2-Dibromo-3-chloropropane	ug/L	ND	20	3.4	17	70-130	M1
1,2-Dibromoethane (EDB)	ug/L	ND	20	3.4	17	70-130	M1
1,2-Dichlorobenzene	ug/L	ND	20	3.9	20	70-130	M1
1,2-Dichloroethane	ug/L	ND	20	4.0	20	70-130	M1
1,2-Dichloropropane	ug/L	ND	20	3.9	20	70-130	M1
1,3-Dichlorobenzene	ug/L	ND	20	3.8	19	70-130	M1
1,3-Dichloropropane	ug/L	ND	20	3.6	18	70-130	M1
1,4-Dichlorobenzene	ug/L	ND	20	3.8	19	70-130	M1
2,2-Dichloropropane	ug/L	ND	20	3.9	20	70-130	M1
2-Butanone (MEK)	ug/L	ND	40	8.8	22	70-130	M1
2-Chlorotoluene	ug/L	ND	20	4.1	21	70-130	M1
2-Hexanone	ug/L	ND	40	7.7	19	70-130	M1
4-Chlorotoluene	ug/L	ND	20	3.7	18	70-130	M1
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	8.2	20	70-130	M1
Acetone	ug/L	ND	40	13.4J	18	70-130	M1
Benzene	ug/L	ND	20	4.2	21	70-148	M1
Bromobenzene	ug/L	ND	20	4.1	21	70-130	M1
Bromochloromethane	ug/L	ND	20	3.9	20	70-130	M1
Bromodichloromethane	ug/L	ND	20	4.0	20	70-130	M1
Bromoform	ug/L	ND	20	7.8	39	70-130	M1
Bromomethane	ug/L	ND	20	4.0	20	70-130	M1
Carbon tetrachloride	ug/L	ND	20	4.1	20	70-130	M1
Chlorobenzene	ug/L	ND	20	3.9	19	70-146	M1
Chloroethane	ug/L	ND	20	4.7	24	70-130	M1
Chloroform	ug/L	ND	20	4.1	21	70-130	M1
Chloromethane	ug/L	ND	20	5.5	27	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	20	4.2	21	70-130	M1
cis-1,3-Dichloropropene	ug/L	ND	20	3.8	19	70-130	M1
Dibromochloromethane	ug/L	ND	20	4.4	22	70-130	M1
Dibromomethane	ug/L	ND	20	3.9	19	70-130	M1
Dichlorodifluoromethane	ug/L	ND	20	5.0	25	70-130	M1
Diisopropyl ether	ug/L	ND	20	3.6	18	70-130	M1
Ethylbenzene	ug/L	ND	20	4.0	20	70-130	M1
Hexachloro-1,3-butadiene	ug/L	ND	20	3.8	19	70-130	M1
m&p-Xylene	ug/L	ND	40	8.0	20	70-130	M1
Methyl-tert-butyl ether	ug/L	ND	20	4.4	18	70-130	M1
Methylene Chloride	ug/L	ND	20	ND	1	70-130	M1

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1993636

Parameter	Units	92339162002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	20	3.6	18	70-130	M1
o-Xylene	ug/L	ND	20	3.9	20	70-130	M1
p-Isopropyltoluene	ug/L	ND	20	3.7	18	70-130	M1
Styrene	ug/L	ND	20	3.8	19	70-130	M1
Tetrachloroethene	ug/L	ND	20	3.4	17	70-130	M1
Toluene	ug/L	ND	20	4.5	22	70-155	M1
trans-1,2-Dichloroethene	ug/L	ND	20	4.2	21	70-130	M1
trans-1,3-Dichloropropene	ug/L	ND	20	3.5	18	70-130	M1
Trichloroethene	ug/L	ND	20	3.6	18	69-151	M1
Trichlorofluoromethane	ug/L	ND	20	4.9	24	70-130	M1
Vinyl acetate	ug/L	ND	40	7.6	19	70-130	M1
Vinyl chloride	ug/L	ND	20	4.8	24	70-130	M1
1,2-Dichloroethane-d4 (S)	%				107	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				108	70-130	

SAMPLE DUPLICATE: 1992726

Parameter	Units	92339162014 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	27.7	26.5	5	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	6.6	6.7	2	30	
1,1-Dichloroethene	ug/L	5.9	5.7	3	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	ND	ND		30	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

SAMPLE DUPLICATE: 1992726

Parameter	Units	92339162014 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	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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	108	104	4		
4-Bromofluorobenzene (S)	%	94	92	3		
Toluene-d8 (S)	%	108	111	3		

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359395 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162011, 92339162012

METHOD BLANK: 1993244 Matrix: Water
Associated Lab Samples: 92339162011, 92339162012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/05/17 16:10	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/05/17 16:10	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/05/17 16:10	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/05/17 16:10	
1,1-Dichloroethane	ug/L	ND	1.0	05/05/17 16:10	
1,1-Dichloroethene	ug/L	ND	1.0	05/05/17 16:10	
1,1-Dichloropropene	ug/L	ND	1.0	05/05/17 16:10	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/05/17 16:10	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/05/17 16:10	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/05/17 16:10	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/05/17 16:10	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/05/17 16:10	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/05/17 16:10	
1,2-Dichloroethane	ug/L	ND	1.0	05/05/17 16:10	
1,2-Dichloropropane	ug/L	ND	1.0	05/05/17 16:10	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/05/17 16:10	
1,3-Dichloropropane	ug/L	ND	1.0	05/05/17 16:10	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/05/17 16:10	
2,2-Dichloropropane	ug/L	ND	1.0	05/05/17 16:10	
2-Butanone (MEK)	ug/L	ND	5.0	05/05/17 16:10	
2-Chlorotoluene	ug/L	ND	1.0	05/05/17 16:10	
2-Hexanone	ug/L	ND	5.0	05/05/17 16:10	
4-Chlorotoluene	ug/L	ND	1.0	05/05/17 16:10	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/05/17 16:10	
Acetone	ug/L	ND	25.0	05/05/17 16:10	
Benzene	ug/L	ND	1.0	05/05/17 16:10	
Bromobenzene	ug/L	ND	1.0	05/05/17 16:10	
Bromochloromethane	ug/L	ND	1.0	05/05/17 16:10	
Bromodichloromethane	ug/L	ND	1.0	05/05/17 16:10	
Bromoform	ug/L	ND	1.0	05/05/17 16:10	
Bromomethane	ug/L	ND	2.0	05/05/17 16:10	
Carbon tetrachloride	ug/L	ND	1.0	05/05/17 16:10	
Chlorobenzene	ug/L	ND	1.0	05/05/17 16:10	
Chloroethane	ug/L	ND	1.0	05/05/17 16:10	
Chloroform	ug/L	ND	1.0	05/05/17 16:10	
Chloromethane	ug/L	ND	1.0	05/05/17 16:10	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/05/17 16:10	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/05/17 16:10	
Dibromochloromethane	ug/L	ND	1.0	05/05/17 16:10	
Dibromomethane	ug/L	ND	1.0	05/05/17 16:10	
Dichlorodifluoromethane	ug/L	ND	1.0	05/05/17 16:10	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1993244 Matrix: Water
Associated Lab Samples: 92339162011, 92339162012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	05/05/17 16:10	
Ethylbenzene	ug/L	ND	1.0	05/05/17 16:10	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/05/17 16:10	
m&p-Xylene	ug/L	ND	2.0	05/05/17 16:10	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/05/17 16:10	
Methylene Chloride	ug/L	ND	2.0	05/05/17 16:10	
Naphthalene	ug/L	ND	1.0	05/05/17 16:10	
o-Xylene	ug/L	ND	1.0	05/05/17 16:10	
p-Isopropyltoluene	ug/L	ND	1.0	05/05/17 16:10	
Styrene	ug/L	ND	1.0	05/05/17 16:10	
Tetrachloroethene	ug/L	ND	1.0	05/05/17 16:10	
Toluene	ug/L	ND	1.0	05/05/17 16:10	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/05/17 16:10	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/05/17 16:10	
Trichloroethene	ug/L	ND	1.0	05/05/17 16:10	
Trichlorofluoromethane	ug/L	ND	1.0	05/05/17 16:10	
Vinyl acetate	ug/L	ND	2.0	05/05/17 16:10	
Vinyl chloride	ug/L	ND	1.0	05/05/17 16:10	
Xylene (Total)	ug/L	ND	1.0	05/05/17 16:10	
1,2-Dichloroethane-d4 (S)	%	104	70-130	05/05/17 16:10	
4-Bromofluorobenzene (S)	%	98	70-130	05/05/17 16:10	
Toluene-d8 (S)	%	110	70-130	05/05/17 16:10	

LABORATORY CONTROL SAMPLE: 1993245

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	51.4	103	70-130	
1,1,1-Trichloroethane	ug/L	50	49.5	99	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	46.2	92	70-130	
1,1,2-Trichloroethane	ug/L	50	49.8	100	70-130	
1,1-Dichloroethane	ug/L	50	48.9	98	70-130	
1,1-Dichloroethene	ug/L	50	50.1	100	70-132	
1,1-Dichloropropene	ug/L	50	53.3	107	70-130	
1,2,3-Trichlorobenzene	ug/L	50	51.5	103	70-135	
1,2,3-Trichloropropane	ug/L	50	46.9	94	70-130	
1,2,4-Trichlorobenzene	ug/L	50	51.4	103	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	46.9	94	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	53.2	106	70-130	
1,2-Dichlorobenzene	ug/L	50	48.8	98	70-130	
1,2-Dichloroethane	ug/L	50	46.3	93	70-130	
1,2-Dichloropropane	ug/L	50	49.2	98	70-130	
1,3-Dichlorobenzene	ug/L	50	49.0	98	70-130	
1,3-Dichloropropane	ug/L	50	52.4	105	70-130	
1,4-Dichlorobenzene	ug/L	50	47.4	95	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1993245

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	50.6	101	58-145	
2-Butanone (MEK)	ug/L	100	99.8	100	70-145	
2-Chlorotoluene	ug/L	50	47.9	96	70-130	
2-Hexanone	ug/L	100	94.5	95	70-144	
4-Chlorotoluene	ug/L	50	46.6	93	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	88.1	88	70-140	
Acetone	ug/L	100	104	104	50-175	
Benzene	ug/L	50	51.6	103	70-130	
Bromobenzene	ug/L	50	48.4	97	70-130	
Bromochloromethane	ug/L	50	52.0	104	70-130	
Bromodichloromethane	ug/L	50	50.3	101	70-130	
Bromoform	ug/L	50	40.9	82	70-130	
Bromomethane	ug/L	50	67.5	135	54-130	L1
Carbon tetrachloride	ug/L	50	51.5	103	70-132	
Chlorobenzene	ug/L	50	49.8	100	70-130	
Chloroethane	ug/L	50	46.6	93	64-134	
Chloroform	ug/L	50	49.2	98	70-130	
Chloromethane	ug/L	50	58.2	116	64-130	
cis-1,2-Dichloroethene	ug/L	50	49.0	98	70-131	
cis-1,3-Dichloropropene	ug/L	50	53.1	106	70-130	
Dibromochloromethane	ug/L	50	49.6	99	70-130	
Dibromomethane	ug/L	50	48.4	97	70-131	
Dichlorodifluoromethane	ug/L	50	61.8	124	56-130	
Diisopropyl ether	ug/L	50	50.1	100	70-130	
Ethylbenzene	ug/L	50	49.8	100	70-130	
Hexachloro-1,3-butadiene	ug/L	50	54.0	108	70-130	
m&p-Xylene	ug/L	100	96.5	97	70-130	
Methyl-tert-butyl ether	ug/L	50	50.6	101	70-130	
Methylene Chloride	ug/L	50	54.1	108	63-130	
Naphthalene	ug/L	50	51.4	103	70-138	
o-Xylene	ug/L	50	48.4	97	70-130	
p-Isopropyltoluene	ug/L	50	49.1	98	70-130	
Styrene	ug/L	50	49.5	99	70-130	
Tetrachloroethene	ug/L	50	48.8	98	70-130	
Toluene	ug/L	50	48.1	96	70-130	
trans-1,2-Dichloroethene	ug/L	50	47.8	96	70-130	
trans-1,3-Dichloropropene	ug/L	50	50.4	101	70-132	
Trichloroethene	ug/L	50	50.4	101	70-130	
Trichlorofluoromethane	ug/L	50	48.6	97	62-133	
Vinyl acetate	ug/L	100	101	101	66-157	
Vinyl chloride	ug/L	50	51.3	103	50-150	
Xylene (Total)	ug/L	150	145	97	70-130	
1,2-Dichloroethane-d4 (S)	%			95	70-130	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			95	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1993246 1993247

Parameter	Units	92339019001 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	20	20	22.0	19.8	110	99	70-130	11	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	23.5	23.1	117	115	70-130	2	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	21.7	20.2	109	101	70-130	7	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	22.4	20.7	112	103	70-130	8	30	
1,1-Dichloroethane	ug/L	0.96J	20	20	23.8	24.1	114	116	70-130	1	30	
1,1-Dichloroethene	ug/L	ND	20	20	25.5	26.1	128	130	70-166	2	30	
1,1-Dichloropropene	ug/L	ND	20	20	25.9	23.8	130	119	70-130	9	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	24.4	22.3	122	112	70-130	9	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	23.5	19.4	117	97	70-130	19	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	23.0	21.4	115	107	70-130	7	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	20	21.9	19.9	109	99	70-130	10	30	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	22.0	21.2	110	106	70-130	4	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	22.5	20.8	112	104	70-130	8	30	
1,2-Dichloroethane	ug/L	ND	20	20	22.5	21.5	113	107	70-130	5	30	
1,2-Dichloropropane	ug/L	ND	20	20	24.3	23.2	121	116	70-130	5	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	21.5	20.0	107	100	70-130	7	30	
1,3-Dichloropropane	ug/L	ND	20	20	23.3	21.7	116	109	70-130	7	30	
1,4-Dichlorobenzene	ug/L	2.8	20	20	23.3	22.9	103	101	70-130	2	30	
2,2-Dichloropropane	ug/L	ND	20	20	24.6	24.0	123	120	70-130	2	30	
2-Butanone (MEK)	ug/L	ND	40	40	48.2	39.6	121	99	70-130	20	30	
2-Chlorotoluene	ug/L	ND	20	20	22.8	21.8	114	109	70-130	4	30	
2-Hexanone	ug/L	ND	40	40	50.3	42.9	126	107	70-130	16	30	
4-Chlorotoluene	ug/L	ND	20	20	21.7	20.4	109	102	70-130	7	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40	44.9	42.9	112	107	70-130	5	30	
Acetone	ug/L	ND	40	40	54.4	45.4	125	103	70-130	18	30	
Benzene	ug/L	ND	20	20	24.8	23.3	124	117	70-148	6	30	
Bromobenzene	ug/L	ND	20	20	22.4	21.3	112	107	70-130	5	30	
Bromochloromethane	ug/L	ND	20	20	23.6	23.5	118	117	70-130	1	30	
Bromodichloromethane	ug/L	ND	20	20	22.4	21.7	112	108	70-130	3	30	
Bromoform	ug/L	ND	20	20	20.9	19.4	104	97	70-130	7	30	
Bromomethane	ug/L	ND	20	20	27.8	28.2	139	141	70-130	1	30	M0
Carbon tetrachloride	ug/L	ND	20	20	24.5	24.1	122	121	70-130	2	30	
Chlorobenzene	ug/L	0.64J	20	20	22.8	21.1	111	102	70-146	8	30	
Chloroethane	ug/L	ND	20	20	24.8	24.5	124	123	70-130	1	30	
Chloroform	ug/L	ND	20	20	22.9	23.1	115	116	70-130	1	30	
Chloromethane	ug/L	ND	20	20	30.7	29.2	153	146	70-130	5	30	M1
cis-1,2-Dichloroethene	ug/L	2.1	20	20	24.5	24.5	112	112	70-130	0	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	23.5	21.9	117	109	70-130	7	30	
Dibromochloromethane	ug/L	ND	20	20	21.3	19.7	106	99	70-130	8	30	
Dibromomethane	ug/L	ND	20	20	23.3	21.4	117	107	70-130	9	30	
Dichlorodifluoromethane	ug/L	ND	20	20	30.5	29.5	153	148	70-130	3	30	M1
Diisopropyl ether	ug/L	0.14J	20	20	24.4	21.8	121	108	70-130	11	30	
Ethylbenzene	ug/L	ND	20	20	23.1	21.7	116	109	70-130	6	30	
Hexachloro-1,3-butadiene	ug/L	ND	20	20	26.2	23.5	131	118	70-130	11	30	M1

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1993246 1993247

Parameter	Units	92339019001 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	40	40	45.1	42.8	112	106	70-130	5	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	23.2	22.3	116	112	70-130	4	30	
Methylene Chloride	ug/L	ND	20	20	26.1	25.7	130	129	70-130	1	30	
Naphthalene	ug/L	ND	20	20	22.6	20.9	113	105	70-130	8	30	
o-Xylene	ug/L	0.27J	20	20	22.2	21.3	110	105	70-130	4	30	
p-Isopropyltoluene	ug/L	ND	20	20	23.0	21.2	115	106	70-130	8	30	
Styrene	ug/L	ND	20	20	21.9	20.9	109	104	70-130	5	30	
Tetrachloroethene	ug/L	ND	20	20	22.2	21.3	111	106	70-130	4	30	
Toluene	ug/L	ND	20	20	22.9	22.4	115	112	70-155	2	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	23.6	23.2	118	116	70-130	2	30	
trans-1,3-Dichloropropene	ug/L	ND	20	20	22.2	20.9	111	104	70-130	6	30	
Trichloroethene	ug/L	ND	20	20	24.1	22.8	120	114	69-151	6	30	
Trichlorofluoromethane	ug/L	ND	20	20	25.3	24.5	127	123	70-130	3	30	
Vinyl acetate	ug/L	ND	40	40	45.3	41.9	113	105	70-130	8	30	
Vinyl chloride	ug/L	ND	20	20	26.7	27.4	133	137	70-130	3	30	M1
1,2-Dichloroethane-d4 (S)	%						100	105	70-130			
4-Bromofluorobenzene (S)	%						101	103	70-130			
Toluene-d8 (S)	%						98	101	70-130			

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(704)875-9092

QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359429 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162017, 92339162020, 92339162023, 92339162028

METHOD BLANK: 1993549 Matrix: Water
Associated Lab Samples: 92339162017, 92339162020, 92339162023, 92339162028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/06/17 01:39	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/06/17 01:39	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/06/17 01:39	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/06/17 01:39	
1,1-Dichloroethane	ug/L	ND	1.0	05/06/17 01:39	
1,1-Dichloroethene	ug/L	ND	1.0	05/06/17 01:39	
1,1-Dichloropropene	ug/L	ND	1.0	05/06/17 01:39	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/06/17 01:39	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/06/17 01:39	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/06/17 01:39	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/06/17 01:39	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/06/17 01:39	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/06/17 01:39	
1,2-Dichloroethane	ug/L	ND	1.0	05/06/17 01:39	
1,2-Dichloropropane	ug/L	ND	1.0	05/06/17 01:39	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/06/17 01:39	
1,3-Dichloropropane	ug/L	ND	1.0	05/06/17 01:39	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/06/17 01:39	
2,2-Dichloropropane	ug/L	ND	1.0	05/06/17 01:39	
2-Butanone (MEK)	ug/L	ND	5.0	05/06/17 01:39	
2-Chlorotoluene	ug/L	ND	1.0	05/06/17 01:39	
2-Hexanone	ug/L	ND	5.0	05/06/17 01:39	
4-Chlorotoluene	ug/L	ND	1.0	05/06/17 01:39	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/06/17 01:39	
Acetone	ug/L	ND	25.0	05/06/17 01:39	
Benzene	ug/L	ND	1.0	05/06/17 01:39	
Bromobenzene	ug/L	ND	1.0	05/06/17 01:39	
Bromochloromethane	ug/L	ND	1.0	05/06/17 01:39	
Bromodichloromethane	ug/L	ND	1.0	05/06/17 01:39	
Bromoform	ug/L	ND	1.0	05/06/17 01:39	
Bromomethane	ug/L	ND	2.0	05/06/17 01:39	
Carbon tetrachloride	ug/L	ND	1.0	05/06/17 01:39	
Chlorobenzene	ug/L	ND	1.0	05/06/17 01:39	
Chloroethane	ug/L	ND	1.0	05/06/17 01:39	
Chloroform	ug/L	ND	1.0	05/06/17 01:39	
Chloromethane	ug/L	ND	1.0	05/06/17 01:39	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/06/17 01:39	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/06/17 01:39	
Dibromochloromethane	ug/L	ND	1.0	05/06/17 01:39	
Dibromomethane	ug/L	ND	1.0	05/06/17 01:39	
Dichlorodifluoromethane	ug/L	ND	1.0	05/06/17 01:39	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1993549 Matrix: Water
Associated Lab Samples: 92339162017, 92339162020, 92339162023, 92339162028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	05/06/17 01:39	
Ethylbenzene	ug/L	ND	1.0	05/06/17 01:39	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/06/17 01:39	
m&p-Xylene	ug/L	ND	2.0	05/06/17 01:39	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/06/17 01:39	
Methylene Chloride	ug/L	ND	2.0	05/06/17 01:39	
Naphthalene	ug/L	ND	1.0	05/06/17 01:39	
o-Xylene	ug/L	ND	1.0	05/06/17 01:39	
p-Isopropyltoluene	ug/L	ND	1.0	05/06/17 01:39	
Styrene	ug/L	ND	1.0	05/06/17 01:39	
Tetrachloroethene	ug/L	ND	1.0	05/06/17 01:39	
Toluene	ug/L	ND	1.0	05/06/17 01:39	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/06/17 01:39	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/06/17 01:39	
Trichloroethene	ug/L	ND	1.0	05/06/17 01:39	
Trichlorofluoromethane	ug/L	ND	1.0	05/06/17 01:39	
Vinyl acetate	ug/L	ND	2.0	05/06/17 01:39	
Vinyl chloride	ug/L	ND	1.0	05/06/17 01:39	
Xylene (Total)	ug/L	ND	1.0	05/06/17 01:39	
1,2-Dichloroethane-d4 (S)	%	103	70-130	05/06/17 01:39	
4-Bromofluorobenzene (S)	%	98	70-130	05/06/17 01:39	
Toluene-d8 (S)	%	107	70-130	05/06/17 01:39	

LABORATORY CONTROL SAMPLE: 1993550

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.1	100	70-130	
1,1,1-Trichloroethane	ug/L	50	47.8	96	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.0	98	70-130	
1,1,2-Trichloroethane	ug/L	50	51.3	103	70-130	
1,1-Dichloroethane	ug/L	50	47.4	95	70-130	
1,1-Dichloroethene	ug/L	50	51.4	103	70-132	
1,1-Dichloropropene	ug/L	50	53.0	106	70-130	
1,2,3-Trichlorobenzene	ug/L	50	51.1	102	70-135	
1,2,3-Trichloropropane	ug/L	50	49.4	99	70-130	
1,2,4-Trichlorobenzene	ug/L	50	48.3	97	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	50.7	101	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	52.0	104	70-130	
1,2-Dichlorobenzene	ug/L	50	48.8	98	70-130	
1,2-Dichloroethane	ug/L	50	47.4	95	70-130	
1,2-Dichloropropane	ug/L	50	49.8	100	70-130	
1,3-Dichlorobenzene	ug/L	50	48.6	97	70-130	
1,3-Dichloropropane	ug/L	50	54.1	108	70-130	
1,4-Dichlorobenzene	ug/L	50	47.1	94	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1993550

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	46.3	93	58-145	
2-Butanone (MEK)	ug/L	100	108	108	70-145	
2-Chlorotoluene	ug/L	50	49.7	99	70-130	
2-Hexanone	ug/L	100	104	104	70-144	
4-Chlorotoluene	ug/L	50	47.4	95	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.2	99	70-140	
Acetone	ug/L	100	99.5	99	50-175	
Benzene	ug/L	50	51.8	104	70-130	
Bromobenzene	ug/L	50	50.4	101	70-130	
Bromochloromethane	ug/L	50	50.2	100	70-130	
Bromodichloromethane	ug/L	50	49.9	100	70-130	
Bromoform	ug/L	50	42.0	84	70-130	
Bromomethane	ug/L	50	64.0	128	54-130	
Carbon tetrachloride	ug/L	50	49.9	100	70-132	
Chlorobenzene	ug/L	50	49.8	100	70-130	
Chloroethane	ug/L	50	46.8	94	64-134	
Chloroform	ug/L	50	48.3	97	70-130	
Chloromethane	ug/L	50	55.6	111	64-130	
cis-1,2-Dichloroethene	ug/L	50	47.9	96	70-131	
cis-1,3-Dichloropropene	ug/L	50	52.3	105	70-130	
Dibromochloromethane	ug/L	50	49.4	99	70-130	
Dibromomethane	ug/L	50	48.2	96	70-131	
Dichlorodifluoromethane	ug/L	50	57.2	114	56-130	
Diisopropyl ether	ug/L	50	50.9	102	70-130	
Ethylbenzene	ug/L	50	48.9	98	70-130	
Hexachloro-1,3-butadiene	ug/L	50	50.0	100	70-130	
m&p-Xylene	ug/L	100	96.2	96	70-130	
Methyl-tert-butyl ether	ug/L	50	53.4	107	70-130	
Methylene Chloride	ug/L	50	51.1	102	63-130	
Naphthalene	ug/L	50	51.5	103	70-138	
o-Xylene	ug/L	50	47.8	96	70-130	
p-Isopropyltoluene	ug/L	50	50.4	101	70-130	
Styrene	ug/L	50	48.5	97	70-130	
Tetrachloroethene	ug/L	50	46.8	94	70-130	
Toluene	ug/L	50	48.2	96	70-130	
trans-1,2-Dichloroethene	ug/L	50	48.1	96	70-130	
trans-1,3-Dichloropropene	ug/L	50	51.0	102	70-132	
Trichloroethene	ug/L	50	51.1	102	70-130	
Trichlorofluoromethane	ug/L	50	47.4	95	62-133	
Vinyl acetate	ug/L	100	102	102	66-157	
Vinyl chloride	ug/L	50	49.3	99	50-150	
Xylene (Total)	ug/L	150	144	96	70-130	
1,2-Dichloroethane-d4 (S)	%			94	70-130	
4-Bromofluorobenzene (S)	%			96	70-130	
Toluene-d8 (S)	%			94	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994182

Parameter	Units	92339164001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.3	106	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	22.7	113	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.9	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.6	108	70-130	
1,1-Dichloroethane	ug/L	ND	20	23.6	118	70-130	
1,1-Dichloroethene	ug/L	ND	20	26.3	132	70-166	
1,1-Dichloropropene	ug/L	ND	20	23.7	118	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	22.5	112	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	21.8	109	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	21.5	107	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	19.7	98	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	21.2	106	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.5	107	70-130	
1,2-Dichloroethane	ug/L	ND	20	22.4	112	70-130	
1,2-Dichloropropane	ug/L	ND	20	23.5	118	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	21.1	105	70-130	
1,3-Dichloropropane	ug/L	ND	20	22.4	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
2,2-Dichloropropane	ug/L	ND	20	23.5	117	70-130	
2-Butanone (MEK)	ug/L	ND	40	42.9	107	70-130	
2-Chlorotoluene	ug/L	ND	20	22.2	111	70-130	
2-Hexanone	ug/L	ND	40	45.2	113	70-130	
4-Chlorotoluene	ug/L	ND	20	21.6	108	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	42.6	107	70-130	
Acetone	ug/L	ND	40	48.9	109	70-130	
Benzene	ug/L	ND	20	23.6	118	70-148	
Bromobenzene	ug/L	ND	20	22.1	111	70-130	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	22.5	113	70-130	
Bromoform	ug/L	ND	20	20.5	103	70-130	
Bromomethane	ug/L	ND	20	28.7	144	70-130	M1
Carbon tetrachloride	ug/L	ND	20	23.8	119	70-130	
Chlorobenzene	ug/L	ND	20	22.5	112	70-146	
Chloroethane	ug/L	ND	20	23.0	115	70-130	
Chloroform	ug/L	ND	20	22.1	111	70-130	
Chloromethane	ug/L	ND	20	29.1	146	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	20	22.7	114	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	23.4	117	70-130	
Dibromochloromethane	ug/L	ND	20	21.0	105	70-130	
Dibromomethane	ug/L	ND	20	22.2	111	70-130	
Dichlorodifluoromethane	ug/L	ND	20	27.4	137	70-130	M1
Diisopropyl ether	ug/L	ND	20	22.6	113	70-130	
Ethylbenzene	ug/L	ND	20	23.2	116	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	24.5	123	70-130	
m&p-Xylene	ug/L	ND	40	45.0	112	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	21.7	108	70-130	
Methylene Chloride	ug/L	ND	20	23.6	118	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994182

Parameter	Units	92339164001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	20	21.4	107	70-130	
o-Xylene	ug/L	ND	20	22.8	114	70-130	
p-Isopropyltoluene	ug/L	ND	20	22.0	110	70-130	
Styrene	ug/L	ND	20	21.7	109	70-130	
Tetrachloroethene	ug/L	ND	20	22.0	110	70-130	
Toluene	ug/L	ND	20	22.5	112	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	23.2	116	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	22.2	111	70-130	
Trichloroethene	ug/L	ND	20	23.2	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	23.7	119	70-130	
Vinyl acetate	ug/L	ND	40	43.7	109	70-130	
Vinyl chloride	ug/L	ND	20	26.2	131	70-130	M1
1,2-Dichloroethane-d4 (S)	%				101	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1994183

Parameter	Units	92339170006 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	ND	ND		30	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

SAMPLE DUPLICATE: 1994183

Parameter	Units	92339170006 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	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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	107	103	4		
4-Bromofluorobenzene (S)	%	99	103	4		
Toluene-d8 (S)	%	111	107	4		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359430 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162019

METHOD BLANK: 1993551 Matrix: Water
Associated Lab Samples: 92339162019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/06/17 01:57	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/06/17 01:57	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/06/17 01:57	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/06/17 01:57	
1,1-Dichloroethane	ug/L	ND	1.0	05/06/17 01:57	
1,1-Dichloroethene	ug/L	ND	1.0	05/06/17 01:57	
1,1-Dichloropropene	ug/L	ND	1.0	05/06/17 01:57	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/06/17 01:57	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/06/17 01:57	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/06/17 01:57	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/06/17 01:57	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/06/17 01:57	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/06/17 01:57	
1,2-Dichloroethane	ug/L	ND	1.0	05/06/17 01:57	
1,2-Dichloropropane	ug/L	ND	1.0	05/06/17 01:57	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/06/17 01:57	
1,3-Dichloropropane	ug/L	ND	1.0	05/06/17 01:57	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/06/17 01:57	
2,2-Dichloropropane	ug/L	ND	1.0	05/06/17 01:57	
2-Butanone (MEK)	ug/L	ND	5.0	05/06/17 01:57	
2-Chlorotoluene	ug/L	ND	1.0	05/06/17 01:57	
2-Hexanone	ug/L	ND	5.0	05/06/17 01:57	
4-Chlorotoluene	ug/L	ND	1.0	05/06/17 01:57	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/06/17 01:57	
Acetone	ug/L	ND	25.0	05/06/17 01:57	
Benzene	ug/L	ND	1.0	05/06/17 01:57	
Bromobenzene	ug/L	ND	1.0	05/06/17 01:57	
Bromochloromethane	ug/L	ND	1.0	05/06/17 01:57	
Bromodichloromethane	ug/L	ND	1.0	05/06/17 01:57	
Bromoform	ug/L	ND	1.0	05/06/17 01:57	
Bromomethane	ug/L	ND	2.0	05/06/17 01:57	
Carbon tetrachloride	ug/L	ND	1.0	05/06/17 01:57	
Chlorobenzene	ug/L	ND	1.0	05/06/17 01:57	
Chloroethane	ug/L	ND	1.0	05/06/17 01:57	
Chloroform	ug/L	ND	1.0	05/06/17 01:57	
Chloromethane	ug/L	ND	1.0	05/06/17 01:57	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/06/17 01:57	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/06/17 01:57	
Dibromochloromethane	ug/L	ND	1.0	05/06/17 01:57	
Dibromomethane	ug/L	ND	1.0	05/06/17 01:57	
Dichlorodifluoromethane	ug/L	ND	1.0	05/06/17 01:57	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1993551 Matrix: Water
Associated Lab Samples: 92339162019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	05/06/17 01:57	
Ethylbenzene	ug/L	ND	1.0	05/06/17 01:57	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/06/17 01:57	
m&p-Xylene	ug/L	ND	2.0	05/06/17 01:57	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/06/17 01:57	
Methylene Chloride	ug/L	ND	2.0	05/06/17 01:57	
Naphthalene	ug/L	ND	1.0	05/06/17 01:57	
o-Xylene	ug/L	ND	1.0	05/06/17 01:57	
p-Isopropyltoluene	ug/L	ND	1.0	05/06/17 01:57	
Styrene	ug/L	ND	1.0	05/06/17 01:57	
Tetrachloroethene	ug/L	ND	1.0	05/06/17 01:57	
Toluene	ug/L	ND	1.0	05/06/17 01:57	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/06/17 01:57	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/06/17 01:57	
Trichloroethene	ug/L	ND	1.0	05/06/17 01:57	
Trichlorofluoromethane	ug/L	ND	1.0	05/06/17 01:57	
Vinyl acetate	ug/L	ND	2.0	05/06/17 01:57	
Vinyl chloride	ug/L	ND	1.0	05/06/17 01:57	
Xylene (Total)	ug/L	ND	1.0	05/06/17 01:57	
1,2-Dichloroethane-d4 (S)	%	103	70-130	05/06/17 01:57	
4-Bromofluorobenzene (S)	%	99	70-130	05/06/17 01:57	
Toluene-d8 (S)	%	107	70-130	05/06/17 01:57	

LABORATORY CONTROL SAMPLE: 1993552

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	53.8	108	70-130	
1,1,1-Trichloroethane	ug/L	50	49.0	98	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.9	100	70-130	
1,1,2-Trichloroethane	ug/L	50	48.8	98	70-130	
1,1-Dichloroethane	ug/L	50	48.2	96	70-130	
1,1-Dichloroethene	ug/L	50	47.1	94	70-132	
1,1-Dichloropropene	ug/L	50	52.5	105	70-130	
1,2,3-Trichlorobenzene	ug/L	50	52.4	105	70-135	
1,2,3-Trichloropropane	ug/L	50	51.2	102	70-130	
1,2,4-Trichlorobenzene	ug/L	50	50.6	101	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	50.1	100	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	55.1	110	70-130	
1,2-Dichlorobenzene	ug/L	50	49.5	99	70-130	
1,2-Dichloroethane	ug/L	50	46.4	93	70-130	
1,2-Dichloropropane	ug/L	50	50.3	101	70-130	
1,3-Dichlorobenzene	ug/L	50	49.1	98	70-130	
1,3-Dichloropropane	ug/L	50	54.9	110	70-130	
1,4-Dichlorobenzene	ug/L	50	49.0	98	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1993552

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	44.4	89	58-145	
2-Butanone (MEK)	ug/L	100	108	108	70-145	
2-Chlorotoluene	ug/L	50	49.5	99	70-130	
2-Hexanone	ug/L	100	106	106	70-144	
4-Chlorotoluene	ug/L	50	47.3	95	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	97.4	97	70-140	
Acetone	ug/L	100	106	106	50-175	
Benzene	ug/L	50	51.4	103	70-130	
Bromobenzene	ug/L	50	49.3	99	70-130	
Bromochloromethane	ug/L	50	50.2	100	70-130	
Bromodichloromethane	ug/L	50	49.0	98	70-130	
Bromoform	ug/L	50	43.0	86	70-130	
Bromomethane	ug/L	50	60.2	120	54-130	
Carbon tetrachloride	ug/L	50	50.5	101	70-132	
Chlorobenzene	ug/L	50	50.7	101	70-130	
Chloroethane	ug/L	50	46.5	93	64-134	
Chloroform	ug/L	50	47.9	96	70-130	
Chloromethane	ug/L	50	55.6	111	64-130	
cis-1,2-Dichloroethene	ug/L	50	47.5	95	70-131	
cis-1,3-Dichloropropene	ug/L	50	53.0	106	70-130	
Dibromochloromethane	ug/L	50	51.1	102	70-130	
Dibromomethane	ug/L	50	48.8	98	70-131	
Dichlorodifluoromethane	ug/L	50	58.8	118	56-130	
Diisopropyl ether	ug/L	50	52.0	104	70-130	
Ethylbenzene	ug/L	50	51.0	102	70-130	
Hexachloro-1,3-butadiene	ug/L	50	51.7	103	70-130	
m&p-Xylene	ug/L	100	99.6	100	70-130	
Methyl-tert-butyl ether	ug/L	50	53.4	107	70-130	
Methylene Chloride	ug/L	50	52.4	105	63-130	
Naphthalene	ug/L	50	51.8	104	70-138	
o-Xylene	ug/L	50	49.6	99	70-130	
p-Isopropyltoluene	ug/L	50	50.2	100	70-130	
Styrene	ug/L	50	50.9	102	70-130	
Tetrachloroethene	ug/L	50	49.7	99	70-130	
Toluene	ug/L	50	48.5	97	70-130	
trans-1,2-Dichloroethene	ug/L	50	49.4	99	70-130	
trans-1,3-Dichloropropene	ug/L	50	51.4	103	70-132	
Trichloroethene	ug/L	50	51.5	103	70-130	
Trichlorofluoromethane	ug/L	50	48.6	97	62-133	
Vinyl acetate	ug/L	100	101	101	66-157	
Vinyl chloride	ug/L	50	50.2	100	50-150	
Xylene (Total)	ug/L	150	149	99	70-130	
1,2-Dichloroethane-d4 (S)	%			95	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			95	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994184

Parameter	Units	92339289001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.0	115	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.6	108	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.8	109	70-130	
1,1-Dichloroethane	ug/L	ND	20	24.2	121	70-130	
1,1-Dichloroethene	ug/L	ND	20	25.7	128	70-166	
1,1-Dichloropropene	ug/L	ND	20	25.2	126	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	22.6	113	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	21.8	109	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	22.0	110	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	19.8	99	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	22.1	111	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	22.0	110	70-130	
1,2-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,2-Dichloropropane	ug/L	ND	20	24.4	122	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	21.7	108	70-130	
1,3-Dichloropropane	ug/L	ND	20	23.7	119	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.6	103	70-130	
2,2-Dichloropropane	ug/L	ND	20	25.1	125	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.9	115	70-130	
2-Chlorotoluene	ug/L	ND	20	23.1	115	70-130	
2-Hexanone	ug/L	ND	40	46.9	117	70-130	
4-Chlorotoluene	ug/L	ND	20	21.7	109	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	43.1	108	70-130	
Acetone	ug/L	ND	40	48.7	108	70-130	
Benzene	ug/L	ND	20	24.5	122	70-148	
Bromobenzene	ug/L	ND	20	22.7	114	70-130	
Bromochloromethane	ug/L	ND	20	23.7	119	70-130	
Bromodichloromethane	ug/L	ND	20	22.7	114	70-130	
Bromoform	ug/L	ND	20	20.8	104	70-130	
Bromomethane	ug/L	ND	20	30.2	151	70-130	M1
Carbon tetrachloride	ug/L	ND	20	25.2	126	70-130	
Chlorobenzene	ug/L	ND	20	22.1	110	70-146	
Chloroethane	ug/L	ND	20	24.4	122	70-130	
Chloroform	ug/L	ND	20	23.6	118	70-130	
Chloromethane	ug/L	ND	20	30.1	150	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	20	23.8	119	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	23.6	118	70-130	
Dibromochloromethane	ug/L	ND	20	21.8	109	70-130	
Dibromomethane	ug/L	ND	20	23.4	117	70-130	
Dichlorodifluoromethane	ug/L	ND	20	29.2	146	70-130	M1
Diisopropyl ether	ug/L	ND	20	23.5	118	70-130	
Ethylbenzene	ug/L	ND	20	23.6	118	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	24.4	122	70-130	
m&p-Xylene	ug/L	ND	40	46.4	116	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	21.9	110	70-130	
Methylene Chloride	ug/L	ND	20	24.5	122	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994184

Parameter	Units	92339289001 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	22.6	113	70-130	
p-Isopropyltoluene	ug/L	ND	20	22.1	110	70-130	
Styrene	ug/L	ND	20	22.7	114	70-130	
Tetrachloroethene	ug/L	ND	20	22.9	114	70-130	
Toluene	ug/L	ND	20	23.2	116	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	25.9	129	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	21.7	109	70-130	
Trichloroethene	ug/L	ND	20	23.5	117	69-151	
Trichlorofluoromethane	ug/L	ND	20	26.7	134	70-130	M1
Vinyl acetate	ug/L	ND	40	42.7	107	70-130	
Vinyl chloride	ug/L	ND	20	27.1	136	70-130	M1
1,2-Dichloroethane-d4 (S)	%				103	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1994185

Parameter	Units	92339289002 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	ND	ND		30	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

SAMPLE DUPLICATE: 1994185

Parameter	Units	92339289002 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	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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	110	103	6		
4-Bromofluorobenzene (S)	%	101	101	1		
Toluene-d8 (S)	%	107	108	0		

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REPORT OF LABORATORY ANALYSIS

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(704)875-9092

QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359493 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162007

METHOD BLANK: 1993794 Matrix: Water
Associated Lab Samples: 92339162007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/07/17 03:19	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/07/17 03:19	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/07/17 03:19	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/07/17 03:19	
1,1-Dichloroethane	ug/L	ND	1.0	05/07/17 03:19	
1,1-Dichloroethene	ug/L	ND	1.0	05/07/17 03:19	
1,1-Dichloropropene	ug/L	ND	1.0	05/07/17 03:19	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/07/17 03:19	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/07/17 03:19	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/07/17 03:19	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/07/17 03:19	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/07/17 03:19	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/07/17 03:19	
1,2-Dichloroethane	ug/L	ND	1.0	05/07/17 03:19	
1,2-Dichloropropane	ug/L	ND	1.0	05/07/17 03:19	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/07/17 03:19	
1,3-Dichloropropane	ug/L	ND	1.0	05/07/17 03:19	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/07/17 03:19	
2,2-Dichloropropane	ug/L	ND	1.0	05/07/17 03:19	
2-Butanone (MEK)	ug/L	ND	5.0	05/07/17 03:19	
2-Chlorotoluene	ug/L	ND	1.0	05/07/17 03:19	
2-Hexanone	ug/L	ND	5.0	05/07/17 03:19	
4-Chlorotoluene	ug/L	ND	1.0	05/07/17 03:19	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/07/17 03:19	
Acetone	ug/L	ND	25.0	05/07/17 03:19	
Benzene	ug/L	ND	1.0	05/07/17 03:19	
Bromobenzene	ug/L	ND	1.0	05/07/17 03:19	
Bromochloromethane	ug/L	ND	1.0	05/07/17 03:19	
Bromodichloromethane	ug/L	ND	1.0	05/07/17 03:19	
Bromoform	ug/L	ND	1.0	05/07/17 03:19	
Bromomethane	ug/L	ND	2.0	05/07/17 03:19	
Carbon tetrachloride	ug/L	ND	1.0	05/07/17 03:19	
Chlorobenzene	ug/L	ND	1.0	05/07/17 03:19	
Chloroethane	ug/L	ND	1.0	05/07/17 03:19	
Chloroform	ug/L	ND	1.0	05/07/17 03:19	
Chloromethane	ug/L	ND	1.0	05/07/17 03:19	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/07/17 03:19	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/07/17 03:19	
Dibromochloromethane	ug/L	ND	1.0	05/07/17 03:19	
Dibromomethane	ug/L	ND	1.0	05/07/17 03:19	
Dichlorodifluoromethane	ug/L	ND	1.0	05/07/17 03:19	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1993794 Matrix: Water
Associated Lab Samples: 92339162007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	05/07/17 03:19	
Ethylbenzene	ug/L	ND	1.0	05/07/17 03:19	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/07/17 03:19	
m&p-Xylene	ug/L	ND	2.0	05/07/17 03:19	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/07/17 03:19	
Methylene Chloride	ug/L	ND	2.0	05/07/17 03:19	
Naphthalene	ug/L	ND	1.0	05/07/17 03:19	
o-Xylene	ug/L	ND	1.0	05/07/17 03:19	
p-Isopropyltoluene	ug/L	ND	1.0	05/07/17 03:19	
Styrene	ug/L	ND	1.0	05/07/17 03:19	
Tetrachloroethene	ug/L	ND	1.0	05/07/17 03:19	
Toluene	ug/L	ND	1.0	05/07/17 03:19	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/07/17 03:19	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/07/17 03:19	
Trichloroethene	ug/L	ND	1.0	05/07/17 03:19	
Trichlorofluoromethane	ug/L	ND	1.0	05/07/17 03:19	
Vinyl acetate	ug/L	ND	2.0	05/07/17 03:19	
Vinyl chloride	ug/L	ND	1.0	05/07/17 03:19	
Xylene (Total)	ug/L	ND	1.0	05/07/17 03:19	
1,2-Dichloroethane-d4 (S)	%	107	70-130	05/07/17 03:19	
4-Bromofluorobenzene (S)	%	101	70-130	05/07/17 03:19	
Toluene-d8 (S)	%	106	70-130	05/07/17 03:19	

LABORATORY CONTROL SAMPLE: 1993795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.7	97	70-130	
1,1,1-Trichloroethane	ug/L	50	44.9	90	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	48.3	97	70-130	
1,1,2-Trichloroethane	ug/L	50	49.4	99	70-130	
1,1-Dichloroethane	ug/L	50	46.0	92	70-130	
1,1-Dichloroethene	ug/L	50	49.7	99	70-132	
1,1-Dichloropropene	ug/L	50	49.7	99	70-130	
1,2,3-Trichlorobenzene	ug/L	50	50.3	101	70-135	
1,2,3-Trichloropropane	ug/L	50	46.5	93	70-130	
1,2,4-Trichlorobenzene	ug/L	50	47.8	96	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	48.6	97	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	50.8	102	70-130	
1,2-Dichlorobenzene	ug/L	50	47.3	95	70-130	
1,2-Dichloroethane	ug/L	50	46.9	94	70-130	
1,2-Dichloropropane	ug/L	50	50.0	100	70-130	
1,3-Dichlorobenzene	ug/L	50	45.6	91	70-130	
1,3-Dichloropropane	ug/L	50	52.7	105	70-130	
1,4-Dichlorobenzene	ug/L	50	44.3	89	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1993795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	42.9	86	58-145	
2-Butanone (MEK)	ug/L	100	100	100	70-145	
2-Chlorotoluene	ug/L	50	45.5	91	70-130	
2-Hexanone	ug/L	100	99.4	99	70-144	
4-Chlorotoluene	ug/L	50	44.6	89	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	94.4	94	70-140	
Acetone	ug/L	100	103	103	50-175	
Benzene	ug/L	50	50.5	101	70-130	
Bromobenzene	ug/L	50	46.0	92	70-130	
Bromochloromethane	ug/L	50	48.1	96	70-130	
Bromodichloromethane	ug/L	50	48.8	98	70-130	
Bromoform	ug/L	50	42.3	85	70-130	
Bromomethane	ug/L	50	48.2	96	54-130	
Carbon tetrachloride	ug/L	50	47.7	95	70-132	
Chlorobenzene	ug/L	50	47.4	95	70-130	
Chloroethane	ug/L	50	46.4	93	64-134	
Chloroform	ug/L	50	44.6	89	70-130	
Chloromethane	ug/L	50	48.1	96	64-130	
cis-1,2-Dichloroethene	ug/L	50	46.0	92	70-131	
cis-1,3-Dichloropropene	ug/L	50	51.5	103	70-130	
Dibromochloromethane	ug/L	50	48.3	97	70-130	
Dibromomethane	ug/L	50	48.6	97	70-131	
Dichlorodifluoromethane	ug/L	50	52.9	106	56-130	
Diisopropyl ether	ug/L	50	50.4	101	70-130	
Ethylbenzene	ug/L	50	47.5	95	70-130	
Hexachloro-1,3-butadiene	ug/L	50	47.6	95	70-130	
m&p-Xylene	ug/L	100	92.2	92	70-130	
Methyl-tert-butyl ether	ug/L	50	49.7	99	70-130	
Methylene Chloride	ug/L	50	51.2	102	63-130	
Naphthalene	ug/L	50	48.5	97	70-138	
o-Xylene	ug/L	50	45.6	91	70-130	
p-Isopropyltoluene	ug/L	50	45.3	91	70-130	
Styrene	ug/L	50	46.9	94	70-130	
Tetrachloroethene	ug/L	50	46.3	93	70-130	
Toluene	ug/L	50	45.9	92	70-130	
trans-1,2-Dichloroethene	ug/L	50	45.2	90	70-130	
trans-1,3-Dichloropropene	ug/L	50	50.0	100	70-132	
Trichloroethene	ug/L	50	47.5	95	70-130	
Trichlorofluoromethane	ug/L	50	48.4	97	62-133	
Vinyl acetate	ug/L	100	100	100	66-157	
Vinyl chloride	ug/L	50	48.3	97	50-150	
Xylene (Total)	ug/L	150	138	92	70-130	
1,2-Dichloroethane-d4 (S)	%			101	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			96	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1993796

Parameter	Units	92339535007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.6	98	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.4	107	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.3	102	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.3	96	70-130	
1,1-Dichloroethane	ug/L	ND	20	21.4	107	70-130	
1,1-Dichloroethene	ug/L	ND	20	23.4	117	70-166	
1,1-Dichloropropene	ug/L	ND	20	23.1	115	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	20.8	104	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	19.8	99	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	20.1	101	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	19.0	95	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	19.8	99	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.2	96	70-130	
1,2-Dichloroethane	ug/L	ND	20	20.9	105	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.4	107	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	18.4	92	70-130	
1,3-Dichloropropane	ug/L	ND	20	20.5	102	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	18.5	93	70-130	
2,2-Dichloropropane	ug/L	ND	20	21.2	106	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.5	114	70-130	
2-Chlorotoluene	ug/L	ND	20	20.1	101	70-130	
2-Hexanone	ug/L	ND	40	45.0	112	70-130	
4-Chlorotoluene	ug/L	ND	20	19.1	96	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	38.6	96	70-130	
Acetone	ug/L	13.6J	40	67.1	134	70-130	M1
Benzene	ug/L	ND	20	20.8	104	70-148	
Bromobenzene	ug/L	ND	20	19.2	96	70-130	
Bromochloromethane	ug/L	ND	20	22.2	111	70-130	
Bromodichloromethane	ug/L	ND	20	20.0	100	70-130	
Bromoform	ug/L	ND	20	18.8	94	70-130	
Bromomethane	ug/L	ND	20	24.3	122	70-130	
Carbon tetrachloride	ug/L	ND	20	21.2	106	70-130	
Chlorobenzene	ug/L	ND	20	20.1	100	70-146	
Chloroethane	ug/L	ND	20	22.8	114	70-130	
Chloroform	ug/L	ND	20	21.1	105	70-130	
Chloromethane	ug/L	ND	20	25.0	125	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	21.8	109	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.1	101	70-130	
Dibromochloromethane	ug/L	ND	20	20.1	100	70-130	
Dibromomethane	ug/L	ND	20	19.9	99	70-130	
Dichlorodifluoromethane	ug/L	ND	20	26.3	131	70-130	M1
Diisopropyl ether	ug/L	ND	20	22.1	110	70-130	
Ethylbenzene	ug/L	ND	20	20.5	103	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	21.9	110	70-130	
m&p-Xylene	ug/L	ND	40	40.6	101	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	21.3	107	70-130	
Methylene Chloride	ug/L	ND	20	21.8	109	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1993796

Parameter	Units	92339535007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	20	21.0	105	70-130	
o-Xylene	ug/L	ND	20	20.1	101	70-130	
p-Isopropyltoluene	ug/L	ND	20	19.0	95	70-130	
Styrene	ug/L	ND	20	19.8	99	70-130	
Tetrachloroethene	ug/L	ND	20	19.4	97	70-130	
Toluene	ug/L	ND	20	19.7	99	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.9	114	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.8	99	70-130	
Trichloroethene	ug/L	ND	20	20.1	100	69-151	
Trichlorofluoromethane	ug/L	ND	20	23.4	117	70-130	
Vinyl acetate	ug/L	ND	40	36.9	92	70-130	
Vinyl chloride	ug/L	ND	20	24.2	121	70-130	
1,2-Dichloroethane-d4 (S)	%				111	70-130	
4-Bromofluorobenzene (S)	%				104	70-130	
Toluene-d8 (S)	%				99	70-130	

SAMPLE DUPLICATE: 1993797

Parameter	Units	92339535016 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	12.4J	34.2		30	
Benzene	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

SAMPLE DUPLICATE: 1993797

Parameter	Units	92339535016 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	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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	102	108	6		
4-Bromofluorobenzene (S)	%	105	100	4		
Toluene-d8 (S)	%	112	108	4		

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359596 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162001, 92339162004, 92339162016, 92339162018, 92339162021, 92339162022, 92339162024, 92339162025, 92339162027

METHOD BLANK: 1994333 Matrix: Water
Associated Lab Samples: 92339162001, 92339162004, 92339162016, 92339162018, 92339162021, 92339162022, 92339162024, 92339162025, 92339162027

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/08/17 15:52	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/08/17 15:52	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/08/17 15:52	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/08/17 15:52	
1,1-Dichloroethane	ug/L	ND	1.0	05/08/17 15:52	
1,1-Dichloroethene	ug/L	ND	1.0	05/08/17 15:52	
1,1-Dichloropropene	ug/L	ND	1.0	05/08/17 15:52	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/08/17 15:52	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/08/17 15:52	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/08/17 15:52	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/08/17 15:52	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/08/17 15:52	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/08/17 15:52	
1,2-Dichloroethane	ug/L	ND	1.0	05/08/17 15:52	
1,2-Dichloropropane	ug/L	ND	1.0	05/08/17 15:52	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/08/17 15:52	
1,3-Dichloropropane	ug/L	ND	1.0	05/08/17 15:52	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/08/17 15:52	
2,2-Dichloropropane	ug/L	ND	1.0	05/08/17 15:52	
2-Butanone (MEK)	ug/L	ND	5.0	05/08/17 15:52	
2-Chlorotoluene	ug/L	ND	1.0	05/08/17 15:52	
2-Hexanone	ug/L	ND	5.0	05/08/17 15:52	
4-Chlorotoluene	ug/L	ND	1.0	05/08/17 15:52	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/08/17 15:52	
Acetone	ug/L	ND	25.0	05/08/17 15:52	
Benzene	ug/L	ND	1.0	05/08/17 15:52	
Bromobenzene	ug/L	ND	1.0	05/08/17 15:52	
Bromochloromethane	ug/L	ND	1.0	05/08/17 15:52	
Bromodichloromethane	ug/L	ND	1.0	05/08/17 15:52	
Bromoform	ug/L	ND	1.0	05/08/17 15:52	
Bromomethane	ug/L	ND	2.0	05/08/17 15:52	
Carbon tetrachloride	ug/L	ND	1.0	05/08/17 15:52	
Chlorobenzene	ug/L	ND	1.0	05/08/17 15:52	
Chloroethane	ug/L	ND	1.0	05/08/17 15:52	
Chloroform	ug/L	ND	1.0	05/08/17 15:52	
Chloromethane	ug/L	ND	1.0	05/08/17 15:52	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/08/17 15:52	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/08/17 15:52	
Dibromochloromethane	ug/L	ND	1.0	05/08/17 15:52	
Dibromomethane	ug/L	ND	1.0	05/08/17 15:52	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1994333 Matrix: Water
Associated Lab Samples: 92339162001, 92339162004, 92339162016, 92339162018, 92339162021, 92339162022, 92339162024, 92339162025, 92339162027

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	05/08/17 15:52	
Diisopropyl ether	ug/L	ND	1.0	05/08/17 15:52	
Ethylbenzene	ug/L	ND	1.0	05/08/17 15:52	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/08/17 15:52	
m&p-Xylene	ug/L	ND	2.0	05/08/17 15:52	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/08/17 15:52	
Methylene Chloride	ug/L	ND	2.0	05/08/17 15:52	
Naphthalene	ug/L	ND	1.0	05/08/17 15:52	
o-Xylene	ug/L	ND	1.0	05/08/17 15:52	
p-Isopropyltoluene	ug/L	ND	1.0	05/08/17 15:52	
Styrene	ug/L	ND	1.0	05/08/17 15:52	
Tetrachloroethene	ug/L	ND	1.0	05/08/17 15:52	
Toluene	ug/L	ND	1.0	05/08/17 15:52	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/08/17 15:52	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/08/17 15:52	
Trichloroethene	ug/L	ND	1.0	05/08/17 15:52	
Trichlorofluoromethane	ug/L	ND	1.0	05/08/17 15:52	
Vinyl acetate	ug/L	ND	2.0	05/08/17 15:52	
Vinyl chloride	ug/L	ND	1.0	05/08/17 15:52	
Xylene (Total)	ug/L	ND	1.0	05/08/17 15:52	
1,2-Dichloroethane-d4 (S)	%	99	70-130	05/08/17 15:52	
4-Bromofluorobenzene (S)	%	105	70-130	05/08/17 15:52	
Toluene-d8 (S)	%	109	70-130	05/08/17 15:52	

LABORATORY CONTROL SAMPLE: 1994334

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.2	100	70-130	
1,1,1-Trichloroethane	ug/L	50	49.3	99	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	47.6	95	70-130	
1,1,2-Trichloroethane	ug/L	50	49.8	100	70-130	
1,1-Dichloroethane	ug/L	50	50.1	100	70-130	
1,1-Dichloroethene	ug/L	50	52.9	106	70-132	
1,1-Dichloropropene	ug/L	50	54.6	109	70-130	
1,2,3-Trichlorobenzene	ug/L	50	52.0	104	70-135	
1,2,3-Trichloropropane	ug/L	50	46.8	94	70-130	
1,2,4-Trichlorobenzene	ug/L	50	50.6	101	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	45.9	92	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	49.3	99	70-130	
1,2-Dichlorobenzene	ug/L	50	47.9	96	70-130	
1,2-Dichloroethane	ug/L	50	47.9	96	70-130	
1,2-Dichloropropane	ug/L	50	52.8	106	70-130	
1,3-Dichlorobenzene	ug/L	50	46.4	93	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1994334

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,3-Dichloropropane	ug/L	50	52.2	104	70-130	
1,4-Dichlorobenzene	ug/L	50	45.1	90	70-130	
2,2-Dichloropropane	ug/L	50	51.6	103	58-145	
2-Butanone (MEK)	ug/L	100	119	119	70-145	
2-Chlorotoluene	ug/L	50	45.7	91	70-130	
2-Hexanone	ug/L	100	102	102	70-144	
4-Chlorotoluene	ug/L	50	45.5	91	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.6	100	70-140	
Acetone	ug/L	100	136	136	50-175	
Benzene	ug/L	50	53.1	106	70-130	
Bromobenzene	ug/L	50	46.7	93	70-130	
Bromochloromethane	ug/L	50	50.7	101	70-130	
Bromodichloromethane	ug/L	50	50.7	101	70-130	
Bromoform	ug/L	50	41.6	83	70-130	
Bromomethane	ug/L	50	60.9	122	54-130	
Carbon tetrachloride	ug/L	50	51.4	103	70-132	
Chlorobenzene	ug/L	50	46.8	94	70-130	
Chloroethane	ug/L	50	51.6	103	64-134	
Chloroform	ug/L	50	49.5	99	70-130	
Chloromethane	ug/L	50	59.7	119	64-130	
cis-1,2-Dichloroethene	ug/L	50	50.0	100	70-131	
cis-1,3-Dichloropropene	ug/L	50	53.9	108	70-130	
Dibromochloromethane	ug/L	50	47.9	96	70-130	
Dibromomethane	ug/L	50	49.7	99	70-131	
Dichlorodifluoromethane	ug/L	50	60.8	122	56-130	
Diisopropyl ether	ug/L	50	53.1	106	70-130	
Ethylbenzene	ug/L	50	47.6	95	70-130	
Hexachloro-1,3-butadiene	ug/L	50	53.6	107	70-130	
m&p-Xylene	ug/L	100	93.2	93	70-130	
Methyl-tert-butyl ether	ug/L	50	53.8	108	70-130	
Methylene Chloride	ug/L	50	56.0	112	63-130	
Naphthalene	ug/L	50	49.0	98	70-138	
o-Xylene	ug/L	50	45.1	90	70-130	
p-Isopropyltoluene	ug/L	50	47.7	95	70-130	
Styrene	ug/L	50	47.2	94	70-130	
Tetrachloroethene	ug/L	50	47.5	95	70-130	
Toluene	ug/L	50	48.8	98	70-130	
trans-1,2-Dichloroethene	ug/L	50	50.9	102	70-130	
trans-1,3-Dichloropropene	ug/L	50	52.7	105	70-132	
Trichloroethene	ug/L	50	52.6	105	70-130	
Trichlorofluoromethane	ug/L	50	50.8	102	62-133	
Vinyl acetate	ug/L	100	107	107	66-157	
Vinyl chloride	ug/L	50	54.3	109	50-150	
Xylene (Total)	ug/L	150	138	92	70-130	
1,2-Dichloroethane-d4 (S)	%			98	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			98	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994802

Parameter	Units	92339162016 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.5	103	70-130	
1,1,1-Trichloroethane	ug/L	1.0	20	24.2	116	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.5	108	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	22.1	110	70-130	
1,1-Dichloroethane	ug/L	10.4	20	32.4	110	70-130	
1,1-Dichloroethene	ug/L	88.9	20	99.2	51	70-166	M1
1,1-Dichloropropene	ug/L	ND	20	23.7	118	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	22.9	114	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	21.2	106	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	21.2	106	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	22.4	112	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	22.8	114	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.3	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	22.5	112	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.1	110	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
1,3-Dichloropropane	ug/L	ND	20	22.3	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
2,2-Dichloropropane	ug/L	ND	20	24.2	121	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.7	114	70-130	
2-Chlorotoluene	ug/L	ND	20	21.6	108	70-130	
2-Hexanone	ug/L	ND	40	49.3	123	70-130	
4-Chlorotoluene	ug/L	ND	20	21.2	106	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	44.5	111	70-130	
Acetone	ug/L	ND	40	55.6	139	70-130	M1
Benzene	ug/L	ND	20	23.2	116	70-148	
Bromobenzene	ug/L	ND	20	21.7	109	70-130	
Bromochloromethane	ug/L	ND	20	22.4	112	70-130	
Bromodichloromethane	ug/L	ND	20	21.5	108	70-130	
Bromoform	ug/L	ND	20	20.9	105	70-130	
Bromomethane	ug/L	ND	20	29.6	148	70-130	M1
Carbon tetrachloride	ug/L	ND	20	23.5	117	70-130	
Chlorobenzene	ug/L	ND	20	22.4	112	70-146	
Chloroethane	ug/L	ND	20	23.5	118	70-130	
Chloroform	ug/L	ND	20	21.8	109	70-130	
Chloromethane	ug/L	ND	20	28.3	141	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	20	23.2	116	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	22.9	115	70-130	
Dibromochloromethane	ug/L	ND	20	21.4	107	70-130	
Dibromomethane	ug/L	ND	20	22.4	112	70-130	
Dichlorodifluoromethane	ug/L	ND	20	27.1	135	70-130	M1
Diisopropyl ether	ug/L	ND	20	23.1	115	70-130	
Ethylbenzene	ug/L	ND	20	22.3	112	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	23.9	120	70-130	
m&p-Xylene	ug/L	ND	40	44.0	110	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	22.6	113	70-130	
Methylene Chloride	ug/L	ND	20	23.8	119	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994802

Parameter	Units	92339162016 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	20	22.0	110	70-130	
o-Xylene	ug/L	ND	20	21.7	108	70-130	
p-Isopropyltoluene	ug/L	ND	20	21.6	108	70-130	
Styrene	ug/L	ND	20	21.7	109	70-130	
Tetrachloroethene	ug/L	ND	20	21.5	108	70-130	
Toluene	ug/L	ND	20	22.1	111	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.3	112	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	22.0	110	70-130	
Trichloroethene	ug/L	ND	20	23.5	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	23.1	115	70-130	
Vinyl acetate	ug/L	ND	40	45.7	114	70-130	
Vinyl chloride	ug/L	ND	20	25.3	127	70-130	
1,2-Dichloroethane-d4 (S)	%				100	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 1994336

Parameter	Units	92339162027 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	31.3	33.7	7	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	741	692	7	30	
1,1-Dichloroethene	ug/L	1320	1190	10	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	ND	ND		30	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

SAMPLE DUPLICATE: 1994336

Parameter	Units	92339162027 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	24.6	25.6	4	30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	8.3J		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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	106	105	2		
4-Bromofluorobenzene (S)	%	103	105	2		
Toluene-d8 (S)	%	109	109	0		

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359680 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162015

METHOD BLANK: 1994646 Matrix: Water
Associated Lab Samples: 92339162015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/09/17 12:47	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/09/17 12:47	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/09/17 12:47	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/09/17 12:47	
1,1-Dichloroethane	ug/L	ND	1.0	05/09/17 12:47	
1,1-Dichloroethene	ug/L	ND	1.0	05/09/17 12:47	
1,1-Dichloropropene	ug/L	ND	1.0	05/09/17 12:47	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/09/17 12:47	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/09/17 12:47	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/09/17 12:47	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/09/17 12:47	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/09/17 12:47	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/09/17 12:47	
1,2-Dichloroethane	ug/L	ND	1.0	05/09/17 12:47	
1,2-Dichloropropane	ug/L	ND	1.0	05/09/17 12:47	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/09/17 12:47	
1,3-Dichloropropane	ug/L	ND	1.0	05/09/17 12:47	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/09/17 12:47	
2,2-Dichloropropane	ug/L	ND	1.0	05/09/17 12:47	
2-Butanone (MEK)	ug/L	ND	5.0	05/09/17 12:47	
2-Chlorotoluene	ug/L	ND	1.0	05/09/17 12:47	
2-Hexanone	ug/L	ND	5.0	05/09/17 12:47	
4-Chlorotoluene	ug/L	ND	1.0	05/09/17 12:47	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/09/17 12:47	
Acetone	ug/L	ND	25.0	05/09/17 12:47	
Benzene	ug/L	ND	1.0	05/09/17 12:47	
Bromobenzene	ug/L	ND	1.0	05/09/17 12:47	
Bromochloromethane	ug/L	ND	1.0	05/09/17 12:47	
Bromodichloromethane	ug/L	ND	1.0	05/09/17 12:47	
Bromoform	ug/L	ND	1.0	05/09/17 12:47	
Bromomethane	ug/L	ND	2.0	05/09/17 12:47	
Carbon tetrachloride	ug/L	ND	1.0	05/09/17 12:47	
Chlorobenzene	ug/L	ND	1.0	05/09/17 12:47	
Chloroethane	ug/L	ND	1.0	05/09/17 12:47	
Chloroform	ug/L	ND	1.0	05/09/17 12:47	
Chloromethane	ug/L	ND	1.0	05/09/17 12:47	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/09/17 12:47	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/09/17 12:47	
Dibromochloromethane	ug/L	ND	1.0	05/09/17 12:47	
Dibromomethane	ug/L	ND	1.0	05/09/17 12:47	
Dichlorodifluoromethane	ug/L	ND	1.0	05/09/17 12:47	

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(704)875-9092

QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1994646 Matrix: Water
Associated Lab Samples: 92339162015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	05/09/17 12:47	
Ethylbenzene	ug/L	ND	1.0	05/09/17 12:47	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/09/17 12:47	
m&p-Xylene	ug/L	ND	2.0	05/09/17 12:47	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/09/17 12:47	
Methylene Chloride	ug/L	ND	2.0	05/09/17 12:47	
Naphthalene	ug/L	ND	1.0	05/09/17 12:47	
o-Xylene	ug/L	ND	1.0	05/09/17 12:47	
p-Isopropyltoluene	ug/L	ND	1.0	05/09/17 12:47	
Styrene	ug/L	ND	1.0	05/09/17 12:47	
Tetrachloroethene	ug/L	ND	1.0	05/09/17 12:47	
Toluene	ug/L	ND	1.0	05/09/17 12:47	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/09/17 12:47	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/09/17 12:47	
Trichloroethene	ug/L	ND	1.0	05/09/17 12:47	
Trichlorofluoromethane	ug/L	ND	1.0	05/09/17 12:47	
Vinyl acetate	ug/L	ND	2.0	05/09/17 12:47	
Vinyl chloride	ug/L	ND	1.0	05/09/17 12:47	
Xylene (Total)	ug/L	ND	1.0	05/09/17 12:47	
1,2-Dichloroethane-d4 (S)	%	104	70-130	05/09/17 12:47	
4-Bromofluorobenzene (S)	%	104	70-130	05/09/17 12:47	
Toluene-d8 (S)	%	108	70-130	05/09/17 12:47	

LABORATORY CONTROL SAMPLE: 1994647

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.6	99	70-130	
1,1,1-Trichloroethane	ug/L	50	49.5	99	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	48.7	97	70-130	
1,1,2-Trichloroethane	ug/L	50	50.1	100	70-130	
1,1-Dichloroethane	ug/L	50	49.6	99	70-130	
1,1-Dichloroethene	ug/L	50	53.7	107	70-132	
1,1-Dichloropropene	ug/L	50	54.0	108	70-130	
1,2,3-Trichlorobenzene	ug/L	50	51.9	104	70-135	
1,2,3-Trichloropropane	ug/L	50	50.6	101	70-130	
1,2,4-Trichlorobenzene	ug/L	50	50.3	101	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	49.3	99	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	51.6	103	70-130	
1,2-Dichlorobenzene	ug/L	50	48.7	97	70-130	
1,2-Dichloroethane	ug/L	50	46.1	92	70-130	
1,2-Dichloropropane	ug/L	50	51.9	104	70-130	
1,3-Dichlorobenzene	ug/L	50	48.6	97	70-130	
1,3-Dichloropropane	ug/L	50	52.1	104	70-130	
1,4-Dichlorobenzene	ug/L	50	46.5	93	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1994647

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	51.7	103	58-145	
2-Butanone (MEK)	ug/L	100	121	121	70-145	
2-Chlorotoluene	ug/L	50	47.3	95	70-130	
2-Hexanone	ug/L	100	110	110	70-144	
4-Chlorotoluene	ug/L	50	46.7	93	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	100	100	70-140	
Acetone	ug/L	100	149	149	50-175	
Benzene	ug/L	50	53.5	107	70-130	
Bromobenzene	ug/L	50	48.0	96	70-130	
Bromochloromethane	ug/L	50	50.8	102	70-130	
Bromodichloromethane	ug/L	50	50.6	101	70-130	
Bromoform	ug/L	50	43.9	88	70-130	
Bromomethane	ug/L	50	60.2	120	54-130	
Carbon tetrachloride	ug/L	50	53.7	107	70-132	
Chlorobenzene	ug/L	50	49.3	99	70-130	
Chloroethane	ug/L	50	47.5	95	64-134	
Chloroform	ug/L	50	50.3	101	70-130	
Chloromethane	ug/L	50	57.3	115	64-130	
cis-1,2-Dichloroethene	ug/L	50	49.6	99	70-131	
cis-1,3-Dichloropropene	ug/L	50	55.3	111	70-130	
Dibromochloromethane	ug/L	50	49.8	100	70-130	
Dibromomethane	ug/L	50	50.7	101	70-131	
Dichlorodifluoromethane	ug/L	50	55.2	110	56-130	
Diisopropyl ether	ug/L	50	53.7	107	70-130	
Ethylbenzene	ug/L	50	48.8	98	70-130	
Hexachloro-1,3-butadiene	ug/L	50	54.4	109	70-130	
m&p-Xylene	ug/L	100	96.5	97	70-130	
Methyl-tert-butyl ether	ug/L	50	52.9	106	70-130	
Methylene Chloride	ug/L	50	55.1	110	63-130	
Naphthalene	ug/L	50	49.8	100	70-138	
o-Xylene	ug/L	50	46.8	94	70-130	
p-Isopropyltoluene	ug/L	50	49.6	99	70-130	
Styrene	ug/L	50	48.1	96	70-130	
Tetrachloroethene	ug/L	50	48.3	97	70-130	
Toluene	ug/L	50	49.4	99	70-130	
trans-1,2-Dichloroethene	ug/L	50	48.3	97	70-130	
trans-1,3-Dichloropropene	ug/L	50	52.2	104	70-132	
Trichloroethene	ug/L	50	51.2	102	70-130	
Trichlorofluoromethane	ug/L	50	49.3	99	62-133	
Vinyl acetate	ug/L	100	106	106	66-157	
Vinyl chloride	ug/L	50	51.3	103	50-150	
Xylene (Total)	ug/L	150	143	96	70-130	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			97	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994788

Parameter	Units	92338972002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	400	398	99	70-130	
1,1,1-Trichloroethane	ug/L	ND	400	444	111	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	400	399	100	70-130	
1,1,2-Trichloroethane	ug/L	ND	400	423	106	70-130	
1,1-Dichloroethane	ug/L	ND	400	459	115	70-130	
1,1-Dichloroethene	ug/L	ND	400	504	126	70-166	
1,1-Dichloropropene	ug/L	ND	400	496	124	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	400	423	106	70-130	
1,2,3-Trichloropropane	ug/L	ND	400	397	99	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	400	390	97	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	400	343	86	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	400	420	105	70-130	
1,2-Dichlorobenzene	ug/L	ND	400	389	97	70-130	
1,2-Dichloroethane	ug/L	ND	400	433	108	70-130	
1,2-Dichloropropane	ug/L	ND	400	448	112	70-130	
1,3-Dichlorobenzene	ug/L	ND	400	399	100	70-130	
1,3-Dichloropropane	ug/L	ND	400	437	109	70-130	
1,4-Dichlorobenzene	ug/L	ND	400	388	97	70-130	
2,2-Dichloropropane	ug/L	ND	400	424	106	70-130	
2-Butanone (MEK)	ug/L	ND	800	893	112	70-130	
2-Chlorotoluene	ug/L	ND	400	413	103	70-130	
2-Hexanone	ug/L	ND	800	782	98	70-130	
4-Chlorotoluene	ug/L	ND	400	399	100	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	800	810	101	70-130	
Acetone	ug/L	ND	800	833	104	70-130	
Benzene	ug/L	ND	400	460	115	70-148	
Bromobenzene	ug/L	ND	400	420	105	70-130	
Bromochloromethane	ug/L	ND	400	454	113	70-130	
Bromodichloromethane	ug/L	ND	400	438	110	70-130	
Bromoform	ug/L	ND	400	375	94	70-130	
Bromomethane	ug/L	ND	400	540	135	70-130	M1
Carbon tetrachloride	ug/L	ND	400	455	114	70-130	
Chlorobenzene	ug/L	ND	400	416	104	70-146	
Chloroethane	ug/L	ND	400	468	117	70-130	
Chloroform	ug/L	ND	400	438	109	70-130	
Chloromethane	ug/L	ND	400	579	145	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	400	460	115	70-130	
cis-1,3-Dichloropropene	ug/L	ND	400	445	111	70-130	
Dibromochloromethane	ug/L	ND	400	406	101	70-130	
Dibromomethane	ug/L	ND	400	445	111	70-130	
Dichlorodifluoromethane	ug/L	ND	400	524	131	70-130	M1
Diisopropyl ether	ug/L	ND	400	455	114	70-130	
Ethylbenzene	ug/L	ND	400	435	109	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	400	420	105	70-130	
m&p-Xylene	ug/L	ND	800	860	108	70-130	
Methyl-tert-butyl ether	ug/L	ND	400	461	115	70-130	
Methylene Chloride	ug/L	ND	400	513	128	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

MATRIX SPIKE SAMPLE: 1994788

Parameter	Units	92338972002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	400	388	97	70-130	
o-Xylene	ug/L	ND	400	416	104	70-130	
p-Isopropyltoluene	ug/L	ND	400	405	101	70-130	
Styrene	ug/L	ND	400	407	102	70-130	
Tetrachloroethene	ug/L	ND	400	412	103	70-130	
Toluene	ug/L	ND	400	433	108	70-155	
trans-1,2-Dichloroethene	ug/L	ND	400	460	115	70-130	
trans-1,3-Dichloropropene	ug/L	ND	400	411	103	70-130	
Trichloroethene	ug/L	ND	400	466	116	69-151	
Trichlorofluoromethane	ug/L	ND	400	474	118	70-130	
Vinyl acetate	ug/L	ND	800	880	110	70-130	
Vinyl chloride	ug/L	ND	400	520	130	70-130	
1,2-Dichloroethane-d4 (S)	%				106	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 1995717

Parameter	Units	92339162015 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	2.3	2.2	3	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	6.9	7.0	1	30	
1,1-Dichloroethene	ug/L	111	117	6	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	1.4	1.4	1	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	ND	ND		30	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

SAMPLE DUPLICATE: 1995717

Parameter	Units	92339162015 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	.51J		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	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	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	104	108	4		
4-Bromofluorobenzene (S)	%	102	106	4		
Toluene-d8 (S)	%	111	109	2		

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359896 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92339162026

METHOD BLANK: 1995864 Matrix: Water
Associated Lab Samples: 92339162026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/10/17 11:48	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/10/17 11:48	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/10/17 11:48	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/10/17 11:48	
1,1-Dichloroethane	ug/L	ND	1.0	05/10/17 11:48	
1,1-Dichloroethene	ug/L	ND	1.0	05/10/17 11:48	
1,1-Dichloropropene	ug/L	ND	1.0	05/10/17 11:48	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	05/10/17 11:48	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/10/17 11:48	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	05/10/17 11:48	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	05/10/17 11:48	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/10/17 11:48	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/10/17 11:48	
1,2-Dichloroethane	ug/L	ND	1.0	05/10/17 11:48	
1,2-Dichloropropane	ug/L	ND	1.0	05/10/17 11:48	
1,3-Dichlorobenzene	ug/L	ND	1.0	05/10/17 11:48	
1,3-Dichloropropane	ug/L	ND	1.0	05/10/17 11:48	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/10/17 11:48	
2,2-Dichloropropane	ug/L	ND	1.0	05/10/17 11:48	
2-Butanone (MEK)	ug/L	ND	5.0	05/10/17 11:48	
2-Chlorotoluene	ug/L	ND	1.0	05/10/17 11:48	
2-Hexanone	ug/L	ND	5.0	05/10/17 11:48	
4-Chlorotoluene	ug/L	ND	1.0	05/10/17 11:48	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/10/17 11:48	
Acetone	ug/L	ND	25.0	05/10/17 11:48	
Benzene	ug/L	ND	1.0	05/10/17 11:48	
Bromobenzene	ug/L	ND	1.0	05/10/17 11:48	
Bromochloromethane	ug/L	ND	1.0	05/10/17 11:48	
Bromodichloromethane	ug/L	ND	1.0	05/10/17 11:48	
Bromoform	ug/L	ND	1.0	05/10/17 11:48	
Bromomethane	ug/L	ND	2.0	05/10/17 11:48	
Carbon tetrachloride	ug/L	ND	1.0	05/10/17 11:48	
Chlorobenzene	ug/L	ND	1.0	05/10/17 11:48	
Chloroethane	ug/L	ND	1.0	05/10/17 11:48	
Chloroform	ug/L	ND	1.0	05/10/17 11:48	
Chloromethane	ug/L	ND	1.0	05/10/17 11:48	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/10/17 11:48	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/10/17 11:48	
Dibromochloromethane	ug/L	ND	1.0	05/10/17 11:48	
Dibromomethane	ug/L	ND	1.0	05/10/17 11:48	
Dichlorodifluoromethane	ug/L	ND	1.0	05/10/17 11:48	

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(704)875-9092

QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

METHOD BLANK: 1995864 Matrix: Water
Associated Lab Samples: 92339162026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	05/10/17 11:48	
Ethylbenzene	ug/L	ND	1.0	05/10/17 11:48	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	05/10/17 11:48	
m&p-Xylene	ug/L	ND	2.0	05/10/17 11:48	
Methyl-tert-butyl ether	ug/L	ND	1.0	05/10/17 11:48	
Methylene Chloride	ug/L	ND	2.0	05/10/17 11:48	
Naphthalene	ug/L	ND	1.0	05/10/17 11:48	
o-Xylene	ug/L	ND	1.0	05/10/17 11:48	
p-Isopropyltoluene	ug/L	ND	1.0	05/10/17 11:48	
Styrene	ug/L	ND	1.0	05/10/17 11:48	
Tetrachloroethene	ug/L	ND	1.0	05/10/17 11:48	
Toluene	ug/L	ND	1.0	05/10/17 11:48	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/10/17 11:48	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/10/17 11:48	
Trichloroethene	ug/L	ND	1.0	05/10/17 11:48	
Trichlorofluoromethane	ug/L	ND	1.0	05/10/17 11:48	
Vinyl acetate	ug/L	ND	2.0	05/10/17 11:48	
Vinyl chloride	ug/L	ND	1.0	05/10/17 11:48	
Xylene (Total)	ug/L	ND	1.0	05/10/17 11:48	
1,2-Dichloroethane-d4 (S)	%	99	70-130	05/10/17 11:48	
4-Bromofluorobenzene (S)	%	101	70-130	05/10/17 11:48	
Toluene-d8 (S)	%	111	70-130	05/10/17 11:48	

LABORATORY CONTROL SAMPLE: 1995865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.4	101	70-130	
1,1,1-Trichloroethane	ug/L	50	47.4	95	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	49.4	99	70-130	
1,1,2-Trichloroethane	ug/L	50	52.0	104	70-130	
1,1-Dichloroethane	ug/L	50	46.8	94	70-130	
1,1-Dichloroethene	ug/L	50	48.8	98	70-132	
1,1-Dichloropropene	ug/L	50	50.2	100	70-130	
1,2,3-Trichlorobenzene	ug/L	50	50.7	101	70-135	
1,2,3-Trichloropropane	ug/L	50	49.3	99	70-130	
1,2,4-Trichlorobenzene	ug/L	50	49.0	98	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	46.9	94	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	52.6	105	70-130	
1,2-Dichlorobenzene	ug/L	50	47.4	95	70-130	
1,2-Dichloroethane	ug/L	50	46.6	93	70-130	
1,2-Dichloropropane	ug/L	50	52.9	106	70-130	
1,3-Dichlorobenzene	ug/L	50	47.1	94	70-130	
1,3-Dichloropropane	ug/L	50	51.7	103	70-130	
1,4-Dichlorobenzene	ug/L	50	46.2	92	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

LABORATORY CONTROL SAMPLE: 1995865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	48.2	96	58-145	
2-Butanone (MEK)	ug/L	100	122	122	70-145	
2-Chlorotoluene	ug/L	50	46.6	93	70-130	
2-Hexanone	ug/L	100	111	111	70-144	
4-Chlorotoluene	ug/L	50	45.3	91	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	103	70-140	
Acetone	ug/L	100	145	145	50-175	
Benzene	ug/L	50	52.9	106	70-130	
Bromobenzene	ug/L	50	45.6	91	70-130	
Bromochloromethane	ug/L	50	50.0	100	70-130	
Bromodichloromethane	ug/L	50	50.9	102	70-130	
Bromoform	ug/L	50	41.5	83	70-130	
Bromomethane	ug/L	50	60.2	120	54-130	
Carbon tetrachloride	ug/L	50	50.4	101	70-132	
Chlorobenzene	ug/L	50	48.9	98	70-130	
Chloroethane	ug/L	50	45.6	91	64-134	
Chloroform	ug/L	50	47.7	95	70-130	
Chloromethane	ug/L	50	54.0	108	64-130	
cis-1,2-Dichloroethene	ug/L	50	47.7	95	70-131	
cis-1,3-Dichloropropene	ug/L	50	53.7	107	70-130	
Dibromochloromethane	ug/L	50	48.5	97	70-130	
Dibromomethane	ug/L	50	50.9	102	70-131	
Dichlorodifluoromethane	ug/L	50	56.1	112	56-130	
Diisopropyl ether	ug/L	50	53.8	108	70-130	
Ethylbenzene	ug/L	50	48.4	97	70-130	
Hexachloro-1,3-butadiene	ug/L	50	51.7	103	70-130	
m&p-Xylene	ug/L	100	94.9	95	70-130	
Methyl-tert-butyl ether	ug/L	50	53.0	106	70-130	
Methylene Chloride	ug/L	50	54.5	109	63-130	
Naphthalene	ug/L	50	49.5	99	70-138	
o-Xylene	ug/L	50	47.3	95	70-130	
p-Isopropyltoluene	ug/L	50	48.1	96	70-130	
Styrene	ug/L	50	48.3	97	70-130	
Tetrachloroethene	ug/L	50	48.2	96	70-130	
Toluene	ug/L	50	49.1	98	70-130	
trans-1,2-Dichloroethene	ug/L	50	48.2	96	70-130	
trans-1,3-Dichloropropene	ug/L	50	52.5	105	70-132	
Trichloroethene	ug/L	50	51.9	104	70-130	
Trichlorofluoromethane	ug/L	50	47.8	96	62-133	
Vinyl acetate	ug/L	100	107	107	66-157	
Vinyl chloride	ug/L	50	50.4	101	50-150	
Xylene (Total)	ug/L	150	142	95	70-130	
1,2-Dichloroethane-d4 (S)	%			93	70-130	
4-Bromofluorobenzene (S)	%			103	70-130	
Toluene-d8 (S)	%			96	70-130	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359219 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92339162001, 92339162002, 92339162003, 92339162004, 92339162005, 92339162006, 92339162007, 92339162008, 92339162009, 92339162010, 92339162011, 92339162012, 92339162013, 92339162014, 92339162015, 92339162016, 92339162017, 92339162018, 92339162019

METHOD BLANK: 1992345 Matrix: Water
Associated Lab Samples: 92339162001, 92339162002, 92339162003, 92339162004, 92339162005, 92339162006, 92339162007, 92339162008, 92339162009, 92339162010, 92339162011, 92339162012, 92339162013, 92339162014, 92339162015, 92339162016, 92339162017, 92339162018, 92339162019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	05/04/17 14:08	
1,2-Dichloroethane-d4 (S)	%	98	50-150	05/04/17 14:08	
Toluene-d8 (S)	%	102	50-150	05/04/17 14:08	

LABORATORY CONTROL SAMPLE: 1992346

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	20.1	100	71-125	
1,2-Dichloroethane-d4 (S)	%			99	50-150	
Toluene-d8 (S)	%			102	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1992347 1992348

Parameter	Units	92339162003 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	ND	20	20	23.0	22.8	108	107	50-150	1	30	
1,2-Dichloroethane-d4 (S)	%						100	100	50-150		150	
Toluene-d8 (S)	%						104	103	50-150		150	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359223 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92339162021, 92339162022, 92339162023, 92339162024, 92339162025, 92339162026, 92339162027

METHOD BLANK: 1992373 Matrix: Water
Associated Lab Samples: 92339162021, 92339162022, 92339162023, 92339162024, 92339162025, 92339162026, 92339162027

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	05/04/17 14:27	
1,2-Dichloroethane-d4 (S)	%	98	50-150	05/04/17 14:27	
Toluene-d8 (S)	%	102	50-150	05/04/17 14:27	

LABORATORY CONTROL SAMPLE: 1992374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	19.3	97	71-125	
1,2-Dichloroethane-d4 (S)	%			99	50-150	
Toluene-d8 (S)	%			103	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1992375 1992376

Parameter	Units	92339162023 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	20.8	20	20	37.0	40.0	81	96	50-150	8	30	
1,2-Dichloroethane-d4 (S)	%						101	102	50-150		150	
Toluene-d8 (S)	%						105	106	50-150		150	

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QUALITY CONTROL DATA

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

QC Batch: 359379 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92339162020, 92339162028

METHOD BLANK: 1993070 Matrix: Water
Associated Lab Samples: 92339162020, 92339162028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	05/05/17 12:18	
1,2-Dichloroethane-d4 (S)	%	99	50-150	05/05/17 12:18	
Toluene-d8 (S)	%	107	50-150	05/05/17 12:18	

LABORATORY CONTROL SAMPLE: 1993071

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	20.3	102	71-125	
1,2-Dichloroethane-d4 (S)	%			105	50-150	
Toluene-d8 (S)	%			107	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1993072 1993073

Parameter	Units	92339170010 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	ND	20	20	16.7	17.9	83	90	50-150	7	30	
1,2-Dichloroethane-d4 (S)	%						99	98	50-150		150	
Toluene-d8 (S)	%						107	107	50-150		150	

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QUALIFIERS

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

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.

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.

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TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
MS	Analyte recovery in the matrix spike was outside QC limits for one or more of the constituent analytes used in the calculated result.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92339162001	**MW-23D-050117**	EPA 8260	359596		
92339162002	**MW-27D-050117**	EPA 8260	359283		
92339162003	**MW-03-050117**	EPA 8260	359283		
92339162004	**MW-43-050117**	EPA 8260	359596		
92339162005	**MW-38R-050117**	EPA 8260	359283		
92339162006	**MW-39-050117**	EPA 8260	359283		
92339162007	**MW-42-050117**	EPA 8260	359493		
92339162008	**MW-18-050117**	EPA 8260	359283		
92339162009	**MW-40D-050117**	EPA 8260	359283		
92339162010	**MW-5R-050117**	EPA 8260	359283		
92339162011	**RW-1S-050117**	EPA 8260	359395		
92339162012	**RW-2S-050117**	EPA 8260	359395		
92339162013	**RW-3S-050117**	EPA 8260	359283		
92339162014	**MW-44-050117**	EPA 8260	359283		
92339162015	**MW-21D-050117**	EPA 8260	359680		
92339162016	**RW-1D-050117**	EPA 8260	359596		
92339162017	**MW-41D-050117**	EPA 8260	359429		
92339162018	**RW-2D-050117**	EPA 8260	359596		
92339162019	**MW-1D-050117**	EPA 8260	359430		
92339162020	**MW-22-050217**	EPA 8260	359429		
92339162021	**MW-20-050217**	EPA 8260	359596		
92339162022	**MW-04-050217**	EPA 8260	359596		
92339162023	**MW-09-050217**	EPA 8260	359429		
92339162024	**MW-16D-050217**	EPA 8260	359596		
92339162025	**MW-100-050217**	EPA 8260	359596		
92339162026	**MW-16-050217**	EPA 8260	359896		
92339162027	**MW-200-050217**	EPA 8260	359596		
92339162028	**TRIP BLANK**	EPA 8260	359429		
92339162001	**MW-23D-050117**	EPA 8260B Mod.	359219		
92339162002	**MW-27D-050117**	EPA 8260B Mod.	359219		
92339162003	**MW-03-050117**	EPA 8260B Mod.	359219		
92339162004	**MW-43-050117**	EPA 8260B Mod.	359219		
92339162005	**MW-38R-050117**	EPA 8260B Mod.	359219		
92339162006	**MW-39-050117**	EPA 8260B Mod.	359219		
92339162007	**MW-42-050117**	EPA 8260B Mod.	359219		
92339162008	**MW-18-050117**	EPA 8260B Mod.	359219		
92339162009	**MW-40D-050117**	EPA 8260B Mod.	359219		
92339162010	**MW-5R-050117**	EPA 8260B Mod.	359219		
92339162011	**RW-1S-050117**	EPA 8260B Mod.	359219		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31400390-6 FORMER KOP FLEX
Pace Project No.: 92339162

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92339162012	**RW-2S-050117**	EPA 8260B Mod.	359219		
92339162013	**RW-3S-050117**	EPA 8260B Mod.	359219		
92339162014	**MW-44-050117**	EPA 8260B Mod.	359219		
92339162015	**MW-21D-050117**	EPA 8260B Mod.	359219		
92339162016	**RW-1D-050117**	EPA 8260B Mod.	359219		
92339162017	**MW-41D-050117**	EPA 8260B Mod.	359219		
92339162018	**RW-2D-050117**	EPA 8260B Mod.	359219		
92339162019	**MW-1D-050117**	EPA 8260B Mod.	359219		
92339162020	**MW-22-050217**	EPA 8260B Mod.	359379		
92339162021	**MW-20-050217**	EPA 8260B Mod.	359223		
92339162022	**MW-04-050217**	EPA 8260B Mod.	359223		
92339162023	**MW-09-050217**	EPA 8260B Mod.	359223		
92339162024	**MW-16D-050217**	EPA 8260B Mod.	359223		
92339162025	**MW-100-050217**	EPA 8260B Mod.	359223		
92339162026	**MW-16-050217**	EPA 8260B Mod.	359223		
92339162027	**MW-200-050217**	EPA 8260B Mod.	359223		
92339162028	**TRIP BLANK**	EPA 8260B Mod.	359379		

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Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.01	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt **Client Name:** WSP **Project**

WO# : 92339162

92339162

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

Custody Seal Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No BM 5/3

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:____ **Date/Initials Person Examining Contents:** DM 5/3

Thermometer: ☐ IR Gun ID: T1603 **Type of Ice:** ☐ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 5.1 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

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.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9. ONly received 6 TB's
-Includes Date/Time/ID/Analysis Matrix: WT BM 5/3				
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: _____

Project Manager SCURF Review: JY **Date:** 5/4/17

Project Manager SRF Review: JY **Date:** 5/4/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

1/3

***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#: 92339162**

PM: KRG Due Date: 05/10/17

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																6												
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12																6												

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 #

23

*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#: 92339162

PM: KRG Due Date: 05/10/17

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																6													
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11																6													
12																5													

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 #

***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#: 92339162

PM: KRG Due Date: 05/10/17

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)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 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																5													
2																6													
3																6													
4																#6	B53												
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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 #

CHAIN-OF-CUSTODY RECORD

WSP | Parsons Brinckerhoff Office Address	13530 Dulles Technology Drive, Herndon, VA, Suite 300 20171
Project Name	Former KopFlex
WSP | Parsons Brinckerhoff Contact Name	Eric Johnson
Project Location	Hanover, MD
WSP | Parsons Brinckerhoff Contact E-mail	Eric.Johnson@wspgroup.com
Project Number & Task	31400390 - 6
WSP | Parsons Brinckerhoff Contact Phone	703-709-6500
Sampler(s) Name(s)	Matt Richardson, Rob Wallace
Sampler(s) Signature(s)	

No. 004513 — WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location	PACE Huntersville NC
Laboratory Project Manager	Kevin Godwin
Requested Turn-Around-Time	☒ Standard ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ ___ HR
	92389102

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Requested Analyses & Preservatives: VOCs 8260	8260 1,4 Diox SIM								Sample Comments
MW-23D-050117	Ag	5/1	0835			6	X	X								001
MW-27D-050117	Ag	5/1	0900			6	X	X								002
MW-03-050117	Ag	5/1	0920			6	X	X								003
MW-43-050117	Ag	5/1	0935			6	X	X								004
MW-38R-050117	Ag	5/1	0950			6	X	X								005
MW-39-050117	Ag	5/1	1010			6	X	X								006
MW-42-050117	Ag	5/1	1030			6	X	X								007
MW-18-050117	Ag	5/1	1045			6	X	X								008
MW-40D-050117	Ag	5/1	1105			6	X	X								009
MW-5R-050117	Ag	5/1	1120			6	X	X								010
RW-1S-050117	Ag	5/1	1325			6	X	X								011
RW-2S-050117	Ag	5/1	1340			6	X	X								012
RW-3S-050117	Ag	5/1	1400			6	X	X								013
MW-44-050117	Ag	5/1	1420			6	X	X								014
MW-21D-050117	Ag	5/1	1435			6	X	X								015

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	5/2/17	1730	FedEx Express	5/2/17	1730	FedEx Express	8111 9584 3761
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
			BUCKEYE/PACE/HVL	5/3/17	9:30	3	3894, 3895

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

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

CHAIN-OF-CUSTODY RECORD

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Drive, Suite 300, Herndon, VA, 20171

No. 004515 — WSP | PARSONS BRINCKERHOFF

Project Name: Former KopFlex	WSP | Parsons Brinckerhoff Contact Name: Eric Johnson
Project Location: Hanover, MD	WSP | Parsons Brinckerhoff Contact E-mail: Eric.Johnson @wspgroup.com
Project Number & Task: 31400390-6	WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500
Sampler(s) Name(s): Matt Richardson, Rob Wallace	Sampler(s) Signature(s):

Laboratory Name & Location: PACE Huntersville, NC

Laboratory Project Manager: Kevin Godwin

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ___ HR 92339102

Requested Analyses & Preservatives

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	VOCs 8260	8260 1,4 DIOX SIM	Sample Comments
RW-1D-050117	Ag	5/1	1450			6	X	X	016
MW-4ID-050117	Ag	5/1	1505			6	X	X	017
RW-2D-050117	Ag	5/1	1530			6	X	X	018
MW-1D-050117	Ag	5/1	1540			6	X	X	019
MW-22-050217	Ag	5/2	0745			6	X	X	020
MW-20-050217	Ag	5/2	0805			6	X	X	021
MW-04-050217	Ag	5/2	0815			6	X	X	022
MW-09-050217	Ag	5/2	0830			6	X	X	023
MW-16D-050217	Ag	5/2	0850			5	X	X	024
MW-100-050217	Ag	5/2	0800			5	X	X	025
MW-16-050217	Ag	5/2	0910			6	X	X	026
MW-200-050217	Ag	5/2	0900			6	X	X	027
Trip Blank	Ag	-	-			8	X	X	Lab Prepared 028

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	5/2/17	1730	FedEx Express	5/2/17	1730	FedEx Express	8111 9584 3761
Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Number of Packages	Custody Seal Number(s)
			BUCKEYE/PACE/HVL	5/3/17	930	3	3894, 3895

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

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

SYSTEM

VSP-1

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031312

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-05

March 27, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031312**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-05

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 **17031312**.

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 April 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031312

Project ID: 31400390-05

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031312-001	INFLUENT VSP-1	WATER	03/13/17 14:30
17031312-002	Carbon Effluent	WATER	03/13/17 14:52

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

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

COVER LETTER

Lynn Jackson
Phase Separation
6630 Baltimore National Pike, Suite 103
Baltimore, MD 21228

RE: General Analysis

March 22, 2017
Report No.: 17C0855

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 03/13/2017 15:40.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Certifications/Notes and Definitions
- Cooler Receipt Log
- Chain of Custody



Final report reviewed by:	Coretta S. Davis/Project Manager	3/22/2017 Report issue date

All samples received in proper condition and results conform to ISO 17025 and TNI NELAC standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Coretta S. Davis/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
Influent VSP-1	17C0855-01	Water	Grab	03/13/2017 14:30	03/13/2017 15:40
Carbon Effluent	17C0855-02	Water	Grab	03/13/2017 14:52	03/13/2017 15:40

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Influent VSP-1

17C0855-01 (Water) Sampled: 03/13/2017 14:30; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	ND	0.020	mg LAS/L (MW 320)		031517 0920	031517 1119	LCR	SM 5540 C-11	



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Baltimore Division
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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Project Requested Certification(s):

A2LA (Environmental)

Analyte Certification Exception Summary

No certification exceptions

All analysis performed were analyzed under the required certification unless otherwise noted in the above summary.

Certification List

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

Code	Description	Certification Number	Expires
Microbac Laboratories, Inc. - Baltimore			
A2LA1	A2LA (Biology)	410.02	04/30/2017
A2LA2	A2LA (Environmental)	410.01	04/30/2017
VA-B	Commonwealth of Virginia (NELAC) - Baltimore	460285	03/14/2018
CPSC	CPSC Testing of Childrens Products and Jewelry	1115	04/30/2017
Pb	Environmental Lead (ELLAP)	410.01	04/30/2017
MD	State of Maryland (Drinking Water)	109	06/30/2017
WV	West Virginia	054	08/31/2017
Microbac Laboratories, Inc. - Richmond			
VA-R	Commonwealth of Virginia (NELAC) - Richmond	460022	06/14/2017

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Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Qualifiers/Notes and Definitions

General Definitions:

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** 13.50°C **Work Order:** 17C0855

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Chain of Custody Form for Subcontracted Analyses

17C0855

Phase Separation Science, Inc
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

For Questions or issues please contact: Amber Confer

W.O. No. : **17031312**
P.O. No. :
Project Number : 31400390-05
Report To LOD : No

Report Due On :03/27/17 05:00

Samples Transferred To:
Microbac - Baltimore
2101 Van Deman Street
Baltimore, MD 21224

Contacts : sales - Mike Arbaugh / PMs (when we d
Phone : 410-633-1800

Lab Sample ID	Field Sample ID	Date Sampled	Time Sampled	Matrix	Analyses Required	Method	Type of Container	Preservative
17031312-001	INFLUENT VSP-1	03/13/17	14:30	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL
17031312-002	Carbon Effluent	03/13/17	14:52	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL

Data Deliverables Required: COA

Send Report Attn : reporting@phaseonline.com

Perform Q.C. on Sample :

Send InvoiceAttn : invoicing@phaseonline.com

Airbill No.: Carrier : TTE

Condition Upon Receipt :

Comments :

Samples Relinquished By : Date : 03/13/17 Time: 15:40 Samples Received By : 13.5°C

Samples Relinquished By: Date : Time : Samples Received By:

Samples Relinquished By: Date: Time: Samples Received By:

CHAIN-OF-CUSTODY RECORD

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Dr #300 Herndon, VA 20171

Project Name: Kap-FLEX

WSP | Parsons Brinckerhoff Contact Name: Eric Johnson

Project Location: Hanover, MD

WSP | Parsons Brinckerhoff Contact E-mail: Eric.Johnson@wspgroup.com

Project Number & Task: 31400390-05

WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500

Sampler(s) Name(s): Pam Graff, Maria Kaplan

Sampler(s) Signature(s):

No. 004518 WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location: Microbac

Laboratory Project Manager: Amber Conner (Phase)

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ____ HR

Requested Analyses & Preservatives

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Surfactant MBAS	Sample Comments
INFLUENT VSP-1	AQ	3/13/17	1430			1	X	
Carbon Effluent	AQ	3/13/17	1452			1	X	

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/13/17	1507		3/13/17	1508	courier	
Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Number of Packages	Custody Seal Number(s)
	3/13/17	1517		03/13/17	1540	1	03270

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

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

13.5°C

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Number of Coolers Received: 1
Client: Phase Separation Science
Form Completed By: Anthony Smith
Shipper:

Receipt Date / Time: 03/13/17 15:40
Work Order # 1703055, 1703053

☐ Microbac ☑ Client ☐ UPS ☐ FedEx
Custody Tape Intact: YES / NO / NA
Containers Intact: YES / NO
Sample Received on Ice or refrigerated: YES / NO / NA
Infrared (IR) Temperature: 13.5 °C

Chain of Custody Present with shipment: YES / NO
Sample Bottle IDs agree with COC: YES / NO
Preservation requirements met: YES / NO / Not Checked
Correct Number of Containers / Sample Volume: YES / NO (If No, contact client immediately)
Headspace in container: YES / NO / NA
Type of Sample: Water Soil Wipes Oil Filter Solid Sludge Food Swab Other_____

***Container Type / Quantity*:**

A - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid: If preserved pH <2___, pH >10___
B - 3 Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
C - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
D - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
E - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
H - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
K - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
L - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
M- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
P - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
W- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
V - ___ Unpreserved ___ HCl ___ HCl / Ascorbic Acid ___ HCl / NaTHIO **(Checked at time of Analysis)**
F - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
S - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
SN- ___ Unpreserved ___NaTHIO ___NaTHIO/EDTA **(Checked at time of Analysis)**

___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___

Describe preservation requirements not met:
All Acid preserved <2 pH *NaOH preserved >12 pH* *All others >2 and <10 (usually 4-8)*
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
H_2SO_4 – Sulfuric Acid, HNO_3 – Nitric Acid, NaOH – Sodium Hydroxide, ASC – Ascorbic Acid, NaTHIO – Sodium Thiosulfate

Describe Anomalies:_____

Contact information / Summary of Actions:
Date / Time:_____ Contact:_____ Contact By:_____
Comments:_____

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031312

Project ID: 31400390-05

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:

Samples not received at PSS. Sent directly to sub lab by courier on 3/13/17.

17031312: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

CHAIN-OF-CUSTODY RECORD

1703132

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Dr #300 Herndon, VA 20171

No. 004518 — WSP | PARSONS BRINCKERHOFF

Project Name	Kop-FLEX
Project Location	Hanover, MD
Project Number & Task	31400390-05
Sampler(s) Name(s)	Pam Groff Maria Kaplan
WSP | Parsons Brinckerhoff Contact Name	Eric Johnson
WSP | Parsons Brinckerhoff Contact E-mail	Eric.Johnson@wspgroup.com
WSP | Parsons Brinckerhoff Contact Phone	703-709-6500
Sampler(s) Signature(s)	
Laboratory Name & Location	Microbac
Laboratory Project Manager	Amber Conner (Phase)

Requested Turn-Around-Time: [x] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ____ HR

Requested Analyses & Preservatives: Surfactant MBAS

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Surfactant MBAS	Sample Comments
INFLUENT VSP-1	AQ	3/13/17	1430			1	X	
Carbon Effluent	AQ	3/13/17	1452			1	X	

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/13/17	1507		3/13/17	1520	Courier	
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	3/13/17	1517		03/13/17	15:40	1	03270

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031312	**Received By**	Microbac - Baltimore
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-05	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	13.5
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

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

Sample Container

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

Total No. of Samples Received 2 Total No. of Containers Received 2

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)	N/A
Do VOA vials have zero headspace?		N/A
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 not received at PSS. Sent directly to sub lab by courier on 3/13/17.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/13/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 03/15/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031520

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 3140039-5

March 27, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031520**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 3140039-5

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 **17031520**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031520

Project ID: 3140039-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031520-001	Influent VSP-1	WATER	03/15/17 13:05
17031520-002	Carbon Effluent	WATER	03/15/17 12:51

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

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

COVER LETTER

Lynn Jackson
Phase Separation
6630 Baltimore National Pike, Suite 103
Baltimore, MD 21228

March 24, 2017
Report No.: 17C0975

RE: General Analysis

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 03/16/2017 09:30.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Certifications/Notes and Definitions
- Cooler Receipt Log
- Chain of Custody



Final report reviewed by:	Coretta S. Davis/Project Manager	3/24/2017 Report issue date

All samples received in proper condition and results conform to ISO 17025 and TNI NELAC standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Coretta S. Davis/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

MICROBAC®

Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
17031520-001 - Influent VSP-1	17C0975-01	Water	Grab	03/15/2017 13:05	03/16/2017 09:30
17031520-002 - Carbon Effluent	17C0975-02	Water	Grab	03/15/2017 12:51	03/16/2017 09:30

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Baltimore Division
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Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17031520-001 - Influent VSP-1

17C0975-01 (Water) Sampled: 03/15/2017 13:05; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	ND	0.020	mg LAS/L (MW 320)		031617 1200	031617 1719	LCR	SM 5540 C-11	

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Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Project Requested Certification(s):

A2LA (Environmental)

Analyte Certification Exception Summary

No certification exceptions

All analysis performed were analyzed under the required certification unless otherwise noted in the above summary.

Certification List

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

Code	Description	Certification Number	Expires
Microbac Laboratories, Inc. - Baltimore			
A2LA1	A2LA (Biology)	410.02	04/30/2017
A2LA2	A2LA (Environmental)	410.01	04/30/2017
VA-B	Commonwealth of Virginia (NELAC) - Baltimore	460285	03/14/2018
CPSC	CPSC Testing of Childrens Products and Jewelry	1115	04/30/2017
Pb	Environmental Lead (ELLAP)	410.01	04/30/2017
MD	State of Maryland (Drinking Water)	109	06/30/2017
WV	West Virginia	054	08/31/2017
Microbac Laboratories, Inc. - Richmond			
VA-R	Commonwealth of Virginia (NELAC) - Richmond	460022	06/14/2017

Microbac Laboratories, Inc. - Baltimore



Coretta S. Davis, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Qualifiers/Notes and Definitions

General Definitions:

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** 5.40°C **Work Order:** 17C0975

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Chain of Custody Form for Subcontracted Analyses

Phase Separation Science, Inc
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

For Questions or issues please contact: Amber Confer

W.O. No. : **17031520**
P.O. No. :
Project Number : 3140039-5
Report To LOD : No

Report Due On :03/29/17 05:00

Samples Transferred To:
Microbac - Baltimore
2101 Van Deman Street
Baltimore, MD 21224

Contacts : sales - Mike Arbaugh / PMs (when we d
Phone : 410-633-1800

Lab Sample ID	Field Sample ID	Date Sampled	Time Sampled	Matrix	Analyses Required	Method	Type of Container	Preserva
17031520-001	Influent VSP-1	03/15/17	13:05	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL
17031520-002	Carbon Effluent	03/15/17	12:51	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL

Data Deliverables Required: COA

Perform Q.C. on Sample :

Send Report Attn : reporting@phaseonline.com

Send InvoiceAttn : invoicing@phaseonline.com

Airbill No.: _____ Carrier : ~~TTE~~ ~~Microbac~~ BW TTE

Condition Upon Receipt :

Comments :

Samples Relinquished By : Bart Weber Date : 08:50 Time: 03/16/17 Samples Received By : Dan Parks

Samples Relinquished By: Dan Parks Date : 03/16/17 Time : 0930 Samples Received By: [signature] HNDillinger

Samples Relinquished By: _____ Date: _____ Time: _____ Samples Received By: _____

5.4°C
Received on ice

17C0975

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Number of Coolers Received: 1
Client: Phase Separation
Form Completed By: JN Dillinger
Shipper: FIRST
Receipt Date / Time: 03/16/17 0930
Work Order # 17C0975

Custody Tape Intact: ☐ Microbac ☒ Client ☐ UPS ☐ FedEx
Containers Intact: YES / NO / NA
Sample Received on Ice or refrigerated: YES / NO / NA
Infrared (IR) Temperature: 5.4 °C

Chain of Custody Present with shipment: YES / NO
Sample Bottle IDs agree with COC: YES / NO
Preservation requirements met: YES / NO / Not Checked
Correct Number of Containers / Sample Volume: YES / NO (If No, contact client immediately)
Headspace in container: YES / NO / NA
Type of Sample: Water Soil Wipes Oil Filter Solid Sludge Food Swab Other _____

Container Type / Quantity:

A - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid: If preserved pH <2___, pH >10___
B - 2 Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
C - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
D - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
E - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
H - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
K - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
L - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
M- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
P - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
W- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
V - ___ Unpreserved ___ HCl ___ HCl / Ascorbic Acid ___ HCl / NaTHIO **(Checked at time of Analysis)**
F - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
S - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
SN- ___ Unpreserved ___NaTHIO ___NaTHIO/EDTA **(Checked at time of Analysis)**

___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___

Describe preservation requirements not met:

All Acid preserved <2 pH *NaOH preserved >12 pH* *All others >2 and <10 (usually 4-8)*

Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added

H_2SO_4 – Sulfuric Acid, HNO_3 – Nitric Acid, NaOH – Sodium Hydroxide, ASC – Ascorbic Acid, NaTHIO – Sodium Thiosulfate

Describe Anomalies:_____

Contact information / Summary of Actions:

Date / Time:_____ Contact:_____ Contact By:_____
Comments:_____

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031520

Project ID: 3140039-5

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.

17031520: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

CHAIN-OF-CUSTODY RECORD 1703152o

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Drive St 300 Herndon VA 20171

Project Name: KopFlex

WSP | Parsons Brinckerhoff Contact Name: Eric Johnson

Project Location: Hanover, MD

WSP | Parsons Brinckerhoff Contact E-mail: eric.johnson@wspgroup.com

Project Number & Task: 31400390-5

WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500

Sampler(s) Name(s): Maria Kaplan

Sampler(s) Signature(s):

No. 004520 WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location: Amber Confer

Laboratory Project Manager: Phase Separation Science, Baltimore MD

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ___ HR

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Requested Analyses & Preservatives: Surfactant MBAS	Sample Comments
Influent VSP-1	AQ	3/15/17	1305			1	X	
Carbon Effluent	AQ	3/15/17	1251			1	X	

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp 4°-10°C
Shipping Carrier: FTE

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	1534		03/15/17	1534		
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	03/15/17	1620					

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031520	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	3140039-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

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 2 Total No. of Containers Received 2

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)	N/A
Do VOA vials have zero headspace?		N/A
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: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/16/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031522

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-5

March 29, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 29, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031522**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17031522**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031522

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031522-001	Influent VSP-1	WATER	03/15/17 13:05
17031522-002	Carbon Effluent	WATER	03/15/17 12:51
17031522-003	Trip Blank - 031517	WATER	03/15/17 16:20

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: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/15/2017 13:05** **PSS Sample ID: 17031522-001**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 21:34	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 21:34	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 21:34	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 21:34	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Chloroethane	**3.4**	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 21:34	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 21:34	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,1-Dichloroethane	**200**	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,2-Dichloroethane	**2.0**	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
cis-1,2-Dichloroethene	**2.3**	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,1-Dichloroethene	**360**	ug/L	10		10	03/16/17	03/18/17 15:54	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/15/2017 13:05** **PSS Sample ID: 17031522-001**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 21:34	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 21:34	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 21:34	1011
Methylene Chloride	**1.5**	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 21:34	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,1,1-Trichloroethane	**150**	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Trichloroethene	**3.4**	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 21:34	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 21:34	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:34	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)	**440**	ug/L	10		10	03/17/17	03/17/17 14:33	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blank - 031517 **Date/Time Sampled: 03/15/2017 16:20** **PSS Sample ID: 17031522-003**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 22:20	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011

OFFICES:
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BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blank - 031517 **Date/Time Sampled: 03/15/2017 16:20** **PSS Sample ID: 17031522-003**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 22:20	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 22:20	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031522
Project ID: 31400390-5

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): **17031522**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17031522-001	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 21:34
	Carbon Effluent	Initial	17031522-002	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 21:57
	Trip Blank - 031517	Initial	17031522-003	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 22:20
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
	Lead Ambersorb S	MS	17031316-002 S	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:25
	Lead Ambersorb SD	MSD	17031316-002 SD	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:47
	65324-1-BKS	BKS	65324-1-BKS	1011	W	65324	140928	--------	03/18/2017 08:57	03/18/2017 10:09
	65324-1-BLK	BLK	65324-1-BLK	1011	W	65324	140928	--------	03/18/2017 08:57	03/18/2017 11:02
	T-1100 Rinse S	MS	17031608-001 S	1011	W	65324	140928	03/16/2017	03/18/2017 08:57	03/18/2017 12:47
	T-1100 Rinse SD	MSD	17031608-001 SD	1011	W	65324	140928	03/16/2017	03/18/2017 08:57	03/18/2017 13:10
	Influent VSP-1	Reanalysis	17031522-001	1011	W	65300	140928	03/15/2017	03/16/2017 13:41	03/18/2017 15:54
SW-846 8260 B-Modified	Carbon Effluent	Initial	17031522-002	1011	W	65319	140916	03/15/2017	03/17/2017 10:14	03/17/2017 13:43
	65319-1-BKS	BKS	65319-1-BKS	1011	W	65319	140916	--------	03/17/2017 10:14	03/17/2017 12:51
	65319-1-BLK	BLK	65319-1-BLK	1011	W	65319	140916	--------	03/17/2017 10:14	03/17/2017 12:24
	65319-1-BSD	BSD	65319-1-BSD	1011	W	65319	140916	--------	03/17/2017 10:14	03/17/2017 11:37
	Influent VSP-1	Reanalysis	17031522-001	1011	W	65319	140916	03/15/2017	03/17/2017 10:14	03/17/2017 14:33

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031522

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031522-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/16/17 21:34
Dibromofluoromethane	105		91-119	%	03/16/17 21:34
Toluene-D8	101		90-117	%	03/16/17 21:34

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140916 Matrix: Water Date Prep: 03/17/2017
PSS Sample ID: 17031522-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	93		80-120	%	03/17/17 14:08

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031522-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/16/17 21:57
Dibromofluoromethane	104		91-119	%	03/16/17 21:57
Toluene-D8	101		90-117	%	03/16/17 21:57

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140916 Matrix: Water Date Prep: 03/17/2017
PSS Sample ID: 17031522-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	90		80-120	%	03/17/17 13:43

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031522-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 22:20
Dibromofluoromethane	98		91-119	%	03/16/17 22:20
Toluene-D8	97		90-117	%	03/16/17 22:20

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

WSP Environment & Energy - Herndon
Kop-Flex

L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031522

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031522

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/17
MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140928 Matrix: Water Date Prep: 03/18/17
MB Sample Id: 65324-1-BLK LCS Sample Id: 65324-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
1,1-Dichloroethene	<1.000	50.00	46.90	94	85-127	ug/L	03/18/17 10:09	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		100		86-111	%	03/18/17 10:09
Dibromofluoromethane	98		105		91-119	%	03/18/17 10:09
Toluene-D8	100		101		90-117	%	03/18/17 10:09

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140916 Matrix: Water Date Prep: 03/17/17
MB Sample Id: 65319-1-BLK LCS Sample Id: 65319-1-BKS LCSD Sample Id: 65319-1-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	31.87	106	32.17	107	50-150	1	20	ug/L	03/17/17 12:51	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	92		95		96		80-120	%	03/17/17 12:51

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

CHAIN-OF-CUSTODY RECORD 1703522

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Bulles Technology Drive St 300 Herndon VA 20171

Project Name: Kop Flex

WSP | Parsons Brinckerhoff Contact Name: Eric Johnson

Project Location: Hanover, MD

WSP | Parsons Brinckerhoff Contact E-mail: eric.johnson@wspgroup.com

Project Number & Task: 31400390-5

WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500

Sampler(s) Name(s): Maria Kaplan

Sampler(s) Signature(s):

No. 004521 WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location: PSS, Baltimore MD

Laboratory Project Manager: Amber Cafer

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ___ HR

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Requested Analyses & Preservatives: VOCs (8260)	1,4 Dioxane (8260 SIM)								Sample Comments
Influent VSP-1	AQ	3/15/17	1305			6	X	X								
Carbon Effluent	AQ	3/15/17	1251			6	X	X								
~~Lead Absorb~~	~~AQ~~					6	X	X		MK						
~~Effluent VSP-4~~	~~AQ~~					6	X			MK						
Trip blank-031517	AQ					2	X									

# of Coolers: 1

Custody Seal: ABS

Ice Present: YES

Temp: 8°-10°C

Shipping Carrier: FED EX

3/15/17

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	1534		03/15/17	1534		
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	03/15/17	1620					

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031522	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

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 14

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: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/16/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032016

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

March 22, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 22, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032016**
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 **17032016**.

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 April 24, 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/20/2017 at 03:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032016-001	Effluent VSP-4	WASTE WATER	03/20/17 12:47
17032016-002	Influent VSP-1	WASTE WATER	03/20/17 12:55
17032016-003	Carbon Effluent	WASTE WATER	03/20/17 13:01
17032016-004	Lead Ambersorb Effluent	WASTE WATER	03/20/17 13:08

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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ROUTE 40 WEST
BALTIMORE, MD 21228
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800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032016

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/20/2017 12:55** **PSS Sample ID: 17032016-002**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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	03/21/17	03/21/17 13:00	1011
Benzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Bromochloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Bromoform	ND	ug/L	5.0		1	03/21/17	03/21/17 13:00	1011
Bromomethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/21/17	03/21/17 13:00	1011
Carbon Disulfide	ND	ug/L	10		1	03/21/17	03/21/17 13:00	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Chlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Chloroethane	**2.3**	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Chloroform	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Chloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Cyclohexane	ND	ug/L	10		1	03/21/17	03/21/17 13:00	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/21/17	03/21/17 13:00	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,1-Dichloroethane	**110**	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,2-Dichloroethane	**2.5**	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,1-Dichloroethene	**260**	ug/L	10		10	03/21/17	03/21/17 13:28	1011
cis-1,2-Dichloroethene	**1.2**	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Ethylbenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032016

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/20/2017 12:55** **PSS Sample ID: 17032016-002**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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	03/21/17	03/21/17 13:00	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Methyl Acetate	ND	ug/L	10		1	03/21/17	03/21/17 13:00	1011
Methylcyclohexane	ND	ug/L	10		1	03/21/17	03/21/17 13:00	1011
Methylene Chloride	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/21/17	03/21/17 13:00	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Naphthalene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Styrene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Toluene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,1,1-Trichloroethane	**92**	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Trichloroethene	**2.2**	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/21/17	03/21/17 13:00	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/21/17	03/21/17 13:00	1011
o-Xylene	ND	ug/L	1.0		1	03/21/17	03/21/17 13:00	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)	**360**	ug/L	10		10	03/21/17	03/21/17 20:25	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016
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): **17032016**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:00
	Carbon Effluent	Initial	17032016-003	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:35
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:15
	65357-1-BKS	BKS	65357-1-BKS	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 10:56
	65357-1-BLK	BLK	65357-1-BLK	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 11:52
	Lead Ambersorb Effluent S	MS	17032016-004 S	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:55
	Lead Ambersorb Effluent SD	MSD	17032016-004 SD	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 14:17
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:28
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17032016-001	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 19:10
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 17:58
	65359-1-BKS	BKS	65359-1-BKS	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:26
	65359-1-BLK	BLK	65359-1-BLK	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 17:36
	65359-1-BSD	BSD	65359-1-BSD	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:49
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 20:25
	Carbon Effluent	Reanalysis	17032016-003	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 18:46

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:10

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/21/17 13:00
Dibromofluoromethane	103		91-119	%	03/21/17 13:00
Toluene-D8	100		90-117	%	03/21/17 13:00

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:59

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/21/17 12:35
Dibromofluoromethane	99		91-119	%	03/21/17 12:35
Toluene-D8	99		90-117	%	03/21/17 12:35

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	97		80-120	%	03/21/17 18:24

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/21/17 12:15
Dibromofluoromethane	100		91-119	%	03/21/17 12:15
Toluene-D8	104		90-117	%	03/21/17 12:15

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

Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 17:58

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 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	36.24	72	29-149	ug/L	03/21/17 10:56	
Benzene	<1.000	50.00	54.82	110	85-123	ug/L	03/21/17 10:56	
Bromochloromethane	<1.000	50.00	54.51	109	82-136	ug/L	03/21/17 10:56	
Bromodichloromethane	<1.000	50.00	58.87	118	88-133	ug/L	03/21/17 10:56	
Bromoform	<5.000	50.00	57.15	114	80-126	ug/L	03/21/17 10:56	
Bromomethane	<1.000	50.00	50.69	101	64-139	ug/L	03/21/17 10:56	
2-Butanone (MEK)	<10.00	50.00	39.55	79	39-135	ug/L	03/21/17 10:56	
Carbon Disulfide	<10.00	50.00	54.33	109	85-124	ug/L	03/21/17 10:56	
Carbon Tetrachloride	<1.000	50.00	52.96	106	81-138	ug/L	03/21/17 10:56	
Chlorobenzene	<1.000	50.00	56.89	114	85-120	ug/L	03/21/17 10:56	
Chloroethane	<1.000	50.00	50.49	101	75-129	ug/L	03/21/17 10:56	
Chloroform	<1.000	50.00	53.46	107	85-128	ug/L	03/21/17 10:56	
Chloromethane	<1.000	50.00	52.87	106	60-139	ug/L	03/21/17 10:56	
Cyclohexane	<10.00	50.00	55.79	112	55-131	ug/L	03/21/17 10:56	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.41	97	69-127	ug/L	03/21/17 10:56	
Dibromochloromethane	<1.000	50.00	51.34	103	82-127	ug/L	03/21/17 10:56	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.19	102	82-121	ug/L	03/21/17 10:56	
1,2-Dichlorobenzene	<1.000	50.00	57.99	116	82-123	ug/L	03/21/17 10:56	
1,3-Dichlorobenzene	<1.000	50.00	57.92	116	81-123	ug/L	03/21/17 10:56	
1,4-Dichlorobenzene	<1.000	50.00	56.06	112	81-121	ug/L	03/21/17 10:56	
Dichlorodifluoromethane	<1.000	50.00	58.73	117	69-147	ug/L	03/21/17 10:56	
1,1-Dichloroethane	<1.000	50.00	54.48	109	83-123	ug/L	03/21/17 10:56	
1,2-Dichloroethane	<1.000	50.00	58.72	117	86-138	ug/L	03/21/17 10:56	
1,1-Dichloroethene	<1.000	50.00	51.03	102	85-127	ug/L	03/21/17 10:56	
cis-1,2-Dichloroethene	<1.000	50.00	52.82	106	87-127	ug/L	03/21/17 10:56	
1,2-Dichloropropane	<1.000	50.00	50.48	101	79-125	ug/L	03/21/17 10:56	
cis-1,3-Dichloropropene	<1.000	50.00	51.95	104	79-131	ug/L	03/21/17 10:56	
trans-1,3-Dichloropropene	<1.000	50.00	53.20	106	82-133	ug/L	03/21/17 10:56	
trans-1,2-Dichloroethene	<1.000	50.00	51.21	102	85-125	ug/L	03/21/17 10:56	
Ethylbenzene	<1.000	50.00	57.90	116	83-123	ug/L	03/21/17 10:56	
2-Hexanone	<5.000	50.00	40.31	81	37-137	ug/L	03/21/17 10:56	
Isopropylbenzene	<1.000	50.00	57.86	116	70-131	ug/L	03/21/17 10:56	
Methyl Acetate	<10.00	50.00	72.48	145	69-127	ug/L	03/21/17 10:56	H
Methylcyclohexane	<10.00	50.00	60.46	121	75-129	ug/L	03/21/17 10:56	
Methylene Chloride	<1.000	50.00	56.62	113	86-124	ug/L	03/21/17 10:56	
4-Methyl-2-Pentanone	<5.000	50.00	40.55	81	39-143	ug/L	03/21/17 10:56	
Methyl-t-butyl ether	<1.000	50.00	51.80	104	75-134	ug/L	03/21/17 10:56	
Naphthalene	<1.000	50.00	49.88	100	61-118	ug/L	03/21/17 10:56	
Styrene	<1.000	50.00	51.04	102	80-120	ug/L	03/21/17 10:56	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.43	95	64-125	ug/L	03/21/17 10:56	
Tetrachloroethene	<1.000	50.00	59.56	119	83-138	ug/L	03/21/17 10:56	
Toluene	<1.000	50.00	58.32	117	88-126	ug/L	03/21/17 10:56	
1,2,3-Trichlorobenzene	<1.000	50.00	52.81	106	75-124	ug/L	03/21/17 10:56	
1,2,4-Trichlorobenzene	<1.000	50.00	51.86	104	77-131	ug/L	03/21/17 10:56	
1,1,1-Trichloroethane	<1.000	50.00	56.56	113	68-146	ug/L	03/21/17 10:56	
1,1,2-Trichloroethane	<1.000	50.00	51.62	103	85-124	ug/L	03/21/17 10:56	
Trichloroethene	<1.000	50.00	53.11	106	87-127	ug/L	03/21/17 10:56	
Trichlorofluoromethane	<5.000	50.00	49.57	99	77-147	ug/L	03/21/17 10:56	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.27	107	68-135	ug/L	03/21/17 10:56	
Vinyl Chloride	<1.000	50.00	67.26	135	74-138	ug/L	03/21/17 10:56	
m,p-Xylenes	<2.000	100	116.8	117	84-124	ug/L	03/21/17 10:56	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	58.25	117	79-126	ug/L	03/21/17 10:56	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/21/17 10:56
Dibromofluoromethane	104		98		91-119	%	03/21/17 10:56
Toluene-D8	101		102		90-117	%	03/21/17 10:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	35.15	70	34.75	70	46-138	1	25	ug/L	03/21/17 13:55	
Benzene	<1.000	50.00	58.48	117	56.70	113	77-126	3	25	ug/L	03/21/17 13:55	
Bromochloromethane	<1.000	50.00	58.30	117	57.27	115	74-133	2	25	ug/L	03/21/17 13:55	
Bromodichloromethane	<1.000	50.00	58.83	118	57.09	114	79-130	3	25	ug/L	03/21/17 13:55	
Bromoform	<5.000	50.00	57.77	116	55.77	112	69-120	4	25	ug/L	03/21/17 13:55	
Bromomethane	<1.000	50.00	48.92	98	49.11	98	64-130	0	25	ug/L	03/21/17 13:55	
2-Butanone (MEK)	<10.00	50.00	39.17	78	38.07	76	34-126	3	25	ug/L	03/21/17 13:55	
Carbon Disulfide	<10.00	50.00	55.46	111	52.14	104	76-126	6	25	ug/L	03/21/17 13:55	
Carbon Tetrachloride	<1.000	50.00	55.09	110	53.56	107	77-137	3	25	ug/L	03/21/17 13:55	
Chlorobenzene	<1.000	50.00	58.17	116	55.66	111	74-120	4	25	ug/L	03/21/17 13:55	
Chloroethane	<1.000	50.00	49.52	99	48.44	97	68-133	2	25	ug/L	03/21/17 13:55	
Chloroform	<1.000	50.00	57.17	114	55.68	111	77-127	3	25	ug/L	03/21/17 13:55	
Chloromethane	<1.000	50.00	53.44	107	51.11	102	50-143	4	25	ug/L	03/21/17 13:55	
Cyclohexane	<10.00	50.00	59.96	120	57.24	114	53-139	5	25	ug/L	03/21/17 13:55	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.47	95	48.01	96	56-123	1	25	ug/L	03/21/17 13:55	
Dibromochloromethane	<1.000	50.00	52.67	105	50.55	101	70-125	4	25	ug/L	03/21/17 13:55	
1,2-Dibromoethane (EDB)	<1.000	50.00	50.46	101	49.96	100	69-121	1	25	ug/L	03/21/17 13:55	
1,2-Dichlorobenzene	<1.000	50.00	57.00	114	57.37	115	69-118	1	25	ug/L	03/21/17 13:55	
1,3-Dichlorobenzene	<1.000	50.00	56.58	113	56.12	112	68-119	1	25	ug/L	03/21/17 13:55	
1,4-Dichlorobenzene	<1.000	50.00	54.87	110	55.28	111	67-117	1	25	ug/L	03/21/17 13:55	
Dichlorodifluoromethane	<1.000	50.00	55.82	112	55.83	112	68-139	0	25	ug/L	03/21/17 13:55	
1,1-Dichloroethane	<1.000	50.00	55.93	112	52.94	106	78-126	5	25	ug/L	03/21/17 13:55	
1,2-Dichloroethane	<1.000	50.00	58.54	117	57.09	114	78-134	3	25	ug/L	03/21/17 13:55	
1,1-Dichloroethene	<1.000	50.00	52.71	105	49.79	100	78-125	6	25	ug/L	03/21/17 13:55	
cis-1,2-Dichloroethene	<1.000	50.00	52.54	105	57.86	116	78-128	10	25	ug/L	03/21/17 13:55	
1,2-Dichloropropane	<1.000	50.00	51.40	103	49.15	98	73-126	4	25	ug/L	03/21/17 13:55	
cis-1,3-Dichloropropene	<1.000	50.00	51.19	102	50.43	101	67-126	1	25	ug/L	03/21/17 13:55	
trans-1,3-Dichloropropene	<1.000	50.00	51.84	104	50.47	101	68-129	3	25	ug/L	03/21/17 13:55	
trans-1,2-Dichloroethene	<1.000	50.00	52.86	106	50.84	102	76-128	4	25	ug/L	03/21/17 13:55	
Ethylbenzene	<1.000	50.00	60.09	120	57.53	115	74-123	4	25	ug/L	03/21/17 13:55	
2-Hexanone	<5.000	50.00	38.40	77	38.96	78	38-125	1	25	ug/L	03/21/17 13:55	
Isopropylbenzene	<1.000	50.00	58.27	117	58.30	117	58-129	0	25	ug/L	03/21/17 13:55	
Methyl Acetate	<10.00	50.00	71.53	143	67.91	136	63-115	5	25	ug/L	03/21/17 13:55	X
Methylcyclohexane	<10.00	50.00	59.94	120	57.38	115	69-130	4	25	ug/L	03/21/17 13:55	
Methylene Chloride	<1.000	50.00	55.88	112	53.41	107	76-124	5	25	ug/L	03/21/17 13:55	
4-Methyl-2-Pentanone	<5.000	50.00	39.01	78	38.43	77	35-123	1	25	ug/L	03/21/17 13:55	
Methyl-t-butyl ether	<1.000	50.00	50.49	101	50.10	100	64-129	1	25	ug/L	03/21/17 13:55	
Naphthalene	<1.000	50.00	47.34	95	49.19	98	45-109	4	25	ug/L	03/21/17 13:55	
Styrene	<1.000	50.00	52.38	105	51.03	102	61-124	3	25	ug/L	03/21/17 13:55	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.88	96	49.19	98	47-130	3	25	ug/L	03/21/17 13:55	
Tetrachloroethene	<1.000	50.00	58.91	118	57.43	115	68-139	3	25	ug/L	03/21/17 13:55	
Toluene	<1.000	50.00	58.42	117	56.44	113	79-128	3	25	ug/L	03/21/17 13:55	
1,2,3-Trichlorobenzene	<1.000	50.00	50.84	102	51.25	103	48-122	1	25	ug/L	03/21/17 13:55	
1,2,4-Trichlorobenzene	<1.000	50.00	50.48	101	51.76	104	54-124	3	25	ug/L	03/21/17 13:55	
1,1,1-Trichloroethane	<1.000	50.00	58.53	117	56.53	113	73-140	3	25	ug/L	03/21/17 13:55	
1,1,2-Trichloroethane	<1.000	50.00	50.37	101	49.52	99	78-124	2	25	ug/L	03/21/17 13:55	
Trichloroethene	<1.000	50.00	50.75	102	49.85	100	77-131	2	25	ug/L	03/21/17 13:55	
Trichlorofluoromethane	<5.000	50.00	50.97	102	49.00	98	73-144	4	25	ug/L	03/21/17 13:55	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	54.03	108	50.94	102	65-140	6	25	ug/L	03/21/17 13:55	
Vinyl Chloride	<1.000	50.00	68.98	138	65.01	130	60-146	6	25	ug/L	03/21/17 13:55	
m,p-Xylenes	<2.000	100	119.4	119	115.4	115	75-125	3	25	ug/L	03/21/17 13:55	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	59.57	119	57.37	115	69-126	4	25	ug/L	03/21/17 13:55	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		100		86-111	%	03/21/17 13:55
Dibromofluoromethane	103		103		91-119	%	03/21/17 13:55
Toluene-D8	98		98		90-117	%	03/21/17 13:55

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

Seq Number: 140981 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65359-1-BLK LCS Sample Id: 65359-1-BKS LCSD Sample Id: 65359-1-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	30.41	101	29.99	100	50-150	1	20	ug/L	03/21/17 16:26	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		98		94		80-120	%	03/21/17 16:26

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kop-Flex PROJECT NO.: 31400396-07
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kaplan DW CERT NO.:

PSS Work Order #: 17032016 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
							HCl	HCl		
1	Effluent VSP-4	3/20/17	1247	WW	~~10~~ 30	G	X	X		48-hr TAT
2	Influent VSP-1	3/20/17	1255	WW	6	G	X	X		
3 *	Carbon Effluent	3/20/17	1301	WW	6	G	X	X		
4 *	Lead Amberserb Effluent	3/20/17	1308	WW	6	G	X	X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/20/17	1447	LMACKLIN 655
Relinquished By: (2)	Date	Time	Received By:
LMACKLIN	3/20/17	3:20	
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 62
Custody Seal: Cooler - Intact
Ice Present: PRES Temp: 6°-11°C
Shipping Carrier: FTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032016	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/20/2017 03:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	04/24/2017	**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	Pam Groff
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 4 Total No. of Containers Received 21

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: 03/20/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/21/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032324

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

March 30, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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PHASE SEPARATION SCIENCE, INC.

March 30, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032324**
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 **17032324**.

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 April 27, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032324

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/23/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032324-001	Carbon Effluent	WASTE WATER	03/23/17 08:56
17032324-002	Influent VSP - 1	WASTE WATER	03/23/17 09:08

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

OFFICES:
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ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032324

WSP Environment & Energy - Herndon, Herndon, VA

March 30, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: Carbon Effluent **Date/Time Sampled: 03/23/2017 08:56** **PSS Sample ID: 17032324-001**

Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

MBAS Surfactants — Analytical Method: SM 5540C

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Surfactants	ND	mg/L	0.1		03/24/17	03/24/17 13:00	4009

Sample ID: Influent VSP - 1 **Date/Time Sampled: 03/23/2017 09:08** **PSS Sample ID: 17032324-002**

Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

MBAS Surfactants — Analytical Method: SM 5540C

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Surfactants	ND	mg/L	0.1		03/24/17	03/24/17 13:00	4009

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032324

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.

17032324: Analyses associated with analyst code 4009 were performed by Martel Laboratories

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

SM 5540C

Analytical Data Package Information Summary

Work Order(s): **17032324**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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
SM 5540C	Carbon Effluent	Initial	17032324-001	4009	W	141164	141164	03/23/2017	03/24/2017 13:00	03/24/2017 13:00
	Influent VSP - 1	Initial	17032324-002	4009	W	141164	141164	03/23/2017	03/24/2017 13:00	03/24/2017 13:00

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: VSP *OFFICE LOC. Hanlon VA
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500
EMAIL: eric.johnson@wsp-group.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.:
SITE LOCATION: Hanches MD P.O. NO.:
SAMPLER(S): Marien Kaplan DW CERT NO.:

PSS Work Order #: 17032324 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)	(3) * Preservatives Used / Analysis/ Method Required: Surfactant (MBAS)	REMARKS
1	Carbon Effluent	3/23/17	0855	WW	1	G	X	
2	Influent VSP-1	3/23/17	0905	WW	1	G	X	

(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 3°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 3°-6°C
Shipping Carrier: TTE

Special Instructions:

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

(5)

Relinquished By:	Date	Time	Received By:
(1)	3/23/17	15:11	LMACKLIN 655
(2) LMACKLIN	3/23/17	3:40	
(3)			
(4)			

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032324	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/23/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	04/27/2017	**Tracking No**	Not Applicable
		Logged In By	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 2 Total No. of Containers Received 2

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)	N/A
Do VOA vials have zero headspace?		N/A
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: 03/23/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 03/24/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032325

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390.9

March 27, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032325**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390.9

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 **17032325**.

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 April 27, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325

Project ID: 31400390.9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/23/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032325-001	Effluent VSP - 4	WASTE WATER	03/23/17 08:23
17032325-002	Lead Ambersorb Effluent	WASTE WATER	03/23/17 08:45
17032325-003	Carbon Effluent	WASTE WATER	03/23/17 08:56
17032325-004	Influent VSP-1	WASTE WATER	03/23/17 09:08
17032325-005	TB-032317	WATER	03/23/17 15:40

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: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/23/2017 09:08** **PSS Sample ID: 17032325-004**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 20:08	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 20:08	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 20:08	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 20:08	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Chloroethane	**2.4**	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 20:08	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 20:08	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,1-Dichloroethane	**140**	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,2-Dichloroethane	**3.1**	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
cis-1,2-Dichloroethene	**1.8**	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,1-Dichloroethene	**360**	ug/L	10		10	03/23/17	03/23/17 20:30	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/23/2017 09:08** **PSS Sample ID: 17032325-004**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 20:08	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 20:08	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 20:08	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 20:08	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,1,1-Trichloroethane	**81**	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Trichloroethene	**2.8**	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 20:08	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 20:08	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 20:08	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)	**330**	ug/L	10		10	03/24/17	03/24/17 17:52	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 18:40	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325
Project ID: 31400390.9

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): 17032325
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Effluent VSP - 4	Initial	17032325-001	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:02
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:23
	Carbon Effluent	Initial	17032325-003	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:45
	Influent VSP-1	Initial	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:08
	TB-032317	Initial	17032325-005	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 18:40
	65396-1-BKS	BKS	65396-1-BKS	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 10:37
	65396-1-BLK	BLK	65396-1-BLK	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 11:46
	Corrado S	MS	17032303-001 S	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 15:42
	Corrado SD	MSD	17032303-001 SD	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 16:04
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:30
SW-846 8260 B-Modified	Effluent VSP - 4	Initial	17032325-001	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:00
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:25
	65413-1-BKS	BKS	65413-1-BKS	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:32
	65413-1-BLK	BLK	65413-1-BLK	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 15:37
	65413-1-BSD	BSD	65413-1-BSD	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:54
	Carbon Effluent	Reanalysis	17032325-003	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:09
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:52

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 19:02
Dibromofluoromethane	106		91-119	%	03/23/17 19:02
Toluene-D8	101		90-117	%	03/23/17 19:02

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:00

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:23
Dibromofluoromethane	105		91-119	%	03/23/17 19:23
Toluene-D8	105		90-117	%	03/23/17 19:23

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:25

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:45
Dibromofluoromethane	107		91-119	%	03/23/17 19:45
Toluene-D8	101		90-117	%	03/23/17 19:45

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	03/24/17 16:46

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 20:08
Dibromofluoromethane	106		91-119	%	03/23/17 20:08
Toluene-D8	99		90-117	%	03/23/17 20:08

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 17:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/23/17 18:40
Dibromofluoromethane	101		91-119	%	03/23/17 18:40
Toluene-D8	103		90-117	%	03/23/17 18:40

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 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	40.22	80	29-149	ug/L	03/23/17 10:37	
Benzene	<1.000	50.00	56.24	112	85-123	ug/L	03/23/17 10:37	
Bromochloromethane	<1.000	50.00	55.86	112	82-136	ug/L	03/23/17 10:37	
Bromodichloromethane	<1.000	50.00	60.48	121	88-133	ug/L	03/23/17 10:37	
Bromoform	<5.000	50.00	57.21	114	80-126	ug/L	03/23/17 10:37	
Bromomethane	<1.000	50.00	58.90	118	64-139	ug/L	03/23/17 10:37	
2-Butanone (MEK)	<10.00	50.00	40.04	80	39-135	ug/L	03/23/17 10:37	
Carbon Disulfide	<10.00	50.00	56.83	114	85-124	ug/L	03/23/17 10:37	
Carbon Tetrachloride	<1.000	50.00	56.63	113	81-138	ug/L	03/23/17 10:37	
Chlorobenzene	<1.000	50.00	58.68	117	85-120	ug/L	03/23/17 10:37	
Chloroethane	<1.000	50.00	52.17	104	75-129	ug/L	03/23/17 10:37	
Chloroform	<1.000	50.00	55.84	112	85-128	ug/L	03/23/17 10:37	
Chloromethane	<1.000	50.00	57.55	115	60-139	ug/L	03/23/17 10:37	
Cyclohexane	<10.00	50.00	58.52	117	55-131	ug/L	03/23/17 10:37	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.10	96	69-127	ug/L	03/23/17 10:37	
Dibromochloromethane	<1.000	50.00	53.30	107	82-127	ug/L	03/23/17 10:37	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.06	102	82-121	ug/L	03/23/17 10:37	
1,2-Dichlorobenzene	<1.000	50.00	59.05	118	82-123	ug/L	03/23/17 10:37	
1,3-Dichlorobenzene	<1.000	50.00	59.33	119	81-123	ug/L	03/23/17 10:37	
1,4-Dichlorobenzene	<1.000	50.00	57.57	115	81-121	ug/L	03/23/17 10:37	
Dichlorodifluoromethane	<1.000	50.00	60.36	121	69-147	ug/L	03/23/17 10:37	
1,1-Dichloroethane	<1.000	50.00	58.08	116	83-123	ug/L	03/23/17 10:37	
1,2-Dichloroethane	<1.000	50.00	59.51	119	86-138	ug/L	03/23/17 10:37	
1,1-Dichloroethene	<1.000	50.00	54.08	108	85-127	ug/L	03/23/17 10:37	
cis-1,2-Dichloroethene	<1.000	50.00	56.40	113	87-127	ug/L	03/23/17 10:37	
1,2-Dichloropropane	<1.000	50.00	52.57	105	79-125	ug/L	03/23/17 10:37	
cis-1,3-Dichloropropene	<1.000	50.00	54.65	109	79-131	ug/L	03/23/17 10:37	
trans-1,3-Dichloropropene	<1.000	50.00	54.22	108	82-133	ug/L	03/23/17 10:37	
trans-1,2-Dichloroethene	<1.000	50.00	55.28	111	85-125	ug/L	03/23/17 10:37	
Ethylbenzene	<1.000	50.00	59.23	118	83-123	ug/L	03/23/17 10:37	
2-Hexanone	<5.000	50.00	41.47	83	37-137	ug/L	03/23/17 10:37	
Isopropylbenzene	<1.000	50.00	59.18	118	70-131	ug/L	03/23/17 10:37	
Methyl Acetate	<10.00	50.00	71.66	143	69-127	ug/L	03/23/17 10:37	H
Methylcyclohexane	<10.00	50.00	61.41	123	75-129	ug/L	03/23/17 10:37	
Methylene Chloride	<1.000	50.00	57.60	115	86-124	ug/L	03/23/17 10:37	
4-Methyl-2-Pentanone	<5.000	50.00	41.73	83	39-143	ug/L	03/23/17 10:37	
Methyl-t-butyl ether	<1.000	50.00	54.35	109	75-134	ug/L	03/23/17 10:37	
Naphthalene	<1.000	50.00	48.91	98	61-118	ug/L	03/23/17 10:37	
Styrene	<1.000	50.00	52.67	105	80-120	ug/L	03/23/17 10:37	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.32	97	64-125	ug/L	03/23/17 10:37	
Tetrachloroethene	<1.000	50.00	61.17	122	83-138	ug/L	03/23/17 10:37	
Toluene	<1.000	50.00	60.82	122	88-126	ug/L	03/23/17 10:37	
1,2,3-Trichlorobenzene	<1.000	50.00	52.95	106	75-124	ug/L	03/23/17 10:37	
1,2,4-Trichlorobenzene	<1.000	50.00	54.50	109	77-131	ug/L	03/23/17 10:37	
1,1,1-Trichloroethane	<1.000	50.00	60.16	120	68-146	ug/L	03/23/17 10:37	
1,1,2-Trichloroethane	<1.000	50.00	53.26	107	85-124	ug/L	03/23/17 10:37	
Trichloroethene	<1.000	50.00	53.03	106	87-127	ug/L	03/23/17 10:37	
Trichlorofluoromethane	<5.000	50.00	52.87	106	77-147	ug/L	03/23/17 10:37	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.65	111	68-135	ug/L	03/23/17 10:37	
Vinyl Chloride	<1.000	50.00	72.13	144	74-138	ug/L	03/23/17 10:37	H
m,p-Xylenes	<2.000	100	120.6	121	84-124	ug/L	03/23/17 10:37	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	60.09	120	79-126	ug/L	03/23/17 10:37	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		100		86-111	%	03/23/17 10:37
Dibromofluoromethane	107		100		91-119	%	03/23/17 10:37
Toluene-D8	102		103		90-117	%	03/23/17 10:37

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

Seq Number: 141076 Matrix: Water Date Prep: 03/24/17

MB Sample Id: 65413-1-BLK LCS Sample Id: 65413-1-BKS LCSD Sample Id: 65413-1-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	27.80	93	29.93	100	50-150	7	20	ug/L	03/24/17 14:32	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	97		95		96		80-120	%	03/24/17 14:32

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.: 31400340.7
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Mark Kaplan DW CERT NO.:

PSS Work Order #: 1703235 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 DO (8260 SIM)	REMARKS
1	Effluent VSP-4	3/23/17	0823	WW	6	G		X	X	
2	Red Anderson Effluent	3/23/17	0845	WW	6	G		X	X	
3	Carbon Effluent	3/23/17	0856	WW	6	G		X	X	
4	Influent VSP-1	3/23/17	0908	WW	6	G		X	X	
5	TB-032317	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/23/17	15:11	LMACKLIN
Relinquished By: (2) LMACKLIN	Date 3/23/17	Time 3:40	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: 3°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 3°-6° 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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032325	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/23/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390.9	**Tracking No**	Not Applicable
Disposal Date	04/27/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 5 Total No. of Containers Received 26

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: 03/23/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 03/24/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032929

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

March 31, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

March 31, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032929**
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 **17032929**.

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 May 3, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032929

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/29/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032929-001	Influent VSP-1	GROUND WATER	03/29/17 10:49
17032929-002	TB-032917	WATER	03/29/17 16:20
17032929-003	Effluent VSP-4	WASTE WATER	03/29/17 10:38
17032929-004	Lead Ambersorb Ef.	WASTE WATER	03/29/17 10:55

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: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/29/2017 10:49** **PSS Sample ID: 17032929-001**
Matrix: GROUND WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 15:32	1011
Benzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Bromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Bromoform	ND	ug/L	5.0		1	03/31/17	03/31/17 15:32	1011
Bromomethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/31/17	03/31/17 15:32	1011
Carbon Disulfide	ND	ug/L	10		1	03/31/17	03/31/17 15:32	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Chlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Chloroethane	**2.3**	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Chloroform	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Chloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Cyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 15:32	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/31/17	03/31/17 15:32	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,1-Dichloroethane	**150**	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,2-Dichloroethane	**3.5**	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,1-Dichloroethene	**360**	ug/L	10		10	03/31/17	03/31/17 15:54	1011
cis-1,2-Dichloroethene	**1.9**	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Ethylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 03/29/2017 10:49** **PSS Sample ID: 17032929-001**
Matrix: GROUND WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 15:32	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Methyl Acetate	ND	ug/L	10		1	03/31/17	03/31/17 15:32	1011
Methylcyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 15:32	1011
Methylene Chloride	**1.1**	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/31/17	03/31/17 15:32	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Naphthalene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Styrene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Toluene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,1,1-Trichloroethane	**82**	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Trichloroethene	**2.8**	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/31/17	03/31/17 15:32	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/31/17	03/31/17 15:32	1011
o-Xylene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:32	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)	**340**	ug/L	10		10	03/30/17	03/30/17 16:18	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: TB-032917 **Date/Time Sampled: 03/29/2017 16:20** **PSS Sample ID: 17032929-002**
Matrix: WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 14:42	1011
Benzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Bromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Bromoform	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
Bromomethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Carbon Disulfide	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chloroform	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Cyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Ethylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: TB-032917 **Date/Time Sampled: 03/29/2017 16:20** **PSS Sample ID: 17032929-002**
Matrix: WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 14:42	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Methyl Acetate	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Methylcyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Methylene Chloride	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Naphthalene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Styrene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Toluene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Trichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/31/17	03/31/17 14:42	1011
o-Xylene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/29/2017 10:38** **PSS Sample ID: 17032929-003**
Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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	03/30/17	03/30/17 17:08	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032929

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. Analysis is on hold, per client.

Analytical:

TCL Volatile Organic Compounds

Batch: 141273

Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form.

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): **17032929**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032929-001	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 15:32
	TB-032917	Initial	17032929-002	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 14:42
	Lead Ambersorb Ef.	Initial	17032929-004	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 15:11
	65502-1-BKS	BKS	65502-1-BKS	1011	W	65502	141273	--------	03/31/2017 09:34	03/31/2017 12:33
	65502-1-BLK	BLK	65502-1-BLK	1011	W	65502	141273	--------	03/31/2017 09:34	03/31/2017 13:30
	Influent VSP-1	Reanalysis	17032929-001	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 15:54
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17032929-003	1011	W	65495	141246	03/29/2017	03/30/2017 14:02	03/30/2017 17:08
	Lead Ambersorb Ef.	Initial	17032929-004	1011	W	65495	141246	03/29/2017	03/30/2017 14:02	03/30/2017 17:59
	65495-1-BKS	BKS	65495-1-BKS	1011	W	65495	141246	--------	03/30/2017 14:02	03/30/2017 14:48
	65495-1-BLK	BLK	65495-1-BLK	1011	W	65495	141246	--------	03/30/2017 14:02	03/30/2017 15:34
	65495-1-BSD	BSD	65495-1-BSD	1011	W	65495	141246	--------	03/30/2017 14:02	03/30/2017 15:12
	Influent VSP-1	Reanalysis	17032929-001	1011	W	65495	141246	03/29/2017	03/30/2017 14:02	03/30/2017 16:18

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032929

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141246 Matrix: Ground Water Date Prep: 03/30/2017
PSS Sample ID: 17032929-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	95		80-120	%	03/30/17 15:56

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141273 Matrix: Ground Water Date Prep: 03/31/2017
PSS Sample ID: 17032929-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/31/17 15:32
Dibromofluoromethane	100		91-119	%	03/31/17 15:32
Toluene-D8	100		90-117	%	03/31/17 15:32

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141273 Matrix: Water Date Prep: 03/31/2017
PSS Sample ID: 17032929-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/31/17 14:42
Dibromofluoromethane	106		91-119	%	03/31/17 14:42
Toluene-D8	104		90-117	%	03/31/17 14:42

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141246 Matrix: Waste Water Date Prep: 03/30/2017
PSS Sample ID: 17032929-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	95		80-120	%	03/30/17 17:08

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141246 Matrix: Waste Water Date Prep: 03/30/2017
PSS Sample ID: 17032929-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/30/17 17:59

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032929

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141273 Matrix: Waste Water Date Prep: 03/31/2017
PSS Sample ID: 17032929-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	96		86-111	%	03/31/17 15:11
Dibromofluoromethane	100		91-119	%	03/31/17 15:11
Toluene-D8	100		90-117	%	03/31/17 15:11

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 17032929

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141273 Matrix: Water Date Prep: 03/31/17

MB Sample Id: 65502-1-BLK LCS Sample Id: 65502-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	40.10	80	29-149	ug/L	03/31/17 12:33	
Benzene	<1.000	50.00	43.87	88	85-123	ug/L	03/31/17 12:33	
Bromochloromethane	<1.000	50.00	44.06	88	82-136	ug/L	03/31/17 12:33	
Bromodichloromethane	<1.000	50.00	48.11	96	88-133	ug/L	03/31/17 12:33	
Bromoform	<5.000	50.00	46.81	94	80-126	ug/L	03/31/17 12:33	
Bromomethane	<1.000	50.00	39.72	79	64-139	ug/L	03/31/17 12:33	
2-Butanone (MEK)	<10.00	50.00	43.07	86	39-135	ug/L	03/31/17 12:33	
Carbon Disulfide	<10.00	50.00	43.75	88	85-124	ug/L	03/31/17 12:33	
Carbon Tetrachloride	<1.000	50.00	43.75	88	81-138	ug/L	03/31/17 12:33	
Chlorobenzene	<1.000	50.00	45.02	90	85-120	ug/L	03/31/17 12:33	
Chloroethane	<1.000	50.00	40.97	82	75-129	ug/L	03/31/17 12:33	
Chloroform	<1.000	50.00	44.48	89	85-128	ug/L	03/31/17 12:33	
Chloromethane	<1.000	50.00	44.55	89	60-139	ug/L	03/31/17 12:33	
Cyclohexane	<10.00	50.00	44.45	89	55-131	ug/L	03/31/17 12:33	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	39.97	80	69-127	ug/L	03/31/17 12:33	
Dibromochloromethane	<1.000	50.00	42.38	85	82-127	ug/L	03/31/17 12:33	
1,2-Dibromoethane (EDB)	<1.000	50.00	40.75	82	82-121	ug/L	03/31/17 12:33	
1,2-Dichlorobenzene	<1.000	50.00	47.05	94	82-123	ug/L	03/31/17 12:33	
1,3-Dichlorobenzene	<1.000	50.00	47.01	94	81-123	ug/L	03/31/17 12:33	
1,4-Dichlorobenzene	<1.000	50.00	45.36	91	81-121	ug/L	03/31/17 12:33	
Dichlorodifluoromethane	<1.000	50.00	48.23	96	69-147	ug/L	03/31/17 12:33	
1,1-Dichloroethane	<1.000	50.00	44.67	89	83-123	ug/L	03/31/17 12:33	
1,2-Dichloroethane	<1.000	50.00	48.58	97	86-138	ug/L	03/31/17 12:33	
1,1-Dichloroethene	<1.000	50.00	41.48	83	85-127	ug/L	03/31/17 12:33	L
cis-1,2-Dichloroethene	<1.000	50.00	43.51	87	87-127	ug/L	03/31/17 12:33	
1,2-Dichloropropane	<1.000	50.00	40.28	81	79-125	ug/L	03/31/17 12:33	
cis-1,3-Dichloropropene	<1.000	50.00	41.20	82	79-131	ug/L	03/31/17 12:33	
trans-1,3-Dichloropropene	<1.000	50.00	42.04	84	82-133	ug/L	03/31/17 12:33	
trans-1,2-Dichloroethene	<1.000	50.00	41.77	84	85-125	ug/L	03/31/17 12:33	L
Ethylbenzene	<1.000	50.00	45.94	92	83-123	ug/L	03/31/17 12:33	
2-Hexanone	<5.000	50.00	48.98	98	37-137	ug/L	03/31/17 12:33	
Isopropylbenzene	<1.000	50.00	47.01	94	70-131	ug/L	03/31/17 12:33	
Methyl Acetate	<10.00	50.00	48.31	97	69-127	ug/L	03/31/17 12:33	
Methylcyclohexane	<10.00	50.00	47.33	95	75-129	ug/L	03/31/17 12:33	
Methylene Chloride	<1.000	50.00	45.71	91	86-124	ug/L	03/31/17 12:33	
4-Methyl-2-Pentanone	<5.000	50.00	48.24	96	39-143	ug/L	03/31/17 12:33	
Methyl-t-butyl ether	<1.000	50.00	42.47	85	75-134	ug/L	03/31/17 12:33	
Naphthalene	<1.000	50.00	40.81	82	61-118	ug/L	03/31/17 12:33	
Styrene	<1.000	50.00	41.03	82	80-120	ug/L	03/31/17 12:33	
1,1,2,2-Tetrachloroethane	<1.000	50.00	39.94	80	64-125	ug/L	03/31/17 12:33	
Tetrachloroethene	<1.000	50.00	47.26	95	83-138	ug/L	03/31/17 12:33	
Toluene	<1.000	50.00	45.54	91	88-126	ug/L	03/31/17 12:33	
1,2,3-Trichlorobenzene	<1.000	50.00	43.44	87	75-124	ug/L	03/31/17 12:33	
1,2,4-Trichlorobenzene	<1.000	50.00	43.06	86	77-131	ug/L	03/31/17 12:33	
1,1,1-Trichloroethane	<1.000	50.00	47.26	95	68-146	ug/L	03/31/17 12:33	
1,1,2-Trichloroethane	<1.000	50.00	40.95	82	85-124	ug/L	03/31/17 12:33	L
Trichloroethene	<1.000	50.00	40.91	82	87-127	ug/L	03/31/17 12:33	L
Trichlorofluoromethane	<5.000	50.00	41.47	83	77-147	ug/L	03/31/17 12:33	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	43.28	87	68-135	ug/L	03/31/17 12:33	
Vinyl Chloride	<1.000	50.00	55.68	111	74-138	ug/L	03/31/17 12:33	
m,p-Xylenes	<2.000	100	92.23	92	84-124	ug/L	03/31/17 12:33	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032929

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141273 Matrix: Water Date Prep: 03/31/17

MB Sample Id: 65502-1-BLK LCS Sample Id: 65502-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	46.39	93	79-126	ug/L	03/31/17 12:33	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		98		86-111	%	03/31/17 12:33
Dibromofluoromethane	101		99		91-119	%	03/31/17 12:33
Toluene-D8	100		100		90-117	%	03/31/17 12:33

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

Seq Number: 141246 Matrix: Water Date Prep: 03/30/17

MB Sample Id: 65495-1-BLK LCS Sample Id: 65495-1-BKS LCSD Sample Id: 65495-1-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	29.05	97	31.03	103	50-150	7	20	ug/L	03/30/17 14:48	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	98		96		97		80-120	%	03/30/17 14:48

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.

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.:
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Mara Kaplan + Dan Groff DW CERT NO.:

PSS Work Order #: 17032929 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)	Total Zn, Ni, Pb, Cu	dissolved Zn, Ni, Pb, Cu	REMARKS
1	Influent USP-1	3/29/17	1049	GW	8	G	HCl	X	X	X	X	~~2 Day TAT~~ (#) (MP)
2	TB-032917	—	—	DW	2		HCl	X				2 Day TAT
3	Effluent USP-4	3/29/17	1038	WW	3	G			X			2 Day TAT
4	Lead Amber-sorb Eff.	3/29/17	1055	WW	6	G	HCl	X	X			2 Day TAT

(5)

Relinquished By: (1)	Date	Time	Received By:
[signature]	3/29/17	1520	[signature] TTE
Relinquished By: (2)	Date	Time	Received By:
[signature] TTE	3/30/17	920	Barb Wiley
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 1°C)
Custody Seal: cooler intact
Ice Present: Pres Temp: 1-6°C
Shipping Carrier: TTE

Special Instructions:
(#) Run VOCs + 1,4 Dioxane on 2 day TAT, Hold total & dissolved metals

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032929	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/29/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/03/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	Temp Blank Present	Yes

Documentation

		Sampler Name	Maria Kaplan & Pam
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 4 Total No. of Containers Received 19

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)		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.

Sample aliquots for dissolved metals were not field filtered and were received unpreserved. Analysis is on hold, per client.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/29/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 03/30/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17040321

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

April 5, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

April 5, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17040321**
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 **17040321**.

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 May 8, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040321

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/03/2017 at 03:55 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17040321-001	Effluent VSP-4	WASTE WATER	04/03/17 08:45
17040321-002	Lead Ambersorb Ef	WASTE WATER	04/03/17 08:50
17040321-003	Influent VSP-1	WASTE WATER	04/03/17 09:00
17040321-004	TB-040317	WATER	04/03/17 15:55

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: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 04/03/2017 09:00** **PSS Sample ID: 17040321-003**
Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 12:13	1011
Benzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Bromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Bromoform	ND	ug/L	5.0		1	04/04/17	04/04/17 12:13	1011
Bromomethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/04/17	04/04/17 12:13	1011
Carbon Disulfide	ND	ug/L	10		1	04/04/17	04/04/17 12:13	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Chlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Chloroethane	**2.7**	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Chloroform	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Chloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Cyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 12:13	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/04/17	04/04/17 12:13	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,1-Dichloroethane	**140**	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,2-Dichloroethane	**3.6**	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
cis-1,2-Dichloroethene	**2.5**	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,1-Dichloroethene	**390**	ug/L	10		10	04/04/17	04/04/17 12:37	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Ethylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 04/03/2017 09:00** **PSS Sample ID: 17040321-003**
Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 12:13	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Methyl Acetate	ND	ug/L	10		1	04/04/17	04/04/17 12:13	1011
Methylcyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 12:13	1011
Methylene Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/04/17	04/04/17 12:13	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Naphthalene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Styrene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Toluene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,1,1-Trichloroethane	**62**	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Trichloroethene	**3.0**	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 12:13	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/04/17	04/04/17 12:13	1011
o-Xylene	ND	ug/L	1.0		1	04/04/17	04/04/17 12:13	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)	**330**	ug/L	10		10	04/04/17	04/04/17 17:48	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: TB-040317 **Date/Time Sampled: 04/03/2017 15:55** **PSS Sample ID: 17040321-004**
Matrix: WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:26	1011
Benzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromoform	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Bromomethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Carbon Disulfide	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloroform	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Cyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Ethylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: TB-040317 **Date/Time Sampled: 04/03/2017 15:55** **PSS Sample ID: 17040321-004**
Matrix: WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:26	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Methyl Acetate	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Methylcyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Methylene Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Naphthalene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Styrene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Toluene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Trichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/04/17	04/04/17 11:26	1011
o-Xylene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040321

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:

No sampling date or time on COC for sample 'Influent VSP-1'. Information obtained from container labels.

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): **17040321**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Lead Ambersorb Ef	Initial	17040321-002	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 11:49
	Influent VSP-1	Initial	17040321-003	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:13
	TB-040317	Initial	17040321-004	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 11:26
	65547-1-BKS	BKS	65547-1-BKS	1011	W	65547	141361	--------	04/04/2017 09:08	04/04/2017 10:11
	65547-1-BLK	BLK	65547-1-BLK	1011	W	65547	141361	--------	04/04/2017 09:08	04/04/2017 10:58
	Lead Ambersorb Ef S	MS	17040321-002 S	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:58
	Lead Ambersorb Ef SD	MSD	17040321-002 SD	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 13:20
	Influent VSP-1	Reanalysis	17040321-003	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:37
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17040321-001	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 16:40
	Lead Ambersorb Ef	Initial	17040321-002	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 17:02
	65548-1-BKS	BKS	65548-1-BKS	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 15:09
	65548-1-BLK	BLK	65548-1-BLK	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 16:18
	65548-1-BSD	BSD	65548-1-BSD	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 15:31
	Influent VSP-1	Reanalysis	17040321-003	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 17:48

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	04/04/17 16:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	04/04/17 11:49
Dibromofluoromethane	105		91-119	%	04/04/17 11:49
Toluene-D8	101		90-117	%	04/04/17 11:49

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	04/04/17 17:02

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	04/04/17 12:13
Dibromofluoromethane	102		91-119	%	04/04/17 12:13
Toluene-D8	100		90-117	%	04/04/17 12:13

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	96		80-120	%	04/04/17 17:26

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	04/04/17 11:26
Dibromofluoromethane	102		91-119	%	04/04/17 11:26
Toluene-D8	102		90-117	%	04/04/17 11:26

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 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65547-1-BLK LCS Sample Id: 65547-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.83	80	29-149	ug/L	04/04/17 10:11	
Benzene	<1.000	50.00	50.66	101	85-123	ug/L	04/04/17 10:11	
Bromochloromethane	<1.000	50.00	52.27	105	82-136	ug/L	04/04/17 10:11	
Bromodichloromethane	<1.000	50.00	56.62	113	88-133	ug/L	04/04/17 10:11	
Bromoform	<5.000	50.00	52.81	106	80-126	ug/L	04/04/17 10:11	
Bromomethane	<1.000	50.00	55.03	110	64-139	ug/L	04/04/17 10:11	
2-Butanone (MEK)	<10.00	50.00	44.06	88	39-135	ug/L	04/04/17 10:11	
Carbon Disulfide	<10.00	50.00	51.56	103	85-124	ug/L	04/04/17 10:11	
Carbon Tetrachloride	<1.000	50.00	51.25	103	81-138	ug/L	04/04/17 10:11	
Chlorobenzene	<1.000	50.00	52.55	105	85-120	ug/L	04/04/17 10:11	
Chloroethane	<1.000	50.00	47.32	95	75-129	ug/L	04/04/17 10:11	
Chloroform	<1.000	50.00	52.28	105	85-128	ug/L	04/04/17 10:11	
Chloromethane	<1.000	50.00	53.09	106	60-139	ug/L	04/04/17 10:11	
Cyclohexane	<10.00	50.00	52.70	105	55-131	ug/L	04/04/17 10:11	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.79	92	69-127	ug/L	04/04/17 10:11	
Dibromochloromethane	<1.000	50.00	48.25	97	82-127	ug/L	04/04/17 10:11	
1,2-Dibromoethane (EDB)	<1.000	50.00	46.58	93	82-121	ug/L	04/04/17 10:11	
1,2-Dichlorobenzene	<1.000	50.00	53.24	106	82-123	ug/L	04/04/17 10:11	
1,3-Dichlorobenzene	<1.000	50.00	52.84	106	81-123	ug/L	04/04/17 10:11	
1,4-Dichlorobenzene	<1.000	50.00	51.60	103	81-121	ug/L	04/04/17 10:11	
Dichlorodifluoromethane	<1.000	50.00	56.72	113	69-147	ug/L	04/04/17 10:11	
1,1-Dichloroethane	<1.000	50.00	54.10	108	83-123	ug/L	04/04/17 10:11	
1,2-Dichloroethane	<1.000	50.00	55.84	112	86-138	ug/L	04/04/17 10:11	
1,1-Dichloroethene	<1.000	50.00	50.22	100	85-127	ug/L	04/04/17 10:11	
cis-1,2-Dichloroethene	<1.000	50.00	52.45	105	87-127	ug/L	04/04/17 10:11	
1,2-Dichloropropane	<1.000	50.00	47.42	95	79-125	ug/L	04/04/17 10:11	
cis-1,3-Dichloropropene	<1.000	50.00	49.20	98	79-131	ug/L	04/04/17 10:11	
trans-1,3-Dichloropropene	<1.000	50.00	49.66	99	82-133	ug/L	04/04/17 10:11	
trans-1,2-Dichloroethene	<1.000	50.00	52.19	104	85-125	ug/L	04/04/17 10:11	
Ethylbenzene	<1.000	50.00	53.51	107	83-123	ug/L	04/04/17 10:11	
2-Hexanone	<5.000	50.00	44.96	90	37-137	ug/L	04/04/17 10:11	
Isopropylbenzene	<1.000	50.00	52.37	105	70-131	ug/L	04/04/17 10:11	
Methyl Acetate	<10.00	50.00	58.66	117	69-127	ug/L	04/04/17 10:11	
Methylcyclohexane	<10.00	50.00	56.04	112	75-129	ug/L	04/04/17 10:11	
Methylene Chloride	<1.000	50.00	52.05	104	86-124	ug/L	04/04/17 10:11	
4-Methyl-2-Pentanone	<5.000	50.00	44.60	89	39-143	ug/L	04/04/17 10:11	
Methyl-t-butyl ether	<1.000	50.00	51.64	103	75-134	ug/L	04/04/17 10:11	
Naphthalene	<1.000	50.00	44.90	90	61-118	ug/L	04/04/17 10:11	
Styrene	<1.000	50.00	47.14	94	80-120	ug/L	04/04/17 10:11	
1,1,2,2-Tetrachloroethane	<1.000	50.00	44.54	89	64-125	ug/L	04/04/17 10:11	
Tetrachloroethene	<1.000	50.00	55.55	111	83-138	ug/L	04/04/17 10:11	
Toluene	<1.000	50.00	54.55	109	88-126	ug/L	04/04/17 10:11	
1,2,3-Trichlorobenzene	<1.000	50.00	48.39	97	75-124	ug/L	04/04/17 10:11	
1,2,4-Trichlorobenzene	<1.000	50.00	48.71	97	77-131	ug/L	04/04/17 10:11	
1,1,1-Trichloroethane	<1.000	50.00	54.89	110	68-146	ug/L	04/04/17 10:11	
1,1,2-Trichloroethane	<1.000	50.00	49.08	98	85-124	ug/L	04/04/17 10:11	
Trichloroethene	<1.000	50.00	47.96	96	87-127	ug/L	04/04/17 10:11	
Trichlorofluoromethane	<5.000	50.00	49.30	99	77-147	ug/L	04/04/17 10:11	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	52.07	104	68-135	ug/L	04/04/17 10:11	
Vinyl Chloride	<1.000	50.00	66.22	132	74-138	ug/L	04/04/17 10:11	
m,p-Xylenes	<2.000	100	107.2	107	84-124	ug/L	04/04/17 10:11	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65547-1-BLK LCS Sample Id: 65547-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	53.37	107	79-126	ug/L	04/04/17 10:11	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		97		86-111	%	04/04/17 10:11
Dibromofluoromethane	101		103		91-119	%	04/04/17 10:11
Toluene-D8	99		104		90-117	%	04/04/17 10:11

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040321-002 MS Sample Id: 17040321-002 S MSD Sample Id: 17040321-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	38.15	76	38.48	77	46-138	1	25	ug/L	04/04/17 12:58	
Benzene	<1.000	50.00	45.55	91	45.41	91	77-126	0	25	ug/L	04/04/17 12:58	
Bromochloromethane	<1.000	50.00	46.91	94	46.26	93	74-133	1	25	ug/L	04/04/17 12:58	
Bromodichloromethane	<1.000	50.00	50.52	101	49.73	99	79-130	2	25	ug/L	04/04/17 12:58	
Bromoform	<5.000	50.00	45.36	91	47.48	95	69-120	5	25	ug/L	04/04/17 12:58	
Bromomethane	<1.000	50.00	49.58	99	50.70	101	64-130	2	25	ug/L	04/04/17 12:58	
2-Butanone (MEK)	<10.00	50.00	43.37	87	44.27	89	34-126	2	25	ug/L	04/04/17 12:58	
Carbon Disulfide	<10.00	50.00	45.82	92	45.61	91	76-126	0	25	ug/L	04/04/17 12:58	
Carbon Tetrachloride	<1.000	50.00	46.72	93	46.70	93	77-137	0	25	ug/L	04/04/17 12:58	
Chlorobenzene	<1.000	50.00	47.18	94	46.48	93	74-120	1	25	ug/L	04/04/17 12:58	
Chloroethane	<1.000	50.00	43.06	86	43.52	87	68-133	1	25	ug/L	04/04/17 12:58	
Chloroform	<1.000	50.00	47.48	95	46.91	94	77-127	1	25	ug/L	04/04/17 12:58	
Chloromethane	<1.000	50.00	48.57	97	48.77	98	50-143	0	25	ug/L	04/04/17 12:58	
Cyclohexane	<10.00	50.00	46.38	93	45.56	91	53-139	2	25	ug/L	04/04/17 12:58	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	38.42	77	40.31	81	56-123	5	25	ug/L	04/04/17 12:58	
Dibromochloromethane	<1.000	50.00	42.44	85	42.64	85	70-125	0	25	ug/L	04/04/17 12:58	
1,2-Dibromoethane (EDB)	<1.000	50.00	41.08	82	41.54	83	69-121	1	25	ug/L	04/04/17 12:58	
1,2-Dichlorobenzene	<1.000	50.00	47.19	94	46.37	93	69-118	2	25	ug/L	04/04/17 12:58	
1,3-Dichlorobenzene	<1.000	50.00	46.21	92	46.36	93	68-119	0	25	ug/L	04/04/17 12:58	
1,4-Dichlorobenzene	<1.000	50.00	44.52	89	44.04	88	67-117	1	25	ug/L	04/04/17 12:58	
Dichlorodifluoromethane	<1.000	50.00	49.66	99	49.23	98	68-139	1	25	ug/L	04/04/17 12:58	
1,1-Dichloroethane	<1.000	50.00	50.55	101	47.79	96	78-126	6	25	ug/L	04/04/17 12:58	
1,2-Dichloroethane	<1.000	50.00	50.10	100	50.52	101	78-134	1	25	ug/L	04/04/17 12:58	
1,1-Dichloroethene	<1.000	50.00	44.78	90	44.71	89	78-125	0	25	ug/L	04/04/17 12:58	
cis-1,2-Dichloroethene	<1.000	50.00	47.71	95	45.35	91	78-128	5	25	ug/L	04/04/17 12:58	
1,2-Dichloropropane	<1.000	50.00	42.25	85	42.10	84	73-126	0	25	ug/L	04/04/17 12:58	
cis-1,3-Dichloropropene	<1.000	50.00	42.88	86	42.28	85	67-126	1	25	ug/L	04/04/17 12:58	
trans-1,3-Dichloropropene	<1.000	50.00	43.22	86	42.84	86	68-129	1	25	ug/L	04/04/17 12:58	
trans-1,2-Dichloroethene	<1.000	50.00	45.13	90	44.26	89	76-128	2	25	ug/L	04/04/17 12:58	
Ethylbenzene	<1.000	50.00	47.75	96	46.94	94	74-123	2	25	ug/L	04/04/17 12:58	
2-Hexanone	<5.000	50.00	46.60	93	47.30	95	38-125	1	25	ug/L	04/04/17 12:58	
Isopropylbenzene	<1.000	50.00	46.49	93	45.89	92	58-129	1	25	ug/L	04/04/17 12:58	
Methyl Acetate	<10.00	50.00	48.12	96	49.77	100	63-115	3	25	ug/L	04/04/17 12:58	
Methylcyclohexane	<10.00	50.00	49.24	98	48.55	97	69-130	1	25	ug/L	04/04/17 12:58	
Methylene Chloride	<1.000	50.00	48.32	97	47.23	94	76-124	2	25	ug/L	04/04/17 12:58	
4-Methyl-2-Pentanone	<5.000	50.00	46.22	92	46.65	93	35-123	1	25	ug/L	04/04/17 12:58	
Methyl-t-butyl ether	<1.000	50.00	43.03	86	43.63	87	64-129	1	25	ug/L	04/04/17 12:58	
Naphthalene	<1.000	50.00	38.34	77	39.48	79	45-109	3	25	ug/L	04/04/17 12:58	
Styrene	<1.000	50.00	42.15	84	41.80	84	61-124	1	25	ug/L	04/04/17 12:58	
1,1,2,2-Tetrachloroethane	<1.000	50.00	38.52	77	39.85	80	47-130	3	25	ug/L	04/04/17 12:58	
Tetrachloroethene	<1.000	50.00	48.42	97	49.82	100	68-139	3	25	ug/L	04/04/17 12:58	
Toluene	<1.000	50.00	48.39	97	49.04	98	79-128	1	25	ug/L	04/04/17 12:58	
1,2,3-Trichlorobenzene	<1.000	50.00	40.91	82	41.91	84	48-122	2	25	ug/L	04/04/17 12:58	
1,2,4-Trichlorobenzene	<1.000	50.00	41.38	83	40.49	81	54-124	2	25	ug/L	04/04/17 12:58	
1,1,1-Trichloroethane	<1.000	50.00	49.98	100	49.85	100	73-140	0	25	ug/L	04/04/17 12:58	
1,1,2-Trichloroethane	<1.000	50.00	42.37	85	43.70	87	78-124	3	25	ug/L	04/04/17 12:58	
Trichloroethene	<1.000	50.00	42.82	86	43.68	87	77-131	2	25	ug/L	04/04/17 12:58	
Trichlorofluoromethane	<5.000	50.00	45.17	90	44.39	89	73-144	2	25	ug/L	04/04/17 12:58	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	45.12	90	45.66	91	65-140	1	25	ug/L	04/04/17 12:58	
Vinyl Chloride	<1.000	50.00	59.56	119	60.02	120	60-146	1	25	ug/L	04/04/17 12:58	
m,p-Xylenes	<2.000	100	95.57	96	94.80	95	75-125	1	25	ug/L	04/04/17 12:58	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040321-002 MS Sample Id: 17040321-002 S MSD Sample Id: 17040321-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	48.99	98	47.98	96	69-126	2	25	ug/L	04/04/17 12:58	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		97		86-111	%	04/04/17 12:58
Dibromofluoromethane	105		106		91-119	%	04/04/17 12:58
Toluene-D8	102		104		90-117	%	04/04/17 12:58

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

Seq Number: 141362 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65548-1-BLK LCS Sample Id: 65548-1-BKS LCSD Sample Id: 65548-1-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	30.78	103	32.00	107	50-150	4	20	ug/L	04/04/17 15:09	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	95		94		96		80-120	%	04/04/17 15:09

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.

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

(1) *CLIENT: USP *OFFICE LOC. Hanover VA

*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500

EMAIL: erjohnson@uspgroup.com FAX NO.: ( )

*PROJECT NAME: Kapflex PROJECT NO.:

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

SAMPLER(S): Dan Graff + Marian Kapfer DW CERT NO.:

PSS Work Order #: 17040321 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) * L4Diorex (8270 SIM)	UCCS (8260)	REMARKS
1	Effluent USP-4	4/3/17	0845	WW	3	G		X		
2	Leach Ambersorb Eff	4/3/17	0850	WW	6	G		X	X	
3	Influent USP-1			WW	6	G		X	X	
4	TB-040317	—	—	DW	2	—			X	

04/03/17

(5)

Relinquished By: (1)	Date	Time	Received By:
Dan Graff	4/3/17	1520	Dan Carter
Relinquished By: (2)	Date	Time	Received By:
Dan Carter	04/03/17	1555	Brad Weber
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 6°C)

Custody Seal: Abs

Ice Present: Pres Temp: 3-6 °C

Shipping Carrier: TTG

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17040321	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/03/2017 03:55:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/08/2017	**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)	6
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Pam Groff/Maria Kaj
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 4 Total No. of Containers Received 17

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.

No sampling date or time on COC for sample 'Influent VSP-1'. Information obtained from container labels.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/03/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 04/04/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17041211

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

April 14, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

April 14, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17041211**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17041211**.

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 May 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041211

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/12/2017 at 01:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17041211-001	Influent VSP-1	GROUND WATER	04/12/17 08:32
17041211-002	Lead Ambersorb Ef	WASTE WATER	04/12/17 08:20
17041211-003	Effluent VSP-4	WASTE WATER	04/12/17 08:05
17041211-004	TB041217	WATER	04/12/17 13:05

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: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Influent VSP-1 **Date/Time Sampled: 04/12/2017 08:32** **PSS Sample ID: 17041211-001**
Matrix: GROUND WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 12:02	1011
Benzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Bromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Bromoform	ND	ug/L	5.0		1	04/14/17	04/14/17 12:02	1011
Bromomethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/14/17	04/14/17 12:02	1011
Carbon Disulfide	ND	ug/L	10		1	04/14/17	04/14/17 12:02	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Chlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Chloroethane	**2.5**	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Chloroform	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Chloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Cyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 12:02	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/14/17	04/14/17 12:02	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,1-Dichloroethane	**140**	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,2-Dichloroethane	**3.5**	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,1-Dichloroethene	**380**	ug/L	10		10	04/14/17	04/14/17 12:25	1011
cis-1,2-Dichloroethene	**2.6**	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Ethylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Influent VSP-1 **Date/Time Sampled: 04/12/2017 08:32** **PSS Sample ID: 17041211-001**
Matrix: GROUND WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 12:02	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Methyl Acetate	ND	ug/L	10		1	04/14/17	04/14/17 12:02	1011
Methylcyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 12:02	1011
Methylene Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/14/17	04/14/17 12:02	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Naphthalene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Styrene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Toluene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,1,1-Trichloroethane	**55**	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Trichloroethene	**3.0**	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/14/17	04/14/17 12:02	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/14/17	04/14/17 12:02	1011
o-Xylene	ND	ug/L	1.0		1	04/14/17	04/14/17 12:02	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)	**290**	ug/L	10		10	04/13/17	04/13/17 13:56	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: TB041217 **Date/Time Sampled: 04/12/2017 13:05** **PSS Sample ID: 17041211-004**
Matrix: WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 10:56	1011
Benzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromoform	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Bromomethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Carbon Disulfide	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloroform	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Cyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Ethylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: TB041217 **Date/Time Sampled: 04/12/2017 13:05** **PSS Sample ID: 17041211-004**
Matrix: WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 10:56	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Methyl Acetate	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Methylcyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Methylene Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Naphthalene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Styrene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Toluene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Trichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/14/17	04/14/17 10:56	1011
o-Xylene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041211
Project ID: 31400390-9

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:

Custody seal was affixed to only one side of lid and cooler where lid could be opened from another side.

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): 17041211
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17041211-001	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:02
	Lead Ambersorb Ef	Initial	17041211-002	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 11:17
	Effluent VSP-4	Initial	17041211-003	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 11:40
	TB041217	Initial	17041211-004	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 10:56
	65694-1-BKS	BKS	65694-1-BKS	1011	W	65694	141673	--------	04/14/2017 08:20	04/14/2017 09:30
	65694-1-BLK	BLK	65694-1-BLK	1011	W	65694	141673	--------	04/14/2017 08:20	04/14/2017 10:23
	Lead Ambersorb Ef S	MS	17041211-002 S	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:56
	Lead Ambersorb Ef SD	MSD	17041211-002 SD	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 13:18
	Influent VSP-1	Reanalysis	17041211-001	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:25
SW-846 8260 B-Modified	Lead Ambersorb Ef	Initial	17041211-002	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 11:47
	Effluent VSP-4	Initial	17041211-003	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 12:09
	65688-1-BKS	BKS	65688-1-BKS	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 11:04
	65688-1-BLK	BLK	65688-1-BLK	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 10:42
	65688-1-BSD	BSD	65688-1-BSD	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 10:20
	Influent VSP-1	Reanalysis	17041211-001	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 13:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Ground Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	04/13/17 12:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Ground Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 12:02
Dibromofluoromethane	104		91-119	%	04/14/17 12:02
Toluene-D8	100		90-117	%	04/14/17 12:02

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Waste Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	95		80-120	%	04/13/17 11:47

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 11:17
Dibromofluoromethane	97		91-119	%	04/14/17 11:17
Toluene-D8	98		90-117	%	04/14/17 11:17

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Waste Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	04/13/17 12:09

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	04/14/17 11:40
Dibromofluoromethane	101		91-119	%	04/14/17 11:40
Toluene-D8	98		90-117	%	04/14/17 11:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 10:56
Dibromofluoromethane	104		91-119	%	04/14/17 10:56
Toluene-D8	101		90-117	%	04/14/17 10:56

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 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Water Date Prep: 04/14/17

MB Sample Id: 65694-1-BLK LCS Sample Id: 65694-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	45.09	90	29-149	ug/L	04/14/17 09:30	
Benzene	<1.000	50.00	55.23	110	85-123	ug/L	04/14/17 09:30	
Bromochloromethane	<1.000	50.00	49.17	98	82-136	ug/L	04/14/17 09:30	
Bromodichloromethane	<1.000	50.00	49.87	100	88-133	ug/L	04/14/17 09:30	
Bromoform	<5.000	50.00	50.26	101	80-126	ug/L	04/14/17 09:30	
Bromomethane	<1.000	50.00	52.08	104	64-139	ug/L	04/14/17 09:30	
2-Butanone (MEK)	<10.00	50.00	43.25	87	39-135	ug/L	04/14/17 09:30	
Carbon Disulfide	<10.00	50.00	54.50	109	85-124	ug/L	04/14/17 09:30	
Carbon Tetrachloride	<1.000	50.00	49.16	98	81-138	ug/L	04/14/17 09:30	
Chlorobenzene	<1.000	50.00	56.60	113	85-120	ug/L	04/14/17 09:30	
Chloroethane	<1.000	50.00	50.63	101	75-129	ug/L	04/14/17 09:30	
Chloroform	<1.000	50.00	55.01	110	85-128	ug/L	04/14/17 09:30	
Chloromethane	<1.000	50.00	49.29	99	60-139	ug/L	04/14/17 09:30	
Cyclohexane	<10.00	50.00	54.77	110	55-131	ug/L	04/14/17 09:30	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.12	94	69-127	ug/L	04/14/17 09:30	
Dibromochloromethane	<1.000	50.00	52.01	104	82-127	ug/L	04/14/17 09:30	
1,2-Dibromoethane (EDB)	<1.000	50.00	56.33	113	82-121	ug/L	04/14/17 09:30	
1,2-Dichlorobenzene	<1.000	50.00	58.79	118	82-123	ug/L	04/14/17 09:30	
1,3-Dichlorobenzene	<1.000	50.00	59.85	120	81-123	ug/L	04/14/17 09:30	
1,4-Dichlorobenzene	<1.000	50.00	57.63	115	81-121	ug/L	04/14/17 09:30	
Dichlorodifluoromethane	<1.000	50.00	55.80	112	69-147	ug/L	04/14/17 09:30	
1,1-Dichloroethane	<1.000	50.00	54.26	109	83-123	ug/L	04/14/17 09:30	
1,2-Dichloroethane	<1.000	50.00	54.94	110	86-138	ug/L	04/14/17 09:30	
1,1-Dichloroethene	<1.000	50.00	48.65	97	85-127	ug/L	04/14/17 09:30	
cis-1,2-Dichloroethene	<1.000	50.00	57.05	114	87-127	ug/L	04/14/17 09:30	
1,2-Dichloropropane	<1.000	50.00	56.31	113	79-125	ug/L	04/14/17 09:30	
cis-1,3-Dichloropropene	<1.000	50.00	50.03	100	79-131	ug/L	04/14/17 09:30	
trans-1,3-Dichloropropene	<1.000	50.00	49.75	100	82-133	ug/L	04/14/17 09:30	
trans-1,2-Dichloroethene	<1.000	50.00	48.58	97	85-125	ug/L	04/14/17 09:30	
Ethylbenzene	<1.000	50.00	59.84	120	83-123	ug/L	04/14/17 09:30	
2-Hexanone	<5.000	50.00	42.59	85	37-137	ug/L	04/14/17 09:30	
Isopropylbenzene	<1.000	50.00	52.93	106	70-131	ug/L	04/14/17 09:30	
Methyl Acetate	<10.00	50.00	69.67	139	69-127	ug/L	04/14/17 09:30	H
Methylcyclohexane	<10.00	50.00	58.28	117	75-129	ug/L	04/14/17 09:30	
Methylene Chloride	<1.000	50.00	53.59	107	86-124	ug/L	04/14/17 09:30	
4-Methyl-2-Pentanone	<5.000	50.00	49.30	99	39-143	ug/L	04/14/17 09:30	
Methyl-t-butyl ether	<1.000	50.00	58.77	118	75-134	ug/L	04/14/17 09:30	
Naphthalene	<1.000	50.00	50.57	101	61-118	ug/L	04/14/17 09:30	
Styrene	<1.000	50.00	51.26	103	80-120	ug/L	04/14/17 09:30	
1,1,2,2-Tetrachloroethane	<1.000	50.00	49.76	100	64-125	ug/L	04/14/17 09:30	
Tetrachloroethene	<1.000	50.00	49.64	99	83-138	ug/L	04/14/17 09:30	
Toluene	<1.000	50.00	55.06	110	88-126	ug/L	04/14/17 09:30	
1,2,3-Trichlorobenzene	<1.000	50.00	53.05	106	75-124	ug/L	04/14/17 09:30	
1,2,4-Trichlorobenzene	<1.000	50.00	54.59	109	77-131	ug/L	04/14/17 09:30	
1,1,1-Trichloroethane	<1.000	50.00	55.17	110	68-146	ug/L	04/14/17 09:30	
1,1,2-Trichloroethane	<1.000	50.00	47.88	96	85-124	ug/L	04/14/17 09:30	
Trichloroethene	<1.000	50.00	55.89	112	87-127	ug/L	04/14/17 09:30	
Trichlorofluoromethane	<5.000	50.00	50.96	102	77-147	ug/L	04/14/17 09:30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	48.93	98	68-135	ug/L	04/14/17 09:30	
Vinyl Chloride	<1.000	50.00	62.45	125	74-138	ug/L	04/14/17 09:30	
m,p-Xylenes	<2.000	100	116.9	117	84-124	ug/L	04/14/17 09:30	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Water Date Prep: 04/14/17

MB Sample Id: 65694-1-BLK LCS Sample Id: 65694-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	51.68	103	79-126	ug/L	04/14/17 09:30	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		101		86-111	%	04/14/17 09:30
Dibromofluoromethane	95		98		91-119	%	04/14/17 09:30
Toluene-D8	98		98		90-117	%	04/14/17 09:30

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/17

Parent Sample Id: 17041211-002 MS Sample Id: 17041211-002 S MSD Sample Id: 17041211-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	41.74	83	41.95	84	46-138	1	25	ug/L	04/14/17 12:56	
Benzene	<1.000	50.00	54.17	108	52.64	105	77-126	3	25	ug/L	04/14/17 12:56	
Bromochloromethane	<1.000	50.00	46.86	94	50.23	100	74-133	7	25	ug/L	04/14/17 12:56	
Bromodichloromethane	<1.000	50.00	50.37	101	49.17	98	79-130	2	25	ug/L	04/14/17 12:56	
Bromoform	<5.000	50.00	49.05	98	50.05	100	69-120	2	25	ug/L	04/14/17 12:56	
Bromomethane	<1.000	50.00	49.79	100	48.46	97	64-130	3	25	ug/L	04/14/17 12:56	
2-Butanone (MEK)	<10.00	50.00	41.35	83	39.80	80	34-126	4	25	ug/L	04/14/17 12:56	
Carbon Disulfide	<10.00	50.00	55.04	110	52.25	105	76-126	5	25	ug/L	04/14/17 12:56	
Carbon Tetrachloride	<1.000	50.00	51.43	103	49.69	99	77-137	3	25	ug/L	04/14/17 12:56	
Chlorobenzene	<1.000	50.00	55.29	111	55.06	110	74-120	0	25	ug/L	04/14/17 12:56	
Chloroethane	<1.000	50.00	52.01	104	49.55	99	68-133	5	25	ug/L	04/14/17 12:56	
Chloroform	<1.000	50.00	55.39	111	55.79	112	77-127	1	25	ug/L	04/14/17 12:56	
Chloromethane	<1.000	50.00	52.70	105	50.00	100	50-143	5	25	ug/L	04/14/17 12:56	
Cyclohexane	<10.00	50.00	55.97	112	54.33	109	53-139	3	25	ug/L	04/14/17 12:56	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.84	92	50.47	101	56-123	10	25	ug/L	04/14/17 12:56	
Dibromochloromethane	<1.000	50.00	51.21	102	51.52	103	70-125	1	25	ug/L	04/14/17 12:56	
1,2-Dibromoethane (EDB)	<1.000	50.00	56.10	112	56.18	112	69-121	0	25	ug/L	04/14/17 12:56	
1,2-Dichlorobenzene	<1.000	50.00	53.25	107	55.71	111	69-118	5	25	ug/L	04/14/17 12:56	
1,3-Dichlorobenzene	<1.000	50.00	55.08	110	57.18	114	68-119	4	25	ug/L	04/14/17 12:56	
1,4-Dichlorobenzene	<1.000	50.00	54.27	109	56.56	113	67-117	4	25	ug/L	04/14/17 12:56	
Dichlorodifluoromethane	<1.000	50.00	58.76	118	56.08	112	68-139	5	25	ug/L	04/14/17 12:56	
1,1-Dichloroethane	<1.000	50.00	55.32	111	52.72	105	78-126	5	25	ug/L	04/14/17 12:56	
1,2-Dichloroethane	<1.000	50.00	57.28	115	55.24	110	78-134	4	25	ug/L	04/14/17 12:56	
1,1-Dichloroethene	<1.000	50.00	49.97	100	45.79	92	78-125	9	25	ug/L	04/14/17 12:56	
cis-1,2-Dichloroethene	<1.000	50.00	56.27	113	51.17	102	78-128	9	25	ug/L	04/14/17 12:56	
1,2-Dichloropropane	<1.000	50.00	55.94	112	53.95	108	73-126	4	25	ug/L	04/14/17 12:56	
cis-1,3-Dichloropropene	<1.000	50.00	48.21	96	47.02	94	67-126	2	25	ug/L	04/14/17 12:56	
trans-1,3-Dichloropropene	<1.000	50.00	48.21	96	47.53	95	68-129	1	25	ug/L	04/14/17 12:56	
trans-1,2-Dichloroethene	<1.000	50.00	49.03	98	45.98	92	76-128	6	25	ug/L	04/14/17 12:56	
Ethylbenzene	<1.000	50.00	57.99	116	58.62	117	74-123	1	25	ug/L	04/14/17 12:56	
2-Hexanone	<5.000	50.00	41.39	83	42.33	85	38-125	2	25	ug/L	04/14/17 12:56	
Isopropylbenzene	<1.000	50.00	48.38	97	50.47	101	58-129	4	25	ug/L	04/14/17 12:56	
Methyl Acetate	<10.00	50.00	65.98	132	68.24	136	63-115	3	25	ug/L	04/14/17 12:56	X
Methylcyclohexane	<10.00	50.00	57.65	115	53.34	107	69-130	8	25	ug/L	04/14/17 12:56	
Methylene Chloride	<1.000	50.00	54.30	109	51.21	102	76-124	6	25	ug/L	04/14/17 12:56	
4-Methyl-2-Pentanone	<5.000	50.00	47.36	95	47.31	95	35-123	0	25	ug/L	04/14/17 12:56	
Methyl-t-butyl ether	<1.000	50.00	55.49	111	54.07	108	64-129	3	25	ug/L	04/14/17 12:56	
Naphthalene	<1.000	50.00	45.17	90	48.46	97	45-109	7	25	ug/L	04/14/17 12:56	
Styrene	<1.000	50.00	50.14	100	49.90	100	61-124	0	25	ug/L	04/14/17 12:56	
1,1,2,2-Tetrachloroethane	<1.000	50.00	45.60	91	49.97	100	47-130	9	25	ug/L	04/14/17 12:56	
Tetrachloroethene	<1.000	50.00	49.09	98	46.76	94	68-139	5	25	ug/L	04/14/17 12:56	
Toluene	<1.000	50.00	54.90	110	52.77	106	79-128	4	25	ug/L	04/14/17 12:56	
1,2,3-Trichlorobenzene	<1.000	50.00	47.29	95	50.92	102	48-122	7	25	ug/L	04/14/17 12:56	
1,2,4-Trichlorobenzene	<1.000	50.00	48.90	98	50.80	102	54-124	4	25	ug/L	04/14/17 12:56	
1,1,1-Trichloroethane	<1.000	50.00	57.91	116	55.30	111	73-140	5	25	ug/L	04/14/17 12:56	
1,1,2-Trichloroethane	<1.000	50.00	46.23	92	46.13	92	78-124	0	25	ug/L	04/14/17 12:56	
Trichloroethene	<1.000	50.00	55.28	111	52.85	106	77-131	4	25	ug/L	04/14/17 12:56	
Trichlorofluoromethane	<5.000	50.00	54.19	108	51.19	102	73-144	6	25	ug/L	04/14/17 12:56	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	50.26	101	46.78	94	65-140	7	25	ug/L	04/14/17 12:56	
Vinyl Chloride	<1.000	50.00	66.50	133	63.16	126	60-146	5	25	ug/L	04/14/17 12:56	
m,p-Xylenes	<2.000	100	115.1	115	111.6	112	75-125	3	25	ug/L	04/14/17 12:56	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/17

Parent Sample Id: 17041211-002 MS Sample Id: 17041211-002 S MSD Sample Id: 17041211-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	50.41	101	50.61	101	69-126	0	25	ug/L	04/14/17 12:56	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		102		86-111	%	04/14/17 12:56
Dibromofluoromethane	102		103		91-119	%	04/14/17 12:56
Toluene-D8	97		97		90-117	%	04/14/17 12:56

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

Seq Number: 141651 Matrix: Water Date Prep: 04/13/17

MB Sample Id: 65688-1-BLK LCS Sample Id: 65688-1-BKS LCSD Sample Id: 65688-1-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	29.17	97	30.50	102	50-150	4	20	ug/L	04/13/17 11:04	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		94		97		80-120	%	04/13/17 11:04

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.

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

(1) *CLIENT: WSP *OFFICE LOC.: Hanover VA
*PROJECT MGR.: Eric Johnson *PHONE NO.: (703) 709-6500
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Kopfle PROJECT NO.: 34003907
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Maria Kaplan DW CERT NO.:

PSS Work Order #: 1704121 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 (8260)	1,4 Dioxane (8260 SIM)	REMARKS
1	Influent WSP-1	4/12/17	0832	GW	6	G		X	X	
2	Lead Absorb Eff	4/12/17	0820	WW	6	G		X	X	
3	Effluent WSP-4	4/12/17	0805	WW	6	G		X	X	
4	TB041217	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	4/12/17	1235	#65
Relinquished By: (2)	Date	Time	Received By:
#65	4/12/17	15	
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 7°C
Custody Seal: Cooler - One side only Broken
Ice Present: PRES Temp: 7-8°C
Shipping Carrier: FTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17041211	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/12/2017 01:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	05/17/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	No	Temp (deg C)	8
Seal(s) Signed / Dated?	Yes	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 4 Total No. of Containers Received 20

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.

Custody seal was affixed to only one side of lid and cooler where lid could be opened from another side.

Samples Inspected/Checklist Completed By: Barb Weber Date: 04/12/2017

Barb Weber

PM Review and Approval: N Y Jackson Date: 04/12/2017

Lynn Jackson

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: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: TB-04-19-17 **Date/Time Sampled: 04/19/2017 16:00** **PSS Sample ID: 17041927-001**
Matrix: WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:12	1011
Benzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromoform	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Bromomethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Carbon Disulfide	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloroform	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Cyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Ethylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: TB-04-19-17 **Date/Time Sampled: 04/19/2017 16:00** **PSS Sample ID: 17041927-001**
Matrix: WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:12	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Methyl Acetate	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Methylcyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Methylene Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Naphthalene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Styrene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Toluene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Trichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/20/17	04/20/17 14:12	1011
o-Xylene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041927

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): **17041927**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	TB-04-19-17	Initial	17041927-001	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:12
	Influent VSP-1	Initial	17041927-002	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 15:17
	Effluent VSP-4	Initial	17041927-003	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:34
	Lead Ambersorb Ef	Initial	17041927-004	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:56
	65789-1-BKS	BKS	65789-1-BKS	1011	W	65789	141870	--------	04/20/2017 08:58	04/20/2017 10:22
	65789-1-BLK	BLK	65789-1-BLK	1011	W	65789	141870	--------	04/20/2017 08:58	04/20/2017 11:15
	Corrado Tank 2 Eff. 4/17 S	MS	17041805-001 S	1011	W	65789	141870	04/17/2017	04/20/2017 08:58	04/20/2017 13:08
	Corrado Tank 2 Eff. 4/17 SD	MSD	17041805-001 SD	1011	W	65789	141870	04/17/2017	04/20/2017 08:58	04/20/2017 13:29
	Influent VSP-1	Reanalysis	17041927-002	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 15:39
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17041927-003	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 11:22
	Lead Ambersorb Ef	Initial	17041927-004	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 11:43
	65797-1-BKS	BKS	65797-1-BKS	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 09:35
	65797-1-BLK	BLK	65797-1-BLK	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 10:41
	65797-1-BSD	BSD	65797-1-BSD	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 09:58
	Influent VSP-1	Reanalysis	17041927-002	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 12:48

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	04/20/17 14:12
Dibromofluoromethane	102		91-119	%	04/20/17 14:12
Toluene-D8	101		90-117	%	04/20/17 14:12

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/20/17 15:17
Dibromofluoromethane	100		91-119	%	04/20/17 15:17
Toluene-D8	103		90-117	%	04/20/17 15:17

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	04/21/17 13:10

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/20/17 14:34
Dibromofluoromethane	101		91-119	%	04/20/17 14:34
Toluene-D8	101		90-117	%	04/20/17 14:34

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	102		80-120	%	04/21/17 11:22

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	04/20/17 14:56
Dibromofluoromethane	102		91-119	%	04/20/17 14:56
Toluene-D8	103		90-117	%	04/20/17 14:56

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	98		80-120	%	04/21/17 11:43

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 17041927

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141870 Matrix: Water Date Prep: 04/20/17

MB Sample Id: 65789-1-BLK LCS Sample Id: 65789-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	52.45	105	29-149	ug/L	04/20/17 10:22	
Benzene	<1.000	50.00	53.01	106	85-123	ug/L	04/20/17 10:22	
Bromochloromethane	<1.000	50.00	54.32	109	82-136	ug/L	04/20/17 10:22	
Bromodichloromethane	<1.000	50.00	54.48	109	88-133	ug/L	04/20/17 10:22	
Bromoform	<5.000	50.00	52.11	104	80-126	ug/L	04/20/17 10:22	
Bromomethane	<1.000	50.00	41.78	84	64-139	ug/L	04/20/17 10:22	
2-Butanone (MEK)	<10.00	50.00	48.84	98	39-135	ug/L	04/20/17 10:22	
Carbon Disulfide	<10.00	50.00	53.47	107	85-124	ug/L	04/20/17 10:22	
Carbon Tetrachloride	<1.000	50.00	48.23	96	81-138	ug/L	04/20/17 10:22	
Chlorobenzene	<1.000	50.00	53.20	106	85-120	ug/L	04/20/17 10:22	
Chloroethane	<1.000	50.00	49.57	99	75-129	ug/L	04/20/17 10:22	
Chloroform	<1.000	50.00	52.94	106	85-128	ug/L	04/20/17 10:22	
Chloromethane	<1.000	50.00	48.03	96	60-139	ug/L	04/20/17 10:22	
Cyclohexane	<10.00	50.00	55.36	111	55-131	ug/L	04/20/17 10:22	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.39	95	69-127	ug/L	04/20/17 10:22	
Dibromochloromethane	<1.000	50.00	49.11	98	82-127	ug/L	04/20/17 10:22	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.48	99	82-121	ug/L	04/20/17 10:22	
1,2-Dichlorobenzene	<1.000	50.00	53.28	107	82-123	ug/L	04/20/17 10:22	
1,3-Dichlorobenzene	<1.000	50.00	53.84	108	81-123	ug/L	04/20/17 10:22	
1,4-Dichlorobenzene	<1.000	50.00	52.84	106	81-121	ug/L	04/20/17 10:22	
Dichlorodifluoromethane	<1.000	50.00	55.12	110	69-147	ug/L	04/20/17 10:22	
1,1-Dichloroethane	<1.000	50.00	52.41	105	83-123	ug/L	04/20/17 10:22	
1,2-Dichloroethane	<1.000	50.00	51.91	104	86-138	ug/L	04/20/17 10:22	
1,1-Dichloroethene	<1.000	50.00	54.33	109	85-127	ug/L	04/20/17 10:22	
cis-1,2-Dichloroethene	<1.000	50.00	52.54	105	87-127	ug/L	04/20/17 10:22	
1,2-Dichloropropane	<1.000	50.00	53.05	106	79-125	ug/L	04/20/17 10:22	
cis-1,3-Dichloropropene	<1.000	50.00	49.06	98	79-131	ug/L	04/20/17 10:22	
trans-1,3-Dichloropropene	<1.000	50.00	49.38	99	82-133	ug/L	04/20/17 10:22	
trans-1,2-Dichloroethene	<1.000	50.00	53.42	107	85-125	ug/L	04/20/17 10:22	
Ethylbenzene	<1.000	50.00	55.34	111	83-123	ug/L	04/20/17 10:22	
2-Hexanone	<5.000	50.00	47.08	94	37-137	ug/L	04/20/17 10:22	
Isopropylbenzene	<1.000	50.00	49.66	99	70-131	ug/L	04/20/17 10:22	
Methyl Acetate	<10.00	50.00	53.81	108	69-127	ug/L	04/20/17 10:22	
Methylcyclohexane	<10.00	50.00	50.00	100	75-129	ug/L	04/20/17 10:22	
Methylene Chloride	<1.000	50.00	52.21	104	86-124	ug/L	04/20/17 10:22	
4-Methyl-2-Pentanone	<5.000	50.00	47.96	96	39-143	ug/L	04/20/17 10:22	
Methyl-t-butyl ether	<1.000	50.00	55.21	110	75-134	ug/L	04/20/17 10:22	
Naphthalene	<1.000	50.00	48.00	96	61-118	ug/L	04/20/17 10:22	
Styrene	<1.000	50.00	50.34	101	80-120	ug/L	04/20/17 10:22	
1,1,2,2-Tetrachloroethane	<1.000	50.00	51.43	103	64-125	ug/L	04/20/17 10:22	
Tetrachloroethene	<1.000	50.00	53.34	107	83-138	ug/L	04/20/17 10:22	
Toluene	<1.000	50.00	53.28	107	88-126	ug/L	04/20/17 10:22	
1,2,3-Trichlorobenzene	<1.000	50.00	49.25	99	75-124	ug/L	04/20/17 10:22	
1,2,4-Trichlorobenzene	<1.000	50.00	49.22	98	77-131	ug/L	04/20/17 10:22	
1,1,1-Trichloroethane	<1.000	50.00	52.63	105	68-146	ug/L	04/20/17 10:22	
1,1,2-Trichloroethane	<1.000	50.00	53.62	107	85-124	ug/L	04/20/17 10:22	
Trichloroethene	<1.000	50.00	53.96	108	87-127	ug/L	04/20/17 10:22	
Trichlorofluoromethane	<5.000	50.00	49.87	100	77-147	ug/L	04/20/17 10:22	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.31	111	68-135	ug/L	04/20/17 10:22	
Vinyl Chloride	<1.000	50.00	56.96	114	74-138	ug/L	04/20/17 10:22	
m,p-Xylenes	<2.000	100	99.53	100	84-124	ug/L	04/20/17 10:22	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141870 Matrix: Water Date Prep: 04/20/17

MB Sample Id: 65789-1-BLK LCS Sample Id: 65789-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	49.78	100	79-126	ug/L	04/20/17 10:22	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		99		86-111	%	04/20/17 10:22
Dibromofluoromethane	100		100		91-119	%	04/20/17 10:22
Toluene-D8	101		101		90-117	%	04/20/17 10:22

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

Seq Number: 141872 Matrix: Water Date Prep: 04/21/17

MB Sample Id: 65797-1-BLK LCS Sample Id: 65797-1-BKS LCSD Sample Id: 65797-1-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	27.32	91	30.31	101	50-150	10	20	ug/L	04/21/17 09:35	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	100		104		103		80-120	%	04/21/17 09:35

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.

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: Koppers PROJECT NO.:

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

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

PSS Work Order #: 17041927 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 (8270 SIM)	REMARKS
							HCl	HCl			
1	TB-04-19-17	—	—	DW	2	—			X		
2	Influent VSP-1	4/19/17	1055	WW	6	G			X	X	
3	Effluent VSP-4	4/19/17	1032	WW	6	G			X	X	
4	Lead Ambersorb EF	4/19/17	1043	WW	6	G			X	X	

(5)

	Date	Time	
Relinquished By: (1)	4/19/17	1522	Received By:
Relinquished By: (2)	04/19/17	1600	Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)			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 3°C)

Custody Seal: Cooler Intact

Ice Present: Pres Temp: 3°C-6°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17041927	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/19/2017 04:00:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/24/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 4 Total No. of Containers Received 20

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: 04/19/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 04/20/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17050818

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

May 15, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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PHASE SEPARATION SCIENCE, INC.

May 15, 2017

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

Reference: PSS Work Order(s) No: **17050818**
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 **17050818**.

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 June 12, 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): 17050818

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/08/2017 at 04:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17050818-001	Effluent VSP-4	WASTE WATER	05/08/17 10:20
17050818-002	Influent VSP-1	GROUND WATER	05/08/17 09:55
17050818-003	TB-050817	WATER	05/08/17 16:05

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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ROUTE 40 WEST
BALTIMORE, MD 21228
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800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 05/08/2017 09:55** **PSS Sample ID: 17050818-002**
Matrix: GROUND WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 15:15	1011
Benzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Bromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Bromodichloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Bromoform	ND	ug/L	5.0		1	05/10/17	05/10/17 15:15	1011
Bromomethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
2-Butanone (MEK)	ND	ug/L	10		1	05/10/17	05/10/17 15:15	1011
Carbon Disulfide	ND	ug/L	10		1	05/10/17	05/10/17 15:15	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Chlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Chloroethane	**2.7**	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Chloroform	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Chloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Cyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 15:15	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	05/10/17	05/10/17 15:15	1011
Dibromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,1-Dichloroethane	**86**	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,2-Dichloroethane	**2.6**	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,1-Dichloroethene	**350**	ug/L	10		10	05/10/17	05/10/17 15:37	1011
cis-1,2-Dichloroethene	**1.9**	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Ethylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 05/08/2017 09:55** **PSS Sample ID: 17050818-002**
Matrix: GROUND WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 15:15	1011
Isopropylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Methyl Acetate	ND	ug/L	10		1	05/10/17	05/10/17 15:15	1011
Methylcyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 15:15	1011
Methylene Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	05/10/17	05/10/17 15:15	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Naphthalene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Styrene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Tetrachloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Toluene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,1,1-Trichloroethane	**41**	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Trichloroethene	**2.6**	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 15:15	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
Vinyl Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	1011
m,p-Xylenes	ND	ug/L	2.0		1	05/10/17	05/10/17 15:15	1011
o-Xylene	ND	ug/L	1.0		1	05/10/17	05/10/17 15:15	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)	**220**	ug/L	10		10	05/13/17	05/13/17 11:03	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: TB-050817 **Date/Time Sampled: 05/08/2017 16:05** **PSS Sample ID: 17050818-003**
Matrix: WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 14:32	1011
Benzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Bromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Bromodichloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Bromoform	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
Bromomethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
2-Butanone (MEK)	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Carbon Disulfide	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chloroform	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Cyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
Dibromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Ethylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: TB-050817 **Date/Time Sampled: 05/08/2017 16:05** **PSS Sample ID: 17050818-003**
Matrix: WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 14:32	1011
Isopropylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Methyl Acetate	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Methylcyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Methylene Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Naphthalene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Styrene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Tetrachloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Toluene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Trichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Vinyl Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
m,p-Xylenes	ND	ug/L	2.0		1	05/10/17	05/10/17 14:32	1011
o-Xylene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17050818

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): 17050818
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	Effluent VSP-4	Initial	17050818-001	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 14:54
	Influent VSP-1	Initial	17050818-002	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 15:15
	TB-050817	Initial	17050818-003	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 14:32
	66078-1-BKS	BKS	66078-1-BKS	1011	W	66078	142446	--------	05/10/2017 07:48	05/10/2017 08:52
	66078-1-BLK	BLK	66078-1-BLK	1011	W	66078	142446	--------	05/10/2017 07:48	05/10/2017 10:24
	Effluent VSP-4 S	MS	17050818-001 S	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 16:00
	Effluent VSP-4 SD	MSD	17050818-001 SD	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 16:25
	Influent VSP-1	Reanalysis	17050818-002	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 15:37
SW-846 8260 B-Modified	66128-1-BKS	BKS	66128-1-BKS	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 08:47
	66128-1-BLK	BLK	66128-1-BLK	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 10:17
	66128-1-BSD	BSD	66128-1-BSD	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 09:09
	Influent VSP-1	Reanalysis	17050818-002	1011	W	66128	142550	05/08/2017	05/13/2017 07:56	05/13/2017 11:03

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Waste Water Date Prep: 05/10/2017
PSS Sample ID: 17050818-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	05/10/17 14:54
Dibromofluoromethane	100		91-119	%	05/10/17 14:54
Toluene-D8	100		90-117	%	05/10/17 14:54

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Ground Water Date Prep: 05/10/2017
PSS Sample ID: 17050818-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	05/10/17 15:15
Dibromofluoromethane	99		91-119	%	05/10/17 15:15
Toluene-D8	100		90-117	%	05/10/17 15:15

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 142550 Matrix: Ground Water Date Prep: 05/13/2017
PSS Sample ID: 17050818-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	101		80-120	%	05/13/17 11:26

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Water Date Prep: 05/10/2017
PSS Sample ID: 17050818-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	05/10/17 14:32
Dibromofluoromethane	100		91-119	%	05/10/17 14:32
Toluene-D8	101		90-117	%	05/10/17 14:32

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 17050818

WSP USA - Herndon

Kop-Flex

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

Seq Number: 142446 Matrix: Water Date Prep: 05/10/17

MB Sample Id: 66078-1-BLK LCS Sample Id: 66078-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	49.30	99	29-149	ug/L	05/10/17 08:52	
Benzene	<1.000	50.00	52.03	104	85-123	ug/L	05/10/17 08:52	
Bromochloromethane	<1.000	50.00	53.44	107	82-136	ug/L	05/10/17 08:52	
Bromodichloromethane	<1.000	50.00	52.46	105	88-133	ug/L	05/10/17 08:52	
Bromoform	<5.000	50.00	50.82	102	80-126	ug/L	05/10/17 08:52	
Bromomethane	<1.000	50.00	50.66	101	64-139	ug/L	05/10/17 08:52	
2-Butanone (MEK)	<10.00	50.00	53.10	106	39-135	ug/L	05/10/17 08:52	
Carbon Disulfide	<10.00	50.00	49.23	98	85-124	ug/L	05/10/17 08:52	
Carbon Tetrachloride	<1.000	50.00	53.78	108	81-138	ug/L	05/10/17 08:52	
Chlorobenzene	<1.000	50.00	49.69	99	85-120	ug/L	05/10/17 08:52	
Chloroethane	<1.000	50.00	50.67	101	75-129	ug/L	05/10/17 08:52	
Chloroform	<1.000	50.00	50.63	101	85-128	ug/L	05/10/17 08:52	
Chloromethane	<1.000	50.00	47.76	96	60-139	ug/L	05/10/17 08:52	
Cyclohexane	<10.00	50.00	51.48	103	55-131	ug/L	05/10/17 08:52	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	51.40	103	69-127	ug/L	05/10/17 08:52	
Dibromochloromethane	<1.000	50.00	52.91	106	82-127	ug/L	05/10/17 08:52	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.72	103	82-121	ug/L	05/10/17 08:52	
1,2-Dichlorobenzene	<1.000	50.00	51.73	103	82-123	ug/L	05/10/17 08:52	
1,3-Dichlorobenzene	<1.000	50.00	50.40	101	81-123	ug/L	05/10/17 08:52	
1,4-Dichlorobenzene	<1.000	50.00	49.49	99	81-121	ug/L	05/10/17 08:52	
Dichlorodifluoromethane	<1.000	50.00	45.68	91	69-147	ug/L	05/10/17 08:52	
1,1-Dichloroethane	<1.000	50.00	52.26	105	83-123	ug/L	05/10/17 08:52	
1,2-Dichloroethane	<1.000	50.00	49.99	100	86-138	ug/L	05/10/17 08:52	
1,1-Dichloroethene	<1.000	50.00	52.80	106	85-127	ug/L	05/10/17 08:52	
cis-1,2-Dichloroethene	<1.000	50.00	52.56	105	87-127	ug/L	05/10/17 08:52	
1,2-Dichloropropane	<1.000	50.00	52.30	105	79-125	ug/L	05/10/17 08:52	
cis-1,3-Dichloropropene	<1.000	50.00	55.55	111	79-131	ug/L	05/10/17 08:52	
trans-1,3-Dichloropropene	<1.000	50.00	55.65	111	82-133	ug/L	05/10/17 08:52	
trans-1,2-Dichloroethene	<1.000	50.00	51.83	104	85-125	ug/L	05/10/17 08:52	
Ethylbenzene	<1.000	50.00	53.20	106	83-123	ug/L	05/10/17 08:52	
2-Hexanone	<5.000	50.00	47.82	96	37-137	ug/L	05/10/17 08:52	
Isopropylbenzene	<1.000	50.00	53.80	108	70-131	ug/L	05/10/17 08:52	
Methyl Acetate	<10.00	50.00	50.07	100	69-127	ug/L	05/10/17 08:52	
Methylcyclohexane	<10.00	50.00	51.63	103	75-129	ug/L	05/10/17 08:52	
Methylene Chloride	<1.000	50.00	50.79	102	86-124	ug/L	05/10/17 08:52	
4-Methyl-2-Pentanone	<5.000	50.00	48.32	97	39-143	ug/L	05/10/17 08:52	
Methyl-t-butyl ether	<1.000	50.00	54.30	109	75-134	ug/L	05/10/17 08:52	
Naphthalene	<1.000	50.00	49.93	100	61-118	ug/L	05/10/17 08:52	
Styrene	<1.000	50.00	55.90	112	80-120	ug/L	05/10/17 08:52	
1,1,2,2-Tetrachloroethane	<1.000	50.00	51.25	103	64-125	ug/L	05/10/17 08:52	
Tetrachloroethene	<1.000	50.00	50.81	102	83-138	ug/L	05/10/17 08:52	
Toluene	<1.000	50.00	52.99	106	88-126	ug/L	05/10/17 08:52	
1,2,3-Trichlorobenzene	<1.000	50.00	51.06	102	75-124	ug/L	05/10/17 08:52	
1,2,4-Trichlorobenzene	<1.000	50.00	50.70	101	77-131	ug/L	05/10/17 08:52	
1,1,1-Trichloroethane	<1.000	50.00	51.77	104	68-146	ug/L	05/10/17 08:52	
1,1,2-Trichloroethane	<1.000	50.00	51.21	102	85-124	ug/L	05/10/17 08:52	
Trichloroethene	<1.000	50.00	53.06	106	87-127	ug/L	05/10/17 08:52	
Trichlorofluoromethane	<5.000	50.00	49.47	99	77-147	ug/L	05/10/17 08:52	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	50.98	102	68-135	ug/L	05/10/17 08:52	
Vinyl Chloride	<1.000	50.00	48.33	97	74-138	ug/L	05/10/17 08:52	
m,p-Xylenes	<2.000	100	106.3	106	84-124	ug/L	05/10/17 08:52	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon
Kop-Flex

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

Seq Number: 142446 Matrix: Water Date Prep: 05/10/17

MB Sample Id: 66078-1-BLK LCS Sample Id: 66078-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	53.86	108	79-126	ug/L	05/10/17 08:52	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		99		86-111	%	05/10/17 08:52
Dibromofluoromethane	98		99		91-119	%	05/10/17 08:52
Toluene-D8	101		101		90-117	%	05/10/17 08:52

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon

Kop-Flex

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

Seq Number: 142446 Matrix: Waste Water Date Prep: 05/10/17

Parent Sample Id: 17050818-001 MS Sample Id: 17050818-001 S MSD Sample Id: 17050818-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	44.36	89	44.51	89	46-138	0	25	ug/L	05/10/17 16:00	
Benzene	<1.000	50.00	53.49	107	54.16	108	77-126	1	25	ug/L	05/10/17 16:00	
Bromochloromethane	<1.000	50.00	54.88	110	55.39	111	74-133	1	25	ug/L	05/10/17 16:00	
Bromodichloromethane	<1.000	50.00	53.72	107	54.15	108	79-130	1	25	ug/L	05/10/17 16:00	
Bromoform	<5.000	50.00	51.49	103	52.65	105	69-120	2	25	ug/L	05/10/17 16:00	
Bromomethane	<1.000	50.00	52.49	105	51.81	104	64-130	1	25	ug/L	05/10/17 16:00	
2-Butanone (MEK)	<10.00	50.00	43.86	88	44.75	90	34-126	2	25	ug/L	05/10/17 16:00	
Carbon Disulfide	<10.00	50.00	50.64	101	50.73	101	76-126	0	25	ug/L	05/10/17 16:00	
Carbon Tetrachloride	<1.000	50.00	56.26	113	56.25	113	77-137	0	25	ug/L	05/10/17 16:00	
Chlorobenzene	<1.000	50.00	51.42	103	52.83	106	74-120	3	25	ug/L	05/10/17 16:00	
Chloroethane	<1.000	50.00	53.34	107	52.04	104	68-133	2	25	ug/L	05/10/17 16:00	
Chloroform	<1.000	50.00	51.80	104	52.49	105	77-127	1	25	ug/L	05/10/17 16:00	
Chloromethane	<1.000	50.00	50.43	101	50.16	100	50-143	1	25	ug/L	05/10/17 16:00	
Cyclohexane	<10.00	50.00	52.93	106	52.27	105	53-139	1	25	ug/L	05/10/17 16:00	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	52.76	106	53.84	108	56-123	2	25	ug/L	05/10/17 16:00	
Dibromochloromethane	<1.000	50.00	54.96	110	56.11	112	70-125	2	25	ug/L	05/10/17 16:00	
1,2-Dibromoethane (EDB)	<1.000	50.00	52.84	106	53.97	108	69-121	2	25	ug/L	05/10/17 16:00	
1,2-Dichlorobenzene	<1.000	50.00	51.64	103	52.85	106	69-118	2	25	ug/L	05/10/17 16:00	
1,3-Dichlorobenzene	<1.000	50.00	50.94	102	52.37	105	68-119	3	25	ug/L	05/10/17 16:00	
1,4-Dichlorobenzene	<1.000	50.00	50.08	100	50.62	101	67-117	1	25	ug/L	05/10/17 16:00	
Dichlorodifluoromethane	<1.000	50.00	45.69	91	46.76	94	68-139	2	25	ug/L	05/10/17 16:00	
1,1-Dichloroethane	<1.000	50.00	52.72	105	54.24	108	78-126	3	25	ug/L	05/10/17 16:00	
1,2-Dichloroethane	<1.000	50.00	51.91	104	51.60	103	78-134	1	25	ug/L	05/10/17 16:00	
1,1-Dichloroethene	<1.000	50.00	55.02	110	54.35	109	78-125	1	25	ug/L	05/10/17 16:00	
cis-1,2-Dichloroethene	<1.000	50.00	52.67	105	53.83	108	78-128	2	25	ug/L	05/10/17 16:00	
1,2-Dichloropropane	<1.000	50.00	52.68	105	52.50	105	73-126	0	25	ug/L	05/10/17 16:00	
cis-1,3-Dichloropropene	<1.000	50.00	53.75	108	53.92	108	67-126	0	25	ug/L	05/10/17 16:00	
trans-1,3-Dichloropropene	<1.000	50.00	53.57	107	55.74	111	68-129	4	25	ug/L	05/10/17 16:00	
trans-1,2-Dichloroethene	<1.000	50.00	52.93	106	54.30	109	76-128	3	25	ug/L	05/10/17 16:00	
Ethylbenzene	<1.000	50.00	54.17	108	55.43	111	74-123	2	25	ug/L	05/10/17 16:00	
2-Hexanone	<5.000	50.00	40.93	82	41.73	83	38-125	2	25	ug/L	05/10/17 16:00	
Isopropylbenzene	<1.000	50.00	55.15	110	54.83	110	58-129	1	25	ug/L	05/10/17 16:00	
Methyl Acetate	<10.00	50.00	49.20	98	49.48	99	63-115	1	25	ug/L	05/10/17 16:00	
Methylcyclohexane	<10.00	50.00	51.52	103	50.34	101	69-130	2	25	ug/L	05/10/17 16:00	
Methylene Chloride	<1.000	50.00	52.54	105	52.47	105	76-124	0	25	ug/L	05/10/17 16:00	
4-Methyl-2-Pentanone	<5.000	50.00	40.14	80	41.62	83	35-123	4	25	ug/L	05/10/17 16:00	
Methyl-t-butyl ether	<1.000	50.00	50.48	101	52.45	105	64-129	4	25	ug/L	05/10/17 16:00	
Naphthalene	<1.000	50.00	48.87	98	49.05	98	45-109	0	25	ug/L	05/10/17 16:00	
Styrene	<1.000	50.00	57.22	114	57.76	116	61-124	1	25	ug/L	05/10/17 16:00	
1,1,2,2-Tetrachloroethane	<1.000	50.00	52.83	106	54.11	108	47-130	2	25	ug/L	05/10/17 16:00	
Tetrachloroethene	<1.000	50.00	50.48	101	50.95	102	68-139	1	25	ug/L	05/10/17 16:00	
Toluene	<1.000	50.00	53.73	107	54.67	109	79-128	2	25	ug/L	05/10/17 16:00	
1,2,3-Trichlorobenzene	<1.000	50.00	52.51	105	51.68	103	48-122	2	25	ug/L	05/10/17 16:00	
1,2,4-Trichlorobenzene	<1.000	50.00	50.39	101	51.58	103	54-124	2	25	ug/L	05/10/17 16:00	
1,1,1-Trichloroethane	<1.000	50.00	52.51	105	53.33	107	73-140	2	25	ug/L	05/10/17 16:00	
1,1,2-Trichloroethane	<1.000	50.00	53.07	106	53.54	107	78-124	1	25	ug/L	05/10/17 16:00	
Trichloroethene	<1.000	50.00	52.61	105	53.59	107	77-131	2	25	ug/L	05/10/17 16:00	
Trichlorofluoromethane	<5.000	50.00	52.09	104	51.47	103	73-144	1	25	ug/L	05/10/17 16:00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	50.67	101	50.56	101	65-140	0	25	ug/L	05/10/17 16:00	
Vinyl Chloride	<1.000	50.00	52.57	105	51.65	103	60-146	2	25	ug/L	05/10/17 16:00	
m,p-Xylenes	<2.000	100	110.9	111	109.3	109	75-125	1	25	ug/L	05/10/17 16:00	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Waste Water Date Prep: 05/10/17
Parent Sample Id: 17050818-001 MS Sample Id: 17050818-001 S MSD Sample Id: 17050818-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	55.04	110	56.24	112	69-126	2	25	ug/L	05/10/17 16:00	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	05/10/17 16:00
Dibromofluoromethane	99		98		91-119	%	05/10/17 16:00
Toluene-D8	99		99		90-117	%	05/10/17 16:00

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 142550 Matrix: Water Date Prep: 05/13/17
MB Sample Id: 66128-1-BLK LCS Sample Id: 66128-1-BKS LCSD Sample Id: 66128-1-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	30.14	100	29.49	98	50-150	2	20	ug/L	05/13/17 08:47	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	97		104		101		80-120	%	05/13/17 08:47

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.

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@wspgroup.com FAX NO.: ( )

*PROJECT NAME: Koppers PROJECT NO.:

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

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

PSS Work Order #: 1705081 8 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														REMARKS
								HCl	HCl												
							Analysis/ Method Required (3) *														
									1,4 Dioxane (8260 SIM)												
								VOCs (8260)													
1	Effluent VSP-4	5/8/17	1020	WW	3	G	X														
2	Influent VSP-1	5/8/17	0955	GW	6	G	X	X													
3	TB-050817	—	—	DW	2	—	X														

(5)

Relinquished By: (1)	Date	Time	Received By:
	5/8/17	1605	
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

Custody Seal: Cooler Intact

Ice Present: PRES Temp: 7°-9°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17050818	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	05/08/2017 04:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Client
Disposal Date	06/12/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	9
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

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: 05/08/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 05/09/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17062102

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

June 28, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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PHASE SEPARATION SCIENCE, INC.

June 28, 2017

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

Reference: PSS Work Order(s) No: **17062102**
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 **17062102**.

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 July 26, 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): 17062102

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 06/21/2017 at 10:35 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17062102-001	Influent VSP-1	WASTE WATER	06/21/17 09:15
17062102-002	Effluent VSP-4	WASTE WATER	06/21/17 09:00
17062102-003	TB-062117	WATER	06/21/17 10:35

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

OFFICES:
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ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17062102

WSP USA - Herndon, Herndon, VA

June 28, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 06/21/2017 09:15** **PSS Sample ID: 17062102-001**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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	06/23/17	06/23/17 14:09	1011
Benzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Bromochloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Bromodichloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Bromoform	ND	ug/L	5.0		1	06/23/17	06/23/17 14:09	1011
Bromomethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
2-Butanone (MEK)	ND	ug/L	10		1	06/23/17	06/23/17 14:09	1011
Carbon Disulfide	ND	ug/L	10		1	06/23/17	06/23/17 14:09	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Chlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Chloroethane	**2.7**	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Chloroform	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Chloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Cyclohexane	ND	ug/L	10		1	06/23/17	06/23/17 14:09	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	06/23/17	06/23/17 14:09	1011
Dibromochloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,1-Dichloroethane	**59**	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,2-Dichloroethane	**2.1**	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,1-Dichloroethene	**310**	ug/L	10		10	06/23/17	06/23/17 14:31	1011
cis-1,2-Dichloroethene	**1.4**	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Ethylbenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17062102

WSP USA - Herndon, Herndon, VA

June 28, 2017

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

Sample ID: Influent VSP-1 **Date/Time Sampled: 06/21/2017 09:15** **PSS Sample ID: 17062102-001**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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	06/23/17	06/23/17 14:09	1011
Isopropylbenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Methyl Acetate	ND	ug/L	10		1	06/23/17	06/23/17 14:09	1011
Methylcyclohexane	ND	ug/L	10		1	06/23/17	06/23/17 14:09	1011
Methylene Chloride	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	06/23/17	06/23/17 14:09	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Naphthalene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Styrene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Tetrachloroethene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Toluene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,1,1-Trichloroethane	**39**	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Trichloroethene	**2.2**	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	06/23/17	06/23/17 14:09	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
Vinyl Chloride	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	1011
m,p-Xylenes	ND	ug/L	2.0		1	06/23/17	06/23/17 14:09	1011
o-Xylene	ND	ug/L	1.0		1	06/23/17	06/23/17 14:09	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)	**190**	ug/L	10		10	06/26/17	06/26/17 20:34	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17062102

WSP USA - Herndon, Herndon, VA

June 28, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 06/21/2017 09:00** **PSS Sample ID: 17062102-002**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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	06/26/17	06/26/17 20:13	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17062102

WSP USA - Herndon, Herndon, VA

June 28, 2017

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

Sample ID: TB-062117 **Date/Time Sampled: 06/21/2017 10:35** **PSS Sample ID: 17062102-003**
Matrix: WATER **Date/Time Received: 06/21/2017 10:35**

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	06/23/17	06/23/17 13:47	1011
Benzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Bromochloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Bromodichloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Bromoform	ND	ug/L	5.0		1	06/23/17	06/23/17 13:47	1011
Bromomethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
2-Butanone (MEK)	ND	ug/L	10		1	06/23/17	06/23/17 13:47	1011
Carbon Disulfide	ND	ug/L	10		1	06/23/17	06/23/17 13:47	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Chlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Chloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Chloroform	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Chloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Cyclohexane	ND	ug/L	10		1	06/23/17	06/23/17 13:47	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	06/23/17	06/23/17 13:47	1011
Dibromochloromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Ethylbenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17062102

WSP USA - Herndon, Herndon, VA

June 28, 2017

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

Sample ID: TB-062117 **Date/Time Sampled: 06/21/2017 10:35** **PSS Sample ID: 17062102-003**
Matrix: WATER **Date/Time Received: 06/21/2017 10:35**

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	06/23/17	06/23/17 13:47	1011
Isopropylbenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Methyl Acetate	ND	ug/L	10		1	06/23/17	06/23/17 13:47	1011
Methylcyclohexane	ND	ug/L	10		1	06/23/17	06/23/17 13:47	1011
Methylene Chloride	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	06/23/17	06/23/17 13:47	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Naphthalene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Styrene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Tetrachloroethene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Toluene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Trichloroethene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	06/23/17	06/23/17 13:47	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
Vinyl Chloride	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011
m,p-Xylenes	ND	ug/L	2.0		1	06/23/17	06/23/17 13:47	1011
o-Xylene	ND	ug/L	1.0		1	06/23/17	06/23/17 13:47	1011

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17062102

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): **17062102**
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	17062102-001	1011	W	66735	143889	06/21/2017	06/23/2017 08:30	06/23/2017 14:09
	TB-062117	Initial	17062102-003	1011	W	66735	143889	06/21/2017	06/23/2017 08:30	06/23/2017 13:47
	66735-1-BKS	BKS	66735-1-BKS	1011	W	66735	143889	--------	06/23/2017 08:30	06/23/2017 09:35
	66735-1-BLK	BLK	66735-1-BLK	1011	W	66735	143889	--------	06/23/2017 08:30	06/23/2017 10:27
	MW- S	MS	17062209-001 S	1011	W	66735	143889	06/22/2017	06/23/2017 08:30	06/23/2017 15:58
	MW- SD	MSD	17062209-001 SD	1011	W	66735	143889	06/22/2017	06/23/2017 08:30	06/23/2017 16:19
	Influent VSP-1	Reanalysis	17062102-001	1011	W	66735	143889	06/21/2017	06/23/2017 08:30	06/23/2017 14:31
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17062102-002	1011	W	66750	143922	06/21/2017	06/26/2017 10:47	06/26/2017 20:13
	66750-1-BKS	BKS	66750-1-BKS	1011	W	66750	143922	--------	06/26/2017 10:47	06/26/2017 18:25
	66750-1-BLK	BLK	66750-1-BLK	1011	W	66750	143922	--------	06/26/2017 10:47	06/26/2017 19:51
	66750-1-BSD	BSD	66750-1-BSD	1011	W	66750	143922	--------	06/26/2017 10:47	06/26/2017 18:46
	Influent VSP-1	Reanalysis	17062102-001	1011	W	66750	143922	06/21/2017	06/26/2017 10:47	06/26/2017 20:34

PHASE SEPARATION SCIENCE, INC.

QC Summary 17062102

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 143889 Matrix: Waste Water Date Prep: 06/23/2017
PSS Sample ID: 17062102-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	06/23/17 14:09
Dibromofluoromethane	106		91-119	%	06/23/17 14:09
Toluene-D8	102		90-117	%	06/23/17 14:09

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 143922 Matrix: Waste Water Date Prep: 06/26/2017
PSS Sample ID: 17062102-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	93		80-120	%	06/26/17 20:56

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 143922 Matrix: Waste Water Date Prep: 06/26/2017
PSS Sample ID: 17062102-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	104		80-120	%	06/26/17 20:13

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 143889 Matrix: Water Date Prep: 06/23/2017
PSS Sample ID: 17062102-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	06/23/17 13:47
Dibromofluoromethane	93		91-119	%	06/23/17 13:47
Toluene-D8	90		90-117	%	06/23/17 13:47

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 17062102

WSP USA - Herndon
Kop-Flex

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

Seq Number: 143889 Matrix: Water Date Prep: 06/23/17

MB Sample Id: 66735-1-BLK LCS Sample Id: 66735-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	53.08	106	29-149	ug/L	06/23/17 09:35	
Benzene	<1.000	50.00	56.00	112	85-123	ug/L	06/23/17 09:35	
Bromochloromethane	<1.000	50.00	50.46	101	82-136	ug/L	06/23/17 09:35	
Bromodichloromethane	<1.000	50.00	52.02	104	88-133	ug/L	06/23/17 09:35	
Bromoform	<5.000	50.00	51.21	102	80-126	ug/L	06/23/17 09:35	
Bromomethane	<1.000	50.00	60.32	121	64-139	ug/L	06/23/17 09:35	
2-Butanone (MEK)	<10.00	50.00	47.13	94	39-135	ug/L	06/23/17 09:35	
Carbon Disulfide	<10.00	50.00	53.91	108	85-124	ug/L	06/23/17 09:35	
Carbon Tetrachloride	<1.000	50.00	52.02	104	81-138	ug/L	06/23/17 09:35	
Chlorobenzene	<1.000	50.00	56.50	113	85-120	ug/L	06/23/17 09:35	
Chloroethane	<1.000	50.00	56.49	113	75-129	ug/L	06/23/17 09:35	
Chloroform	<1.000	50.00	51.21	102	85-128	ug/L	06/23/17 09:35	
Chloromethane	<1.000	50.00	55.40	111	60-139	ug/L	06/23/17 09:35	
Cyclohexane	<10.00	50.00	61.95	124	55-131	ug/L	06/23/17 09:35	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	53.71	107	69-127	ug/L	06/23/17 09:35	
Dibromochloromethane	<1.000	50.00	50.33	101	82-127	ug/L	06/23/17 09:35	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.26	103	82-121	ug/L	06/23/17 09:35	
1,2-Dichlorobenzene	<1.000	50.00	58.21	116	82-123	ug/L	06/23/17 09:35	
1,3-Dichlorobenzene	<1.000	50.00	56.03	112	81-123	ug/L	06/23/17 09:35	
1,4-Dichlorobenzene	<1.000	50.00	56.63	113	81-121	ug/L	06/23/17 09:35	
Dichlorodifluoromethane	<1.000	50.00	53.15	106	69-147	ug/L	06/23/17 09:35	
1,1-Dichloroethane	<1.000	50.00	54.79	110	83-123	ug/L	06/23/17 09:35	
1,2-Dichloroethane	<1.000	50.00	53.31	107	86-138	ug/L	06/23/17 09:35	
1,1-Dichloroethene	<1.000	50.00	56.56	113	85-127	ug/L	06/23/17 09:35	
cis-1,2-Dichloroethene	<1.000	50.00	51.20	102	87-127	ug/L	06/23/17 09:35	
1,2-Dichloropropane	<1.000	50.00	52.18	104	79-125	ug/L	06/23/17 09:35	
cis-1,3-Dichloropropene	<1.000	50.00	52.35	105	79-131	ug/L	06/23/17 09:35	
trans-1,3-Dichloropropene	<1.000	50.00	51.15	102	82-133	ug/L	06/23/17 09:35	
trans-1,2-Dichloroethene	<1.000	50.00	56.62	113	85-125	ug/L	06/23/17 09:35	
Ethylbenzene	<1.000	50.00	55.24	110	83-123	ug/L	06/23/17 09:35	
2-Hexanone	<5.000	50.00	48.92	98	37-137	ug/L	06/23/17 09:35	
Isopropylbenzene	<1.000	50.00	57.52	115	70-131	ug/L	06/23/17 09:35	
Methyl Acetate	<10.00	50.00	58.75	118	69-127	ug/L	06/23/17 09:35	
Methylcyclohexane	<10.00	50.00	54.53	109	75-129	ug/L	06/23/17 09:35	
Methylene Chloride	<1.000	50.00	57.57	115	86-124	ug/L	06/23/17 09:35	
4-Methyl-2-Pentanone	<5.000	50.00	48.90	98	39-143	ug/L	06/23/17 09:35	
Methyl-t-butyl ether	<1.000	50.00	53.05	106	75-134	ug/L	06/23/17 09:35	
Naphthalene	<1.000	50.00	55.62	111	61-118	ug/L	06/23/17 09:35	
Styrene	<1.000	50.00	52.98	106	80-120	ug/L	06/23/17 09:35	
1,1,2,2-Tetrachloroethane	<1.000	50.00	58.36	117	64-125	ug/L	06/23/17 09:35	
Tetrachloroethene	<1.000	50.00	53.57	107	83-138	ug/L	06/23/17 09:35	
Toluene	<1.000	50.00	53.41	107	88-126	ug/L	06/23/17 09:35	
1,2,3-Trichlorobenzene	<1.000	50.00	51.72	103	75-124	ug/L	06/23/17 09:35	
1,2,4-Trichlorobenzene	<1.000	50.00	55.12	110	77-131	ug/L	06/23/17 09:35	
1,1,1-Trichloroethane	<1.000	50.00	53.65	107	68-146	ug/L	06/23/17 09:35	
1,1,2-Trichloroethane	<1.000	50.00	53.97	108	85-124	ug/L	06/23/17 09:35	
Trichloroethene	<1.000	50.00	53.45	107	87-127	ug/L	06/23/17 09:35	
Trichlorofluoromethane	<5.000	50.00	57.73	115	77-147	ug/L	06/23/17 09:35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	57.36	115	68-135	ug/L	06/23/17 09:35	
Vinyl Chloride	<1.000	50.00	63.46	127	74-138	ug/L	06/23/17 09:35	
m,p-Xylenes	<2.000	100	106.3	106	84-124	ug/L	06/23/17 09:35	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17062102

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 143889 Matrix: Water Date Prep: 06/23/17
MB Sample Id: 66735-1-BLK LCS Sample Id: 66735-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	51.38	103	79-126	ug/L	06/23/17 09:35	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	102		97		86-111	%	06/23/17 09:35
Dibromofluoromethane	86	*	100		91-119	%	06/23/17 09:35
Toluene-D8	97		98		90-117	%	06/23/17 09:35

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 143922 Matrix: Water Date Prep: 06/26/17
MB Sample Id: 66750-1-BLK LCS Sample Id: 66750-1-BKS LCSD Sample Id: 66750-1-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	32.04	107	32.53	108	50-150	2	20	ug/L	06/26/17 18:25	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	99		102		104		80-120	%	06/26/17 18:25

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.

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.: 31400390-89

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

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

PSS Work Order #: 17062102 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)	14 Day Extend (8260 SIM)	REMARKS
1	Influent USP-1	6/21/17	0915	WW	6	G	HCl	X	X	
2	Effluent USP-4	6/21/17	0900	WW	3	G			X	
3	TB-062117	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	6/21/17	1035	
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-14°C

Custody Seal: Cooler-Intact

Ice Present: PRES Temp: 12°-14°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17062102	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	06/21/2017 10:35:00 AM
Project Name	Kop-Flex	**Delivered By**	Client
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	07/26/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	14
Seal(s) Signed / Dated?	Yes	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: 06/21/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 06/21/2017

Amber Confer

CARBON VESSEL EFF

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031312

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-05

March 27, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031312**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-05

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 **17031312**.

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 April 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031312

Project ID: 31400390-05

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031312-001	INFLUENT VSP-1	WATER	03/13/17 14:30
17031312-002	Carbon Effluent	WATER	03/13/17 14:52

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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Baltimore Division

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Fax: 410-633-6553
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COVER LETTER

Lynn Jackson
Phase Separation
6630 Baltimore National Pike, Suite 103
Baltimore, MD 21228

RE: General Analysis

March 22, 2017
Report No.: 17C0855

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 03/13/2017 15:40.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Certifications/Notes and Definitions
- Cooler Receipt Log
- Chain of Custody



Final report reviewed by:	Coretta S. Davis/Project Manager	3/22/2017 Report issue date

All samples received in proper condition and results conform to ISO 17025 and TNI NELAC standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Coretta S. Davis/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
Influent VSP-1	17C0855-01	Water	Grab	03/13/2017 14:30	03/13/2017 15:40
Carbon Effluent	17C0855-02	Water	Grab	03/13/2017 14:52	03/13/2017 15:40

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Carbon Effluent

17C0855-02 (Water) Sampled: 03/13/2017 14:52; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	ND	0.020	mg LAS/L (MW 320)		031517 0920	031517 1119	LCR	SM 5540 C-11	

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Project Requested Certification(s):

A2LA (Environmental)

Analyte Certification Exception Summary

No certification exceptions

All analysis performed were analyzed under the required certification unless otherwise noted in the above summary.

Certification List

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

Code	Description	Certification Number	Expires
Microbac Laboratories, Inc. - Baltimore			
A2LA1	A2LA (Biology)	410.02	04/30/2017
A2LA2	A2LA (Environmental)	410.01	04/30/2017
VA-B	Commonwealth of Virginia (NELAC) - Baltimore	460285	03/14/2018
CPSC	CPSC Testing of Childrens Products and Jewelry	1115	04/30/2017
Pb	Environmental Lead (ELLAP)	410.01	04/30/2017
MD	State of Maryland (Drinking Water)	109	06/30/2017
WV	West Virginia	054	08/31/2017
Microbac Laboratories, Inc. - Richmond			
VA-R	Commonwealth of Virginia (NELAC) - Richmond	460022	06/14/2017

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0855
6630 Baltimore National Pike, Suite 103	Project Number: General Wet Chem Analysis	Reported: 03/22/2017 14:54
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Qualifiers/Notes and Definitions

General Definitions:

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Microbac Laboratories, Inc.

Baltimore Division

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Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** 13.50°C **Work Order:** 17C0855

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Chain of Custody Form for Subcontracted Analyses

17C0855

Phase Separation Science, Inc
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

For Questions or issues please contact: Amber Confer

W.O. No. : **17031312**
P.O. No. :
Project Number : 31400390-05
Report To LOD : No

Report Due On :03/27/17 05:00

Samples Transferred To:
Microbac - Baltimore
2101 Van Deman Street
Baltimore, MD 21224

Contacts : sales - Mike Arbaugh / PMs (when we d
Phone : 410-633-1800

Lab Sample ID	Field Sample ID	Date Sampled	Time Sampled	Matrix	Analyses Required	Method	Type of Container	Preservative
17031312-001	INFLUENT VSP-1	03/13/17	14:30	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL
17031312-002	Carbon Effluent	03/13/17	14:52	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL

Data Deliverables Required: COA

Send Report Attn : reporting@phaseonline.com

Perform Q.C. on Sample :

Send InvoiceAttn : invoicing@phaseonline.com

Airbill No.: Carrier : TTE

Condition Upon Receipt :

Comments :

Samples Relinquished By : Date : 03/13/17 Time: 15:40 Samples Received By : 13.5°C

Samples Relinquished By: Date : Time : Samples Received By:

Samples Relinquished By: Date: Time: Samples Received By:

CHAIN-OF-CUSTODY RECORD

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Dr #300 Herndon, VA 20171

Project Name: Kap-FLEX

WSP | Parsons Brinckerhoff Contact Name: Eric Johnson

Project Location: Hanover, MD

WSP | Parsons Brinckerhoff Contact E-mail: Eric.Johnson@wspgroup.com

Project Number & Task: 31400390-05

WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500

Sampler(s) Name(s): Pam Graff, Maria Kaplan

Sampler(s) Signature(s):

No. 004518 WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location: Microbac

Laboratory Project Manager: Amber Conner (Phase)

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ____ HR

Requested Analyses & Preservatives

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Surfactant MBAS	Sample Comments
INFLUENT VSP-1	AQ	3/13/17	1430			1	X	
Carbon Effluent	AQ	3/13/17	1452			1	X	

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/13/17	1507		3/13/17	1508	courier	
Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Number of Packages	Custody Seal Number(s)
	3/13/17	1517		03/13/17	1540	1	03270

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

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

13.5°C

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Number of Coolers Received: 1
Client: Phase Separation Science
Form Completed By: Anthony Smith
Shipper:

Receipt Date / Time: 03/13/17 15:40
Work Order # 1703055, 1703053

☐ Microbac ☑ Client ☐ UPS ☐ FedEx
Custody Tape Intact: YES / NO / NA
Containers Intact: YES / NO
Sample Received on Ice or refrigerated: YES / NO / NA
Infrared (IR) Temperature: 13.5 °C

Chain of Custody Present with shipment: YES / NO
Sample Bottle IDs agree with COC: YES / NO
Preservation requirements met: YES / NO / Not Checked
Correct Number of Containers / Sample Volume: YES / NO (If No, contact client immediately)
Headspace in container: YES / NO / NA
Type of Sample: Water Soil Wipes Oil Filter Solid Sludge Food Swab Other_____

***Container Type / Quantity*:**

A - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid: If preserved pH <2___, pH >10___
B - 3 Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
C - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
D - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
E - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
H - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
K - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
L - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
M- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
P - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
W- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
V - ___ Unpreserved ___ HCl ___ HCl / Ascorbic Acid ___ HCl / NaTHIO **(Checked at time of Analysis)**
F - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
S - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
SN- ___ Unpreserved ___NaTHIO ___NaTHIO/EDTA **(Checked at time of Analysis)**

___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___

Describe preservation requirements not met:
All Acid preserved <2 pH *NaOH preserved >12 pH* *All others >2 and <10 (usually 4-8)*
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
H_2SO_4 – Sulfuric Acid, HNO_3 – Nitric Acid, NaOH – Sodium Hydroxide, ASC – Ascorbic Acid, NaTHIO – Sodium Thiosulfate

Describe Anomalies:_____

Contact information / Summary of Actions:
Date / Time:_____ Contact:_____ Contact By:_____
Comments:_____

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031312

Project ID: 31400390-05

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:

Samples not received at PSS. Sent directly to sub lab by courier on 3/13/17.

17031312: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

CHAIN-OF-CUSTODY RECORD

1703132

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Dr #300 Herndon, VA 20171

No. 004518 — WSP | PARSONS BRINCKERHOFF

Project Name	Kop-FLEX
Project Location	Hanover, MD
Project Number & Task	31400390-05
Sampler(s) Name(s)	Pam Groff Maria Kaplan
WSP | Parsons Brinckerhoff Contact Name	Eric Johnson
WSP | Parsons Brinckerhoff Contact E-mail	Eric.Johnson@wspgroup.com
WSP | Parsons Brinckerhoff Contact Phone	703-709-6500
Sampler(s) Signature(s)	
Laboratory Name & Location	Microbac
Laboratory Project Manager	Amber Conner (Phase)

Requested Turn-Around-Time: [x] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ____ HR

Requested Analyses & Preservatives: Surfactant MBAS

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Surfactant MBAS	Sample Comments
INFLUENT VSP-1	AQ	3/13/17	1430			1	X	
Carbon Effluent	AQ	3/13/17	1452			1	X	

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/13/17	1507		3/13/17	1520	Courier	
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	3/13/17	1517		03/13/17	15:40	1	03270

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031312	**Received By**	Microbac - Baltimore
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-05	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	13.5
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

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

Sample Container

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

Total No. of Samples Received 2 Total No. of Containers Received 2

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)	N/A
Do VOA vials have zero headspace?		N/A
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 not received at PSS. Sent directly to sub lab by courier on 3/13/17.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/13/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 03/15/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031520

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 3140039-5

March 27, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031520**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 3140039-5

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 **17031520**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031520

Project ID: 3140039-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031520-001	Influent VSP-1	WATER	03/15/17 13:05
17031520-002	Carbon Effluent	WATER	03/15/17 12:51

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

MICROBAC®

Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

COVER LETTER

Lynn Jackson
Phase Separation
6630 Baltimore National Pike, Suite 103
Baltimore, MD 21228

March 24, 2017
Report No.: 17C0975

RE: General Analysis

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 03/16/2017 09:30.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Certifications/Notes and Definitions
- Cooler Receipt Log
- Chain of Custody



Final report reviewed by:	Coretta S. Davis/Project Manager	3/24/2017 Report issue date

All samples received in proper condition and results conform to ISO 17025 and TNI NELAC standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact Coretta S. Davis/Project Manager at 410-633-1800. You may also contact Trevor Boyce, President at trevor.boyce@microbac.com

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Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
17031520-001 - Influent VSP-1	17C0975-01	Water	Grab	03/15/2017 13:05	03/16/2017 09:30
17031520-002 - Carbon Effluent	17C0975-02	Water	Grab	03/15/2017 12:51	03/16/2017 09:30

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www.microbac.com

CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

17031520-002 - Carbon Effluent

17C0975-02 (Water) Sampled: 03/15/2017 12:51; Type: Grab

Analyte	Result	Reporting Limit	Units	Limits	Prepared	Analyzed	Analyst	Method	Notes
Microbac Laboratories, Inc. - Baltimore									
Wet Chemistry									
Surfactants, MBAS	ND	0.020	mg LAS/L (MW 320)		031617 1200	031617 1719	LCR	SM 5540 C-11	



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Project Requested Certification(s):

A2LA (Environmental)

Analyte Certification Exception Summary

No certification exceptions

All analysis performed were analyzed under the required certification unless otherwise noted in the above summary.

Certification List

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

Code	Description	Certification Number	Expires
Microbac Laboratories, Inc. - Baltimore			
A2LA1	A2LA (Biology)	410.02	04/30/2017
A2LA2	A2LA (Environmental)	410.01	04/30/2017
VA-B	Commonwealth of Virginia (NELAC) - Baltimore	460285	03/14/2018
CPSC	CPSC Testing of Childrens Products and Jewelry	1115	04/30/2017
Pb	Environmental Lead (ELLAP)	410.01	04/30/2017
MD	State of Maryland (Drinking Water)	109	06/30/2017
WV	West Virginia	054	08/31/2017
Microbac Laboratories, Inc. - Richmond			
VA-R	Commonwealth of Virginia (NELAC) - Richmond	460022	06/14/2017

Microbac Laboratories, Inc. - Baltimore



Coretta S. Davis, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

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CERTIFICATE OF ANALYSIS

Phase Separation	Project: General Analysis	Report: 17C0975
6630 Baltimore National Pike, Suite 103	Project Number: 3140039-5, WO# 17031520	Reported: 03/24/2017 12:44
Baltimore, MD 21228	Project Manager: Lynn Jackson	

Qualifiers/Notes and Definitions

General Definitions:

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

Cooler Receipt Log

Cooler ID: Default Cooler **Cooler Temp:** 5.40°C **Work Order:** 17C0975

Custody Seals Intact:	Yes	COC/Containers Agree:	Yes
Containers Intact:	Yes	Correct Preservation:	Yes
Received On Ice:	Yes	Correct Number of Containers Received:	Yes
Radiation Scan Acceptable:	Yes	Sufficient Sample Volume for Testing:	Yes
COC Present:	Yes	Samples Received in Proper Condition:	Yes

Comments:

Chain of Custody Form for Subcontracted Analyses

Phase Separation Science, Inc
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

For Questions or issues please contact: Amber Confer

W.O. No. : **17031520**
P.O. No. :
Project Number : 3140039-5
Report To LOD : No

Report Due On :03/29/17 05:00

Samples Transferred To:
Microbac - Baltimore
2101 Van Deman Street
Baltimore, MD 21224

Contacts : sales - Mike Arbaugh / PMs (when we d
Phone : 410-633-1800

Lab Sample ID	Field Sample ID	Date Sampled	Time Sampled	Matrix	Analyses Required	Method	Type of Container	Preserva
17031520-001	Influent VSP-1	03/15/17	13:05	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL
17031520-002	Carbon Effluent	03/15/17	12:51	Water	MBAS Surfactants	SM5540C	1L HDPE	COOL

Data Deliverables Required: COA

Perform Q.C. on Sample :

Send Report Attn : reporting@phaseonline.com

Send InvoiceAttn : invoicing@phaseonline.com

Airbill No.: _____ Carrier : ~~TTE~~ ~~Microbac~~ BW TTE

Condition Upon Receipt :

Comments :

Samples Relinquished By : Bart Weber Date : 08:50 Time: 03/16/17 Samples Received By : Dan Parks

Samples Relinquished By: Dan Parks Date : 03/16/17 Time : 0930 Samples Received By: [signature] HNDillinger

Samples Relinquished By: _____ Date: _____ Time: _____ Samples Received By: _____

5.4°C
Received on ice

17C0975

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Number of Coolers Received: 1
Client: Phase Separation
Form Completed By: JN Dillinger
Shipper: FIRST
Receipt Date / Time: 03/16/17 0930
Work Order # 17C0975

Custody Tape Intact: ☐ Microbac ☒ Client ☐ UPS ☐ FedEx
Containers Intact: YES / NO / NA
Sample Received on Ice or refrigerated: YES / NO / NA
Infrared (IR) Temperature: 5.4 °C

Chain of Custody Present with shipment: YES / NO
Sample Bottle IDs agree with COC: YES / NO
Preservation requirements met: YES / NO / Not Checked
Correct Number of Containers / Sample Volume: YES / NO (If No, contact client immediately)
Headspace in container: YES / NO / NA
Type of Sample: Water Soil Wipes Oil Filter Solid Sludge Food Swab Other _____

Container Type / Quantity:

A - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid: If preserved pH <2___, pH >10___
B - 2 Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
C - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
D - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
E - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
H - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
K - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
L - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
M- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
P - ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
W- ___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
V - ___ Unpreserved ___ HCl ___ HCl / Ascorbic Acid ___ HCl / NaTHIO **(Checked at time of Analysis)**
F - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
S - ___ Unpreserved ___ NaTHIO **(Checked at time of Analysis)**
SN- ___ Unpreserved ___NaTHIO ___NaTHIO/EDTA **(Checked at time of Analysis)**

___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___
___ Unpreserved ___ H2SO4 ___ HNO3 ___ HCl ___ NaOH ___ NaOH/Ascorbic Acid If preserved pH <2___, pH >10___

Describe preservation requirements not met:

All Acid preserved <2 pH *NaOH preserved >12 pH* *All others >2 and <10 (usually 4-8)*

Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added
Sample ID:_____ H_2SO_4 HNO_3 NaOH _____ mls added

H_2SO_4 – Sulfuric Acid, HNO_3 – Nitric Acid, NaOH – Sodium Hydroxide, ASC – Ascorbic Acid, NaTHIO – Sodium Thiosulfate

Describe Anomalies:_____

Contact information / Summary of Actions:

Date / Time:_____ Contact:_____ Contact By:_____
Comments:_____

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031520

Project ID: 3140039-5

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.

17031520: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

CHAIN-OF-CUSTODY RECORD 1703152o

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Drive St 300 Herndon VA 20171

Project Name: KopFlex

WSP | Parsons Brinckerhoff Contact Name: Eric Johnson

Project Location: Hanover, MD

WSP | Parsons Brinckerhoff Contact E-mail: eric.johnson@wspgroup.com

Project Number & Task: 31400390-5

WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500

Sampler(s) Name(s): Maria Kaplan

Sampler(s) Signature(s):

No. 004520 WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location: Amber Confer

Laboratory Project Manager: Phase Separation Science, Baltimore MD

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ___ HR

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Requested Analyses & Preservatives: Surfactant MBAS	Sample Comments
Influent VSP-1	AQ	3/15/17	1305			1	X	
Carbon Effluent	AQ	3/15/17	1251			1	X	

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp 4°-10°C
Shipping Carrier: FTE

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	1534		03/15/17	1534		
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	03/15/17	1620					

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031520	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	3140039-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

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 2 Total No. of Containers Received 2

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)	N/A
Do VOA vials have zero headspace?		N/A
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: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/16/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031522

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-5

March 29, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
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PHASE SEPARATION SCIENCE, INC.

March 29, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031522**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17031522**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031522

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031522-001	Influent VSP-1	WATER	03/15/17 13:05
17031522-002	Carbon Effluent	WATER	03/15/17 12:51
17031522-003	Trip Blank - 031517	WATER	03/15/17 16:20

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: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Carbon Effluent **Date/Time Sampled: 03/15/2017 12:51** **PSS Sample ID: 17031522-002**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	**16**	ug/L	10		1	03/16/17	03/16/17 21:57	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 21:57	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 21:57	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 21:57	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 21:57	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 21:57	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Carbon Effluent **Date/Time Sampled: 03/15/2017 12:51** **PSS Sample ID: 17031522-002**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 21:57	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 21:57	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 21:57	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 21:57	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 21:57	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 21:57	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 21:57	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)	ND	ug/L	1.0		1	03/17/17	03/17/17 13:43	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blank - 031517 **Date/Time Sampled: 03/15/2017 16:20** **PSS Sample ID: 17031522-003**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 22:20	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031522

WSP Environment & Energy - Herndon, Herndon, VA

March 29, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blank - 031517 **Date/Time Sampled: 03/15/2017 16:20** **PSS Sample ID: 17031522-003**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 22:20	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 22:20	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 22:20	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 22:20	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 22:20	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031522
Project ID: 31400390-5

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): **17031522**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17031522-001	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 21:34
	Carbon Effluent	Initial	17031522-002	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 21:57
	Trip Blank - 031517	Initial	17031522-003	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 22:20
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
	Lead Ambersorb S	MS	17031316-002 S	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:25
	Lead Ambersorb SD	MSD	17031316-002 SD	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:47
	65324-1-BKS	BKS	65324-1-BKS	1011	W	65324	140928	--------	03/18/2017 08:57	03/18/2017 10:09
	65324-1-BLK	BLK	65324-1-BLK	1011	W	65324	140928	--------	03/18/2017 08:57	03/18/2017 11:02
	T-1100 Rinse S	MS	17031608-001 S	1011	W	65324	140928	03/16/2017	03/18/2017 08:57	03/18/2017 12:47
	T-1100 Rinse SD	MSD	17031608-001 SD	1011	W	65324	140928	03/16/2017	03/18/2017 08:57	03/18/2017 13:10
	Influent VSP-1	Reanalysis	17031522-001	1011	W	65300	140928	03/15/2017	03/16/2017 13:41	03/18/2017 15:54
SW-846 8260 B-Modified	Carbon Effluent	Initial	17031522-002	1011	W	65319	140916	03/15/2017	03/17/2017 10:14	03/17/2017 13:43
	65319-1-BKS	BKS	65319-1-BKS	1011	W	65319	140916	--------	03/17/2017 10:14	03/17/2017 12:51
	65319-1-BLK	BLK	65319-1-BLK	1011	W	65319	140916	--------	03/17/2017 10:14	03/17/2017 12:24
	65319-1-BSD	BSD	65319-1-BSD	1011	W	65319	140916	--------	03/17/2017 10:14	03/17/2017 11:37
	Influent VSP-1	Reanalysis	17031522-001	1011	W	65319	140916	03/15/2017	03/17/2017 10:14	03/17/2017 14:33

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031522

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031522-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/16/17 21:34
Dibromofluoromethane	105		91-119	%	03/16/17 21:34
Toluene-D8	101		90-117	%	03/16/17 21:34

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140916 Matrix: Water Date Prep: 03/17/2017
PSS Sample ID: 17031522-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	93		80-120	%	03/17/17 14:08

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031522-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/16/17 21:57
Dibromofluoromethane	104		91-119	%	03/16/17 21:57
Toluene-D8	101		90-117	%	03/16/17 21:57

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140916 Matrix: Water Date Prep: 03/17/2017
PSS Sample ID: 17031522-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	90		80-120	%	03/17/17 13:43

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031522-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 22:20
Dibromofluoromethane	98		91-119	%	03/16/17 22:20
Toluene-D8	97		90-117	%	03/16/17 22:20

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

WSP Environment & Energy - Herndon
Kop-Flex

L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031522

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031522

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/17
MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140928 Matrix: Water Date Prep: 03/18/17
MB Sample Id: 65324-1-BLK LCS Sample Id: 65324-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
1,1-Dichloroethene	<1.000	50.00	46.90	94	85-127	ug/L	03/18/17 10:09	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		100		86-111	%	03/18/17 10:09
Dibromofluoromethane	98		105		91-119	%	03/18/17 10:09
Toluene-D8	100		101		90-117	%	03/18/17 10:09

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140916 Matrix: Water Date Prep: 03/17/17
MB Sample Id: 65319-1-BLK LCS Sample Id: 65319-1-BKS LCSD Sample Id: 65319-1-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	31.87	106	32.17	107	50-150	1	20	ug/L	03/17/17 12:51	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	92		95		96		80-120	%	03/17/17 12:51

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

CHAIN-OF-CUSTODY RECORD 1703522

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Bulles Technology Drive St 300 Herndon VA 20171

Project Name: Kop Flex

WSP | Parsons Brinckerhoff Contact Name: Eric Johnson

Project Location: Hanover, MD

WSP | Parsons Brinckerhoff Contact E-mail: eric.johnson@wspgroup.com

Project Number & Task: 31400390-5

WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500

Sampler(s) Name(s): Maria Kaplan

Sampler(s) Signature(s):

No. 004521 WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location: PSS, Baltimore MD

Laboratory Project Manager: Amber Cafer

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ___ HR

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Requested Analyses & Preservatives: VOCs (8260)	1,4 Dioxane (8260 SIM)								Sample Comments
Influent VSP-1	AQ	3/15/17	1305			6	X	X								
Carbon Effluent	AQ	3/15/17	1251			6	X	X								
~~Lead Absorb~~	~~AQ~~					6	X	X		MK						
~~Effluent VSP-4~~	~~AQ~~					6	X			MK						
Trip blank-031517	AQ					2	X									

# of Coolers: 1

Custody Seal: ABS

Ice Present: YES

Temp: 8°-10°C

Shipping Carrier: FED EX

3/15/17

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	1534		03/15/17	1534		
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	03/15/17	1620					

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031522	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

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 14

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: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/16/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032016

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

March 22, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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PHASE SEPARATION SCIENCE, INC.

March 22, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032016**
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 **17032016**.

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 April 24, 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/20/2017 at 03:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032016-001	Effluent VSP-4	WASTE WATER	03/20/17 12:47
17032016-002	Influent VSP-1	WASTE WATER	03/20/17 12:55
17032016-003	Carbon Effluent	WASTE WATER	03/20/17 13:01
17032016-004	Lead Ambersorb Effluent	WASTE WATER	03/20/17 13:08

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032016

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Carbon Effluent **Date/Time Sampled: 03/20/2017 13:01** **PSS Sample ID: 17032016-003**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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	03/21/17	03/21/17 12:35	1011
Benzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Bromochloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Bromoform	ND	ug/L	5.0		1	03/21/17	03/21/17 12:35	1011
Bromomethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/21/17	03/21/17 12:35	1011
Carbon Disulfide	ND	ug/L	10		1	03/21/17	03/21/17 12:35	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Chlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Chloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Chloroform	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Chloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Cyclohexane	ND	ug/L	10		1	03/21/17	03/21/17 12:35	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/21/17	03/21/17 12:35	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Ethylbenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032016

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Carbon Effluent **Date/Time Sampled: 03/20/2017 13:01** **PSS Sample ID: 17032016-003**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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	03/21/17	03/21/17 12:35	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Methyl Acetate	ND	ug/L	10		1	03/21/17	03/21/17 12:35	1011
Methylcyclohexane	ND	ug/L	10		1	03/21/17	03/21/17 12:35	1011
Methylene Chloride	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/21/17	03/21/17 12:35	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Naphthalene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Styrene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Toluene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Trichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/21/17	03/21/17 12:35	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/21/17	03/21/17 12:35	1011
o-Xylene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:35	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)	**150**	ug/L	10		10	03/21/17	03/21/17 18:46	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016
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): **17032016**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:00
	Carbon Effluent	Initial	17032016-003	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:35
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:15
	65357-1-BKS	BKS	65357-1-BKS	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 10:56
	65357-1-BLK	BLK	65357-1-BLK	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 11:52
	Lead Ambersorb Effluent S	MS	17032016-004 S	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:55
	Lead Ambersorb Effluent SD	MSD	17032016-004 SD	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 14:17
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:28
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17032016-001	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 19:10
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 17:58
	65359-1-BKS	BKS	65359-1-BKS	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:26
	65359-1-BLK	BLK	65359-1-BLK	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 17:36
	65359-1-BSD	BSD	65359-1-BSD	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:49
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 20:25
	Carbon Effluent	Reanalysis	17032016-003	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 18:46

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:10

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/21/17 13:00
Dibromofluoromethane	103		91-119	%	03/21/17 13:00
Toluene-D8	100		90-117	%	03/21/17 13:00

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:59

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/21/17 12:35
Dibromofluoromethane	99		91-119	%	03/21/17 12:35
Toluene-D8	99		90-117	%	03/21/17 12:35

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	97		80-120	%	03/21/17 18:24

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/21/17 12:15
Dibromofluoromethane	100		91-119	%	03/21/17 12:15
Toluene-D8	104		90-117	%	03/21/17 12:15

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

Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 17:58

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 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	36.24	72	29-149	ug/L	03/21/17 10:56	
Benzene	<1.000	50.00	54.82	110	85-123	ug/L	03/21/17 10:56	
Bromochloromethane	<1.000	50.00	54.51	109	82-136	ug/L	03/21/17 10:56	
Bromodichloromethane	<1.000	50.00	58.87	118	88-133	ug/L	03/21/17 10:56	
Bromoform	<5.000	50.00	57.15	114	80-126	ug/L	03/21/17 10:56	
Bromomethane	<1.000	50.00	50.69	101	64-139	ug/L	03/21/17 10:56	
2-Butanone (MEK)	<10.00	50.00	39.55	79	39-135	ug/L	03/21/17 10:56	
Carbon Disulfide	<10.00	50.00	54.33	109	85-124	ug/L	03/21/17 10:56	
Carbon Tetrachloride	<1.000	50.00	52.96	106	81-138	ug/L	03/21/17 10:56	
Chlorobenzene	<1.000	50.00	56.89	114	85-120	ug/L	03/21/17 10:56	
Chloroethane	<1.000	50.00	50.49	101	75-129	ug/L	03/21/17 10:56	
Chloroform	<1.000	50.00	53.46	107	85-128	ug/L	03/21/17 10:56	
Chloromethane	<1.000	50.00	52.87	106	60-139	ug/L	03/21/17 10:56	
Cyclohexane	<10.00	50.00	55.79	112	55-131	ug/L	03/21/17 10:56	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.41	97	69-127	ug/L	03/21/17 10:56	
Dibromochloromethane	<1.000	50.00	51.34	103	82-127	ug/L	03/21/17 10:56	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.19	102	82-121	ug/L	03/21/17 10:56	
1,2-Dichlorobenzene	<1.000	50.00	57.99	116	82-123	ug/L	03/21/17 10:56	
1,3-Dichlorobenzene	<1.000	50.00	57.92	116	81-123	ug/L	03/21/17 10:56	
1,4-Dichlorobenzene	<1.000	50.00	56.06	112	81-121	ug/L	03/21/17 10:56	
Dichlorodifluoromethane	<1.000	50.00	58.73	117	69-147	ug/L	03/21/17 10:56	
1,1-Dichloroethane	<1.000	50.00	54.48	109	83-123	ug/L	03/21/17 10:56	
1,2-Dichloroethane	<1.000	50.00	58.72	117	86-138	ug/L	03/21/17 10:56	
1,1-Dichloroethene	<1.000	50.00	51.03	102	85-127	ug/L	03/21/17 10:56	
cis-1,2-Dichloroethene	<1.000	50.00	52.82	106	87-127	ug/L	03/21/17 10:56	
1,2-Dichloropropane	<1.000	50.00	50.48	101	79-125	ug/L	03/21/17 10:56	
cis-1,3-Dichloropropene	<1.000	50.00	51.95	104	79-131	ug/L	03/21/17 10:56	
trans-1,3-Dichloropropene	<1.000	50.00	53.20	106	82-133	ug/L	03/21/17 10:56	
trans-1,2-Dichloroethene	<1.000	50.00	51.21	102	85-125	ug/L	03/21/17 10:56	
Ethylbenzene	<1.000	50.00	57.90	116	83-123	ug/L	03/21/17 10:56	
2-Hexanone	<5.000	50.00	40.31	81	37-137	ug/L	03/21/17 10:56	
Isopropylbenzene	<1.000	50.00	57.86	116	70-131	ug/L	03/21/17 10:56	
Methyl Acetate	<10.00	50.00	72.48	145	69-127	ug/L	03/21/17 10:56	H
Methylcyclohexane	<10.00	50.00	60.46	121	75-129	ug/L	03/21/17 10:56	
Methylene Chloride	<1.000	50.00	56.62	113	86-124	ug/L	03/21/17 10:56	
4-Methyl-2-Pentanone	<5.000	50.00	40.55	81	39-143	ug/L	03/21/17 10:56	
Methyl-t-butyl ether	<1.000	50.00	51.80	104	75-134	ug/L	03/21/17 10:56	
Naphthalene	<1.000	50.00	49.88	100	61-118	ug/L	03/21/17 10:56	
Styrene	<1.000	50.00	51.04	102	80-120	ug/L	03/21/17 10:56	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.43	95	64-125	ug/L	03/21/17 10:56	
Tetrachloroethene	<1.000	50.00	59.56	119	83-138	ug/L	03/21/17 10:56	
Toluene	<1.000	50.00	58.32	117	88-126	ug/L	03/21/17 10:56	
1,2,3-Trichlorobenzene	<1.000	50.00	52.81	106	75-124	ug/L	03/21/17 10:56	
1,2,4-Trichlorobenzene	<1.000	50.00	51.86	104	77-131	ug/L	03/21/17 10:56	
1,1,1-Trichloroethane	<1.000	50.00	56.56	113	68-146	ug/L	03/21/17 10:56	
1,1,2-Trichloroethane	<1.000	50.00	51.62	103	85-124	ug/L	03/21/17 10:56	
Trichloroethene	<1.000	50.00	53.11	106	87-127	ug/L	03/21/17 10:56	
Trichlorofluoromethane	<5.000	50.00	49.57	99	77-147	ug/L	03/21/17 10:56	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.27	107	68-135	ug/L	03/21/17 10:56	
Vinyl Chloride	<1.000	50.00	67.26	135	74-138	ug/L	03/21/17 10:56	
m,p-Xylenes	<2.000	100	116.8	117	84-124	ug/L	03/21/17 10:56	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	58.25	117	79-126	ug/L	03/21/17 10:56	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/21/17 10:56
Dibromofluoromethane	104		98		91-119	%	03/21/17 10:56
Toluene-D8	101		102		90-117	%	03/21/17 10:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	35.15	70	34.75	70	46-138	1	25	ug/L	03/21/17 13:55	
Benzene	<1.000	50.00	58.48	117	56.70	113	77-126	3	25	ug/L	03/21/17 13:55	
Bromochloromethane	<1.000	50.00	58.30	117	57.27	115	74-133	2	25	ug/L	03/21/17 13:55	
Bromodichloromethane	<1.000	50.00	58.83	118	57.09	114	79-130	3	25	ug/L	03/21/17 13:55	
Bromoform	<5.000	50.00	57.77	116	55.77	112	69-120	4	25	ug/L	03/21/17 13:55	
Bromomethane	<1.000	50.00	48.92	98	49.11	98	64-130	0	25	ug/L	03/21/17 13:55	
2-Butanone (MEK)	<10.00	50.00	39.17	78	38.07	76	34-126	3	25	ug/L	03/21/17 13:55	
Carbon Disulfide	<10.00	50.00	55.46	111	52.14	104	76-126	6	25	ug/L	03/21/17 13:55	
Carbon Tetrachloride	<1.000	50.00	55.09	110	53.56	107	77-137	3	25	ug/L	03/21/17 13:55	
Chlorobenzene	<1.000	50.00	58.17	116	55.66	111	74-120	4	25	ug/L	03/21/17 13:55	
Chloroethane	<1.000	50.00	49.52	99	48.44	97	68-133	2	25	ug/L	03/21/17 13:55	
Chloroform	<1.000	50.00	57.17	114	55.68	111	77-127	3	25	ug/L	03/21/17 13:55	
Chloromethane	<1.000	50.00	53.44	107	51.11	102	50-143	4	25	ug/L	03/21/17 13:55	
Cyclohexane	<10.00	50.00	59.96	120	57.24	114	53-139	5	25	ug/L	03/21/17 13:55	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.47	95	48.01	96	56-123	1	25	ug/L	03/21/17 13:55	
Dibromochloromethane	<1.000	50.00	52.67	105	50.55	101	70-125	4	25	ug/L	03/21/17 13:55	
1,2-Dibromoethane (EDB)	<1.000	50.00	50.46	101	49.96	100	69-121	1	25	ug/L	03/21/17 13:55	
1,2-Dichlorobenzene	<1.000	50.00	57.00	114	57.37	115	69-118	1	25	ug/L	03/21/17 13:55	
1,3-Dichlorobenzene	<1.000	50.00	56.58	113	56.12	112	68-119	1	25	ug/L	03/21/17 13:55	
1,4-Dichlorobenzene	<1.000	50.00	54.87	110	55.28	111	67-117	1	25	ug/L	03/21/17 13:55	
Dichlorodifluoromethane	<1.000	50.00	55.82	112	55.83	112	68-139	0	25	ug/L	03/21/17 13:55	
1,1-Dichloroethane	<1.000	50.00	55.93	112	52.94	106	78-126	5	25	ug/L	03/21/17 13:55	
1,2-Dichloroethane	<1.000	50.00	58.54	117	57.09	114	78-134	3	25	ug/L	03/21/17 13:55	
1,1-Dichloroethene	<1.000	50.00	52.71	105	49.79	100	78-125	6	25	ug/L	03/21/17 13:55	
cis-1,2-Dichloroethene	<1.000	50.00	52.54	105	57.86	116	78-128	10	25	ug/L	03/21/17 13:55	
1,2-Dichloropropane	<1.000	50.00	51.40	103	49.15	98	73-126	4	25	ug/L	03/21/17 13:55	
cis-1,3-Dichloropropene	<1.000	50.00	51.19	102	50.43	101	67-126	1	25	ug/L	03/21/17 13:55	
trans-1,3-Dichloropropene	<1.000	50.00	51.84	104	50.47	101	68-129	3	25	ug/L	03/21/17 13:55	
trans-1,2-Dichloroethene	<1.000	50.00	52.86	106	50.84	102	76-128	4	25	ug/L	03/21/17 13:55	
Ethylbenzene	<1.000	50.00	60.09	120	57.53	115	74-123	4	25	ug/L	03/21/17 13:55	
2-Hexanone	<5.000	50.00	38.40	77	38.96	78	38-125	1	25	ug/L	03/21/17 13:55	
Isopropylbenzene	<1.000	50.00	58.27	117	58.30	117	58-129	0	25	ug/L	03/21/17 13:55	
Methyl Acetate	<10.00	50.00	71.53	143	67.91	136	63-115	5	25	ug/L	03/21/17 13:55	X
Methylcyclohexane	<10.00	50.00	59.94	120	57.38	115	69-130	4	25	ug/L	03/21/17 13:55	
Methylene Chloride	<1.000	50.00	55.88	112	53.41	107	76-124	5	25	ug/L	03/21/17 13:55	
4-Methyl-2-Pentanone	<5.000	50.00	39.01	78	38.43	77	35-123	1	25	ug/L	03/21/17 13:55	
Methyl-t-butyl ether	<1.000	50.00	50.49	101	50.10	100	64-129	1	25	ug/L	03/21/17 13:55	
Naphthalene	<1.000	50.00	47.34	95	49.19	98	45-109	4	25	ug/L	03/21/17 13:55	
Styrene	<1.000	50.00	52.38	105	51.03	102	61-124	3	25	ug/L	03/21/17 13:55	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.88	96	49.19	98	47-130	3	25	ug/L	03/21/17 13:55	
Tetrachloroethene	<1.000	50.00	58.91	118	57.43	115	68-139	3	25	ug/L	03/21/17 13:55	
Toluene	<1.000	50.00	58.42	117	56.44	113	79-128	3	25	ug/L	03/21/17 13:55	
1,2,3-Trichlorobenzene	<1.000	50.00	50.84	102	51.25	103	48-122	1	25	ug/L	03/21/17 13:55	
1,2,4-Trichlorobenzene	<1.000	50.00	50.48	101	51.76	104	54-124	3	25	ug/L	03/21/17 13:55	
1,1,1-Trichloroethane	<1.000	50.00	58.53	117	56.53	113	73-140	3	25	ug/L	03/21/17 13:55	
1,1,2-Trichloroethane	<1.000	50.00	50.37	101	49.52	99	78-124	2	25	ug/L	03/21/17 13:55	
Trichloroethene	<1.000	50.00	50.75	102	49.85	100	77-131	2	25	ug/L	03/21/17 13:55	
Trichlorofluoromethane	<5.000	50.00	50.97	102	49.00	98	73-144	4	25	ug/L	03/21/17 13:55	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	54.03	108	50.94	102	65-140	6	25	ug/L	03/21/17 13:55	
Vinyl Chloride	<1.000	50.00	68.98	138	65.01	130	60-146	6	25	ug/L	03/21/17 13:55	
m,p-Xylenes	<2.000	100	119.4	119	115.4	115	75-125	3	25	ug/L	03/21/17 13:55	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	59.57	119	57.37	115	69-126	4	25	ug/L	03/21/17 13:55	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		100		86-111	%	03/21/17 13:55
Dibromofluoromethane	103		103		91-119	%	03/21/17 13:55
Toluene-D8	98		98		90-117	%	03/21/17 13:55

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

Seq Number: 140981 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65359-1-BLK LCS Sample Id: 65359-1-BKS LCSD Sample Id: 65359-1-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	30.41	101	29.99	100	50-150	1	20	ug/L	03/21/17 16:26	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		98		94		80-120	%	03/21/17 16:26

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kop-Flex PROJECT NO.: 31400396-07
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kaplan DW CERT NO.:

PSS Work Order #: 17032016 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
							HCl	HCl		
1	Effluent VSP-4	3/20/17	1247	WW	~~10~~ 30	G	X	X		48-hr TAT
2	Influent VSP-1	3/20/17	1255	WW	6	G	X	X		
3 *	Carbon Effluent	3/20/17	1301	WW	6	G	X	X		
4 *	Lead Amberserb Effluent	3/20/17	1308	WW	6	G	X	X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/20/17	1447	LMACKLIN 655
Relinquished By: (2)	Date	Time	Received By:
LMACKLIN	3/20/17	3:20	
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 62
Custody Seal: Cooler - Intact
Ice Present: PRES Temp: 6°-11°C
Shipping Carrier: FTE

Special Instructions:

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

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032016	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/20/2017 03:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	04/24/2017	**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	Pam Groff
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 4 Total No. of Containers Received 21

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: 03/20/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/21/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032324

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

March 30, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 30, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032324**
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 **17032324**.

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 April 27, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032324

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/23/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032324-001	Carbon Effluent	WASTE WATER	03/23/17 08:56
17032324-002	Influent VSP - 1	WASTE WATER	03/23/17 09:08

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: 17032324

WSP Environment & Energy - Herndon, Herndon, VA

March 30, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: Carbon Effluent **Date/Time Sampled: 03/23/2017 08:56** **PSS Sample ID: 17032324-001**

Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

MBAS Surfactants — Analytical Method: SM 5540C

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Surfactants	ND	mg/L	0.1		03/24/17	03/24/17 13:00	4009

Sample ID: Influent VSP - 1 **Date/Time Sampled: 03/23/2017 09:08** **PSS Sample ID: 17032324-002**

Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

MBAS Surfactants — Analytical Method: SM 5540C

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Surfactants	ND	mg/L	0.1		03/24/17	03/24/17 13:00	4009

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032324

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.

17032324: Analyses associated with analyst code 4009 were performed by Martel Laboratories

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

SM 5540C

Analytical Data Package Information Summary

Work Order(s): **17032324**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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
SM 5540C	Carbon Effluent	Initial	17032324-001	4009	W	141164	141164	03/23/2017	03/24/2017 13:00	03/24/2017 13:00
	Influent VSP - 1	Initial	17032324-002	4009	W	141164	141164	03/23/2017	03/24/2017 13:00	03/24/2017 13:00

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: VSP *OFFICE LOC. Hanlon VA
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500
EMAIL: eric.johnson@wsp-group.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.:
SITE LOCATION: Hanches MD P.O. NO.:
SAMPLER(S): Marien Kaplan DW CERT NO.:

PSS Work Order #: 17032324 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)	(3) * Preservatives Used / Analysis/ Method Required: Surfactant (MBAS)	REMARKS
1	Carbon Effluent	3/23/17	0855	WW	1	G	X	
2	Influent VSP-1	3/23/17	0905	WW	1	G	X	

(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 3°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 3°-6°C
Shipping Carrier: TTE

Special Instructions:

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

(5)

Relinquished By:	Date	Time	Received By:
(1)	3/23/17	15:11	LMACKLIN 655
(2) LMACKLIN	3/23/17	3:40	
(3)			
(4)			

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032324	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/23/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	04/27/2017	**Tracking No**	Not Applicable
		Logged In By	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 2 Total No. of Containers Received 2

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)	N/A
Do VOA vials have zero headspace?		N/A
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: 03/23/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 03/24/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032325

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390.9

March 27, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032325**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390.9

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 **17032325**.

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 April 27, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325

Project ID: 31400390.9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/23/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032325-001	Effluent VSP - 4	WASTE WATER	03/23/17 08:23
17032325-002	Lead Ambersorb Effluent	WASTE WATER	03/23/17 08:45
17032325-003	Carbon Effluent	WASTE WATER	03/23/17 08:56
17032325-004	Influent VSP-1	WASTE WATER	03/23/17 09:08
17032325-005	TB-032317	WATER	03/23/17 15:40

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: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Carbon Effluent **Date/Time Sampled: 03/23/2017 08:56** **PSS Sample ID: 17032325-003**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 19:45	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 19:45	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 19:45	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 19:45	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Chloroethane	**2.0**	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 19:45	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 19:45	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Carbon Effluent **Date/Time Sampled: 03/23/2017 08:56** **PSS Sample ID: 17032325-003**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 19:45	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 19:45	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 19:45	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 19:45	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Trichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 19:45	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 19:45	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:45	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)	**410**	ug/L	10		10	03/24/17	03/24/17 17:09	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 18:40	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325
Project ID: 31400390.9

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): 17032325
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Effluent VSP - 4	Initial	17032325-001	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:02
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:23
	Carbon Effluent	Initial	17032325-003	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:45
	Influent VSP-1	Initial	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:08
	TB-032317	Initial	17032325-005	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 18:40
	65396-1-BKS	BKS	65396-1-BKS	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 10:37
	65396-1-BLK	BLK	65396-1-BLK	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 11:46
	Corrado S	MS	17032303-001 S	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 15:42
	Corrado SD	MSD	17032303-001 SD	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 16:04
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:30
SW-846 8260 B-Modified	Effluent VSP - 4	Initial	17032325-001	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:00
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:25
	65413-1-BKS	BKS	65413-1-BKS	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:32
	65413-1-BLK	BLK	65413-1-BLK	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 15:37
	65413-1-BSD	BSD	65413-1-BSD	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:54
	Carbon Effluent	Reanalysis	17032325-003	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:09
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:52

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 19:02
Dibromofluoromethane	106		91-119	%	03/23/17 19:02
Toluene-D8	101		90-117	%	03/23/17 19:02

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:00

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:23
Dibromofluoromethane	105		91-119	%	03/23/17 19:23
Toluene-D8	105		90-117	%	03/23/17 19:23

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:25

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:45
Dibromofluoromethane	107		91-119	%	03/23/17 19:45
Toluene-D8	101		90-117	%	03/23/17 19:45

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	03/24/17 16:46

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 20:08
Dibromofluoromethane	106		91-119	%	03/23/17 20:08
Toluene-D8	99		90-117	%	03/23/17 20:08

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 17:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/23/17 18:40
Dibromofluoromethane	101		91-119	%	03/23/17 18:40
Toluene-D8	103		90-117	%	03/23/17 18:40

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 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	40.22	80	29-149	ug/L	03/23/17 10:37	
Benzene	<1.000	50.00	56.24	112	85-123	ug/L	03/23/17 10:37	
Bromochloromethane	<1.000	50.00	55.86	112	82-136	ug/L	03/23/17 10:37	
Bromodichloromethane	<1.000	50.00	60.48	121	88-133	ug/L	03/23/17 10:37	
Bromoform	<5.000	50.00	57.21	114	80-126	ug/L	03/23/17 10:37	
Bromomethane	<1.000	50.00	58.90	118	64-139	ug/L	03/23/17 10:37	
2-Butanone (MEK)	<10.00	50.00	40.04	80	39-135	ug/L	03/23/17 10:37	
Carbon Disulfide	<10.00	50.00	56.83	114	85-124	ug/L	03/23/17 10:37	
Carbon Tetrachloride	<1.000	50.00	56.63	113	81-138	ug/L	03/23/17 10:37	
Chlorobenzene	<1.000	50.00	58.68	117	85-120	ug/L	03/23/17 10:37	
Chloroethane	<1.000	50.00	52.17	104	75-129	ug/L	03/23/17 10:37	
Chloroform	<1.000	50.00	55.84	112	85-128	ug/L	03/23/17 10:37	
Chloromethane	<1.000	50.00	57.55	115	60-139	ug/L	03/23/17 10:37	
Cyclohexane	<10.00	50.00	58.52	117	55-131	ug/L	03/23/17 10:37	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.10	96	69-127	ug/L	03/23/17 10:37	
Dibromochloromethane	<1.000	50.00	53.30	107	82-127	ug/L	03/23/17 10:37	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.06	102	82-121	ug/L	03/23/17 10:37	
1,2-Dichlorobenzene	<1.000	50.00	59.05	118	82-123	ug/L	03/23/17 10:37	
1,3-Dichlorobenzene	<1.000	50.00	59.33	119	81-123	ug/L	03/23/17 10:37	
1,4-Dichlorobenzene	<1.000	50.00	57.57	115	81-121	ug/L	03/23/17 10:37	
Dichlorodifluoromethane	<1.000	50.00	60.36	121	69-147	ug/L	03/23/17 10:37	
1,1-Dichloroethane	<1.000	50.00	58.08	116	83-123	ug/L	03/23/17 10:37	
1,2-Dichloroethane	<1.000	50.00	59.51	119	86-138	ug/L	03/23/17 10:37	
1,1-Dichloroethene	<1.000	50.00	54.08	108	85-127	ug/L	03/23/17 10:37	
cis-1,2-Dichloroethene	<1.000	50.00	56.40	113	87-127	ug/L	03/23/17 10:37	
1,2-Dichloropropane	<1.000	50.00	52.57	105	79-125	ug/L	03/23/17 10:37	
cis-1,3-Dichloropropene	<1.000	50.00	54.65	109	79-131	ug/L	03/23/17 10:37	
trans-1,3-Dichloropropene	<1.000	50.00	54.22	108	82-133	ug/L	03/23/17 10:37	
trans-1,2-Dichloroethene	<1.000	50.00	55.28	111	85-125	ug/L	03/23/17 10:37	
Ethylbenzene	<1.000	50.00	59.23	118	83-123	ug/L	03/23/17 10:37	
2-Hexanone	<5.000	50.00	41.47	83	37-137	ug/L	03/23/17 10:37	
Isopropylbenzene	<1.000	50.00	59.18	118	70-131	ug/L	03/23/17 10:37	
Methyl Acetate	<10.00	50.00	71.66	143	69-127	ug/L	03/23/17 10:37	H
Methylcyclohexane	<10.00	50.00	61.41	123	75-129	ug/L	03/23/17 10:37	
Methylene Chloride	<1.000	50.00	57.60	115	86-124	ug/L	03/23/17 10:37	
4-Methyl-2-Pentanone	<5.000	50.00	41.73	83	39-143	ug/L	03/23/17 10:37	
Methyl-t-butyl ether	<1.000	50.00	54.35	109	75-134	ug/L	03/23/17 10:37	
Naphthalene	<1.000	50.00	48.91	98	61-118	ug/L	03/23/17 10:37	
Styrene	<1.000	50.00	52.67	105	80-120	ug/L	03/23/17 10:37	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.32	97	64-125	ug/L	03/23/17 10:37	
Tetrachloroethene	<1.000	50.00	61.17	122	83-138	ug/L	03/23/17 10:37	
Toluene	<1.000	50.00	60.82	122	88-126	ug/L	03/23/17 10:37	
1,2,3-Trichlorobenzene	<1.000	50.00	52.95	106	75-124	ug/L	03/23/17 10:37	
1,2,4-Trichlorobenzene	<1.000	50.00	54.50	109	77-131	ug/L	03/23/17 10:37	
1,1,1-Trichloroethane	<1.000	50.00	60.16	120	68-146	ug/L	03/23/17 10:37	
1,1,2-Trichloroethane	<1.000	50.00	53.26	107	85-124	ug/L	03/23/17 10:37	
Trichloroethene	<1.000	50.00	53.03	106	87-127	ug/L	03/23/17 10:37	
Trichlorofluoromethane	<5.000	50.00	52.87	106	77-147	ug/L	03/23/17 10:37	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.65	111	68-135	ug/L	03/23/17 10:37	
Vinyl Chloride	<1.000	50.00	72.13	144	74-138	ug/L	03/23/17 10:37	H
m,p-Xylenes	<2.000	100	120.6	121	84-124	ug/L	03/23/17 10:37	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	60.09	120	79-126	ug/L	03/23/17 10:37	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		100		86-111	%	03/23/17 10:37
Dibromofluoromethane	107		100		91-119	%	03/23/17 10:37
Toluene-D8	102		103		90-117	%	03/23/17 10:37

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

Seq Number: 141076 Matrix: Water Date Prep: 03/24/17

MB Sample Id: 65413-1-BLK LCS Sample Id: 65413-1-BKS LCSD Sample Id: 65413-1-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	27.80	93	29.93	100	50-150	7	20	ug/L	03/24/17 14:32	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	97		95		96		80-120	%	03/24/17 14:32

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.: 31400340.7
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Mark Kaplan DW CERT NO.:

PSS Work Order #: 1703235 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 DO (8260 SIM)	REMARKS
1	Effluent VSP-4	3/23/17	0823	WW	6	G		X	X	
2	Red Anderson Effluent	3/23/17	0845	WW	6	G		X	X	
3	Carbon Effluent	3/23/17	0856	WW	6	G		X	X	
4	Influent VSP-1	3/23/17	0908	WW	6	G		X	X	
5	TB-032317	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/23/17	15:11	LMACKLIN
Relinquished By: (2) LMACKLIN	Date 3/23/17	Time 3:40	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: 3°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 3°-6° 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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032325	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/23/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390.9	**Tracking No**	Not Applicable
Disposal Date	04/27/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 5 Total No. of Containers Received 26

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: 03/23/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 03/24/2017

Amber Confer

AMBERSORB LEAD EFF

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031316

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-05

March 16, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

March 16, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031316**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-05

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 **17031316**.

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 April 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031316

Project ID: 31400390-05

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 04:25 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031316-001	Effluent VSP-4	WASTE WATER	03/13/17 14:20
17031316-002	Lead Ambersorb	WASTE WATER	03/13/17 15:00

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

OFFICES:
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ROUTE 40 WEST
BALTIMORE, MD 21228
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031316

WSP Environment & Energy - Herndon, Herndon, VA

March 16, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-05

Sample ID: Lead Ambersorb **Date/Time Sampled: 03/13/2017 15:00** **PSS Sample ID: 17031316-002**
Matrix: WASTE WATER **Date/Time Received: 03/13/2017 16:25**

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	03/16/17	03/16/17 15:58	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 15:58	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 15:58	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 15:58	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 15:58	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 15:58	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011

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: 17031316

WSP Environment & Energy - Herndon, Herndon, VA

March 16, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-05

Sample ID: Lead Ambersorb **Date/Time Sampled: 03/13/2017 15:00** **PSS Sample ID: 17031316-002**
Matrix: WASTE WATER **Date/Time Received: 03/13/2017 16:25**

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	03/16/17	03/16/17 15:58	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 15:58	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 15:58	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 15:58	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 15:58	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 15:58	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 15:58	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)	ND	ug/L	1.0		1	03/15/17	03/15/17 18:10	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031316

Project ID: 31400390-05

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): **17031316**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Lead Ambersorb	Initial	17031316-002	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 15:58
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17031316-001	1011	W	65290	140849	03/13/2017	03/15/2017 10:22	03/15/2017 17:43
	Lead Ambersorb	Initial	17031316-002	1011	W	65290	140849	03/13/2017	03/15/2017 10:22	03/15/2017 18:10
	65290-1-BKS	BKS	65290-1-BKS	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 15:52
	65290-1-BLK	BLK	65290-1-BLK	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 17:13
	65290-1-BSD	BSD	65290-1-BSD	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 16:25

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031316

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140849 Matrix: Waste Water Date Prep: 03/15/2017

PSS Sample ID: 17031316-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	96		80-120	%	03/15/17 17:43

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

Seq Number: 140849 Matrix: Waste Water Date Prep: 03/15/2017

PSS Sample ID: 17031316-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	03/15/17 18:10

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

Seq Number: 140877 Matrix: Waste Water Date Prep: 03/16/2017

PSS Sample ID: 17031316-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	102		86-111	%	03/16/17 15:58
Dibromofluoromethane	98		91-119	%	03/16/17 15:58
Toluene-D8	99		90-117	%	03/16/17 15:58

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 17031316

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031316

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

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

Seq Number: 140849 Matrix: Water Date Prep: 03/15/17

MB Sample Id: 65290-1-BLK LCS Sample Id: 65290-1-BKS LCSD Sample Id: 65290-1-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	32.21	107	32.09	107	50-150	0	20	ug/L	03/15/17 15:52	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		94		94		80-120	%	03/15/17 15:52

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.

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.johnso@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kapp-Flex PROJECT NO.: 31400390-5
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kaylar PW CERT NO.:

PSS Work Order #: 1703316 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
	~~FSP-4~~ Effluent ~~VSP-4~~	3/13/17	1420	WW	3	G	X			2 DAY TAT
	Lead Ambersorb	3/13/17	1500	WW	6	G	X	X		2 Day TAT

3/13/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/13/17	1510	
Relinquished By: (2)	Date	Time	Received By:
	3/13/17	1625	
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 blnk 9.2
Custody Seal: Cooler intact
Ice Present: Pres Temp: 7-11°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031316	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 04:25:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-05	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**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	Pam Groff
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 2 Total No. of Containers Received 9

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: 03/13/2017

Thomas Wingate

PM Review and Approval: N L Jackson Date: 03/13/2017

Lynn Jackson

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031512

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-5

March 17, 2017

Phase Separation Science, Inc.

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

March 17, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031512**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17031512**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031512

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 11:25 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031512-001	Effluent VSP-4	WATER	03/14/17 15:40
17031512-002	Lead Ambersorb	WATER	03/14/17 15:45
17031512-003	Trip Blanks	WATER	03/15/17 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: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Lead Ambersorb **Date/Time Sampled: 03/14/2017 15:45** **PSS Sample ID: 17031512-002**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 18:01	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 18:01	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 18:01	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 18:01	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:01	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:01	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Lead Ambersorb **Date/Time Sampled: 03/14/2017 15:45** **PSS Sample ID: 17031512-002**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 18:01	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 18:01	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:01	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 18:01	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:01	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 18:01	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:01	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)	ND	ug/L	1.0		1	03/15/17	03/15/17 18:59	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blanks **Date/Time Sampled: 03/15/2017 11:25** **PSS Sample ID: 17031512-003**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 18:22	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blanks **Date/Time Sampled: 03/15/2017 11:25** **PSS Sample ID: 17031512-003**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 18:22	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 18:22	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031512
Project ID: 31400390-5

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 dates and times were not listed on the COC. Information was obtained from container labels.
Received Trip Blanks that were not on the COC. Logged in for 8260.

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): **17031512**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Effluent VSP-4	Initial	17031512-001	1011	W	65300	140877	03/14/2017	03/16/2017 13:41	03/16/2017 17:34
	Lead Ambersorb	Initial	17031512-002	1011	W	65300	140877	03/14/2017	03/16/2017 13:41	03/16/2017 18:01
	Trip Blanks	Initial	17031512-003	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 18:22
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
	Lead Ambersorb S	MS	17031316-002 S	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:25
	Lead Ambersorb SD	MSD	17031316-002 SD	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:47
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17031512-001	1011	W	65290	140849	03/14/2017	03/15/2017 10:22	03/15/2017 18:33
	Lead Ambersorb	Initial	17031512-002	1011	W	65290	140849	03/14/2017	03/15/2017 10:22	03/15/2017 18:59
	65290-1-BKS	BKS	65290-1-BKS	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 15:52
	65290-1-BLK	BLK	65290-1-BLK	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 17:13
	65290-1-BSD	BSD	65290-1-BSD	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 16:25

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140849 Matrix: Water Date Prep: 03/15/2017
PSS Sample ID: 17031512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/15/17 18:33

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/16/17 17:34
Dibromofluoromethane	102		91-119	%	03/16/17 17:34
Toluene-D8	103		90-117	%	03/16/17 17:34

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140849 Matrix: Water Date Prep: 03/15/2017
PSS Sample ID: 17031512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/15/17 18:59

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 18:01
Dibromofluoromethane	102		91-119	%	03/16/17 18:01
Toluene-D8	99		90-117	%	03/16/17 18:01

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031512-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 18:22
Dibromofluoromethane	100		91-119	%	03/16/17 18:22
Toluene-D8	102		90-117	%	03/16/17 18:22

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

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon
Kop-Flex

L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

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

Seq Number: 140849 Matrix: Water Date Prep: 03/15/17

MB Sample Id: 65290-1-BLK LCS Sample Id: 65290-1-BKS LCSD Sample Id: 65290-1-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	32.21	107	32.09	107	50-150	0	20	ug/L	03/15/17 15:52	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		94		94		80-120	%	03/15/17 15:52

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

CHAIN-OF-CUSTODY RECORD 1703512

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Drive St 300 Herndon VA 20171

No. 004522 WSP | PARSONS BRINCKERHOFF

Project Name: Kop flex	WSP | Parsons Brinckerhoff Contact Name: Eric Johnson
Project Location: Hanover MD	WSP | Parsons Brinckerhoff Contact E-mail: Eric.Johnson@wspgroup.com
Project Number & Task: 31400390-5	WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500
Sampler(s) Name(s): Maria Kaplan	Sampler(s) Signature(s):

Laboratory Name & Location: Phase Sep Science Baltimore MD

Laboratory Project Manager: Amber Confer

Requested Turn-Around-Time: ☐ Standard ☐ 24 HR ☒ 48 HR ☐ 72 HR ☐ ____ HR

Requested Analyses & Preservatives

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	VOCs (8260)	1,4 Dioxane (8260 SIM)	Sample Comments
Effluent VSP-4	AQ					6	X	X	
Lead Ambersorb	AQ					6	X	X	

# of Coolers: 1
Custody Seal: Cooler intact
Ice Present: Pres Temp: 2-4°C
Shipping Carrier: TTE

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	0920		03/15/17	9:20		
Dan Carter	03/15/17	1125	Carl Weber			Number of Packages	Custody Seal Number(s)

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031512	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 11:25:00 AM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	4
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

Documentation

		Sampler Name	Maria Kaplan
COC agrees with sample labels?	No	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 14

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.

Sample dates and times were not listed on the COC. Information was obtained from container labels.
Received Trip Blanks that were not on the COC. Logged in for 8260.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 03/15/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031521

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-5

March 17, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

March 17, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031521**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17031521**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031521

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031521-001	Lead Ambersorb	WATER	03/15/17 12:55
17031521-002	Effluent VSP-4	WATER	03/15/17 12:46

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: 17031521

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Lead Ambersorb **Date/Time Sampled: 03/15/2017 12:55** **PSS Sample ID: 17031521-001**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 18:48	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 18:48	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 18:48	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 18:48	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:48	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:48	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031521

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Lead Ambersorb **Date/Time Sampled: 03/15/2017 12:55** **PSS Sample ID: 17031521-001**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 18:48	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 18:48	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:48	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 18:48	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:48	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 18:48	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:48	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)	ND	ug/L	1.0		1	03/16/17	03/16/17 12:22	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031521
Project ID: 31400390-5

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): **17031521**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Lead Ambersorb	Initial	17031521-001	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 18:48
	Effluent VSP-4	Initial	17031521-002	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 19:10
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
	Lead Ambersorb S	MS	17031316-002 S	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:25
	Lead Ambersorb SD	MSD	17031316-002 SD	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:47
SW-846 8260 B-Modified	Lead Ambersorb	Initial	17031521-001	1011	W	65294	140856	03/15/2017	03/16/2017 09:14	03/16/2017 12:22
	Effluent VSP-4	Initial	17031521-002	1011	W	65294	140856	03/15/2017	03/16/2017 09:14	03/16/2017 12:45
	65294-1-BKS	BKS	65294-1-BKS	1011	W	65294	140856	--------	03/16/2017 09:14	03/16/2017 10:45
	65294-1-BLK	BLK	65294-1-BLK	1011	W	65294	140856	--------	03/16/2017 09:14	03/16/2017 11:32
	65294-1-BSD	BSD	65294-1-BSD	1011	W	65294	140856	--------	03/16/2017 09:14	03/16/2017 11:07

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031521

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140856 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/16/17 12:22

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 18:48
Dibromofluoromethane	104		91-119	%	03/16/17 18:48
Toluene-D8	99		90-117	%	03/16/17 18:48

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140856 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/16/17 12:45

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/16/17 19:10
Dibromofluoromethane	102		91-119	%	03/16/17 19:10
Toluene-D8	103		90-117	%	03/16/17 19:10

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 17031521

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031521

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

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

Seq Number: 140856 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65294-1-BLK LCS Sample Id: 65294-1-BKS LCSD Sample Id: 65294-1-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	33.77	113	32.95	110	50-150	2	20	ug/L	03/16/17 10:45	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	95		96		94		80-120	%	03/16/17 10:45

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

CHAIN-OF-CUSTODY RECORD 1703152

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Drive Suite 300 Herndon VA

No. 004527 WSP | PARSONS BRINCKERHOFF

Project Name: Kop Plex	WSP | Parsons Brinckerhoff Contact Name: Eric Johnson
Project Location: Hanover, MD	WSP | Parsons Brinckerhoff Contact E-mail: eric.johnson@wspgroup.com
Project Number & Task: 31400390-5	WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500
Sampler(s) Name(s): Maria Kaplan	Sampler(s) Signature(s):

Laboratory Name & Location: PSS, Baltimore MD

Laboratory Project Manager: Amber Carter

Requested Turn-Around-Time: ☐ Standard ☐ 24 HR ☒ 48 HR ☐ 72 HR ☐ ___ HR

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Requested Analyses & Preservatives: VOCs (8260)	1,4 Dioxane (8260 SIM)	Sample Comments
Lead Ambersorb	AQ	3/15/17	1255			6	X	X	
Effluent VSP-4	AQ	3/15/17	1246			6	X	X	

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES
Shipping Carrier: FE
Temp: 2°C

3/15/17

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	1534		3/15/17	1535		
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	03/15/17	1620					

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031521	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

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 2 Total No. of Containers Received 12

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: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/16/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032016

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

March 22, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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PHASE SEPARATION SCIENCE, INC.

March 22, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032016**
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 **17032016**.

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 April 24, 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/20/2017 at 03:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032016-001	Effluent VSP-4	WASTE WATER	03/20/17 12:47
17032016-002	Influent VSP-1	WASTE WATER	03/20/17 12:55
17032016-003	Carbon Effluent	WASTE WATER	03/20/17 13:01
17032016-004	Lead Ambersorb Effluent	WASTE WATER	03/20/17 13:08

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

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: 17032016

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Lead Ambersorb Effluent **Date/Time Sampled: 03/20/2017 13:08** **PSS Sample ID: 17032016-004**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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	03/21/17	03/21/17 12:15	1011
Benzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Bromochloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Bromoform	ND	ug/L	5.0		1	03/21/17	03/21/17 12:15	1011
Bromomethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/21/17	03/21/17 12:15	1011
Carbon Disulfide	ND	ug/L	10		1	03/21/17	03/21/17 12:15	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Chlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Chloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Chloroform	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Chloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Cyclohexane	ND	ug/L	10		1	03/21/17	03/21/17 12:15	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/21/17	03/21/17 12:15	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Ethylbenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032016

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Lead Ambersorb Effluent **Date/Time Sampled: 03/20/2017 13:08** **PSS Sample ID: 17032016-004**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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	03/21/17	03/21/17 12:15	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Methyl Acetate	ND	ug/L	10		1	03/21/17	03/21/17 12:15	1011
Methylcyclohexane	ND	ug/L	10		1	03/21/17	03/21/17 12:15	1011
Methylene Chloride	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/21/17	03/21/17 12:15	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Naphthalene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Styrene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Toluene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Trichloroethene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/21/17	03/21/17 12:15	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/21/17	03/21/17 12:15	1011
o-Xylene	ND	ug/L	1.0		1	03/21/17	03/21/17 12:15	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)	ND	ug/L	1.0		1	03/21/17	03/21/17 17:58	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016
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): **17032016**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:00
	Carbon Effluent	Initial	17032016-003	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:35
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:15
	65357-1-BKS	BKS	65357-1-BKS	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 10:56
	65357-1-BLK	BLK	65357-1-BLK	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 11:52
	Lead Ambersorb Effluent S	MS	17032016-004 S	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:55
	Lead Ambersorb Effluent SD	MSD	17032016-004 SD	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 14:17
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:28
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17032016-001	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 19:10
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 17:58
	65359-1-BKS	BKS	65359-1-BKS	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:26
	65359-1-BLK	BLK	65359-1-BLK	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 17:36
	65359-1-BSD	BSD	65359-1-BSD	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:49
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 20:25
	Carbon Effluent	Reanalysis	17032016-003	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 18:46

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:10

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/21/17 13:00
Dibromofluoromethane	103		91-119	%	03/21/17 13:00
Toluene-D8	100		90-117	%	03/21/17 13:00

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:59

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/21/17 12:35
Dibromofluoromethane	99		91-119	%	03/21/17 12:35
Toluene-D8	99		90-117	%	03/21/17 12:35

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	97		80-120	%	03/21/17 18:24

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/21/17 12:15
Dibromofluoromethane	100		91-119	%	03/21/17 12:15
Toluene-D8	104		90-117	%	03/21/17 12:15

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

Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 17:58

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 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	36.24	72	29-149	ug/L	03/21/17 10:56	
Benzene	<1.000	50.00	54.82	110	85-123	ug/L	03/21/17 10:56	
Bromochloromethane	<1.000	50.00	54.51	109	82-136	ug/L	03/21/17 10:56	
Bromodichloromethane	<1.000	50.00	58.87	118	88-133	ug/L	03/21/17 10:56	
Bromoform	<5.000	50.00	57.15	114	80-126	ug/L	03/21/17 10:56	
Bromomethane	<1.000	50.00	50.69	101	64-139	ug/L	03/21/17 10:56	
2-Butanone (MEK)	<10.00	50.00	39.55	79	39-135	ug/L	03/21/17 10:56	
Carbon Disulfide	<10.00	50.00	54.33	109	85-124	ug/L	03/21/17 10:56	
Carbon Tetrachloride	<1.000	50.00	52.96	106	81-138	ug/L	03/21/17 10:56	
Chlorobenzene	<1.000	50.00	56.89	114	85-120	ug/L	03/21/17 10:56	
Chloroethane	<1.000	50.00	50.49	101	75-129	ug/L	03/21/17 10:56	
Chloroform	<1.000	50.00	53.46	107	85-128	ug/L	03/21/17 10:56	
Chloromethane	<1.000	50.00	52.87	106	60-139	ug/L	03/21/17 10:56	
Cyclohexane	<10.00	50.00	55.79	112	55-131	ug/L	03/21/17 10:56	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.41	97	69-127	ug/L	03/21/17 10:56	
Dibromochloromethane	<1.000	50.00	51.34	103	82-127	ug/L	03/21/17 10:56	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.19	102	82-121	ug/L	03/21/17 10:56	
1,2-Dichlorobenzene	<1.000	50.00	57.99	116	82-123	ug/L	03/21/17 10:56	
1,3-Dichlorobenzene	<1.000	50.00	57.92	116	81-123	ug/L	03/21/17 10:56	
1,4-Dichlorobenzene	<1.000	50.00	56.06	112	81-121	ug/L	03/21/17 10:56	
Dichlorodifluoromethane	<1.000	50.00	58.73	117	69-147	ug/L	03/21/17 10:56	
1,1-Dichloroethane	<1.000	50.00	54.48	109	83-123	ug/L	03/21/17 10:56	
1,2-Dichloroethane	<1.000	50.00	58.72	117	86-138	ug/L	03/21/17 10:56	
1,1-Dichloroethene	<1.000	50.00	51.03	102	85-127	ug/L	03/21/17 10:56	
cis-1,2-Dichloroethene	<1.000	50.00	52.82	106	87-127	ug/L	03/21/17 10:56	
1,2-Dichloropropane	<1.000	50.00	50.48	101	79-125	ug/L	03/21/17 10:56	
cis-1,3-Dichloropropene	<1.000	50.00	51.95	104	79-131	ug/L	03/21/17 10:56	
trans-1,3-Dichloropropene	<1.000	50.00	53.20	106	82-133	ug/L	03/21/17 10:56	
trans-1,2-Dichloroethene	<1.000	50.00	51.21	102	85-125	ug/L	03/21/17 10:56	
Ethylbenzene	<1.000	50.00	57.90	116	83-123	ug/L	03/21/17 10:56	
2-Hexanone	<5.000	50.00	40.31	81	37-137	ug/L	03/21/17 10:56	
Isopropylbenzene	<1.000	50.00	57.86	116	70-131	ug/L	03/21/17 10:56	
Methyl Acetate	<10.00	50.00	72.48	145	69-127	ug/L	03/21/17 10:56	H
Methylcyclohexane	<10.00	50.00	60.46	121	75-129	ug/L	03/21/17 10:56	
Methylene Chloride	<1.000	50.00	56.62	113	86-124	ug/L	03/21/17 10:56	
4-Methyl-2-Pentanone	<5.000	50.00	40.55	81	39-143	ug/L	03/21/17 10:56	
Methyl-t-butyl ether	<1.000	50.00	51.80	104	75-134	ug/L	03/21/17 10:56	
Naphthalene	<1.000	50.00	49.88	100	61-118	ug/L	03/21/17 10:56	
Styrene	<1.000	50.00	51.04	102	80-120	ug/L	03/21/17 10:56	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.43	95	64-125	ug/L	03/21/17 10:56	
Tetrachloroethene	<1.000	50.00	59.56	119	83-138	ug/L	03/21/17 10:56	
Toluene	<1.000	50.00	58.32	117	88-126	ug/L	03/21/17 10:56	
1,2,3-Trichlorobenzene	<1.000	50.00	52.81	106	75-124	ug/L	03/21/17 10:56	
1,2,4-Trichlorobenzene	<1.000	50.00	51.86	104	77-131	ug/L	03/21/17 10:56	
1,1,1-Trichloroethane	<1.000	50.00	56.56	113	68-146	ug/L	03/21/17 10:56	
1,1,2-Trichloroethane	<1.000	50.00	51.62	103	85-124	ug/L	03/21/17 10:56	
Trichloroethene	<1.000	50.00	53.11	106	87-127	ug/L	03/21/17 10:56	
Trichlorofluoromethane	<5.000	50.00	49.57	99	77-147	ug/L	03/21/17 10:56	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.27	107	68-135	ug/L	03/21/17 10:56	
Vinyl Chloride	<1.000	50.00	67.26	135	74-138	ug/L	03/21/17 10:56	
m,p-Xylenes	<2.000	100	116.8	117	84-124	ug/L	03/21/17 10:56	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	58.25	117	79-126	ug/L	03/21/17 10:56	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/21/17 10:56
Dibromofluoromethane	104		98		91-119	%	03/21/17 10:56
Toluene-D8	101		102		90-117	%	03/21/17 10:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	35.15	70	34.75	70	46-138	1	25	ug/L	03/21/17 13:55	
Benzene	<1.000	50.00	58.48	117	56.70	113	77-126	3	25	ug/L	03/21/17 13:55	
Bromochloromethane	<1.000	50.00	58.30	117	57.27	115	74-133	2	25	ug/L	03/21/17 13:55	
Bromodichloromethane	<1.000	50.00	58.83	118	57.09	114	79-130	3	25	ug/L	03/21/17 13:55	
Bromoform	<5.000	50.00	57.77	116	55.77	112	69-120	4	25	ug/L	03/21/17 13:55	
Bromomethane	<1.000	50.00	48.92	98	49.11	98	64-130	0	25	ug/L	03/21/17 13:55	
2-Butanone (MEK)	<10.00	50.00	39.17	78	38.07	76	34-126	3	25	ug/L	03/21/17 13:55	
Carbon Disulfide	<10.00	50.00	55.46	111	52.14	104	76-126	6	25	ug/L	03/21/17 13:55	
Carbon Tetrachloride	<1.000	50.00	55.09	110	53.56	107	77-137	3	25	ug/L	03/21/17 13:55	
Chlorobenzene	<1.000	50.00	58.17	116	55.66	111	74-120	4	25	ug/L	03/21/17 13:55	
Chloroethane	<1.000	50.00	49.52	99	48.44	97	68-133	2	25	ug/L	03/21/17 13:55	
Chloroform	<1.000	50.00	57.17	114	55.68	111	77-127	3	25	ug/L	03/21/17 13:55	
Chloromethane	<1.000	50.00	53.44	107	51.11	102	50-143	4	25	ug/L	03/21/17 13:55	
Cyclohexane	<10.00	50.00	59.96	120	57.24	114	53-139	5	25	ug/L	03/21/17 13:55	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.47	95	48.01	96	56-123	1	25	ug/L	03/21/17 13:55	
Dibromochloromethane	<1.000	50.00	52.67	105	50.55	101	70-125	4	25	ug/L	03/21/17 13:55	
1,2-Dibromoethane (EDB)	<1.000	50.00	50.46	101	49.96	100	69-121	1	25	ug/L	03/21/17 13:55	
1,2-Dichlorobenzene	<1.000	50.00	57.00	114	57.37	115	69-118	1	25	ug/L	03/21/17 13:55	
1,3-Dichlorobenzene	<1.000	50.00	56.58	113	56.12	112	68-119	1	25	ug/L	03/21/17 13:55	
1,4-Dichlorobenzene	<1.000	50.00	54.87	110	55.28	111	67-117	1	25	ug/L	03/21/17 13:55	
Dichlorodifluoromethane	<1.000	50.00	55.82	112	55.83	112	68-139	0	25	ug/L	03/21/17 13:55	
1,1-Dichloroethane	<1.000	50.00	55.93	112	52.94	106	78-126	5	25	ug/L	03/21/17 13:55	
1,2-Dichloroethane	<1.000	50.00	58.54	117	57.09	114	78-134	3	25	ug/L	03/21/17 13:55	
1,1-Dichloroethene	<1.000	50.00	52.71	105	49.79	100	78-125	6	25	ug/L	03/21/17 13:55	
cis-1,2-Dichloroethene	<1.000	50.00	52.54	105	57.86	116	78-128	10	25	ug/L	03/21/17 13:55	
1,2-Dichloropropane	<1.000	50.00	51.40	103	49.15	98	73-126	4	25	ug/L	03/21/17 13:55	
cis-1,3-Dichloropropene	<1.000	50.00	51.19	102	50.43	101	67-126	1	25	ug/L	03/21/17 13:55	
trans-1,3-Dichloropropene	<1.000	50.00	51.84	104	50.47	101	68-129	3	25	ug/L	03/21/17 13:55	
trans-1,2-Dichloroethene	<1.000	50.00	52.86	106	50.84	102	76-128	4	25	ug/L	03/21/17 13:55	
Ethylbenzene	<1.000	50.00	60.09	120	57.53	115	74-123	4	25	ug/L	03/21/17 13:55	
2-Hexanone	<5.000	50.00	38.40	77	38.96	78	38-125	1	25	ug/L	03/21/17 13:55	
Isopropylbenzene	<1.000	50.00	58.27	117	58.30	117	58-129	0	25	ug/L	03/21/17 13:55	
Methyl Acetate	<10.00	50.00	71.53	143	67.91	136	63-115	5	25	ug/L	03/21/17 13:55	X
Methylcyclohexane	<10.00	50.00	59.94	120	57.38	115	69-130	4	25	ug/L	03/21/17 13:55	
Methylene Chloride	<1.000	50.00	55.88	112	53.41	107	76-124	5	25	ug/L	03/21/17 13:55	
4-Methyl-2-Pentanone	<5.000	50.00	39.01	78	38.43	77	35-123	1	25	ug/L	03/21/17 13:55	
Methyl-t-butyl ether	<1.000	50.00	50.49	101	50.10	100	64-129	1	25	ug/L	03/21/17 13:55	
Naphthalene	<1.000	50.00	47.34	95	49.19	98	45-109	4	25	ug/L	03/21/17 13:55	
Styrene	<1.000	50.00	52.38	105	51.03	102	61-124	3	25	ug/L	03/21/17 13:55	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.88	96	49.19	98	47-130	3	25	ug/L	03/21/17 13:55	
Tetrachloroethene	<1.000	50.00	58.91	118	57.43	115	68-139	3	25	ug/L	03/21/17 13:55	
Toluene	<1.000	50.00	58.42	117	56.44	113	79-128	3	25	ug/L	03/21/17 13:55	
1,2,3-Trichlorobenzene	<1.000	50.00	50.84	102	51.25	103	48-122	1	25	ug/L	03/21/17 13:55	
1,2,4-Trichlorobenzene	<1.000	50.00	50.48	101	51.76	104	54-124	3	25	ug/L	03/21/17 13:55	
1,1,1-Trichloroethane	<1.000	50.00	58.53	117	56.53	113	73-140	3	25	ug/L	03/21/17 13:55	
1,1,2-Trichloroethane	<1.000	50.00	50.37	101	49.52	99	78-124	2	25	ug/L	03/21/17 13:55	
Trichloroethene	<1.000	50.00	50.75	102	49.85	100	77-131	2	25	ug/L	03/21/17 13:55	
Trichlorofluoromethane	<5.000	50.00	50.97	102	49.00	98	73-144	4	25	ug/L	03/21/17 13:55	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	54.03	108	50.94	102	65-140	6	25	ug/L	03/21/17 13:55	
Vinyl Chloride	<1.000	50.00	68.98	138	65.01	130	60-146	6	25	ug/L	03/21/17 13:55	
m,p-Xylenes	<2.000	100	119.4	119	115.4	115	75-125	3	25	ug/L	03/21/17 13:55	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	59.57	119	57.37	115	69-126	4	25	ug/L	03/21/17 13:55	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		100		86-111	%	03/21/17 13:55
Dibromofluoromethane	103		103		91-119	%	03/21/17 13:55
Toluene-D8	98		98		90-117	%	03/21/17 13:55

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

Seq Number: 140981 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65359-1-BLK LCS Sample Id: 65359-1-BKS LCSD Sample Id: 65359-1-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	30.41	101	29.99	100	50-150	1	20	ug/L	03/21/17 16:26	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		98		94		80-120	%	03/21/17 16:26

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kop-Flex PROJECT NO.: 31400396-07
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kaplan DW CERT NO.:

PSS Work Order #: 17032016 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
							HCl	HCl		
1	Effluent VSP-4	3/20/17	1247	WW	~~10~~ 30	G	X	X		48-hr TAT
2	Influent VSP-1	3/20/17	1255	WW	6	G	X	X		
3 *	Carbon Effluent	3/20/17	1301	WW	6	G	X	X		
4 *	Lead Amberserb Effluent	3/20/17	1308	WW	6	G	X	X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/20/17	1447	LMACKLIN 655
Relinquished By: (2)	Date	Time	Received By:
LMACKLIN	3/20/17	3:20	
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 62
Custody Seal: Cooler - Intact
Ice Present: PRES Temp: 6°-11°C
Shipping Carrier: FTE

Special Instructions:

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

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032016	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/20/2017 03:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	04/24/2017	**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	Pam Groff
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 4 Total No. of Containers Received 21

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: 03/20/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/21/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032325

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390.9

March 27, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032325**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390.9

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 **17032325**.

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 April 27, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325

Project ID: 31400390.9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/23/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032325-001	Effluent VSP - 4	WASTE WATER	03/23/17 08:23
17032325-002	Lead Ambersorb Effluent	WASTE WATER	03/23/17 08:45
17032325-003	Carbon Effluent	WASTE WATER	03/23/17 08:56
17032325-004	Influent VSP-1	WASTE WATER	03/23/17 09:08
17032325-005	TB-032317	WATER	03/23/17 15:40

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: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Lead Ambersorb Effluent **Date/Time Sampled: 03/23/2017 08:45** **PSS Sample ID: 17032325-002**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 19:23	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 19:23	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 19:23	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 19:23	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Chloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 19:23	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 19:23	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Lead Ambersorb Effluent **Date/Time Sampled: 03/23/2017 08:45** **PSS Sample ID: 17032325-002**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 19:23	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 19:23	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 19:23	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 19:23	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Trichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 19:23	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 19:23	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:23	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)	**2.1**	ug/L	1.0		1	03/24/17	03/24/17 16:25	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 18:40	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325
Project ID: 31400390.9

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): 17032325
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Effluent VSP - 4	Initial	17032325-001	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:02
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:23
	Carbon Effluent	Initial	17032325-003	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:45
	Influent VSP-1	Initial	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:08
	TB-032317	Initial	17032325-005	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 18:40
	65396-1-BKS	BKS	65396-1-BKS	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 10:37
	65396-1-BLK	BLK	65396-1-BLK	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 11:46
	Corrado S	MS	17032303-001 S	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 15:42
	Corrado SD	MSD	17032303-001 SD	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 16:04
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:30
SW-846 8260 B-Modified	Effluent VSP - 4	Initial	17032325-001	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:00
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:25
	65413-1-BKS	BKS	65413-1-BKS	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:32
	65413-1-BLK	BLK	65413-1-BLK	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 15:37
	65413-1-BSD	BSD	65413-1-BSD	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:54
	Carbon Effluent	Reanalysis	17032325-003	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:09
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:52

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 19:02
Dibromofluoromethane	106		91-119	%	03/23/17 19:02
Toluene-D8	101		90-117	%	03/23/17 19:02

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:00

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:23
Dibromofluoromethane	105		91-119	%	03/23/17 19:23
Toluene-D8	105		90-117	%	03/23/17 19:23

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:25

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:45
Dibromofluoromethane	107		91-119	%	03/23/17 19:45
Toluene-D8	101		90-117	%	03/23/17 19:45

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	03/24/17 16:46

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 20:08
Dibromofluoromethane	106		91-119	%	03/23/17 20:08
Toluene-D8	99		90-117	%	03/23/17 20:08

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 17:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/23/17 18:40
Dibromofluoromethane	101		91-119	%	03/23/17 18:40
Toluene-D8	103		90-117	%	03/23/17 18:40

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 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	40.22	80	29-149	ug/L	03/23/17 10:37	
Benzene	<1.000	50.00	56.24	112	85-123	ug/L	03/23/17 10:37	
Bromochloromethane	<1.000	50.00	55.86	112	82-136	ug/L	03/23/17 10:37	
Bromodichloromethane	<1.000	50.00	60.48	121	88-133	ug/L	03/23/17 10:37	
Bromoform	<5.000	50.00	57.21	114	80-126	ug/L	03/23/17 10:37	
Bromomethane	<1.000	50.00	58.90	118	64-139	ug/L	03/23/17 10:37	
2-Butanone (MEK)	<10.00	50.00	40.04	80	39-135	ug/L	03/23/17 10:37	
Carbon Disulfide	<10.00	50.00	56.83	114	85-124	ug/L	03/23/17 10:37	
Carbon Tetrachloride	<1.000	50.00	56.63	113	81-138	ug/L	03/23/17 10:37	
Chlorobenzene	<1.000	50.00	58.68	117	85-120	ug/L	03/23/17 10:37	
Chloroethane	<1.000	50.00	52.17	104	75-129	ug/L	03/23/17 10:37	
Chloroform	<1.000	50.00	55.84	112	85-128	ug/L	03/23/17 10:37	
Chloromethane	<1.000	50.00	57.55	115	60-139	ug/L	03/23/17 10:37	
Cyclohexane	<10.00	50.00	58.52	117	55-131	ug/L	03/23/17 10:37	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.10	96	69-127	ug/L	03/23/17 10:37	
Dibromochloromethane	<1.000	50.00	53.30	107	82-127	ug/L	03/23/17 10:37	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.06	102	82-121	ug/L	03/23/17 10:37	
1,2-Dichlorobenzene	<1.000	50.00	59.05	118	82-123	ug/L	03/23/17 10:37	
1,3-Dichlorobenzene	<1.000	50.00	59.33	119	81-123	ug/L	03/23/17 10:37	
1,4-Dichlorobenzene	<1.000	50.00	57.57	115	81-121	ug/L	03/23/17 10:37	
Dichlorodifluoromethane	<1.000	50.00	60.36	121	69-147	ug/L	03/23/17 10:37	
1,1-Dichloroethane	<1.000	50.00	58.08	116	83-123	ug/L	03/23/17 10:37	
1,2-Dichloroethane	<1.000	50.00	59.51	119	86-138	ug/L	03/23/17 10:37	
1,1-Dichloroethene	<1.000	50.00	54.08	108	85-127	ug/L	03/23/17 10:37	
cis-1,2-Dichloroethene	<1.000	50.00	56.40	113	87-127	ug/L	03/23/17 10:37	
1,2-Dichloropropane	<1.000	50.00	52.57	105	79-125	ug/L	03/23/17 10:37	
cis-1,3-Dichloropropene	<1.000	50.00	54.65	109	79-131	ug/L	03/23/17 10:37	
trans-1,3-Dichloropropene	<1.000	50.00	54.22	108	82-133	ug/L	03/23/17 10:37	
trans-1,2-Dichloroethene	<1.000	50.00	55.28	111	85-125	ug/L	03/23/17 10:37	
Ethylbenzene	<1.000	50.00	59.23	118	83-123	ug/L	03/23/17 10:37	
2-Hexanone	<5.000	50.00	41.47	83	37-137	ug/L	03/23/17 10:37	
Isopropylbenzene	<1.000	50.00	59.18	118	70-131	ug/L	03/23/17 10:37	
Methyl Acetate	<10.00	50.00	71.66	143	69-127	ug/L	03/23/17 10:37	H
Methylcyclohexane	<10.00	50.00	61.41	123	75-129	ug/L	03/23/17 10:37	
Methylene Chloride	<1.000	50.00	57.60	115	86-124	ug/L	03/23/17 10:37	
4-Methyl-2-Pentanone	<5.000	50.00	41.73	83	39-143	ug/L	03/23/17 10:37	
Methyl-t-butyl ether	<1.000	50.00	54.35	109	75-134	ug/L	03/23/17 10:37	
Naphthalene	<1.000	50.00	48.91	98	61-118	ug/L	03/23/17 10:37	
Styrene	<1.000	50.00	52.67	105	80-120	ug/L	03/23/17 10:37	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.32	97	64-125	ug/L	03/23/17 10:37	
Tetrachloroethene	<1.000	50.00	61.17	122	83-138	ug/L	03/23/17 10:37	
Toluene	<1.000	50.00	60.82	122	88-126	ug/L	03/23/17 10:37	
1,2,3-Trichlorobenzene	<1.000	50.00	52.95	106	75-124	ug/L	03/23/17 10:37	
1,2,4-Trichlorobenzene	<1.000	50.00	54.50	109	77-131	ug/L	03/23/17 10:37	
1,1,1-Trichloroethane	<1.000	50.00	60.16	120	68-146	ug/L	03/23/17 10:37	
1,1,2-Trichloroethane	<1.000	50.00	53.26	107	85-124	ug/L	03/23/17 10:37	
Trichloroethene	<1.000	50.00	53.03	106	87-127	ug/L	03/23/17 10:37	
Trichlorofluoromethane	<5.000	50.00	52.87	106	77-147	ug/L	03/23/17 10:37	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.65	111	68-135	ug/L	03/23/17 10:37	
Vinyl Chloride	<1.000	50.00	72.13	144	74-138	ug/L	03/23/17 10:37	H
m,p-Xylenes	<2.000	100	120.6	121	84-124	ug/L	03/23/17 10:37	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	60.09	120	79-126	ug/L	03/23/17 10:37	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		100		86-111	%	03/23/17 10:37
Dibromofluoromethane	107		100		91-119	%	03/23/17 10:37
Toluene-D8	102		103		90-117	%	03/23/17 10:37

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

Seq Number: 141076 Matrix: Water Date Prep: 03/24/17

MB Sample Id: 65413-1-BLK LCS Sample Id: 65413-1-BKS LCSD Sample Id: 65413-1-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	27.80	93	29.93	100	50-150	7	20	ug/L	03/24/17 14:32	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	97		95		96		80-120	%	03/24/17 14:32

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.: 31400340.7
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Mark Kaplan DW CERT NO.:

PSS Work Order #: 1703235 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 DO (8260 SIM)	REMARKS
1	Effluent VSP-4	3/23/17	0823	WW	6	G		X	X	
2	Red Anderson Effluent	3/23/17	0845	WW	6	G		X	X	
3	Carbon Effluent	3/23/17	0856	WW	6	G		X	X	
4	Influent VSP-1	3/23/17	0908	WW	6	G		X	X	
5	TB-032317	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/23/17	15:11	LMACKLIN
Relinquished By: (2) LMACKLIN	Date 3/23/17	Time 3:40	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: 3°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 3°-6° C
Shipping Carrier: TTE

Special Instructions:

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

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032325	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/23/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390.9	**Tracking No**	Not Applicable
Disposal Date	04/27/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 5 Total No. of Containers Received 26

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: 03/23/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 03/24/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032929

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

March 31, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 31, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032929**
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 **17032929**.

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 May 3, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032929

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/29/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032929-001	Influent VSP-1	GROUND WATER	03/29/17 10:49
17032929-002	TB-032917	WATER	03/29/17 16:20
17032929-003	Effluent VSP-4	WASTE WATER	03/29/17 10:38
17032929-004	Lead Ambersorb Ef.	WASTE WATER	03/29/17 10:55

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: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: Lead Ambersorb Ef. **Date/Time Sampled: 03/29/2017 10:55** **PSS Sample ID: 17032929-004**
Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 15:11	1011
Benzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Bromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Bromoform	ND	ug/L	5.0		1	03/31/17	03/31/17 15:11	1011
Bromomethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/31/17	03/31/17 15:11	1011
Carbon Disulfide	ND	ug/L	10		1	03/31/17	03/31/17 15:11	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Chlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Chloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Chloroform	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Chloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Cyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 15:11	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/31/17	03/31/17 15:11	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Ethylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: Lead Ambersorb Ef. **Date/Time Sampled: 03/29/2017 10:55** **PSS Sample ID: 17032929-004**
Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 15:11	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Methyl Acetate	ND	ug/L	10		1	03/31/17	03/31/17 15:11	1011
Methylcyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 15:11	1011
Methylene Chloride	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/31/17	03/31/17 15:11	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Naphthalene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Styrene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Toluene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Trichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/31/17	03/31/17 15:11	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/31/17	03/31/17 15:11	1011
o-Xylene	ND	ug/L	1.0		1	03/31/17	03/31/17 15:11	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)	ND	ug/L	1.0		1	03/30/17	03/30/17 17:59	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: TB-032917 **Date/Time Sampled: 03/29/2017 16:20** **PSS Sample ID: 17032929-002**
Matrix: WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 14:42	1011
Benzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Bromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Bromoform	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
Bromomethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Carbon Disulfide	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chloroform	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Chloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Cyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Ethylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032929

WSP Environment & Energy - Herndon, Herndon, VA

March 31, 2017

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

Sample ID: TB-032917 **Date/Time Sampled: 03/29/2017 16:20** **PSS Sample ID: 17032929-002**
Matrix: WATER **Date/Time Received: 03/29/2017 16:20**

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	03/31/17	03/31/17 14:42	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Methyl Acetate	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Methylcyclohexane	ND	ug/L	10		1	03/31/17	03/31/17 14:42	1011
Methylene Chloride	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Naphthalene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Styrene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Toluene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Trichloroethene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/31/17	03/31/17 14:42	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/31/17	03/31/17 14:42	1011
o-Xylene	ND	ug/L	1.0		1	03/31/17	03/31/17 14:42	1011

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/29/2017 10:38** **PSS Sample ID: 17032929-003**
Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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	03/30/17	03/30/17 17:08	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032929

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. Analysis is on hold, per client.

Analytical:

TCL Volatile Organic Compounds

Batch: 141273

Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form.

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): **17032929**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032929-001	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 15:32
	TB-032917	Initial	17032929-002	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 14:42
	Lead Ambersorb Ef.	Initial	17032929-004	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 15:11
	65502-1-BKS	BKS	65502-1-BKS	1011	W	65502	141273	--------	03/31/2017 09:34	03/31/2017 12:33
	65502-1-BLK	BLK	65502-1-BLK	1011	W	65502	141273	--------	03/31/2017 09:34	03/31/2017 13:30
	Influent VSP-1	Reanalysis	17032929-001	1011	W	65502	141273	03/29/2017	03/31/2017 09:34	03/31/2017 15:54
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17032929-003	1011	W	65495	141246	03/29/2017	03/30/2017 14:02	03/30/2017 17:08
	Lead Ambersorb Ef.	Initial	17032929-004	1011	W	65495	141246	03/29/2017	03/30/2017 14:02	03/30/2017 17:59
	65495-1-BKS	BKS	65495-1-BKS	1011	W	65495	141246	--------	03/30/2017 14:02	03/30/2017 14:48
	65495-1-BLK	BLK	65495-1-BLK	1011	W	65495	141246	--------	03/30/2017 14:02	03/30/2017 15:34
	65495-1-BSD	BSD	65495-1-BSD	1011	W	65495	141246	--------	03/30/2017 14:02	03/30/2017 15:12
	Influent VSP-1	Reanalysis	17032929-001	1011	W	65495	141246	03/29/2017	03/30/2017 14:02	03/30/2017 16:18

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032929

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141246 Matrix: Ground Water Date Prep: 03/30/2017
PSS Sample ID: 17032929-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	95		80-120	%	03/30/17 15:56

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141273 Matrix: Ground Water Date Prep: 03/31/2017
PSS Sample ID: 17032929-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/31/17 15:32
Dibromofluoromethane	100		91-119	%	03/31/17 15:32
Toluene-D8	100		90-117	%	03/31/17 15:32

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141273 Matrix: Water Date Prep: 03/31/2017
PSS Sample ID: 17032929-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/31/17 14:42
Dibromofluoromethane	106		91-119	%	03/31/17 14:42
Toluene-D8	104		90-117	%	03/31/17 14:42

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141246 Matrix: Waste Water Date Prep: 03/30/2017
PSS Sample ID: 17032929-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	95		80-120	%	03/30/17 17:08

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141246 Matrix: Waste Water Date Prep: 03/30/2017
PSS Sample ID: 17032929-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/30/17 17:59

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032929

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141273 Matrix: Waste Water Date Prep: 03/31/2017
PSS Sample ID: 17032929-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	96		86-111	%	03/31/17 15:11
Dibromofluoromethane	100		91-119	%	03/31/17 15:11
Toluene-D8	100		90-117	%	03/31/17 15:11

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 17032929

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141273 Matrix: Water Date Prep: 03/31/17

MB Sample Id: 65502-1-BLK LCS Sample Id: 65502-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	40.10	80	29-149	ug/L	03/31/17 12:33	
Benzene	<1.000	50.00	43.87	88	85-123	ug/L	03/31/17 12:33	
Bromochloromethane	<1.000	50.00	44.06	88	82-136	ug/L	03/31/17 12:33	
Bromodichloromethane	<1.000	50.00	48.11	96	88-133	ug/L	03/31/17 12:33	
Bromoform	<5.000	50.00	46.81	94	80-126	ug/L	03/31/17 12:33	
Bromomethane	<1.000	50.00	39.72	79	64-139	ug/L	03/31/17 12:33	
2-Butanone (MEK)	<10.00	50.00	43.07	86	39-135	ug/L	03/31/17 12:33	
Carbon Disulfide	<10.00	50.00	43.75	88	85-124	ug/L	03/31/17 12:33	
Carbon Tetrachloride	<1.000	50.00	43.75	88	81-138	ug/L	03/31/17 12:33	
Chlorobenzene	<1.000	50.00	45.02	90	85-120	ug/L	03/31/17 12:33	
Chloroethane	<1.000	50.00	40.97	82	75-129	ug/L	03/31/17 12:33	
Chloroform	<1.000	50.00	44.48	89	85-128	ug/L	03/31/17 12:33	
Chloromethane	<1.000	50.00	44.55	89	60-139	ug/L	03/31/17 12:33	
Cyclohexane	<10.00	50.00	44.45	89	55-131	ug/L	03/31/17 12:33	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	39.97	80	69-127	ug/L	03/31/17 12:33	
Dibromochloromethane	<1.000	50.00	42.38	85	82-127	ug/L	03/31/17 12:33	
1,2-Dibromoethane (EDB)	<1.000	50.00	40.75	82	82-121	ug/L	03/31/17 12:33	
1,2-Dichlorobenzene	<1.000	50.00	47.05	94	82-123	ug/L	03/31/17 12:33	
1,3-Dichlorobenzene	<1.000	50.00	47.01	94	81-123	ug/L	03/31/17 12:33	
1,4-Dichlorobenzene	<1.000	50.00	45.36	91	81-121	ug/L	03/31/17 12:33	
Dichlorodifluoromethane	<1.000	50.00	48.23	96	69-147	ug/L	03/31/17 12:33	
1,1-Dichloroethane	<1.000	50.00	44.67	89	83-123	ug/L	03/31/17 12:33	
1,2-Dichloroethane	<1.000	50.00	48.58	97	86-138	ug/L	03/31/17 12:33	
1,1-Dichloroethene	<1.000	50.00	41.48	83	85-127	ug/L	03/31/17 12:33	L
cis-1,2-Dichloroethene	<1.000	50.00	43.51	87	87-127	ug/L	03/31/17 12:33	
1,2-Dichloropropane	<1.000	50.00	40.28	81	79-125	ug/L	03/31/17 12:33	
cis-1,3-Dichloropropene	<1.000	50.00	41.20	82	79-131	ug/L	03/31/17 12:33	
trans-1,3-Dichloropropene	<1.000	50.00	42.04	84	82-133	ug/L	03/31/17 12:33	
trans-1,2-Dichloroethene	<1.000	50.00	41.77	84	85-125	ug/L	03/31/17 12:33	L
Ethylbenzene	<1.000	50.00	45.94	92	83-123	ug/L	03/31/17 12:33	
2-Hexanone	<5.000	50.00	48.98	98	37-137	ug/L	03/31/17 12:33	
Isopropylbenzene	<1.000	50.00	47.01	94	70-131	ug/L	03/31/17 12:33	
Methyl Acetate	<10.00	50.00	48.31	97	69-127	ug/L	03/31/17 12:33	
Methylcyclohexane	<10.00	50.00	47.33	95	75-129	ug/L	03/31/17 12:33	
Methylene Chloride	<1.000	50.00	45.71	91	86-124	ug/L	03/31/17 12:33	
4-Methyl-2-Pentanone	<5.000	50.00	48.24	96	39-143	ug/L	03/31/17 12:33	
Methyl-t-butyl ether	<1.000	50.00	42.47	85	75-134	ug/L	03/31/17 12:33	
Naphthalene	<1.000	50.00	40.81	82	61-118	ug/L	03/31/17 12:33	
Styrene	<1.000	50.00	41.03	82	80-120	ug/L	03/31/17 12:33	
1,1,2,2-Tetrachloroethane	<1.000	50.00	39.94	80	64-125	ug/L	03/31/17 12:33	
Tetrachloroethene	<1.000	50.00	47.26	95	83-138	ug/L	03/31/17 12:33	
Toluene	<1.000	50.00	45.54	91	88-126	ug/L	03/31/17 12:33	
1,2,3-Trichlorobenzene	<1.000	50.00	43.44	87	75-124	ug/L	03/31/17 12:33	
1,2,4-Trichlorobenzene	<1.000	50.00	43.06	86	77-131	ug/L	03/31/17 12:33	
1,1,1-Trichloroethane	<1.000	50.00	47.26	95	68-146	ug/L	03/31/17 12:33	
1,1,2-Trichloroethane	<1.000	50.00	40.95	82	85-124	ug/L	03/31/17 12:33	L
Trichloroethene	<1.000	50.00	40.91	82	87-127	ug/L	03/31/17 12:33	L
Trichlorofluoromethane	<5.000	50.00	41.47	83	77-147	ug/L	03/31/17 12:33	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	43.28	87	68-135	ug/L	03/31/17 12:33	
Vinyl Chloride	<1.000	50.00	55.68	111	74-138	ug/L	03/31/17 12:33	
m,p-Xylenes	<2.000	100	92.23	92	84-124	ug/L	03/31/17 12:33	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032929

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141273 Matrix: Water Date Prep: 03/31/17

MB Sample Id: 65502-1-BLK LCS Sample Id: 65502-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	46.39	93	79-126	ug/L	03/31/17 12:33	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		98		86-111	%	03/31/17 12:33
Dibromofluoromethane	101		99		91-119	%	03/31/17 12:33
Toluene-D8	100		100		90-117	%	03/31/17 12:33

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

Seq Number: 141246 Matrix: Water Date Prep: 03/30/17

MB Sample Id: 65495-1-BLK LCS Sample Id: 65495-1-BKS LCSD Sample Id: 65495-1-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	29.05	97	31.03	103	50-150	7	20	ug/L	03/30/17 14:48	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	98		96		97		80-120	%	03/30/17 14:48

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.

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.:
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Mara Kaplan + Dan Groff DW CERT NO.:

PSS Work Order #: 17032929 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)	Total Zn, Ni, Pb, Cu	dissolved Zn, Ni, Pb, Cu	REMARKS
1	Influent USP-1	3/29/17	1049	GW	8	G	HCl	X	X	X	X	~~2 Day TAT~~ (#) (MP)
2	TB-032917	—	—	DW	2		HCl	X				2 Day TAT
3	Effluent USP-4	3/29/17	1038	WW	3	G			X			2 Day TAT
4	Lead Amber-sorb Eff.	3/29/17	1055	WW	6	G	HCl	X	X			2 Day TAT

(5)

Relinquished By: (1)	Date	Time	Received By:
[signature]	3/29/17	1520	[signature] TTE
Relinquished By: (2)	Date	Time	Received By:
[signature] TTE	3/30/17	920	Barb Wiley
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 1°C)
Custody Seal: cooler intact
Ice Present: Pres Temp: 1-6°C
Shipping Carrier: TTE

Special Instructions:
(#) Run VOCs + 1,4 Dioxane on 2 day TAT, Hold total & dissolved metals

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032929	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/29/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/03/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	Temp Blank Present	Yes

Documentation

		Sampler Name	Maria Kaplan & Pam
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 4 Total No. of Containers Received 19

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)		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.

Sample aliquots for dissolved metals were not field filtered and were received unpreserved. Analysis is on hold, per client.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/29/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 03/30/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17040321

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

April 5, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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.

April 5, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17040321**
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 **17040321**.

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 May 8, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040321

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/03/2017 at 03:55 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17040321-001	Effluent VSP-4	WASTE WATER	04/03/17 08:45
17040321-002	Lead Ambersorb Ef	WASTE WATER	04/03/17 08:50
17040321-003	Influent VSP-1	WASTE WATER	04/03/17 09:00
17040321-004	TB-040317	WATER	04/03/17 15:55

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: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: Lead Ambersorb Ef **Date/Time Sampled: 04/03/2017 08:50** **PSS Sample ID: 17040321-002**
Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:49	1011
Benzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Bromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Bromoform	ND	ug/L	5.0		1	04/04/17	04/04/17 11:49	1011
Bromomethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/04/17	04/04/17 11:49	1011
Carbon Disulfide	ND	ug/L	10		1	04/04/17	04/04/17 11:49	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Chlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Chloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Chloroform	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Chloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Cyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:49	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:49	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Ethylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: Lead Ambersorb Ef **Date/Time Sampled: 04/03/2017 08:50** **PSS Sample ID: 17040321-002**
Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:49	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Methyl Acetate	ND	ug/L	10		1	04/04/17	04/04/17 11:49	1011
Methylcyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:49	1011
Methylene Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/04/17	04/04/17 11:49	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Naphthalene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Styrene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Toluene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Trichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:49	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/04/17	04/04/17 11:49	1011
o-Xylene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:49	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)	**25**	ug/L	1.0		1	04/04/17	04/04/17 17:02	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: TB-040317 **Date/Time Sampled: 04/03/2017 15:55** **PSS Sample ID: 17040321-004**
Matrix: WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:26	1011
Benzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromoform	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Bromomethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Carbon Disulfide	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloroform	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Cyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Ethylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: TB-040317 **Date/Time Sampled: 04/03/2017 15:55** **PSS Sample ID: 17040321-004**
Matrix: WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:26	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Methyl Acetate	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Methylcyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Methylene Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Naphthalene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Styrene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Toluene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Trichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/04/17	04/04/17 11:26	1011
o-Xylene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040321

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:

No sampling date or time on COC for sample 'Influent VSP-1'. Information obtained from container labels.

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): **17040321**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Lead Ambersorb Ef	Initial	17040321-002	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 11:49
	Influent VSP-1	Initial	17040321-003	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:13
	TB-040317	Initial	17040321-004	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 11:26
	65547-1-BKS	BKS	65547-1-BKS	1011	W	65547	141361	--------	04/04/2017 09:08	04/04/2017 10:11
	65547-1-BLK	BLK	65547-1-BLK	1011	W	65547	141361	--------	04/04/2017 09:08	04/04/2017 10:58
	Lead Ambersorb Ef S	MS	17040321-002 S	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:58
	Lead Ambersorb Ef SD	MSD	17040321-002 SD	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 13:20
	Influent VSP-1	Reanalysis	17040321-003	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:37
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17040321-001	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 16:40
	Lead Ambersorb Ef	Initial	17040321-002	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 17:02
	65548-1-BKS	BKS	65548-1-BKS	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 15:09
	65548-1-BLK	BLK	65548-1-BLK	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 16:18
	65548-1-BSD	BSD	65548-1-BSD	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 15:31
	Influent VSP-1	Reanalysis	17040321-003	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 17:48

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	04/04/17 16:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	04/04/17 11:49
Dibromofluoromethane	105		91-119	%	04/04/17 11:49
Toluene-D8	101		90-117	%	04/04/17 11:49

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	04/04/17 17:02

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	04/04/17 12:13
Dibromofluoromethane	102		91-119	%	04/04/17 12:13
Toluene-D8	100		90-117	%	04/04/17 12:13

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	96		80-120	%	04/04/17 17:26

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	04/04/17 11:26
Dibromofluoromethane	102		91-119	%	04/04/17 11:26
Toluene-D8	102		90-117	%	04/04/17 11:26

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 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65547-1-BLK LCS Sample Id: 65547-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.83	80	29-149	ug/L	04/04/17 10:11	
Benzene	<1.000	50.00	50.66	101	85-123	ug/L	04/04/17 10:11	
Bromochloromethane	<1.000	50.00	52.27	105	82-136	ug/L	04/04/17 10:11	
Bromodichloromethane	<1.000	50.00	56.62	113	88-133	ug/L	04/04/17 10:11	
Bromoform	<5.000	50.00	52.81	106	80-126	ug/L	04/04/17 10:11	
Bromomethane	<1.000	50.00	55.03	110	64-139	ug/L	04/04/17 10:11	
2-Butanone (MEK)	<10.00	50.00	44.06	88	39-135	ug/L	04/04/17 10:11	
Carbon Disulfide	<10.00	50.00	51.56	103	85-124	ug/L	04/04/17 10:11	
Carbon Tetrachloride	<1.000	50.00	51.25	103	81-138	ug/L	04/04/17 10:11	
Chlorobenzene	<1.000	50.00	52.55	105	85-120	ug/L	04/04/17 10:11	
Chloroethane	<1.000	50.00	47.32	95	75-129	ug/L	04/04/17 10:11	
Chloroform	<1.000	50.00	52.28	105	85-128	ug/L	04/04/17 10:11	
Chloromethane	<1.000	50.00	53.09	106	60-139	ug/L	04/04/17 10:11	
Cyclohexane	<10.00	50.00	52.70	105	55-131	ug/L	04/04/17 10:11	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.79	92	69-127	ug/L	04/04/17 10:11	
Dibromochloromethane	<1.000	50.00	48.25	97	82-127	ug/L	04/04/17 10:11	
1,2-Dibromoethane (EDB)	<1.000	50.00	46.58	93	82-121	ug/L	04/04/17 10:11	
1,2-Dichlorobenzene	<1.000	50.00	53.24	106	82-123	ug/L	04/04/17 10:11	
1,3-Dichlorobenzene	<1.000	50.00	52.84	106	81-123	ug/L	04/04/17 10:11	
1,4-Dichlorobenzene	<1.000	50.00	51.60	103	81-121	ug/L	04/04/17 10:11	
Dichlorodifluoromethane	<1.000	50.00	56.72	113	69-147	ug/L	04/04/17 10:11	
1,1-Dichloroethane	<1.000	50.00	54.10	108	83-123	ug/L	04/04/17 10:11	
1,2-Dichloroethane	<1.000	50.00	55.84	112	86-138	ug/L	04/04/17 10:11	
1,1-Dichloroethene	<1.000	50.00	50.22	100	85-127	ug/L	04/04/17 10:11	
cis-1,2-Dichloroethene	<1.000	50.00	52.45	105	87-127	ug/L	04/04/17 10:11	
1,2-Dichloropropane	<1.000	50.00	47.42	95	79-125	ug/L	04/04/17 10:11	
cis-1,3-Dichloropropene	<1.000	50.00	49.20	98	79-131	ug/L	04/04/17 10:11	
trans-1,3-Dichloropropene	<1.000	50.00	49.66	99	82-133	ug/L	04/04/17 10:11	
trans-1,2-Dichloroethene	<1.000	50.00	52.19	104	85-125	ug/L	04/04/17 10:11	
Ethylbenzene	<1.000	50.00	53.51	107	83-123	ug/L	04/04/17 10:11	
2-Hexanone	<5.000	50.00	44.96	90	37-137	ug/L	04/04/17 10:11	
Isopropylbenzene	<1.000	50.00	52.37	105	70-131	ug/L	04/04/17 10:11	
Methyl Acetate	<10.00	50.00	58.66	117	69-127	ug/L	04/04/17 10:11	
Methylcyclohexane	<10.00	50.00	56.04	112	75-129	ug/L	04/04/17 10:11	
Methylene Chloride	<1.000	50.00	52.05	104	86-124	ug/L	04/04/17 10:11	
4-Methyl-2-Pentanone	<5.000	50.00	44.60	89	39-143	ug/L	04/04/17 10:11	
Methyl-t-butyl ether	<1.000	50.00	51.64	103	75-134	ug/L	04/04/17 10:11	
Naphthalene	<1.000	50.00	44.90	90	61-118	ug/L	04/04/17 10:11	
Styrene	<1.000	50.00	47.14	94	80-120	ug/L	04/04/17 10:11	
1,1,2,2-Tetrachloroethane	<1.000	50.00	44.54	89	64-125	ug/L	04/04/17 10:11	
Tetrachloroethene	<1.000	50.00	55.55	111	83-138	ug/L	04/04/17 10:11	
Toluene	<1.000	50.00	54.55	109	88-126	ug/L	04/04/17 10:11	
1,2,3-Trichlorobenzene	<1.000	50.00	48.39	97	75-124	ug/L	04/04/17 10:11	
1,2,4-Trichlorobenzene	<1.000	50.00	48.71	97	77-131	ug/L	04/04/17 10:11	
1,1,1-Trichloroethane	<1.000	50.00	54.89	110	68-146	ug/L	04/04/17 10:11	
1,1,2-Trichloroethane	<1.000	50.00	49.08	98	85-124	ug/L	04/04/17 10:11	
Trichloroethene	<1.000	50.00	47.96	96	87-127	ug/L	04/04/17 10:11	
Trichlorofluoromethane	<5.000	50.00	49.30	99	77-147	ug/L	04/04/17 10:11	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	52.07	104	68-135	ug/L	04/04/17 10:11	
Vinyl Chloride	<1.000	50.00	66.22	132	74-138	ug/L	04/04/17 10:11	
m,p-Xylenes	<2.000	100	107.2	107	84-124	ug/L	04/04/17 10:11	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65547-1-BLK LCS Sample Id: 65547-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	53.37	107	79-126	ug/L	04/04/17 10:11	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		97		86-111	%	04/04/17 10:11
Dibromofluoromethane	101		103		91-119	%	04/04/17 10:11
Toluene-D8	99		104		90-117	%	04/04/17 10:11

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040321-002 MS Sample Id: 17040321-002 S MSD Sample Id: 17040321-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	38.15	76	38.48	77	46-138	1	25	ug/L	04/04/17 12:58	
Benzene	<1.000	50.00	45.55	91	45.41	91	77-126	0	25	ug/L	04/04/17 12:58	
Bromochloromethane	<1.000	50.00	46.91	94	46.26	93	74-133	1	25	ug/L	04/04/17 12:58	
Bromodichloromethane	<1.000	50.00	50.52	101	49.73	99	79-130	2	25	ug/L	04/04/17 12:58	
Bromoform	<5.000	50.00	45.36	91	47.48	95	69-120	5	25	ug/L	04/04/17 12:58	
Bromomethane	<1.000	50.00	49.58	99	50.70	101	64-130	2	25	ug/L	04/04/17 12:58	
2-Butanone (MEK)	<10.00	50.00	43.37	87	44.27	89	34-126	2	25	ug/L	04/04/17 12:58	
Carbon Disulfide	<10.00	50.00	45.82	92	45.61	91	76-126	0	25	ug/L	04/04/17 12:58	
Carbon Tetrachloride	<1.000	50.00	46.72	93	46.70	93	77-137	0	25	ug/L	04/04/17 12:58	
Chlorobenzene	<1.000	50.00	47.18	94	46.48	93	74-120	1	25	ug/L	04/04/17 12:58	
Chloroethane	<1.000	50.00	43.06	86	43.52	87	68-133	1	25	ug/L	04/04/17 12:58	
Chloroform	<1.000	50.00	47.48	95	46.91	94	77-127	1	25	ug/L	04/04/17 12:58	
Chloromethane	<1.000	50.00	48.57	97	48.77	98	50-143	0	25	ug/L	04/04/17 12:58	
Cyclohexane	<10.00	50.00	46.38	93	45.56	91	53-139	2	25	ug/L	04/04/17 12:58	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	38.42	77	40.31	81	56-123	5	25	ug/L	04/04/17 12:58	
Dibromochloromethane	<1.000	50.00	42.44	85	42.64	85	70-125	0	25	ug/L	04/04/17 12:58	
1,2-Dibromoethane (EDB)	<1.000	50.00	41.08	82	41.54	83	69-121	1	25	ug/L	04/04/17 12:58	
1,2-Dichlorobenzene	<1.000	50.00	47.19	94	46.37	93	69-118	2	25	ug/L	04/04/17 12:58	
1,3-Dichlorobenzene	<1.000	50.00	46.21	92	46.36	93	68-119	0	25	ug/L	04/04/17 12:58	
1,4-Dichlorobenzene	<1.000	50.00	44.52	89	44.04	88	67-117	1	25	ug/L	04/04/17 12:58	
Dichlorodifluoromethane	<1.000	50.00	49.66	99	49.23	98	68-139	1	25	ug/L	04/04/17 12:58	
1,1-Dichloroethane	<1.000	50.00	50.55	101	47.79	96	78-126	6	25	ug/L	04/04/17 12:58	
1,2-Dichloroethane	<1.000	50.00	50.10	100	50.52	101	78-134	1	25	ug/L	04/04/17 12:58	
1,1-Dichloroethene	<1.000	50.00	44.78	90	44.71	89	78-125	0	25	ug/L	04/04/17 12:58	
cis-1,2-Dichloroethene	<1.000	50.00	47.71	95	45.35	91	78-128	5	25	ug/L	04/04/17 12:58	
1,2-Dichloropropane	<1.000	50.00	42.25	85	42.10	84	73-126	0	25	ug/L	04/04/17 12:58	
cis-1,3-Dichloropropene	<1.000	50.00	42.88	86	42.28	85	67-126	1	25	ug/L	04/04/17 12:58	
trans-1,3-Dichloropropene	<1.000	50.00	43.22	86	42.84	86	68-129	1	25	ug/L	04/04/17 12:58	
trans-1,2-Dichloroethene	<1.000	50.00	45.13	90	44.26	89	76-128	2	25	ug/L	04/04/17 12:58	
Ethylbenzene	<1.000	50.00	47.75	96	46.94	94	74-123	2	25	ug/L	04/04/17 12:58	
2-Hexanone	<5.000	50.00	46.60	93	47.30	95	38-125	1	25	ug/L	04/04/17 12:58	
Isopropylbenzene	<1.000	50.00	46.49	93	45.89	92	58-129	1	25	ug/L	04/04/17 12:58	
Methyl Acetate	<10.00	50.00	48.12	96	49.77	100	63-115	3	25	ug/L	04/04/17 12:58	
Methylcyclohexane	<10.00	50.00	49.24	98	48.55	97	69-130	1	25	ug/L	04/04/17 12:58	
Methylene Chloride	<1.000	50.00	48.32	97	47.23	94	76-124	2	25	ug/L	04/04/17 12:58	
4-Methyl-2-Pentanone	<5.000	50.00	46.22	92	46.65	93	35-123	1	25	ug/L	04/04/17 12:58	
Methyl-t-butyl ether	<1.000	50.00	43.03	86	43.63	87	64-129	1	25	ug/L	04/04/17 12:58	
Naphthalene	<1.000	50.00	38.34	77	39.48	79	45-109	3	25	ug/L	04/04/17 12:58	
Styrene	<1.000	50.00	42.15	84	41.80	84	61-124	1	25	ug/L	04/04/17 12:58	
1,1,2,2-Tetrachloroethane	<1.000	50.00	38.52	77	39.85	80	47-130	3	25	ug/L	04/04/17 12:58	
Tetrachloroethene	<1.000	50.00	48.42	97	49.82	100	68-139	3	25	ug/L	04/04/17 12:58	
Toluene	<1.000	50.00	48.39	97	49.04	98	79-128	1	25	ug/L	04/04/17 12:58	
1,2,3-Trichlorobenzene	<1.000	50.00	40.91	82	41.91	84	48-122	2	25	ug/L	04/04/17 12:58	
1,2,4-Trichlorobenzene	<1.000	50.00	41.38	83	40.49	81	54-124	2	25	ug/L	04/04/17 12:58	
1,1,1-Trichloroethane	<1.000	50.00	49.98	100	49.85	100	73-140	0	25	ug/L	04/04/17 12:58	
1,1,2-Trichloroethane	<1.000	50.00	42.37	85	43.70	87	78-124	3	25	ug/L	04/04/17 12:58	
Trichloroethene	<1.000	50.00	42.82	86	43.68	87	77-131	2	25	ug/L	04/04/17 12:58	
Trichlorofluoromethane	<5.000	50.00	45.17	90	44.39	89	73-144	2	25	ug/L	04/04/17 12:58	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	45.12	90	45.66	91	65-140	1	25	ug/L	04/04/17 12:58	
Vinyl Chloride	<1.000	50.00	59.56	119	60.02	120	60-146	1	25	ug/L	04/04/17 12:58	
m,p-Xylenes	<2.000	100	95.57	96	94.80	95	75-125	1	25	ug/L	04/04/17 12:58	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040321-002 MS Sample Id: 17040321-002 S MSD Sample Id: 17040321-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	48.99	98	47.98	96	69-126	2	25	ug/L	04/04/17 12:58	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		97		86-111	%	04/04/17 12:58
Dibromofluoromethane	105		106		91-119	%	04/04/17 12:58
Toluene-D8	102		104		90-117	%	04/04/17 12:58

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

Seq Number: 141362 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65548-1-BLK LCS Sample Id: 65548-1-BKS LCSD Sample Id: 65548-1-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	30.78	103	32.00	107	50-150	4	20	ug/L	04/04/17 15:09	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	95		94		96		80-120	%	04/04/17 15:09

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.

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

(1) *CLIENT: USP *OFFICE LOC. Hanover VA

*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500

EMAIL: erjohnson@uspgroup.com FAX NO.: ( )

*PROJECT NAME: Kapflex PROJECT NO.:

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

SAMPLER(S): Dan Graff + Marian Kapfer DW CERT NO.:

PSS Work Order #: 17040321 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) * L4Diorex (8270 SIM)	UCCS (8260)	REMARKS
1	Effluent USP-4	4/3/17	0845	WW	3	G		X		
2	Leach Ambersorb Eff	4/3/17	0850	WW	6	G		X	X	
3	Influent USP-1			WW	6	G		X	X	
4	TB-040317	—	—	DW	2	—			X	

04/03/17

(5)

Relinquished By: (1)	Date	Time	Received By:
Dan Graff	4/3/17	1520	Dan Carter
Relinquished By: (2)	Date	Time	Received By:
Dan Carter	04/03/17	1555	Brad Weber
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 6°C)

Custody Seal: Abs

Ice Present: Pres Temp: 3-6 °C

Shipping Carrier: TTG

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17040321	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/03/2017 03:55:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/08/2017	**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)	6
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Pam Groff/Maria Kaj
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 4 Total No. of Containers Received 17

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.

No sampling date or time on COC for sample 'Influent VSP-1'. Information obtained from container labels.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/03/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 04/04/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17041211

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

April 14, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

April 14, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17041211**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17041211**.

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 May 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041211

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/12/2017 at 01:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17041211-001	Influent VSP-1	GROUND WATER	04/12/17 08:32
17041211-002	Lead Ambersorb Ef	WASTE WATER	04/12/17 08:20
17041211-003	Effluent VSP-4	WASTE WATER	04/12/17 08:05
17041211-004	TB041217	WATER	04/12/17 13:05

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: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Lead Ambersorb Ef **Date/Time Sampled: 04/12/2017 08:20** **PSS Sample ID: 17041211-002**
Matrix: WASTE WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 11:17	1011
Benzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Bromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Bromoform	ND	ug/L	5.0		1	04/14/17	04/14/17 11:17	1011
Bromomethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/14/17	04/14/17 11:17	1011
Carbon Disulfide	ND	ug/L	10		1	04/14/17	04/14/17 11:17	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Chlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Chloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Chloroform	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Chloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Cyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 11:17	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/14/17	04/14/17 11:17	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Ethylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Lead Ambersorb Ef **Date/Time Sampled: 04/12/2017 08:20** **PSS Sample ID: 17041211-002**
Matrix: WASTE WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 11:17	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Methyl Acetate	ND	ug/L	10		1	04/14/17	04/14/17 11:17	1011
Methylcyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 11:17	1011
Methylene Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/14/17	04/14/17 11:17	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Naphthalene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Styrene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Toluene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Trichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/14/17	04/14/17 11:17	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/14/17	04/14/17 11:17	1011
o-Xylene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:17	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)	ND	ug/L	1.0		1	04/13/17	04/13/17 11:47	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: TB041217 **Date/Time Sampled: 04/12/2017 13:05** **PSS Sample ID: 17041211-004**
Matrix: WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 10:56	1011
Benzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromoform	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Bromomethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Carbon Disulfide	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloroform	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Cyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Ethylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: TB041217 **Date/Time Sampled: 04/12/2017 13:05** **PSS Sample ID: 17041211-004**
Matrix: WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 10:56	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Methyl Acetate	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Methylcyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Methylene Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Naphthalene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Styrene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Toluene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Trichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/14/17	04/14/17 10:56	1011
o-Xylene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041211
Project ID: 31400390-9

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:

Custody seal was affixed to only one side of lid and cooler where lid could be opened from another side.

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): 17041211
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17041211-001	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:02
	Lead Ambersorb Ef	Initial	17041211-002	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 11:17
	Effluent VSP-4	Initial	17041211-003	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 11:40
	TB041217	Initial	17041211-004	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 10:56
	65694-1-BKS	BKS	65694-1-BKS	1011	W	65694	141673	--------	04/14/2017 08:20	04/14/2017 09:30
	65694-1-BLK	BLK	65694-1-BLK	1011	W	65694	141673	--------	04/14/2017 08:20	04/14/2017 10:23
	Lead Ambersorb Ef S	MS	17041211-002 S	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:56
	Lead Ambersorb Ef SD	MSD	17041211-002 SD	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 13:18
	Influent VSP-1	Reanalysis	17041211-001	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:25
SW-846 8260 B-Modified	Lead Ambersorb Ef	Initial	17041211-002	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 11:47
	Effluent VSP-4	Initial	17041211-003	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 12:09
	65688-1-BKS	BKS	65688-1-BKS	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 11:04
	65688-1-BLK	BLK	65688-1-BLK	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 10:42
	65688-1-BSD	BSD	65688-1-BSD	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 10:20
	Influent VSP-1	Reanalysis	17041211-001	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 13:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Ground Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	04/13/17 12:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Ground Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 12:02
Dibromofluoromethane	104		91-119	%	04/14/17 12:02
Toluene-D8	100		90-117	%	04/14/17 12:02

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Waste Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	95		80-120	%	04/13/17 11:47

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 11:17
Dibromofluoromethane	97		91-119	%	04/14/17 11:17
Toluene-D8	98		90-117	%	04/14/17 11:17

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Waste Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	04/13/17 12:09

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	04/14/17 11:40
Dibromofluoromethane	101		91-119	%	04/14/17 11:40
Toluene-D8	98		90-117	%	04/14/17 11:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 10:56
Dibromofluoromethane	104		91-119	%	04/14/17 10:56
Toluene-D8	101		90-117	%	04/14/17 10:56

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 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Water Date Prep: 04/14/17

MB Sample Id: 65694-1-BLK LCS Sample Id: 65694-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	45.09	90	29-149	ug/L	04/14/17 09:30	
Benzene	<1.000	50.00	55.23	110	85-123	ug/L	04/14/17 09:30	
Bromochloromethane	<1.000	50.00	49.17	98	82-136	ug/L	04/14/17 09:30	
Bromodichloromethane	<1.000	50.00	49.87	100	88-133	ug/L	04/14/17 09:30	
Bromoform	<5.000	50.00	50.26	101	80-126	ug/L	04/14/17 09:30	
Bromomethane	<1.000	50.00	52.08	104	64-139	ug/L	04/14/17 09:30	
2-Butanone (MEK)	<10.00	50.00	43.25	87	39-135	ug/L	04/14/17 09:30	
Carbon Disulfide	<10.00	50.00	54.50	109	85-124	ug/L	04/14/17 09:30	
Carbon Tetrachloride	<1.000	50.00	49.16	98	81-138	ug/L	04/14/17 09:30	
Chlorobenzene	<1.000	50.00	56.60	113	85-120	ug/L	04/14/17 09:30	
Chloroethane	<1.000	50.00	50.63	101	75-129	ug/L	04/14/17 09:30	
Chloroform	<1.000	50.00	55.01	110	85-128	ug/L	04/14/17 09:30	
Chloromethane	<1.000	50.00	49.29	99	60-139	ug/L	04/14/17 09:30	
Cyclohexane	<10.00	50.00	54.77	110	55-131	ug/L	04/14/17 09:30	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.12	94	69-127	ug/L	04/14/17 09:30	
Dibromochloromethane	<1.000	50.00	52.01	104	82-127	ug/L	04/14/17 09:30	
1,2-Dibromoethane (EDB)	<1.000	50.00	56.33	113	82-121	ug/L	04/14/17 09:30	
1,2-Dichlorobenzene	<1.000	50.00	58.79	118	82-123	ug/L	04/14/17 09:30	
1,3-Dichlorobenzene	<1.000	50.00	59.85	120	81-123	ug/L	04/14/17 09:30	
1,4-Dichlorobenzene	<1.000	50.00	57.63	115	81-121	ug/L	04/14/17 09:30	
Dichlorodifluoromethane	<1.000	50.00	55.80	112	69-147	ug/L	04/14/17 09:30	
1,1-Dichloroethane	<1.000	50.00	54.26	109	83-123	ug/L	04/14/17 09:30	
1,2-Dichloroethane	<1.000	50.00	54.94	110	86-138	ug/L	04/14/17 09:30	
1,1-Dichloroethene	<1.000	50.00	48.65	97	85-127	ug/L	04/14/17 09:30	
cis-1,2-Dichloroethene	<1.000	50.00	57.05	114	87-127	ug/L	04/14/17 09:30	
1,2-Dichloropropane	<1.000	50.00	56.31	113	79-125	ug/L	04/14/17 09:30	
cis-1,3-Dichloropropene	<1.000	50.00	50.03	100	79-131	ug/L	04/14/17 09:30	
trans-1,3-Dichloropropene	<1.000	50.00	49.75	100	82-133	ug/L	04/14/17 09:30	
trans-1,2-Dichloroethene	<1.000	50.00	48.58	97	85-125	ug/L	04/14/17 09:30	
Ethylbenzene	<1.000	50.00	59.84	120	83-123	ug/L	04/14/17 09:30	
2-Hexanone	<5.000	50.00	42.59	85	37-137	ug/L	04/14/17 09:30	
Isopropylbenzene	<1.000	50.00	52.93	106	70-131	ug/L	04/14/17 09:30	
Methyl Acetate	<10.00	50.00	69.67	139	69-127	ug/L	04/14/17 09:30	H
Methylcyclohexane	<10.00	50.00	58.28	117	75-129	ug/L	04/14/17 09:30	
Methylene Chloride	<1.000	50.00	53.59	107	86-124	ug/L	04/14/17 09:30	
4-Methyl-2-Pentanone	<5.000	50.00	49.30	99	39-143	ug/L	04/14/17 09:30	
Methyl-t-butyl ether	<1.000	50.00	58.77	118	75-134	ug/L	04/14/17 09:30	
Naphthalene	<1.000	50.00	50.57	101	61-118	ug/L	04/14/17 09:30	
Styrene	<1.000	50.00	51.26	103	80-120	ug/L	04/14/17 09:30	
1,1,2,2-Tetrachloroethane	<1.000	50.00	49.76	100	64-125	ug/L	04/14/17 09:30	
Tetrachloroethene	<1.000	50.00	49.64	99	83-138	ug/L	04/14/17 09:30	
Toluene	<1.000	50.00	55.06	110	88-126	ug/L	04/14/17 09:30	
1,2,3-Trichlorobenzene	<1.000	50.00	53.05	106	75-124	ug/L	04/14/17 09:30	
1,2,4-Trichlorobenzene	<1.000	50.00	54.59	109	77-131	ug/L	04/14/17 09:30	
1,1,1-Trichloroethane	<1.000	50.00	55.17	110	68-146	ug/L	04/14/17 09:30	
1,1,2-Trichloroethane	<1.000	50.00	47.88	96	85-124	ug/L	04/14/17 09:30	
Trichloroethene	<1.000	50.00	55.89	112	87-127	ug/L	04/14/17 09:30	
Trichlorofluoromethane	<5.000	50.00	50.96	102	77-147	ug/L	04/14/17 09:30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	48.93	98	68-135	ug/L	04/14/17 09:30	
Vinyl Chloride	<1.000	50.00	62.45	125	74-138	ug/L	04/14/17 09:30	
m,p-Xylenes	<2.000	100	116.9	117	84-124	ug/L	04/14/17 09:30	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Water Date Prep: 04/14/17

MB Sample Id: 65694-1-BLK LCS Sample Id: 65694-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	51.68	103	79-126	ug/L	04/14/17 09:30	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		101		86-111	%	04/14/17 09:30
Dibromofluoromethane	95		98		91-119	%	04/14/17 09:30
Toluene-D8	98		98		90-117	%	04/14/17 09:30

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/17

Parent Sample Id: 17041211-002 MS Sample Id: 17041211-002 S MSD Sample Id: 17041211-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	41.74	83	41.95	84	46-138	1	25	ug/L	04/14/17 12:56	
Benzene	<1.000	50.00	54.17	108	52.64	105	77-126	3	25	ug/L	04/14/17 12:56	
Bromochloromethane	<1.000	50.00	46.86	94	50.23	100	74-133	7	25	ug/L	04/14/17 12:56	
Bromodichloromethane	<1.000	50.00	50.37	101	49.17	98	79-130	2	25	ug/L	04/14/17 12:56	
Bromoform	<5.000	50.00	49.05	98	50.05	100	69-120	2	25	ug/L	04/14/17 12:56	
Bromomethane	<1.000	50.00	49.79	100	48.46	97	64-130	3	25	ug/L	04/14/17 12:56	
2-Butanone (MEK)	<10.00	50.00	41.35	83	39.80	80	34-126	4	25	ug/L	04/14/17 12:56	
Carbon Disulfide	<10.00	50.00	55.04	110	52.25	105	76-126	5	25	ug/L	04/14/17 12:56	
Carbon Tetrachloride	<1.000	50.00	51.43	103	49.69	99	77-137	3	25	ug/L	04/14/17 12:56	
Chlorobenzene	<1.000	50.00	55.29	111	55.06	110	74-120	0	25	ug/L	04/14/17 12:56	
Chloroethane	<1.000	50.00	52.01	104	49.55	99	68-133	5	25	ug/L	04/14/17 12:56	
Chloroform	<1.000	50.00	55.39	111	55.79	112	77-127	1	25	ug/L	04/14/17 12:56	
Chloromethane	<1.000	50.00	52.70	105	50.00	100	50-143	5	25	ug/L	04/14/17 12:56	
Cyclohexane	<10.00	50.00	55.97	112	54.33	109	53-139	3	25	ug/L	04/14/17 12:56	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.84	92	50.47	101	56-123	10	25	ug/L	04/14/17 12:56	
Dibromochloromethane	<1.000	50.00	51.21	102	51.52	103	70-125	1	25	ug/L	04/14/17 12:56	
1,2-Dibromoethane (EDB)	<1.000	50.00	56.10	112	56.18	112	69-121	0	25	ug/L	04/14/17 12:56	
1,2-Dichlorobenzene	<1.000	50.00	53.25	107	55.71	111	69-118	5	25	ug/L	04/14/17 12:56	
1,3-Dichlorobenzene	<1.000	50.00	55.08	110	57.18	114	68-119	4	25	ug/L	04/14/17 12:56	
1,4-Dichlorobenzene	<1.000	50.00	54.27	109	56.56	113	67-117	4	25	ug/L	04/14/17 12:56	
Dichlorodifluoromethane	<1.000	50.00	58.76	118	56.08	112	68-139	5	25	ug/L	04/14/17 12:56	
1,1-Dichloroethane	<1.000	50.00	55.32	111	52.72	105	78-126	5	25	ug/L	04/14/17 12:56	
1,2-Dichloroethane	<1.000	50.00	57.28	115	55.24	110	78-134	4	25	ug/L	04/14/17 12:56	
1,1-Dichloroethene	<1.000	50.00	49.97	100	45.79	92	78-125	9	25	ug/L	04/14/17 12:56	
cis-1,2-Dichloroethene	<1.000	50.00	56.27	113	51.17	102	78-128	9	25	ug/L	04/14/17 12:56	
1,2-Dichloropropane	<1.000	50.00	55.94	112	53.95	108	73-126	4	25	ug/L	04/14/17 12:56	
cis-1,3-Dichloropropene	<1.000	50.00	48.21	96	47.02	94	67-126	2	25	ug/L	04/14/17 12:56	
trans-1,3-Dichloropropene	<1.000	50.00	48.21	96	47.53	95	68-129	1	25	ug/L	04/14/17 12:56	
trans-1,2-Dichloroethene	<1.000	50.00	49.03	98	45.98	92	76-128	6	25	ug/L	04/14/17 12:56	
Ethylbenzene	<1.000	50.00	57.99	116	58.62	117	74-123	1	25	ug/L	04/14/17 12:56	
2-Hexanone	<5.000	50.00	41.39	83	42.33	85	38-125	2	25	ug/L	04/14/17 12:56	
Isopropylbenzene	<1.000	50.00	48.38	97	50.47	101	58-129	4	25	ug/L	04/14/17 12:56	
Methyl Acetate	<10.00	50.00	65.98	132	68.24	136	63-115	3	25	ug/L	04/14/17 12:56	X
Methylcyclohexane	<10.00	50.00	57.65	115	53.34	107	69-130	8	25	ug/L	04/14/17 12:56	
Methylene Chloride	<1.000	50.00	54.30	109	51.21	102	76-124	6	25	ug/L	04/14/17 12:56	
4-Methyl-2-Pentanone	<5.000	50.00	47.36	95	47.31	95	35-123	0	25	ug/L	04/14/17 12:56	
Methyl-t-butyl ether	<1.000	50.00	55.49	111	54.07	108	64-129	3	25	ug/L	04/14/17 12:56	
Naphthalene	<1.000	50.00	45.17	90	48.46	97	45-109	7	25	ug/L	04/14/17 12:56	
Styrene	<1.000	50.00	50.14	100	49.90	100	61-124	0	25	ug/L	04/14/17 12:56	
1,1,2,2-Tetrachloroethane	<1.000	50.00	45.60	91	49.97	100	47-130	9	25	ug/L	04/14/17 12:56	
Tetrachloroethene	<1.000	50.00	49.09	98	46.76	94	68-139	5	25	ug/L	04/14/17 12:56	
Toluene	<1.000	50.00	54.90	110	52.77	106	79-128	4	25	ug/L	04/14/17 12:56	
1,2,3-Trichlorobenzene	<1.000	50.00	47.29	95	50.92	102	48-122	7	25	ug/L	04/14/17 12:56	
1,2,4-Trichlorobenzene	<1.000	50.00	48.90	98	50.80	102	54-124	4	25	ug/L	04/14/17 12:56	
1,1,1-Trichloroethane	<1.000	50.00	57.91	116	55.30	111	73-140	5	25	ug/L	04/14/17 12:56	
1,1,2-Trichloroethane	<1.000	50.00	46.23	92	46.13	92	78-124	0	25	ug/L	04/14/17 12:56	
Trichloroethene	<1.000	50.00	55.28	111	52.85	106	77-131	4	25	ug/L	04/14/17 12:56	
Trichlorofluoromethane	<5.000	50.00	54.19	108	51.19	102	73-144	6	25	ug/L	04/14/17 12:56	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	50.26	101	46.78	94	65-140	7	25	ug/L	04/14/17 12:56	
Vinyl Chloride	<1.000	50.00	66.50	133	63.16	126	60-146	5	25	ug/L	04/14/17 12:56	
m,p-Xylenes	<2.000	100	115.1	115	111.6	112	75-125	3	25	ug/L	04/14/17 12:56	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/17

Parent Sample Id: 17041211-002 MS Sample Id: 17041211-002 S MSD Sample Id: 17041211-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	50.41	101	50.61	101	69-126	0	25	ug/L	04/14/17 12:56	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		102		86-111	%	04/14/17 12:56
Dibromofluoromethane	102		103		91-119	%	04/14/17 12:56
Toluene-D8	97		97		90-117	%	04/14/17 12:56

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

Seq Number: 141651 Matrix: Water Date Prep: 04/13/17

MB Sample Id: 65688-1-BLK LCS Sample Id: 65688-1-BKS LCSD Sample Id: 65688-1-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	29.17	97	30.50	102	50-150	4	20	ug/L	04/13/17 11:04	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		94		97		80-120	%	04/13/17 11:04

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.

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

(1) *CLIENT: WSP *OFFICE LOC.: Hanover VA
*PROJECT MGR.: Eric Johnson *PHONE NO.: (703) 709-6500
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Kopfle PROJECT NO.: 34003907
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Maria Kaplan DW CERT NO.:

PSS Work Order #: 1704121 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 (8260)	1,4 Dioxane (8260 SIM)	REMARKS
1	Influent WSP-1	4/12/17	0832	GW	6	G		X	X	
2	Lead Absorb Eff	4/12/17	0820	WW	6	G		X	X	
3	Effluent WSP-4	4/12/17	0805	WW	6	G		X	X	
4	TB041217	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	4/12/17	1235	#65
Relinquished By: (2)	Date	Time	Received By:
#65	4/12/17	15	
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 7°C
Custody Seal: Cooler - One side only Broken
Ice Present: PRES Temp: 7-8°C
Shipping Carrier: FTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17041211	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/12/2017 01:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	05/17/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	No	Temp (deg C)	8
Seal(s) Signed / Dated?	Yes	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 4 Total No. of Containers Received 20

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.

Custody seal was affixed to only one side of lid and cooler where lid could be opened from another side.

Samples Inspected/Checklist Completed By: Barb Weber Date: 04/12/2017

Barb Weber

PM Review and Approval: N Y Jackson Date: 04/12/2017

Lynn Jackson

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17041927

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

April 21, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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

PHASE SEPARATION SCIENCE, INC.

April 21, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17041927**
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 **17041927**.

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 May 24, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041927

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/19/2017 at 04:00 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17041927-001	TB-04-19-17	WATER	04/19/17 16:00
17041927-002	Influent VSP-1	WASTE WATER	04/19/17 10:55
17041927-003	Effluent VSP-4	WASTE WATER	04/19/17 10:32
17041927-004	Lead Ambersorb Ef	WASTE WATER	04/19/17 10:43

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: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: TB-04-19-17 **Date/Time Sampled: 04/19/2017 16:00** **PSS Sample ID: 17041927-001**
Matrix: WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:12	1011
Benzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromoform	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Bromomethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Carbon Disulfide	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloroform	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Cyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Ethylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: TB-04-19-17 **Date/Time Sampled: 04/19/2017 16:00** **PSS Sample ID: 17041927-001**
Matrix: WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:12	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Methyl Acetate	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Methylcyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Methylene Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Naphthalene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Styrene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Toluene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Trichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/20/17	04/20/17 14:12	1011
o-Xylene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: Lead Ambersorb Ef **Date/Time Sampled: 04/19/2017 10:43** **PSS Sample ID: 17041927-004**
Matrix: WASTE WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:56	1011
Benzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Bromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Bromoform	ND	ug/L	5.0		1	04/20/17	04/20/17 14:56	1011
Bromomethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/20/17	04/20/17 14:56	1011
Carbon Disulfide	ND	ug/L	10		1	04/20/17	04/20/17 14:56	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Chlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Chloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Chloroform	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Chloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Cyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:56	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:56	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Ethylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: Lead Ambersorb Ef **Date/Time Sampled: 04/19/2017 10:43** **PSS Sample ID: 17041927-004**
Matrix: WASTE WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:56	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Methyl Acetate	ND	ug/L	10		1	04/20/17	04/20/17 14:56	1011
Methylcyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:56	1011
Methylene Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/20/17	04/20/17 14:56	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Naphthalene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Styrene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Toluene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Trichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:56	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/20/17	04/20/17 14:56	1011
o-Xylene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:56	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)	**2.4**	ug/L	1.0		1	04/21/17	04/21/17 11:43	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041927

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): **17041927**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	TB-04-19-17	Initial	17041927-001	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:12
	Influent VSP-1	Initial	17041927-002	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 15:17
	Effluent VSP-4	Initial	17041927-003	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:34
	Lead Ambersorb Ef	Initial	17041927-004	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:56
	65789-1-BKS	BKS	65789-1-BKS	1011	W	65789	141870	--------	04/20/2017 08:58	04/20/2017 10:22
	65789-1-BLK	BLK	65789-1-BLK	1011	W	65789	141870	--------	04/20/2017 08:58	04/20/2017 11:15
	Corrado Tank 2 Eff. 4/17 S	MS	17041805-001 S	1011	W	65789	141870	04/17/2017	04/20/2017 08:58	04/20/2017 13:08
	Corrado Tank 2 Eff. 4/17 SD	MSD	17041805-001 SD	1011	W	65789	141870	04/17/2017	04/20/2017 08:58	04/20/2017 13:29
	Influent VSP-1	Reanalysis	17041927-002	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 15:39
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17041927-003	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 11:22
	Lead Ambersorb Ef	Initial	17041927-004	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 11:43
	65797-1-BKS	BKS	65797-1-BKS	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 09:35
	65797-1-BLK	BLK	65797-1-BLK	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 10:41
	65797-1-BSD	BSD	65797-1-BSD	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 09:58
	Influent VSP-1	Reanalysis	17041927-002	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 12:48

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	04/20/17 14:12
Dibromofluoromethane	102		91-119	%	04/20/17 14:12
Toluene-D8	101		90-117	%	04/20/17 14:12

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/20/17 15:17
Dibromofluoromethane	100		91-119	%	04/20/17 15:17
Toluene-D8	103		90-117	%	04/20/17 15:17

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	04/21/17 13:10

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/20/17 14:34
Dibromofluoromethane	101		91-119	%	04/20/17 14:34
Toluene-D8	101		90-117	%	04/20/17 14:34

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	102		80-120	%	04/21/17 11:22

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	04/20/17 14:56
Dibromofluoromethane	102		91-119	%	04/20/17 14:56
Toluene-D8	103		90-117	%	04/20/17 14:56

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	98		80-120	%	04/21/17 11:43

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 17041927

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141870 Matrix: Water Date Prep: 04/20/17

MB Sample Id: 65789-1-BLK LCS Sample Id: 65789-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	52.45	105	29-149	ug/L	04/20/17 10:22	
Benzene	<1.000	50.00	53.01	106	85-123	ug/L	04/20/17 10:22	
Bromochloromethane	<1.000	50.00	54.32	109	82-136	ug/L	04/20/17 10:22	
Bromodichloromethane	<1.000	50.00	54.48	109	88-133	ug/L	04/20/17 10:22	
Bromoform	<5.000	50.00	52.11	104	80-126	ug/L	04/20/17 10:22	
Bromomethane	<1.000	50.00	41.78	84	64-139	ug/L	04/20/17 10:22	
2-Butanone (MEK)	<10.00	50.00	48.84	98	39-135	ug/L	04/20/17 10:22	
Carbon Disulfide	<10.00	50.00	53.47	107	85-124	ug/L	04/20/17 10:22	
Carbon Tetrachloride	<1.000	50.00	48.23	96	81-138	ug/L	04/20/17 10:22	
Chlorobenzene	<1.000	50.00	53.20	106	85-120	ug/L	04/20/17 10:22	
Chloroethane	<1.000	50.00	49.57	99	75-129	ug/L	04/20/17 10:22	
Chloroform	<1.000	50.00	52.94	106	85-128	ug/L	04/20/17 10:22	
Chloromethane	<1.000	50.00	48.03	96	60-139	ug/L	04/20/17 10:22	
Cyclohexane	<10.00	50.00	55.36	111	55-131	ug/L	04/20/17 10:22	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.39	95	69-127	ug/L	04/20/17 10:22	
Dibromochloromethane	<1.000	50.00	49.11	98	82-127	ug/L	04/20/17 10:22	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.48	99	82-121	ug/L	04/20/17 10:22	
1,2-Dichlorobenzene	<1.000	50.00	53.28	107	82-123	ug/L	04/20/17 10:22	
1,3-Dichlorobenzene	<1.000	50.00	53.84	108	81-123	ug/L	04/20/17 10:22	
1,4-Dichlorobenzene	<1.000	50.00	52.84	106	81-121	ug/L	04/20/17 10:22	
Dichlorodifluoromethane	<1.000	50.00	55.12	110	69-147	ug/L	04/20/17 10:22	
1,1-Dichloroethane	<1.000	50.00	52.41	105	83-123	ug/L	04/20/17 10:22	
1,2-Dichloroethane	<1.000	50.00	51.91	104	86-138	ug/L	04/20/17 10:22	
1,1-Dichloroethene	<1.000	50.00	54.33	109	85-127	ug/L	04/20/17 10:22	
cis-1,2-Dichloroethene	<1.000	50.00	52.54	105	87-127	ug/L	04/20/17 10:22	
1,2-Dichloropropane	<1.000	50.00	53.05	106	79-125	ug/L	04/20/17 10:22	
cis-1,3-Dichloropropene	<1.000	50.00	49.06	98	79-131	ug/L	04/20/17 10:22	
trans-1,3-Dichloropropene	<1.000	50.00	49.38	99	82-133	ug/L	04/20/17 10:22	
trans-1,2-Dichloroethene	<1.000	50.00	53.42	107	85-125	ug/L	04/20/17 10:22	
Ethylbenzene	<1.000	50.00	55.34	111	83-123	ug/L	04/20/17 10:22	
2-Hexanone	<5.000	50.00	47.08	94	37-137	ug/L	04/20/17 10:22	
Isopropylbenzene	<1.000	50.00	49.66	99	70-131	ug/L	04/20/17 10:22	
Methyl Acetate	<10.00	50.00	53.81	108	69-127	ug/L	04/20/17 10:22	
Methylcyclohexane	<10.00	50.00	50.00	100	75-129	ug/L	04/20/17 10:22	
Methylene Chloride	<1.000	50.00	52.21	104	86-124	ug/L	04/20/17 10:22	
4-Methyl-2-Pentanone	<5.000	50.00	47.96	96	39-143	ug/L	04/20/17 10:22	
Methyl-t-butyl ether	<1.000	50.00	55.21	110	75-134	ug/L	04/20/17 10:22	
Naphthalene	<1.000	50.00	48.00	96	61-118	ug/L	04/20/17 10:22	
Styrene	<1.000	50.00	50.34	101	80-120	ug/L	04/20/17 10:22	
1,1,2,2-Tetrachloroethane	<1.000	50.00	51.43	103	64-125	ug/L	04/20/17 10:22	
Tetrachloroethene	<1.000	50.00	53.34	107	83-138	ug/L	04/20/17 10:22	
Toluene	<1.000	50.00	53.28	107	88-126	ug/L	04/20/17 10:22	
1,2,3-Trichlorobenzene	<1.000	50.00	49.25	99	75-124	ug/L	04/20/17 10:22	
1,2,4-Trichlorobenzene	<1.000	50.00	49.22	98	77-131	ug/L	04/20/17 10:22	
1,1,1-Trichloroethane	<1.000	50.00	52.63	105	68-146	ug/L	04/20/17 10:22	
1,1,2-Trichloroethane	<1.000	50.00	53.62	107	85-124	ug/L	04/20/17 10:22	
Trichloroethene	<1.000	50.00	53.96	108	87-127	ug/L	04/20/17 10:22	
Trichlorofluoromethane	<5.000	50.00	49.87	100	77-147	ug/L	04/20/17 10:22	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.31	111	68-135	ug/L	04/20/17 10:22	
Vinyl Chloride	<1.000	50.00	56.96	114	74-138	ug/L	04/20/17 10:22	
m,p-Xylenes	<2.000	100	99.53	100	84-124	ug/L	04/20/17 10:22	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141870 Matrix: Water Date Prep: 04/20/17

MB Sample Id: 65789-1-BLK LCS Sample Id: 65789-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	49.78	100	79-126	ug/L	04/20/17 10:22	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		99		86-111	%	04/20/17 10:22
Dibromofluoromethane	100		100		91-119	%	04/20/17 10:22
Toluene-D8	101		101		90-117	%	04/20/17 10:22

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

Seq Number: 141872 Matrix: Water Date Prep: 04/21/17

MB Sample Id: 65797-1-BLK LCS Sample Id: 65797-1-BKS LCSD Sample Id: 65797-1-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	27.32	91	30.31	101	50-150	10	20	ug/L	04/21/17 09:35	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	100		104		103		80-120	%	04/21/17 09:35

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.

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: Koppers PROJECT NO.:

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

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

PSS Work Order #: 17041927 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 (8270 SIM)	REMARKS
							HCl	HCl			
1	TB-04-19-17	—	—	DW	2	—			X		
2	Influent VSP-1	4/19/17	1055	WW	6	G			X	X	
3	Effluent VSP-4	4/19/17	1032	WW	6	G			X	X	
4	Lead Ambersorb EF	4/19/17	1043	WW	6	G			X	X	

(5)

	Date	Time	
Relinquished By: (1)	4/19/17	1522	Received By:
Relinquished By: (2)	04/19/17	1600	Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)			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 3°C)

Custody Seal: Cooler Intact

Ice Present: Pres Temp: 3°C-6°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17041927	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/19/2017 04:00:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/24/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 4 Total No. of Containers Received 20

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: 04/19/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 04/20/2017

Amber Confer

VSP-4

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031313

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-5

March 21, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

March 21, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031313**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17031313**.

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 April 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031313

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031313-001	Effluent VSP-4	WATER	03/13/17 14:20

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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BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031313

WSP Environment & Energy - Herndon, Herndon, VA

March 21, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/13/2017 14:20** **PSS Sample ID: 17031313-001**
Matrix: WATER **Date/Time Received: 03/13/2017 15:40**

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

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	2.00		03/15/17	03/15/17 13:30	4006

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031313
Project ID: 31400390-5

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 not received at PSS. Sent directly to sub lab by courier on 3/13/17.

17031313: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

Analytical Data Package Information Summary

Work Order(s): **17031313**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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
SM 5210B -2011	Effluent VSP-4	Initial	17031313-001	4006	W	140956	140956	03/13/2017	03/15/2017 13:30	03/15/2017 13:30

17031313

CHAIN-OF-CUSTODY RECORD

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Dr St 300 Herndon VA 20171	Requested Analyses & Preservatives
Project Name: Kop Flex	WSP | Parsons Brinckerhoff Contact Name: Eric Johnson
Project Location: Hanover, MD	WSP | Parsons Brinckerhoff Contact E-mail: Eric.Johnson @wspgroup.com
Project Number & Task: 31400390-5	WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500
Sampler(s) Name(s): Maria Kaplan, Pam Groff	Sampler(s) Signature(s):

No. 004519 WSP | PARSONS BRINCKERHOFF

Laboratory Name & Location: PSS Baltimore, MD

Laboratory Project Manager: Amber confer

Requested Turn-Around-Time: [X] Standard [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] ____ HR

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	BOD5	Pan 1780	Sample Comments
Effluent VSP-4	AQ	3/13/17	1420			1	X		

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/13/17	1587		3/13/17	1507	Courier	
Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Number of Packages	Custody Seal Number(s)
	3/13/17	1517		03/13/17	15:40		03270

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031313	**Received By**	Microbac - Baltimore
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 03:40:19 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	13.5
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

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

Sample Container

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

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

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)	N/A
Do VOA vials have zero headspace?		N/A
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.

Sample not received at PSS. Sent directly to sub lab by courier on 3/13/17.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/13/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 03/15/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031314

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-05

March 20, 2017

Phase Separation Science, Inc.

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Fax: (410) 788-8723

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.

March 20, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031314**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-05

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 **17031314**.

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 April 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031314

Project ID: 31400390-05

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 04:25 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031314-001	Effluent VSP-4	WASTE WATER	03/13/17 14:20

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: 17031314

WSP Environment & Energy - Herndon, Herndon, VA

March 20, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-05

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/13/2017 14:20** **PSS Sample ID: 17031314-001**
Matrix: WASTE WATER **Date/Time Received: 03/13/2017 16:25**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	ND	ug/L	1.0		1	03/16/17	03/16/17 13:36	1033
Lead	ND	ug/L	1.0		1	03/16/17	03/16/17 13:36	1033
Nickel	ND	ug/L	1.0		1	03/16/17	03/16/17 13:36	1033
Zinc	ND	ug/L	20		1	03/16/17	03/16/17 13:36	1033

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**28,600**	ug/L	2,000		20	03/15/17	03/16/17 18:10	1051
Copper	ND	ug/L	1.0		1	03/15/17	03/15/17 21:04	1051
Lead	ND	ug/L	1.0		1	03/15/17	03/15/17 21:04	1051
Magnesium	**4,690**	ug/L	100		1	03/15/17	03/15/17 21:04	1051
Nickel	**1.5**	ug/L	1.0		1	03/15/17	03/15/17 21:04	1051
Zinc	ND	ug/L	20		1	03/15/17	03/15/17 21:04	1051
Hardness (Ca & Mg)	**91**	mg/L	5.4		1	03/15/17	03/15/17 21:04	1051

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	1.0		1	03/16/17	03/16/17 16:21	1033

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031314
Project ID: 31400390-05

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.

Analytical:

Total Metals + Hardness

Batch: 140850

Matrix spike and/or matrix spike duplicate (MS/MSD) exceedances identified; see MS summary form.
The concentration of the following analyte(s) in the reference sample was greater than four times the matrix spike concentration : calcium, magnesium

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

Analytical Data Package Information Summary

Work Order(s): **17031314**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17031314-001	1051	W	65275	140850	03/13/2017	03/15/2017 10:41	03/15/2017 21:04
	65275-1-BKS	BKS	65275-1-BKS	1051	W	65275	140850	--------	03/15/2017 10:41	03/15/2017 20:57
	65275-1-BLK	BLK	65275-1-BLK	1051	W	65275	140850	--------	03/15/2017 10:41	03/15/2017 20:51
	Effluent VSP-4 S	MS	17031314-001 S	1051	W	65275	140850	03/13/2017	03/15/2017 10:41	03/15/2017 21:10
	Effluent VSP-4 S	Reanalysis	17031314-001 S	1051	W	65275	140850	03/13/2017	03/15/2017 10:41	03/15/2017 21:10
	Effluent VSP-4 SD	MSD	17031314-001 SD	1051	W	65275	140850	03/13/2017	03/15/2017 10:41	03/15/2017 21:16
	Effluent VSP-4 SD	Reanalysis	17031314-001 SD	1051	W	65275	140850	03/13/2017	03/15/2017 10:41	03/15/2017 21:16
	65275-1-BKS	Reanalysis	65275-1-BKS	1051	W	65275	140887	--------	03/15/2017 10:41	03/16/2017 17:39
	Effluent VSP-4	Reanalysis	17031314-001	1051	W	65275	140887	03/13/2017	03/15/2017 10:41	03/16/2017 18:10
EPA 200.8	Effluent VSP-4	Initial	17031314-001	1033	W	65293	140886	03/13/2017	03/16/2017 12:50	03/16/2017 13:36
	65293-1-BKS	BKS	65293-1-BKS	1033	W	65293	140886	--------	03/16/2017 12:50	03/16/2017 13:30
	65293-1-BLK	BLK	65293-1-BLK	1033	W	65293	140886	--------	03/16/2017 12:50	03/16/2017 13:23
	Effluent VSP-4 S	MS	17031314-001 S	1033	W	65293	140886	03/13/2017	03/16/2017 12:50	03/16/2017 13:43
	Effluent VSP-4 SD	MSD	17031314-001 SD	1033	W	65293	140886	03/13/2017	03/16/2017 12:50	03/16/2017 13:50
SM 2540D -2011	Effluent VSP-4	Initial	17031314-001	1033	W	140876	140876	03/13/2017	03/16/2017 16:21	03/16/2017 16:21
	140876-1-BLK	BLK	140876-1-BLK	1033	W	140876	140876	--------	03/16/2017 16:21	03/16/2017 16:21
	601 D	MD	17031310-002 D	1033	W	140876	140876	03/13/2017	03/16/2017 16:21	03/16/2017 16:21

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031314

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 140876 Matrix: Water
MB Sample Id: 140876-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	03/16/17 16:21	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 140850 Matrix: Water Date Prep: 03/15/17
MB Sample Id: 65275-1-BLK LCS Sample Id: 65275-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	460.4	115	85-115	ug/L	03/15/17 20:57	
Copper	<1.000	40	38.08	0	85-115	ug/L	03/16/17 17:39	
Lead	<1.000	40.00	42.76	107	85-115	ug/L	03/15/17 20:57	
Magnesium	<100	400	431.4	108	85-115	ug/L	03/15/17 20:57	
Nickel	<1.000	40.00	46.18	115	85-115	ug/L	03/15/17 20:57	
Zinc	<20.00	200	190.9	0	85-115	ug/L	03/16/17 17:39	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 140886 Matrix: Water Date Prep: 03/16/17
MB Sample Id: 65293-1-BLK LCS Sample Id: 65293-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	36.96	92	85-115	ug/L	03/16/17 13:30	
Lead	<1.000	40.00	37.25	93	85-115	ug/L	03/16/17 13:30	
Nickel	<1.000	40.00	34.23	86	85-115	ug/L	03/16/17 13:30	
Zinc	<20.00	200	180.4	90	85-115	ug/L	03/16/17 13:30	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 140850 Matrix: Waste Water Date Prep: 03/15/17
Parent Sample Id: 17031314-001 MS Sample Id: 17031314-001 S MSD Sample Id: 17031314-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Calcium	17170	400	18850	420	20330	790	70-130	8	25	ug/L	03/15/17 21:10	X
Copper	<1.000	40.00	43.15	108	44.67	112	70-130	3	25	ug/L	03/15/17 21:10	
Lead	<1.000	40.00	40.62	102	41.74	104	70-130	3	25	ug/L	03/15/17 21:10	
Magnesium	4689	400	5422	183	5667	245	70-130	4	25	ug/L	03/15/17 21:10	X
Nickel	1.470	40.00	43.71	106	45.15	109	70-130	3	25	ug/L	03/15/17 21:10	
Zinc	<20.00	200	214.6	107	221.9	111	70-130	3	25	ug/L	03/15/17 21:10	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031314

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 140886 Matrix: Waste Water Date Prep: 03/16/17

Parent Sample Id: 17031314-001 MS Sample Id: 17031314-001 S MSD Sample Id: 17031314-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	<1.000	40.00	36.37	91	35.98	90	70-130	1	25	ug/L	03/16/17 13:43	
Lead	<1.000	40.00	34.38	86	34.83	87	70-130	1	25	ug/L	03/16/17 13:43	
Nickel	<1.000	40.00	34.89	87	34.31	86	70-130	2	25	ug/L	03/16/17 13:43	
Zinc	<20.00	200	182.5	91	180.6	90	70-130	1	25	ug/L	03/16/17 13:43	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 140887 Matrix: Water Date Prep: 03/15/17

REBLK Sample Id: 65275-1-BLK LCS Sample Id: 65275-1-BKS

Parameter	REBLK Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	342.4	86	70-130	ug/L	03/16/17 17:39	
Lead	<1.000	40.00	37.35	93	70-130	ug/L	03/16/17 17:39	
Magnesium	<100	400	355.8	89	70-130	ug/L	03/16/17 17:39	
Nickel	<1.000	40.00	37.47	94	70-130	ug/L	03/16/17 17:39	

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.

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

(1) *CLIENT: WSP | *OFFICE LOC.: Herndon, VA
*PROJECT MGR: Eric Johnson | *PHONE NO.: (703) 709-6600
EMAIL: eric.johnson@wsp.com | FAX NO.: ( )
*PROJECT NAME: Kop-Flex | PROJECT NO.: 31400390-5
SITE LOCATION: Hanover, MD | P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kaplan | DW CERT NO.:

PSS Work Order #: 1703134 | 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) *	REMARKS
	~~VSP-4~~ EFFLUENT VSP-4	3/13/17	1420	WW	3	G	—	—	HA — BOD5 — TSS — Total Zinc, Nickel, Lead, Copper, Hardness — Dissolved Zn, Ni, Pb, Cu, Hardness

3/13/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/13/17	1507	
Relinquished By: (2)	Date	Time	Received By:
	3/13/17	1625	
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 9°C
Custody Seal: cooler intact
Ice Present: Pres Temp: 7-11°C
Shipping Carrier: TTE

Special Instructions:

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

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031314	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 04:25:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-05	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**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	Pam Groff/Maria Kaj
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 3

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)	N/A
Do VOA vials have zero headspace?		N/A
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.

Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/13/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 03/15/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031315

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-05

March 15, 2017

Phase Separation Science, Inc.

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

March 15, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031315**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-05

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 **17031315**.

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 April 17, 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.

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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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031315

Project ID: 31400390-05

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 04:25 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031315-001	Effluent VSP-4	WASTE WATER	03/13/17 14:20

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:

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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)].
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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.
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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

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: 17031315

WSP Environment & Energy - Herndon, Herndon, VA

March 15, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-05

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/13/2017 14:20** **PSS Sample ID: 17031315-001**
Matrix: WASTE WATER **Date/Time Received: 03/13/2017 16:25**

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

pH=1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Chloromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Vinyl Chloride	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Bromomethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Chloroethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Methylene Chloride	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Chloroform	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Benzene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Trichloroethene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Bromodichloromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Toluene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Tetrachloroethylene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Dibromochloromethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Chlorobenzene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Ethylbenzene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
Bromoform	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031315

WSP Environment & Energy - Herndon, Herndon, VA

March 15, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-05

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/13/2017 14:20** **PSS Sample ID: 17031315-001**
Matrix: WASTE WATER **Date/Time Received: 03/13/2017 16:25**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624
pH=1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dichlorobenzene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	03/13/17	03/13/17 16:45	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031315

Project ID: 31400390-05

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.

Analytical:

Volatile Organics Compounds (TVO)

Batch: 140799

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.

Analytical Data Package Information Summary

Work Order(s): 17031315
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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 624	Effluent VSP-4	Initial	17031315-001	1011	W	65270	140799	03/13/2017	03/13/2017 16:00	03/13/2017 16:45
	65270-1-BKS	BKS	65270-1-BKS	1011	W	65270	140799	--------	03/13/2017 16:00	03/13/2017 14:46
	65270-1-BLK	BLK	65270-1-BLK	1011	W	65270	140799	--------	03/13/2017 16:00	03/13/2017 15:25
	Effluent VSP-4 S	MS	17031315-001 S	1011	W	65270	140799	03/13/2017	03/13/2017 16:00	03/13/2017 17:26
	Effluent VSP-4 SD	MSD	17031315-001 SD	1011	W	65270	140799	03/13/2017	03/13/2017 16:00	03/13/2017 18:06

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031315

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 140799 Matrix: Waste Water Date Prep: 03/13/2017
PSS Sample ID: 17031315-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	101		87-114	%	03/13/17 16:45
4-Bromofluorobenzene	142	*	90-114	%	03/13/17 16:45
Toluene-D8	100		93-108	%	03/13/17 16:45

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 17031315

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 140799 Matrix: Water Date Prep: 03/13/17

MB Sample Id: 65270-1-BLK LCS Sample Id: 65270-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	65.91	110	51-139	ug/L	03/13/17 14:46	
Chloromethane	<5.000	60.00	58.36	97	56-144	ug/L	03/13/17 14:46	
Vinyl Chloride	<5.000	60.00	65.66	109	46-157	ug/L	03/13/17 14:46	
Bromomethane	<5.000	60.00	57.57	96	63-134	ug/L	03/13/17 14:46	
Chloroethane	<5.000	60.00	57.46	96	56-143	ug/L	03/13/17 14:46	
Trichlorofluoromethane	<5.000	60.00	56.46	94	56-138	ug/L	03/13/17 14:46	
1,1-Dichloroethene	<5.000	60.00	59.12	99	63-134	ug/L	03/13/17 14:46	
Methylene Chloride	<5.000	60.00	59.20	99	65-126	ug/L	03/13/17 14:46	
trans-1,2-dichloroethene	<5.000	60.00	64.11	107	67-129	ug/L	03/13/17 14:46	
1,1-Dichloroethane	<5.000	60.00	61.89	103	66-131	ug/L	03/13/17 14:46	
Chloroform	<5.000	60.00	61.54	103	69-130	ug/L	03/13/17 14:46	
1,1,1-Trichloroethane	<5.000	60.00	66.39	111	66-129	ug/L	03/13/17 14:46	
Carbon Tetrachloride	<5.000	60.00	64.94	108	70-133	ug/L	03/13/17 14:46	
Benzene	<5.000	60.00	59.64	99	69-127	ug/L	03/13/17 14:46	
1,2-Dichloroethane	<5.000	60.00	63.59	106	62-133	ug/L	03/13/17 14:46	
Trichloroethene	<5.000	60.00	62.17	104	71-127	ug/L	03/13/17 14:46	
1,2-Dichloropropane	<5.000	60.00	59.88	100	67-133	ug/L	03/13/17 14:46	
Bromodichloromethane	<5.000	60.00	62.85	105	63-132	ug/L	03/13/17 14:46	
2-Chloroethyl Vinyl Ether	<5.000	60.00	34.95	58	21-140	ug/L	03/13/17 14:46	
cis-1,3-Dichloropropene	<5.000	60.00	60.31	101	65-128	ug/L	03/13/17 14:46	
Toluene	<5.000	60.00	60.84	101	67-130	ug/L	03/13/17 14:46	
trans-1,3-dichloropropene	<5.000	60.00	60.78	101	63-127	ug/L	03/13/17 14:46	
1,1,2-Trichloroethane	<5.000	60.00	61.85	103	62-136	ug/L	03/13/17 14:46	
Tetrachloroethylene	<5.000	60.00	64.65	108	64-135	ug/L	03/13/17 14:46	
Dibromochloromethane	<5.000	60.00	66.56	111	65-126	ug/L	03/13/17 14:46	
Chlorobenzene	<5.000	60.00	63.05	105	70-127	ug/L	03/13/17 14:46	
Ethylbenzene	<5.000	60.00	64.96	108	71-131	ug/L	03/13/17 14:46	
Bromoform	<5.000	60.00	67.39	112	58-128	ug/L	03/13/17 14:46	
1,1,2,2-Tetrachloroethane	<5.000	60.00	68.53	114	63-134	ug/L	03/13/17 14:46	
1,3-Dichlorobenzene	<5.000	60.00	67.66	113	67-128	ug/L	03/13/17 14:46	
1,4-Dichlorobenzene	<5.000	60.00	68.29	114	67-127	ug/L	03/13/17 14:46	
1,2-Dichlorobenzene	<5.000	60.00	69.20	115	67-126	ug/L	03/13/17 14:46	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	102		101		87-114	%	03/13/17 14:46
4-Bromofluorobenzene	148	*	95		90-114	%	03/13/17 14:46
Toluene-D8	99		100		93-108	%	03/13/17 14:46

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031315

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 140799 Matrix: Waste Water Date Prep: 03/13/17

Parent Sample Id: 17031315-001 MS Sample Id: 17031315-001 S MSD Sample Id: 17031315-001 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	62.52	104	77.04	128	38-157	21	25	ug/L	03/13/17 17:26	
Chloromethane	<5.000	60.00	59.70	100	73.35	122	43-155	21	25	ug/L	03/13/17 17:26	
Vinyl Chloride	<5.000	60.00	65.85	110	82.11	137	48-154	22	25	ug/L	03/13/17 17:26	
Bromomethane	<5.000	60.00	57.94	97	77.33	129	52-143	29	25	ug/L	03/13/17 17:26	F
Chloroethane	<5.000	60.00	56.09	93	71.29	119	47-150	24	25	ug/L	03/13/17 17:26	
Trichlorofluoromethane	<5.000	60.00	52.94	88	67.35	112	59-142	24	25	ug/L	03/13/17 17:26	
1,1-Dichloroethene	<5.000	60.00	55.96	93	71.02	118	55-138	24	25	ug/L	03/13/17 17:26	
Methylene Chloride	<5.000	60.00	53.97	90	63.87	106	60-133	17	25	ug/L	03/13/17 17:26	
trans-1,2-dichloroethene	<5.000	60.00	59.43	99	68.46	114	62-133	14	25	ug/L	03/13/17 17:26	
1,1-Dichloroethane	<5.000	60.00	56.60	94	65.09	108	62-134	14	25	ug/L	03/13/17 17:26	
Chloroform	<5.000	60.00	55.87	93	64.12	107	53-142	14	25	ug/L	03/13/17 17:26	
1,1,1-Trichloroethane	<5.000	60.00	60.98	102	71.38	119	63-135	16	25	ug/L	03/13/17 17:26	
Carbon Tetrachloride	<5.000	60.00	59.57	99	69.74	116	62-134	16	25	ug/L	03/13/17 17:26	
Benzene	<5.000	60.00	55.50	93	63.37	106	56-138	13	25	ug/L	03/13/17 17:26	
1,2-Dichloroethane	<5.000	60.00	58.69	98	65.04	108	61-132	10	25	ug/L	03/13/17 17:26	
Trichloroethene	<5.000	60.00	58.42	97	65.99	110	57-142	12	25	ug/L	03/13/17 17:26	
1,2-Dichloropropane	<5.000	60.00	57.13	95	62.54	104	56-141	9	25	ug/L	03/13/17 17:26	
Bromodichloromethane	<5.000	60.00	57.40	96	64.81	108	52-141	12	25	ug/L	03/13/17 17:26	
2-Chloroethyl Vinyl Ether	<5.000	60.00	<5.000	0	<5.000	0	21-140	NC	25	ug/L	03/13/17 17:26	X
cis-1,3-Dichloropropene	<5.000	60.00	55.66	93	61.51	103	29-156	10	25	ug/L	03/13/17 17:26	
Toluene	<5.000	60.00	56.99	95	65.40	109	55-141	14	25	ug/L	03/13/17 17:26	
trans-1,3-dichloropropene	<5.000	60.00	53.68	89	61.62	103	27-156	14	25	ug/L	03/13/17 17:26	
1,1,2-Trichloroethane	<5.000	60.00	57.03	95	62.15	104	50-151	9	25	ug/L	03/13/17 17:26	
Tetrachloroethylene	<5.000	60.00	62.85	105	70.87	118	43-148	12	25	ug/L	03/13/17 17:26	
Dibromochloromethane	<5.000	60.00	59.51	99	65.72	110	45-146	10	25	ug/L	03/13/17 17:26	
Chlorobenzene	<5.000	60.00	57.97	97	66.93	112	57-140	14	25	ug/L	03/13/17 17:26	
Ethylbenzene	<5.000	60.00	60.76	101	69.93	117	58-146	14	25	ug/L	03/13/17 17:26	
Bromoform	<5.000	60.00	60.36	101	66.61	111	42-145	10	25	ug/L	03/13/17 17:26	
1,1,2,2-Tetrachloroethane	<5.000	60.00	62.92	105	68.32	114	48-156	8	25	ug/L	03/13/17 17:26	
1,3-Dichlorobenzene	<5.000	60.00	59.86	100	70.81	118	54-141	17	25	ug/L	03/13/17 17:26	
1,4-Dichlorobenzene	<5.000	60.00	59.51	99	71.18	119	54-140	18	25	ug/L	03/13/17 17:26	
1,2-Dichlorobenzene	<5.000	60.00	58.44	97	69.80	116	53-141	18	25	ug/L	03/13/17 17:26	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Dibromofluoromethane	100		100		87-114	%	03/13/17 17:26
4-Bromofluorobenzene	97		97		90-114	%	03/13/17 17:26
Toluene-D8	100		99		93-108	%	03/13/17 17:26

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kop-Flex PROJECT NO.: 31400390 -5
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kapka DW CERT NO.:

PSS Work Order #: 1703135 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	Analysis/ Method Required (3): VOCs (624) *	REMARKS
	VSP-4 EFFLUENT VSP-4	3/13/17	1420	WW	3	G	X		2-Day TAT

3/13/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/13/17	1507	
Relinquished By: (2)	Date	Time	Received By:
	3/13/17	1625	
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 9°C
Custody Seal: cooler intact
Ice Present: Pres Temp: 7-11°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031315	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 04:25:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-05	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**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	Pam Groff
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 3

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)		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.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/13/2017

Thomas Wingate

PM Review and Approval: N L Jackson Date: 03/13/2017

Lynn Jackson

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031316

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-05

March 16, 2017

Phase Separation Science, Inc.

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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

March 16, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031316**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-05

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 **17031316**.

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 April 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031316

Project ID: 31400390-05

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/13/2017 at 04:25 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031316-001	Effluent VSP-4	WASTE WATER	03/13/17 14:20
17031316-002	Lead Ambersorb	WASTE WATER	03/13/17 15:00

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

OFFICES:
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ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031316

WSP Environment & Energy - Herndon, Herndon, VA

March 16, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-05

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/13/2017 14:20** **PSS Sample ID: 17031316-001**
Matrix: WASTE WATER **Date/Time Received: 03/13/2017 16:25**

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	03/15/17	03/15/17 17:43	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031316

Project ID: 31400390-05

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): **17031316**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Lead Ambersorb	Initial	17031316-002	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 15:58
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17031316-001	1011	W	65290	140849	03/13/2017	03/15/2017 10:22	03/15/2017 17:43
	Lead Ambersorb	Initial	17031316-002	1011	W	65290	140849	03/13/2017	03/15/2017 10:22	03/15/2017 18:10
	65290-1-BKS	BKS	65290-1-BKS	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 15:52
	65290-1-BLK	BLK	65290-1-BLK	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 17:13
	65290-1-BSD	BSD	65290-1-BSD	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 16:25

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031316

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140849 Matrix: Waste Water Date Prep: 03/15/2017

PSS Sample ID: 17031316-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	96		80-120	%	03/15/17 17:43

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

Seq Number: 140849 Matrix: Waste Water Date Prep: 03/15/2017

PSS Sample ID: 17031316-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	03/15/17 18:10

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

Seq Number: 140877 Matrix: Waste Water Date Prep: 03/16/2017

PSS Sample ID: 17031316-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	102		86-111	%	03/16/17 15:58
Dibromofluoromethane	98		91-119	%	03/16/17 15:58
Toluene-D8	99		90-117	%	03/16/17 15:58

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 17031316

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031316

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

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

Seq Number: 140849 Matrix: Water Date Prep: 03/15/17

MB Sample Id: 65290-1-BLK LCS Sample Id: 65290-1-BKS LCSD Sample Id: 65290-1-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	32.21	107	32.09	107	50-150	0	20	ug/L	03/15/17 15:52	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		94		94		80-120	%	03/15/17 15:52

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.

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.johnso@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kapp-Flex PROJECT NO.: 31400390-5
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kaylar PW CERT NO.:

PSS Work Order #: 1703316 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
	~~FSP-4~~ Effluent ~~VSP-4~~	3/13/17	1420	WW	3	G	X			2 DAY TAT
	Lead Ambersorb	3/13/17	1500	WW	6	G	X	X		2 Day TAT

3/13/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/13/17	1510	
Relinquished By: (2)	Date	Time	Received By:
	3/13/17	1625	
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 blnk 9.2
Custody Seal: Cooler intact
Ice Present: Pres Temp: 7-11°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031316	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/13/2017 04:25:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-05	**Tracking No**	Not Applicable
Disposal Date	04/17/2017	**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	Pam Groff
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 2 Total No. of Containers Received 9

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: 03/13/2017

Thomas Wingate

PM Review and Approval: N L Jackson Date: 03/13/2017

Lynn Jackson

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031512

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-5

March 17, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 17, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031512**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17031512**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031512

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 11:25 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031512-001	Effluent VSP-4	WATER	03/14/17 15:40
17031512-002	Lead Ambersorb	WATER	03/14/17 15:45
17031512-003	Trip Blanks	WATER	03/15/17 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: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/14/2017 15:40** **PSS Sample ID: 17031512-001**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 17:34	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 17:34	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 17:34	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 17:34	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 17:34	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 17:34	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/14/2017 15:40** **PSS Sample ID: 17031512-001**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 17:34	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 17:34	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 17:34	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 17:34	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 17:34	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 17:34	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 17:34	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)	ND	ug/L	1.0		1	03/15/17	03/15/17 18:33	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blanks **Date/Time Sampled: 03/15/2017 11:25** **PSS Sample ID: 17031512-003**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 18:22	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031512

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Trip Blanks **Date/Time Sampled: 03/15/2017 11:25** **PSS Sample ID: 17031512-003**
Matrix: WATER **Date/Time Received: 03/15/2017 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	03/16/17	03/16/17 18:22	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 18:22	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 18:22	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 18:22	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 18:22	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031512
Project ID: 31400390-5

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 dates and times were not listed on the COC. Information was obtained from container labels.
Received Trip Blanks that were not on the COC. Logged in for 8260.

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): **17031512**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Effluent VSP-4	Initial	17031512-001	1011	W	65300	140877	03/14/2017	03/16/2017 13:41	03/16/2017 17:34
	Lead Ambersorb	Initial	17031512-002	1011	W	65300	140877	03/14/2017	03/16/2017 13:41	03/16/2017 18:01
	Trip Blanks	Initial	17031512-003	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 18:22
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
	Lead Ambersorb S	MS	17031316-002 S	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:25
	Lead Ambersorb SD	MSD	17031316-002 SD	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:47
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17031512-001	1011	W	65290	140849	03/14/2017	03/15/2017 10:22	03/15/2017 18:33
	Lead Ambersorb	Initial	17031512-002	1011	W	65290	140849	03/14/2017	03/15/2017 10:22	03/15/2017 18:59
	65290-1-BKS	BKS	65290-1-BKS	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 15:52
	65290-1-BLK	BLK	65290-1-BLK	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 17:13
	65290-1-BSD	BSD	65290-1-BSD	1011	W	65290	140849	--------	03/15/2017 10:22	03/15/2017 16:25

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140849 Matrix: Water Date Prep: 03/15/2017
PSS Sample ID: 17031512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/15/17 18:33

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/16/17 17:34
Dibromofluoromethane	102		91-119	%	03/16/17 17:34
Toluene-D8	103		90-117	%	03/16/17 17:34

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140849 Matrix: Water Date Prep: 03/15/2017
PSS Sample ID: 17031512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/15/17 18:59

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 18:01
Dibromofluoromethane	102		91-119	%	03/16/17 18:01
Toluene-D8	99		90-117	%	03/16/17 18:01

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031512-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 18:22
Dibromofluoromethane	100		91-119	%	03/16/17 18:22
Toluene-D8	102		90-117	%	03/16/17 18:22

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

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon
Kop-Flex

L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031512

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

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

Seq Number: 140849 Matrix: Water Date Prep: 03/15/17

MB Sample Id: 65290-1-BLK LCS Sample Id: 65290-1-BKS LCSD Sample Id: 65290-1-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	32.21	107	32.09	107	50-150	0	20	ug/L	03/15/17 15:52	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		94		94		80-120	%	03/15/17 15:52

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

CHAIN-OF-CUSTODY RECORD 1703512

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Drive St 300 Herndon VA 20171

No. 004522 WSP | PARSONS BRINCKERHOFF

Project Name: Kop flex	WSP | Parsons Brinckerhoff Contact Name: Eric Johnson
Project Location: Hanover MD	WSP | Parsons Brinckerhoff Contact E-mail: Eric.Johnson@wspgroup.com
Project Number & Task: 31400390-5	WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500
Sampler(s) Name(s): Maria Kaplan	Sampler(s) Signature(s):

Laboratory Name & Location: Phase Sep Science Baltimore MD

Laboratory Project Manager: Amber Confer

Requested Turn-Around-Time: ☐ Standard ☐ 24 HR ☒ 48 HR ☐ 72 HR ☐ ____ HR

Requested Analyses & Preservatives

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	VOCs (8260)	1,4 Dioxane (8260 SIM)	Sample Comments
Effluent VSP-4	AQ					6	X	X	
Lead Ambersorb	AQ					6	X	X	

# of Coolers: 1
Custody Seal: Cooler intact
Ice Present: Pres Temp: 2-4°C
Shipping Carrier: TTE

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	0920		03/15/17	9:20		
Dan Carter	03/15/17	1125	Carl Weber			Number of Packages	Custody Seal Number(s)

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031512	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 11:25:00 AM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	4
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

Documentation

		Sampler Name	Maria Kaplan
COC agrees with sample labels?	No	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 14

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.

Sample dates and times were not listed on the COC. Information was obtained from container labels.
Received Trip Blanks that were not on the COC. Logged in for 8260.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 03/15/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17031521

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-5

March 17, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

March 17, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17031521**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-5

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 **17031521**.

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 April 19, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031521

Project ID: 31400390-5

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/15/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17031521-001	Lead Ambersorb	WATER	03/15/17 12:55
17031521-002	Effluent VSP-4	WATER	03/15/17 12:46

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: 17031521

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/15/2017 12:46** **PSS Sample ID: 17031521-002**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 19:10	1011
Benzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Bromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Bromoform	ND	ug/L	5.0		1	03/16/17	03/16/17 19:10	1011
Bromomethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/16/17	03/16/17 19:10	1011
Carbon Disulfide	ND	ug/L	10		1	03/16/17	03/16/17 19:10	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Chlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Chloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Chloroform	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Chloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Cyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 19:10	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/16/17	03/16/17 19:10	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Ethylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17031521

WSP Environment & Energy - Herndon, Herndon, VA

March 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-5

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/15/2017 12:46** **PSS Sample ID: 17031521-002**
Matrix: WATER **Date/Time Received: 03/15/2017 16:20**

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	03/16/17	03/16/17 19:10	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Methyl Acetate	ND	ug/L	10		1	03/16/17	03/16/17 19:10	1011
Methylcyclohexane	ND	ug/L	10		1	03/16/17	03/16/17 19:10	1011
Methylene Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/16/17	03/16/17 19:10	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Naphthalene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Styrene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Toluene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Trichloroethene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/16/17	03/16/17 19:10	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/16/17	03/16/17 19:10	1011
o-Xylene	ND	ug/L	1.0		1	03/16/17	03/16/17 19:10	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)	ND	ug/L	1.0		1	03/16/17	03/16/17 12:45	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17031521
Project ID: 31400390-5

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): **17031521**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Lead Ambersorb	Initial	17031521-001	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 18:48
	Effluent VSP-4	Initial	17031521-002	1011	W	65300	140877	03/15/2017	03/16/2017 13:41	03/16/2017 19:10
	65300-1-BKS	BKS	65300-1-BKS	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 14:49
	65300-1-BLK	BLK	65300-1-BLK	1011	W	65300	140877	--------	03/16/2017 13:41	03/16/2017 15:37
	Lead Ambersorb S	MS	17031316-002 S	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:25
	Lead Ambersorb SD	MSD	17031316-002 SD	1011	W	65300	140877	03/13/2017	03/16/2017 13:41	03/16/2017 16:47
SW-846 8260 B-Modified	Lead Ambersorb	Initial	17031521-001	1011	W	65294	140856	03/15/2017	03/16/2017 09:14	03/16/2017 12:22
	Effluent VSP-4	Initial	17031521-002	1011	W	65294	140856	03/15/2017	03/16/2017 09:14	03/16/2017 12:45
	65294-1-BKS	BKS	65294-1-BKS	1011	W	65294	140856	--------	03/16/2017 09:14	03/16/2017 10:45
	65294-1-BLK	BLK	65294-1-BLK	1011	W	65294	140856	--------	03/16/2017 09:14	03/16/2017 11:32
	65294-1-BSD	BSD	65294-1-BSD	1011	W	65294	140856	--------	03/16/2017 09:14	03/16/2017 11:07

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031521

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140856 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/16/17 12:22

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/16/17 18:48
Dibromofluoromethane	104		91-119	%	03/16/17 18:48
Toluene-D8	99		90-117	%	03/16/17 18:48

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140856 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/16/17 12:45

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140877 Matrix: Water Date Prep: 03/16/2017
PSS Sample ID: 17031521-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/16/17 19:10
Dibromofluoromethane	102		91-119	%	03/16/17 19:10
Toluene-D8	103		90-117	%	03/16/17 19:10

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 17031521

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.64	79	29-149	ug/L	03/16/17 14:49	
Benzene	<1.000	50.00	54.80	110	85-123	ug/L	03/16/17 14:49	
Bromochloromethane	<1.000	50.00	56.13	112	82-136	ug/L	03/16/17 14:49	
Bromodichloromethane	<1.000	50.00	58.49	117	88-133	ug/L	03/16/17 14:49	
Bromoform	<5.000	50.00	55.83	112	80-126	ug/L	03/16/17 14:49	
Bromomethane	<1.000	50.00	48.90	98	64-139	ug/L	03/16/17 14:49	
2-Butanone (MEK)	<10.00	50.00	43.31	87	39-135	ug/L	03/16/17 14:49	
Carbon Disulfide	<10.00	50.00	53.69	107	85-124	ug/L	03/16/17 14:49	
Carbon Tetrachloride	<1.000	50.00	53.14	106	81-138	ug/L	03/16/17 14:49	
Chlorobenzene	<1.000	50.00	55.98	112	85-120	ug/L	03/16/17 14:49	
Chloroethane	<1.000	50.00	50.68	101	75-129	ug/L	03/16/17 14:49	
Chloroform	<1.000	50.00	54.91	110	85-128	ug/L	03/16/17 14:49	
Chloromethane	<1.000	50.00	51.54	103	60-139	ug/L	03/16/17 14:49	
Cyclohexane	<10.00	50.00	56.36	113	55-131	ug/L	03/16/17 14:49	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.74	95	69-127	ug/L	03/16/17 14:49	
Dibromochloromethane	<1.000	50.00	49.92	100	82-127	ug/L	03/16/17 14:49	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.08	98	82-121	ug/L	03/16/17 14:49	
1,2-Dichlorobenzene	<1.000	50.00	56.55	113	82-123	ug/L	03/16/17 14:49	
1,3-Dichlorobenzene	<1.000	50.00	56.59	113	81-123	ug/L	03/16/17 14:49	
1,4-Dichlorobenzene	<1.000	50.00	55.06	110	81-121	ug/L	03/16/17 14:49	
Dichlorodifluoromethane	<1.000	50.00	54.47	109	69-147	ug/L	03/16/17 14:49	
1,1-Dichloroethane	<1.000	50.00	56.57	113	83-123	ug/L	03/16/17 14:49	
1,2-Dichloroethane	<1.000	50.00	57.35	115	86-138	ug/L	03/16/17 14:49	
1,1-Dichloroethene	<1.000	50.00	51.28	103	85-127	ug/L	03/16/17 14:49	
cis-1,2-Dichloroethene	<1.000	50.00	55.47	111	87-127	ug/L	03/16/17 14:49	
1,2-Dichloropropane	<1.000	50.00	49.58	99	79-125	ug/L	03/16/17 14:49	
cis-1,3-Dichloropropene	<1.000	50.00	51.11	102	79-131	ug/L	03/16/17 14:49	
trans-1,3-Dichloropropene	<1.000	50.00	52.37	105	82-133	ug/L	03/16/17 14:49	
trans-1,2-Dichloroethene	<1.000	50.00	53.43	107	85-125	ug/L	03/16/17 14:49	
Ethylbenzene	<1.000	50.00	56.31	113	83-123	ug/L	03/16/17 14:49	
2-Hexanone	<5.000	50.00	40.69	81	37-137	ug/L	03/16/17 14:49	
Isopropylbenzene	<1.000	50.00	55.60	111	70-131	ug/L	03/16/17 14:49	
Methyl Acetate	<10.00	50.00	62.24	124	69-127	ug/L	03/16/17 14:49	
Methylcyclohexane	<10.00	50.00	58.19	116	75-129	ug/L	03/16/17 14:49	
Methylene Chloride	<1.000	50.00	56.02	112	86-124	ug/L	03/16/17 14:49	
4-Methyl-2-Pentanone	<5.000	50.00	40.69	81	39-143	ug/L	03/16/17 14:49	
Methyl-t-butyl ether	<1.000	50.00	53.44	107	75-134	ug/L	03/16/17 14:49	
Naphthalene	<1.000	50.00	49.02	98	61-118	ug/L	03/16/17 14:49	
Styrene	<1.000	50.00	51.19	102	80-120	ug/L	03/16/17 14:49	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.17	96	64-125	ug/L	03/16/17 14:49	
Tetrachloroethene	<1.000	50.00	59.77	120	83-138	ug/L	03/16/17 14:49	
Toluene	<1.000	50.00	57.94	116	88-126	ug/L	03/16/17 14:49	
1,2,3-Trichlorobenzene	<1.000	50.00	50.24	100	75-124	ug/L	03/16/17 14:49	
1,2,4-Trichlorobenzene	<1.000	50.00	51.45	103	77-131	ug/L	03/16/17 14:49	
1,1,1-Trichloroethane	<1.000	50.00	56.16	112	68-146	ug/L	03/16/17 14:49	
1,1,2-Trichloroethane	<1.000	50.00	51.70	103	85-124	ug/L	03/16/17 14:49	
Trichloroethene	<1.000	50.00	50.27	101	87-127	ug/L	03/16/17 14:49	
Trichlorofluoromethane	<5.000	50.00	49.11	98	77-147	ug/L	03/16/17 14:49	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.40	107	68-135	ug/L	03/16/17 14:49	
Vinyl Chloride	<1.000	50.00	64.63	129	74-138	ug/L	03/16/17 14:49	
m,p-Xylenes	<2.000	100	116.5	117	84-124	ug/L	03/16/17 14:49	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17031521

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140877 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65300-1-BLK LCS Sample Id: 65300-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	57.95	116	79-126	ug/L	03/16/17 14:49	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/16/17 14:49
Dibromofluoromethane	101		103		91-119	%	03/16/17 14:49
Toluene-D8	98		103		90-117	%	03/16/17 14:49

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

Seq Number: 140856 Matrix: Water Date Prep: 03/16/17

MB Sample Id: 65294-1-BLK LCS Sample Id: 65294-1-BKS LCSD Sample Id: 65294-1-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	33.77	113	32.95	110	50-150	2	20	ug/L	03/16/17 10:45	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	95		96		94		80-120	%	03/16/17 10:45

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

CHAIN-OF-CUSTODY RECORD 1703152

Page 1 of 1

WSP | Parsons Brinckerhoff Office Address: 13530 Dulles Technology Drive Suite 300 Herndon VA

No. 004527 WSP | PARSONS BRINCKERHOFF

Project Name: Kop Plex	WSP | Parsons Brinckerhoff Contact Name: Eric Johnson
Project Location: Hanover, MD	WSP | Parsons Brinckerhoff Contact E-mail: eric.johnson@wspgroup.com
Project Number & Task: 31400390-5	WSP | Parsons Brinckerhoff Contact Phone: 703-709-6500
Sampler(s) Name(s): Maria Kaplan	Sampler(s) Signature(s):

Laboratory Name & Location: PSS, Baltimore MD

Laboratory Project Manager: Amber Carter

Requested Turn-Around-Time: ☐ Standard ☐ 24 HR ☒ 48 HR ☐ 72 HR ☐ ___ HR

Sample Identification	Matrix	Collection Start* Date	Collection Start* Time	Collection Stop* Date	Collection Stop* Time	Number of Containers	Requested Analyses & Preservatives: VOCs (8260)	1,4 Dioxane (8260 SIM)	Sample Comments
Lead Ambersorb	AQ	3/15/17	1255			6	X	X	
Effluent VSP-4	AQ	3/15/17	1246			6	X	X	

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES
Shipping Carrier: FE
Temp: 2°C

3/15/17

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method	Tracking Number(s)
	3/15/17	1534		3/15/17	1535		
Relinquished By (Signature)	**Date**	**Time**	**Received By (Signature)**	**Date**	**Time**	**Number of Packages**	**Custody Seal Number(s)**
	03/15/17	1620					

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17031521	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/15/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-5	**Tracking No**	Not Applicable
Disposal Date	04/19/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

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 2 Total No. of Containers Received 12

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: 03/15/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/16/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032016

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

March 22, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

March 22, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032016**
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 **17032016**.

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 April 24, 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/20/2017 at 03:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032016-001	Effluent VSP-4	WASTE WATER	03/20/17 12:47
17032016-002	Influent VSP-1	WASTE WATER	03/20/17 12:55
17032016-003	Carbon Effluent	WASTE WATER	03/20/17 13:01
17032016-004	Lead Ambersorb Effluent	WASTE WATER	03/20/17 13:08

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

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: 17032016

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/20/2017 12:47** **PSS Sample ID: 17032016-001**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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	03/21/17	03/21/17 19:10	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032016
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): **17032016**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:00
	Carbon Effluent	Initial	17032016-003	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:35
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 12:15
	65357-1-BKS	BKS	65357-1-BKS	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 10:56
	65357-1-BLK	BLK	65357-1-BLK	1011	W	65357	140980	--------	03/21/2017 09:44	03/21/2017 11:52
	Lead Ambersorb Effluent S	MS	17032016-004 S	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:55
	Lead Ambersorb Effluent SD	MSD	17032016-004 SD	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 14:17
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65357	140980	03/20/2017	03/21/2017 09:44	03/21/2017 13:28
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17032016-001	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 19:10
	Lead Ambersorb Effluent	Initial	17032016-004	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 17:58
	65359-1-BKS	BKS	65359-1-BKS	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:26
	65359-1-BLK	BLK	65359-1-BLK	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 17:36
	65359-1-BSD	BSD	65359-1-BSD	1011	W	65359	140981	--------	03/21/2017 15:03	03/21/2017 16:49
	Influent VSP-1	Reanalysis	17032016-002	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 20:25
	Carbon Effluent	Reanalysis	17032016-003	1011	W	65359	140981	03/20/2017	03/21/2017 15:03	03/21/2017 18:46

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:10

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/21/17 13:00
Dibromofluoromethane	103		91-119	%	03/21/17 13:00
Toluene-D8	100		90-117	%	03/21/17 13:00

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 19:59

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/21/17 12:35
Dibromofluoromethane	99		91-119	%	03/21/17 12:35
Toluene-D8	99		90-117	%	03/21/17 12:35

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017
PSS Sample ID: 17032016-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	97		80-120	%	03/21/17 18:24

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	03/21/17 12:15
Dibromofluoromethane	100		91-119	%	03/21/17 12:15
Toluene-D8	104		90-117	%	03/21/17 12:15

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

Seq Number: 140981 Matrix: Waste Water Date Prep: 03/21/2017

PSS Sample ID: 17032016-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	03/21/17 17:58

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 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	36.24	72	29-149	ug/L	03/21/17 10:56	
Benzene	<1.000	50.00	54.82	110	85-123	ug/L	03/21/17 10:56	
Bromochloromethane	<1.000	50.00	54.51	109	82-136	ug/L	03/21/17 10:56	
Bromodichloromethane	<1.000	50.00	58.87	118	88-133	ug/L	03/21/17 10:56	
Bromoform	<5.000	50.00	57.15	114	80-126	ug/L	03/21/17 10:56	
Bromomethane	<1.000	50.00	50.69	101	64-139	ug/L	03/21/17 10:56	
2-Butanone (MEK)	<10.00	50.00	39.55	79	39-135	ug/L	03/21/17 10:56	
Carbon Disulfide	<10.00	50.00	54.33	109	85-124	ug/L	03/21/17 10:56	
Carbon Tetrachloride	<1.000	50.00	52.96	106	81-138	ug/L	03/21/17 10:56	
Chlorobenzene	<1.000	50.00	56.89	114	85-120	ug/L	03/21/17 10:56	
Chloroethane	<1.000	50.00	50.49	101	75-129	ug/L	03/21/17 10:56	
Chloroform	<1.000	50.00	53.46	107	85-128	ug/L	03/21/17 10:56	
Chloromethane	<1.000	50.00	52.87	106	60-139	ug/L	03/21/17 10:56	
Cyclohexane	<10.00	50.00	55.79	112	55-131	ug/L	03/21/17 10:56	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.41	97	69-127	ug/L	03/21/17 10:56	
Dibromochloromethane	<1.000	50.00	51.34	103	82-127	ug/L	03/21/17 10:56	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.19	102	82-121	ug/L	03/21/17 10:56	
1,2-Dichlorobenzene	<1.000	50.00	57.99	116	82-123	ug/L	03/21/17 10:56	
1,3-Dichlorobenzene	<1.000	50.00	57.92	116	81-123	ug/L	03/21/17 10:56	
1,4-Dichlorobenzene	<1.000	50.00	56.06	112	81-121	ug/L	03/21/17 10:56	
Dichlorodifluoromethane	<1.000	50.00	58.73	117	69-147	ug/L	03/21/17 10:56	
1,1-Dichloroethane	<1.000	50.00	54.48	109	83-123	ug/L	03/21/17 10:56	
1,2-Dichloroethane	<1.000	50.00	58.72	117	86-138	ug/L	03/21/17 10:56	
1,1-Dichloroethene	<1.000	50.00	51.03	102	85-127	ug/L	03/21/17 10:56	
cis-1,2-Dichloroethene	<1.000	50.00	52.82	106	87-127	ug/L	03/21/17 10:56	
1,2-Dichloropropane	<1.000	50.00	50.48	101	79-125	ug/L	03/21/17 10:56	
cis-1,3-Dichloropropene	<1.000	50.00	51.95	104	79-131	ug/L	03/21/17 10:56	
trans-1,3-Dichloropropene	<1.000	50.00	53.20	106	82-133	ug/L	03/21/17 10:56	
trans-1,2-Dichloroethene	<1.000	50.00	51.21	102	85-125	ug/L	03/21/17 10:56	
Ethylbenzene	<1.000	50.00	57.90	116	83-123	ug/L	03/21/17 10:56	
2-Hexanone	<5.000	50.00	40.31	81	37-137	ug/L	03/21/17 10:56	
Isopropylbenzene	<1.000	50.00	57.86	116	70-131	ug/L	03/21/17 10:56	
Methyl Acetate	<10.00	50.00	72.48	145	69-127	ug/L	03/21/17 10:56	H
Methylcyclohexane	<10.00	50.00	60.46	121	75-129	ug/L	03/21/17 10:56	
Methylene Chloride	<1.000	50.00	56.62	113	86-124	ug/L	03/21/17 10:56	
4-Methyl-2-Pentanone	<5.000	50.00	40.55	81	39-143	ug/L	03/21/17 10:56	
Methyl-t-butyl ether	<1.000	50.00	51.80	104	75-134	ug/L	03/21/17 10:56	
Naphthalene	<1.000	50.00	49.88	100	61-118	ug/L	03/21/17 10:56	
Styrene	<1.000	50.00	51.04	102	80-120	ug/L	03/21/17 10:56	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.43	95	64-125	ug/L	03/21/17 10:56	
Tetrachloroethene	<1.000	50.00	59.56	119	83-138	ug/L	03/21/17 10:56	
Toluene	<1.000	50.00	58.32	117	88-126	ug/L	03/21/17 10:56	
1,2,3-Trichlorobenzene	<1.000	50.00	52.81	106	75-124	ug/L	03/21/17 10:56	
1,2,4-Trichlorobenzene	<1.000	50.00	51.86	104	77-131	ug/L	03/21/17 10:56	
1,1,1-Trichloroethane	<1.000	50.00	56.56	113	68-146	ug/L	03/21/17 10:56	
1,1,2-Trichloroethane	<1.000	50.00	51.62	103	85-124	ug/L	03/21/17 10:56	
Trichloroethene	<1.000	50.00	53.11	106	87-127	ug/L	03/21/17 10:56	
Trichlorofluoromethane	<5.000	50.00	49.57	99	77-147	ug/L	03/21/17 10:56	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	53.27	107	68-135	ug/L	03/21/17 10:56	
Vinyl Chloride	<1.000	50.00	67.26	135	74-138	ug/L	03/21/17 10:56	
m,p-Xylenes	<2.000	100	116.8	117	84-124	ug/L	03/21/17 10:56	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65357-1-BLK LCS Sample Id: 65357-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	58.25	117	79-126	ug/L	03/21/17 10:56	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	03/21/17 10:56
Dibromofluoromethane	104		98		91-119	%	03/21/17 10:56
Toluene-D8	101		102		90-117	%	03/21/17 10:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	35.15	70	34.75	70	46-138	1	25	ug/L	03/21/17 13:55	
Benzene	<1.000	50.00	58.48	117	56.70	113	77-126	3	25	ug/L	03/21/17 13:55	
Bromochloromethane	<1.000	50.00	58.30	117	57.27	115	74-133	2	25	ug/L	03/21/17 13:55	
Bromodichloromethane	<1.000	50.00	58.83	118	57.09	114	79-130	3	25	ug/L	03/21/17 13:55	
Bromoform	<5.000	50.00	57.77	116	55.77	112	69-120	4	25	ug/L	03/21/17 13:55	
Bromomethane	<1.000	50.00	48.92	98	49.11	98	64-130	0	25	ug/L	03/21/17 13:55	
2-Butanone (MEK)	<10.00	50.00	39.17	78	38.07	76	34-126	3	25	ug/L	03/21/17 13:55	
Carbon Disulfide	<10.00	50.00	55.46	111	52.14	104	76-126	6	25	ug/L	03/21/17 13:55	
Carbon Tetrachloride	<1.000	50.00	55.09	110	53.56	107	77-137	3	25	ug/L	03/21/17 13:55	
Chlorobenzene	<1.000	50.00	58.17	116	55.66	111	74-120	4	25	ug/L	03/21/17 13:55	
Chloroethane	<1.000	50.00	49.52	99	48.44	97	68-133	2	25	ug/L	03/21/17 13:55	
Chloroform	<1.000	50.00	57.17	114	55.68	111	77-127	3	25	ug/L	03/21/17 13:55	
Chloromethane	<1.000	50.00	53.44	107	51.11	102	50-143	4	25	ug/L	03/21/17 13:55	
Cyclohexane	<10.00	50.00	59.96	120	57.24	114	53-139	5	25	ug/L	03/21/17 13:55	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.47	95	48.01	96	56-123	1	25	ug/L	03/21/17 13:55	
Dibromochloromethane	<1.000	50.00	52.67	105	50.55	101	70-125	4	25	ug/L	03/21/17 13:55	
1,2-Dibromoethane (EDB)	<1.000	50.00	50.46	101	49.96	100	69-121	1	25	ug/L	03/21/17 13:55	
1,2-Dichlorobenzene	<1.000	50.00	57.00	114	57.37	115	69-118	1	25	ug/L	03/21/17 13:55	
1,3-Dichlorobenzene	<1.000	50.00	56.58	113	56.12	112	68-119	1	25	ug/L	03/21/17 13:55	
1,4-Dichlorobenzene	<1.000	50.00	54.87	110	55.28	111	67-117	1	25	ug/L	03/21/17 13:55	
Dichlorodifluoromethane	<1.000	50.00	55.82	112	55.83	112	68-139	0	25	ug/L	03/21/17 13:55	
1,1-Dichloroethane	<1.000	50.00	55.93	112	52.94	106	78-126	5	25	ug/L	03/21/17 13:55	
1,2-Dichloroethane	<1.000	50.00	58.54	117	57.09	114	78-134	3	25	ug/L	03/21/17 13:55	
1,1-Dichloroethene	<1.000	50.00	52.71	105	49.79	100	78-125	6	25	ug/L	03/21/17 13:55	
cis-1,2-Dichloroethene	<1.000	50.00	52.54	105	57.86	116	78-128	10	25	ug/L	03/21/17 13:55	
1,2-Dichloropropane	<1.000	50.00	51.40	103	49.15	98	73-126	4	25	ug/L	03/21/17 13:55	
cis-1,3-Dichloropropene	<1.000	50.00	51.19	102	50.43	101	67-126	1	25	ug/L	03/21/17 13:55	
trans-1,3-Dichloropropene	<1.000	50.00	51.84	104	50.47	101	68-129	3	25	ug/L	03/21/17 13:55	
trans-1,2-Dichloroethene	<1.000	50.00	52.86	106	50.84	102	76-128	4	25	ug/L	03/21/17 13:55	
Ethylbenzene	<1.000	50.00	60.09	120	57.53	115	74-123	4	25	ug/L	03/21/17 13:55	
2-Hexanone	<5.000	50.00	38.40	77	38.96	78	38-125	1	25	ug/L	03/21/17 13:55	
Isopropylbenzene	<1.000	50.00	58.27	117	58.30	117	58-129	0	25	ug/L	03/21/17 13:55	
Methyl Acetate	<10.00	50.00	71.53	143	67.91	136	63-115	5	25	ug/L	03/21/17 13:55	X
Methylcyclohexane	<10.00	50.00	59.94	120	57.38	115	69-130	4	25	ug/L	03/21/17 13:55	
Methylene Chloride	<1.000	50.00	55.88	112	53.41	107	76-124	5	25	ug/L	03/21/17 13:55	
4-Methyl-2-Pentanone	<5.000	50.00	39.01	78	38.43	77	35-123	1	25	ug/L	03/21/17 13:55	
Methyl-t-butyl ether	<1.000	50.00	50.49	101	50.10	100	64-129	1	25	ug/L	03/21/17 13:55	
Naphthalene	<1.000	50.00	47.34	95	49.19	98	45-109	4	25	ug/L	03/21/17 13:55	
Styrene	<1.000	50.00	52.38	105	51.03	102	61-124	3	25	ug/L	03/21/17 13:55	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.88	96	49.19	98	47-130	3	25	ug/L	03/21/17 13:55	
Tetrachloroethene	<1.000	50.00	58.91	118	57.43	115	68-139	3	25	ug/L	03/21/17 13:55	
Toluene	<1.000	50.00	58.42	117	56.44	113	79-128	3	25	ug/L	03/21/17 13:55	
1,2,3-Trichlorobenzene	<1.000	50.00	50.84	102	51.25	103	48-122	1	25	ug/L	03/21/17 13:55	
1,2,4-Trichlorobenzene	<1.000	50.00	50.48	101	51.76	104	54-124	3	25	ug/L	03/21/17 13:55	
1,1,1-Trichloroethane	<1.000	50.00	58.53	117	56.53	113	73-140	3	25	ug/L	03/21/17 13:55	
1,1,2-Trichloroethane	<1.000	50.00	50.37	101	49.52	99	78-124	2	25	ug/L	03/21/17 13:55	
Trichloroethene	<1.000	50.00	50.75	102	49.85	100	77-131	2	25	ug/L	03/21/17 13:55	
Trichlorofluoromethane	<5.000	50.00	50.97	102	49.00	98	73-144	4	25	ug/L	03/21/17 13:55	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	54.03	108	50.94	102	65-140	6	25	ug/L	03/21/17 13:55	
Vinyl Chloride	<1.000	50.00	68.98	138	65.01	130	60-146	6	25	ug/L	03/21/17 13:55	
m,p-Xylenes	<2.000	100	119.4	119	115.4	115	75-125	3	25	ug/L	03/21/17 13:55	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032016

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 140980 Matrix: Waste Water Date Prep: 03/21/17

Parent Sample Id: 17032016-004 MS Sample Id: 17032016-004 S MSD Sample Id: 17032016-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	59.57	119	57.37	115	69-126	4	25	ug/L	03/21/17 13:55	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		100		86-111	%	03/21/17 13:55
Dibromofluoromethane	103		103		91-119	%	03/21/17 13:55
Toluene-D8	98		98		90-117	%	03/21/17 13:55

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

Seq Number: 140981 Matrix: Water Date Prep: 03/21/17

MB Sample Id: 65359-1-BLK LCS Sample Id: 65359-1-BKS LCSD Sample Id: 65359-1-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	30.41	101	29.99	100	50-150	1	20	ug/L	03/21/17 16:26	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		98		94		80-120	%	03/21/17 16:26

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kop-Flex PROJECT NO.: 31400396-07
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Pam Groff, Maria Kaplan DW CERT NO.:

PSS Work Order #: 17032016 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
							HCl	HCl		
1	Effluent VSP-4	3/20/17	1247	WW	~~10~~ 30	G	X	X		48-hr TAT
2	Influent VSP-1	3/20/17	1255	WW	6	G	X	X		
3 *	Carbon Effluent	3/20/17	1301	WW	6	G	X	X		
4 *	Lead Amberserb Effluent	3/20/17	1308	WW	6	G	X	X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/20/17	1447	LMACKLIN 655
Relinquished By: (2)	Date	Time	Received By:
LMACKLIN	3/20/17	3:20	
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 62
Custody Seal: Cooler - Intact
Ice Present: PRES Temp: 6°-11°C
Shipping Carrier: FTE

Special Instructions:

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

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032016	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/20/2017 03:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	04/24/2017	**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	Pam Groff
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 4 Total No. of Containers Received 21

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: 03/20/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/21/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032017

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

March 22, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 22, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032017**
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 **17032017**.

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 April 24, 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032017

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/20/2017 at 03:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032017-001	Effluent VSP-4	WASTE WATER	03/20/17 12:47

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: 17032017

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/20/2017 12:47** **PSS Sample ID: 17032017-001**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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

pH=1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Chloromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Vinyl Chloride	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Bromomethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Chloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Methylene Chloride	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Chloroform	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Benzene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Trichloroethene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Bromodichloromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Toluene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Tetrachloroethylene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Dibromochloromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Chlorobenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Ethylbenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
Bromoform	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032017

WSP Environment & Energy - Herndon, Herndon, VA

March 22, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/20/2017 12:47** **PSS Sample ID: 17032017-001**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624
pH=1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dichlorobenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 13:09	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032017

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.

Analytical:

Volatile Organics Compounds (TVO)

Batch: 141006

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.

Analytical Data Package Information Summary

Work Order(s): **17032017**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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 624	Effluent VSP-4	Initial	17032017-001	1011	W	65371	141006	03/20/2017	03/22/2017 09:06	03/22/2017 13:09
	65371-1-BKS	BKS	65371-1-BKS	1011	W	65371	141006	--------	03/22/2017 09:06	03/22/2017 11:34
	65371-1-BLK	BLK	65371-1-BLK	1011	W	65371	141006	--------	03/22/2017 09:06	03/22/2017 12:14

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032017

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 141006 Matrix: Waste Water Date Prep: 03/22/2017
PSS Sample ID: 17032017-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	102		87-114	%	03/22/17 13:09
4-Bromofluorobenzene	143	*	90-114	%	03/22/17 13:09
Toluene-D8	97		93-108	%	03/22/17 13:09

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 17032017

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 141006 Matrix: Water Date Prep: 03/22/17

MB Sample Id: 65371-1-BLK LCS Sample Id: 65371-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	66.33	111	51-139	ug/L	03/22/17 11:34	
Chloromethane	<5.000	60.00	61.54	103	56-144	ug/L	03/22/17 11:34	
Vinyl Chloride	<5.000	60.00	65.46	109	46-157	ug/L	03/22/17 11:34	
Bromomethane	<5.000	60.00	58.94	98	63-134	ug/L	03/22/17 11:34	
Chloroethane	<5.000	60.00	59.37	99	56-143	ug/L	03/22/17 11:34	
Trichlorofluoromethane	<5.000	60.00	61.64	103	56-138	ug/L	03/22/17 11:34	
1,1-Dichloroethene	<5.000	60.00	61.53	103	63-134	ug/L	03/22/17 11:34	
Methylene Chloride	<5.000	60.00	60.68	101	65-126	ug/L	03/22/17 11:34	
trans-1,2-dichloroethene	<5.000	60.00	59.20	99	67-129	ug/L	03/22/17 11:34	
1,1-Dichloroethane	<5.000	60.00	56.39	94	66-131	ug/L	03/22/17 11:34	
Chloroform	<5.000	60.00	55.02	92	69-130	ug/L	03/22/17 11:34	
1,1,1-Trichloroethane	<5.000	60.00	57.77	96	66-129	ug/L	03/22/17 11:34	
Carbon Tetrachloride	<5.000	60.00	60.08	100	70-133	ug/L	03/22/17 11:34	
Benzene	<5.000	60.00	56.97	95	69-127	ug/L	03/22/17 11:34	
1,2-Dichloroethane	<5.000	60.00	57.22	95	62-133	ug/L	03/22/17 11:34	
Trichloroethene	<5.000	60.00	57.74	96	71-127	ug/L	03/22/17 11:34	
1,2-Dichloropropane	<5.000	60.00	56.05	93	67-133	ug/L	03/22/17 11:34	
Bromodichloromethane	<5.000	60.00	58.72	98	63-132	ug/L	03/22/17 11:34	
2-Chloroethyl Vinyl Ether	<5.000	60.00	50.72	85	21-140	ug/L	03/22/17 11:34	
cis-1,3-Dichloropropene	<5.000	60.00	56.05	93	65-128	ug/L	03/22/17 11:34	
Toluene	<5.000	60.00	58.67	98	67-130	ug/L	03/22/17 11:34	
trans-1,3-dichloropropene	<5.000	60.00	56.87	95	63-127	ug/L	03/22/17 11:34	
1,1,2-Trichloroethane	<5.000	60.00	59.76	100	62-136	ug/L	03/22/17 11:34	
Tetrachloroethylene	<5.000	60.00	61.38	102	64-135	ug/L	03/22/17 11:34	
Dibromochloromethane	<5.000	60.00	56.32	94	65-126	ug/L	03/22/17 11:34	
Chlorobenzene	<5.000	60.00	57.61	96	70-127	ug/L	03/22/17 11:34	
Ethylbenzene	<5.000	60.00	57.71	96	71-131	ug/L	03/22/17 11:34	
Bromoform	<5.000	60.00	57.89	96	58-128	ug/L	03/22/17 11:34	
1,1,2,2-Tetrachloroethane	<5.000	60.00	64.60	108	63-134	ug/L	03/22/17 11:34	
1,3-Dichlorobenzene	<5.000	60.00	58.81	98	67-128	ug/L	03/22/17 11:34	
1,4-Dichlorobenzene	<5.000	60.00	59.54	99	67-127	ug/L	03/22/17 11:34	
1,2-Dichlorobenzene	<5.000	60.00	58.84	98	67-126	ug/L	03/22/17 11:34	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	102		100		87-114	%	03/22/17 11:34
4-Bromofluorobenzene	140	*	93		90-114	%	03/22/17 11:34
Toluene-D8	98		102		93-108	%	03/22/17 11:34

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.

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@wspgroup.com FAX NO.: ( )

*PROJECT NAME: Kop-Flex PROJECT NO.: 31400390-09

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

SAMPLER(S): Pam Groff, Maria Kaplan DW CERT NO.:

PSS Work Order #: 17032017 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	Analysis/ Method Required (3) * VOCs (624)	REMARKS
1	Effluent VSP-4	3/20/17	1247	WW	3	G	X		48-hr TAT

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/20/17	1447	LMACKLIN 6SS
Relinquished By: (2) LMACKLIN	Date 3/20/17	Time 3:20	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

Custody Seal: Cooler-Intact

Ice Present: PRES Temp: 6°-8°C

Shipping Carrier: TTE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE: ____

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

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032017	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/20/2017 03:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	04/24/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	8
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

Documentation

		Sampler Name	Pam Groff/Maria Kaj
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 3

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)		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.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/20/2017

Thomas Wingate

PM Review and Approval: Amber J Confer Date: 03/21/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032018

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

March 28, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 28, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032018**
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 **17032018**.

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 April 24, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032018

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/20/2017 at 03:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032018-001	Effluent VSP-4	WASTE WATER	03/20/17 12:47
17032018-002	TB-032117-01	WATER	03/20/17 12:47

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: 17032018

WSP Environment & Energy - Herndon, Herndon, VA

March 28, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/20/2017 12:47** **PSS Sample ID: 17032018-001**
Matrix: WASTE WATER **Date/Time Received: 03/20/2017 15:20**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	ND	ug/L	1.0		1	03/23/17	03/23/17 13:51	1033
Lead	ND	ug/L	1.0		1	03/23/17	03/23/17 13:51	1033
Nickel	**27.3**	ug/L	1.00		1	03/23/17	03/23/17 13:51	1033
Zinc	**163**	ug/L	20.0		1	03/23/17	03/23/17 13:51	1033

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**3,650**	ug/L	100		1	03/21/17	03/21/17 15:01	1033
Copper	ND	ug/L	1.0		1	03/21/17	03/21/17 15:01	1033
Lead	ND	ug/L	1.0		1	03/21/17	03/21/17 15:01	1033
Magnesium	**1,470**	ug/L	500		5	03/21/17	03/22/17 14:29	1033
Nickel	**29.9**	ug/L	1.00		1	03/21/17	03/21/17 15:01	1033
Zinc	**179**	ug/L	20.0		1	03/21/17	03/21/17 15:01	1033
Hardness (Ca & Mg)	**15**	mg/L	2.3		1	03/21/17	03/21/17 15:01	1033

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	1.0		1	03/22/17	03/22/17 14:37	1051

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

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	2.00		03/21/17	03/26/17 09:00	4006

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032018

WSP Environment & Energy - Herndon, Herndon, VA

March 28, 2017

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

Sample ID: TB-032117-01 **Date/Time Sampled: 03/20/2017 12:47** **PSS Sample ID: 17032018-002**
Matrix: WATER **Date/Time Received: 03/20/2017 15:20**

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	03/22/17	03/22/17 16:28	1011
Chloromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Vinyl Chloride	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Bromomethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Chloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Methylene Chloride	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Chloroform	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Benzene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Trichloroethene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Bromodichloromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Toluene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Tetrachloroethylene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Dibromochloromethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Chlorobenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Ethylbenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
Bromoform	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032018

WSP Environment & Energy - Herndon, Herndon, VA

March 28, 2017

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

Sample ID: TB-032117-01 **Date/Time Sampled: 03/20/2017 12:47** **PSS Sample ID: 17032018-002**
Matrix: WATER **Date/Time Received: 03/20/2017 15:20**

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	03/22/17	03/22/17 16:28	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	03/22/17	03/22/17 16:28	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032018

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.

17032018: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

Analytical:

Volatile Organics Compounds (TVO)

Batch: 141006

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.

Analytical Data Package Information Summary

Work Order(s): **17032018**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032018-001	1033	W	65342	140985	03/20/2017	03/21/2017 09:38	03/21/2017 15:01
	65342-1-BKS	BKS	65342-1-BKS	1033	W	65342	140985	--------	03/21/2017 09:38	03/21/2017 14:09
	65342-1-BLK	BLK	65342-1-BLK	1033	W	65342	140985	--------	03/21/2017 09:38	03/21/2017 14:02
	SAPS#1 INFLOW S	MS	17031706-001 S	1033	W	65342	140985	03/17/2017	03/21/2017 09:38	03/21/2017 14:22
	SAPS#1 INFLOW SD	MSD	17031706-001 SD	1033	W	65342	140985	03/17/2017	03/21/2017 09:38	03/21/2017 14:29
	Effluent VSP-4	Reanalysis	17032018-001	1033	W	65342	141019	03/20/2017	03/21/2017 09:38	03/22/2017 14:29
EPA 200.8	Effluent VSP-4	Initial	17032018-001	1033	W	65376	141046	03/20/2017	03/23/2017 09:27	03/23/2017 13:51
	65376-1-BKS	BKS	65376-1-BKS	1033	W	65376	141046	--------	03/23/2017 09:27	03/23/2017 13:44
	65376-1-BLK	BLK	65376-1-BLK	1033	W	65376	141046	--------	03/23/2017 09:27	03/23/2017 13:37
	Effluent VSP-4 S	MS	17032018-001 S	1033	W	65376	141046	03/20/2017	03/23/2017 09:27	03/23/2017 13:57
	Effluent VSP-4 SD	MSD	17032018-001 SD	1033	W	65376	141046	03/20/2017	03/23/2017 09:27	03/23/2017 14:04
EPA 624	TB-032117-01	Initial	17032018-002	1011	W	65371	141006	03/20/2017	03/22/2017 09:06	03/22/2017 16:28
	65371-1-BKS	BKS	65371-1-BKS	1011	W	65371	141006	--------	03/22/2017 09:06	03/22/2017 11:34
	65371-1-BLK	BLK	65371-1-BLK	1011	W	65371	141006	--------	03/22/2017 09:06	03/22/2017 12:14
	Effluent VSP-4 S	MS	17032017-001 S	1011	W	65371	141006	03/20/2017	03/22/2017 09:06	03/22/2017 13:48
	Effluent VSP-4 SD	MSD	17032017-001 SD	1011	W	65371	141006	03/20/2017	03/22/2017 09:06	03/22/2017 14:29
SM 2540D -2011	Effluent VSP-4	Initial	17032018-001	1051	W	141005	141005	03/20/2017	03/22/2017 14:37	03/22/2017 14:37
	141005-1-BLK	BLK	141005-1-BLK	1051	W	141005	141005	--------	03/22/2017 14:37	03/22/2017 14:37
	Discharge 1123603 D	MD	17032007-001 D	1051	W	141005	141005	03/17/2017	03/22/2017 14:37	03/22/2017 14:37
SM 5210B -2011	Effluent VSP-4	Initial	17032018-001	4006	W	141119	141119	03/20/2017	03/21/2017 12:50	03/26/2017 09:00

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032018

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 141006 Matrix: Water Date Prep: 03/22/2017

PSS Sample ID: 17032018-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	103		87-114	%	03/22/17 16:28
4-Bromofluorobenzene	148	*	90-114	%	03/22/17 16:28
Toluene-D8	97		93-108	%	03/22/17 16:28

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 17032018

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 141005 Matrix: Water
MB Sample Id: 141005-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	03/22/17 14:37	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 140985 Matrix: Water Date Prep: 03/21/17
MB Sample Id: 65342-1-BLK LCS Sample Id: 65342-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	402.6	101	85-115	ug/L	03/21/17 14:09	
Copper	<1.000	40.00	38.48	96	85-115	ug/L	03/21/17 14:09	
Lead	<1.000	40.00	43.02	108	85-115	ug/L	03/21/17 14:09	
Magnesium	<100	400	381.1	95	85-115	ug/L	03/21/17 14:09	
Nickel	<1.000	40.00	40.63	102	85-115	ug/L	03/21/17 14:09	
Zinc	<20.00	200	205.9	103	85-115	ug/L	03/21/17 14:09	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 141046 Matrix: Water Date Prep: 03/23/17
MB Sample Id: 65376-1-BLK LCS Sample Id: 65376-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	40.14	100	85-115	ug/L	03/23/17 13:44	
Lead	<1.000	40.00	37.73	94	85-115	ug/L	03/23/17 13:44	
Nickel	<1.000	40.00	39.86	100	85-115	ug/L	03/23/17 13:44	
Zinc	<20.00	200	201.4	101	85-115	ug/L	03/23/17 13:44	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 141046 Matrix: Waste Water Date Prep: 03/23/17
Parent Sample Id: 17032018-001 MS Sample Id: 17032018-001 S MSD Sample Id: 17032018-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	<1.000	40.00	39.63	99	37.99	95	70-130	4	25	ug/L	03/23/17 13:57	
Lead	<1.000	40.00	37.20	93	37.84	95	70-130	2	25	ug/L	03/23/17 13:57	
Nickel	27.28	40.00	66.93	99	64.89	94	70-130	3	25	ug/L	03/23/17 13:57	
Zinc	163	200	368.6	103	355.5	96	70-130	4	25	ug/L	03/23/17 13:57	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032018

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 141006 Matrix: Water Date Prep: 03/22/17

MB Sample Id: 65371-1-BLK LCS Sample Id: 65371-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	66.33	111	51-139	ug/L	03/22/17 11:34	
Chloromethane	<5.000	60.00	61.54	103	56-144	ug/L	03/22/17 11:34	
Vinyl Chloride	<5.000	60.00	65.46	109	46-157	ug/L	03/22/17 11:34	
Bromomethane	<5.000	60.00	58.94	98	63-134	ug/L	03/22/17 11:34	
Chloroethane	<5.000	60.00	59.37	99	56-143	ug/L	03/22/17 11:34	
Trichlorofluoromethane	<5.000	60.00	61.64	103	56-138	ug/L	03/22/17 11:34	
1,1-Dichloroethene	<5.000	60.00	61.53	103	63-134	ug/L	03/22/17 11:34	
Methylene Chloride	<5.000	60.00	60.68	101	65-126	ug/L	03/22/17 11:34	
trans-1,2-dichloroethene	<5.000	60.00	59.20	99	67-129	ug/L	03/22/17 11:34	
1,1-Dichloroethane	<5.000	60.00	56.39	94	66-131	ug/L	03/22/17 11:34	
Chloroform	<5.000	60.00	55.02	92	69-130	ug/L	03/22/17 11:34	
1,1,1-Trichloroethane	<5.000	60.00	57.77	96	66-129	ug/L	03/22/17 11:34	
Carbon Tetrachloride	<5.000	60.00	60.08	100	70-133	ug/L	03/22/17 11:34	
Benzene	<5.000	60.00	56.97	95	69-127	ug/L	03/22/17 11:34	
1,2-Dichloroethane	<5.000	60.00	57.22	95	62-133	ug/L	03/22/17 11:34	
Trichloroethene	<5.000	60.00	57.74	96	71-127	ug/L	03/22/17 11:34	
1,2-Dichloropropane	<5.000	60.00	56.05	93	67-133	ug/L	03/22/17 11:34	
Bromodichloromethane	<5.000	60.00	58.72	98	63-132	ug/L	03/22/17 11:34	
2-Chloroethyl Vinyl Ether	<5.000	60.00	50.72	85	21-140	ug/L	03/22/17 11:34	
cis-1,3-Dichloropropene	<5.000	60.00	56.05	93	65-128	ug/L	03/22/17 11:34	
Toluene	<5.000	60.00	58.67	98	67-130	ug/L	03/22/17 11:34	
trans-1,3-dichloropropene	<5.000	60.00	56.87	95	63-127	ug/L	03/22/17 11:34	
1,1,2-Trichloroethane	<5.000	60.00	59.76	100	62-136	ug/L	03/22/17 11:34	
Tetrachloroethylene	<5.000	60.00	61.38	102	64-135	ug/L	03/22/17 11:34	
Dibromochloromethane	<5.000	60.00	56.32	94	65-126	ug/L	03/22/17 11:34	
Chlorobenzene	<5.000	60.00	57.61	96	70-127	ug/L	03/22/17 11:34	
Ethylbenzene	<5.000	60.00	57.71	96	71-131	ug/L	03/22/17 11:34	
Bromoform	<5.000	60.00	57.89	96	58-128	ug/L	03/22/17 11:34	
1,1,2,2-Tetrachloroethane	<5.000	60.00	64.60	108	63-134	ug/L	03/22/17 11:34	
1,3-Dichlorobenzene	<5.000	60.00	58.81	98	67-128	ug/L	03/22/17 11:34	
1,4-Dichlorobenzene	<5.000	60.00	59.54	99	67-127	ug/L	03/22/17 11:34	
1,2-Dichlorobenzene	<5.000	60.00	58.84	98	67-126	ug/L	03/22/17 11:34	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	102		100		87-114	%	03/22/17 11:34
4-Bromofluorobenzene	140	*	93		90-114	%	03/22/17 11:34
Toluene-D8	98		102		93-108	%	03/22/17 11:34

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kop-Flex PROJECT NO.: 314 00390-09
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Sam Groff, Maria Kaplan DW CERT NO.:

PSS Work Order #: 1703201B 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			HNO_3		HCl								REMARKS
							Analysis/ Method Required (3) *	BOD5	TSS	Total Cu, Pb, Ni, Zn Hardness Dissolved Cu, Pb, Ni, Zn	VOCs (624)									
1	Effluent VSP-4	3/20/17	1247	WW	4	G		X	X	X	X									Lab filter dissolved metals
2	TB-032117-01	3/20/17	Lab Supplied	DW	2	—						X								

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/20/17	1442	CMACKLIN LSS
Relinquished By: (2) CMACKLIN	Date 3/20/17	Time 3:20	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 Blnk: 6°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 6°-11°C
Shipping Carrier: TTE

Special Instructions:

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

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032018	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/20/2017 03:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	04/24/2017	**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	Pam Groff/Maria Kaj
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 2 Total No. of Containers Received 6

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)		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.

Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 03/20/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 03/21/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032325

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390.9

March 27, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

March 27, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032325**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390.9

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 **17032325**.

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 April 27, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325

Project ID: 31400390.9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/23/2017 at 03:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032325-001	Effluent VSP - 4	WASTE WATER	03/23/17 08:23
17032325-002	Lead Ambersorb Effluent	WASTE WATER	03/23/17 08:45
17032325-003	Carbon Effluent	WASTE WATER	03/23/17 08:56
17032325-004	Influent VSP-1	WASTE WATER	03/23/17 09:08
17032325-005	TB-032317	WATER	03/23/17 15:40

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: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Effluent VSP - 4 **Date/Time Sampled: 03/23/2017 08:23** **PSS Sample ID: 17032325-001**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 19:02	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 19:02	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 19:02	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 19:02	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Chloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 19:02	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 19:02	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: Effluent VSP - 4 **Date/Time Sampled: 03/23/2017 08:23** **PSS Sample ID: 17032325-001**
Matrix: WASTE WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 19:02	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 19:02	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 19:02	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 19:02	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Trichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 19:02	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 19:02	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 19:02	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)	ND	ug/L	1.0		1	03/24/17	03/24/17 16:00	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Benzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Bromoform	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Bromomethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Disulfide	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloroform	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Chloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Cyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Ethylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

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: 17032325

WSP Environment & Energy - Herndon, Herndon, VA

March 27, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390.9

Sample ID: TB-032317 **Date/Time Sampled: 03/23/2017 15:40** **PSS Sample ID: 17032325-005**
Matrix: WATER **Date/Time Received: 03/23/2017 15:40**

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	03/23/17	03/23/17 18:40	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Methyl Acetate	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylcyclohexane	ND	ug/L	10		1	03/23/17	03/23/17 18:40	1011
Methylene Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Naphthalene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Styrene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Toluene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichloroethene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/23/17	03/23/17 18:40	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
Vinyl Chloride	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011
m,p-Xylenes	ND	ug/L	2.0		1	03/23/17	03/23/17 18:40	1011
o-Xylene	ND	ug/L	1.0		1	03/23/17	03/23/17 18:40	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032325
Project ID: 31400390.9

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): 17032325
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Effluent VSP - 4	Initial	17032325-001	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:02
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:23
	Carbon Effluent	Initial	17032325-003	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 19:45
	Influent VSP-1	Initial	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:08
	TB-032317	Initial	17032325-005	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 18:40
	65396-1-BKS	BKS	65396-1-BKS	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 10:37
	65396-1-BLK	BLK	65396-1-BLK	1011	W	65396	141045	--------	03/23/2017 09:24	03/23/2017 11:46
	Corrado S	MS	17032303-001 S	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 15:42
	Corrado SD	MSD	17032303-001 SD	1011	W	65396	141045	03/22/2017	03/23/2017 09:24	03/23/2017 16:04
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65396	141045	03/23/2017	03/23/2017 09:24	03/23/2017 20:30
SW-846 8260 B-Modified	Effluent VSP - 4	Initial	17032325-001	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:00
	Lead Ambersorb Effluent	Initial	17032325-002	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 16:25
	65413-1-BKS	BKS	65413-1-BKS	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:32
	65413-1-BLK	BLK	65413-1-BLK	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 15:37
	65413-1-BSD	BSD	65413-1-BSD	1011	W	65413	141076	--------	03/24/2017 13:17	03/24/2017 14:54
	Carbon Effluent	Reanalysis	17032325-003	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:09
	Influent VSP-1	Reanalysis	17032325-004	1011	W	65413	141076	03/23/2017	03/24/2017 13:17	03/24/2017 17:52

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 19:02
Dibromofluoromethane	106		91-119	%	03/23/17 19:02
Toluene-D8	101		90-117	%	03/23/17 19:02

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:00

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:23
Dibromofluoromethane	105		91-119	%	03/23/17 19:23
Toluene-D8	105		90-117	%	03/23/17 19:23

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 16:25

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		86-111	%	03/23/17 19:45
Dibromofluoromethane	107		91-119	%	03/23/17 19:45
Toluene-D8	101		90-117	%	03/23/17 19:45

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	03/24/17 16:46

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Waste Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	03/23/17 20:08
Dibromofluoromethane	106		91-119	%	03/23/17 20:08
Toluene-D8	99		90-117	%	03/23/17 20:08

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141076 Matrix: Waste Water Date Prep: 03/24/2017
PSS Sample ID: 17032325-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	03/24/17 17:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141045 Matrix: Water Date Prep: 03/23/2017
PSS Sample ID: 17032325-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	03/23/17 18:40
Dibromofluoromethane	101		91-119	%	03/23/17 18:40
Toluene-D8	103		90-117	%	03/23/17 18:40

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 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	40.22	80	29-149	ug/L	03/23/17 10:37	
Benzene	<1.000	50.00	56.24	112	85-123	ug/L	03/23/17 10:37	
Bromochloromethane	<1.000	50.00	55.86	112	82-136	ug/L	03/23/17 10:37	
Bromodichloromethane	<1.000	50.00	60.48	121	88-133	ug/L	03/23/17 10:37	
Bromoform	<5.000	50.00	57.21	114	80-126	ug/L	03/23/17 10:37	
Bromomethane	<1.000	50.00	58.90	118	64-139	ug/L	03/23/17 10:37	
2-Butanone (MEK)	<10.00	50.00	40.04	80	39-135	ug/L	03/23/17 10:37	
Carbon Disulfide	<10.00	50.00	56.83	114	85-124	ug/L	03/23/17 10:37	
Carbon Tetrachloride	<1.000	50.00	56.63	113	81-138	ug/L	03/23/17 10:37	
Chlorobenzene	<1.000	50.00	58.68	117	85-120	ug/L	03/23/17 10:37	
Chloroethane	<1.000	50.00	52.17	104	75-129	ug/L	03/23/17 10:37	
Chloroform	<1.000	50.00	55.84	112	85-128	ug/L	03/23/17 10:37	
Chloromethane	<1.000	50.00	57.55	115	60-139	ug/L	03/23/17 10:37	
Cyclohexane	<10.00	50.00	58.52	117	55-131	ug/L	03/23/17 10:37	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	48.10	96	69-127	ug/L	03/23/17 10:37	
Dibromochloromethane	<1.000	50.00	53.30	107	82-127	ug/L	03/23/17 10:37	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.06	102	82-121	ug/L	03/23/17 10:37	
1,2-Dichlorobenzene	<1.000	50.00	59.05	118	82-123	ug/L	03/23/17 10:37	
1,3-Dichlorobenzene	<1.000	50.00	59.33	119	81-123	ug/L	03/23/17 10:37	
1,4-Dichlorobenzene	<1.000	50.00	57.57	115	81-121	ug/L	03/23/17 10:37	
Dichlorodifluoromethane	<1.000	50.00	60.36	121	69-147	ug/L	03/23/17 10:37	
1,1-Dichloroethane	<1.000	50.00	58.08	116	83-123	ug/L	03/23/17 10:37	
1,2-Dichloroethane	<1.000	50.00	59.51	119	86-138	ug/L	03/23/17 10:37	
1,1-Dichloroethene	<1.000	50.00	54.08	108	85-127	ug/L	03/23/17 10:37	
cis-1,2-Dichloroethene	<1.000	50.00	56.40	113	87-127	ug/L	03/23/17 10:37	
1,2-Dichloropropane	<1.000	50.00	52.57	105	79-125	ug/L	03/23/17 10:37	
cis-1,3-Dichloropropene	<1.000	50.00	54.65	109	79-131	ug/L	03/23/17 10:37	
trans-1,3-Dichloropropene	<1.000	50.00	54.22	108	82-133	ug/L	03/23/17 10:37	
trans-1,2-Dichloroethene	<1.000	50.00	55.28	111	85-125	ug/L	03/23/17 10:37	
Ethylbenzene	<1.000	50.00	59.23	118	83-123	ug/L	03/23/17 10:37	
2-Hexanone	<5.000	50.00	41.47	83	37-137	ug/L	03/23/17 10:37	
Isopropylbenzene	<1.000	50.00	59.18	118	70-131	ug/L	03/23/17 10:37	
Methyl Acetate	<10.00	50.00	71.66	143	69-127	ug/L	03/23/17 10:37	H
Methylcyclohexane	<10.00	50.00	61.41	123	75-129	ug/L	03/23/17 10:37	
Methylene Chloride	<1.000	50.00	57.60	115	86-124	ug/L	03/23/17 10:37	
4-Methyl-2-Pentanone	<5.000	50.00	41.73	83	39-143	ug/L	03/23/17 10:37	
Methyl-t-butyl ether	<1.000	50.00	54.35	109	75-134	ug/L	03/23/17 10:37	
Naphthalene	<1.000	50.00	48.91	98	61-118	ug/L	03/23/17 10:37	
Styrene	<1.000	50.00	52.67	105	80-120	ug/L	03/23/17 10:37	
1,1,2,2-Tetrachloroethane	<1.000	50.00	48.32	97	64-125	ug/L	03/23/17 10:37	
Tetrachloroethene	<1.000	50.00	61.17	122	83-138	ug/L	03/23/17 10:37	
Toluene	<1.000	50.00	60.82	122	88-126	ug/L	03/23/17 10:37	
1,2,3-Trichlorobenzene	<1.000	50.00	52.95	106	75-124	ug/L	03/23/17 10:37	
1,2,4-Trichlorobenzene	<1.000	50.00	54.50	109	77-131	ug/L	03/23/17 10:37	
1,1,1-Trichloroethane	<1.000	50.00	60.16	120	68-146	ug/L	03/23/17 10:37	
1,1,2-Trichloroethane	<1.000	50.00	53.26	107	85-124	ug/L	03/23/17 10:37	
Trichloroethene	<1.000	50.00	53.03	106	87-127	ug/L	03/23/17 10:37	
Trichlorofluoromethane	<5.000	50.00	52.87	106	77-147	ug/L	03/23/17 10:37	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.65	111	68-135	ug/L	03/23/17 10:37	
Vinyl Chloride	<1.000	50.00	72.13	144	74-138	ug/L	03/23/17 10:37	H
m,p-Xylenes	<2.000	100	120.6	121	84-124	ug/L	03/23/17 10:37	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032325

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141045 Matrix: Water Date Prep: 03/23/17

MB Sample Id: 65396-1-BLK LCS Sample Id: 65396-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	60.09	120	79-126	ug/L	03/23/17 10:37	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		100		86-111	%	03/23/17 10:37
Dibromofluoromethane	107		100		91-119	%	03/23/17 10:37
Toluene-D8	102		103		90-117	%	03/23/17 10:37

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

Seq Number: 141076 Matrix: Water Date Prep: 03/24/17

MB Sample Id: 65413-1-BLK LCS Sample Id: 65413-1-BKS LCSD Sample Id: 65413-1-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	27.80	93	29.93	100	50-150	7	20	ug/L	03/24/17 14:32	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	97		95		96		80-120	%	03/24/17 14:32

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.

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@wspgroup.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.: 31400340.7
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Mark Kaplan DW CERT NO.:

PSS Work Order #: 1703235 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 DO (8260 SIM)	REMARKS
1	Effluent VSP-4	3/23/17	0823	WW	6	G		X	X	
2	Red Anderson Effluent	3/23/17	0845	WW	6	G		X	X	
3	Carbon Effluent	3/23/17	0856	WW	6	G		X	X	
4	Influent VSP-1	3/23/17	0908	WW	6	G		X	X	
5	TB-032317	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/23/17	15:11	LMACKLIN
Relinquished By: (2) LMACKLIN	Date 3/23/17	Time 3:40	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: 3°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 3°-6° 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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032325	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/23/2017 03:40:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390.9	**Tracking No**	Not Applicable
Disposal Date	04/27/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 5 Total No. of Containers Received 26

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: 03/23/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 03/24/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032928

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

April 6, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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.

April 6, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032928**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17032928**.

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 May 3, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032928

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/29/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032928-001	Effluent VSP-4	WASTE WATER	03/29/17 10:38

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

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: 17032928

WSP Environment & Energy - Herndon, Herndon, VA

April 6, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/29/2017 10:38** **PSS Sample ID: 17032928-001**
Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	3.0		03/31/17	04/05/17 12:00	4006

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032928
Project ID: 31400390-9

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.

17032928: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

Analytical Data Package Information Summary

Work Order(s): **17032928**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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
SM 5210B -2011	Effluent VSP-4	Initial	17032928-001	4006	W	141427	141427	03/29/2017	03/31/2017 00:00	04/05/2017 12:00

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

1

*CLIENT: WSP *OFFICE LOC. Annapolis, MD

*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500

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

*PROJECT NAME: Kapflex PROJECT NO.: 31400390-9

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

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

PSS Work Order #: 17032928 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: 1	Analysis/ Method Required (3): * BOD5	REMARKS
	Effluent WSP-4	3/29/17	1038	WW	1	G	X		

3 2 2

3/29/17

5

Relinquished By: (1)	Date	Time	Received By:
	3/29/17	1520	#659
Relinquished By: (2) #659	Date 3/30/17	Time 420	Received By: Barb Weber
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 1°C)

Custody Seal: cooler intact

Ice Present: Yes Temp: 5°C

Shipping Carrier: FTC

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032928	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/29/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	05/03/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	5
Seal(s) Signed / Dated?	Yes	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 1

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)	N/A
Do VOA vials have zero headspace?		N/A
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: 03/29/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 03/30/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032931

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

April 5, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

April 5, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032931**
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 **17032931**.

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 May 3, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032931

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/29/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032931-001	Effluent VSP-4	WASTE WATER	03/29/17 10:38

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: 17032931

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/29/2017 10:38** **PSS Sample ID: 17032931-001**

Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

Total Suspended Solids

Analytical Method: SM 2540D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	1.0		1	04/03/17	04/03/17 11:03	1051

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032931

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.

Analytical Data Package Information Summary

Work Order(s): **17032931**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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
SM 2540D -2011	Effluent VSP-4	Initial	17032931-001	1051	W	141287	141287	03/29/2017	04/03/2017 11:03	04/03/2017 11:03
	141287-1-BLK	BLK	141287-1-BLK	1051	W	141287	141287	--------	04/03/2017 11:03	04/03/2017 11:03
	TSS D	MD	17032912-001 D	1051	W	141287	141287	03/28/2017	04/03/2017 11:03	04/03/2017 11:03

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032931

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 141287 Matrix: Water
MB Sample Id: 141287-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	04/03/17 11:03	

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.

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-cup.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 #: 1703293 1 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) * TSS	Total Zn+Al+Fe Cu (acidified)	Dissolved Zn, Ni, Pb, Cu	REMARKS
	Effluent USP-4	3/29/17 ~~1020~~	1038	WW	3	G		X	X	X	

3/29/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/29/17	1520	
Relinquished By: (2)	Date	Time	Received By:
	3/29/17	~~1620~~ 1631	Bart Weber
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 1°C)
Custody Seal: cooler intact
Ice Present: Pres Temp: 3°C
Shipping Carrier: FTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032931	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/29/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/03/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	3
Seal(s) Signed / Dated?	Yes	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 1

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)	N/A
Do VOA vials have zero headspace?		N/A
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: 03/29/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 03/30/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17032932

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

April 3, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

April 3, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17032932**
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 **17032932**.

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 May 3, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032932

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/29/2017 at 04:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17032932-001	Effluent VSP-4	WASTE WATER	03/29/17 10:38

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: 17032932

WSP Environment & Energy - Herndon, Herndon, VA

April 3, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/29/2017 10:38** **PSS Sample ID: 17032932-001**
Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	ND	ug/L	1.0		1	03/31/17	03/31/17 15:58	1033
Lead	ND	ug/L	1.0		1	03/31/17	03/31/17 15:58	1033
Nickel	**2.5**	ug/L	1.0		1	03/31/17	03/31/17 15:58	1033
Zinc	ND	ug/L	20		1	03/31/17	03/31/17 15:58	1033

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**3,400**	ug/L	1,000		10	03/31/17	04/03/17 14:49	1033
Copper	ND	ug/L	1.0		1	03/31/17	03/31/17 16:05	1033
Lead	ND	ug/L	1.0		1	03/31/17	03/31/17 16:05	1033
Magnesium	**1,260**	ug/L	1,000		10	03/31/17	04/03/17 14:49	1033
Nickel	**2.6**	ug/L	1.0		1	03/31/17	03/31/17 16:05	1033
Zinc	**27.2**	ug/L	20.0		1	03/31/17	03/31/17 16:05	1033
Hardness (Ca & Mg)	**14.0**	mg/L	6.60		10	03/31/17	04/03/17 14:49	1033

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032932

WSP Environment & Energy - Herndon, Herndon, VA

April 3, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/29/2017 10:38** **PSS Sample ID: 17032932-001**
Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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	03/30/17	03/30/17 14:13	1011
Chloromethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Vinyl Chloride	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Bromomethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Chloroethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Methylene Chloride	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Chloroform	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Benzene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Trichloroethene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Bromodichloromethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Toluene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Tetrachloroethylene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Dibromochloromethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Chlorobenzene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Ethylbenzene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
Bromoform	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17032932

WSP Environment & Energy - Herndon, Herndon, VA

April 3, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/29/2017 10:38** **PSS Sample ID: 17032932-001**

Matrix: WASTE WATER **Date/Time Received: 03/29/2017 16:20**

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	03/30/17	03/30/17 14:13	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	03/30/17	03/30/17 14:13	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17032932

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.

Analytical:

Volatile Organics Compounds (TVO)

Batch: 141241

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.

Analytical Data Package Information Summary

Work Order(s): **17032932**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17032932-001	1033	W	65490	141272	03/29/2017	03/31/2017 09:26	03/31/2017 16:05
	65490-1-BKS	BKS	65490-1-BKS	1033	W	65490	141272	--------	03/31/2017 09:26	03/31/2017 18:44
	65490-1-BLK	BLK	65490-1-BLK	1033	W	65490	141272	--------	03/31/2017 09:26	03/31/2017 18:38
	Greenbelt Day #2 - Composite S	MS	17032918-001 S	1033	W	65490	141272	03/28/2017	03/31/2017 09:26	03/31/2017 18:58
	Greenbelt Day #2 - Composite SD	MSD	17032918-001 SD	1033	W	65490	141272	03/28/2017	03/31/2017 09:26	03/31/2017 19:04
	Effluent VSP-4	Reanalysis	17032932-001	1033	W	65490	141315	03/29/2017	03/31/2017 09:26	04/03/2017 14:49
EPA 200.8	Effluent VSP-4	Initial	17032932-001	1033	W	65491	141268	03/29/2017	03/31/2017 09:42	03/31/2017 15:58
	65491-1-BKS	BKS	65491-1-BKS	1033	W	65491	141268	--------	03/31/2017 09:42	03/31/2017 17:25
	65491-1-BLK	BLK	65491-1-BLK	1033	W	65491	141268	--------	03/31/2017 09:42	03/31/2017 17:18
	Effluent VSP-4 S	MS	17032932-001 S	1033	W	65491	141268	03/29/2017	03/31/2017 09:42	03/31/2017 17:31
	Effluent VSP-4 SD	MSD	17032932-001 SD	1033	W	65491	141268	03/29/2017	03/31/2017 09:42	03/31/2017 17:38
EPA 624	Effluent VSP-4	Initial	17032932-001	1011	W	65492	141241	03/29/2017	03/30/2017 09:57	03/30/2017 14:13
	65492-1-BKS	BKS	65492-1-BKS	1011	W	65492	141241	--------	03/30/2017 09:57	03/30/2017 12:53
	65492-1-BLK	BLK	65492-1-BLK	1011	W	65492	141241	--------	03/30/2017 09:57	03/30/2017 13:33
	Effluent VSP-4 S	MS	17032932-001 S	1011	W	65492	141241	03/29/2017	03/30/2017 09:57	03/30/2017 15:33
	Effluent VSP-4 SD	MSD	17032932-001 SD	1011	W	65492	141241	03/29/2017	03/30/2017 09:57	03/30/2017 16:13

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032932

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 141241 Matrix: Waste Water Date Prep: 03/30/2017
PSS Sample ID: 17032932-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	107		87-114	%	03/30/17 14:13
4-Bromofluorobenzene	143	*	90-114	%	03/30/17 14:13
Toluene-D8	100		93-108	%	03/30/17 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

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032932

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 200.8 | Prep Method: E200.8_PREP

Seq Number: 141272 | Matrix: Water | Date Prep: 03/31/17

MB Sample Id: 65490-1-BLK | LCS Sample Id: 65490-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	412.3	103	85-115	ug/L	03/31/17 18:44	
Copper	<1.000	40.00	42.47	106	85-115	ug/L	03/31/17 18:44	
Lead	<1.000	40.00	40.21	101	85-115	ug/L	03/31/17 18:44	
Magnesium	<100	400	400.8	100	85-115	ug/L	03/31/17 18:44	
Nickel	<1.000	40.00	41.64	104	85-115	ug/L	03/31/17 18:44	
Zinc	<20.00	200	211.5	106	85-115	ug/L	03/31/17 18:44	

Analytical Method: EPA 200.8 | Prep Method: E200.8_PREP

Seq Number: 141268 | Matrix: Water | Date Prep: 03/31/17

MB Sample Id: 65491-1-BLK | LCS Sample Id: 65491-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	41.72	104	85-115	ug/L	03/31/17 17:25	
Lead	<1.000	40.00	38.25	96	85-115	ug/L	03/31/17 17:25	
Nickel	<1.000	40.00	41.29	103	85-115	ug/L	03/31/17 17:25	
Zinc	<20.00	200	209.4	105	85-115	ug/L	03/31/17 17:25	

Analytical Method: EPA 200.8 | Prep Method: E200.8_PREP

Seq Number: 141268 | Matrix: Waste Water | Date Prep: 03/31/17

Parent Sample Id: 17032932-001 | MS Sample Id: 17032932-001 S | MSD Sample Id: 17032932-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	<1.000	40.00	46.45	116	40.33	101	70-130	14	25	ug/L	03/31/17 17:31	
Lead	<1.000	40.00	44.29	111	40.38	101	70-130	9	25	ug/L	03/31/17 17:31	
Nickel	2.500	40.00	48.14	114	41.93	99	70-130	14	25	ug/L	03/31/17 17:31	
Zinc	<20.00	200	247.9	124	215.5	108	70-130	14	25	ug/L	03/31/17 17:31	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032932

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 141241 Matrix: Water Date Prep: 03/30/17

MB Sample Id: 65492-1-BLK LCS Sample Id: 65492-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	60.80	101	51-139	ug/L	03/30/17 12:53	
Chloromethane	<5.000	60.00	52.24	87	56-144	ug/L	03/30/17 12:53	
Vinyl Chloride	<5.000	60.00	49.11	82	46-157	ug/L	03/30/17 12:53	
Bromomethane	<5.000	60.00	52.12	87	63-134	ug/L	03/30/17 12:53	
Chloroethane	<5.000	60.00	48.80	81	56-143	ug/L	03/30/17 12:53	
Trichlorofluoromethane	<5.000	60.00	54.40	91	56-138	ug/L	03/30/17 12:53	
1,1-Dichloroethene	<5.000	60.00	58.27	97	63-134	ug/L	03/30/17 12:53	
Methylene Chloride	<5.000	60.00	59.03	98	65-126	ug/L	03/30/17 12:53	
trans-1,2-dichloroethene	<5.000	60.00	58.95	98	67-129	ug/L	03/30/17 12:53	
1,1-Dichloroethane	<5.000	60.00	58.63	98	66-131	ug/L	03/30/17 12:53	
Chloroform	<5.000	60.00	55.76	93	69-130	ug/L	03/30/17 12:53	
1,1,1-Trichloroethane	<5.000	60.00	59.82	100	66-129	ug/L	03/30/17 12:53	
Carbon Tetrachloride	<5.000	60.00	61.16	102	70-133	ug/L	03/30/17 12:53	
Benzene	<5.000	60.00	59.39	99	69-127	ug/L	03/30/17 12:53	
1,2-Dichloroethane	<5.000	60.00	56.92	95	62-133	ug/L	03/30/17 12:53	
Trichloroethene	<5.000	60.00	61.03	102	71-127	ug/L	03/30/17 12:53	
1,2-Dichloropropane	<5.000	60.00	58.46	97	67-133	ug/L	03/30/17 12:53	
Bromodichloromethane	<5.000	60.00	59.94	100	63-132	ug/L	03/30/17 12:53	
2-Chloroethyl Vinyl Ether	<5.000	60.00	81.38	136	21-140	ug/L	03/30/17 12:53	
cis-1,3-Dichloropropene	<5.000	60.00	57.10	95	65-128	ug/L	03/30/17 12:53	
Toluene	<5.000	60.00	61.47	102	67-130	ug/L	03/30/17 12:53	
trans-1,3-dichloropropene	<5.000	60.00	59.31	99	63-127	ug/L	03/30/17 12:53	
1,1,2-Trichloroethane	<5.000	60.00	64.73	108	62-136	ug/L	03/30/17 12:53	
Tetrachloroethylene	<5.000	60.00	63.28	105	64-135	ug/L	03/30/17 12:53	
Dibromochloromethane	<5.000	60.00	61.83	103	65-126	ug/L	03/30/17 12:53	
Chlorobenzene	<5.000	60.00	62.97	105	70-127	ug/L	03/30/17 12:53	
Ethylbenzene	<5.000	60.00	61.27	102	71-131	ug/L	03/30/17 12:53	
Bromoform	<5.000	60.00	64.51	108	58-128	ug/L	03/30/17 12:53	
1,1,2,2-Tetrachloroethane	<5.000	60.00	67.52	113	63-134	ug/L	03/30/17 12:53	
1,3-Dichlorobenzene	<5.000	60.00	60.00	100	67-128	ug/L	03/30/17 12:53	
1,4-Dichlorobenzene	<5.000	60.00	60.71	101	67-127	ug/L	03/30/17 12:53	
1,2-Dichlorobenzene	<5.000	60.00	60.79	101	67-126	ug/L	03/30/17 12:53	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	106		101		87-114	%	03/30/17 12:53
4-Bromofluorobenzene	142	*	89	*	90-114	%	03/30/17 12:53
Toluene-D8	97		103		93-108	%	03/30/17 12:53

PHASE SEPARATION SCIENCE, INC.

QC Summary 17032932

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 141241 Matrix: Waste Water Date Prep: 03/30/17

Parent Sample Id: 17032932-001 MS Sample Id: 17032932-001 S MSD Sample Id: 17032932-001 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	55.21	92	65.85	110	38-157	18	25	ug/L	03/30/17 15:33	
Chloromethane	<5.000	60.00	46.96	78	54.20	90	43-155	14	25	ug/L	03/30/17 15:33	
Vinyl Chloride	<5.000	60.00	54.48	91	62.27	104	48-154	13	25	ug/L	03/30/17 15:33	
Bromomethane	<5.000	60.00	47.65	79	57.10	95	52-143	18	25	ug/L	03/30/17 15:33	
Chloroethane	<5.000	60.00	47.13	79	55.89	93	47-150	17	25	ug/L	03/30/17 15:33	
Trichlorofluoromethane	<5.000	60.00	49.54	83	54.21	90	59-142	9	25	ug/L	03/30/17 15:33	
1,1-Dichloroethene	<5.000	60.00	51.50	86	62.71	105	55-138	20	25	ug/L	03/30/17 15:33	
Methylene Chloride	<5.000	60.00	54.58	91	66.04	110	60-133	19	25	ug/L	03/30/17 15:33	
trans-1,2-dichloroethene	<5.000	60.00	54.98	92	66.84	111	62-133	19	25	ug/L	03/30/17 15:33	
1,1-Dichloroethane	<5.000	60.00	55.86	93	66.29	110	62-134	17	25	ug/L	03/30/17 15:33	
Chloroform	<5.000	60.00	53.58	89	62.74	105	53-142	16	25	ug/L	03/30/17 15:33	
1,1,1-Trichloroethane	<5.000	60.00	56.83	95	67.32	112	63-135	17	25	ug/L	03/30/17 15:33	
Carbon Tetrachloride	<5.000	60.00	58.74	98	67.82	113	62-134	14	25	ug/L	03/30/17 15:33	
Benzene	<5.000	60.00	56.24	94	66.39	111	56-138	17	25	ug/L	03/30/17 15:33	
1,2-Dichloroethane	<5.000	60.00	53.66	89	63.56	106	61-132	17	25	ug/L	03/30/17 15:33	
Trichloroethene	<5.000	60.00	57.43	96	66.65	111	57-142	15	25	ug/L	03/30/17 15:33	
1,2-Dichloropropane	<5.000	60.00	56.18	94	66.90	112	56-141	17	25	ug/L	03/30/17 15:33	
Bromodichloromethane	<5.000	60.00	56.69	94	67.21	112	52-141	17	25	ug/L	03/30/17 15:33	
2-Chloroethyl Vinyl Ether	<5.000	60.00	<5.000	0	<5.000	0	21-140	NC	25	ug/L	03/30/17 15:33	X
cis-1,3-Dichloropropene	<5.000	60.00	52.24	87	63.34	106	29-156	19	25	ug/L	03/30/17 15:33	
Toluene	<5.000	60.00	57.81	96	67.70	113	55-141	16	25	ug/L	03/30/17 15:33	
trans-1,3-dichloropropene	<5.000	60.00	54.36	91	64.46	107	27-156	17	25	ug/L	03/30/17 15:33	
1,1,2-Trichloroethane	<5.000	60.00	59.96	100	70.56	118	50-151	16	25	ug/L	03/30/17 15:33	
Tetrachloroethylene	<5.000	60.00	59.40	99	68.36	114	43-148	14	25	ug/L	03/30/17 15:33	
Dibromochloromethane	<5.000	60.00	58.80	98	71.49	119	45-146	19	25	ug/L	03/30/17 15:33	
Chlorobenzene	<5.000	60.00	60.97	102	72.16	120	57-140	17	25	ug/L	03/30/17 15:33	
Ethylbenzene	<5.000	60.00	60.52	101	70.85	118	58-146	16	25	ug/L	03/30/17 15:33	
Bromoform	<5.000	60.00	60.30	101	72.71	121	42-145	19	25	ug/L	03/30/17 15:33	
1,1,2,2-Tetrachloroethane	<5.000	60.00	67.60	113	78.81	131	48-156	15	25	ug/L	03/30/17 15:33	
1,3-Dichlorobenzene	<5.000	60.00	58.16	97	69.34	116	54-141	18	25	ug/L	03/30/17 15:33	
1,4-Dichlorobenzene	<5.000	60.00	58.17	97	69.20	115	54-140	17	25	ug/L	03/30/17 15:33	
1,2-Dichlorobenzene	<5.000	60.00	57.93	97	69.82	116	53-141	19	25	ug/L	03/30/17 15:33	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Dibromofluoromethane	102		100		87-114	%	03/30/17 15:33
4-Bromofluorobenzene	92		89	*	90-114	%	03/30/17 15:33
Toluene-D8	99		99		93-108	%	03/30/17 15:33

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.

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

(1) *CLIENT: WSP *OFFICE LOC. Herndon VA
PSS Work Order #: 1703932 PAGE 1 OF 1
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6520
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.:
SITE LOCATION: Hanover MD P.O. NO.:
SAMPLER(S): Maria Kapka 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)	Preservatives Used	Analysis/ Method Required (3) * VOCs (624)	Total Zn, Ni, Pb	Dissolved Zn, Ni, Pb, Cu, Hardness	REMARKS
	Effluent USP-4	3/29/17	1038	WW	5	G	HCl	X	X	X	
							Hydro				
							/				

(5)

Relinquished By: (1)	Date	Time	Received By:
	3/29/17	1520	
Relinquished By: (2)	Date	Time	Received By:
	3/30/17	420	Barb Weber
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 1°C)
Custody Seal: Cooler intact
Ice Present: Pres Temp: 3-5°C
Shipping Carrier: FTE

Special Instructions:
lab filter-dissolve metals

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17032932	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/29/2017 04:20:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/03/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	5
Seal(s) Signed / Dated?	Yes	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 5

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: Thomas Wingate Date: 03/29/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 03/30/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17033019

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

April 6, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

April 6, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17033019**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17033019**.

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 May 4, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17033019

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/30/2017 at 03:15 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17033019-001	Effluent VSP-4	WASTE WATER	03/30/17 11:04

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

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: 17033019

WSP Environment & Energy - Herndon, Herndon, VA

April 6, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 03/30/2017 11:04** **PSS Sample ID: 17033019-001**
Matrix: WASTE WATER **Date/Time Received: 03/30/2017 15:15**

Inorganic Anions — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrite (as N)	ND	mg/L	0.10		1	03/30/17	03/30/17 16:17	1053
Nitrate (as N)	**0.68**	mg/L	0.10		1	03/30/17	03/30/17 16:17	1053

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	ND	mg/L	0.4		04/04/17	04/04/17 14:51	4005

Nitrogen, Organic — Analytical Method: N_ORG Calc. TKN-NH3

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Organic (as N)	ND	mg/L			03/30/17	03/30/17 16:17	4005

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	04/04/17	04/04/17 13:17	1053

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17033019
Project ID: 31400390-9

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.

17033019: 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.

EPA 351.2

Analytical Data Package Information Summary

Work Order(s): 17033019
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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 300.0	Effluent VSP-4	Initial	17033019-001	1053	W	65477	141250	03/30/2017	03/30/2017 16:12	03/30/2017 16:17
	65477-1-BKS	BKS	65477-1-BKS	1053	W	65477	141250	--------	03/30/2017 11:09	03/30/2017 12:19
	65477-1-BLK	BLK	65477-1-BLK	1053	W	65477	141250	--------	03/30/2017 11:09	03/30/2017 11:56
	65477-1-BSD	BSD	65477-1-BSD	1053	W	65477	141250	--------	03/30/2017 11:09	03/30/2017 12:41
	WW-1 S	MS	17033002-001 S	1053	W	65477	141250	03/29/2017	03/30/2017 11:09	03/30/2017 13:48
EPA 351.2	Effluent VSP-4	Initial	17033019-001	4005	W	141445	141445	03/30/2017	04/04/2017 14:51	04/04/2017 14:51
N_ORG Calc. TKN-NH3	Effluent VSP-4	Initial	17033019-001	4005	W	141445	141445	03/30/2017	03/30/2017 16:17	03/30/2017 16:17
SM 4500-NH3-F - 2011	Effluent VSP-4	Initial	17033019-001	1053	W	65534	141342	03/30/2017	04/04/2017 10:23	04/04/2017 13:17
	65534-1-BKS	BKS	65534-1-BKS	1053	W	65534	141342	--------	04/04/2017 10:23	04/04/2017 12:57
	65534-1-BLK	BLK	65534-1-BLK	1053	W	65534	141342	--------	04/04/2017 10:23	04/04/2017 12:53
	65534-1-BSD	BSD	65534-1-BSD	1053	W	65534	141342	--------	04/04/2017 10:23	04/04/2017 13:01
	WW-1 S	MS	17033002-001 S	1053	W	65534	141342	03/29/2017	04/04/2017 10:23	04/04/2017 13:09
	WW-1 SD	MSD	17033002-001 SD	1053	W	65534	141342	03/29/2017	04/04/2017 10:23	04/04/2017 13:13

PHASE SEPARATION SCIENCE, INC.

QC Summary 17033019

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B

Seq Number: 141342 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65534-1-BLK LCS Sample Id: 65534-1-BKS LCSD Sample Id: 65534-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.424	97	2.444	98	85-115	1	20	mg/L	04/04/17 12:57	

Analytical Method: EPA 300.0 Prep Method: E300.0P

Seq Number: 141250 Matrix: Water Date Prep: 03/30/17

MB Sample Id: 65477-1-BLK LCS Sample Id: 65477-1-BKS LCSD Sample Id: 65477-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrite (as N)	<0.1000	5.000	4.883	98	4.915	98	90-110	1	20	mg/L	03/30/17 12:19	
Nitrate (as N)	<0.1000	5.000	4.623	92	4.711	94	90-110	2	20	mg/L	03/30/17 12:19	

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.

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: Kapflux PROJECT NO.: 31400310-4

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

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

PSS Work Order #: 1703301 9 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) * Nitrogen, Ammonia SM 4500	Nitrogen, TKN	Inorganic Anions EPA 300	REMARKS
							H2SO4				
1	Effluent WSP-4	3/30/17	1104	WW	3	G	X	X	X		All vials Between 2-12°C TW

All other containers 4°C TW

3/30/17

(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
[ ] [ ] [ ] _____

# of Coolers: 1 Temp Blank 4°C

Custody Seal: Cooler-Intact

Ice Present: PRES Temp: 5°-6°C

Shipping Carrier: TTE

Special Instructions:

DW COMPLIANCE? YES [ ]

EDD FORMAT TYPE: _____

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

(5)

Relinquished By:	Date	Time	Received By:
(1)	3/30/17	1441	
(2)	3/30	3:15	
(3)			
(4)			

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17033019	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	03/30/2017 03:15:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	05/04/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 3

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)	Yes
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
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: 03/30/2017

Thomas Wingate

PM Review and Approval: Amber J Confer Date: 03/31/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17040321

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

April 5, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

April 5, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17040321**
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 **17040321**.

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 May 8, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040321

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/03/2017 at 03:55 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17040321-001	Effluent VSP-4	WASTE WATER	04/03/17 08:45
17040321-002	Lead Ambersorb Ef	WASTE WATER	04/03/17 08:50
17040321-003	Influent VSP-1	WASTE WATER	04/03/17 09:00
17040321-004	TB-040317	WATER	04/03/17 15:55

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: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/03/2017 08:45** **PSS Sample ID: 17040321-001**

Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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)	ND	ug/L	1.0		1	04/04/17	04/04/17 16:40	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: TB-040317 **Date/Time Sampled: 04/03/2017 15:55** **PSS Sample ID: 17040321-004**
Matrix: WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:26	1011
Benzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Bromoform	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Bromomethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Carbon Disulfide	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloroform	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Chloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Cyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Ethylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040321

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

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

Sample ID: TB-040317 **Date/Time Sampled: 04/03/2017 15:55** **PSS Sample ID: 17040321-004**
Matrix: WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 11:26	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Methyl Acetate	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Methylcyclohexane	ND	ug/L	10		1	04/04/17	04/04/17 11:26	1011
Methylene Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Naphthalene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Styrene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Toluene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Trichloroethene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 11:26	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/04/17	04/04/17 11:26	1011
o-Xylene	ND	ug/L	1.0		1	04/04/17	04/04/17 11:26	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040321

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:

No sampling date or time on COC for sample 'Influent VSP-1'. Information obtained from container labels.

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): **17040321**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	Lead Ambersorb Ef	Initial	17040321-002	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 11:49
	Influent VSP-1	Initial	17040321-003	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:13
	TB-040317	Initial	17040321-004	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 11:26
	65547-1-BKS	BKS	65547-1-BKS	1011	W	65547	141361	--------	04/04/2017 09:08	04/04/2017 10:11
	65547-1-BLK	BLK	65547-1-BLK	1011	W	65547	141361	--------	04/04/2017 09:08	04/04/2017 10:58
	Lead Ambersorb Ef S	MS	17040321-002 S	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:58
	Lead Ambersorb Ef SD	MSD	17040321-002 SD	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 13:20
	Influent VSP-1	Reanalysis	17040321-003	1011	W	65547	141361	04/03/2017	04/04/2017 09:08	04/04/2017 12:37
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17040321-001	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 16:40
	Lead Ambersorb Ef	Initial	17040321-002	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 17:02
	65548-1-BKS	BKS	65548-1-BKS	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 15:09
	65548-1-BLK	BLK	65548-1-BLK	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 16:18
	65548-1-BSD	BSD	65548-1-BSD	1011	W	65548	141362	--------	04/04/2017 14:25	04/04/2017 15:31
	Influent VSP-1	Reanalysis	17040321-003	1011	W	65548	141362	04/03/2017	04/04/2017 14:25	04/04/2017 17:48

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	94		80-120	%	04/04/17 16:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	97		86-111	%	04/04/17 11:49
Dibromofluoromethane	105		91-119	%	04/04/17 11:49
Toluene-D8	101		90-117	%	04/04/17 11:49

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	04/04/17 17:02

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	04/04/17 12:13
Dibromofluoromethane	102		91-119	%	04/04/17 12:13
Toluene-D8	100		90-117	%	04/04/17 12:13

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141362 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	96		80-120	%	04/04/17 17:26

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141361 Matrix: Water Date Prep: 04/04/2017
PSS Sample ID: 17040321-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	04/04/17 11:26
Dibromofluoromethane	102		91-119	%	04/04/17 11:26
Toluene-D8	102		90-117	%	04/04/17 11:26

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 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65547-1-BLK LCS Sample Id: 65547-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	39.83	80	29-149	ug/L	04/04/17 10:11	
Benzene	<1.000	50.00	50.66	101	85-123	ug/L	04/04/17 10:11	
Bromochloromethane	<1.000	50.00	52.27	105	82-136	ug/L	04/04/17 10:11	
Bromodichloromethane	<1.000	50.00	56.62	113	88-133	ug/L	04/04/17 10:11	
Bromoform	<5.000	50.00	52.81	106	80-126	ug/L	04/04/17 10:11	
Bromomethane	<1.000	50.00	55.03	110	64-139	ug/L	04/04/17 10:11	
2-Butanone (MEK)	<10.00	50.00	44.06	88	39-135	ug/L	04/04/17 10:11	
Carbon Disulfide	<10.00	50.00	51.56	103	85-124	ug/L	04/04/17 10:11	
Carbon Tetrachloride	<1.000	50.00	51.25	103	81-138	ug/L	04/04/17 10:11	
Chlorobenzene	<1.000	50.00	52.55	105	85-120	ug/L	04/04/17 10:11	
Chloroethane	<1.000	50.00	47.32	95	75-129	ug/L	04/04/17 10:11	
Chloroform	<1.000	50.00	52.28	105	85-128	ug/L	04/04/17 10:11	
Chloromethane	<1.000	50.00	53.09	106	60-139	ug/L	04/04/17 10:11	
Cyclohexane	<10.00	50.00	52.70	105	55-131	ug/L	04/04/17 10:11	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.79	92	69-127	ug/L	04/04/17 10:11	
Dibromochloromethane	<1.000	50.00	48.25	97	82-127	ug/L	04/04/17 10:11	
1,2-Dibromoethane (EDB)	<1.000	50.00	46.58	93	82-121	ug/L	04/04/17 10:11	
1,2-Dichlorobenzene	<1.000	50.00	53.24	106	82-123	ug/L	04/04/17 10:11	
1,3-Dichlorobenzene	<1.000	50.00	52.84	106	81-123	ug/L	04/04/17 10:11	
1,4-Dichlorobenzene	<1.000	50.00	51.60	103	81-121	ug/L	04/04/17 10:11	
Dichlorodifluoromethane	<1.000	50.00	56.72	113	69-147	ug/L	04/04/17 10:11	
1,1-Dichloroethane	<1.000	50.00	54.10	108	83-123	ug/L	04/04/17 10:11	
1,2-Dichloroethane	<1.000	50.00	55.84	112	86-138	ug/L	04/04/17 10:11	
1,1-Dichloroethene	<1.000	50.00	50.22	100	85-127	ug/L	04/04/17 10:11	
cis-1,2-Dichloroethene	<1.000	50.00	52.45	105	87-127	ug/L	04/04/17 10:11	
1,2-Dichloropropane	<1.000	50.00	47.42	95	79-125	ug/L	04/04/17 10:11	
cis-1,3-Dichloropropene	<1.000	50.00	49.20	98	79-131	ug/L	04/04/17 10:11	
trans-1,3-Dichloropropene	<1.000	50.00	49.66	99	82-133	ug/L	04/04/17 10:11	
trans-1,2-Dichloroethene	<1.000	50.00	52.19	104	85-125	ug/L	04/04/17 10:11	
Ethylbenzene	<1.000	50.00	53.51	107	83-123	ug/L	04/04/17 10:11	
2-Hexanone	<5.000	50.00	44.96	90	37-137	ug/L	04/04/17 10:11	
Isopropylbenzene	<1.000	50.00	52.37	105	70-131	ug/L	04/04/17 10:11	
Methyl Acetate	<10.00	50.00	58.66	117	69-127	ug/L	04/04/17 10:11	
Methylcyclohexane	<10.00	50.00	56.04	112	75-129	ug/L	04/04/17 10:11	
Methylene Chloride	<1.000	50.00	52.05	104	86-124	ug/L	04/04/17 10:11	
4-Methyl-2-Pentanone	<5.000	50.00	44.60	89	39-143	ug/L	04/04/17 10:11	
Methyl-t-butyl ether	<1.000	50.00	51.64	103	75-134	ug/L	04/04/17 10:11	
Naphthalene	<1.000	50.00	44.90	90	61-118	ug/L	04/04/17 10:11	
Styrene	<1.000	50.00	47.14	94	80-120	ug/L	04/04/17 10:11	
1,1,2,2-Tetrachloroethane	<1.000	50.00	44.54	89	64-125	ug/L	04/04/17 10:11	
Tetrachloroethene	<1.000	50.00	55.55	111	83-138	ug/L	04/04/17 10:11	
Toluene	<1.000	50.00	54.55	109	88-126	ug/L	04/04/17 10:11	
1,2,3-Trichlorobenzene	<1.000	50.00	48.39	97	75-124	ug/L	04/04/17 10:11	
1,2,4-Trichlorobenzene	<1.000	50.00	48.71	97	77-131	ug/L	04/04/17 10:11	
1,1,1-Trichloroethane	<1.000	50.00	54.89	110	68-146	ug/L	04/04/17 10:11	
1,1,2-Trichloroethane	<1.000	50.00	49.08	98	85-124	ug/L	04/04/17 10:11	
Trichloroethene	<1.000	50.00	47.96	96	87-127	ug/L	04/04/17 10:11	
Trichlorofluoromethane	<5.000	50.00	49.30	99	77-147	ug/L	04/04/17 10:11	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	52.07	104	68-135	ug/L	04/04/17 10:11	
Vinyl Chloride	<1.000	50.00	66.22	132	74-138	ug/L	04/04/17 10:11	
m,p-Xylenes	<2.000	100	107.2	107	84-124	ug/L	04/04/17 10:11	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65547-1-BLK LCS Sample Id: 65547-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	53.37	107	79-126	ug/L	04/04/17 10:11	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		97		86-111	%	04/04/17 10:11
Dibromofluoromethane	101		103		91-119	%	04/04/17 10:11
Toluene-D8	99		104		90-117	%	04/04/17 10:11

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040321-002 MS Sample Id: 17040321-002 S MSD Sample Id: 17040321-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	38.15	76	38.48	77	46-138	1	25	ug/L	04/04/17 12:58	
Benzene	<1.000	50.00	45.55	91	45.41	91	77-126	0	25	ug/L	04/04/17 12:58	
Bromochloromethane	<1.000	50.00	46.91	94	46.26	93	74-133	1	25	ug/L	04/04/17 12:58	
Bromodichloromethane	<1.000	50.00	50.52	101	49.73	99	79-130	2	25	ug/L	04/04/17 12:58	
Bromoform	<5.000	50.00	45.36	91	47.48	95	69-120	5	25	ug/L	04/04/17 12:58	
Bromomethane	<1.000	50.00	49.58	99	50.70	101	64-130	2	25	ug/L	04/04/17 12:58	
2-Butanone (MEK)	<10.00	50.00	43.37	87	44.27	89	34-126	2	25	ug/L	04/04/17 12:58	
Carbon Disulfide	<10.00	50.00	45.82	92	45.61	91	76-126	0	25	ug/L	04/04/17 12:58	
Carbon Tetrachloride	<1.000	50.00	46.72	93	46.70	93	77-137	0	25	ug/L	04/04/17 12:58	
Chlorobenzene	<1.000	50.00	47.18	94	46.48	93	74-120	1	25	ug/L	04/04/17 12:58	
Chloroethane	<1.000	50.00	43.06	86	43.52	87	68-133	1	25	ug/L	04/04/17 12:58	
Chloroform	<1.000	50.00	47.48	95	46.91	94	77-127	1	25	ug/L	04/04/17 12:58	
Chloromethane	<1.000	50.00	48.57	97	48.77	98	50-143	0	25	ug/L	04/04/17 12:58	
Cyclohexane	<10.00	50.00	46.38	93	45.56	91	53-139	2	25	ug/L	04/04/17 12:58	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	38.42	77	40.31	81	56-123	5	25	ug/L	04/04/17 12:58	
Dibromochloromethane	<1.000	50.00	42.44	85	42.64	85	70-125	0	25	ug/L	04/04/17 12:58	
1,2-Dibromoethane (EDB)	<1.000	50.00	41.08	82	41.54	83	69-121	1	25	ug/L	04/04/17 12:58	
1,2-Dichlorobenzene	<1.000	50.00	47.19	94	46.37	93	69-118	2	25	ug/L	04/04/17 12:58	
1,3-Dichlorobenzene	<1.000	50.00	46.21	92	46.36	93	68-119	0	25	ug/L	04/04/17 12:58	
1,4-Dichlorobenzene	<1.000	50.00	44.52	89	44.04	88	67-117	1	25	ug/L	04/04/17 12:58	
Dichlorodifluoromethane	<1.000	50.00	49.66	99	49.23	98	68-139	1	25	ug/L	04/04/17 12:58	
1,1-Dichloroethane	<1.000	50.00	50.55	101	47.79	96	78-126	6	25	ug/L	04/04/17 12:58	
1,2-Dichloroethane	<1.000	50.00	50.10	100	50.52	101	78-134	1	25	ug/L	04/04/17 12:58	
1,1-Dichloroethene	<1.000	50.00	44.78	90	44.71	89	78-125	0	25	ug/L	04/04/17 12:58	
cis-1,2-Dichloroethene	<1.000	50.00	47.71	95	45.35	91	78-128	5	25	ug/L	04/04/17 12:58	
1,2-Dichloropropane	<1.000	50.00	42.25	85	42.10	84	73-126	0	25	ug/L	04/04/17 12:58	
cis-1,3-Dichloropropene	<1.000	50.00	42.88	86	42.28	85	67-126	1	25	ug/L	04/04/17 12:58	
trans-1,3-Dichloropropene	<1.000	50.00	43.22	86	42.84	86	68-129	1	25	ug/L	04/04/17 12:58	
trans-1,2-Dichloroethene	<1.000	50.00	45.13	90	44.26	89	76-128	2	25	ug/L	04/04/17 12:58	
Ethylbenzene	<1.000	50.00	47.75	96	46.94	94	74-123	2	25	ug/L	04/04/17 12:58	
2-Hexanone	<5.000	50.00	46.60	93	47.30	95	38-125	1	25	ug/L	04/04/17 12:58	
Isopropylbenzene	<1.000	50.00	46.49	93	45.89	92	58-129	1	25	ug/L	04/04/17 12:58	
Methyl Acetate	<10.00	50.00	48.12	96	49.77	100	63-115	3	25	ug/L	04/04/17 12:58	
Methylcyclohexane	<10.00	50.00	49.24	98	48.55	97	69-130	1	25	ug/L	04/04/17 12:58	
Methylene Chloride	<1.000	50.00	48.32	97	47.23	94	76-124	2	25	ug/L	04/04/17 12:58	
4-Methyl-2-Pentanone	<5.000	50.00	46.22	92	46.65	93	35-123	1	25	ug/L	04/04/17 12:58	
Methyl-t-butyl ether	<1.000	50.00	43.03	86	43.63	87	64-129	1	25	ug/L	04/04/17 12:58	
Naphthalene	<1.000	50.00	38.34	77	39.48	79	45-109	3	25	ug/L	04/04/17 12:58	
Styrene	<1.000	50.00	42.15	84	41.80	84	61-124	1	25	ug/L	04/04/17 12:58	
1,1,2,2-Tetrachloroethane	<1.000	50.00	38.52	77	39.85	80	47-130	3	25	ug/L	04/04/17 12:58	
Tetrachloroethene	<1.000	50.00	48.42	97	49.82	100	68-139	3	25	ug/L	04/04/17 12:58	
Toluene	<1.000	50.00	48.39	97	49.04	98	79-128	1	25	ug/L	04/04/17 12:58	
1,2,3-Trichlorobenzene	<1.000	50.00	40.91	82	41.91	84	48-122	2	25	ug/L	04/04/17 12:58	
1,2,4-Trichlorobenzene	<1.000	50.00	41.38	83	40.49	81	54-124	2	25	ug/L	04/04/17 12:58	
1,1,1-Trichloroethane	<1.000	50.00	49.98	100	49.85	100	73-140	0	25	ug/L	04/04/17 12:58	
1,1,2-Trichloroethane	<1.000	50.00	42.37	85	43.70	87	78-124	3	25	ug/L	04/04/17 12:58	
Trichloroethene	<1.000	50.00	42.82	86	43.68	87	77-131	2	25	ug/L	04/04/17 12:58	
Trichlorofluoromethane	<5.000	50.00	45.17	90	44.39	89	73-144	2	25	ug/L	04/04/17 12:58	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	45.12	90	45.66	91	65-140	1	25	ug/L	04/04/17 12:58	
Vinyl Chloride	<1.000	50.00	59.56	119	60.02	120	60-146	1	25	ug/L	04/04/17 12:58	
m,p-Xylenes	<2.000	100	95.57	96	94.80	95	75-125	1	25	ug/L	04/04/17 12:58	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040321

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141361 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040321-002 MS Sample Id: 17040321-002 S MSD Sample Id: 17040321-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	48.99	98	47.98	96	69-126	2	25	ug/L	04/04/17 12:58	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		97		86-111	%	04/04/17 12:58
Dibromofluoromethane	105		106		91-119	%	04/04/17 12:58
Toluene-D8	102		104		90-117	%	04/04/17 12:58

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

Seq Number: 141362 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65548-1-BLK LCS Sample Id: 65548-1-BKS LCSD Sample Id: 65548-1-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	30.78	103	32.00	107	50-150	4	20	ug/L	04/04/17 15:09	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	95		94		96		80-120	%	04/04/17 15:09

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.

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

(1) *CLIENT: USP *OFFICE LOC. Hanover VA

*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500

EMAIL: erjohnson@uspgroup.com FAX NO.: ( )

*PROJECT NAME: Kapflex PROJECT NO.:

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

SAMPLER(S): Dan Graff + Marian Kapfer DW CERT NO.:

PSS Work Order #: 17040321 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) * L4Diorex (8270 SIM)	UCCS (8260)	REMARKS
1	Effluent USP-4	4/3/17	0845	WW	3	G		X		
2	Leach Ambersorb Eff	4/3/17	0850	WW	6	G		X	X	
3	Influent USP-1			WW	6	G		X	X	
4	TB-040317	—	—	DW	2	—			X	

04/03/17

(5)

Relinquished By: (1)	Date	Time	Received By:
Dan Graff	4/3/17	1520	Dan Carter
Relinquished By: (2)	Date	Time	Received By:
Dan Carter	04/03/17	1555	Brad Weber
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 6°C)

Custody Seal: Abs

Ice Present: Pres Temp: 3-6 °C

Shipping Carrier: TTG

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17040321	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/03/2017 03:55:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/08/2017	**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)	6
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Pam Groff/Maria Kaj
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 4 Total No. of Containers Received 17

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.

No sampling date or time on COC for sample 'Influent VSP-1'. Information obtained from container labels.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/03/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 04/04/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17040322

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

April 11, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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PHASE SEPARATION SCIENCE, INC.

April 11, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17040322**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17040322**.

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 May 8, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040322

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/03/2017 at 03:55 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17040322-001	Effluent VSP-4	WASTE WATER	04/03/17 08:45

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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ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040322

WSP Environment & Energy - Herndon, Herndon, VA

April 11, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/03/2017 08:45** **PSS Sample ID: 17040322-001**
Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**1.4**	ug/L	1.0		1	04/07/17	04/07/17 17:58	1033
Lead	ND	ug/L	1.0		1	04/07/17	04/07/17 17:58	1033
Nickel	**8.0**	ug/L	1.0		1	04/07/17	04/07/17 17:58	1033
Zinc	ND	ug/L	20		1	04/07/17	04/07/17 17:58	1033

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**2,840**	ug/L	100		1	04/04/17	04/04/17 22:22	1033
Copper	**3.2**	ug/L	1.0		1	04/04/17	04/04/17 22:22	1033
Lead	ND	ug/L	1.0		1	04/04/17	04/04/17 22:22	1033
Magnesium	**1,220**	ug/L	500		5	04/04/17	04/05/17 14:56	1033
Nickel	**7.7**	ug/L	1.0		1	04/04/17	04/04/17 22:22	1033
Zinc	**24.7**	ug/L	20.0		1	04/04/17	04/04/17 22:22	1033
Hardness (Ca & Mg)	**12**	mg/L	2.3		1	04/04/17	04/04/17 22:22	1033

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	1.0		1	04/05/17	04/05/17 16:43	1051

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

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	2.0		04/05/17	04/10/17 12:20	4006

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040322
Project ID: 31400390-9

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:

Refer to work order 17040323 for VOC analysis.
Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

17040322: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

Analytical Data Package Information Summary

Work Order(s): **17040322**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17040322-001	1033	W	65527	141379	04/03/2017	04/04/2017 09:20	04/04/2017 22:22
	65527-1-BKS	BKS	65527-1-BKS	1033	W	65527	141379	--------	04/04/2017 09:20	04/04/2017 20:03
	65527-1-BLK	BLK	65527-1-BLK	1033	W	65527	141379	--------	04/04/2017 09:20	04/04/2017 19:57
	RW-06-04032017 S	MS	17040311-001 S	1033	W	65527	141379	04/03/2017	04/04/2017 09:20	04/04/2017 20:17
	Effluent VSP-4 S	MS	17040322-001 S	1033	W	65527	141379	04/03/2017	04/04/2017 09:20	04/04/2017 22:29
	Effluent VSP-4 S	Reanalysis	17040322-001 S	1033	W	65527	141379	04/03/2017	04/04/2017 09:20	04/04/2017 22:29
	RW-06-04032017 SD	MSD	17040311-001 SD	1033	W	65527	141379	04/03/2017	04/04/2017 09:20	04/04/2017 20:23
	65527-1-BKS	Reanalysis	65527-1-BKS	1033	W	65527	141462	--------	04/04/2017 09:20	04/06/2017 14:35
	65527-1-BLK	Reanalysis	65527-1-BLK	1033	W	65527	141462	--------	04/04/2017 09:20	04/06/2017 14:28
	Effluent VSP-4	Reanalysis	17040322-001	1033	W	65527	141465	04/03/2017	04/04/2017 09:20	04/05/2017 14:56
EPA 200.8	Effluent VSP-4	Initial	17040322-001	1033	W	65600	141502	04/03/2017	04/07/2017 13:18	04/07/2017 17:58
	65600-1-BKS	BKS	65600-1-BKS	1033	W	65600	141502	--------	04/07/2017 13:18	04/07/2017 17:52
	65600-1-BLK	BLK	65600-1-BLK	1033	W	65600	141502	--------	04/07/2017 13:18	04/07/2017 17:45
	Effluent VSP-4 S	MS	17040322-001 S	1033	W	65600	141502	04/03/2017	04/07/2017 13:18	04/07/2017 18:05
	Effluent VSP-4 SD	MSD	17040322-001 SD	1033	W	65600	141502	04/03/2017	04/07/2017 13:18	04/07/2017 18:12
SM 2540D -2011	Effluent VSP-4	Initial	17040322-001	1051	W	141400	141400	04/03/2017	04/05/2017 16:43	04/05/2017 16:43
	141400-1-BLK	BLK	141400-1-BLK	1051	W	141400	141400	--------	04/05/2017 16:43	04/05/2017 16:43
	INF-1 D	MD	17033119-001 D	1051	W	141400	141400	03/29/2017	04/05/2017 16:43	04/05/2017 16:43
SM 5210B -2011	Effluent VSP-4	Initial	17040322-001	4006	W	141548	141548	04/03/2017	04/05/2017 00:00	04/10/2017 12:20

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040322

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 141400 Matrix: Water
MB Sample Id: 141400-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	04/05/17 16:43	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 141379 Matrix: Water Date Prep: 04/04/17
MB Sample Id: 65527-1-BLK LCS Sample Id: 65527-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	409.3	102	85-115	ug/L	04/04/17 20:03	
Copper	<1.000	40.00	41.57	104	85-115	ug/L	04/04/17 20:03	
Lead	<1.000	40.00	38.68	97	85-115	ug/L	04/04/17 20:03	
Magnesium	<100	400	381.3	95	85-115	ug/L	04/04/17 20:03	
Nickel	<1.000	40.00	40.53	101	85-115	ug/L	04/04/17 20:03	
Zinc	<20.00	200	208.8	104	85-115	ug/L	04/04/17 20:03	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 141502 Matrix: Water Date Prep: 04/07/17
MB Sample Id: 65600-1-BLK LCS Sample Id: 65600-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	38.88	97	85-115	ug/L	04/07/17 17:52	
Lead	<1.000	40.00	35.23	88	85-115	ug/L	04/07/17 17:52	
Nickel	<1.000	40.00	38.01	95	85-115	ug/L	04/07/17 17:52	
Zinc	<20.00	200	198.2	99	85-115	ug/L	04/07/17 17:52	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 141502 Matrix: Waste Water Date Prep: 04/07/17
Parent Sample Id: 17040322-001 MS Sample Id: 17040322-001 S MSD Sample Id: 17040322-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	1.390	40.00	41.69	101	41.12	99	70-130	1	25	ug/L	04/07/17 18:05	
Lead	<1.000	40.00	40.19	100	40.32	101	70-130	0	25	ug/L	04/07/17 18:05	
Nickel	7.980	40.00	46.40	96	45.61	94	70-130	2	25	ug/L	04/07/17 18:05	
Zinc	<20.00	200	214.2	107	213.1	107	70-130	1	25	ug/L	04/07/17 18:05	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040322

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 141379 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040322-001 MS Sample Id: 17040322-001 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Calcium	2835	400	3199	91	70-130	ug/L	04/04/17 22:29	
Copper	3.200	40.00	40.93	94	70-130	ug/L	04/04/17 22:29	
Lead	<1.000	40.00	37.61	94	70-130	ug/L	04/04/17 22:29	
Magnesium	1164	400	1491	82	70-130	ug/L	04/04/17 22:29	
Nickel	7.740	40.00	45.89	95	70-130	ug/L	04/04/17 22:29	
Zinc	24.73	200	211.7	93	70-130	ug/L	04/04/17 22:29	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 141462 Matrix: Water Date Prep: 04/04/17

REBLK Sample Id: 65527-1-BLK LCS Sample Id: 65527-1-BKS

Parameter	REBLK Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	360.2	90	70-130	ug/L	04/06/17 14:35	
Copper	<1.000	40.00	38.03	95	70-130	ug/L	04/06/17 14:35	
Lead	<1.000	40.00	38.10	95	70-130	ug/L	04/06/17 14:35	
Magnesium	<100	400	376.6	94	70-130	ug/L	04/06/17 14:35	
Nickel	<1.000	40.00	37.55	94	70-130	ug/L	04/06/17 14:35	
Zinc	<20.00	200	193	97	70-130	ug/L	04/06/17 14:35	

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.

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: Kopflex PROJECT NO.: 31400390-9

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

SAMPLER(S): Tom Groff + Mandy Koplon DW CERT NO.:

PSS Work Order #: 17040322 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) *	REMARKS
								VOCs 624; total metals - Ni, Pb, Cu; Hardness; dissolved metals - Ni, Pb, Cu; TSS; BOD5	
1	Effluent VSP-4	04/03/17	0845	WW	7	G	HCl, HNO3, —, —, —	X x x x x	*48-hr TAT VOCs only

04/03/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	04/03/17	1520	
Relinquished By: (2)	Date	Time	Received By:
	04/03/17	1555	
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 (VOCs) ☐ Next Day ☐ Emergency ☐ Other

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

Special Instructions: *48-hr TAT for VOCs (624) only

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE

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

# of Coolers: 1 (Temp Blank 6°C)

Custody Seal: Abs

Ice Present: Pres Temp: 3-6°C

Shipping Carrier: FTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17040322	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/03/2017 03:55:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	05/08/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	6
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Pam Groff/Maria Kaj
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 4

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)	N/A
Do VOA vials have zero headspace?		N/A
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.

Refer to work order 17040323 for VOC analysis.
Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/03/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 04/04/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17040323

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

April 5, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

April 5, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17040323**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17040323**.

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 May 8, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040323

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/03/2017 at 03:55 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17040323-001	Effluent VSP-4	WASTE WATER	04/03/17 08:45

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: 17040323

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/03/2017 08:45** **PSS Sample ID: 17040323-001**
Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 15:52	1011
Chloromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Vinyl Chloride	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Bromomethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Chloroethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Methylene Chloride	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Chloroform	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Benzene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Trichloroethene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Bromodichloromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Toluene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Tetrachloroethylene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Dibromochloromethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Chlorobenzene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Ethylbenzene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
Bromoform	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011

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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17040323

WSP Environment & Energy - Herndon, Herndon, VA

April 5, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/03/2017 08:45** **PSS Sample ID: 17040323-001**
Matrix: WASTE WATER **Date/Time Received: 04/03/2017 15:55**

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	04/04/17	04/04/17 15:52	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	04/04/17	04/04/17 15:52	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17040323
Project ID: 31400390-9

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:

Refer to work order 17040322 for remaining analysis.
Acrolein and acrylonitrile not required for EPA 624 samples.

Analytical:

Volatile Organics Compounds (TVO)

Batch: 141359

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.

Analytical Data Package Information Summary

Work Order(s): **17040323**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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 624	Effluent VSP-4	Initial	17040323-001	1011	W	65545	141359	04/03/2017	04/04/2017 10:15	04/04/2017 15:52
	65545-1-BKS	BKS	65545-1-BKS	1011	W	65545	141359	--------	04/04/2017 10:15	04/04/2017 14:32
	65545-1-BLK	BLK	65545-1-BLK	1011	W	65545	141359	--------	04/04/2017 10:15	04/04/2017 15:12
	Effluent VSP-4 S	MS	17040323-001 S	1011	W	65545	141359	04/03/2017	04/04/2017 10:15	04/04/2017 17:12
	Effluent VSP-4 SD	MSD	17040323-001 SD	1011	W	65545	141359	04/03/2017	04/04/2017 10:15	04/04/2017 17:53

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040323

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 141359 Matrix: Waste Water Date Prep: 04/04/2017
PSS Sample ID: 17040323-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	105		87-114	%	04/04/17 15:52
4-Bromofluorobenzene	146	*	90-114	%	04/04/17 15:52
Toluene-D8	97		93-108	%	04/04/17 15:52

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 17040323

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 141359 Matrix: Water Date Prep: 04/04/17

MB Sample Id: 65545-1-BLK LCS Sample Id: 65545-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	58.92	98	51-139	ug/L	04/04/17 14:32	
Chloromethane	<5.000	60.00	47.18	79	56-144	ug/L	04/04/17 14:32	
Vinyl Chloride	<5.000	60.00	46.10	77	46-157	ug/L	04/04/17 14:32	
Bromomethane	<5.000	60.00	47.02	78	63-134	ug/L	04/04/17 14:32	
Chloroethane	<5.000	60.00	45.06	75	56-143	ug/L	04/04/17 14:32	
Trichlorofluoromethane	<5.000	60.00	49.22	82	56-138	ug/L	04/04/17 14:32	
1,1-Dichloroethene	<5.000	60.00	54.36	91	63-134	ug/L	04/04/17 14:32	
Methylene Chloride	<5.000	60.00	56.79	95	65-126	ug/L	04/04/17 14:32	
trans-1,2-dichloroethene	<5.000	60.00	56.68	94	67-129	ug/L	04/04/17 14:32	
1,1-Dichloroethane	<5.000	60.00	54.76	91	66-131	ug/L	04/04/17 14:32	
Chloroform	<5.000	60.00	52.74	88	69-130	ug/L	04/04/17 14:32	
1,1,1-Trichloroethane	<5.000	60.00	57.34	96	66-129	ug/L	04/04/17 14:32	
Carbon Tetrachloride	<5.000	60.00	57.19	95	70-133	ug/L	04/04/17 14:32	
Benzene	<5.000	60.00	56.62	94	69-127	ug/L	04/04/17 14:32	
1,2-Dichloroethane	<5.000	60.00	53.36	89	62-133	ug/L	04/04/17 14:32	
Trichloroethene	<5.000	60.00	57.18	95	71-127	ug/L	04/04/17 14:32	
1,2-Dichloropropane	<5.000	60.00	55.02	92	67-133	ug/L	04/04/17 14:32	
Bromodichloromethane	<5.000	60.00	56.49	94	63-132	ug/L	04/04/17 14:32	
2-Chloroethyl Vinyl Ether	<5.000	60.00	56.34	94	21-140	ug/L	04/04/17 14:32	
cis-1,3-Dichloropropene	<5.000	60.00	53.63	89	65-128	ug/L	04/04/17 14:32	
Toluene	<5.000	60.00	57.66	96	67-130	ug/L	04/04/17 14:32	
trans-1,3-dichloropropene	<5.000	60.00	53.56	89	63-127	ug/L	04/04/17 14:32	
1,1,2-Trichloroethane	<5.000	60.00	61.00	102	62-136	ug/L	04/04/17 14:32	
Tetrachloroethylene	<5.000	60.00	59.15	99	64-135	ug/L	04/04/17 14:32	
Dibromochloromethane	<5.000	60.00	59.63	99	65-126	ug/L	04/04/17 14:32	
Chlorobenzene	<5.000	60.00	59.22	99	70-127	ug/L	04/04/17 14:32	
Ethylbenzene	<5.000	60.00	57.26	95	71-131	ug/L	04/04/17 14:32	
Bromoform	<5.000	60.00	60.90	102	58-128	ug/L	04/04/17 14:32	
1,1,2,2-Tetrachloroethane	<5.000	60.00	67.06	112	63-134	ug/L	04/04/17 14:32	
1,3-Dichlorobenzene	<5.000	60.00	58.50	98	67-128	ug/L	04/04/17 14:32	
1,4-Dichlorobenzene	<5.000	60.00	58.94	98	67-127	ug/L	04/04/17 14:32	
1,2-Dichlorobenzene	<5.000	60.00	59.18	99	67-126	ug/L	04/04/17 14:32	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	106		101		87-114	%	04/04/17 14:32
4-Bromofluorobenzene	151	*	90		90-114	%	04/04/17 14:32
Toluene-D8	95		102		93-108	%	04/04/17 14:32

PHASE SEPARATION SCIENCE, INC.

QC Summary 17040323

WSP Environment & Energy - Herndon

Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 141359 Matrix: Waste Water Date Prep: 04/04/17

Parent Sample Id: 17040323-001 MS Sample Id: 17040323-001 S MSD Sample Id: 17040323-001 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	60.02	100	69.04	115	38-157	14	25	ug/L	04/04/17 17:12	
Chloromethane	<5.000	60.00	39.69	66	46.79	78	43-155	16	25	ug/L	04/04/17 17:12	
Vinyl Chloride	<5.000	60.00	45.39	76	52.84	88	48-154	15	25	ug/L	04/04/17 17:12	
Bromomethane	<5.000	60.00	39.47	66	46.84	78	52-143	17	25	ug/L	04/04/17 17:12	
Chloroethane	<5.000	60.00	37.59	63	45.93	77	47-150	20	25	ug/L	04/04/17 17:12	
Trichlorofluoromethane	<5.000	60.00	38.05	63	45.80	76	59-142	18	25	ug/L	04/04/17 17:12	
1,1-Dichloroethene	<5.000	60.00	50.56	84	59.51	99	55-138	16	25	ug/L	04/04/17 17:12	
Methylene Chloride	<5.000	60.00	50.16	84	60.87	101	60-133	19	25	ug/L	04/04/17 17:12	
trans-1,2-dichloroethene	<5.000	60.00	48.20	80	61.98	103	62-133	25	25	ug/L	04/04/17 17:12	
1,1-Dichloroethane	<5.000	60.00	44.16	74	56.03	93	62-134	24	25	ug/L	04/04/17 17:12	
Chloroform	<5.000	60.00	43.62	73	55.36	92	53-142	24	25	ug/L	04/04/17 17:12	
1,1,1-Trichloroethane	<5.000	60.00	47.32	79	61.53	103	63-135	26	25	ug/L	04/04/17 17:12	F
Carbon Tetrachloride	<5.000	60.00	47.67	79	60.70	101	62-134	24	25	ug/L	04/04/17 17:12	
Benzene	<5.000	60.00	46.60	78	59.57	99	56-138	24	25	ug/L	04/04/17 17:12	
1,2-Dichloroethane	<5.000	60.00	42.08	70	55.00	92	61-132	27	25	ug/L	04/04/17 17:12	F
Trichloroethene	<5.000	60.00	46.52	78	58.82	98	57-142	23	25	ug/L	04/04/17 17:12	
1,2-Dichloropropane	<5.000	60.00	44.59	74	57.26	95	56-141	25	25	ug/L	04/04/17 17:12	
Bromodichloromethane	<5.000	60.00	45.98	77	58.34	97	52-141	24	25	ug/L	04/04/17 17:12	
2-Chloroethyl Vinyl Ether	<5.000	60.00	<5.000	0	<5.000	0	21-140	NC	25	ug/L	04/04/17 17:12	X
cis-1,3-Dichloropropene	<5.000	60.00	42.86	71	54.73	91	29-156	24	25	ug/L	04/04/17 17:12	
Toluene	<5.000	60.00	47.57	79	60.28	100	55-141	24	25	ug/L	04/04/17 17:12	
trans-1,3-dichloropropene	<5.000	60.00	43.54	73	54.83	91	27-156	23	25	ug/L	04/04/17 17:12	
1,1,2-Trichloroethane	<5.000	60.00	49.40	82	60.59	101	50-151	20	25	ug/L	04/04/17 17:12	
Tetrachloroethylene	<5.000	60.00	51.26	85	62.92	105	43-148	20	25	ug/L	04/04/17 17:12	
Dibromochloromethane	<5.000	60.00	44.71	75	59.65	99	45-146	29	25	ug/L	04/04/17 17:12	F
Chlorobenzene	<5.000	60.00	46.55	78	60.79	101	57-140	27	25	ug/L	04/04/17 17:12	F
Ethylbenzene	<5.000	60.00	45.12	75	58.98	98	58-146	27	25	ug/L	04/04/17 17:12	F
Bromoform	<5.000	60.00	47.66	79	61.23	102	42-145	25	25	ug/L	04/04/17 17:12	
1,1,2,2-Tetrachloroethane	<5.000	60.00	53.88	90	69.30	116	48-156	25	25	ug/L	04/04/17 17:12	
1,3-Dichlorobenzene	<5.000	60.00	47.78	80	60.27	100	54-141	23	25	ug/L	04/04/17 17:12	
1,4-Dichlorobenzene	<5.000	60.00	47.41	79	59.53	99	54-140	23	25	ug/L	04/04/17 17:12	
1,2-Dichlorobenzene	<5.000	60.00	50.36	84	62.08	103	53-141	21	25	ug/L	04/04/17 17:12	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Dibromofluoromethane	99		100		87-114	%	04/04/17 17:12
4-Bromofluorobenzene	91		93		90-114	%	04/04/17 17:12
Toluene-D8	102		100		93-108	%	04/04/17 17:12

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.

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.: 31400390-9
SITE LOCATION: Hanover MD P.O. NO.:
SAMPLER(S): Ron Groff + Mona Kapoor DW CERT NO.:

PSS Work Order #: 1704323 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) *	REMARKS
								VOCs 624; 10 tal metals - Al, Sb, Cu, Fe, Pb, Mn, Ni, Se, Ag, Zn; Hardness as CaCO3; Cu, Zn dissolved; TSS; BOD5	
1	Effluent VSP-4	04/03/17	0845	WW	7	G	HCl HNO3 — — —	X X X X X	*48-hr TAT VOCs only

04/03/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	04/03/17	1520	
Relinquished By: (2)	Date	Time	Received By:
	04/03/17	1555	
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 (VOCs)
☐ Next Day ☐ Emergency ☐ Other

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

# of Coolers: 1 (Temp Blank 6°C)
Custody Seal: Abs
Ice Present: Pres Temp: 3-6°C
Shipping Carrier: FTE

Special Instructions: *48-hr TAT for VOCs (624) only

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17040323	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/03/2017 03:55:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	05/08/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	6
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Pam Groff/Maria Kaj
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 3

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)		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.

Refer to work order 17040322 for remaining analysis.
Acrolein and acrylonitrile not required for EPA 624 samples.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/03/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 04/04/2017

Amber Confer

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17041211

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

April 14, 2017

Phase Separation Science, Inc.

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

April 14, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17041211**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17041211**.

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 May 17, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041211

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/12/2017 at 01:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17041211-001	Influent VSP-1	GROUND WATER	04/12/17 08:32
17041211-002	Lead Ambersorb Ef	WASTE WATER	04/12/17 08:20
17041211-003	Effluent VSP-4	WASTE WATER	04/12/17 08:05
17041211-004	TB041217	WATER	04/12/17 13:05

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: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/12/2017 08:05** **PSS Sample ID: 17041211-003**
Matrix: WASTE WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 11:40	1011
Benzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Bromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Bromoform	ND	ug/L	5.0		1	04/14/17	04/14/17 11:40	1011
Bromomethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/14/17	04/14/17 11:40	1011
Carbon Disulfide	ND	ug/L	10		1	04/14/17	04/14/17 11:40	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Chlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Chloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Chloroform	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Chloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Cyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 11:40	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/14/17	04/14/17 11:40	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Ethylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/12/2017 08:05** **PSS Sample ID: 17041211-003**
Matrix: WASTE WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 11:40	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Methyl Acetate	ND	ug/L	10		1	04/14/17	04/14/17 11:40	1011
Methylcyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 11:40	1011
Methylene Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/14/17	04/14/17 11:40	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Naphthalene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Styrene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Toluene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Trichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/14/17	04/14/17 11:40	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/14/17	04/14/17 11:40	1011
o-Xylene	ND	ug/L	1.0		1	04/14/17	04/14/17 11:40	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)	ND	ug/L	1.0		1	04/13/17	04/13/17 12:09	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: TB041217 **Date/Time Sampled: 04/12/2017 13:05** **PSS Sample ID: 17041211-004**
Matrix: WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 10:56	1011
Benzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Bromoform	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Bromomethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Carbon Disulfide	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloroform	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Chloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Cyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Ethylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041211

WSP Environment & Energy - Herndon, Herndon, VA

April 14, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: TB041217 **Date/Time Sampled: 04/12/2017 13:05** **PSS Sample ID: 17041211-004**
Matrix: WATER **Date/Time Received: 04/12/2017 13:05**

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	04/14/17	04/14/17 10:56	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Methyl Acetate	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Methylcyclohexane	ND	ug/L	10		1	04/14/17	04/14/17 10:56	1011
Methylene Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Naphthalene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Styrene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Toluene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Trichloroethene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/14/17	04/14/17 10:56	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/14/17	04/14/17 10:56	1011
o-Xylene	ND	ug/L	1.0		1	04/14/17	04/14/17 10:56	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041211
Project ID: 31400390-9

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:

Custody seal was affixed to only one side of lid and cooler where lid could be opened from another side.

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): 17041211
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	17041211-001	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:02
	Lead Ambersorb Ef	Initial	17041211-002	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 11:17
	Effluent VSP-4	Initial	17041211-003	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 11:40
	TB041217	Initial	17041211-004	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 10:56
	65694-1-BKS	BKS	65694-1-BKS	1011	W	65694	141673	--------	04/14/2017 08:20	04/14/2017 09:30
	65694-1-BLK	BLK	65694-1-BLK	1011	W	65694	141673	--------	04/14/2017 08:20	04/14/2017 10:23
	Lead Ambersorb Ef S	MS	17041211-002 S	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:56
	Lead Ambersorb Ef SD	MSD	17041211-002 SD	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 13:18
	Influent VSP-1	Reanalysis	17041211-001	1011	W	65694	141673	04/12/2017	04/14/2017 08:20	04/14/2017 12:25
SW-846 8260 B-Modified	Lead Ambersorb Ef	Initial	17041211-002	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 11:47
	Effluent VSP-4	Initial	17041211-003	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 12:09
	65688-1-BKS	BKS	65688-1-BKS	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 11:04
	65688-1-BLK	BLK	65688-1-BLK	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 10:42
	65688-1-BSD	BSD	65688-1-BSD	1011	W	65688	141651	--------	04/13/2017 08:58	04/13/2017 10:20
	Influent VSP-1	Reanalysis	17041211-001	1011	W	65688	141651	04/12/2017	04/13/2017 08:58	04/13/2017 13:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Ground Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	91		80-120	%	04/13/17 12:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Ground Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 12:02
Dibromofluoromethane	104		91-119	%	04/14/17 12:02
Toluene-D8	100		90-117	%	04/14/17 12:02

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Waste Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	95		80-120	%	04/13/17 11:47

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 11:17
Dibromofluoromethane	97		91-119	%	04/14/17 11:17
Toluene-D8	98		90-117	%	04/14/17 11:17

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141651 Matrix: Waste Water Date Prep: 04/13/2017
PSS Sample ID: 17041211-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	92		80-120	%	04/13/17 12:09

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	04/14/17 11:40
Dibromofluoromethane	101		91-119	%	04/14/17 11:40
Toluene-D8	98		90-117	%	04/14/17 11:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141673 Matrix: Water Date Prep: 04/14/2017
PSS Sample ID: 17041211-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/14/17 10:56
Dibromofluoromethane	104		91-119	%	04/14/17 10:56
Toluene-D8	101		90-117	%	04/14/17 10:56

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 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Water Date Prep: 04/14/17

MB Sample Id: 65694-1-BLK LCS Sample Id: 65694-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	45.09	90	29-149	ug/L	04/14/17 09:30	
Benzene	<1.000	50.00	55.23	110	85-123	ug/L	04/14/17 09:30	
Bromochloromethane	<1.000	50.00	49.17	98	82-136	ug/L	04/14/17 09:30	
Bromodichloromethane	<1.000	50.00	49.87	100	88-133	ug/L	04/14/17 09:30	
Bromoform	<5.000	50.00	50.26	101	80-126	ug/L	04/14/17 09:30	
Bromomethane	<1.000	50.00	52.08	104	64-139	ug/L	04/14/17 09:30	
2-Butanone (MEK)	<10.00	50.00	43.25	87	39-135	ug/L	04/14/17 09:30	
Carbon Disulfide	<10.00	50.00	54.50	109	85-124	ug/L	04/14/17 09:30	
Carbon Tetrachloride	<1.000	50.00	49.16	98	81-138	ug/L	04/14/17 09:30	
Chlorobenzene	<1.000	50.00	56.60	113	85-120	ug/L	04/14/17 09:30	
Chloroethane	<1.000	50.00	50.63	101	75-129	ug/L	04/14/17 09:30	
Chloroform	<1.000	50.00	55.01	110	85-128	ug/L	04/14/17 09:30	
Chloromethane	<1.000	50.00	49.29	99	60-139	ug/L	04/14/17 09:30	
Cyclohexane	<10.00	50.00	54.77	110	55-131	ug/L	04/14/17 09:30	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.12	94	69-127	ug/L	04/14/17 09:30	
Dibromochloromethane	<1.000	50.00	52.01	104	82-127	ug/L	04/14/17 09:30	
1,2-Dibromoethane (EDB)	<1.000	50.00	56.33	113	82-121	ug/L	04/14/17 09:30	
1,2-Dichlorobenzene	<1.000	50.00	58.79	118	82-123	ug/L	04/14/17 09:30	
1,3-Dichlorobenzene	<1.000	50.00	59.85	120	81-123	ug/L	04/14/17 09:30	
1,4-Dichlorobenzene	<1.000	50.00	57.63	115	81-121	ug/L	04/14/17 09:30	
Dichlorodifluoromethane	<1.000	50.00	55.80	112	69-147	ug/L	04/14/17 09:30	
1,1-Dichloroethane	<1.000	50.00	54.26	109	83-123	ug/L	04/14/17 09:30	
1,2-Dichloroethane	<1.000	50.00	54.94	110	86-138	ug/L	04/14/17 09:30	
1,1-Dichloroethene	<1.000	50.00	48.65	97	85-127	ug/L	04/14/17 09:30	
cis-1,2-Dichloroethene	<1.000	50.00	57.05	114	87-127	ug/L	04/14/17 09:30	
1,2-Dichloropropane	<1.000	50.00	56.31	113	79-125	ug/L	04/14/17 09:30	
cis-1,3-Dichloropropene	<1.000	50.00	50.03	100	79-131	ug/L	04/14/17 09:30	
trans-1,3-Dichloropropene	<1.000	50.00	49.75	100	82-133	ug/L	04/14/17 09:30	
trans-1,2-Dichloroethene	<1.000	50.00	48.58	97	85-125	ug/L	04/14/17 09:30	
Ethylbenzene	<1.000	50.00	59.84	120	83-123	ug/L	04/14/17 09:30	
2-Hexanone	<5.000	50.00	42.59	85	37-137	ug/L	04/14/17 09:30	
Isopropylbenzene	<1.000	50.00	52.93	106	70-131	ug/L	04/14/17 09:30	
Methyl Acetate	<10.00	50.00	69.67	139	69-127	ug/L	04/14/17 09:30	H
Methylcyclohexane	<10.00	50.00	58.28	117	75-129	ug/L	04/14/17 09:30	
Methylene Chloride	<1.000	50.00	53.59	107	86-124	ug/L	04/14/17 09:30	
4-Methyl-2-Pentanone	<5.000	50.00	49.30	99	39-143	ug/L	04/14/17 09:30	
Methyl-t-butyl ether	<1.000	50.00	58.77	118	75-134	ug/L	04/14/17 09:30	
Naphthalene	<1.000	50.00	50.57	101	61-118	ug/L	04/14/17 09:30	
Styrene	<1.000	50.00	51.26	103	80-120	ug/L	04/14/17 09:30	
1,1,2,2-Tetrachloroethane	<1.000	50.00	49.76	100	64-125	ug/L	04/14/17 09:30	
Tetrachloroethene	<1.000	50.00	49.64	99	83-138	ug/L	04/14/17 09:30	
Toluene	<1.000	50.00	55.06	110	88-126	ug/L	04/14/17 09:30	
1,2,3-Trichlorobenzene	<1.000	50.00	53.05	106	75-124	ug/L	04/14/17 09:30	
1,2,4-Trichlorobenzene	<1.000	50.00	54.59	109	77-131	ug/L	04/14/17 09:30	
1,1,1-Trichloroethane	<1.000	50.00	55.17	110	68-146	ug/L	04/14/17 09:30	
1,1,2-Trichloroethane	<1.000	50.00	47.88	96	85-124	ug/L	04/14/17 09:30	
Trichloroethene	<1.000	50.00	55.89	112	87-127	ug/L	04/14/17 09:30	
Trichlorofluoromethane	<5.000	50.00	50.96	102	77-147	ug/L	04/14/17 09:30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	48.93	98	68-135	ug/L	04/14/17 09:30	
Vinyl Chloride	<1.000	50.00	62.45	125	74-138	ug/L	04/14/17 09:30	
m,p-Xylenes	<2.000	100	116.9	117	84-124	ug/L	04/14/17 09:30	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Water Date Prep: 04/14/17

MB Sample Id: 65694-1-BLK LCS Sample Id: 65694-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	51.68	103	79-126	ug/L	04/14/17 09:30	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		101		86-111	%	04/14/17 09:30
Dibromofluoromethane	95		98		91-119	%	04/14/17 09:30
Toluene-D8	98		98		90-117	%	04/14/17 09:30

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/17

Parent Sample Id: 17041211-002 MS Sample Id: 17041211-002 S MSD Sample Id: 17041211-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	41.74	83	41.95	84	46-138	1	25	ug/L	04/14/17 12:56	
Benzene	<1.000	50.00	54.17	108	52.64	105	77-126	3	25	ug/L	04/14/17 12:56	
Bromochloromethane	<1.000	50.00	46.86	94	50.23	100	74-133	7	25	ug/L	04/14/17 12:56	
Bromodichloromethane	<1.000	50.00	50.37	101	49.17	98	79-130	2	25	ug/L	04/14/17 12:56	
Bromoform	<5.000	50.00	49.05	98	50.05	100	69-120	2	25	ug/L	04/14/17 12:56	
Bromomethane	<1.000	50.00	49.79	100	48.46	97	64-130	3	25	ug/L	04/14/17 12:56	
2-Butanone (MEK)	<10.00	50.00	41.35	83	39.80	80	34-126	4	25	ug/L	04/14/17 12:56	
Carbon Disulfide	<10.00	50.00	55.04	110	52.25	105	76-126	5	25	ug/L	04/14/17 12:56	
Carbon Tetrachloride	<1.000	50.00	51.43	103	49.69	99	77-137	3	25	ug/L	04/14/17 12:56	
Chlorobenzene	<1.000	50.00	55.29	111	55.06	110	74-120	0	25	ug/L	04/14/17 12:56	
Chloroethane	<1.000	50.00	52.01	104	49.55	99	68-133	5	25	ug/L	04/14/17 12:56	
Chloroform	<1.000	50.00	55.39	111	55.79	112	77-127	1	25	ug/L	04/14/17 12:56	
Chloromethane	<1.000	50.00	52.70	105	50.00	100	50-143	5	25	ug/L	04/14/17 12:56	
Cyclohexane	<10.00	50.00	55.97	112	54.33	109	53-139	3	25	ug/L	04/14/17 12:56	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.84	92	50.47	101	56-123	10	25	ug/L	04/14/17 12:56	
Dibromochloromethane	<1.000	50.00	51.21	102	51.52	103	70-125	1	25	ug/L	04/14/17 12:56	
1,2-Dibromoethane (EDB)	<1.000	50.00	56.10	112	56.18	112	69-121	0	25	ug/L	04/14/17 12:56	
1,2-Dichlorobenzene	<1.000	50.00	53.25	107	55.71	111	69-118	5	25	ug/L	04/14/17 12:56	
1,3-Dichlorobenzene	<1.000	50.00	55.08	110	57.18	114	68-119	4	25	ug/L	04/14/17 12:56	
1,4-Dichlorobenzene	<1.000	50.00	54.27	109	56.56	113	67-117	4	25	ug/L	04/14/17 12:56	
Dichlorodifluoromethane	<1.000	50.00	58.76	118	56.08	112	68-139	5	25	ug/L	04/14/17 12:56	
1,1-Dichloroethane	<1.000	50.00	55.32	111	52.72	105	78-126	5	25	ug/L	04/14/17 12:56	
1,2-Dichloroethane	<1.000	50.00	57.28	115	55.24	110	78-134	4	25	ug/L	04/14/17 12:56	
1,1-Dichloroethene	<1.000	50.00	49.97	100	45.79	92	78-125	9	25	ug/L	04/14/17 12:56	
cis-1,2-Dichloroethene	<1.000	50.00	56.27	113	51.17	102	78-128	9	25	ug/L	04/14/17 12:56	
1,2-Dichloropropane	<1.000	50.00	55.94	112	53.95	108	73-126	4	25	ug/L	04/14/17 12:56	
cis-1,3-Dichloropropene	<1.000	50.00	48.21	96	47.02	94	67-126	2	25	ug/L	04/14/17 12:56	
trans-1,3-Dichloropropene	<1.000	50.00	48.21	96	47.53	95	68-129	1	25	ug/L	04/14/17 12:56	
trans-1,2-Dichloroethene	<1.000	50.00	49.03	98	45.98	92	76-128	6	25	ug/L	04/14/17 12:56	
Ethylbenzene	<1.000	50.00	57.99	116	58.62	117	74-123	1	25	ug/L	04/14/17 12:56	
2-Hexanone	<5.000	50.00	41.39	83	42.33	85	38-125	2	25	ug/L	04/14/17 12:56	
Isopropylbenzene	<1.000	50.00	48.38	97	50.47	101	58-129	4	25	ug/L	04/14/17 12:56	
Methyl Acetate	<10.00	50.00	65.98	132	68.24	136	63-115	3	25	ug/L	04/14/17 12:56	X
Methylcyclohexane	<10.00	50.00	57.65	115	53.34	107	69-130	8	25	ug/L	04/14/17 12:56	
Methylene Chloride	<1.000	50.00	54.30	109	51.21	102	76-124	6	25	ug/L	04/14/17 12:56	
4-Methyl-2-Pentanone	<5.000	50.00	47.36	95	47.31	95	35-123	0	25	ug/L	04/14/17 12:56	
Methyl-t-butyl ether	<1.000	50.00	55.49	111	54.07	108	64-129	3	25	ug/L	04/14/17 12:56	
Naphthalene	<1.000	50.00	45.17	90	48.46	97	45-109	7	25	ug/L	04/14/17 12:56	
Styrene	<1.000	50.00	50.14	100	49.90	100	61-124	0	25	ug/L	04/14/17 12:56	
1,1,2,2-Tetrachloroethane	<1.000	50.00	45.60	91	49.97	100	47-130	9	25	ug/L	04/14/17 12:56	
Tetrachloroethene	<1.000	50.00	49.09	98	46.76	94	68-139	5	25	ug/L	04/14/17 12:56	
Toluene	<1.000	50.00	54.90	110	52.77	106	79-128	4	25	ug/L	04/14/17 12:56	
1,2,3-Trichlorobenzene	<1.000	50.00	47.29	95	50.92	102	48-122	7	25	ug/L	04/14/17 12:56	
1,2,4-Trichlorobenzene	<1.000	50.00	48.90	98	50.80	102	54-124	4	25	ug/L	04/14/17 12:56	
1,1,1-Trichloroethane	<1.000	50.00	57.91	116	55.30	111	73-140	5	25	ug/L	04/14/17 12:56	
1,1,2-Trichloroethane	<1.000	50.00	46.23	92	46.13	92	78-124	0	25	ug/L	04/14/17 12:56	
Trichloroethene	<1.000	50.00	55.28	111	52.85	106	77-131	4	25	ug/L	04/14/17 12:56	
Trichlorofluoromethane	<5.000	50.00	54.19	108	51.19	102	73-144	6	25	ug/L	04/14/17 12:56	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	50.26	101	46.78	94	65-140	7	25	ug/L	04/14/17 12:56	
Vinyl Chloride	<1.000	50.00	66.50	133	63.16	126	60-146	5	25	ug/L	04/14/17 12:56	
m,p-Xylenes	<2.000	100	115.1	115	111.6	112	75-125	3	25	ug/L	04/14/17 12:56	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041211

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141673 Matrix: Waste Water Date Prep: 04/14/17

Parent Sample Id: 17041211-002 MS Sample Id: 17041211-002 S MSD Sample Id: 17041211-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	50.41	101	50.61	101	69-126	0	25	ug/L	04/14/17 12:56	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		102		86-111	%	04/14/17 12:56
Dibromofluoromethane	102		103		91-119	%	04/14/17 12:56
Toluene-D8	97		97		90-117	%	04/14/17 12:56

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

Seq Number: 141651 Matrix: Water Date Prep: 04/13/17

MB Sample Id: 65688-1-BLK LCS Sample Id: 65688-1-BKS LCSD Sample Id: 65688-1-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	29.17	97	30.50	102	50-150	4	20	ug/L	04/13/17 11:04	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	94		94		97		80-120	%	04/13/17 11:04

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.

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

(1) *CLIENT: WSP *OFFICE LOC.: Hanover VA
*PROJECT MGR.: Eric Johnson *PHONE NO.: (703) 709-6500
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Kopfle PROJECT NO.: 34003907
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Maria Kaplan DW CERT NO.:

PSS Work Order #: 1704121 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 (8260)	1,4 Dioxane (8260 SIM)	REMARKS
1	Influent WSP-1	4/12/17	0832	GW	6	G		X	X	
2	Lead Absorb Eff	4/12/17	0820	WW	6	G		X	X	
3	Effluent WSP-4	4/12/17	0805	WW	6	G		X	X	
4	TB041217	—	—	DW	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	4/12/17	1235	#65
Relinquished By: (2)	Date	Time	Received By:
#65	4/12/17	15	
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 7°C
Custody Seal: Cooler - One side only Broken
Ice Present: PRES Temp: 7-8°C
Shipping Carrier: FTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17041211	**Received By**	Thomas Wingate
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/12/2017 01:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	05/17/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	No	Temp (deg C)	8
Seal(s) Signed / Dated?	Yes	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 4 Total No. of Containers Received 20

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.

Custody seal was affixed to only one side of lid and cooler where lid could be opened from another side.

Samples Inspected/Checklist Completed By: Barb Weber Date: 04/12/2017

Barb Weber

PM Review and Approval: N Y Jackson Date: 04/12/2017

Lynn Jackson

Analytical Report for

WSP Environment & Energy - Herndon

Certificate of Analysis No.: 17041927

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

April 21, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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

PHASE SEPARATION SCIENCE, INC.

April 21, 2017

Eric Johnson
WSP Environment & Energy - Herndon
13530 Dulles Technology Dr, Suite 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17041927**
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 **17041927**.

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 May 24, 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 Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041927

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/19/2017 at 04:00 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17041927-001	TB-04-19-17	WATER	04/19/17 16:00
17041927-002	Influent VSP-1	WASTE WATER	04/19/17 10:55
17041927-003	Effluent VSP-4	WASTE WATER	04/19/17 10:32
17041927-004	Lead Ambersorb Ef	WASTE WATER	04/19/17 10:43

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: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: TB-04-19-17 **Date/Time Sampled: 04/19/2017 16:00** **PSS Sample ID: 17041927-001**
Matrix: WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:12	1011
Benzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Bromoform	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Bromomethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Carbon Disulfide	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloroform	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Chloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Cyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Ethylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: TB-04-19-17 **Date/Time Sampled: 04/19/2017 16:00** **PSS Sample ID: 17041927-001**
Matrix: WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:12	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Methyl Acetate	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Methylcyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:12	1011
Methylene Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Naphthalene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Styrene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Toluene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Trichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:12	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/20/17	04/20/17 14:12	1011
o-Xylene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:12	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/19/2017 10:32** **PSS Sample ID: 17041927-003**
Matrix: WASTE WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:34	1011
Benzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Bromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Bromodichloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Bromoform	ND	ug/L	5.0		1	04/20/17	04/20/17 14:34	1011
Bromomethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
2-Butanone (MEK)	ND	ug/L	10		1	04/20/17	04/20/17 14:34	1011
Carbon Disulfide	ND	ug/L	10		1	04/20/17	04/20/17 14:34	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Chlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Chloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Chloroform	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Chloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Cyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:34	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:34	1011
Dibromochloromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Ethylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17041927

WSP Environment & Energy - Herndon, Herndon, VA

April 21, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 04/19/2017 10:32** **PSS Sample ID: 17041927-003**
Matrix: WASTE WATER **Date/Time Received: 04/19/2017 16:00**

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	04/20/17	04/20/17 14:34	1011
Isopropylbenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Methyl Acetate	ND	ug/L	10		1	04/20/17	04/20/17 14:34	1011
Methylcyclohexane	ND	ug/L	10		1	04/20/17	04/20/17 14:34	1011
Methylene Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	04/20/17	04/20/17 14:34	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Naphthalene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Styrene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Tetrachloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Toluene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Trichloroethene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	04/20/17	04/20/17 14:34	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
Vinyl Chloride	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	1011
m,p-Xylenes	ND	ug/L	2.0		1	04/20/17	04/20/17 14:34	1011
o-Xylene	ND	ug/L	1.0		1	04/20/17	04/20/17 14:34	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)	ND	ug/L	1.0		1	04/21/17	04/21/17 11:22	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17041927

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): **17041927**
Report Prepared For: WSP Environment & Energy - Herndon, Hern
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	TB-04-19-17	Initial	17041927-001	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:12
	Influent VSP-1	Initial	17041927-002	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 15:17
	Effluent VSP-4	Initial	17041927-003	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:34
	Lead Ambersorb Ef	Initial	17041927-004	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 14:56
	65789-1-BKS	BKS	65789-1-BKS	1011	W	65789	141870	--------	04/20/2017 08:58	04/20/2017 10:22
	65789-1-BLK	BLK	65789-1-BLK	1011	W	65789	141870	--------	04/20/2017 08:58	04/20/2017 11:15
	Corrado Tank 2 Eff. 4/17 S	MS	17041805-001 S	1011	W	65789	141870	04/17/2017	04/20/2017 08:58	04/20/2017 13:08
	Corrado Tank 2 Eff. 4/17 SD	MSD	17041805-001 SD	1011	W	65789	141870	04/17/2017	04/20/2017 08:58	04/20/2017 13:29
	Influent VSP-1	Reanalysis	17041927-002	1011	W	65789	141870	04/19/2017	04/20/2017 08:58	04/20/2017 15:39
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17041927-003	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 11:22
	Lead Ambersorb Ef	Initial	17041927-004	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 11:43
	65797-1-BKS	BKS	65797-1-BKS	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 09:35
	65797-1-BLK	BLK	65797-1-BLK	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 10:41
	65797-1-BSD	BSD	65797-1-BSD	1011	W	65797	141872	--------	04/21/2017 08:28	04/21/2017 09:58
	Influent VSP-1	Reanalysis	17041927-002	1011	W	65797	141872	04/19/2017	04/21/2017 08:28	04/21/2017 12:48

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	04/20/17 14:12
Dibromofluoromethane	102		91-119	%	04/20/17 14:12
Toluene-D8	101		90-117	%	04/20/17 14:12

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/20/17 15:17
Dibromofluoromethane	100		91-119	%	04/20/17 15:17
Toluene-D8	103		90-117	%	04/20/17 15:17

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	04/21/17 13:10

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		86-111	%	04/20/17 14:34
Dibromofluoromethane	101		91-119	%	04/20/17 14:34
Toluene-D8	101		90-117	%	04/20/17 14:34

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	102		80-120	%	04/21/17 11:22

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 141870 Matrix: Waste Water Date Prep: 04/20/2017
PSS Sample ID: 17041927-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	04/20/17 14:56
Dibromofluoromethane	102		91-119	%	04/20/17 14:56
Toluene-D8	103		90-117	%	04/20/17 14:56

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 141872 Matrix: Waste Water Date Prep: 04/21/2017
PSS Sample ID: 17041927-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	98		80-120	%	04/21/17 11:43

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 17041927

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141870 Matrix: Water Date Prep: 04/20/17

MB Sample Id: 65789-1-BLK LCS Sample Id: 65789-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	52.45	105	29-149	ug/L	04/20/17 10:22	
Benzene	<1.000	50.00	53.01	106	85-123	ug/L	04/20/17 10:22	
Bromochloromethane	<1.000	50.00	54.32	109	82-136	ug/L	04/20/17 10:22	
Bromodichloromethane	<1.000	50.00	54.48	109	88-133	ug/L	04/20/17 10:22	
Bromoform	<5.000	50.00	52.11	104	80-126	ug/L	04/20/17 10:22	
Bromomethane	<1.000	50.00	41.78	84	64-139	ug/L	04/20/17 10:22	
2-Butanone (MEK)	<10.00	50.00	48.84	98	39-135	ug/L	04/20/17 10:22	
Carbon Disulfide	<10.00	50.00	53.47	107	85-124	ug/L	04/20/17 10:22	
Carbon Tetrachloride	<1.000	50.00	48.23	96	81-138	ug/L	04/20/17 10:22	
Chlorobenzene	<1.000	50.00	53.20	106	85-120	ug/L	04/20/17 10:22	
Chloroethane	<1.000	50.00	49.57	99	75-129	ug/L	04/20/17 10:22	
Chloroform	<1.000	50.00	52.94	106	85-128	ug/L	04/20/17 10:22	
Chloromethane	<1.000	50.00	48.03	96	60-139	ug/L	04/20/17 10:22	
Cyclohexane	<10.00	50.00	55.36	111	55-131	ug/L	04/20/17 10:22	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	47.39	95	69-127	ug/L	04/20/17 10:22	
Dibromochloromethane	<1.000	50.00	49.11	98	82-127	ug/L	04/20/17 10:22	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.48	99	82-121	ug/L	04/20/17 10:22	
1,2-Dichlorobenzene	<1.000	50.00	53.28	107	82-123	ug/L	04/20/17 10:22	
1,3-Dichlorobenzene	<1.000	50.00	53.84	108	81-123	ug/L	04/20/17 10:22	
1,4-Dichlorobenzene	<1.000	50.00	52.84	106	81-121	ug/L	04/20/17 10:22	
Dichlorodifluoromethane	<1.000	50.00	55.12	110	69-147	ug/L	04/20/17 10:22	
1,1-Dichloroethane	<1.000	50.00	52.41	105	83-123	ug/L	04/20/17 10:22	
1,2-Dichloroethane	<1.000	50.00	51.91	104	86-138	ug/L	04/20/17 10:22	
1,1-Dichloroethene	<1.000	50.00	54.33	109	85-127	ug/L	04/20/17 10:22	
cis-1,2-Dichloroethene	<1.000	50.00	52.54	105	87-127	ug/L	04/20/17 10:22	
1,2-Dichloropropane	<1.000	50.00	53.05	106	79-125	ug/L	04/20/17 10:22	
cis-1,3-Dichloropropene	<1.000	50.00	49.06	98	79-131	ug/L	04/20/17 10:22	
trans-1,3-Dichloropropene	<1.000	50.00	49.38	99	82-133	ug/L	04/20/17 10:22	
trans-1,2-Dichloroethene	<1.000	50.00	53.42	107	85-125	ug/L	04/20/17 10:22	
Ethylbenzene	<1.000	50.00	55.34	111	83-123	ug/L	04/20/17 10:22	
2-Hexanone	<5.000	50.00	47.08	94	37-137	ug/L	04/20/17 10:22	
Isopropylbenzene	<1.000	50.00	49.66	99	70-131	ug/L	04/20/17 10:22	
Methyl Acetate	<10.00	50.00	53.81	108	69-127	ug/L	04/20/17 10:22	
Methylcyclohexane	<10.00	50.00	50.00	100	75-129	ug/L	04/20/17 10:22	
Methylene Chloride	<1.000	50.00	52.21	104	86-124	ug/L	04/20/17 10:22	
4-Methyl-2-Pentanone	<5.000	50.00	47.96	96	39-143	ug/L	04/20/17 10:22	
Methyl-t-butyl ether	<1.000	50.00	55.21	110	75-134	ug/L	04/20/17 10:22	
Naphthalene	<1.000	50.00	48.00	96	61-118	ug/L	04/20/17 10:22	
Styrene	<1.000	50.00	50.34	101	80-120	ug/L	04/20/17 10:22	
1,1,2,2-Tetrachloroethane	<1.000	50.00	51.43	103	64-125	ug/L	04/20/17 10:22	
Tetrachloroethene	<1.000	50.00	53.34	107	83-138	ug/L	04/20/17 10:22	
Toluene	<1.000	50.00	53.28	107	88-126	ug/L	04/20/17 10:22	
1,2,3-Trichlorobenzene	<1.000	50.00	49.25	99	75-124	ug/L	04/20/17 10:22	
1,2,4-Trichlorobenzene	<1.000	50.00	49.22	98	77-131	ug/L	04/20/17 10:22	
1,1,1-Trichloroethane	<1.000	50.00	52.63	105	68-146	ug/L	04/20/17 10:22	
1,1,2-Trichloroethane	<1.000	50.00	53.62	107	85-124	ug/L	04/20/17 10:22	
Trichloroethene	<1.000	50.00	53.96	108	87-127	ug/L	04/20/17 10:22	
Trichlorofluoromethane	<5.000	50.00	49.87	100	77-147	ug/L	04/20/17 10:22	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.31	111	68-135	ug/L	04/20/17 10:22	
Vinyl Chloride	<1.000	50.00	56.96	114	74-138	ug/L	04/20/17 10:22	
m,p-Xylenes	<2.000	100	99.53	100	84-124	ug/L	04/20/17 10:22	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17041927

WSP Environment & Energy - Herndon

Kop-Flex

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

Seq Number: 141870 Matrix: Water Date Prep: 04/20/17

MB Sample Id: 65789-1-BLK LCS Sample Id: 65789-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	49.78	100	79-126	ug/L	04/20/17 10:22	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		99		86-111	%	04/20/17 10:22
Dibromofluoromethane	100		100		91-119	%	04/20/17 10:22
Toluene-D8	101		101		90-117	%	04/20/17 10:22

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

Seq Number: 141872 Matrix: Water Date Prep: 04/21/17

MB Sample Id: 65797-1-BLK LCS Sample Id: 65797-1-BKS LCSD Sample Id: 65797-1-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	27.32	91	30.31	101	50-150	10	20	ug/L	04/21/17 09:35	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	100		104		103		80-120	%	04/21/17 09:35

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.

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: Koppers PROJECT NO.:

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

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

PSS Work Order #: 17041927 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 (8270 SIM)	REMARKS
							HCl	HCl			
1	TB-04-19-17	—	—	DW	2	—			X		
2	Influent VSP-1	4/19/17	1055	WW	6	G			X	X	
3	Effluent VSP-4	4/19/17	1032	WW	6	G			X	X	
4	Lead Ambersorb EF	4/19/17	1043	WW	6	G			X	X	

(5)

	Date	Time	
Relinquished By: (1)	4/19/17	1522	Received By:
Relinquished By: (2)	04/19/17	1600	Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)			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 3°C)

Custody Seal: Cooler Intact

Ice Present: Pres Temp: 3°C-6°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17041927	**Received By**	Barb Weber
Client Name	WSP Environment & Energy - Hernd	**Date Received**	04/19/2017 04:00:00 PM
Project Name	Kop-Flex	**Delivered By**	Trans Time Express
Disposal Date	05/24/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	6
Seal(s) Signed / Dated?	Yes	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 4 Total No. of Containers Received 20

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: 04/19/2017

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 04/20/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17050818

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

May 15, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

May 15, 2017

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

Reference: PSS Work Order(s) No: **17050818**
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 **17050818**.

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 June 12, 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): 17050818

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/08/2017 at 04:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17050818-001	Effluent VSP-4	WASTE WATER	05/08/17 10:20
17050818-002	Influent VSP-1	GROUND WATER	05/08/17 09:55
17050818-003	TB-050817	WATER	05/08/17 16:05

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: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 05/08/2017 10:20** **PSS Sample ID: 17050818-001**
Matrix: WASTE WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 14:54	1011
Benzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Bromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Bromodichloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Bromoform	ND	ug/L	5.0		1	05/10/17	05/10/17 14:54	1011
Bromomethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
2-Butanone (MEK)	ND	ug/L	10		1	05/10/17	05/10/17 14:54	1011
Carbon Disulfide	ND	ug/L	10		1	05/10/17	05/10/17 14:54	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Chlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Chloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Chloroform	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Chloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Cyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 14:54	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	05/10/17	05/10/17 14:54	1011
Dibromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Ethylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 05/08/2017 10:20** **PSS Sample ID: 17050818-001**
Matrix: WASTE WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 14:54	1011
Isopropylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Methyl Acetate	ND	ug/L	10		1	05/10/17	05/10/17 14:54	1011
Methylcyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 14:54	1011
Methylene Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	05/10/17	05/10/17 14:54	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Naphthalene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Styrene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Tetrachloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Toluene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Trichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 14:54	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
Vinyl Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011
m,p-Xylenes	ND	ug/L	2.0		1	05/10/17	05/10/17 14:54	1011
o-Xylene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:54	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: TB-050817 **Date/Time Sampled: 05/08/2017 16:05** **PSS Sample ID: 17050818-003**
Matrix: WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 14:32	1011
Benzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Bromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Bromodichloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Bromoform	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
Bromomethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
2-Butanone (MEK)	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Carbon Disulfide	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chloroform	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Chloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Cyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
Dibromochloromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Ethylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050818

WSP USA - Herndon, Herndon, VA

May 15, 2017

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

Sample ID: TB-050817 **Date/Time Sampled: 05/08/2017 16:05** **PSS Sample ID: 17050818-003**
Matrix: WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 14:32	1011
Isopropylbenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Methyl Acetate	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Methylcyclohexane	ND	ug/L	10		1	05/10/17	05/10/17 14:32	1011
Methylene Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Naphthalene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Styrene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Tetrachloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Toluene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Trichloroethene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 14:32	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
Vinyl Chloride	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011
m,p-Xylenes	ND	ug/L	2.0		1	05/10/17	05/10/17 14:32	1011
o-Xylene	ND	ug/L	1.0		1	05/10/17	05/10/17 14:32	1011

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17050818

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): 17050818
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	Effluent VSP-4	Initial	17050818-001	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 14:54
	Influent VSP-1	Initial	17050818-002	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 15:15
	TB-050817	Initial	17050818-003	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 14:32
	66078-1-BKS	BKS	66078-1-BKS	1011	W	66078	142446	--------	05/10/2017 07:48	05/10/2017 08:52
	66078-1-BLK	BLK	66078-1-BLK	1011	W	66078	142446	--------	05/10/2017 07:48	05/10/2017 10:24
	Effluent VSP-4 S	MS	17050818-001 S	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 16:00
	Effluent VSP-4 SD	MSD	17050818-001 SD	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 16:25
	Influent VSP-1	Reanalysis	17050818-002	1011	W	66078	142446	05/08/2017	05/10/2017 07:48	05/10/2017 15:37
SW-846 8260 B-Modified	66128-1-BKS	BKS	66128-1-BKS	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 08:47
	66128-1-BLK	BLK	66128-1-BLK	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 10:17
	66128-1-BSD	BSD	66128-1-BSD	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 09:09
	Influent VSP-1	Reanalysis	17050818-002	1011	W	66128	142550	05/08/2017	05/13/2017 07:56	05/13/2017 11:03

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Waste Water Date Prep: 05/10/2017
PSS Sample ID: 17050818-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		86-111	%	05/10/17 14:54
Dibromofluoromethane	100		91-119	%	05/10/17 14:54
Toluene-D8	100		90-117	%	05/10/17 14:54

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Ground Water Date Prep: 05/10/2017
PSS Sample ID: 17050818-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	05/10/17 15:15
Dibromofluoromethane	99		91-119	%	05/10/17 15:15
Toluene-D8	100		90-117	%	05/10/17 15:15

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 142550 Matrix: Ground Water Date Prep: 05/13/2017
PSS Sample ID: 17050818-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	101		80-120	%	05/13/17 11:26

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Water Date Prep: 05/10/2017
PSS Sample ID: 17050818-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		86-111	%	05/10/17 14:32
Dibromofluoromethane	100		91-119	%	05/10/17 14:32
Toluene-D8	101		90-117	%	05/10/17 14:32

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 17050818

WSP USA - Herndon

Kop-Flex

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

Seq Number: 142446 Matrix: Water Date Prep: 05/10/17

MB Sample Id: 66078-1-BLK LCS Sample Id: 66078-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	49.30	99	29-149	ug/L	05/10/17 08:52	
Benzene	<1.000	50.00	52.03	104	85-123	ug/L	05/10/17 08:52	
Bromochloromethane	<1.000	50.00	53.44	107	82-136	ug/L	05/10/17 08:52	
Bromodichloromethane	<1.000	50.00	52.46	105	88-133	ug/L	05/10/17 08:52	
Bromoform	<5.000	50.00	50.82	102	80-126	ug/L	05/10/17 08:52	
Bromomethane	<1.000	50.00	50.66	101	64-139	ug/L	05/10/17 08:52	
2-Butanone (MEK)	<10.00	50.00	53.10	106	39-135	ug/L	05/10/17 08:52	
Carbon Disulfide	<10.00	50.00	49.23	98	85-124	ug/L	05/10/17 08:52	
Carbon Tetrachloride	<1.000	50.00	53.78	108	81-138	ug/L	05/10/17 08:52	
Chlorobenzene	<1.000	50.00	49.69	99	85-120	ug/L	05/10/17 08:52	
Chloroethane	<1.000	50.00	50.67	101	75-129	ug/L	05/10/17 08:52	
Chloroform	<1.000	50.00	50.63	101	85-128	ug/L	05/10/17 08:52	
Chloromethane	<1.000	50.00	47.76	96	60-139	ug/L	05/10/17 08:52	
Cyclohexane	<10.00	50.00	51.48	103	55-131	ug/L	05/10/17 08:52	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	51.40	103	69-127	ug/L	05/10/17 08:52	
Dibromochloromethane	<1.000	50.00	52.91	106	82-127	ug/L	05/10/17 08:52	
1,2-Dibromoethane (EDB)	<1.000	50.00	51.72	103	82-121	ug/L	05/10/17 08:52	
1,2-Dichlorobenzene	<1.000	50.00	51.73	103	82-123	ug/L	05/10/17 08:52	
1,3-Dichlorobenzene	<1.000	50.00	50.40	101	81-123	ug/L	05/10/17 08:52	
1,4-Dichlorobenzene	<1.000	50.00	49.49	99	81-121	ug/L	05/10/17 08:52	
Dichlorodifluoromethane	<1.000	50.00	45.68	91	69-147	ug/L	05/10/17 08:52	
1,1-Dichloroethane	<1.000	50.00	52.26	105	83-123	ug/L	05/10/17 08:52	
1,2-Dichloroethane	<1.000	50.00	49.99	100	86-138	ug/L	05/10/17 08:52	
1,1-Dichloroethene	<1.000	50.00	52.80	106	85-127	ug/L	05/10/17 08:52	
cis-1,2-Dichloroethene	<1.000	50.00	52.56	105	87-127	ug/L	05/10/17 08:52	
1,2-Dichloropropane	<1.000	50.00	52.30	105	79-125	ug/L	05/10/17 08:52	
cis-1,3-Dichloropropene	<1.000	50.00	55.55	111	79-131	ug/L	05/10/17 08:52	
trans-1,3-Dichloropropene	<1.000	50.00	55.65	111	82-133	ug/L	05/10/17 08:52	
trans-1,2-Dichloroethene	<1.000	50.00	51.83	104	85-125	ug/L	05/10/17 08:52	
Ethylbenzene	<1.000	50.00	53.20	106	83-123	ug/L	05/10/17 08:52	
2-Hexanone	<5.000	50.00	47.82	96	37-137	ug/L	05/10/17 08:52	
Isopropylbenzene	<1.000	50.00	53.80	108	70-131	ug/L	05/10/17 08:52	
Methyl Acetate	<10.00	50.00	50.07	100	69-127	ug/L	05/10/17 08:52	
Methylcyclohexane	<10.00	50.00	51.63	103	75-129	ug/L	05/10/17 08:52	
Methylene Chloride	<1.000	50.00	50.79	102	86-124	ug/L	05/10/17 08:52	
4-Methyl-2-Pentanone	<5.000	50.00	48.32	97	39-143	ug/L	05/10/17 08:52	
Methyl-t-butyl ether	<1.000	50.00	54.30	109	75-134	ug/L	05/10/17 08:52	
Naphthalene	<1.000	50.00	49.93	100	61-118	ug/L	05/10/17 08:52	
Styrene	<1.000	50.00	55.90	112	80-120	ug/L	05/10/17 08:52	
1,1,2,2-Tetrachloroethane	<1.000	50.00	51.25	103	64-125	ug/L	05/10/17 08:52	
Tetrachloroethene	<1.000	50.00	50.81	102	83-138	ug/L	05/10/17 08:52	
Toluene	<1.000	50.00	52.99	106	88-126	ug/L	05/10/17 08:52	
1,2,3-Trichlorobenzene	<1.000	50.00	51.06	102	75-124	ug/L	05/10/17 08:52	
1,2,4-Trichlorobenzene	<1.000	50.00	50.70	101	77-131	ug/L	05/10/17 08:52	
1,1,1-Trichloroethane	<1.000	50.00	51.77	104	68-146	ug/L	05/10/17 08:52	
1,1,2-Trichloroethane	<1.000	50.00	51.21	102	85-124	ug/L	05/10/17 08:52	
Trichloroethene	<1.000	50.00	53.06	106	87-127	ug/L	05/10/17 08:52	
Trichlorofluoromethane	<5.000	50.00	49.47	99	77-147	ug/L	05/10/17 08:52	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	50.98	102	68-135	ug/L	05/10/17 08:52	
Vinyl Chloride	<1.000	50.00	48.33	97	74-138	ug/L	05/10/17 08:52	
m,p-Xylenes	<2.000	100	106.3	106	84-124	ug/L	05/10/17 08:52	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon
Kop-Flex

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

Seq Number: 142446 Matrix: Water Date Prep: 05/10/17

MB Sample Id: 66078-1-BLK LCS Sample Id: 66078-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	53.86	108	79-126	ug/L	05/10/17 08:52	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	98		99		86-111	%	05/10/17 08:52
Dibromofluoromethane	98		99		91-119	%	05/10/17 08:52
Toluene-D8	101		101		90-117	%	05/10/17 08:52

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon

Kop-Flex

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

Seq Number: 142446 Matrix: Waste Water Date Prep: 05/10/17

Parent Sample Id: 17050818-001 MS Sample Id: 17050818-001 S MSD Sample Id: 17050818-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	<10.00	50.00	44.36	89	44.51	89	46-138	0	25	ug/L	05/10/17 16:00	
Benzene	<1.000	50.00	53.49	107	54.16	108	77-126	1	25	ug/L	05/10/17 16:00	
Bromochloromethane	<1.000	50.00	54.88	110	55.39	111	74-133	1	25	ug/L	05/10/17 16:00	
Bromodichloromethane	<1.000	50.00	53.72	107	54.15	108	79-130	1	25	ug/L	05/10/17 16:00	
Bromoform	<5.000	50.00	51.49	103	52.65	105	69-120	2	25	ug/L	05/10/17 16:00	
Bromomethane	<1.000	50.00	52.49	105	51.81	104	64-130	1	25	ug/L	05/10/17 16:00	
2-Butanone (MEK)	<10.00	50.00	43.86	88	44.75	90	34-126	2	25	ug/L	05/10/17 16:00	
Carbon Disulfide	<10.00	50.00	50.64	101	50.73	101	76-126	0	25	ug/L	05/10/17 16:00	
Carbon Tetrachloride	<1.000	50.00	56.26	113	56.25	113	77-137	0	25	ug/L	05/10/17 16:00	
Chlorobenzene	<1.000	50.00	51.42	103	52.83	106	74-120	3	25	ug/L	05/10/17 16:00	
Chloroethane	<1.000	50.00	53.34	107	52.04	104	68-133	2	25	ug/L	05/10/17 16:00	
Chloroform	<1.000	50.00	51.80	104	52.49	105	77-127	1	25	ug/L	05/10/17 16:00	
Chloromethane	<1.000	50.00	50.43	101	50.16	100	50-143	1	25	ug/L	05/10/17 16:00	
Cyclohexane	<10.00	50.00	52.93	106	52.27	105	53-139	1	25	ug/L	05/10/17 16:00	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	52.76	106	53.84	108	56-123	2	25	ug/L	05/10/17 16:00	
Dibromochloromethane	<1.000	50.00	54.96	110	56.11	112	70-125	2	25	ug/L	05/10/17 16:00	
1,2-Dibromoethane (EDB)	<1.000	50.00	52.84	106	53.97	108	69-121	2	25	ug/L	05/10/17 16:00	
1,2-Dichlorobenzene	<1.000	50.00	51.64	103	52.85	106	69-118	2	25	ug/L	05/10/17 16:00	
1,3-Dichlorobenzene	<1.000	50.00	50.94	102	52.37	105	68-119	3	25	ug/L	05/10/17 16:00	
1,4-Dichlorobenzene	<1.000	50.00	50.08	100	50.62	101	67-117	1	25	ug/L	05/10/17 16:00	
Dichlorodifluoromethane	<1.000	50.00	45.69	91	46.76	94	68-139	2	25	ug/L	05/10/17 16:00	
1,1-Dichloroethane	<1.000	50.00	52.72	105	54.24	108	78-126	3	25	ug/L	05/10/17 16:00	
1,2-Dichloroethane	<1.000	50.00	51.91	104	51.60	103	78-134	1	25	ug/L	05/10/17 16:00	
1,1-Dichloroethene	<1.000	50.00	55.02	110	54.35	109	78-125	1	25	ug/L	05/10/17 16:00	
cis-1,2-Dichloroethene	<1.000	50.00	52.67	105	53.83	108	78-128	2	25	ug/L	05/10/17 16:00	
1,2-Dichloropropane	<1.000	50.00	52.68	105	52.50	105	73-126	0	25	ug/L	05/10/17 16:00	
cis-1,3-Dichloropropene	<1.000	50.00	53.75	108	53.92	108	67-126	0	25	ug/L	05/10/17 16:00	
trans-1,3-Dichloropropene	<1.000	50.00	53.57	107	55.74	111	68-129	4	25	ug/L	05/10/17 16:00	
trans-1,2-Dichloroethene	<1.000	50.00	52.93	106	54.30	109	76-128	3	25	ug/L	05/10/17 16:00	
Ethylbenzene	<1.000	50.00	54.17	108	55.43	111	74-123	2	25	ug/L	05/10/17 16:00	
2-Hexanone	<5.000	50.00	40.93	82	41.73	83	38-125	2	25	ug/L	05/10/17 16:00	
Isopropylbenzene	<1.000	50.00	55.15	110	54.83	110	58-129	1	25	ug/L	05/10/17 16:00	
Methyl Acetate	<10.00	50.00	49.20	98	49.48	99	63-115	1	25	ug/L	05/10/17 16:00	
Methylcyclohexane	<10.00	50.00	51.52	103	50.34	101	69-130	2	25	ug/L	05/10/17 16:00	
Methylene Chloride	<1.000	50.00	52.54	105	52.47	105	76-124	0	25	ug/L	05/10/17 16:00	
4-Methyl-2-Pentanone	<5.000	50.00	40.14	80	41.62	83	35-123	4	25	ug/L	05/10/17 16:00	
Methyl-t-butyl ether	<1.000	50.00	50.48	101	52.45	105	64-129	4	25	ug/L	05/10/17 16:00	
Naphthalene	<1.000	50.00	48.87	98	49.05	98	45-109	0	25	ug/L	05/10/17 16:00	
Styrene	<1.000	50.00	57.22	114	57.76	116	61-124	1	25	ug/L	05/10/17 16:00	
1,1,2,2-Tetrachloroethane	<1.000	50.00	52.83	106	54.11	108	47-130	2	25	ug/L	05/10/17 16:00	
Tetrachloroethene	<1.000	50.00	50.48	101	50.95	102	68-139	1	25	ug/L	05/10/17 16:00	
Toluene	<1.000	50.00	53.73	107	54.67	109	79-128	2	25	ug/L	05/10/17 16:00	
1,2,3-Trichlorobenzene	<1.000	50.00	52.51	105	51.68	103	48-122	2	25	ug/L	05/10/17 16:00	
1,2,4-Trichlorobenzene	<1.000	50.00	50.39	101	51.58	103	54-124	2	25	ug/L	05/10/17 16:00	
1,1,1-Trichloroethane	<1.000	50.00	52.51	105	53.33	107	73-140	2	25	ug/L	05/10/17 16:00	
1,1,2-Trichloroethane	<1.000	50.00	53.07	106	53.54	107	78-124	1	25	ug/L	05/10/17 16:00	
Trichloroethene	<1.000	50.00	52.61	105	53.59	107	77-131	2	25	ug/L	05/10/17 16:00	
Trichlorofluoromethane	<5.000	50.00	52.09	104	51.47	103	73-144	1	25	ug/L	05/10/17 16:00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	50.67	101	50.56	101	65-140	0	25	ug/L	05/10/17 16:00	
Vinyl Chloride	<1.000	50.00	52.57	105	51.65	103	60-146	2	25	ug/L	05/10/17 16:00	
m,p-Xylenes	<2.000	100	110.9	111	109.3	109	75-125	1	25	ug/L	05/10/17 16:00	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050818

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 142446 Matrix: Waste Water Date Prep: 05/10/17
Parent Sample Id: 17050818-001 MS Sample Id: 17050818-001 S MSD Sample Id: 17050818-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	55.04	110	56.24	112	69-126	2	25	ug/L	05/10/17 16:00	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	99		99		86-111	%	05/10/17 16:00
Dibromofluoromethane	99		98		91-119	%	05/10/17 16:00
Toluene-D8	99		99		90-117	%	05/10/17 16:00

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 142550 Matrix: Water Date Prep: 05/13/17
MB Sample Id: 66128-1-BLK LCS Sample Id: 66128-1-BKS LCSD Sample Id: 66128-1-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	30.14	100	29.49	98	50-150	2	20	ug/L	05/13/17 08:47	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	97		104		101		80-120	%	05/13/17 08:47

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.

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@wspgroup.com FAX NO.: ( )

*PROJECT NAME: Koppers PROJECT NO.:

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

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

PSS Work Order #: 1705081 8 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														REMARKS
								HCl	HCl												
							Analysis/ Method Required (3) *														
									1,4 Dioxane (8260 SIM)												
								VOCs (8260)													
1	Effluent VSP-4	5/8/17	1020	WW	3	G	X														
2	Influent VSP-1	5/8/17	0955	GW	6	G	X	X													
3	TB-050817	—	—	DW	2	—	X														

(5)

Relinquished By: (1)	Date	Time	Received By:
	5/8/17	1605	
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

Custody Seal: Cooler Intact

Ice Present: PRES Temp: 7°-9°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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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17050818	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	05/08/2017 04:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Client
Disposal Date	06/12/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	9
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

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: 05/08/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 05/09/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17050819

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

May 17, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

May 17, 2017

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

Reference: PSS Work Order(s) No: **17050819**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17050819**.

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 June 12, 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): 17050819

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/08/2017 at 04:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17050819-001	Effluent VSP-4	WASTE WATER	05/08/17 10:20

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: 17050819

WSP USA - Herndon, Herndon, VA

May 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 05/08/2017 10:20** **PSS Sample ID: 17050819-001**
Matrix: WASTE WATER **Date/Time Received: 05/08/2017 16:05**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**3.5**	ug/L	1.0		1	05/10/17	05/10/17 21:06	1033
Lead	ND	ug/L	1.0		1	05/10/17	05/10/17 21:06	1033
Nickel	**9.3**	ug/L	1.0		1	05/10/17	05/10/17 21:06	1033
Zinc	ND	ug/L	20		1	05/10/17	05/10/17 21:06	1033

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**4.7**	ug/L	1.0		1	05/10/17	05/10/17 16:46	1033
Lead	ND	ug/L	1.0		1	05/10/17	05/10/17 16:46	1033
Nickel	**9.4**	ug/L	1.0		1	05/10/17	05/10/17 16:46	1033
Zinc	**20.2**	ug/L	20.0		1	05/10/17	05/10/17 16:46	1033
Hardness (Ca & Mg)	**15**	mg/L	2.3		1	05/10/17	05/10/17 16:46	1033

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050819

WSP USA - Herndon, Herndon, VA

May 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 05/08/2017 10:20** **PSS Sample ID: 17050819-001**
Matrix: WASTE WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 13:11	1011
Chloromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Vinyl Chloride	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Bromomethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Chloroethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Methylene Chloride	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Chloroform	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Benzene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Trichloroethene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Bromodichloromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Toluene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Tetrachloroethylene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Dibromochloromethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Chlorobenzene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Ethylbenzene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
Bromoform	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050819

WSP USA - Herndon, Herndon, VA

May 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 05/08/2017 10:20** **PSS Sample ID: 17050819-001**
Matrix: WASTE WATER **Date/Time Received: 05/08/2017 16:05**

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	05/10/17	05/10/17 13:11	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	05/10/17	05/10/17 13:11	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	05/09/17	05/09/17 16:38	1051

Biochemical Oxygen Demand Analytical Method: SM 5210B -2011

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	2.00		05/10/17	05/15/17 11:30	4006

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17050819
Project ID: 31400390-9

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.

17050819: Analyses associated with analyst code 4006 were performed by Microbac - Baltimore - VA 460285

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

Analytical Data Package Information Summary

Work Order(s): 17050819
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	17050819-001	1033	W	66048	142444	05/08/2017	05/10/2017 09:12	05/10/2017 16:46
	66048-1-BKS	BKS	66048-1-BKS	1033	W	66048	142444	--------	05/10/2017 09:12	05/10/2017 15:48
	66048-1-BLK	BLK	66048-1-BLK	1033	W	66048	142444	--------	05/10/2017 09:12	05/10/2017 15:41
	WSSC-samp pt Bldg 503 - Day 2 S	MS	17050803-002 S	1033	W	66048	142444	05/05/2017	05/10/2017 09:12	05/10/2017 16:27
	514 Spring Ln-05092017 S	MS	17050929-001 S	1033	W	66048	142444	05/09/2017	05/10/2017 09:12	05/10/2017 19:15
	WSSC-samp pt Bldg 503 - Day 2 SD	MSD	17050803-002 SD	1033	W	66048	142444	05/05/2017	05/10/2017 09:12	05/10/2017 16:33
EPA 200.8	Effluent VSP-4	Initial	17050819-001	1033	W	66053	142465	05/08/2017	05/10/2017 09:51	05/10/2017 21:06
	66053-1-BKS	BKS	66053-1-BKS	1033	W	66053	142465	--------	05/10/2017 09:51	05/10/2017 19:48
	66053-1-BLK	BLK	66053-1-BLK	1033	W	66053	142465	--------	05/10/2017 09:51	05/10/2017 19:41
	DSFLC S	MS	17050406-001 S	1033	W	66053	142465	04/28/2017	05/10/2017 09:51	05/10/2017 20:01
	Millville 001 S	MS	17050918-001 S	1033	W	66053	142465	05/09/2017	05/10/2017 09:51	05/10/2017 21:45
	DSFLC SD	MSD	17050406-001 SD	1033	W	66053	142465	04/28/2017	05/10/2017 09:51	05/10/2017 20:07
EPA 624	Effluent VSP-4	Initial	17050819-001	1011	W	66076	142445	05/08/2017	05/10/2017 07:53	05/10/2017 13:11
	66076-1-BKS	BKS	66076-1-BKS	1011	W	66076	142445	--------	05/10/2017 07:53	05/10/2017 10:06
	66076-1-BLK	BLK	66076-1-BLK	1011	W	66076	142445	--------	05/10/2017 07:53	05/10/2017 12:16
	Effluent VSP-4 S	MS	17050819-001 S	1011	W	66076	142445	05/08/2017	05/10/2017 07:53	05/10/2017 13:51
	Effluent VSP-4 SD	MSD	17050819-001 SD	1011	W	66076	142445	05/08/2017	05/10/2017 07:53	05/10/2017 14:31
SM 2540D -2011	Effluent VSP-4	Initial	17050819-001	1051	W	142404	142404	05/08/2017	05/09/2017 16:38	05/09/2017 16:38
	142404-1-BLK	BLK	142404-1-BLK	1051	W	142404	142404	--------	05/09/2017 16:38	05/09/2017 16:38
	Millville 001 D	MD	17050918-001 D	1051	W	142404	142404	05/09/2017	05/09/2017 16:38	05/09/2017 16:38
SM 5210B -2011	Effluent VSP-4	Initial	17050819-001	4006	W	142645	142645	05/08/2017	05/10/2017 00:00	05/15/2017 11:30

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050819

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 142445 Matrix: Waste Water Date Prep: 05/10/2017
PSS Sample ID: 17050819-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	105		87-114	%	05/10/17 13:11
4-Bromofluorobenzene	99		90-114	%	05/10/17 13:11
Toluene-D8	100		93-108	%	05/10/17 13:11

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 17050819

WSP USA - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 142404 Matrix: Water
MB Sample Id: 142404-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	05/09/17 16:38	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 142444 Matrix: Water Date Prep: 05/10/17
MB Sample Id: 66048-1-BLK LCS Sample Id: 66048-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	430.9	108	85-115	ug/L	05/10/17 15:48	
Copper	<1.000	40.00	43.67	109	85-115	ug/L	05/10/17 15:48	
Lead	<1.000	40.00	42.50	106	85-115	ug/L	05/10/17 15:48	
Magnesium	<100	400	440.5	110	85-115	ug/L	05/10/17 15:48	
Nickel	<1.000	40.00	43.56	109	85-115	ug/L	05/10/17 15:48	
Zinc	<20.00	200	215.3	108	85-115	ug/L	05/10/17 15:48	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 142465 Matrix: Water Date Prep: 05/10/17
MB Sample Id: 66053-1-BLK LCS Sample Id: 66053-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	<1.000	0	85-115	ug/L	05/10/17 19:48	L
Lead	<1.000	40.00	<1.000	0	85-115	ug/L	05/10/17 19:48	L
Nickel	<1.000	40.00	<1.000	0	85-115	ug/L	05/10/17 19:48	L
Zinc	<20.00	200	<20.00	0	85-115	ug/L	05/10/17 19:48	L

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050819

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 142445 Matrix: Water Date Prep: 05/10/17

MB Sample Id: 66076-1-BLK LCS Sample Id: 66076-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	61.90	103	51-139	ug/L	05/10/17 10:06	
Chloromethane	<5.000	60.00	62.02	103	56-144	ug/L	05/10/17 10:06	
Vinyl Chloride	<5.000	60.00	57.03	95	46-157	ug/L	05/10/17 10:06	
Bromomethane	<5.000	60.00	61.88	103	63-134	ug/L	05/10/17 10:06	
Chloroethane	<5.000	60.00	56.87	95	56-143	ug/L	05/10/17 10:06	
Trichlorofluoromethane	<5.000	60.00	66.06	110	56-138	ug/L	05/10/17 10:06	
1,1-Dichloroethene	<5.000	60.00	59.20	99	63-134	ug/L	05/10/17 10:06	
Methylene Chloride	<5.000	60.00	53.45	89	65-126	ug/L	05/10/17 10:06	
trans-1,2-dichloroethene	<5.000	60.00	56.86	95	67-129	ug/L	05/10/17 10:06	
1,1-Dichloroethane	<5.000	60.00	61.96	103	66-131	ug/L	05/10/17 10:06	
Chloroform	<5.000	60.00	59.11	99	69-130	ug/L	05/10/17 10:06	
1,1,1-Trichloroethane	<5.000	60.00	57.17	95	66-129	ug/L	05/10/17 10:06	
Carbon Tetrachloride	<5.000	60.00	60.27	100	70-133	ug/L	05/10/17 10:06	
Benzene	<5.000	60.00	60.35	101	69-127	ug/L	05/10/17 10:06	
1,2-Dichloroethane	<5.000	60.00	61.87	103	62-133	ug/L	05/10/17 10:06	
Trichloroethene	<5.000	60.00	58.96	98	71-127	ug/L	05/10/17 10:06	
1,2-Dichloropropane	<5.000	60.00	60.82	101	67-133	ug/L	05/10/17 10:06	
Bromodichloromethane	<5.000	60.00	60.58	101	63-132	ug/L	05/10/17 10:06	
2-Chloroethyl Vinyl Ether	<5.000	60.00	66.60	111	21-140	ug/L	05/10/17 10:06	
cis-1,3-Dichloropropene	<5.000	60.00	57.32	96	65-128	ug/L	05/10/17 10:06	
Toluene	<5.000	60.00	63.58	106	67-130	ug/L	05/10/17 10:06	
trans-1,3-dichloropropene	<5.000	60.00	59.72	100	63-127	ug/L	05/10/17 10:06	
1,1,2-Trichloroethane	<5.000	60.00	65.16	109	62-136	ug/L	05/10/17 10:06	
Tetrachloroethylene	<5.000	60.00	61.15	102	64-135	ug/L	05/10/17 10:06	
Dibromochloromethane	<5.000	60.00	59.18	99	65-126	ug/L	05/10/17 10:06	
Chlorobenzene	<5.000	60.00	59.90	100	70-127	ug/L	05/10/17 10:06	
Ethylbenzene	<5.000	60.00	61.97	103	71-131	ug/L	05/10/17 10:06	
Bromoform	<5.000	60.00	56.98	95	58-128	ug/L	05/10/17 10:06	
1,1,2,2-Tetrachloroethane	<5.000	60.00	60.32	101	63-134	ug/L	05/10/17 10:06	
1,3-Dichlorobenzene	<5.000	60.00	61.06	102	67-128	ug/L	05/10/17 10:06	
1,4-Dichlorobenzene	<5.000	60.00	60.91	102	67-127	ug/L	05/10/17 10:06	
1,2-Dichlorobenzene	<5.000	60.00	60.47	101	67-126	ug/L	05/10/17 10:06	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	110		106		87-114	%	05/10/17 10:06
4-Bromofluorobenzene	102		90		90-114	%	05/10/17 10:06
Toluene-D8	100		102		93-108	%	05/10/17 10:06

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050819

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 142445 Matrix: Waste Water Date Prep: 05/10/17

Parent Sample Id: 17050819-001 MS Sample Id: 17050819-001 S MSD Sample Id: 17050819-001 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	55.73	93	68.31	114	38-157	20	25	ug/L	05/10/17 13:51	
Chloromethane	<5.000	60.00	73.61	123	85.30	142	43-155	15	25	ug/L	05/10/17 13:51	
Vinyl Chloride	<5.000	60.00	75.79	126	83.40	139	48-154	10	25	ug/L	05/10/17 13:51	
Bromomethane	<5.000	60.00	71.28	119	84.65	141	52-143	17	25	ug/L	05/10/17 13:51	
Chloroethane	<5.000	60.00	69.32	116	80.34	134	47-150	15	25	ug/L	05/10/17 13:51	
Trichlorofluoromethane	<5.000	60.00	70.41	117	78.28	130	59-142	11	25	ug/L	05/10/17 13:51	
1,1-Dichloroethene	<5.000	60.00	54.85	91	63.85	106	55-138	15	25	ug/L	05/10/17 13:51	
Methylene Chloride	<5.000	60.00	54.58	91	66.95	112	60-133	20	25	ug/L	05/10/17 13:51	
trans-1,2-dichloroethene	<5.000	60.00	54.00	90	65.93	110	62-133	20	25	ug/L	05/10/17 13:51	
1,1-Dichloroethane	<5.000	60.00	62.32	104	75.79	126	62-134	20	25	ug/L	05/10/17 13:51	
Chloroform	<5.000	60.00	57.83	96	71.22	119	53-142	21	25	ug/L	05/10/17 13:51	
1,1,1-Trichloroethane	<5.000	60.00	56.75	95	65.57	109	63-135	14	25	ug/L	05/10/17 13:51	
Carbon Tetrachloride	<5.000	60.00	61.09	102	68.50	114	62-134	11	25	ug/L	05/10/17 13:51	
Benzene	<5.000	60.00	59.06	98	72.08	120	56-138	20	25	ug/L	05/10/17 13:51	
1,2-Dichloroethane	<5.000	60.00	62.81	105	78.78	131	61-132	23	25	ug/L	05/10/17 13:51	
Trichloroethene	<5.000	60.00	58.22	97	68.29	114	57-142	16	25	ug/L	05/10/17 13:51	
1,2-Dichloropropane	<5.000	60.00	60.98	102	75.89	126	56-141	22	25	ug/L	05/10/17 13:51	
Bromodichloromethane	<5.000	60.00	60.05	100	76.04	127	52-141	23	25	ug/L	05/10/17 13:51	
2-Chloroethyl Vinyl Ether	<5.000	60.00	<5.000	0	<5.000	0	21-140	NC	25	ug/L	05/10/17 13:51	X
cis-1,3-Dichloropropene	<5.000	60.00	54.02	90	68.74	115	29-156	24	25	ug/L	05/10/17 13:51	
Toluene	<5.000	60.00	61.22	102	73.72	123	55-141	19	25	ug/L	05/10/17 13:51	
trans-1,3-dichloropropene	<5.000	60.00	59.82	100	74.34	124	27-156	22	25	ug/L	05/10/17 13:51	
1,1,2-Trichloroethane	<5.000	60.00	66.82	111	83.18	139	50-151	22	25	ug/L	05/10/17 13:51	
Tetrachloroethylene	<5.000	60.00	60.70	101	68.82	115	43-148	13	25	ug/L	05/10/17 13:51	
Dibromochloromethane	<5.000	60.00	59.96	100	75.33	126	45-146	23	25	ug/L	05/10/17 13:51	
Chlorobenzene	<5.000	60.00	60.22	100	73.00	122	57-140	19	25	ug/L	05/10/17 13:51	
Ethylbenzene	<5.000	60.00	61.71	103	72.54	121	58-146	16	25	ug/L	05/10/17 13:51	
Bromoform	<5.000	60.00	60.24	100	74.77	125	42-145	22	25	ug/L	05/10/17 13:51	
1,1,2,2-Tetrachloroethane	<5.000	60.00	59.56	99	73.83	123	48-156	21	25	ug/L	05/10/17 13:51	
1,3-Dichlorobenzene	<5.000	60.00	60.40	101	72.61	121	54-141	18	25	ug/L	05/10/17 13:51	
1,4-Dichlorobenzene	<5.000	60.00	62.24	104	75.24	125	54-140	19	25	ug/L	05/10/17 13:51	
1,2-Dichlorobenzene	<5.000	60.00	59.01	98	75.00	125	53-141	24	25	ug/L	05/10/17 13:51	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Dibromofluoromethane	106		107		87-114	%	05/10/17 13:51
4-Bromofluorobenzene	83	*	82	*	90-114	%	05/10/17 13:51
Toluene-D8	101		100		93-108	%	05/10/17 13:51

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.

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

(1) *CLIENT: USP *OFFICE LOC. Herndon, VA

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

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

*PROJECT NAME: Kaflex PROJECT NO.: 31400396-9

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

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

PSS Work Order #: 17050819 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)	BOD5	TSS	Total dissolved metals: Zn, Cu, Pb, Ni	Total metals: Zn, Cu, Pb, Ni	Hardness, $CaCO_3$	REMARKS
							HCl					HNO3	HNO3	
1	Effluent USP-4	5/8/17	1026	WW	3	G	+							
2	Effluent USP-4	5/8/17	1020	WW	1	G		X						
3	Effluent USP-4	5/8/17	1020	WW	1	G			X					
4	Effluent USP-4	5/8/17	1020	WW	1	G				X				Lab to filter
5	Effluent USP-4	5/8/17	1020	WW	1	G					X	X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	5/8/17	1605	
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

Custody Seal: ABSW Code-Intact

Ice Present: PRES Temp: 7.9°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17050819	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	05/08/2017 04:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Client
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	06/12/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	9
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

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: Amber Confer Date: 05/09/2017

PM Review and Approval: Amber Confer Date: 05/09/2017

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17050820

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

May 15, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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

PHASE SEPARATION SCIENCE, INC.

May 15, 2017

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

Reference: PSS Work Order(s) No: **17050820**
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 **17050820**.

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 June 12, 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): 17050820

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/08/2017 at 04:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17050820-001	Effluent VSP-4	WASTE WATER	05/08/17 10:20

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

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: 17050820

WSP USA - Herndon, Herndon, VA

May 15, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: Effluent VSP-4 **Date/Time Sampled: 05/08/2017 10:20** **PSS Sample ID: 17050820-001**

Matrix: WASTE WATER **Date/Time Received: 05/08/2017 16:05**

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	05/13/17	05/13/17 10:40	1011

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17050820

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): **17050820**
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-Modified	Effluent VSP-4	Initial	17050820-001	1011	W	66128	142550	05/08/2017	05/13/2017 07:56	05/13/2017 10:40
	66128-1-BKS	BKS	66128-1-BKS	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 08:47
	66128-1-BLK	BLK	66128-1-BLK	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 10:17
	66128-1-BSD	BSD	66128-1-BSD	1011	W	66128	142550	--------	05/13/2017 07:56	05/13/2017 09:09

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050820

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 142550 Matrix: Waste Water Date Prep: 05/13/2017
PSS Sample ID: 17050820-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	101		80-120	%	05/13/17 10:40

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 17050820

WSP USA - Herndon
Kop-Flex

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

Seq Number: 142550 Matrix: Water Date Prep: 05/13/17

MB Sample Id: 66128-1-BLK LCS Sample Id: 66128-1-BKS LCSD Sample Id: 66128-1-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	30.14	100	29.49	98	50-150	2	20	ug/L	05/13/17 08:47	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	97		104		101		80-120	%	05/13/17 08:47

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.

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@uspgroup.com FAX NO.: ( )
*PROJECT NAME: Kopflex PROJECT NO.:
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Mark Kaplan DW CERT NO.:

PSS Work Order #: 17050820 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	Analysis/ Method Required (3) * 1,4 Dioxane (8260 SIM)	REMARKS
1	Effluent USP-4	5/8/17	1020	WW	3	G		X	

(5)

Relinquished By:	Date	Time	Received By:
(1)	5/8/17	1605	
(2)			
(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

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE

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

# of Coolers: 1
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 7°-9°C
Shipping Carrier: Client

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17050820	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	05/08/2017 04:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Client
Disposal Date	06/12/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	9
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

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 3

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: 05/08/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 05/09/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17050821

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-9

May 15, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

May 15, 2017

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

Reference: PSS Work Order(s) No: **17050821**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-9

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 **17050821**.

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 June 12, 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): 17050821

Project ID: 31400390-9

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/08/2017 at 04:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17050821-001	Effluent VSP-4	WASTE WATER	05/08/17 10:20

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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ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17050821

WSP USA - Herndon, Herndon, VA

May 15, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-9

Sample ID: Effluent VSP-4 **Date/Time Sampled: 05/08/2017 10:20** **PSS Sample ID: 17050821-001**
Matrix: WASTE WATER **Date/Time Received: 05/08/2017 16:05**

Inorganic Anions — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrite (as N)	ND	mg/L	0.10		1	05/08/17	05/08/17 17:31	1053
Nitrate (as N)	**0.91**	mg/L	0.10		1	05/08/17	05/08/17 17:31	1053

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	ND	mg/L	0.4		05/12/17	05/12/17 13:40	4005

Nitrogen, Organic — Analytical Method: N_ORG Calc. TKN-NH3

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Organic (as N)	ND	mg/L			05/09/17	05/09/17 13:32	4005

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	05/09/17	05/09/17 13:32	1053

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17050821
Project ID: 31400390-9

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.

17050821: 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.

EPA 351.2

Analytical Data Package Information Summary

Work Order(s): 17050821
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 300.0	Effluent VSP-4	Initial	17050821-001	1053	W	66018	142383	05/08/2017	05/08/2017 16:31	05/08/2017 17:31
	66018-1-BKS	BKS	66018-1-BKS	1053	W	66018	142383	--------	05/08/2017 13:56	05/08/2017 12:40
	66018-1-BLK	BLK	66018-1-BLK	1053	W	66018	142383	--------	05/08/2017 13:56	05/08/2017 12:17
	66018-1-BSD	BSD	66018-1-BSD	1053	W	66018	142383	--------	05/08/2017 13:56	05/08/2017 13:02
	G2 CY Pond S	MS	17050806-001 S	1053	W	66018	142383	05/08/2017	05/08/2017 13:56	05/08/2017 17:09
EPA 351.2	Effluent VSP-4	Initial	17050821-001	4005	W	142542	142542	05/08/2017	05/12/2017 13:40	05/12/2017 13:40
N_ORG Calc. TKN-NH3	Effluent VSP-4	Initial	17050821-001	4005	W	142542	142542	05/08/2017	05/09/2017 13:32	05/09/2017 13:32
SM 4500-NH3-F - 2011	Effluent VSP-4	Initial	17050821-001	1053	W	66035	142393	05/08/2017	05/09/2017 10:16	05/09/2017 13:32
	66035-1-BKS	BKS	66035-1-BKS	1053	W	66035	142393	--------	05/09/2017 10:16	05/09/2017 13:12
	66035-1-BLK	BLK	66035-1-BLK	1053	W	66035	142393	--------	05/09/2017 10:16	05/09/2017 13:08
	66035-1-BSD	BSD	66035-1-BSD	1053	W	66035	142393	--------	05/09/2017 10:16	05/09/2017 13:16
	G2 CY Pond S	MS	17050806-001 S	1053	W	66035	142393	05/08/2017	05/09/2017 10:16	05/09/2017 13:24
	G2 CY Pond SD	MSD	17050806-001 SD	1053	W	66035	142393	05/08/2017	05/09/2017 10:16	05/09/2017 13:28

PHASE SEPARATION SCIENCE, INC.

QC Summary 17050821

WSP USA - Herndon
Kop-Flex

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B
Seq Number: 142393 Matrix: Water Date Prep: 05/09/17
MB Sample Id: 66035-1-BLK LCS Sample Id: 66035-1-BKS LCSD Sample Id: 66035-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.441	98	2.486	99	85-115	2	20	mg/L	05/09/17 13:12	

Analytical Method: EPA 300.0 Prep Method: E300.0P
Seq Number: 142383 Matrix: Water Date Prep: 05/08/17
MB Sample Id: 66018-1-BLK LCS Sample Id: 66018-1-BKS LCSD Sample Id: 66018-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrite (as N)	<0.1000	5.000	5.410	108	4.818	96	90-110	12	20	mg/L	05/08/17 12:40	
Nitrate (as N)	<0.1000	5.000	4.809	96	4.599	92	90-110	4	20	mg/L	05/08/17 12:40	

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.

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

(1) *CLIENT: USP *OFFICE LOC.: Herndon, VA
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 705-6500
EMAIL: eric.johnson@uspgroup.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.: 3400390-9
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Maria Kaplan DW CERT NO.:

PSS Work Order #: 1705021 PAGE ____ OF ____

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) * Nitrogen (Ammonia) E-350.1	Nitrogen TKN E-351.2	Inorganic Anions (300.0)	REMARKS
1	Effluent USP-4	5/8/17	1020	WW	1	G		X			
2	Effluent USP-4	5/8/17	1020	WW	1	G			X		
3	Effluent USP-4	5/8/17	1020	WW	1	G				X	

(5)

Relinquished By:	Date	Time	Received By:
(1)	5/8/17	1605	
(2)			
(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
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 7°-9°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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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17050821	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	05/08/2017 04:05:00 PM
Project Name	Kop-Flex	**Delivered By**	Client
Project Number	31400390-9	**Tracking No**	Not Applicable
Disposal Date	06/12/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	9
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

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 3

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)	Yes
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
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: 05/08/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 05/09/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17062103

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

June 29, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

June 29, 2017

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

Reference: PSS Work Order(s) No: **17062103**
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 **17062103**.

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 July 26, 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): 17062103

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 06/21/2017 at 10:35 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17062103-001	Effluent VSP-4	WASTE WATER	06/21/17 09:00
17062103-002	Effluent VSP-4	WASTE WATER	06/21/17 09:00
17062103-003	Effluent VSP-4	WASTE WATER	06/21/17 09:00
17062103-004	Effluent VSP-4	WASTE WATER	06/21/17 09:00
17062103-005	Effluent VSP-4	WASTE WATER	06/21/17 09:00

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: 17062103

WSP USA - Herndon, Herndon, VA

June 29, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 06/21/2017 09:00** **PSS Sample ID: 17062103-001**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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		06/22/17	06/27/17 14:30	4005

Sample ID: Effluent VSP-4 **Date/Time Sampled: 06/21/2017 09:00** **PSS Sample ID: 17062103-002**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	2.0		1	06/26/17	06/26/17 09:56	1061

Sample ID: Effluent VSP-4 **Date/Time Sampled: 06/21/2017 09:00** **PSS Sample ID: 17062103-003**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**1.9**	ug/L	1.0		1	06/22/17	06/23/17 16:24	1051
Lead	ND	ug/L	1.0		1	06/22/17	06/23/17 16:24	1051
Nickel	**9.3**	ug/L	1.0		1	06/22/17	06/23/17 16:24	1051
Zinc	ND	ug/L	20		1	06/22/17	06/23/17 16:24	1051

Sample ID: Effluent VSP-4 **Date/Time Sampled: 06/21/2017 09:00** **PSS Sample ID: 17062103-004**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**3,440**	ug/L	100		1	06/22/17	06/22/17 19:08	1051
Copper	**4.3**	ug/L	1.0		1	06/22/17	06/23/17 14:07	1051
Lead	ND	ug/L	1.0		1	06/22/17	06/22/17 19:08	1051
Magnesium	**1,400**	ug/L	100		1	06/22/17	06/22/17 19:08	1051
Nickel	**9.2**	ug/L	1.0		1	06/22/17	06/22/17 19:08	1051
Zinc	ND	ug/L	20		1	06/22/17	06/22/17 19:08	1051
Hardness (Ca & Mg)	**14**	mg/L	0.66		1	06/22/17	06/22/17 19:08	1051

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17062103

WSP USA - Herndon, Herndon, VA

June 29, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 06/21/2017 09:00** **PSS Sample ID: 17062103-005**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

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

pH=1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Chloromethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Vinyl Chloride	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Bromomethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Chloroethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Methylene Chloride	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Chloroform	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Benzene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Trichloroethene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Bromodichloromethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Toluene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Tetrachloroethylene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Dibromochloromethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Chlorobenzene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Ethylbenzene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
Bromoform	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17062103

WSP USA - Herndon, Herndon, VA

June 29, 2017

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

Sample ID: Effluent VSP-4 **Date/Time Sampled: 06/21/2017 09:00** **PSS Sample ID: 17062103-005**
Matrix: WASTE WATER **Date/Time Received: 06/21/2017 10:35**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624
pH=1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dichlorobenzene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	06/27/17	06/27/17 12:52	1011

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17062103
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.

17062103: Analyses associated with analyst code 4005 were performed by Enviro-Chem Laboratories, Inc.

Analytical:

Volatile Organics Compounds (TVO)

Batch: 143954

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): 17062103
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	17062103-004	1051	W	66698	143851	06/21/2017	06/22/2017 09:47	06/22/2017 19:08
	66698-1-BKS	BKS	66698-1-BKS	1051	W	66698	143851	--------	06/22/2017 09:47	06/22/2017 18:23
	66698-1-BLK	BLK	66698-1-BLK	1051	W	66698	143851	--------	06/22/2017 09:47	06/22/2017 18:16
	2017_2NDQTR_Oakridge_Sump S	MS	17062014-001 S	1051	W	66698	143851	06/19/2017	06/22/2017 09:47	06/22/2017 18:36
	2017_2NDQTR_Oakridge_Sump SD	MSD	17062014-001 SD	1051	W	66698	143851	06/19/2017	06/22/2017 09:47	06/22/2017 18:42
	Effluent VSP-4	Reanalysis	17062103-004	1051	W	66698	143864	06/21/2017	06/22/2017 09:47	06/23/2017 14:07
EPA 200.8	Effluent VSP-4	Initial	17062103-003	1051	W	66696	143894	06/21/2017	06/22/2017 09:42	06/23/2017 16:24
	66696-1-BKS	BKS	66696-1-BKS	1051	W	66696	143894	--------	06/22/2017 09:42	06/23/2017 15:33
	66696-1-BLK	BLK	66696-1-BLK	1051	W	66696	143894	--------	06/22/2017 09:42	06/23/2017 15:26
	2017_2NDQTR_Oakridge_Sump S	MS	17062014-001 S	1051	W	66696	143894	06/19/2017	06/22/2017 09:42	06/23/2017 15:46
	2017_2NDQTR_Oakridge_Sump SD	MSD	17062014-001 SD	1051	W	66696	143894	06/19/2017	06/22/2017 09:42	06/23/2017 15:59
EPA 624	Effluent VSP-4	Initial	17062103-005	1011	W	66764	143954	06/21/2017	06/27/2017 07:58	06/27/2017 12:52
	66764-1-BKS	BKS	66764-1-BKS	1011	W	66764	143954	--------	06/27/2017 07:58	06/27/2017 11:22
	66764-1-BLK	BLK	66764-1-BLK	1011	W	66764	143954	--------	06/27/2017 07:58	06/27/2017 12:02
	Effluent VSP-4 S	MS	17062103-005 S	1011	W	66764	143954	06/21/2017	06/27/2017 07:58	06/27/2017 15:31
	Effluent VSP-4 SD	MSD	17062103-005 SD	1011	W	66764	143954	06/21/2017	06/27/2017 07:58	06/27/2017 16:11
SM 2540D -2011	Effluent VSP-4	Initial	17062103-002	1061	W	143884	143884	06/21/2017	06/26/2017 09:56	06/26/2017 09:56
	143884-1-BLK	BLK	143884-1-BLK	1061	W	143884	143884	--------	06/26/2017 09:56	06/26/2017 09:56
	Effluent VSP-4 D	MD	17062103-002 D	1061	W	143884	143884	06/21/2017	06/26/2017 09:56	06/26/2017 09:56
SM 5210B -2011	Effluent VSP-4	Initial	17062103-001	4005	W	143983	143983	06/21/2017	06/22/2017 00:00	06/27/2017 14:30

PHASE SEPARATION SCIENCE, INC.

QC Summary 17062103

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 143954 Matrix: Waste Water Date Prep: 06/27/2017
PSS Sample ID: 17062103-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	101		87-114	%	06/27/17 12:52
4-Bromofluorobenzene	139	*	90-114	%	06/27/17 12:52
Toluene-D8	93		93-108	%	06/27/17 12:52

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 17062103

WSP USA - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 143884 Matrix: Water
MB Sample Id: 143884-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	06/26/17 09:56	

Analytical Method: SM 2540D -2011
Seq Number: 143884 Matrix: Waste Water
Parent Sample Id: 17062103-002 MD Sample Id: 17062103-002 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Suspended Solids	<2.000	<2.000	0	10	mg/L	06/26/17 09:56	U

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 143894 Matrix: Water Date Prep: 06/22/17
MB Sample Id: 66696-1-BLK LCS Sample Id: 66696-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	36.04	90	85-115	ug/L	06/23/17 15:33	
Lead	<1.000	40.00	34.77	87	85-115	ug/L	06/23/17 15:33	
Nickel	<1.000	40.00	35.96	90	85-115	ug/L	06/23/17 15:33	
Zinc	<20.00	200	184.5	92	85-115	ug/L	06/23/17 15:33	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 143851 Matrix: Water Date Prep: 06/22/17
MB Sample Id: 66698-1-BLK LCS Sample Id: 66698-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	399.1	100	85-115	ug/L	06/22/17 18:23	
Copper	<1.000	40.00	39.90	100	85-115	ug/L	06/22/17 18:23	
Lead	<1.000	40.00	37.64	94	85-115	ug/L	06/22/17 18:23	
Magnesium	<100	400	399.8	100	85-115	ug/L	06/22/17 18:23	
Nickel	<1.000	40.00	39.42	99	85-115	ug/L	06/22/17 18:23	
Zinc	<20.00	200	192.6	96	85-115	ug/L	06/22/17 18:23	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17062103

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 143954 Matrix: Water Date Prep: 06/27/17

MB Sample Id: 66764-1-BLK LCS Sample Id: 66764-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	53.16	89	51-139	ug/L	06/27/17 11:22	
Chloromethane	<5.000	60.00	52.16	87	56-144	ug/L	06/27/17 11:22	
Vinyl Chloride	<5.000	60.00	55.55	93	46-157	ug/L	06/27/17 11:22	
Bromomethane	<5.000	60.00	62.08	103	63-134	ug/L	06/27/17 11:22	
Chloroethane	<5.000	60.00	56.34	94	56-143	ug/L	06/27/17 11:22	
Trichlorofluoromethane	<5.000	60.00	63.48	106	56-138	ug/L	06/27/17 11:22	
1,1-Dichloroethene	<5.000	60.00	56.55	94	63-134	ug/L	06/27/17 11:22	
Methylene Chloride	<5.000	60.00	54.44	91	65-126	ug/L	06/27/17 11:22	
trans-1,2-dichloroethene	<5.000	60.00	58.65	98	67-129	ug/L	06/27/17 11:22	
1,1-Dichloroethane	<5.000	60.00	58.46	97	66-131	ug/L	06/27/17 11:22	
Chloroform	<5.000	60.00	55.26	92	69-130	ug/L	06/27/17 11:22	
1,1,1-Trichloroethane	<5.000	60.00	59.51	99	66-129	ug/L	06/27/17 11:22	
Carbon Tetrachloride	<5.000	60.00	59.94	100	70-133	ug/L	06/27/17 11:22	
Benzene	<5.000	60.00	58.29	97	69-127	ug/L	06/27/17 11:22	
1,2-Dichloroethane	<5.000	60.00	55.34	92	62-133	ug/L	06/27/17 11:22	
Trichloroethene	<5.000	60.00	57.87	96	71-127	ug/L	06/27/17 11:22	
1,2-Dichloropropane	<5.000	60.00	58.69	98	67-133	ug/L	06/27/17 11:22	
Bromodichloromethane	<5.000	60.00	57.16	95	63-132	ug/L	06/27/17 11:22	
2-Chloroethyl Vinyl Ether	<5.000	60.00	23.95	40	21-140	ug/L	06/27/17 11:22	
cis-1,3-Dichloropropene	<5.000	60.00	57.21	95	65-128	ug/L	06/27/17 11:22	
Toluene	<5.000	60.00	59.02	98	67-130	ug/L	06/27/17 11:22	
trans-1,3-dichloropropene	<5.000	60.00	51.93	87	63-127	ug/L	06/27/17 11:22	
1,1,2-Trichloroethane	<5.000	60.00	57.68	96	62-136	ug/L	06/27/17 11:22	
Tetrachloroethylene	<5.000	60.00	59.99	100	64-135	ug/L	06/27/17 11:22	
Dibromochloromethane	<5.000	60.00	59.31	99	65-126	ug/L	06/27/17 11:22	
Chlorobenzene	<5.000	60.00	61.58	103	70-127	ug/L	06/27/17 11:22	
Ethylbenzene	<5.000	60.00	60.57	101	71-131	ug/L	06/27/17 11:22	
Bromoform	<5.000	60.00	62.06	103	58-128	ug/L	06/27/17 11:22	
1,1,2,2-Tetrachloroethane	<5.000	60.00	63.01	105	63-134	ug/L	06/27/17 11:22	
1,3-Dichlorobenzene	<5.000	60.00	62.46	104	67-128	ug/L	06/27/17 11:22	
1,4-Dichlorobenzene	<5.000	60.00	60.91	102	67-127	ug/L	06/27/17 11:22	
1,2-Dichlorobenzene	<5.000	60.00	63.14	105	67-126	ug/L	06/27/17 11:22	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	101		100		87-114	%	06/27/17 11:22
4-Bromofluorobenzene	138	*	100		90-114	%	06/27/17 11:22
Toluene-D8	94		99		93-108	%	06/27/17 11:22

PHASE SEPARATION SCIENCE, INC.

QC Summary 17062103

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 143954 Matrix: Waste Water Date Prep: 06/27/17

Parent Sample Id: 17062103-005 MS Sample Id: 17062103-005 S MSD Sample Id: 17062103-005 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	57.49	96	65.22	109	38-157	13	25	ug/L	06/27/17 15:31	
Chloromethane	<5.000	60.00	54.85	91	62.81	105	43-155	14	25	ug/L	06/27/17 15:31	
Vinyl Chloride	<5.000	60.00	58.09	97	65.96	110	48-154	13	25	ug/L	06/27/17 15:31	
Bromomethane	<5.000	60.00	65.41	109	72.26	120	52-143	10	25	ug/L	06/27/17 15:31	
Chloroethane	<5.000	60.00	57.80	96	65.07	108	47-150	12	25	ug/L	06/27/17 15:31	
Trichlorofluoromethane	<5.000	60.00	63.24	105	72.34	121	59-142	13	25	ug/L	06/27/17 15:31	
1,1-Dichloroethene	<5.000	60.00	57.90	97	65.89	110	55-138	13	25	ug/L	06/27/17 15:31	
Methylene Chloride	<5.000	60.00	56.14	94	64.08	107	60-133	13	25	ug/L	06/27/17 15:31	
trans-1,2-dichloroethene	<5.000	60.00	60.86	101	69.55	116	62-133	13	25	ug/L	06/27/17 15:31	
1,1-Dichloroethane	<5.000	60.00	59.20	99	68.75	115	62-134	15	25	ug/L	06/27/17 15:31	
Chloroform	<5.000	60.00	57.47	96	65.19	109	53-142	13	25	ug/L	06/27/17 15:31	
1,1,1-Trichloroethane	<5.000	60.00	62.00	103	73.15	122	63-135	17	25	ug/L	06/27/17 15:31	
Carbon Tetrachloride	<5.000	60.00	61.03	102	70.31	117	62-134	14	25	ug/L	06/27/17 15:31	
Benzene	<5.000	60.00	60.61	101	69.34	116	56-138	13	25	ug/L	06/27/17 15:31	
1,2-Dichloroethane	<5.000	60.00	57.42	96	64.77	108	61-132	12	25	ug/L	06/27/17 15:31	
Trichloroethene	<5.000	60.00	59.38	99	68.12	114	57-142	14	25	ug/L	06/27/17 15:31	
1,2-Dichloropropane	<5.000	60.00	60.42	101	69.28	115	56-141	14	25	ug/L	06/27/17 15:31	
Bromodichloromethane	<5.000	60.00	60.28	100	67.56	113	52-141	11	25	ug/L	06/27/17 15:31	
2-Chloroethyl Vinyl Ether	<5.000	60.00	<5.000	0	<5.000	0	21-140	NC	25	ug/L	06/27/17 15:31	X
cis-1,3-Dichloropropene	<5.000	60.00	60.36	101	68.74	115	29-156	13	25	ug/L	06/27/17 15:31	
Toluene	<5.000	60.00	61.74	103	70.45	117	55-141	13	25	ug/L	06/27/17 15:31	
trans-1,3-dichloropropene	<5.000	60.00	54.62	91	62.09	103	27-156	13	25	ug/L	06/27/17 15:31	
1,1,2-Trichloroethane	<5.000	60.00	62.85	105	69.27	115	50-151	10	25	ug/L	06/27/17 15:31	
Tetrachloroethylene	<5.000	60.00	62.55	104	71.78	120	43-148	14	25	ug/L	06/27/17 15:31	
Dibromochloromethane	<5.000	60.00	62.64	104	72.19	120	45-146	14	25	ug/L	06/27/17 15:31	
Chlorobenzene	<5.000	60.00	64.26	107	75.08	125	57-140	16	25	ug/L	06/27/17 15:31	
Ethylbenzene	<5.000	60.00	63.15	105	74.75	125	58-146	17	25	ug/L	06/27/17 15:31	
Bromoform	<5.000	60.00	64.70	108	75.64	126	42-145	16	25	ug/L	06/27/17 15:31	
1,1,2,2-Tetrachloroethane	<5.000	60.00	65.13	109	73.33	122	48-156	12	25	ug/L	06/27/17 15:31	
1,3-Dichlorobenzene	<5.000	60.00	65.09	108	75.76	126	54-141	15	25	ug/L	06/27/17 15:31	
1,4-Dichlorobenzene	<5.000	60.00	62.42	104	73.72	123	54-140	17	25	ug/L	06/27/17 15:31	
1,2-Dichlorobenzene	<5.000	60.00	66.64	111	76.86	128	53-141	14	25	ug/L	06/27/17 15:31	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Dibromofluoromethane	99		98		87-114	%	06/27/17 15:31
4-Bromofluorobenzene	98		96		90-114	%	06/27/17 15:31
Toluene-D8	99		97		93-108	%	06/27/17 15:31

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.

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.: 31400390-09
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Marie Kapfer DW CERT NO.:

PSS Work Order #: 17062103 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) * BOD 5	TSS	Total Mercury 1631E	Total metals: 200.8 Ag, As, Pb, Ni	Hardness (SM2340B)	COCs (624)	REMARKS
1	Effluent VSP-4	6/21/17 ~~0900~~	0900	WW	1	G		X						
2	Effluent VSP-4	6/21/17	0900	WW	1	G			X					
3	Effluent VSP-4	6/21/17	0900	WW	1	G				X				Lab to filter
4	Effluent VSP-4	6/21/17	0900	WW	1	G					X	X		
5	Effluent VSP-4	6/21/17	0900	WW	3	G							X	

(5)

Relinquished By: (1)	Date	Time	Received By:
	6/21/17	1035	
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 -14°C
Custody Seal: Cooler-Intact
Ice Present: PRES Temp: 12°-14°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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17062103	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	06/21/2017 10:35:00 AM
Project Name	Kop-Flex	**Delivered By**	Client
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	07/26/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	14
Seal(s) Signed / Dated?	Yes	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 5 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

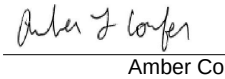
Comments: (Any "No" response must be detailed in the comments section below.)

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: 06/21/2017

Thomas Wingate

PM Review and Approval:  Date: 06/21/2017

Amber Confer

E WELL ABANDONMENT RECORDS

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year) DN15030 - MW07-22

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.151207
LONGITUDE -76.702187

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 21.6 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	21.6

VOLUME OF MATERIAL USED
67 lbs Portland cement
4 lbs granular bentonite

Kevin Pluecke MWD552 (MWD) / MSD / MGS 1/15/2016
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030 - MW1956

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552

CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.150940

LONGITUDE -76.703163

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 55.8 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	55.8

VOLUME OF MATERIAL USED
174 lbs Portland cement
10 lbs granular bentonite

Kevin P Weigle MW0552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) / MSD / MGS
CIRCLE ONE

DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN 15030 - MW 06-36

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149044

LONGITUDE -76.701889

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 38.6 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
cement grout slurry	0	38.6

VOLUME OF MATERIAL USED

120 lbs Portland cement
7 lbs granular bentonite

Kevin Pluviegle MWD552 (MWD) / MSD / MGS
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN 15030-MW14-47

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149364

LONGITUDE -76.701622

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 41.6 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	41.6

VOLUME OF MATERIAL USED

130 lbs Portland cement
7 lbs granular bentonite

Kevin P Weigle MWD 552 (MWD) / MSD / MGS ⊛
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

DN 15030 - MW 10-27

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.150402

LONGITUDE -76.700401

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 22.5 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
cement grout slurry	0	22.5

VOLUME OF MATERIAL USED

70 lbs portland cement
4 lbs granular bentonite

Kevin Weigle MWD 552 (MWD) / MSD / MGS
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030-OW2-55

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmons Road

LATITUDE 39.150223

LONGITUDE 76.702156

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 54.95 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement grout slurry	0	54.95

VOLUME OF MATERIAL USED

172 lbs Portland cement
10 lbs granular bentonite

Kevin P Weigle MWD 552 (MWD) / MSD / MGS
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

DN15030 - MW38-28

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.150089

LONGITUDE -76.702393

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 25.3 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	25.3

VOLUME OF MATERIAL USED

79 lbs Portland cement
4 lbs granular bentonite

Kevin Weigle MWP552 (MWD) / MSD / MGS ____
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN1503Ø - OW1-56

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.150040

LONGITUDE -76.702400

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 56 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	56

VOLUME OF MATERIAL USED

174 lbs portland cement
10 lbs granular bentonite.

Kevin Weigle MWS 552 (MWD) / MSD / MGS
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN 15030-TW1-63

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149952

LONGITUDE -76.702110

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 4 INCHES IN DIAMETER

DEPTH OF WELL: 64.25 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	64.25

VOLUME OF MATERIAL USED

402 lbs Portland cement
23 lbs. granular bentonite

Kevin P Weigle mwd552 (MWD) / MSD / MGS 1/15/16
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030-MW5-31

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149670

LONGITUDE -76.702156

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 28.8 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	28.8

VOLUME OF MATERIAL USED

90 lbs Portland cement
5 lbs granular bentonite

Kevin Weigle MWD552 (MWD) / MSD / MGS
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

DN15030- MW26D-105

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149361

LONGITUDE -76.701714

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 104.9 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	104.9

VOLUME OF MATERIAL USED

328 lbs Portland cement
19 lbs granular bentonite

Kevin P Weigle MWD 552 MWD / MSD / MGS
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

DN15030- MW17-52

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149311

LONGITUDE -76.700714

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 51.6 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	51.6

VOLUME OF MATERIAL USED

161 lbs Portland cement
9 lbs granular bentonite

Kevin Pluegge MWD552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) / MSD / MGS
CIRCLE ONE

DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

DN15030-MW17D-97

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149311
LONGITUDE -76.700684

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 92.68 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
cement grout slurry	0	92.68

VOLUME OF MATERIAL USED
290 lbs Portland cement
17 lbs granular bentonite

Kevin Weigle MWD 552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) / MSD / MGS
CIRCLE ONE

DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030 - TW2-145

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149059

LONGITUDE -76.700233

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 4 INCHES IN DIAMETER

DEPTH OF WELL: 151.8 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement Grout Slurry	0	151.8

VOLUME OF MATERIAL USED

951 lbs Portland cement
551 lbs granular bentonite.

Kevin Weigle MWD 552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) / MSD / MGS
CIRCLE ONE

DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030-MW08-42

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552

CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.150040

LONGITUDE -76.699303

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 44 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement Grout Slurry	0	44

VOLUME OF MATERIAL USED

137 lbs Portland cement.
8 lbs granular bentonite

Kevin P Weigle MWP 552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) / MSD / MGS
CIRCLE ONE

DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

DN15030-MW11-60

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.150188

LONGITUDE -76.700638

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 56.95 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
Cement Grout Slurry	0	56.95

VOLUME OF MATERIAL USED

178 lbs Portland cement
10 lbs granular bentonite

Kevin P Weigle MWD552 MWD / MSD / MGS
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030- MW12-48

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149605

LONGITUDE -76.700584

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 4 INCHES IN DIAMETER

DEPTH OF WELL: 48.3 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement Grout Slurry	0	48.3

VOLUME OF MATERIAL USED

302 lbs Portland cement
17 lbs granular bentonite

Kevin P Weigle MWD 552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) MSD / MGS
CIRCLE ONE

DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030 - MW15-40

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/2016 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149876

LONGITUDE -76.700897

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 39.2 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement Grout Slurry	0	39.2

VOLUME OF MATERIAL USED

122 lbs Portland cement
7 lbs granular bentonite

Kevin Weigle MWD 552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) / MSD / MGS
CIRCLE ONE

DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030-MW02-40

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE (MWD) / MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149773

LONGITUDE -76.700233

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 42.15 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement Grout Slurry	0	42.15

VOLUME OF MATERIAL USED
132 lbs Portland cement
7 lbs granular bentonite

Kevin Pluegge MWD 552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) MSD / MGS
CIRCLE ONE

DATE

ORIGINAL

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

DN15030-MW2D-138

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 01/15/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Kevin Weigle WELL DRILLER'S LICENSE NUMBER: 552
CIRCLE: (MWD) MSD / MGD

* OWNER'S NAME: Kop Flex

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149818

LONGITUDE -76.700180

SITE LOCATION MAP

* TYPE OF WELL BEING ABANDONED:
✓ DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
✓ TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL ✓ PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

DEPTH OF WELL: 138.09 FEET DEEP

WAS ANY CASING REMOVED? ____ YES ✓ NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES ✓ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement Grout Slurry	0	138.09

VOLUME OF MATERIAL USED

432 lbs Portland cement
25 lbs granular bentonite

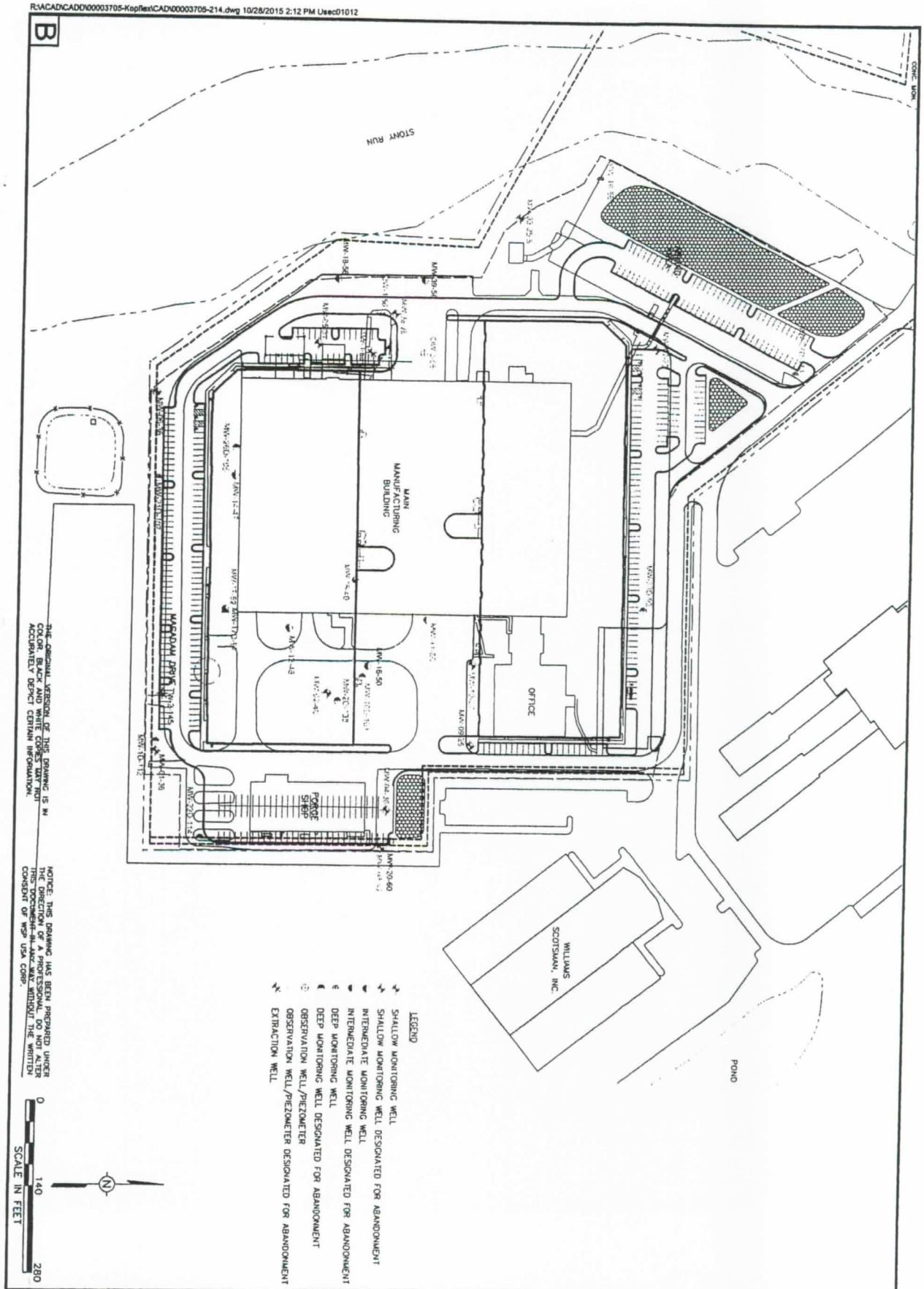
Kevin Weigle MWD552
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE#

(MWD) MSD / MGS
CIRCLE ONE

DATE

ORIGINAL

R:\CAD\CADD\00003705-Kopflex\CAD\00003705-214.dwg 10/28/2015 2:12 PM User:D1012



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 CORP.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK AND WHITE COPIES MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

WSP | PARSONS BRINCKERHOFF
WSP USA Corp.
13530 Dulles Technology Drive, Suite 300
Herdon, Virginia 20171
(703) 709-6500
www.wspgroup.com/usa

Figure 1

EXISTING WELLS PLANNED FOR ABANDONMENT

FORMER KOPFLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

Drawn By:	EGC
Checked:	
Approved:	5/29/2015
DWG Name:	00003705-214

A-ZONE
ENVIRONMENTAL SERVICES

May 20, 2016

Brian Chew
Supervisor, Well Construction and Groundwater Quality Program
Anne Arundel County Health Department
3 Harry S. Truman Pkwy.
Annapolis, MD 21401

Re: Well Abandonment Reports

Dear Mr. Chew:

Enclosed please find 5 completed well abandonment report forms for a site on Harman's Road.

With each report I have included two copies of the location map. Please retain one copy of the map for your records and forward the second copy onto the state.

If you have any questions or need any additional information, please do not hesitate to contact me at 304-724-6458 or csealander@a-zoneenvironmental.com.

Sincerely,

Christina J. Sealander

Christina J. Sealander
General Manager

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 4/12/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Jesse Morgan WELL DRILLER'S LICENSE NUMBER: MD 106
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: Emerson Corporation

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Hanmans Road

LATITUDE 39.149694
LONGITUDE 76.701814

SITE LOCATION MAP

See Attached Map

WSP-1
WSP-2
WSP-3
WSP-4
WSP-5
WSP-6

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 2 INCHES IN DIAMETER

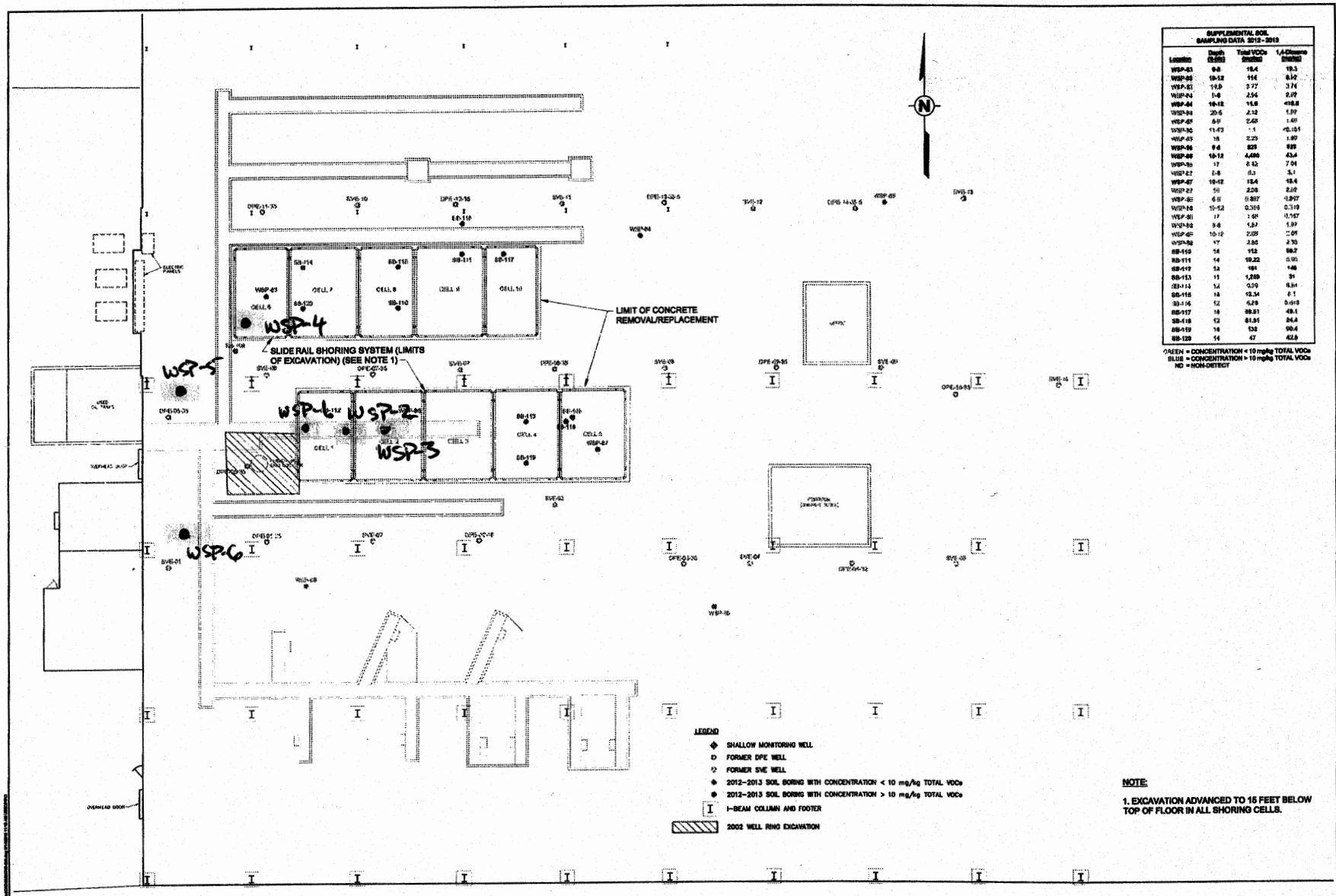
DEPTH OF WELL: 17 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet:

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Portland Cement	0	17

VOLUME OF MATERIAL USED



SUPPLEMENTAL SOIL SAMPLING DATA 2012 - 2013

Location	Depth (ft bls)	Total VOCs (mg/kg)	1,4-Dioxane (mg/kg)
WSP-01	8-8	18.4	18.3
WSP-02	10-12	144	8.97
WSP-03	10-12	9.77	3.74
WSP-04	7-8	2.54	2.07
WSP-04	10-12	11.6	<10.8
WSP-04	20-6	2.12	1.97
WSP-05	8-9	2.48	1.48
WSP-05	11-13	< 1	<0.104
WSP-05	16	2.25	1.89
WSP-06	8-8	823	925
WSP-06	10-12	4,486	43.4
WSP-06	17	8.42	7.04
WSP-07	8-8	6.3	5.1
WSP-07	10-12	18.4	18.4
WSP-07	16	2.08	2.08
WSP-08	6-8	0.887	<0.847
WSP-08	10-12	0.319	0.319
WSP-08	17	1.68	0.747
WSP-09	8-8	1.97	1.97
WSP-09	10-12	2.05	2.05
WSP-09	17	2.86	2.30
SB-110	14	112	59.7
SB-111	14	19.22	0.991
SB-117	14	181	148
SB-113	11	1,289	34
SB-114	14	0.39	0.34
SB-115	14	12.34	8.1
SB-116	12	6.28	0.618
SB-117	14	89.81	49.1
SB-118	12	81.91	24.4
SB-119	14	132	90.4
SB-120	14	47	42.9

GREEN = CONCENTRATION < 10 mg/kg TOTAL VOCs
BLUE = CONCENTRATION > 10 mg/kg TOTAL VOCs
ND = NON-DETECT

REFERENCE: GOOGLE EARTH PRO, IMAGE DATED 9/29/2013.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

REVISIONS

NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

SEAL

DRAWN BY: ESC
CHECKED:
APPROVED: 1/15/2015

AOC 1 SUPPLEMENTAL SOIL BORING LOCATIONS, RESULTS, AND EXCAVATION LIMITS

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

WSP | PARSONS BRINCKERHOFF
WSP USA Corp.
730 Holiday Drive, Suite 410
Pittsburgh, Pennsylvania 15220
(412) 604-1040
www.wsponline.com/usa

FIGURE 6

Drawing Number
00003705-228

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 4/11/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Jesse Morgan WELL DRILLER'S LICENSE NUMBER: MGD 106
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: Emerson Corporation

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Hermans Road

LATITUDE 39.149547

LONGITUDE 76.701939

SITE LOCATION MAP

See Attached Map

SVE-1
SVE-2
SVE-3
SVE-4
SVE-5
SVE-6
SVE-7
SVE-8
SVE-9
SVE-10

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 4 INCHES IN DIAMETER

DEPTH OF WELL: 16 FEET DEEP

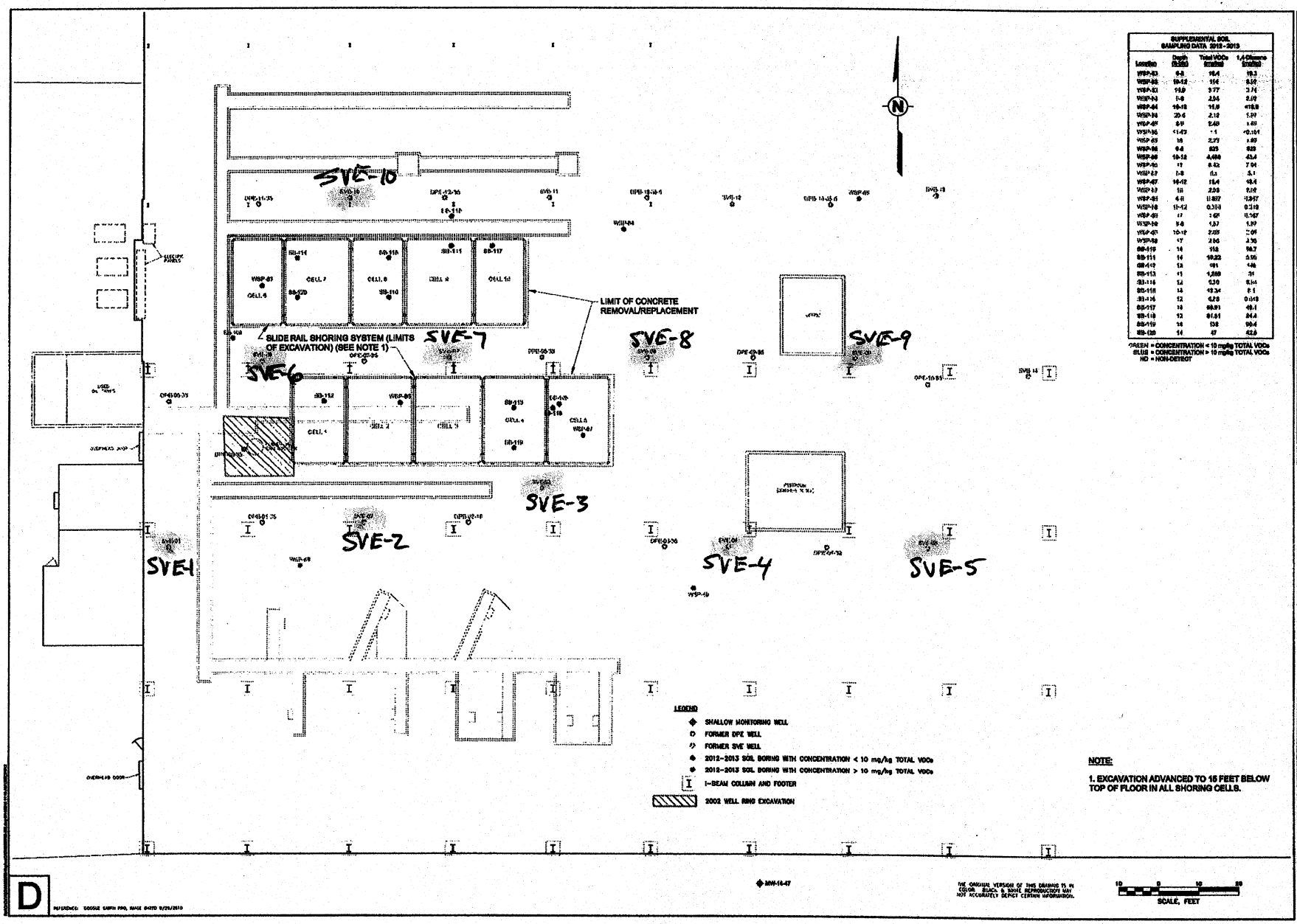
WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Portland Cement	0	16

VOLUME OF MATERIAL USED

15 Gallons



SUPPLEMENTAL SOIL SAMPLING DATA 2012 - 2013

Location	Depth (ft bgs)	Total VOCs (mg/kg)	1,4-Dioxane (mg/kg)
WSP-83	8-8	16.4	16.3
WSP-84	10-12	154	0.55
WSP-85	10-12	3.77	0.74
WSP-86	8-8	2.54	0.09
WSP-87	10-12	11.9	<10.9
WSP-88	20-6	2.12	1.97
WSP-89	8-8	2.49	1.69
WSP-90	11-12	< 1	<0.101
WSP-91	16	2.72	1.89
WSP-92	8-8	825	825
WSP-93	10-12	4,680	43.4
WSP-94	12	8.42	7.94
WSP-95	8-8	6.1	5.1
WSP-96	10-12	15.4	15.4
WSP-97	16	2.58	2.08
WSP-98	8-8	11,897	11,897
WSP-99	11-12	0.318	0.218
WSP-100	17	1.68	0.767
WSP-101	8-8	1.97	1.97
WSP-102	10-12	2.05	2.05
WSP-103	17	2.85	2.35
SB-109	14	118	98.7
SB-111	14	10.22	3.55
SB-112	13	191	146
SB-113	11	1,288	31
SB-114	12	0.39	0.34
SB-116	13	12.34	8.1
SB-116	12	0.78	0.018
SB-117	14	69.91	49.1
SB-118	12	81.61	64.4
SB-119	14	138	90.4
SB-120	14	47	42.8

GREEN = CONCENTRATION < 10 mg/kg TOTAL VOCs
BLUE = CONCENTRATION > 10 mg/kg TOTAL VOCs
ND = NON-DETECT

NOTE:

1. EXCAVATION ADVANCED TO 15 FEET BELOW TOP OF FLOOR IN ALL SHORING CELLS.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

REFERENCE: GOOGLE EARTH PRO, IMAGE DATED 9/29/2010

REVISIONS

REV	DESCRIPTION	BY	DATE
1			
2			
3			

SEAL

DRAWN BY: ESC
CHECKED: [illegible]
APPROVED: [illegible] 1/31/2013

AOC 1 SUPPLEMENTAL SOIL BORING LOCATIONS, RESULTS, AND EXCAVATION LIMITS

FORMER KOPPLEX FACILITY
HANOVER, MARYLAND
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

WSP | PARSONS BRINCKERHOFF
WSP USA Corp.
750 Maryland Drive, Suite 410
Philadelphia, Pennsylvania 19220
(610) 834-1040
www.wspgroup.com/usa

FIGURE 6

Drawing Number
00003705-228

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 4/12/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____
* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____
* PERSON ABANDONING WELL: Jesse Morgan WELL DRILLER'S LICENSE NUMBER: MGD 106
CIRCLE: MWD / MSD / (MGD)
* OWNER'S NAME: Emerson Corporation
* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149836
LONGITUDE 76.701511

SITE LOCATION MAP

See Attached Map
SVE-11
SVE-12
SVE-13
SVE-14

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 4 INCHES IN DIAMETER

DEPTH OF WELL: 16 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

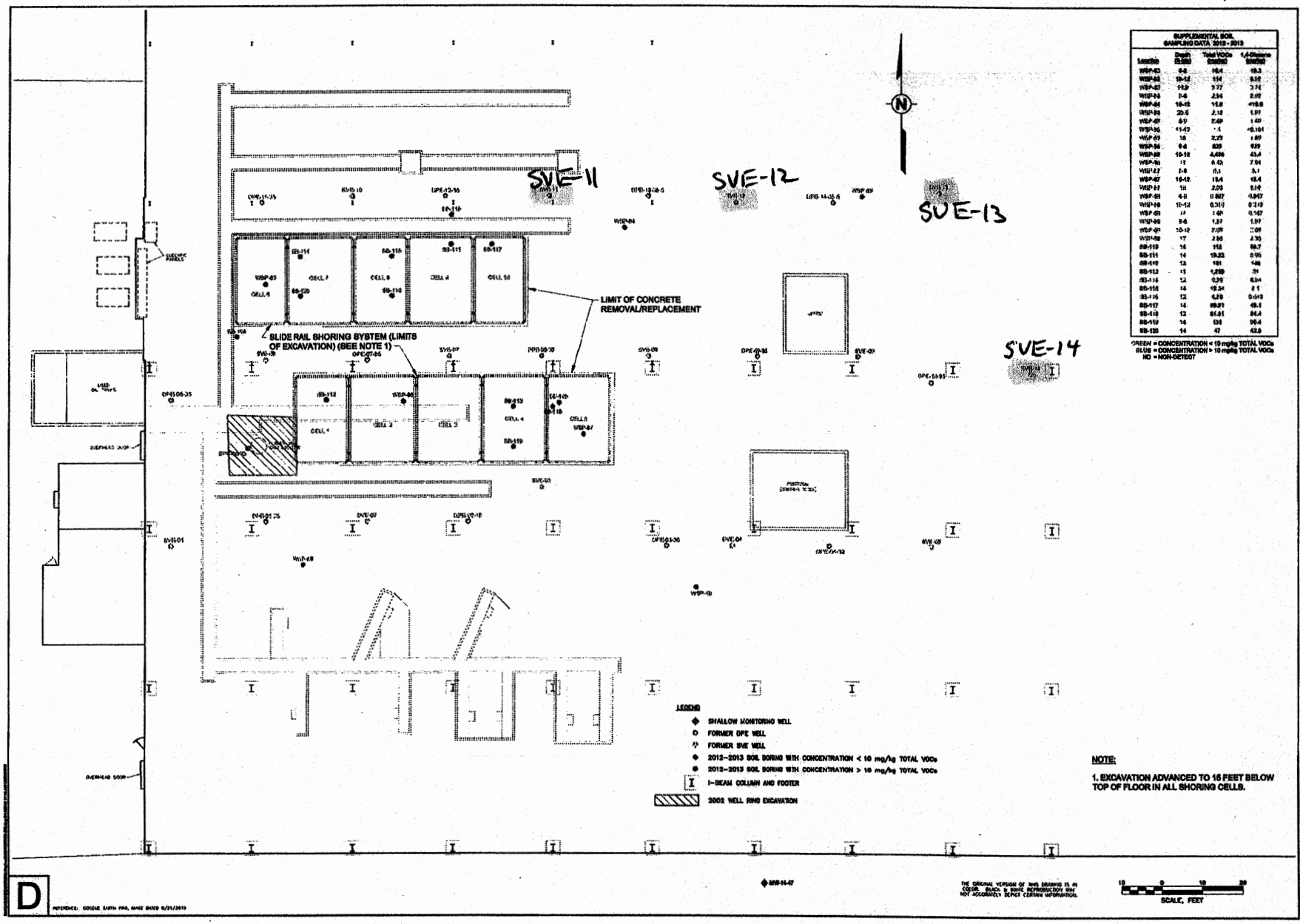
WAS CASING RIPPED OR PERFORATED? ____ YES X NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
Portland Cement	0	16

VOLUME OF MATERIAL USED

15 Gallons per Well



SUPPLEMENTAL SOIL SAMPLING DATA 2012 - 2013

Location	Depth (ft bgs)	Total VOCs (mg/kg)	1,4-Dioxane (mg/kg)
WSP-83	6-8	16.4	16.3
WSP-83	10-12	1.54	0.52
WSP-83	12-2	3.77	3.74
WSP-84	6-8	2.54	2.47
WSP-84	10-12	15.8	15.8
WSP-84	20-5	2.18	1.97
WSP-85	6-8	2.68	1.83
WSP-85	11-12	< 1	<0.101
WSP-85	16	2.25	1.89
WSP-86	6-8	629	629
WSP-86	10-12	4,696	4,694
WSP-86	12	8.43	7.84
WSP-87	6-8	11.1	5.1
WSP-87	10-12	18.4	18.4
WSP-87	16	2.08	0.12
WSP-88	6-8	11,807	11,807
WSP-88	10-12	0.312	0.312
WSP-88	17	1.49	0.167
WSP-89	6-8	1.97	1.97
WSP-89	10-12	2.09	2.09
WSP-89	17	2.85	2.76
SB-109	16	113	99.7
SB-111	14	19.23	0.05
SB-112	13	101	4.86
SB-113	15	1,289	31
SB-114	12	0.35	0.34
SB-115	14	12.54	0.1
SB-116	12	4.78	0.012
SB-117	14	99.81	48.1
SB-118	12	84.81	84.4
SB-119	16	101	99.4
SB-120	14	47	42.8

GREEN = CONCENTRATION < 10 mg/kg TOTAL VOCs
BLUE = CONCENTRATION > 10 mg/kg TOTAL VOCs
ND = NON-DETECT

REFERENCE: GOOGLE EARTH PRO, IMAGE DATED 9/21/2010

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

REVISIONS

REV	DESCRIPTION	BY	DATE
1			
2			
3			

DRAWN BY: DSC
CHECKED: AS
APPROVED: AS/JMF

AOC 1 SUPPLEMENTAL SOIL BORING LOCATIONS, RESULTS, AND EXCAVATION LIMITS

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

WSP | PARSONS BRINCKERHOFF
WSP USA Corp.
700 Holiday Drive, Suite 410
Pittsburgh, Pennsylvania 15220
(412) 924-1040
www.wspgroup.com/usa

FIGURE 6

Drawing Number
00003705–228

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 4/11/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Jesse Morgan WELL DRILLER'S LICENSE NUMBER: MGD06

CIRCLE: MWD / MSD / (MGD)

* OWNER'S NAME: Emerson Corporation

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Rd

LATITUDE 39.149647

LONGITUDE 76.701906

SITE LOCATION MAP

See Attached Map

DPE-1
DPE-2
DPE-3
DPE-4
DPE-5
DPE-6
DPE-7
DPE-8
DPE-9
DPE-10

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 4 INCHES IN DIAMETER

DEPTH OF WELL: 35 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

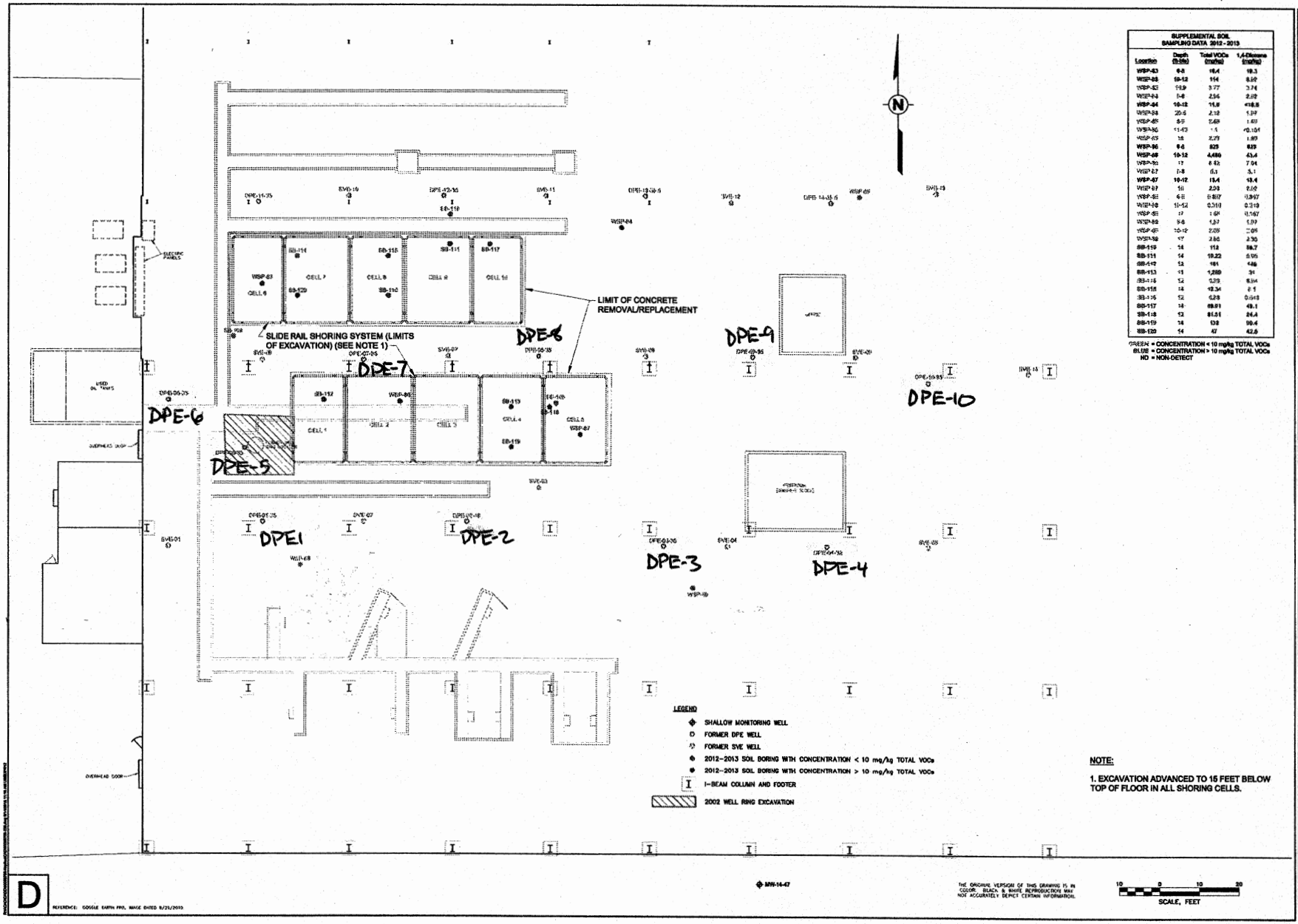
WAS CASING RIPPED OR PERFORATED? YES X NO

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
Portland Cement	0	35

VOLUME OF MATERIAL USED

30 gallons per well



SUPPLEMENTAL SOIL SAMPLING DATA 2012 - 2013

Location	Depth (ft-bls)	Total VOCs (mg/kg)	1,4-Dioxane (mg/kg)
WSP-63	6-8	16.4	18.3
WSP-66	10-12	154	8.59
WSP-62	14-16	3.77	3.74
WSP-64	6-8	2.54	2.02
WSP-64	10-12	11.8	<10.5
WSP-64	20-6	2.12	1.37
WSP-65	8-9	2.68	1.49
WSP-65	11-12	<5	<0.104
WSP-63	16	2.79	1.89
WSP-66	6-8	825	833
WSP-68	10-12	4,486	43.4
WSP-66	17	8.62	7.04
WSP-67	7-8	6.3	5.1
WSP-67	10-12	13.4	13.4
WSP-67	16	2.03	0.05
WSP-68	6-8	8,887	13,847
WSP-68	10-12	0.318	0.318
WSP-68	17	1.68	0.167
WSP-69	5-6	1.27	1.07
WSP-69	10-12	2.09	2.09
WSP-69	17	2.86	2.35
SB-110	14	112	86.7
SB-111	14	19.22	9.05
SB-112	13	181	146
SB-113	15	1,289	34
SB-114	12	0.39	0.04
SB-115	14	12.34	6.1
SB-116	12	0.28	0.043
SB-117	14	69.91	49.1
SB-118	12	81.51	24.4
SB-119	14	0.8	10.4
SB-120	14	47	42.6

GREEN = CONCENTRATION < 10 mg/kg TOTAL VOCs
BLUE = CONCENTRATION > 10 mg/kg TOTAL VOCs
ND = NON-DETECT

REFERENCE: GOOGLE EARTH PRO, IMAGE DATED 8/23/2010

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

REVISIONS

REV	DESCRIPTION	DATE
1	Change	10/4/13
2	Change	10/4/13
3	Change	10/4/13

DRAWN BY: EDC
CHECKED: JCT 4/25/2014
APPROVED

AOC 1 SUPPLEMENTAL SOIL BORING LOCATIONS, RESULTS, AND EXCAVATION LIMITS
FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND
FOR
EMERSON
ST. LOUIS, MISSOURI

WSP | PARSONS BRINCKERHOFF
WSP USA Corp.
750 Holiday Drive, Suite 410
Pittsburgh, Pennsylvania 15220
(412) 604-1040
www.wsponcourse.com

FIGURE 6

Drawing Number
00003705-228

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

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* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 4/11/16 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) ____ — ____

* PERMIT NUMBER OF REPLACEMENT WELL: ____ — ____

* PERSON ABANDONING WELL: Jesse Morgan WELL DRILLER'S LICENSE NUMBER: MGD 106
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: Emerson Corporation

* WELL LOCATION:
COUNTY: Anne Arundel
NEAREST TOWN: Hanover
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 7565 Harmans Road

LATITUDE 39.149881

LONGITUDE 76.701839

SITE LOCATION MAP

See Attached Map
DPE-11
DPE-12
DPE-13
DPE-14

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)
____

SIZE OF CASING: 4 INCHES IN DIAMETER

DEPTH OF WELL: 35 FEET DEEP

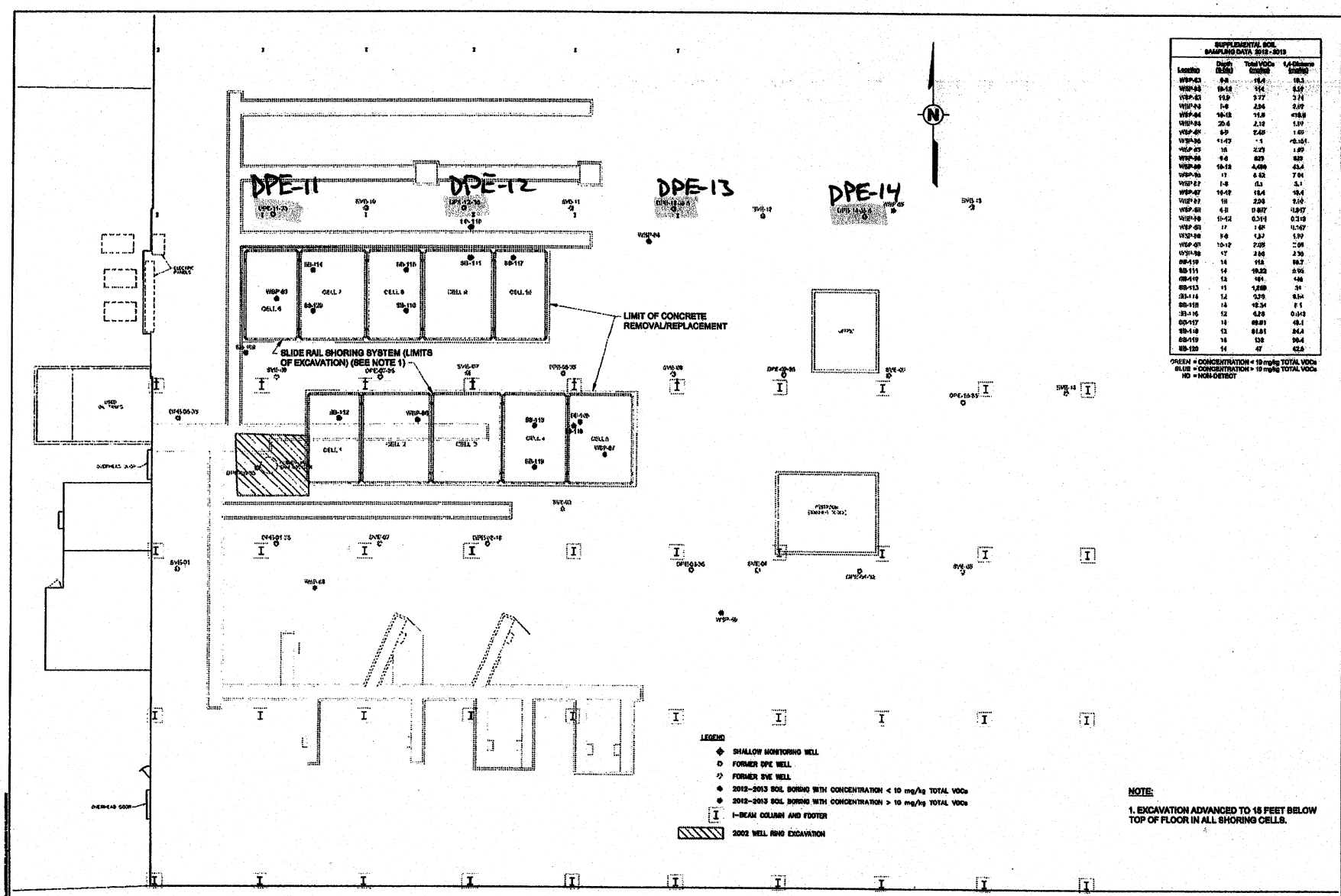
WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
Portaland Cement	0	35

VOLUME OF MATERIAL USED

30 gallons per well


DPE-11
DPE-12
DPE-13
DPE-14
LIMIT OF CONCRETE REMOVAL/REPLACEMENT
SLIDE RAIL SHORING SYSTEM (LIMITS OF EXCAVATION) (SEE NOTE 1)
CELL 1
CELL 2
CELL 3
CELL 4
CELL 5
CELL 6
CELL 7
CELL 8
CELL 9
CELL 10
SB-114
SB-115
SB-116
SB-117
SB-118
SB-119
SB-120
SB-112
WSP-65
WSP-66
WSP-67
WSP-68
WSP-69
SVE-01
SVE-02
SVE-03
SVE-04
SVE-05
SVE-06
SVE-07
SVE-08
SVE-09
SVE-10
SVE-11
SVE-12
SVE-13
SVE-14
SVE-15
SVE-16
SVE-17
SVE-18
SVE-19
DPE-06-35
DPE-07-35
DPE-08-35
DPE-09-35
DPE-10-35
DPE-11-35
DPE-12-35
DPE-13-35
DPE-14-35
DPE-15-35
DPE-16-35
DPE-17-35
DPE-18-35
DPE-19-35
DPE-20-35
DPE-21-35
DPE-22-35
DPE-23-35
DPE-24-35
DPE-25-35
DPE-26-35
DPE-27-35
DPE-28-35
DPE-29-35
DPE-30-35
DPE-31-35
DPE-32-35
DPE-33-35
DPE-34-35
DPE-35-35
DPE-36-35
DPE-37-35
DPE-38-35
DPE-39-35
DPE-40-35
DPE-41-35
DPE-42-35
DPE-43-35
DPE-44-35
DPE-45-35

F WSP FIELD STANDARD OPERATING PROCEDURES

FIELD STANDARD OPERATING PROCEDURE #3

SAMPLE PACKAGING AND SHIPMENT PROCEDURE

Shipping samples is a basic but important component of field work. The majority of field activities include the collection of environmental samples. Proper packing and preservation of those samples is critical to ensuring the integrity of our work product. The user is advised to read the entire standard operating procedure (SOP) and review the site health and safety plan (HASP) before beginning any onsite activities. In accordance with the HASP, proper personal protective equipment (PPE) must be selected and used appropriately.

3.1 ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
IATA	International Air Transport Association
HASP	Health and safety plan
PPE	Personal protective equipment
SOP	Standard operating procedure

3.2 MATERIALS

- Suitable shipping container (e.g., plastic cooler)
- Chain-of-custody forms
- Custody seals
- Sample container custody seals (as necessary)
- Mailing address labels (as necessary)
- Shipping form (with account number, as necessary)
- Tape (e.g., strapping, clear packing)
- Knife or scissors
- Permanent marker
- PPE
- Bubble wrap or other packing material

Temperature-preserved samples:

- Large plastic garbage bag
- Wet ice
- Heavy-duty zipper-style plastic bags
- Universal sorbent materials

Note: Some materials will be supplied by the laboratory, while others are must be supplied by the sampler. Confirm supplier of materials prior to mobilizing to the field.

3.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field

personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

This SOP is written for the sole use of company employees and will be revised periodically to reflect updates to company policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company SOPs. Employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

This SOP is designed to provide the user with a general outline for shipping samples and assumes the user is familiar with basic field procedures, such as recording field notes (SOP 1), sample collection and quality assurance procedures (SOP 4), and investigation derived waste management procedures (SOP 5).

Most environmental samples are classified non-hazardous materials due to unknown characteristics and hazardous classes, however environmental samples can meet the definition of DOT hazardous materials when shipped by air, ground, or rail from a project site to the laboratory (e.g., free product, samples preserved with a hazardous material [TerraCore® samplers]). As such, field staff must work with their assigned company compliance professional to determine whether the sample shipment is subject to any specific requirements (e.g., packaging, marking, labeling, and documentation) under the DOT hazardous materials regulations.

3.4 SAMPLE SHIPMENT PROCEDURES

The two major concerns in shipping samples are incidental breakage during shipment and complying with applicable DOT and courier requirements for hazardous materials shipments.

> **NOTE: Many couriers, including Federal Express and UPS, have requirements that the company register with them before shipping hazard materials. In most cases, it is the sampling location, not the company office address, which needs to be registered. Therefore, each project will likely have unique requirements. Please contact your company compliance professional to determine whether or not you will be required to register for your shipment.**

Protecting the samples from incidental breakage can be achieved using "common sense." Pack all samples in a manner that will prevent them from moving freely about in the cooler or shipping container. Do not allow glass surfaces to contact each other. When possible, repack the sample containers in the same materials that they were originally received in from the laboratory. Cushion each sample container with plastic bubble wrap, styrofoam, or other nonreactive cushioning material. A more detailed procedure for packing environmental samples is presented below.

3.4.1 NON-HAZARDOUS MATERIAL ENVIRONMENTAL SAMPLES

The first step in preparing your samples for shipment is securing an appropriate shipping container. In most cases, the analytical laboratory will supply the appropriate container for bottle shipment, which can be used to return samples once they have been collected. Be sure that the container is large enough to contain the samples plus a sufficient amount of packing materials, and if applicable, enough wet ice to maintain the samples at the preservation temperature (usually 4 degrees Celsius). Use additional shipping containers as needed so that sample containers are protected from breakage due to overcrowding. Do not use lunch-box sized coolers or soft sided coolers, which do not offer sufficient insulation or protection from damage.

3.4.1.1 TEMPERATURE-PRESERVED SAMPLE CONTAINER PREPARATION

Temperature-preserved samples should be shipped to the laboratory in an insulated container (e.g., cooler). If using a plastic cooler with a drain, securely tape the inside of the drain plug with duct tape or other material to ensure that no water leaks from the cooler during shipment. Place universal sorbent materials (e.g., sorbent pads) in the bottom of the insulated container. The amount of sorbent material must be sufficient to absorb any condensation from the wet ice and a reasonable volume of water from melted wet ice (if a bag were to rupture) or a damaged (aqueous) sample container.

The next step is to line the insulated container with a large, heavy-duty plastic garbage bag. If shipping breakable sample containers (e.g., glass), place bubble wrap or other packing materials on the bottom of the container. Place the samples on the packing materials with sufficient space to allow for the addition of more bubble wrap or other packing material between the sample containers. Place large or heavy sample containers on the bottom of the cooler with lighter samples placed on top to minimize the potential for breakage. Place all sample containers in the shipping container right-side up. Do not overfill the cooler with samples; room must be left for a sufficient volume of wet ice. Wet ice must be double-bagged in heavy-duty zipper-style plastic bags (1 gallon-sized, or less); properly seal both bags before placing in the insulated container. Place the bags of ice on top of or between the samples. Place as much ice as possible into the cooler to ensure the samples arrive at the lab at the required preservation temperature, even if the shipment is delayed. Fill any remaining space in the container with bubble wrap or other packing material to limit the airspace and minimize the shifting of the sample containers and in-transit melting of ice. Securely close the top of the heavy-duty plastic bag and seal with tape.

3.4.1.2 NON-TEMPERATURE-PRESERVED SAMPLE CONTAINER PREPARATION

Non-temperature-preserved samples should be shipped to the laboratory in a durable package (e.g., hard plastic container or cardboard box). If shipping breakable sample containers (e.g., glass), place bubble wrap or other packing materials on the bottom of the container. Place the samples on the packing materials with sufficient space to allow for the addition of more bubble wrap or other packing material between and on top of the sample containers. Place large or heavy sample containers on the bottom of the container with lighter samples placed on top to minimize the potential for breakage. Place all sample containers within the shipping container right-side up. Fill any remaining space in the container with bubble wrap or other packing material to limit the airspace and minimize the shifting of the sample containers and in-transit melting of ice.

3.4.1.3 CONTAINER SHIPMENT

Place the original, white, top copy of the chain-of-custody form (i.e., laboratory copy) into a heavy-duty zipper-style plastic bag, affix/tape the bag to the shipping container's inside lid, and then close the shipping container. Only one chain-of-custody form is required to accompany one of the shipping containers per sample shipment; the other coolers in the shipment do not need to include chain-of-custody forms. At this point, sample shipment preparations are complete if using a laboratory courier.

Once the shipping container is sealed, shake test the shipping container to make sure that there are no loose sample containers. If loose sample containers are detected, open the shipping container, repack the contents, and reseal the shipping container. If sending the sample shipment through a commercial shipping vendor, place two signed and dated chain-of-custody seals on alternate sides of the shipping container lid so that it cannot be opened without breaking the seals. Securely fasten the top of the shipping container shut with clear packing tape; carefully tape over the custody seals to prevent damage during shipping.

Using clear tape, affix a mailing label with the company's return address to the top of the shipping container. Ship environmental samples to the contracted analytical laboratory using an appropriate delivery schedule. If applicable, check the appropriate box on the airbill for Saturday delivery (you need to verify with the laboratory that someone will be at the laboratory on a Saturday to receive the sample shipment). Declare the value of samples on the shipping form for insurance purposes, if applicable, and be sure to include the project billable number on the shipping form's internal billing reference section. When shipping samples to a lab, identify a declared value equal to the carrier's default value ($100); additional fees will be charged based on a higher value declared. Our preferred carrier, Federal Express, will only reimburse for the actual value of the cooler and its contents if a sample shipment is lost; they will not reimburse for the cost of having to re-collect the samples. [Please note: if you are shipping something other than samples, such as field equipment, declare the replacement value of the contents.]

Record the tracking numbers from the shipping company forms (i.e., the airbill number) in the field book and retain a copy of the shipping airbill. On the expected delivery date, confirm sample receipt by contacting the laboratory or tracking the package using the tracking number; provide this confirmation information to the project manager.

NOTE: Most shipping carriers adhere to transit schedules with final pickup times each day; these schedules are subject to change and vary by service location. If shipping containers are dropped off at a service location after the final pickup time, transit to the laboratory will not be initiated until the following day, and samples may not be properly preserved. Therefore, confirm transit schedules in advance of each sampling event, and ensure samples are dropped off before the final pickup time of the day.

3.4.2 HAZARDOUS MATERIALS SAMPLES

Employees rarely ship hazardous materials due to DOT shipping requirements. If you find that your samples could be considered a DOT hazardous material, first coordinate with the assigned company compliance professional and project manager to make a hazardous material classification and, if necessary, establish the necessary protocols and to receive the appropriate training/certification.

NOTE: Employees shipping samples regulated as hazardous materials or exempt hazardous materials by air must have International Air Transport Association (IATA) training. IATA training is a separate training required in addition to DOT hazardous materials training for such shipments. Most of our employees do not have IATA training and therefore, anyone who needs to ship by air MUST consult with a company IATA-trained compliance professional.

FIELD STANDARD OPERATING PROCEDURE #11

GROUNDWATER SAMPLING PROCEDURE

Groundwater sampling procedures outlined in this Standard Operating Procedure (SOP) are designed to ensure that collected samples are representative of current site conditions. These procedures can be applied to permanently or temporarily-installed monitoring wells, direct-push sample points, water supply wells with installed plumbing, extraction wells for remedial groundwater treatment systems, and excavations where groundwater is present. The user is advised to read the entire SOP and review the site health and safety plan (HASP) before beginning any onsite activities. In accordance with the HASP, proper personal protective equipment (PPE) must be selected and used appropriately.

11.1 ACRONYMS AND ABBREVIATIONS

ID	Inside diameter
DI	Deionized
DNAPL	Dense non-aqueous phase liquid
DO	Dissolved oxygen
DTW	Depth-to-water
HASP	Health and safety plan
IDW	Investigation-derived waste
L/min	Liters per minute
LNAPL	Light non-aqueous phase liquid
mg/l	Milligrams per liter
mV	Millivolts
NAPL	Non-aqueous phase liquid
NTU	Nephelometric turbidity unit
ORP	Oxygen reduction potential
PID	Photoionization detector
PPE	Personal protective equipment
QAPP	Quality assurance project plan
SOP	Standard operating procedure
SU	Standard units
TD	Total depth
TOC	Top-of-casing
VOCs	Volatile organic compounds

11.2 MATERIALS

- Materials
- Field book
- PPE
- Air quality monitoring equipment (e.g., photoionization detector [PID]), as needed
- Electronic water level indicator or interface probe
- Water quality meter(s) with calibration reagents and standards, as needed
- Field test kits, as needed
- Adjustable wrench or manhole wrench, as needed
- Well key(s), as needed
- Pocket knife or scissors
- Power supply, as needed
- Sample bottles, labels, indelible markers, and clear tape
- Distilled (DI) water
- Container(s) for water storage (e.g., bucket, drum)
- Pump or bailers, tubing, and associated lanyard materials
- Filters, as needed
- Decontamination supplies

11.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

This SOP is written for the sole use of company employees and will be revised periodically to reflect updates to WSP policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company SOPs. WSP employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

This SOP is designed to provide the user with a general outline for conducting groundwater sampling and assumes the user is familiar with basic field procedures, such as recording field notes (SOP 1), utility location (SOP 2), sample shipment procedures (SOP 3), sample collection and quality assurance procedures (SOP 4), investigation derived waste (IDW) management procedures (SOP 5), equipment decontamination (SOP 6), and use and calibration of all sampling and monitoring equipment (SOPs 7 and 8). This SOP does not cover investigation planning, nor does it cover the analysis of the analytical results. These topics are more appropriately addressed in a project-specific work plan. Before groundwater sampling, be sure to review the project-specific work plan or quality assurance project plan (QAPP) and any applicable state and federal guidelines or sampling procedures. All sampling and monitoring references must be available for consultation in the field, including:

- Company SOPs
- Applicable state and federal guidelines or sampling procedures
- Manufacturer's manuals
- Project-specific work plan and HASP
- QAPP

11.4 GENERAL PROCEDURES

Although the techniques used to sample groundwater are varied, most sampling events can be broken down into a three-step sequence:

1 Gauging: The measurement of the water column height (i.e., total well depth less depth-to-water) within the well.

2 Purging: The removal of stagnant water from the well bore to ensure that samples collected are representative of groundwater conditions in the water-bearing zone surrounding the well.
3 Sample Collection: After purging, the collection of aliquots of groundwater in method-specific, preserved (as needed) containers.

The procedures and equipment that are used to accomplish these steps are project-specific and should be discussed by the project team before arriving onsite. All types of groundwater sampling, however, regardless of the equipment used, share common handling and management procedures that are designed to ensure the integrity of the samples collected. These procedures include:

— The use of new, disposable, decontaminated, or dedicated sampling equipment
— The use and rotation of the appropriate PPE
— Selection of a suitable sampling location and staging area

Wear a clean pair of new, disposable gloves each time a different sample is collected and don the gloves immediately prior to collection. This limits the possibility of cross-contamination from accidental contact with gloves soiled during collection of the previous sample. The gloves must not come in contact with the medium being sampled and must be changed any time during sample collection when their cleanliness is compromised. **In no case should gloved hands be used as a sampling device: always use the appropriate sampler to move the sample from the sampling device to the laboratory-supplied containers.**

11.4.1 EQUIPMENT SELECTION

Collect all samples using either new, disposable equipment or properly decontaminated sampling equipment. Groundwater purging and sampling equipment should be selected based on the analytical requirements of the project and the project specific conditions (e.g., well diameter, depth to water, dissolved constituents, etc.) likely to be encountered. The equipment should be constructed of non-reactive, non-leachable materials (e.g., stainless steel, Teflon®, Teflon®-coated steel, polyethylene, polypropylene, etc.) which are compatible with the chemical constituents at the site. Note that project or regulatory guidance may limit the type of equipment for groundwater sampling. When choosing groundwater purging and sampling equipment, give consideration to:

— the diameter and depth of the well
— the depth to groundwater
— the volume of water to be withdrawn
— the sampling and purging technique
— the volume of sample required
— the analytes of interest

Select the decontamination procedures based on the types of sampling to be performed and media encountered; decontamination may require multiple steps or differing cleaning methods (see SOP 6 for decontamination procedures). In no case should disposable, single use materials be used to collect more than one sample.

11.4.2 PRE-SAMPLING CONSIDERATIONS

In preparing for sampling, you should perform the following activities (with all observations and measurements noted in the field book and on the project-specific groundwater monitoring log, if appropriate):

— Perform a quick reconnaissance of the site to identify sampling locations and evaluate the accessibility to the sampling location.
— Record the approximate ambient air temperature, precipitation, wind (direction and speed), tide, and other field conditions. In addition, any site-specific conditions or situations that could potentially affect the samples at the sample locations should be recorded.
— Record sampling locations with respect to approximate distance to and direction from at least one permanent feature.
— Survey the breathing zone around the sampling location with the appropriate air quality meter(s), as necessary (see HASP), to ensure that the level of PPE is appropriate.
— As appropriate, install the pump, tubing, or passive sampler to the depth prescribed in the project-specific work plan or QAPP.

— Containerize and/or manage purge water in accordance with the project-specific work plan.

When sampling groundwater, it is important to find a suitable sampling location away from any sources of cross-contamination that could compromise the integrity of the samples. Consider the following:

— Position the sample collection area away from fuel-powered equipment, such as drill rigs or excavators, and upwind of other site activities (e.g., purging, sampling, decontamination) that could influence the sample. This is particularly important when screening samples in the field for volatile organic compounds with a PID, but should not be limited to the active sample collection.
— Establish a secure sample staging area in an uncontaminated area of the site.

11.5 GAUGING PROCEDURES

All wells should be opened to the atmosphere in advance of sampling to allow any pressure differentials, which could artificially raise or depress the water column in the well, to dissipate. The wells should be inspected to ensure that the protective casing is intact and has not been damaged. Remove the well covers and all standing water around the top of the well casing (for flush mounted-protective covers), as necessary, before opening the inner well cap or plug. Unlock and carefully remove well cap and allow the well to stand undisturbed for a minimum of 15 minutes before conducting any down-hole testing or measurements. If required by the HASP, survey the open well casing and the breathing zone around the wellhead with a PID to ensure that the level of PPE is appropriate.

11.5.1 GROUNDWATER LEVEL AND TOTAL DEPTH MEASUREMENT PROCEDURES

Depth to water (DTW) and total depth (TD) measurements are typically collected prior to sampling and are used to determine the volume water to be purged from the well (if using techniques other than no-purge or low flow sampling). The DTW measurements are also used after the sampling event is completed to establish the groundwater elevation, flow direction, and gradient. Unless otherwise directed, do not place any objects inside the casing of private water wells; accordingly, DTW and TD measurements should not be collected at private water wells. TD measurements are not required for low-flow and no-purge sampling applications and should not be measured before sampling the well.

Water level measurements must be collected within the shortest interval possible from all selected existing wells to be gauged during the event before beginning any purge and sampling procedures at the site. This will ensure a nearly instantaneous snapshot of the water levels before the formations are disturbed by pumping or acted upon by other outside influences, such as tides, precipitation, barometric pressure, river stage, or intermittent pumping of production, irrigation, or supply wells.

— Record the following observations and measurements in the field book:
— Measure the casing inside diameter (ID) and record in inches
— Measure the DTW with an electronic water level indicator (or an interface meter, if non-aqueous phase liquid [NAPL] is potentially present – see procedures below) from the top-of-casing (TOC) at the surveyor's mark, if present, and record the depth (to the nearest 0.01 foot) in feet below TOC
— If no mark is present, measure from the north side of the casing and mark the measuring point with a knife, metal file (if the inner casing is metal) or indelible marker for future reference
— Measure the TD from TOC at the surveyor's mark or north side of the casing, as appropriate.

Because of tape buoyancy and weight effects encountered in deep wells with long water columns, it may be difficult to determine the TD of the well with an electronic water level indicator; sediment in the bottom of the well can also make it difficult to determine TD. Care must be taken and proper equipment selection must be used in these situations to ensure accurate measurements. Multiple TD measurements in silt-laden wells can provide a more precise assessment of the bottom depth.

11.5.2 GAUGING WELLS WITH NON-AQUEOUS PHASE LIQUID

If NAPL is potentially present at the site, the DTW and NAPL thickness measurements are collected using an interface meter capable of distinguishing between the NAPL and the groundwater, or a weighted tape coated with the appropriate reactive

indicator paste for the suspected NAPL. Measuring NAPL thicknesses must be done with care to avoid agitating the liquids and generating an emulsion. This is particularly the case for light NAPL (LNAPL; those having a density less than water), which are typically viscous oils that cling to the probe. Oil coating the probe can result in thickness measurements that are biased high (i.e., overestimate the thickness of the NAPL).

Conduct the following procedures to ensure an accurate measurement of the NAPL thickness:

- For LNAPL, slowly lower the electronic interface probe in the well casing until the electronic tone indicates the probe is at the top of the LNAPL layer; measure the depth below the TOC to the nearest 0.01 foot.
- To gauge the NAPL thickness, advance the probe slowly through the layer until the electronic tone indicates top of the water column and then slowly bring the probe back up to the bottom of the LNAPL. Repeat this process several times to ensure an accurate measurement of the bottom of the LNAPL layer (which can include bubbles and an emulsion layer).
- For dense NAPL (DNAPL), advance the probe through the water column until the tone indicates the top of the DNAPL layer; record the depth below TOC.
- To gauge the DNAPL thickness, advance the probe through the layer to the bottom of the well.

11.6 GROUNDWATER PURGING PROCEDURES

Purging is a process whereby potentially stagnant water is removed allowing the collection of samples that are representative of groundwater conditions in the water-bearing zone. The water in a well bore that has not been purged may be different than the surrounding formation due to a number of factors, such as exposure to ambient air. There are a number of purging methods and several no-purge methods that may be used, depending on specific conditions encountered (e.g., DTW, hydraulic conductivity of the formation, etc.) and the sampling requirements. Several purge/no purge options are described below.

- **Multiple Volume Purge:** Traditional well purging technique that relies on the withdrawal of the volume of the well bore and the surrounding filter pack (if present); typically three to five well volumes are removed using pumps or bailers. This methodology relies on equipment that is easy to obtain and use and is generally accepted in most states as an appropriate purging method.
- **Temporary Well Purge:** A variation of the multiple volume purge technique that typically uses inertia lift pumps, peristaltic pumps, or bailers to remove water from a temporary well or discrete groundwater sampler. This is a less stringent technique that is typically done to minimize the turbidity of the samples, which can be high due to the lack of a well filter pack.
- **Private Water Well or In-Place Plumbing Purge:** A variation on the multiple volume purge technique whereby a tap or faucet is opened on a fixed water supply pipe and is allowed to remain open until the potentially stagnant water within the well casing and other components of the system (e.g., fixed piping, pressure tanks, etc.) has been removed and groundwater representative of the water-bearing zone is discharged at the tap.
- **Low-Flow (Minimal Drawdown/Low Stress) Purge (and Sampling):** A modified purging technique that establishes an isolated, discrete, horizontal flow zone directly adjacent to the pump intake; this method requires the pump to be placed within a screened-interval or open borehole. Pumping rates are typically 0.1 to 0.5 liters per minute (L/min) or less to minimize the stress on the surrounding formation and reduce the geochemical alteration of the groundwater caused by pumping.
- **No-Purge/Passive Sampling Techniques:** These techniques use specialized equipment, such as permeable diffusion bags or trap samplers, to sample the undisturbed water column within a screened interval or open borehole. This methodology assumes that the water in the well is representative of the surrounding formation. Depending on the sampling device used, this approach is well suited for some VOCs, metals, and hydrophobic compounds.

11.6.1 CALCULATING ONE PURGE VOLUME

For multiple volume purging techniques, a **minimum** of three well volumes of water must be removed before sample collection. The actual amount of water removed may be greater than the three volumes, depending on geochemical parameter stabilization (the field measurement of these parameters is discussed below).

Calculate the volume of water in a well or boring using the following equation:

$$\text{Volume (gallons)} = (TD - DTW) \times ID^2 \times 0.041$$

Alternately, the volume of water in a well or boring may also be calculated by multiplying the water column height by the gallons per foot of water for the appropriate well or boring diameter:

ID	GALLONS PER FOOT OF WATER	GALLONS PER THREE WATER COLUMNS
1-inch	0.04	0.12
2-inch	0.16	0.48
3-inch	0.37	1.11
4-inch	0.65	1.98

Calculate the total volume of the pump, associated tubing and container for in situ measurements (flow-through cell), using the following equation:

$$\text{Volume (in gallons)} = P + ((0.0041)*D2*L) + fc$$

where:

P = volume of pump (gallons)

D = tubing diameter (inches)

L = length of tubing (feet)

fc = volume of flow-through cell (gallons)

11.6.2 MULTIPLE VOLUME PURGE PROCEDURES

Begin purging at a rate that will not cause excessive turbulence and drawdown in the well; commonly less than 1 gallon per minute for a typical 2-inch diameter monitoring well. The objective is to remove the stagnant water in the casing and surrounding filter pack or open borehole allowing water from the surrounding water-bearing zone to enter the well for sampling with as little disturbance as possible. Excessive pump rates or well dewatering can result in higher turbidity, potential volatilization, and/or geochemical alteration of dissolved parameters. If drawdown is observed on initiation of pumping, reduce the pump speed and attempt to match the drawdown of the well. Once drawdown is stabilized, measure the flow rate with a calibrated container and stopwatch.

Collect stabilization parameters at a minimum frequency of once for every well volume of water removed during the purge process. Record the measurements in the field book along with any other pertinent details, such as the visual quality of the water (e.g., color, odor, and presence of suspended particulates) and the measured withdrawal rate, as possible. After the minimum purge volume has been removed, review the geochemical measurements to ensure that readings have stabilized. Stabilization occurs when at least three consecutive measurements are within the following tolerances:

TRADITIONAL PURGE STABILIZATION PARAMETERS	
pH	± 0.1 standard units (SU)
Specific Conductance	± 3%
Temperature	± 3%
Dissolved Oxygen (DO)	± 0.2 milligrams per liter (mg/l) or 10% (flow-through cell only)
Tubidity	± 10% for values greater than 10 nephelometric turbidity units (NTU)
Oxygen Reduction Potential (ORP)	± 10 millivolts (mV; flow-through cell only)

If the parameters have not stabilized within five well volumes and your water meter is operating properly, consult your project manager to decide whether or not to collect a sample or to continue purging.

For wells with extremely slow recharge, purging may ultimately dewater the well before the minimum purge can be completed. If the well or borehole is purged dry before removing three well volumes, allow the well or boring to recharge to a level of approximately 90% of the static pre-purge water elevation and proceed immediately to sample collection. If recovery exceeds 2 hours, sample as soon as sufficient sample volume is available, in accordance with applicable regulations.

11.6.3 LOW-FLOW PURGE PROCEDURES

Low flow purging and sampling is used to obtain representative groundwater samples without removing all of the water within the well. The protocol uses low pumping rates (i.e., less than 0.5 L/min) to establish an isolated zone around the inlet of the pump where flow is horizontal (i.e., from the water bearing zone) rather than from the stagnant water in the well casing above and below the pump. Selection of an appropriate pump is critical to establishing the flow zone. A pump must be selected that is suited for low pumping rates and is appropriate for the analytical samples; bailers are not appropriate.

Slowly lower the pump and tubing into the water column to avoid agitating the water column; use of a lanyard is recommended. Once the specified sampling depth is reached, secure the pump and tubing at the wellhead; the depth must be noted in the field book. Avoid contacting the bottom of the well by using pre-cut tubing at the appropriate length or by lowering the pump simultaneously with an electronic water level indicator. Once the pump has been inserted and secured, allow the water levels to return to static conditions before initiating the purge.

The discharge tubing must be connected to an in-line flow-through cell equipped with a multi-parameter real-time water quality meter. The flow-through cell minimizes the exposure of the groundwater to ambient air which has a substantial effect on dissolved oxygen and ORP measurements.

Start the pump and maintain a steady flow rate that results in a stabilized water level (less than 0.3 feet of drawdown). If needed, reduce the pumping rate to the minimum capabilities of the pump. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment. Purging should not exceed 0.5 L/min.

During purging, monitor and record geochemical parameters at 30 seconds to 5 minute intervals (depending on the hydraulic conductivity of the aquifer, diameter of the well, and pumping rate). Stabilization occurs once the following criteria have been met over three successive measurements made at least three minutes apart:

LOW-FLOW PURGE STABILIZATION PARAMETERS	
Water Level Drawdown	<0.3 feet
pH	± 0.1 SU
Specific Conductance	± 3%
Temperature	± 3%
DO	± 0.2 mg/l or 10% (flow-through cell only)
Turbidity	± 10% for values greater than 10 NTU
ORP	± 10 mV (flow-through cell only)

Record any other notable observations in the field book (e.g., groundwater color).

11.6.4 NO-PURGE PASSIVE SAMPLING TECHNIQUES

A number of alternate sampling devices are available, including equilibrated grab samplers, passive diffusion samplers, and other in situ sampling devices. These devices may be particularly useful for sampling low permeability geologic materials, assuming the device is made of materials compatible with the analytical parameters, meets data quality objectives, and has been properly evaluated.

No-purge grab or trap samplers are placed in the well before sampling and typically remain closed (i.e., no water is allowed into the sampler during insertion) until the sampler is activated. This allows the sampler device to equilibrate with the surrounding groundwater (to prevent adsorption to the sampler materials) and for the groundwater to recover and re-establish the natural flow after the disturbance caused by the sampler insertion into the well. Typical equilibration times depend on the well recovery rates and the type of sampler used. Samples are either transferred to containers at the well head or the sampler itself is shipped to the laboratory for analysis. Examples of equilibrated grab samplers include Hydrosleeve®, Snap SamplerTM, and Kemmerer Sampler.

Equilibration time for diffusion samplers are generally dictated by the diffusion rate through the permeable membrane and, thus, are less sensitive to changes induced within the well during deployment. Most diffusion bag samplers have a minimum equilibration time of 14 days prior to sample collection. The samplers may be deployed for an extended period (e.g., three months or longer), although the continuous exchange between the sampler and the well water means that the sampler will likely reflect only the conditions in the few days preceding the sample collection.

11.6.5 TEMPORARY WELL PURGE PROCEDURES

Procedures used to purge temporary groundwater monitoring wells differ from permanent wells because temporary wells are installed for immediate sample acquisition. Wells of this type may include open bedrock boreholes, standard polyvinyl chloride well screen and riser placed in open boreholes, or drilling rod-based sampling devices (e.g., Wellpoint®, Geoprobe® Screen Point or Hydropunch® samplers). Purging temporary wells of this type may not be necessary because stagnant water is typically not present. However, if water is used in the drilling process, purging would be necessary. Purging can minimize the turbidity in the sample, which can be significant due to the disturbance caused by the sampler installation and to rinse the sampling system with groundwater. The exception is for groundwater profiling applications (e.g., using a Waterloo Profiler®) where a more rigorous purge is used (using the multiple volume purge techniques described above) to limit the potential for cross contamination between sample intervals.

11.6.6 PRIVATE WATER WELL OR IN-PLACE PLUMBING PURGE PROCEDURES

The configuration and construction of private water wells varies widely, and access points for obtaining groundwater samples may be limited. WSP personnel should coordinate with the property owner/representative to access functioning ports and valves to avoid causing any inadvertent damage.

Collect the groundwater sample as close to the well as possible (e.g., from a sample port at the well head) to ensure the sample is representative. Ideally, the sample should be collected upstream of the piping and treatment equipment (e.g., particulate filter, water softener, carbon filters, ultra-violet lights), heating unit, or storage tanks. The following potential sampling locations are presented in order of preference:

- Sampling port or spigot near the well head or piping system prior to entry into the storage tank
- Sampling port or spigot at storage tank
- Sampling port or spigot downstream of the pressure tank or holding tank but upstream of any water treatment equipment
- Tap or faucet

If purging from a tap or faucet, try to remove any aerators, filters, or other devices from the tap before purging and work with the property owner/representative to bypass any water treatment systems. Document where the sample was collected and any steps that were taken to minimize the potential alteration of the water sample in the field book.

Purge the system by opening the tap or spigot and allowing the water to run for several minutes. Observe and record the purge rate for the system. The minimum purge volume must be more than the combined volume of the pump, tanks, piping, etc. After the minimum purge volume has been removed, review the geochemical measurements to ensure that readings have stabilized using the same procedures as those used for the multiple volume purge detailed above. If the minimum volume is unknown, purge the system for a minimum of 15 minutes, until the parameter readings have stabilized, and no suspended particles (e.g., iron or rust) are visible. Record the final purge volume in the field book and any water quality observations.

11.7 GROUNDWATER SAMPLE COLLECTION PROCEDURES

Collect groundwater samples as soon as possible after the geochemical parameters indicate representative groundwater is present. As practically possible, reduce the pump flow rate, but maintain a flow rate high enough to deliver a smooth stream of water without splashing or undue agitation. Collect samples directly from the tubing as it exits the well bore; do not sample on the downstream side of flow through cells or any other instrumentation. If using a bailer for sample collection, lower and raise the bailer slowly and smoothly to minimize the disturbance to the water within the well.

Collect groundwater samples in order of volatilization sensitivity with organic compounds sampled first followed by inorganic compounds:

- VOCs
- Extractable organics, petroleum hydrocarbons, aggregate organics, and oil and grease
- Total metals
- Dissolved metals (see filtering procedures below)
- Inorganic non-metallic and physical and aggregate properties
- Microbiological samples
- Radionuclides

Collect quality assurance/quality control samples in accordance with SOP 4 and the project-specific work plan or QAPP.

As necessary, conduct field tests or screening in accordance with the project-specific work plan and manufacturer's specifications for field testing equipment. Field samples must be directly transferred from the sampling equipment to the container that has been specifically prepared for that given parameter; intermediate containers should be avoided.

Record the depth interval, if applicable, which the sample was collected in the field book. Note the volume, phases, and color of the groundwater in the field book.

11.7.1 GROUNDWATER FILTRATION PROCEDURES

Filtered groundwater samples are sometimes used for field kit analyses and should only be collected for laboratory analysis after approval from the appropriate regulatory agency and/or project manager. If groundwater sample filtration is necessary, the following procedures should be followed:

- Use a variable speed peristaltic pump with the in-line filter fitted on the outlet end; pressurized bailers can also be used
- Insert the pump inlet tubing into the intermediate container holding the surface water sample
- Turn on the pump and reduce the flow rate, but maintain a flow rate high enough to deliver a smooth stream of water without splashing or undue agitation, hold the filter upright with the inlet and outlet in the vertical position and pump groundwater through the filter until all atmospheric oxygen has been removed and the minimum volume of water has been flushed through the filter, in accordance with the manufacturer's specifications
- Collect the filtered samples directly into the sample container from the pump-filter assembly
- If sediment is visible in the sample container after filtration, filter break-through has occurred and the sampling and filtering process should be repeated
- Discard the tubing and filter appropriately
- If a submersible pump is used to collect the groundwater sample, attached the in-line filter to the outlet end and follow the last four steps described above

11.7.2 NON-AQUEOUS PHASE LIQUID SAMPLING PROCEDURES

Non-aqueous phase liquid is typically sampled to identify the compound, usually through an analytical "fingerprint" analysis. The usefulness of this type of sampling is limited as many NAPLs weather in the subsurface making definitive identification problematic. If samples are to be collected, the sampling options and techniques should be discussed with the assigned WSP compliance professional and project manager to ensure that the NAPL is not considered to be a hazardous material for the purpose of shipping to the laboratory (SOP 3). Samples of NAPL should be collected using the same procedures as above and placed in the appropriate laboratory-supplied containers, packed on ice, and shipped to the analytical laboratory using procedures outlined in SOP 3.

11.7.3 SAMPLE LABELING AND PREPARATION FOR SHIPMENT

Once collected, prepare the groundwater samples for offsite laboratory analysis:

1. Clean the outside of the sample container, if necessary
2. Affix a sample tag or label to each sample container and complete all required information (sample number, date, time, sampler's initials, analysis, preservatives, place of collection)
3. Place clear tape over the tag or label (if non-waterproof labels are used)
4. Preserve samples immediately after collection by placing them into an insulated cooler filled with bagged wet ice to maintain a temperature of approximately 4°Celcius
5. Record the sample designation, date, time, and the sampler's initials in the field book and on a sample tracking form, if appropriate
6. Complete the chain-of-custody forms with appropriate sampling information, including:
   - location
   - sample name
   - sample collection date and time
   - number of sample containers
   - analytical method
7. Secure the sample packing and shipping in accordance with proper procedures

Do not ship hazardous waste samples without first consulting a WSP compliance professional.

11.8 CLOSING NOTES

Once sampling is completed, secure, restore and/or mark all sample locations with spray paint, stakes, or other appropriate marker for future reference or survey in accordance with the project-specific project work plan. Decontaminate all equipment prior to departure and properly manage all PPE and IDW in conformance with applicable regulations.

G SYSTEM OPERATIONS RECORDS

Appendix G, Table G-1

System Operations and Mass Removal
Former Kop-Flex Facility
Hanover, MD

					Operational Status Since Last Reading					Cumulative VOC Mass Removal by Compound										
	Time Since Last Reading	Effluent Flow Since Last Reading	Effluent Flow Totalizer	Effluent Flow Rate	System Forward Flow	RW-1S	RW-2S	RW-3S	RW-1D	RW-2D	1,1,1-TCA		1,1-DCA		1,1-DCE		Total VOCs		1,4-Dioxane	
Date	Hours	Gal	Gal	gpm	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	lbs	gals	lbs	gals	lbs	gals	lbs	gals	lbs	gals
3/9/17 13:30	0.00	0	0	0.0	Off	Off	Off	Off	Off	Off										
3/9/17 15:30	2.00	2,400	2400	20.0	On	On	On	On	On	On	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00
3/12/17 8:00	64.50	0	2400	0.0	Off	Off	Off	Off	Off	Off	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00
3/12/17 16:00	8.00	14,400	16800	30.0	On	On	On	On	On	On	0.01	0.00	0.03	0.00	0.04	0.00	0.07	0.01	0.04	0.00
3/13/17 8:00	16.00	0	16800	0.0	Off	Off	Off	Off	Off	Off	0.01	0.00	0.03	0.01	0.04	0.01	0.07	0.02	0.04	0.01
3/13/17 16:00	8.00	19,200	36000	40.0	On	On	On	On	On	On	0.02	0.00	0.05	0.01	0.08	0.02	0.15	0.03	0.08	0.02
3/14/17 8:00	16.00	0	36000	0.0	Off	Off	Off	Off	Off	Off	0.02	0.00	0.05	0.02	0.08	0.02	0.15	0.05	0.08	0.02
3/14/17 16:00	8.00	24,000	60000	50.0	On	On	On	On	On	On	0.05	0.01	0.09	0.03	0.13	0.04	0.27	0.07	0.16	0.04
3/15/17 8:00	16.00	0	60000	0.0	Off	Off	Off	Off	Off	Off	0.05	0.01	0.09	0.03	0.13	0.05	0.27	0.10	0.16	0.06
3/15/17 16:00	8.00	28,800	88800	60.0	On	On	On	On	On	On	0.08	0.02	0.14	0.05	0.22	0.07	0.44	0.14	0.27	0.08
3/16/17 8:00	16.00	0	88800	0.0	Off	Off	Off	Off	Off	Off	0.08	0.03	0.14	0.06	0.22	0.09	0.44	0.18	0.27	0.11
3/16/17 16:00	8.00	33,600	122400	70.0	On	On	On	On	On	On	0.12	0.04	0.19	0.08	0.32	0.12	0.64	0.25	0.39	0.15
3/19/17 8:00	64.00	0	122400	0.0	Off	Off	Off	Off	Off	Off	0.12	0.05	0.19	0.10	0.32	0.16	0.64	0.31	0.39	0.19
3/23/17 16:00	104.00	513,000	635400	75.0	On	On	On	On	On	On	0.47	0.09	0.79	0.18	1.86	0.34	3.12	0.62	1.81	0.37
3/28/17 8:00	112.00	0	635400	0.0	Off	Off	Off	Off	Off	Off	0.47	0.14	0.79	0.26	1.86	0.53	3.12	0.92	1.81	0.55
3/29/17 0:00	16.00	66,389	701,789	69.2	On	On	On	On	On	On	0.52	0.18	0.88	0.35	2.06	0.73	3.45	1.26	1.99	0.75
3/30/17 0:00	24.00	107,968	809,756	75.0	On	On	On	On	On	On	0.59	0.24	1.01	0.45	2.38	0.97	3.99	1.66	2.30	0.98
3/31/17 0:00	24.00	100,111	909,867	69.5	On	On	On	On	On	On	0.66	0.30	1.14	0.56	2.68	1.24	4.48	2.10	2.58	1.24
4/1/17 0:00	24.00	104,661	1,014,528	72.7	On	On	On	On	On	On	0.73	0.36	1.27	0.69	3.00	1.54	5.00	2.59	2.88	1.52
4/2/17 0:00	24.00	103,473	1,118,001	71.9	On	On	On	On	On	On	0.80	0.44	1.40	0.83	3.31	1.87	5.51	3.13	3.17	1.84
4/3/17 0:00	24.00	102,646	1,220,647	71.3	On	On	On	On	On	On	0.85	0.51	1.52	0.98	3.64	2.23	6.02	3.73	3.46	2.18
4/4/17 0:00	24.00	102,714	1,323,361	71.3	On	On	On	On	On	On	0.91	0.60	1.64	1.14	3.98	2.63	6.52	4.37	3.74	2.56
4/5/17 0:00	24.00	102,738	1,426,099	71.3	On	On	On	On	On	On	0.96	0.68	1.76	1.32	4.31	3.06	7.03	5.06	4.02	2.96
4/6/17 0:00	24.00	103,621	1,529,720	72.0	On	On	On	On	On	On	1.01	0.78	1.88	1.51	4.65	3.52	7.54	5.81	4.31	3.39
4/7/17 0:00	24.00	104,012	1,633,732	72.2	On	On	On	On	On	On	1.07	0.87	2.00	1.71	4.99	4.02	8.06	6.60	4.59	3.85
4/8/17 0:00	24.00	103,435	1,737,167	71.8	On	On	On	On	On	On	1.12	0.97	2.12	1.92	5.32	4.55	8.57	7.45	4.88	4.34
4/9/17 0:00	24.00	102,952	1,840,119	71.5	On	On	On	On	On	On	1.18	1.08	2.24	2.14	5.66	5.12	9.08	8.34	5.16	4.85
4/10/17 0:00	24.00	102,397	1,942,516	71.1	On	On	On	On	On	On	1.23	1.19	2.36	2.38	5.99	5.72	9.58	9.29	5.45	5.40
4/11/17 0:00	24.00	101,624	2,044,140	70.6	On	On	On	On	On	On	1.28	1.31	2.48	2.62	6.32	6.35	10.08	10.28	5.73	5.97
4/12/17 0:00	24.00	103,889	2,148,029	72.1	On	On	On	On	On	On	1.33	1.43	2.60	2.88	6.65	7.01	10.58	11.33	5.98	6.56
4/13/17 0:00	24.00	102,689	2,250,718	71.3	On	On	On	On	On	On	1.38	1.55	2.72	3.16	6.98	7.71	11.08	12.42	6.23	7.19
4/14/17 0:00	24.00	99,829	2,350,547	69.3	On	On	On	On	On	On	1.42	1.68	2.84	3.44	7.29	8.44	11.55	13.56	6.47	7.83
4/15/17 0:00	24.00	102,823	2,453,369	71.4	On	On	On	On	On	On	1.47	1.82	2.96	3.74	7.62	9.20	12.05	14.75	6.72	8.50
4/16/17 0:00	24.00	102,933	2,556,302	71.5	On	On	On	On	On	On	1.52	1.95	3.08	4.04	7.95	9.99	12.54	15.99	6.96	9.20
4/17/17 0:00	24.00	103,442	2,659,744	71.8	On	On	On	On	On	On	1.56	2.10	3.20	4.36	8.28	10.82	13.04	17.28	7.21	9.92
4/18/17 0:00	24.00	102,739	2,762,483	71.3	On	On	On	On	On	On	1.61	2.24	3.32	4.69	8.60	11.68	13.53	18.61	7.46	10.66
4/19/17 0:00	24.00	103,375	2,865,858	71.8	On	On	On	On	On	On	1.65	2.39	3.42	5.04	8.95	12.57	14.03	20.00	7.70	11.43
4/20/17 0:00	24.00	101,015	2,966,873	70.1	On	On	On	On	On	On	1.69	2.55	3.52	5.39	9.30	13.50	14.52	21.43	7.92	12.22

Appendix G, Table G-1

System Operations and Mass Removal
Former Kop-Flex Facility
Hanover, MD

					Operational Status Since Last Reading						Cumulative VOC Mass Removal by Compound									
	Time Since Last Reading	Effluent Flow Since Last Reading	Effluent Flow Totalizer	Effluent Flow Rate	System Forward Flow	RW-1S	RW-2S	RW-3S	RW-1D	RW-2D	1,1,1-TCA		1,1-DCA		1,1-DCE		Total VOCs		1,4-Dioxane	
Date	Hours	Gal	Gal	gpm	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	lbs	gals	lbs	gals	lbs	gals	lbs	gals	lbs	gals
4/21/17 0:00	24.00	104,210	3,071,084	72.4	On	On	On	On	On	On	1.74	2.70	3.63	5.75	9.66	14.47	15.02	22.92	8.16	13.04
4/22/17 0:00	24.00	103,653	3,174,736	72.0	On	On	On	On	On	On	1.78	2.87	3.73	6.12	10.01	15.47	15.52	24.45	8.39	13.88
4/23/17 0:00	24.00	102,270	3,277,006	71.0	On	On	On	On	On	On	1.82	3.03	3.83	6.50	10.36	16.50	16.02	26.04	8.62	14.74
4/24/17 0:00	24.00	102,093	3,379,099	70.9	On	On	On	On	On	On	1.86	3.20	3.94	6.90	10.71	17.57	16.51	27.67	8.85	15.62
4/25/17 0:00	24.00	103,972	3,483,071	72.2	On	On	On	On	On	On	1.91	3.37	4.04	7.30	11.07	18.67	17.01	29.35	9.09	16.53
4/26/17 0:00	24.00	103,652	3,586,723	72.0	On	On	On	On	On	On	1.95	3.55	4.14	7.72	11.42	19.82	17.51	31.08	9.32	17.46
4/27/17 0:00	24.00	101,642	3,688,365	70.6	On	On	On	On	On	On	1.99	3.73	4.25	8.14	11.77	20.99	18.00	32.86	9.55	18.41
4/28/17 0:00	24.00	103,609	3,791,974	72.0	On	On	On	On	On	On	2.03	3.91	4.35	8.57	12.12	22.20	18.51	34.69	9.78	19.39
4/29/17 0:00	24.00	101,952	3,893,926	70.8	On	On	On	On	On	On	2.07	4.10	4.45	9.02	12.47	23.45	19.00	36.57	10.01	20.39
4/30/17 0:00	24.00	101,762	3,995,689	70.7	On	On	On	On	On	On	2.11	4.29	4.55	9.47	12.82	24.73	19.49	38.49	10.24	21.41
5/1/17 0:00	24.00	102,216	4,097,904	71.0	On	On	On	On	On	On	2.16	4.49	4.66	9.94	13.17	26.04	19.98	40.47	10.47	22.46
5/2/17 0:00	24.00	103,228	4,201,132	71.7	On	On	On	On	On	On	2.20	4.69	4.76	10.41	13.52	27.39	20.48	42.50	10.71	23.53
5/3/17 0:00	24.00	96,900	4,298,032	67.3	On	On	On	On	On	On	2.24	4.89	4.86	10.90	13.86	28.78	20.95	44.57	10.92	24.62
5/4/17 0:00	24.00	102,170	4,400,203	71.0	On	On	On	On	On	On	2.28	5.10	4.96	11.39	14.20	30.19	21.44	46.69	11.15	25.73
5/5/17 0:00	24.00	103,949	4,504,152	72.2	On	On	On	On	On	On	2.32	5.31	5.06	11.90	14.56	31.65	21.95	48.86	11.39	26.87
5/6/17 0:00	24.00	103,728	4,607,879	72.0	On	On	On	On	On	On	2.37	5.53	5.17	12.41	14.92	33.14	22.45	51.08	11.62	28.03
5/7/17 0:00	24.00	102,823	4,710,703	71.4	On	On	On	On	On	On	2.41	5.74	5.27	12.94	15.22	34.66	22.90	53.34	11.85	29.21
5/8/17 0:00	24.00	101,677	4,812,380	70.6	On	On	On	On	On	On	2.44	5.97	5.34	13.47	15.53	36.21	23.31	55.65	12.04	30.41
5/9/17 0:00	24.00	103,180	4,915,560	71.7	On	On	On	On	On	On	2.48	6.19	5.42	14.02	15.84	37.79	23.73	58.00	12.23	31.64
5/10/17 0:00	24.00	102,081	5,017,642	70.9	On	On	On	On	On	On	2.51	6.42	5.49	14.56	16.15	39.40	24.15	60.39	12.42	32.88
5/11/17 0:00	24.00	102,209	5,119,850	71.0	On	On	On	On	On	On	2.55	6.65	5.56	15.12	16.45	41.05	24.56	62.82	12.60	34.13
5/12/17 0:00	24.00	97,512	5,217,362	67.7	On	On	On	On	On	On	2.58	6.88	5.63	15.68	16.75	42.72	24.96	65.28	12.78	35.41
5/13/17 0:00	24.00	103,949	5,321,312	72.2	On	On	On	On	On	On	2.62	7.12	5.71	16.25	17.06	44.42	25.38	67.80	12.97	36.71
5/14/17 0:00	24.00	103,969	5,425,281	72.2	On	On	On	On	On	On	2.65	7.36	5.78	16.83	17.37	46.16	25.81	70.35	13.17	38.02
5/15/17 0:00	24.00	103,742	5,529,023	72.0	On	On	On	On	On	On	2.69	7.61	5.86	17.41	17.68	47.92	26.23	72.94	13.36	39.36
5/16/17 0:00	24.00	104,058	5,633,081	72.3	On	On	On	On	On	On	2.72	7.85	5.93	18.01	18.00	49.72	26.65	75.58	13.55	40.71
5/17/17 0:00	24.00	102,595	5,735,675	71.2	On	On	On	On	On	On	2.76	8.10	6.01	18.61	18.30	51.55	27.07	78.26	13.74	42.08
5/18/17 0:00	24.00	102974.4	5,838,650	71.5	On	On	On	On	On	On	2.79	8.36	6.08	19.21	18.61	53.40	27.49	80.98	13.92	43.47
5/19/17 0:00	24.00	99431.4	5,938,081	69.0	On	On	On	On	On	On	2.83	8.61	6.15	19.83	18.91	55.29	27.89	83.74	14.11	44.88
5/20/17 0:00	24.00	103231.5	6,041,313	71.7	On	On	On	On	On	On	2.86	8.87	6.23	20.45	19.22	57.21	28.31	86.54	14.30	46.31
5/21/17 0:00	24.00	102674	6,143,987	71.3	On	On	On	On	On	On	2.90	9.14	6.30	21.08	19.53	59.16	28.73	89.38	14.48	47.75
5/22/17 0:00	24.00	103257.7	6,247,244	71.7	On	On	On	On	On	On	2.93	9.40	6.37	21.71	19.84	61.14	29.15	92.26	14.67	49.22
5/23/17 0:00	24.00	104361.9	6,351,606	72.5	On	On	On	On	On	On	2.97	9.67	6.45	22.36	20.15	63.16	29.57	95.19	14.87	50.70
5/24/17 0:00	24.00	103384.5	6,454,991	71.8	On	On	On	On	On	On	3.00	9.95	6.52	23.01	20.46	65.20	29.99	98.16	15.06	52.21
5/25/17 0:00	24.00	103776.5	6,558,767	72.1	On	On	On	On	On	On	3.04	10.22	6.60	23.67	20.78	67.27	30.41	101.16	15.25	53.73
5/26/17 0:00	24.00	103499.7	6,662,267	71.9	On	On	On	On	On	On	3.08	10.50	6.67	24.33	21.09	69.38	30.83	104.22	15.44	55.27
5/27/17 0:00	24.00	104329.9	6,766,597	72.5	On	On	On	On	On	On	3.11	10.78	6.75	25.01	21.40	71.52	31.26	107.31	15.63	56.83
5/28/17 0:00	24.00	103442.9	6,870,040	71.8	On	On	On	On	On	On	3.15	11.07	6.82	25.69	21.71	73.69	31.68	110.44	15.82	58.41

System Operations and Mass Removal
Former Kop-Flex Facility
Hanover, MD

					Operational Status Since Last Reading						Cumulative VOC Mass Removal by Compound									
	Time Since Last Reading	Effluent Flow Since Last Reading	Effluent Flow Totalizer	Effluent Flow Rate	System Forward Flow	RW-1S	RW-2S	RW-3S	RW-1D	RW-2D	1,1,1-TCA		1,1-DCA		1,1-DCE		Total VOCs		1,4-Dioxane	
Date	Hours	Gal	Gal	gpm	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	lbs	gals	lbs	gals	lbs	gals	lbs	gals	lbs	gals
5/29/17 0:00	24.00	103508.5	6,973,548	71.9	On	On	On	On	On	On	3.18	11.36	6.89	26.38	22.02	75.88	32.10	113.62	16.01	60.01
5/30/17 0:00	24.00	103529.5	7,077,078	71.9	On	On	On	On	On	On	3.22	11.65	6.97	27.07	22.33	78.11	32.52	116.84	16.20	61.63
5/31/17 0:00	24.00	104166.4	7,181,244	72.3	On	On	On	On	On	On	3.25	11.94	7.04	27.78	22.65	80.38	32.94	120.10	16.39	63.26
6/1/17 0:00	24.00	103383.8	7,284,628	71.8	On	On	On	On	On	On	3.29	12.24	7.09	28.49	22.91	82.66	33.30	123.39	16.55	64.91
6/2/17 0:00	24.00	104131.7	7,388,760	72.3	On	On	On	On	On	On	3.32	12.54	7.15	29.20	23.18	84.98	33.65	126.72	16.72	66.58
6/3/17 0:00	24.00	103031	7,491,791	71.5	On	On	On	On	On	On	3.35	12.85	7.20	29.92	23.45	87.32	34.00	130.09	16.88	68.27
6/4/17 0:00	24.00	102912.1	7,594,703	71.5	On	On	On	On	On	On	3.39	13.16	7.25	30.64	23.72	89.69	34.35	133.49	17.04	69.97
6/5/17 0:00	24.00	103295.9	7,697,999	71.7	On	On	On	On	On	On	3.42	13.47	7.30	31.37	23.98	92.08	34.70	136.92	17.21	71.69
6/6/17 0:00	24.00	104226.1	7,802,225	72.4	On	On	On	On	On	On	3.45	13.78	7.35	32.10	24.25	94.51	35.06	140.39	17.37	73.43
6/7/17 0:00	24.00	103320.4	7,905,545	71.8	On	On	On	On	On	On	3.49	14.10	7.40	32.84	24.52	96.95	35.41	143.89	17.54	75.18
6/8/17 0:00	24.00	103121.6	8,008,667	71.6	On	On	On	On	On	On	3.52	14.42	7.45	33.59	24.79	99.43	35.76	147.43	17.70	76.94
6/9/17 0:00	24.00	102680.5	8,111,347	71.3	On	On	On	On	On	On	3.56	14.74	7.50	34.34	25.05	101.93	36.11	151.01	17.86	78.73
6/10/17 0:00	24.00	103086.6	8,214,434	71.6	On	On	On	On	On	On	3.59	15.07	7.55	35.09	25.32	104.46	36.46	154.61	18.03	80.53
6/11/17 0:00	24.00	102831	8,317,265	71.4	On	On	On	On	On	On	3.62	15.39	7.60	35.85	25.59	107.01	36.81	158.26	18.19	82.34
6/12/17 0:00	24.00	102821.9	8,420,087	71.4	On	On	On	On	On	On	3.66	15.73	7.65	36.61	25.85	109.60	37.16	161.94	18.35	84.18
6/13/17 0:00	24.00	103686.9	8,523,774	72.0	On	On	On	On	On	On	3.69	16.06	7.70	37.38	26.12	112.20	37.51	165.65	18.52	86.03
6/14/17 0:00	24.00	99014.85	8,622,789	68.8	On	On	On	On	On	On	3.72	16.40	7.76	38.16	26.38	114.84	37.86	169.39	18.68	87.89
6/15/17 0:00	24.00	98493.2	8,721,282	68.4	On	On	On	On	On	On	3.76	16.74	7.80	38.94	26.63	117.50	38.19	173.17	18.83	89.77
6/16/17 0:00	24.00	103140.8	8,824,423	71.6	On	On	On	On	On	On	3.79	17.08	7.85	39.72	26.90	120.18	38.54	176.99	18.99	91.67
6/17/17 0:00	24.00	102000.5	8,926,423	70.8	On	On	On	On	On	On	3.82	17.43	7.90	40.51	27.16	122.89	38.89	180.84	19.16	93.58
6/18/17 0:00	24.00	101642.3	9,028,065	70.6	On	On	On	On	On	On	3.85	17.78	7.95	41.30	27.42	125.63	39.23	184.72	19.32	95.51
6/19/17 0:00	24.00	101277.5	9,129,343	70.3	On	On	On	On	On	On	3.89	18.13	8.00	42.10	27.69	128.40	39.58	188.64	19.48	97.46
6/20/17 0:00	24.00	100331.1	9,229,674	69.7	On	On	On	On	On	On	3.92	18.49	8.05	42.91	27.95	131.19	39.92	192.59	19.64	99.42
6/21/17 0:00	24.00	100880.4	9,330,554	70.1	On	On	On	On	On	On	3.95	18.85	8.10	43.72	28.21	134.01	40.26	196.57	19.80	101.39
6/22/17 0:00	24.00	99515.16	9,430,070	69.1	On	On	On	On	On	On	3.99	19.21	8.15	44.53	28.46	136.85	40.60	200.59	19.96	103.39
6/23/17 0:00	24.00	101157.2	9,531,227	70.2	On	On	On	On	On	On	4.02	19.58	8.20	45.35	28.73	139.72	40.95	204.64	20.12	105.39
6/24/17 0:00	24.00	99821.29	9,631,048	69.3	On	On	On	On	On	On	4.05	19.94	8.25	46.17	28.98	142.61	41.29	208.73	20.27	107.42
6/25/17 0:00	24.00	99001.81	9,730,050	68.8	On	On	On	On	On	On	4.08	20.31	8.30	47.00	29.24	145.53	41.63	212.85	20.43	109.46
6/26/17 0:00	24.00	98255.7	9,828,306	68.2	On	On	On	On	On	On	4.12	20.69	8.35	47.84	29.49	148.48	41.96	217.00	20.59	111.51
6/27/17 0:00	24.00	99057.39	9,927,363	68.8	On	On	On	On	On	On	4.15	21.06	8.40	48.68	29.75	151.45	42.30	221.19	20.74	113.59
6/28/17 0:00	24.00	97785.67	10,025,149	67.9	On	On	On	On	On	On	4.18	21.44	8.45	49.52	30.00	154.44	42.63	225.40	20.90	115.67
6/29/17 0:00	24.00	97613.3	10,122,762	67.8	On	On	On	On	On	On	4.21	21.83	8.49	50.37	30.26	157.46	42.96	229.66	21.05	117.77
6/30/17 0:00	24.00	97800.8	10,220,563	67.9	On	On	On	On	On	On	4.24	22.21	8.54	51.22	30.51	160.51	43.30	233.94	21.21	119.89

H DISCHARGE MONITORING REPORTS AND EXCEEDANCE NOTIFICATION

DMR SUBMITTAL – JANUARY 2017 TO JUNE 2017

DMR Copy of Record

Permit					
Permit #:	**MD0069094**	**Permittee:**	EMERSUB 16, LLC	**Facility:**	EMERSUB 16, LLC
Major:	No	**Permittee Address:**	8000 WEST FLORISSANT AVENUE ST. LOUIS, MO 63136	**Facility Location:**	7565 HARMANS ROAD ANNE ARUNDEL COUNTY HANOVER, MD 21076
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 15-DP-3442		
Report Dates & Status					
Monitoring Period:	**From 01/01/17 to 01/31/17**	**DMR Due Date:**	**03/28/17**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
TOTAL VOLATILE ORGANICS IS DEFINEDAS THE SUM OF THE CONCENTRATIONS OFTHE CONSTIIUENTS PRESENT IN THE WASTEWATER ACCORDING TO EPA METHOD 601THE PERMITTEE SHALL INCLUDE IN THEQUARTERLY DMR REPORT THE TOTAL SUMAND EACH INDIVIDUAL CONCENTRATION OF DETECTED CONSTITUENTS.					
Principal Executive Officer					
First Name:	Stephen	**Title:**	President	**Telephone:**	314-553-1953
Last Name:	Clarke				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Permit Req.						>=	5 MINIMUM					19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI							C - No Discharge								
					Sample															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge		C - No Discharge				
					Sample															
00400	pH	1 - Effluent Gross	0	--	Permit Req.						>=	6.5 MINIMUM			<=	8.5 MAXIMUM	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI							C - No Discharge				C - No Discharge				
					Sample															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge		C - No Discharge				
					Sample															
00530	Solids, total suspended	1 - Effluent Gross	2	--	Permit Req.			<=	2031 DAILY MX	50 - lb/yr									01/30 - Monthly	CA - CALCTD
					Value NODI				C - No Discharge											
					Sample															
00530	Solids, total suspended	EG - Effluent Gross	1	--	Permit Req.		Req Mon MO AVG			76 - lb/mo									01/30 - Monthly	CA - CALCTD
					Value NODI		C - No Discharge													
					Sample															
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Value NODI											C - No Discharge				
					Sample															
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Permit Req.		Req Mon MO AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI		C - No Discharge													
					Sample															
00600	Nitrogen, total [as N]	1 - Effluent Gross	2	--	Permit Req.				Req Mon DAILY MX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI				C - No Discharge											
					Sample															
00605	Nitrogen, organic total [as N]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
00609	Ammonia nitrogen, total, [as N] 30 day	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Permit Req.								<=	9 MO AVG	<=	13 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge		C - No Discharge				
					Sample															

01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
01051	Lead, total [as Pb]	1 - Effluent Gross	0	--	Permit Req.										<=	65 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge						
					Sample															
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	1	--	Permit Req.									Req Mon DAILY MX			28 - ug/L		01/07 - Weekly	GR - GRAB
					Value NODI									C - No Discharge						
					Sample															
01067	Nickel, total [as Ni]	1 - Effluent Gross	0	--	Permit Req.								<	470 DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge						
					Sample															
01090	Zinc, dissolved [as Zn]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge						
					Sample															
01092	Zinc, total [as Zn]	1 - Effluent Gross	0	--	Permit Req.								<=	120 MO AVG	<	120 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge		C - No Discharge				
					Sample															
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Permit Req.		Req Mon MO AVG		Req Mon DAILY MX	07 - gal/d									01/30 - Monthly	MS - MEASRD
					Value NODI		C - No Discharge		C - No Discharge											
					Sample															
61162	1,1-Dichloroethene	1 - Effluent Gross	0	--	Permit Req.								<=	32 MO AVG			28 - ug/L		02/30 - Twice Per Month	GR - GRAB
					Value NODI									C - No Discharge						
					Sample															
76029	Organics, tot purgeables [Method 624]	1 - Effluent Gross	0	--	Permit Req.										<=	100 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI											C - No Discharge				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

EMERSUB 16, LLC

User:	laura.barsauskas@wspgroup.com	Date/Time:	2017-02-15 14:57 (Time Zone: -05:00)
Name:	Laura Barsauskas		
E-Mail:	laura.barsauskas@wspgroup.com		

DMR Copy of Record

Permit					
Permit #:	**MD0069094**	**Permittee:**	EMERSUB 16, LLC	**Facility:**	EMERSUB 16, LLC
Major:	No	**Permittee Address:**	8000 WEST FLORISSANT AVENUE ST. LOUIS, MO 63136	**Facility Location:**	7565 HARMANS ROAD ANNE ARUNDEL COUNTY HANOVER, MD 21076
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 15-DP-3442		
Report Dates & Status					
Monitoring Period:	**From 02/01/17 to 02/28/17**	**DMR Due Date:**	**04/28/17**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
TOTAL VOLATILE ORGANICS IS DEFINEDAS THE SUM OF THE CONCENTRATIONS OFTHE CONSTIIUENTS PRESENT IN THE WASTEWATER ACCORDING TO EPA METHOD 601THE PERMITTEE SHALL INCLUDE IN THEQUARTERLY DMR REPORT THE TOTAL SUMAND EACH INDIVIDUAL CONCENTRATION OF DETECTED CONSTITUENTS.					
Principal Executive Officer					
First Name:	Stephen	**Title:**	President	**Telephone:**	314-553-1953
Last Name:	Clarke				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Permit Req.						>=	5 MINIMUM					19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI							C - No Discharge								
					Sample															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge		C - No Discharge				
					Sample															
00400	pH	1 - Effluent Gross	0	--	Permit Req.						>=	6.5 MINIMUM			<=	8.5 MAXIMUM	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI							C - No Discharge				C - No Discharge				
					Sample															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge		C - No Discharge				
					Sample															
00530	Solids, total suspended	1 - Effluent Gross	2	--	Permit Req.			<=	2031 DAILY MX	50 - lb/yr									01/30 - Monthly	CA - CALCTD
					Value NODI				C - No Discharge											
					Sample															
00530	Solids, total suspended	EG - Effluent Gross	1	--	Permit Req.		Req Mon MO AVG			76 - lb/mo									01/30 - Monthly	CA - CALCTD
					Value NODI		C - No Discharge													
					Sample															
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Value NODI											C - No Discharge				
					Sample															
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Permit Req.		Req Mon MO AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI		C - No Discharge													
					Sample															
00600	Nitrogen, total [as N]	1 - Effluent Gross	2	--	Permit Req.				Req Mon DAILY MX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI				C - No Discharge											
					Sample															
00605	Nitrogen, organic total [as N]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
00609	Ammonia nitrogen, total, [as N] 30 day	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.											Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI											C - No Discharge				
					Sample															
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Permit Req.								<=	9 MO AVG	<=	13 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI									C - No Discharge		C - No Discharge				
					Sample															

01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.												Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												C - No Discharge				
					Sample																
01051	Lead, total [as Pb]	1 - Effluent Gross	0	--	Permit Req.											<=	65 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												C - No Discharge				
					Sample																
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	0	--	Permit Req.										Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI										C - No Discharge						
					Sample																
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	1	--	Permit Req.										Req Mon DAILY MX			28 - ug/L		01/07 - Weekly	GR - GRAB
					Value NODI										C - No Discharge						
					Sample																
01067	Nickel, total [as Ni]	1 - Effluent Gross	0	--	Permit Req.									<	470 DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI										C - No Discharge						
					Sample																
01090	Zinc, dissolved [as Zn]	1 - Effluent Gross	0	--	Permit Req.										Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI										C - No Discharge						
					Sample																
01092	Zinc, total [as Zn]	1 - Effluent Gross	0	--	Permit Req.									<=	120 MO AVG	<	120 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI										C - No Discharge		C - No Discharge				
					Sample																
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Permit Req.		Req Mon MO AVG		Req Mon DAILY MX	07 - gal/d										01/30 - Monthly	MS - MEASRD
					Value NODI		C - No Discharge		C - No Discharge												
					Sample																
61162	1,1-Dichloroethene	1 - Effluent Gross	0	--	Permit Req.									<=	32 MO AVG			28 - ug/L		02/30 - Twice Per Month	GR - GRAB
					Value NODI										C - No Discharge						
					Sample																
76029	Organics, tot purgeables [Method 624]	1 - Effluent Gross	0	--	Permit Req.											<=	100 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												C - No Discharge				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

EMERSUB 16, LLC

User:	laura.barsauskas@wspgroup.com	Date/Time:	2017-03-20 15:40 (Time Zone: -04:00)
Name:	Laura Barsauskas		
E-Mail:	laura.barsauskas@wspgroup.com		

DMR Copy of Record

Permit					
Permit #:	**MD0069094**	**Permittee:**	EMERSUB 16, LLC	**Facility:**	EMERSUB 16, LLC
Major:	No	**Permittee Address:**	8000 WEST FLORISSANT AVENUE ST. LOUIS, MO 63136	**Facility Location:**	7565 HARMANS ROAD ANNE ARUNDEL COUNTY HANOVER, MD 21076
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 15-DP-3442		
Report Dates & Status					
Monitoring Period:	**From 03/01/17 to 03/31/17**	**DMR Due Date:**	**05/28/17**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
TOTAL VOLATILE ORGANICS IS DEFINEDAS THE SUM OF THE CONCENTRATIONS OFTHE CONSTIIUENTS PRESENT IN THE WASTEWATER ACCORDING TO EPA METHOD 601THE PERMITTEE SHALL INCLUDE IN THEQUARTERLY DMR REPORT THE TOTAL SUMAND EACH INDIVIDUAL CONCENTRATION OF DETECTED CONSTITUENTS.					
Principal Executive Officer					
First Name:	Stephen	**Title:**	President	**Telephone:**	314-553-1953
Last Name:	Clarke				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	7.08					19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	5 MINIMUM					19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
X 00400	pH	1 - Effluent Gross	0	--	Sample						=	5.85			=	7.3	12 - SU		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	8.5 MAXIMUM	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
00530	Solids, total suspended	1 - Effluent Gross	2	--	Sample															
					Permit Req.			<=	2031 DAILY MX	50 - lb/yr									01/30 - Monthly	CA - CALCTD
					Value NODI				B - Below Detection Limit/No Detection											
00530	Solids, total suspended	EG - Effluent Gross	1	--	Sample															
					Permit Req.		Req Mon MO AVG			76 - lb/mo									01/30 - Monthly	CA - CALCTD
					Value NODI		B - Below Detection Limit/No Detection													
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Sample										=	1.18	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Sample	=	12			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.		Req Mon MO AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	2	--	Sample			=	12	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Permit Req.				Req Mon DAILY MX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
					Sample										=	0.4	19 - mg/L		01/90 - Quarterly	GR - GRAB

00605	Nitrogen, organic total [as N]	1 - Effluent Gross	0	--	Permit Req.													Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI																		
00609	Ammonia nitrogen, total, [as N] 30 day	1 - Effluent Gross	0	--	Sample																		
					Permit Req.													Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI													B - Below Detection Limit/No Detection					
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample												=	0.78	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Permit Req.													Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI																		
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Sample												=	91	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.													Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI																		
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample												=	1.4	28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.													Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																		
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Sample									=	0.8	=	3.2		28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<=	9 MO AVG	<=	13 DAILY MX		28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																		
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample																		
					Permit Req.													Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI													B - Below Detection Limit/No Detection					
01051	Lead, total [as Pb]	1 - Effluent Gross	0	--	Sample																		
					Permit Req.											<=	65 DAILY MX		28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI													B - Below Detection Limit/No Detection					
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	0	--	Sample									=	27.3				28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.										Req Mon DAILY MX				28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																		
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	1	--	Sample									=	27.3				28 - ug/L		01/07 - Weekly	GR - GRAB
					Permit Req.										Req Mon DAILY MX				28 - ug/L		01/07 - Weekly	GR - GRAB
					Value NODI																		
01067	Nickel, total [as Ni]	1 - Effluent Gross	0	--	Sample									=	29.9				28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<	470 DAILY MX				28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																		
01090	Zinc, dissolved [as Zn]	1 - Effluent Gross	0	--	Sample									=	163				28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.										Req Mon DAILY MX				28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																		
X 01092	Zinc, total [as Zn]	1 - Effluent Gross	0	--	Sample									=	57.73	=	179		28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<=	120 MO AVG	<	120 DAILY MX		28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																		
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Sample	=	87120	=	108000	07 - gal/d											01/30 - Monthly	MS - MEASRD
					Permit Req.		Req Mon MO AVG		Req Mon DAILY MX	07 - gal/d											01/30 - Monthly	MS - MEASRD
					Value NODI																		
61162	1,1-Dichloroethene	1 - Effluent Gross	0	--	Sample																		
					Permit Req.									<=	32 MO AVG				28 - ug/L		02/30 - Twice Per Month	GR - GRAB

					Value NODI									8 - Other (See Comments)							
76029	Organics, tot purgeables [Method 624]	1 - Effluent Gross	0	--	Sample																
					Permit Req.										<=	100 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB	
					Value NODI											B - Below Detection Limit/No Detection					

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

Parameter		Monitoring Location	Field	Type	Description	Acknowledge
Code	Name					
00400	pH	1 - Effluent Gross	Quality or Concentration Sample Value 1	Soft	The provided sample value is outside the permit limit. (Error Code: 1)	Yes
01092	Zinc, total [as Zn]	1 - Effluent Gross	Quality or Concentration Sample Value 3	Soft	The provided sample value is outside the permit limit. (Error Code: 1)	Yes

Comments

Data attachments: Attached to this DRM is one .pdf including laboratory data packages for all analyzed parameters and exceedance letters previously submitted to MDE (2 letters for pH exceedances and 1 letter for a Zinc exceedance). 1,1-DCE: this parameter is not required to be analyzed per the permit effluent limitations and monitoring requirements; however, it was analyzed weekly for the first 4 weeks of discharge in order to determine total purgeable organics. It is unclear as to why this is required here. Laboratory data is provided in the attachment.

Attachments

Name	Type	Size
_Final_March_DMR_Attachment.pdf	pdf	4164891

Report Last Saved By

EMERSUB 16, LLC

User: laura.barsauskas@wspgroup.com | Date/Time: 2017-04-28 16:27 (Time Zone: -04:00)

Name: Laura Barsauskas

E-Mail: laura.barsauskas@wspgroup.com

DMR Copy of Record

Permit					
Permit #:	**MD0069094**	**Permittee:**	EMERSUB 16, LLC	**Facility:**	EMERSUB 16, LLC
Major:	No	**Permittee Address:**	8000 WEST FLORISSANT AVENUE ST. LOUIS, MO 63136	**Facility Location:**	7565 HARMANS ROAD ANNE ARUNDEL COUNTY HANOVER, MD 21076
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 15-DP-3442		
Report Dates & Status					
Monitoring Period:	**From 04/01/17 to 04/30/17**	**DMR Due Date:**	**06/28/17**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
TOTAL VOLATILE ORGANICS IS DEFINEDAS THE SUM OF THE CONCENTRATIONS OFTHE CONSTIIUENTS PRESENT IN THE WASTEWATER ACCORDING TO EPA METHOD 601THE PERMITTEE SHALL INCLUDE IN THEQUARTERLY DMR REPORT THE TOTAL SUMAND EACH INDIVIDUAL CONCENTRATION OF DETECTED CONSTITUENTS.					
Principal Executive Officer					
First Name:	Stephen	**Title:**	President	**Telephone:**	314-553-1953
Last Name:	Clarke				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	7.35					19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	5 MINIMUM					19 - mg/L	0	01/30 - Monthly	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
X 00400	pH	1 - Effluent Gross	0	--	Sample						=	6.3			=	6.56	12 - SU		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	8.5 MAXIMUM	12 - SU	1	01/30 - Monthly	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
00530	Solids, total suspended	1 - Effluent Gross	2	--	Sample															
					Permit Req.			<=	2031 DAILY MX	50 - lb/yr									01/30 - Monthly	CA - CALCTD
					Value NODI				B - Below Detection Limit/No Detection											
00530	Solids, total suspended	EG - Effluent Gross	1	--	Sample															
					Permit Req.		Req Mon MO AVG			76 - lb/mo									01/30 - Monthly	CA - CALCTD
					Value NODI		B - Below Detection Limit/No Detection													
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Sample															
					Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Value NODI											9 - Conditional Monitoring - Not Required This Period				
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Sample															
					Permit Req.		Req Mon MO AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI		9 - Conditional Monitoring - Not Required This Period													
00600	Nitrogen, total [as N]	1 - Effluent Gross	2	--	Sample															
					Permit Req.				Req Mon DAILY MX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI				9 - Conditional Monitoring - Not Required This Period											
00605	Nitrogen, organic total [as N]	1 - Effluent Gross	0	--	Sample															
					Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value											9 - Conditional Monitoring - Not Required				

					NODI												This Period						
00609	Ammonia nitrogen, total, [as N] 30 day	1 - Effluent Gross	0	--	Sample																		
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB		
					Value NODI												9 - Conditional Monitoring - Not Required This Period						
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample																		
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB		
					Value NODI												9 - Conditional Monitoring - Not Required This Period						
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Sample											=	12	19 - mg/L		01/30 - Monthly	GR - GRAB		
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB		
					Value NODI																		
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample											=	1.4	28 - ug/L		01/30 - Monthly	GR - GRAB		
					Permit Req.												Req Mon DAILY MX	28 - ug/L	0	01/30 - Monthly	GR - GRAB		
					Value NODI																		
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Sample							=	3.2	=	3.2	28 - ug/L		01/30 - Monthly	GR - GRAB		
					Permit Req.							<=	9 MO AVG	<=	13 DAILY MX	28 - ug/L	0	01/30 - Monthly	GR - GRAB		
					Value NODI																		
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample																		
					Permit Req.												Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB		
					Value NODI												B - Below Detection Limit/No Detection						
01051	Lead, total [as Pb]	1 - Effluent Gross	0	--	Sample																		
					Permit Req.											<=	65 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB		
					Value NODI												B - Below Detection Limit/No Detection						
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	0	--	Sample							=	8			28 - ug/L		01/30 - Monthly	GR - GRAB		
					Permit Req.								Req Mon DAILY MX			28 - ug/L	0	01/30 - Monthly	GR - GRAB		
					Value NODI																		
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	1	--	Sample																		
					Permit Req.								Req Mon DAILY MX			28 - ug/L		01/07 - Weekly	GR - GRAB		
					Value NODI								9 - Conditional Monitoring - Not Required This Period										
01067	Nickel, total [as Ni]	1 - Effluent Gross	0	--	Sample							=	7.7			28 - ug/L		01/30 - Monthly	GR - GRAB		
					Permit Req.							<	470 DAILY MX			28 - ug/L	0	01/30 - Monthly	GR - GRAB		
					Value NODI																		
01090	Zinc, dissolved [as Zn]	1 - Effluent Gross	0	--	Sample																		
					Permit Req.								Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB		
					Value NODI								B - Below Detection Limit/No Detection										
01092	Zinc, total [as Zn]	1 - Effluent Gross	0	--	Sample							=	24.7	=	24.7	28 - ug/L		01/30 - Monthly	GR - GRAB		
					Permit Req.							<=	120 MO AVG	<	120 DAILY MX	28 - ug/L	0	01/30 - Monthly	GR - GRAB		
					Value NODI																		
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Sample	=	102806	=	104660	07 - gal/d								01/30 - Monthly	MS - MEASRD				
					Permit Req.		Req Mon MO AVG		Req Mon DAILY MX	07 - gal/d								01/30 - Monthly	MS - MEASRD				
					Value NODI																		
61162	1,1-Dichloroethene	1 - Effluent Gross	0	--	Sample																		
					Permit Req.							<=	32 MO AVG			28 - ug/L		02/30 - Twice Per Month	GR - GRAB		
					Value NODI								B - Below Detection Limit/No Detection										
76029	Organics, tot purgeables [Method 624]	1 - Effluent Gross	0	--	Sample																		
					Permit Req.									<=	100 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB		
					Value																		

| | | |

DMR Copy of Record

Permit					
Permit #:	**MD0069094**	**Permittee:**	EMERSUB 16, LLC	**Facility:**	EMERSUB 16, LLC
Major:	No	**Permittee Address:**	8000 WEST FLORISSANT AVENUE ST. LOUIS, MO 63136	**Facility Location:**	7565 HARMANS ROAD ANNE ARUNDEL COUNTY HANOVER, MD 21076
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 15-DP-3442		
Report Dates & Status					
Monitoring Period:	**From 05/01/17 to 05/31/17**	**DMR Due Date:**	**07/28/17**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
TOTAL VOLATILE ORGANICS IS DEFINEDAS THE SUM OF THE CONCENTRATIONS OFTHE CONSTIIUENTS PRESENT IN THE WASTEWATER ACCORDING TO EPA METHOD 601THE PERMITTEE SHALL INCLUDE IN THEQUARTERLY DMR REPORT THE TOTAL SUMAND EACH INDIVIDUAL CONCENTRATION OF DETECTED CONSTITUENTS.					
Principal Executive Officer					
First Name:	Stephen	**Title:**	President	**Telephone:**	314-553-1953
Last Name:	Clarke				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	11.05					19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	5 MINIMUM					19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
X 00400	pH	1 - Effluent Gross	0	--	Sample						=	6.3			=	6.8	12 - SU		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	8.5 MAXIMUM	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
00530	Solids, total suspended	1 - Effluent Gross	2	--	Sample															
					Permit Req.			<=	2031 DAILY MX	50 - lb/yr									01/30 - Monthly	CA - CALCTD
					Value NODI				B - Below Detection Limit/No Detection											
00530	Solids, total suspended	EG - Effluent Gross	1	--	Sample															
					Permit Req.		Req Mon MO AVG			76 - lb/mo									01/30 - Monthly	CA - CALCTD
					Value NODI		B - Below Detection Limit/No Detection													
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Sample										=	1.41	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Sample	=	37.44			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.		Req Mon MO AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	2	--	Sample			=	49.44	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Permit Req.				Req Mon DAILY MX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
					Sample															

00605	Nitrogen, organic total [as N]	1 - Effluent Gross	0	--	Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
00609	Ammonia nitrogen, total, [as N] 30 day	1 - Effluent Gross	0	--	Sample																
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample											=	0.91	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI																
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Sample											=	15	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample											=	3.5	28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.												Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Sample									=	4.7	=	4.7	28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<=	9 MO AVG	<=	13 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample																
					Permit Req.												Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
01051	Lead, total [as Pb]	1 - Effluent Gross	0	--	Sample																
					Permit Req.											<=	65 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	0	--	Sample									=	9.3			28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.										Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	1	--	Sample																
					Permit Req.										Req Mon DAILY MX			28 - ug/L		01/07 - Weekly	GR - GRAB
					Value NODI										9 - Conditional Monitoring - Not Required This Period						
01067	Nickel, total [as Ni]	1 - Effluent Gross	0	--	Sample									=	9.4			28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<	470 DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01090	Zinc, dissolved [as Zn]	1 - Effluent Gross	0	--	Sample																
					Permit Req.										Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI										B - Below Detection Limit/No Detection						
01092	Zinc, total [as Zn]	1 - Effluent Gross	0	--	Sample									=	20.2	=	20.2	28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<=	120 MO AVG	<	120 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Sample	=	102705	=	104362	07 - gal/d										01/30 - Monthly	MS - MEASRD
					Permit Req.		Req Mon MO AVG		Req Mon DAILY MX	07 - gal/d										01/30 - Monthly	MS - MEASRD
					Value NODI																
61162	1,1-Dichloroethene	1 - Effluent Gross	0	--	Sample																
					Permit Req.									<=	32 MO AVG			28 - ug/L		02/30 - Twice Per Month	GR - GRAB
					Value NODI										B - Below Detection Limit/No Detection						

76029	Organics, tot purgeables [Method 624]	1 - Effluent Gross	0	--	Sample																
					Permit Req.											<=	100 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

Parameter		Monitoring Location	Field	Type	Description	Acknowledge
Code	Name					
00400	pH	1 - Effluent Gross	Quality or Concentration Sample Value 1	Soft	The provided sample value is outside the permit limit. (Error Code: 1)	Yes

Comments

Attachments for this DMR include a pH exceedance letter previously submitted to MDE and one .pdf file that includes data packages for all analyzed parameters.

Attachments

Name	Type	Size
Attachment.pdf	pdf	625071

Report Last Saved By

EMERSUB 16, LLC

User: laura.barsauskas@wspgroup.com Date/Time: 2017-06-29 13:26 (Time Zone: -04:00)

Name: Laura Barsauskas

E-Mail: laura.barsauskas@wspgroup.com

DMR Copy of Record

Permit					
Permit #:	**MD0069094**	**Permittee:**	EMERSUB 16, LLC	**Facility:**	EMERSUB 16, LLC
Major:	No	**Permittee Address:**	8000 WEST FLORISSANT AVENUE ST. LOUIS, MO 63136	**Facility Location:**	7565 HARMANS ROAD ANNE ARUNDEL COUNTY HANOVER, MD 21076
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 15-DP-3442		
Report Dates & Status					
Monitoring Period:	**From 05/01/17 to 05/31/17**	**DMR Due Date:**	**07/28/17**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
TOTAL VOLATILE ORGANICS IS DEFINEDAS THE SUM OF THE CONCENTRATIONS OFTHE CONSTIIUENTS PRESENT IN THE WASTEWATER ACCORDING TO EPA METHOD 601THE PERMITTEE SHALL INCLUDE IN THEQUARTERLY DMR REPORT THE TOTAL SUMAND EACH INDIVIDUAL CONCENTRATION OF DETECTED CONSTITUENTS.					
Principal Executive Officer					
First Name:	Stephen	**Title:**	President	**Telephone:**	314-553-1953
Last Name:	Clarke				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	11.05					19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	5 MINIMUM					19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
X 00400	pH	1 - Effluent Gross	0	--	Sample						=	6.3			=	6.8	12 - SU		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	8.5 MAXIMUM	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample															
					Permit Req.								<=	30 MO AVG	<=	45 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
00530	Solids, total suspended	1 - Effluent Gross	2	--	Sample															
					Permit Req.			<=	2031 DAILY MX	50 - lb/yr									01/30 - Monthly	CA - CALCTD
					Value NODI				B - Below Detection Limit/No Detection											
00530	Solids, total suspended	EG - Effluent Gross	1	--	Sample															
					Permit Req.		Req Mon MO AVG			76 - lb/mo									01/30 - Monthly	CA - CALCTD
					Value NODI		B - Below Detection Limit/No Detection													
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Sample										=	1.41	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Permit Req.											Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	CA - CALCTD
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Sample	=	37.44			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.		Req Mon MO AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	2	--	Sample			=	49.44	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Permit Req.				Req Mon DAILY MX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
					Sample															

00605	Nitrogen, organic total [as N]	1 - Effluent Gross	0	--	Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
00609	Ammonia nitrogen, total, [as N] 30 day	1 - Effluent Gross	0	--	Sample																
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample											=	0.91	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/90 - Quarterly	GR - GRAB
					Value NODI																
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Sample											=	15	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.												Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample											=	3.5	28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.												Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Sample									=	4.7	=	4.7	28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<=	9 MO AVG	<=	13 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample																
					Permit Req.												Req Mon DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
01051	Lead, total [as Pb]	1 - Effluent Gross	0	--	Sample																
					Permit Req.											<=	65 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	0	--	Sample									=	9.3			28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.										Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01065	Nickel, dissolved [as Ni]	1 - Effluent Gross	1	--	Sample																
					Permit Req.										Req Mon DAILY MX			28 - ug/L		01/07 - Weekly	GR - GRAB
					Value NODI										9 - Conditional Monitoring - Not Required This Period						
01067	Nickel, total [as Ni]	1 - Effluent Gross	0	--	Sample									=	9.4			28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<	470 DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
01090	Zinc, dissolved [as Zn]	1 - Effluent Gross	0	--	Sample																
					Permit Req.										Req Mon DAILY MX			28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI										B - Below Detection Limit/No Detection						
01092	Zinc, total [as Zn]	1 - Effluent Gross	0	--	Sample									=	20.2	=	20.2	28 - ug/L		01/30 - Monthly	GR - GRAB
					Permit Req.									<=	120 MO AVG	<	120 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI																
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Sample	=	102705	=	104362	07 - gal/d										01/30 - Monthly	MS - MEASRD
					Permit Req.		Req Mon MO AVG		Req Mon DAILY MX	07 - gal/d										01/30 - Monthly	MS - MEASRD
					Value NODI																
61162	1,1-Dichloroethene	1 - Effluent Gross	0	--	Sample																
					Permit Req.									<=	32 MO AVG			28 - ug/L		02/30 - Twice Per Month	GR - GRAB
					Value NODI										B - Below Detection Limit/No Detection						

76029	Organics, tot purgeables [Method 624]	1 - Effluent Gross	0	--	Sample																
					Permit Req.											<=	100 DAILY MX	28 - ug/L		01/30 - Monthly	GR - GRAB
					Value NODI												B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

Parameter		Monitoring Location	Field	Type	Description	Acknowledge
Code	Name					
00400	pH	1 - Effluent Gross	Quality or Concentration Sample Value 1	Soft	The provided sample value is outside the permit limit. (Error Code: 1)	Yes

Comments

Attachments for this DMR include a pH exceedance letter previously submitted to MDE and one .pdf file that includes data packages for all analyzed parameters.

Attachments

Name	Type	Size
Attachment.pdf	pdf	625071

Report Last Saved By

EMERSUB 16, LLC

User: laura.barsauskas@wspgroup.com Date/Time: 2017-06-29 13:26 (Time Zone: -04:00)

Name: Laura Barsauskas

E-Mail: laura.barsauskas@wspgroup.com

EXCEEDANCE NOTIFICATIONS

WSP | PARSONS BRINCKERHOFF

13530 Dulles Technology Drive
Suite 300
Herndon, VA 20171
Main: 703-709-6500
wsp-pb.com/usa

VIA OVERNIGHT MAIL

March 28, 2017

Maryland Department of the Environment
Water Management Administration – Compliance Program
1800 Washington Boulevard
Suite 425
Baltimore, Maryland 21230-1708

Re: Probable Noncompliance with State Discharge Permit No. 15DP34422,
NPDES Permit MD0069094 Effluent Limitation for pH

Discharge Monitoring Reports:

On behalf of Emersub 16, LLC, WSP USA Corp (WSP) is submitting this letter to notify the Maryland Department of Environment (MDE) of a potential effluent limitation noncompliance, in accordance with General Condition B.2 – Noncompliance with Effluent Limitations of State Discharge Permit No. 15DP3442, National Pollutant Discharge Elimination System (NPDES) Permit MD 0069094 for the site located at 7565 Harmans Road in Hanover, Anne Arundel County, Maryland (the Site). As required in General Condition B.2, WSP also notified the MDE Compliance Program of the situation by telephone on March 23, 2017. Noncompliance information to be provided in accordance with General Condition B.2.a. – is presented below.

General Condition B.2.a – A description of the non-complying discharge including its impact upon the receiving waters

Under the MDE Voluntary Cleanup Program, response actions have been developed for the Site, including the installation of a groundwater extraction and treatment system (System). The purpose of the System is to pump and treat affected groundwater prior to its discharge to Stony Run. Groundwater is extracted from five recovery wells equipped with dedicated electric submersible extraction pumps. Sub-grade water conveyance piping routes the extracted groundwater to the treatment system located on the property. The groundwater is treated to meet the NPDES permit discharge limits using bag filters for suspended solids removal, a metering pump for the addition of an iron sequestering agent, synthetic resin for the removal of volatile organic compounds and 1,4-dioxane, a metering pump for the addition of caustic soda for pH buffering, and an in-line aerator to increase dissolved oxygen levels. When automated, the metering pump for the addition of caustic soda responds to a proportional-integral-derivative (PID) control receiving pH readings from a probe placed in the conveyance piping prior to the discharge of treated groundwater to outfall 001.

WSP began operating the System on March 10, 2017, at a reduced flow rate of 20 gallons per minute (GPM) for 2 hours. The week of March 13, 2017, WSP operated the system up to 8 hours per day through March 17, 2017, gradually increasing flow from 20 GPM, to a maximum flow of 70 GPM on March 17, 2017, when the system was shutdown. During the week of March 20, 2017, the system operated continuously at a flow rate of 75 GPM, until shutdown on Friday afternoon, March 24, 2017.

In accordance with the NPDES permit, weekly samples have been collected of the system effluent since the system began operating for the set of parameters specified in the permit. All monitoring parameters have been within the permitted range, including pH. In addition to the required weekly

sampling, WSP has been periodically monitoring several parameters to confirm effective water treatment prior to discharge. Additional pH measurements were collected using a pH and dissolved oxygen handheld multi-meter (Hach Sension + MM156 Portable Multimeter) which is the same method used for the weekly effluent samples.. This sampling and analysis identified pH values below the NPDES effluent limit range of 6.5 – 8.5 at the effluent port. The following pH values (in standard units [s.u.]) were recorded:

Date	Time	pH
3/20/2017	10:43	6.88
3/20/2017	13:22	6.25
3/20/2017	15:32	5.85
3/21/2017	8:43	6.00
3/21/2017	11:00	5.86
3/21/2017	15:45	5.93
3/22/2017	8:03	5.93
3/22/2017	14:45	6.03
3/23/2017	8:23	6.55
3/24/2017	10:30	6.45
3/24/2017	2:18	6.05

Based on data collected as part of the operation and maintenance of the System, the following volumes of treated groundwater were discharged to Stony Run via Outfall 001 on the days and times the pH exceedances occurred:

Date	Volume
March 20, 2017	52,810 gallons
March 21 ,2017	103,852 gallons
March 22, 2017	103,465 gallons
March 24, 2017	4,640 gallons

As part of ongoing stream monitoring activities, field measurements of the surface water were collected along Stony Run (i.e., the receiving water body) on March 21, 2017 and March 24, 2017. Surface water data were also collected on March 8, 2017, prior to System startup. The pH values are provided below:

Distance from Outfall 001	March 8, 2017	March 21, 2017	March 24, 2017
100 feet upstream	7.42	6.68	6.98
25 feet downstream	7.66	6.63	6.79
175 feet downstream	7.35	6.65	6.68

Based on this information, the pH of the receiving stream remained above the permitted discharge limit of 6.5 s.u.

General Condition B.2.b. – Cause of noncompliance

The noncompliant pH readings on the above dates were attributed to inaccurate pH measurements by the inline pH probe, thereby not activating the automatic injection of caustic into the water stream to reach a level compliant with the permitted range (6.5 s.u. to 8.5 s.u.). WSP field staff evaluated the pH adjustment system after identifying the noncompliance, and determined the pH probe was improperly

seated in the water pipe fitting, measuring stagnant water within the fitting rather than flowing water within the pipe. The continuous discharge of water at the increased flow rate of 75 GPM, which occurred on the same date of the first noncompliance reading (March 20, 2017), likely adjusted the alignment of the probe.

General Condition B.2.c. – Anticipated time the condition of noncompliance is expected to continue

WSP shutdown the system on March 24, 2017. WSP has scheduled replacement of the probe fitting on March 27, 2017, by Groundwater Treatment & Technology, Inc., WSP's construction subcontractor.

General Condition B.2.d. – Steps taken by the permittee to reduce and eliminate the non-complying discharge

Upon identifying the discharge of treated groundwater below the pH range prescribed in the NPDES permit, WSP began manually operating the pH adjustment system to increase the pH. The caustic soda pump rate speed was manually increased, starting on March 20, 2017, until the pH readings taken with the handheld pH meter were within the permitted range. WSP continued periodic monitoring of the pH using the handheld meter throughout the week of March 20, 2017. The groundwater system was shut down on March 24, 2017, following two additional noncompliant readings earlier that day. As indicated above, WSP has scheduled repairs to rectify the issue.

General Condition B.2.e. – Steps to be taken by the permittee to prevent recurrence of the condition of noncompliance

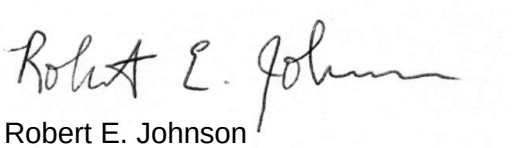
WSP believes this situation of noncompliance is attributable to an improperly installed pH probe. WSP will correct the installation of the pH probe, and operate the pH adjustment system in automated mode.

General Condition B.2.f. – A description of the accelerated or additional monitoring by the permittee to determine the nature and impact of the noncomplying discharge

WSP is continuing the collection of pH readings with a handheld pH meter to ensure compliance with the prescribed NPDES pH effluent range. Based on the effluent pH measurements, WSP may collect additional surface water quality data to determine if an impact to the stream is occurring.

Please do not hesitate to contact me with any questions.

Sincerely,



Robert E. Johnson
Senior Technical Manager - Environment

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cc: Steve Clarke, President, Emersub 16, LLC (via electronic mail)
Steve Kretschman, P.E., WSP USA Corp. (via electronic mail)

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VIA ELECTRONIC MAIL

April 3, 2017

Maryland Department of the Environment
Water Management Administration – Compliance Program
1800 Washington Boulevard
Suite 425
Baltimore, Maryland 21230-1708

Re: Noncompliance with State Discharge Permit No. 15DP34422,
NPDES Permit MD0069094 Effluent Limitation for Zinc

Discharge Monitoring Reports:

On behalf of Emersub 16, LLC, WSP USA Corp (WSP) is submitting this letter to notify the Maryland Department of Environment (MDE) of an effluent limitation noncompliance, in accordance with General Condition B.2 – Noncompliance with Effluent Limitations of State Discharge Permit No. 15DP3442, National Pollutant Discharge Elimination System (NPDES) Permit MD 0069094 for the site located at 7565 Harmans Road in Hanover, Anne Arundel County, Maryland (the Site). As required in General Condition B.2, WSP also notified the MDE Compliance Program of the situation by telephone the morning of March 29, 2017. Noncompliance information is provided below in accordance with General Condition B.2.a.

General Condition B.2.a – A description of the non-complying discharge including its impact upon the receiving waters

Under the MDE Voluntary Cleanup Program, response actions have been developed for the Site, including the installation of a groundwater extraction and treatment system (System). The purpose of the System is to pump and treat affected groundwater prior to its discharge to Stony Run. Groundwater is extracted from five recovery wells equipped with dedicated electric submersible extraction pumps. Sub-grade water conveyance piping routes the extracted groundwater to the treatment system located on the property. The groundwater is treated to meet the NPDES permit discharge limits using bag filters for suspended solids removal, a metering pump for the addition of an iron sequestering agent, synthetic resin for the removal of volatile organic compounds and 1,4-dioxane, a metering pump for the addition of caustic soda for pH buffering, and an in-line aerator to increase dissolved oxygen levels.

WSP began operating the System on March 10, 2017, at a reduced flow rate of 20 gallons per minute (GPM) for 2 hours. The week of March 13, 2017, WSP operated the System up to 8 hours per day through March 17, 2017, gradually increasing flow from 20 GPM, to a maximum flow of 70 GPM on March 17, 2017, when the System was shutdown. During the week of March 20, 2017, the System operated continuously at a flow rate of 75 GPM, until shutdown on Friday afternoon, March 24, 2017. The System was restarted on Wednesday morning, March 29, 2017, at a flow rate of approximately 75 GPM, and remains in continuous operation. Based on the System effluent totalizer, 72,000 gallons of treated groundwater was discharged to Stony Run via Outfall 001 between March 13 and 20, 2017, and 468,000 gallons were discharged between March 20 and 29, 2017 .

In accordance with the NPDES permit, weekly samples have been collected of the System effluent since the System began operating for the set of parameters specified in the permit. The results of

weekly samples collected on March 20, 2017, were received from the laboratory on March 28, 2017. The total zinc concentration in the discharge sample, 179 micrograms per liter (μg/l) exceeded the permit limit (120 μg/l).

Zinc was not detected in the previous weekly sample collected from the discharge on March 13, 2017 (analyzed to a laboratory reporting limit of 20 μg/l), and was detected at 27.2 μg/l in the following weekly discharge sample on March 29, 2017. Therefore, the exact duration of the zinc exceedance is unknown.

General Condition B.2.b. – Cause of noncompliance

Upon identifying the discharge of treated groundwater above the total zinc discharge limit prescribed in the NPDES permit, WSP initiated an evaluation of potential causes, including groundwater and System components. Data collection remains underway to determine the cause.

General Condition B.2.c. – Anticipated time the condition of noncompliance is expected to continue

WSP collected a weekly discharge sample on March 29, 2017, when operation of the System was resumed, and expedited the analysis for zinc following the previous sample's exceedance. The total zinc concentration in the expedited analysis, received on March 31, 2017, was 27.2 μg/l, below the permit limit (120 μg/l). Based on this information, the condition of noncompliance is no longer occurring.

General Condition B.2.d. – Steps taken by the permittee to reduce and eliminate the non-complying discharge

WSP initiated an evaluation of potential causes of the zinc exceedance immediately after identifying the exceedance. Data collection remains underway to determine the source of the zinc exceedance. System modifications will be implemented, as necessary, to ensure a non-complying discharge does not reoccur.

General Condition B.2.e. – Steps to be taken by the permittee to prevent recurrence of the condition of noncompliance

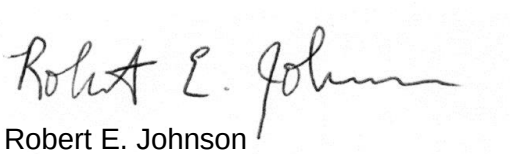
An evaluation is underway to determine the source of the zinc exceedance. System modifications will be implemented, as necessary, to maintain zinc concentrations below the permit limit.

General Condition B.2.f. – A description of the accelerated or additional monitoring by the permittee to determine the nature and impact of the noncomplying discharge

WSP collected a weekly sample on March 29, 2017, when operation of the System was resumed. The analysis of the sample was expedited when WSP received the laboratory analytical report from the previous weekly sampling that indicated the zinc exceedance. WSP received the results of the expedited zinc analysis on March 31, 2017. Because the total zinc concentrations in the weekly discharge samples collected on March 13th and March 29th were below the permit limit, WSP believes the noncomplying discharge on March 20th was an anomaly. WSP will continue to monitor the zinc concentration in the effluent pursuant to the permit, and confirm concentrations remain below the permit limit.

Please do not hesitate to contact me with any questions.

Sincerely,



Robert E. Johnson
Senior Technical Manager - Environment

REJ:rlo
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cc: Steve Clarke, President, Emersub 16, LLC (via electronic mail)
Steve Kretschman, P.E., WSP USA Corp. (via electronic mail)

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VIA ELECTRONIC MAIL

April 8, 2017

Heidi Slagle
Maryland Department of the Environment
Water Management Administration – Compliance Program
1800 Washington Boulevard
Suite 425
Baltimore, Maryland 21230-1708

Re: Noncompliance with State Discharge Permit 15DP34422 and
NPDES Permit MD0069094
Effluent Limitation for pH

Dear Ms. Slagle:

On behalf of Emersub 16, LLC, WSP USA Corp (WSP) is submitting this letter to notify the Maryland Department of Environment (MDE) of an effluent limitation noncompliance, in accordance with General Condition B.2 – Noncompliance with Effluent Limitations of State Discharge Permit No. 15DP3442, National Pollutant Discharge Elimination System (NPDES) Permit MD 0069094 for the site located at 7565 Harmans Road in Hanover, Anne Arundel County, Maryland (the Site). As required in General Condition B.2, WSP also notified the MDE Compliance Program of the situation by telephone on the afternoon of April 3, 2017. Noncompliance information that needs to be provided in accordance with General Condition B.2.a-f.is presented below.

General Condition B.2.a – A description of the non-complying discharge including its impact upon the receiving waters

Under the MDE Voluntary Cleanup Program, response actions have been developed for the Site, including the installation of a groundwater extraction and treatment system (System). The purpose of the System is to pump and treat affected groundwater prior to its discharge to Stony Run. Groundwater is extracted from five recovery wells equipped with dedicated electric submersible extraction pumps. Sub-grade water conveyance piping routes the extracted groundwater to a treatment system located on the property. The groundwater is treated to meet the NPDES permit discharge limits using bag filters for suspended solids removal, a metering pump for the addition of an iron sequestering agent, synthetic resin for the removal of volatile organic compounds (including 1,4-dioxane), a metering pump for the addition of caustic soda for pH buffering, and an in-line aerator to increase dissolved oxygen levels. When automated, the metering pump for the addition of caustic soda responds to a proportional-integral-derivative (PID) controller receiving pH readings from a probe placed in the conveyance piping prior to the discharge of treated groundwater to outfall 001.

The System was operated intermittently from March 10, 2017 to March 24, 2017. The system was re-started on March 29th and has been operating continuously since that date at a flow rate of approximately 70 GPM.

In accordance with the NPDES permit, weekly samples have been collected of the system effluent since the system began discharging water to Stony Run for the set of parameters specified in the permit. The effluent sampling for the week of April 2-8, 2017 was conducted in the early morning of

April 3rd. During this sampling event, the pH measurement for the treated water obtained using a handheld multi-parameter meter (Hach Sension + MM156 Portable Multimeter) was 6.3 standard units (SU), which is slightly below the NPDES effluent limit range of 6.5 – 8.5 SU. The pH values for treated water samples collected and analyzed later that day ranged from 6.5 to 6.6 SU. Although the pH of the effluent sample was slightly below the permit range, the System did not automatically send an alarm notifying the operator because the pH readings by the in-line probe were within the range of the set points for alarm activation.

Based on data collected as part of the operation and maintenance of the System, the estimated volume of treated groundwater that was discharged to Stony Run via Outfall 001 for the times the pH exceeded the effluent limit was 140,000 gallons.

General Condition B.2.b. – Cause of noncompliance

The noncompliant pH reading on the above dates were attributed to inaccurate pH measurements by the inline pH probe, thereby not automatically increasing the injection rate of caustic soda into the water stream to reach a level compliant with the permitted range (6.5 s.u. to 8.5 s.u.). WSP field staff evaluated the pH adjustment system after identifying the noncompliance, and determined the pH probe was reading slightly higher pH values than samples collected from the effluent sampling port and tested using the hand-held meter. The minor inaccuracy of the inline pH probe measurements may be caused by interference from the introduction of air upstream of the probe by operation of the aeration system used to increase the dissolved oxygen concentration of the water. In addition, WSP observed an inconsistent injection rate of the caustic soda caused by siphoning of caustic solution from the caustic feed piping. Under these conditions, the pH readings by the handheld meter may have been the result of a temporary under-dosing caused by the fluctuation in the caustic soda feed rate.

General Condition B.2.c. – Anticipated time the condition of noncompliance is expected to continue

WSP is in process of scheduling modifications to the pH adjustment system to address the issues associated with the aerator and caustic injection feed rate. The necessary modifications will be completed as quickly as possible.

General Condition B.2.d. – Steps taken by the permittee to reduce and eliminate the non-complying discharge

Until these System modifications are completed, the feed rate of caustic soda is being set manually to ensure the effluent pH is within the permit range. WSP will continue to periodically monitor the pH using the handheld meter and adjust the caustic soda addition accordingly. As indicated above, WSP is scheduling repairs to rectify the measurement issue with the in-line probe.

General Condition B.2.e. – Steps to be taken by the permittee to prevent recurrence of the condition of noncompliance

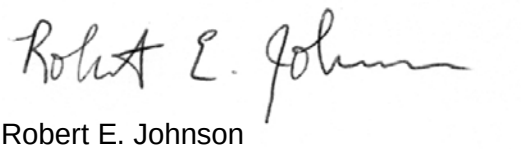
WSP believes this situation of noncompliance is attributable to the influence of the aerator and caustic injection rate on measurements by the pH probe. WSP will modify these System components to mitigate their detrimental effects, and operate the pH adjustment system in automated mode. After completion of the System start-up phase and determination the pH adjustment system is operating properly in automated mode, the alarm will be set to shut down the System when the probe indicates the effluent pH is outside the permitted range.

General Condition B.2.f. – A description of the accelerated or additional monitoring by the permittee to determine the nature and impact of the noncomplying discharge

WSP is continuing the collection of pH readings with a handheld pH meter to ensure compliance with the prescribed NPDES pH effluent range. Based on the effluent pH measurements, WSP may collect additional surface water quality data to determine if an impact to the stream is occurring.

Please do not hesitate to contact me with any questions.

Sincerely,



Robert E. Johnson
Senior Technical Manager - Environment

REJ
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cc: Steve Clarke, President, Emersub 16, LLC (via electronic mail)
Steve Kretschman, P.E., WSP USA Corp. (via electronic mail)

VIA ELECTRONIC MAIL

May 23, 2017

Heidi Slagle
Maryland Department of the Environment
Water Management Administration – Compliance Program
1800 Washington Boulevard
Suite 425
Baltimore, Maryland 21230-1708

Re: Noncompliance with State Discharge Permit 15DP3442 and NPDES Permit MD0069094 Effluent Limitation for pH

Dear Ms. Slagle:

On behalf of EMERSUB 16, LLC, WSP USA Inc. (WSP) is submitting this letter to notify the Maryland Department of Environment (MDE) of an effluent limitation noncompliance, in accordance with General Condition B.2 – Noncompliance with Effluent Limitations, of State Discharge Permit No. 15DP3442, National Pollutant Discharge Elimination System (NPDES) Permit MD 0069094 for the site located at 7565 Harmans Road in Hanover, Anne Arundel County, Maryland (the Site). As required in General Condition B.2, WSP also notified the MDE Compliance Program of the incident by electronic mail in the late afternoon on May 19, 2017, and by telephone on the morning of May 22, 2017. Noncompliance information that needs to be provided in accordance with General Condition B.2.a-f is presented below.

GENERAL CONDITION B.2.A – A DESCRIPTION OF THE NON-COMPLYING DISCHARGE INCLUDING ITS IMPACT UPON THE RECEIVING WATERS

Under the MDE Voluntary Cleanup Program, a groundwater extraction and treatment system (System) has been installed at the Site to control the migration of contaminants from the property. Groundwater is extracted from five recovery wells equipped with electric submersible extraction pumps, and the water is conveyed to a treatment system located on the property. The groundwater is treated to meet the NPDES permit discharge limits using bag filters for suspended solids removal, a metering pump for the addition of an iron sequestering agent, synthetic resin for the removal of volatile organic compounds (VOCs), including 1,4-dioxane, a metering pump for the addition of 25% caustic soda for pH buffering, and an in-line aerator to increase dissolved oxygen levels. When automated, the metering pump for the addition of caustic soda responds to a proportional-integral-derivative (PID) controller receiving pH readings from a probe placed in the conveyance piping prior to the discharge of treated groundwater to Stony Run via outfall 001. The System has been operating continuously since March 29, 2017, at a flow rate of 70-75 gallons per minute (GPM).

Treatment system operation requires the regular steam regeneration of two synthetic resin vessels to remove the adsorbed VOCs. During the initial phase of the resin regeneration process conducted on May 18, 2017, the flow increased to a rate approaching 80 GPM for a very short (1- to 2-hour) time period. The treated water pH was checked during this period of higher flow using a handheld multi-parameter meter (Hach Sension + MM156 Portable Multimeter). The measured pH of the discharge was 6.3 standard units (SU), which is slightly below the NPDES effluent limit range of 6.5 – 8.5 SU. The pH values for treated water samples collected under normal flow conditions (i.e., 70 – 75 GPM) both before and after this period of increased flow were approximately

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6.8 SU. At present, the feed rate of caustic soda is set automatically to adjust the effluent pH to within the permit range and the pH periodically checked using the handheld pH meter.

Based on data collected during the resin regeneration process, the estimated volume of treated groundwater that was discharged to Stony Run via Outfall 001 for the time the pH exceeded the effluent limit was approximately 7,100 gallons.

GENERAL CONDITION B.2.B. – CAUSE OF NONCOMPLIANCE

The noncompliant pH reading on the above date was attributed to the transient increase in the flow rate through the treatment system during the initial phase of the resin regeneration process. Under normal System flow conditions, the caustic soda injection rate produced by the metering pump had reached maximum capacity to ensure a pH level compliant with the permitted range. A review of the pump settings indicated the rate of caustic addition could not be increased during the short-term period of higher discharge during regeneration. WSP field staff evaluated the pH adjustment system and determined the size of the metering pump tubing and possible buildup of caustic in the tubing was a limiting factor to the caustic soda feed rate to the water stream.

GENERAL CONDITION B.2.C. – ANTICIPATED TIME THE CONDITION OF NONCOMPLIANCE IS EXPECTED TO CONTINUE

As discussed above, the transient decrease in pH is associated with the short term increase in flow during the initial phase of regeneration of synthetic resin, which occurs every 4 days. Upon discovery of the exceedance, WSP immediately evaluated options for modifying the amount of caustic soda added during upcoming regeneration events, and implemented changes to the pH adjustment system as quickly as possible. Modifications related to the addition of caustic soda should prevent a reduction in the discharge water pH below the 6.5 SU lower limit during periods of higher flow.

GENERAL CONDITION B.2.D. – STEPS TAKEN BY THE PERMITTEE TO REDUCE AND ELIMINATE THE NON-COMPLYING DISCHARGE

On May 19, 2017, the operation and maintenance (O&M) contractor for the System re-piped the suction line from the caustic storage tote to the metering pump with larger inside diameter tubing to allow for an increase the rate of 25% caustic soda addition to the water stream. After replacing the feed tubing, WSP staff noted an increase in the pH of the treated water under normal flow conditions. WSP and the O&M contractor will continue to monitor the discharge pH during all phases of treatment system operation to ensure compliance with the prescribed NPDES pH effluent range. As an additional safety measure, WSP will reprogram the contols to initiate a System shut-down if an alarm condition indicates a pH level outside of the specified limits.

GENERAL CONDITION B.2.E. – STEPS TO BE TAKEN BY THE PERMITTEE TO PREVENT RECURRENCE OF THE CONDITION OF NONCOMPLIANCE

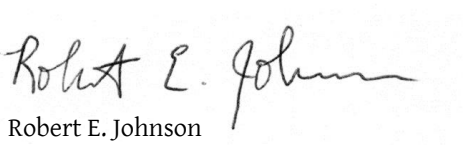
WSP believes the transient pH noncompliance was attributable to factors that limited the addition of sufficient caustic soda to increase the treated water pH to within the permitted range of 6.5 – 8.5 SU. As indicated above, WSP has modified the intake tubing to increase the amount of 25% caustic soda that can be added to the water stream and will continue to check the pH of the discharge. The operational information reviewed to date suggest this modification will maintain the pH within the permit range during variations in System flow. WSP will carefully monitor the discharge water to ensure the aforementioned modification is able to adequately adjust the pH under varying flow conditions. If subsequent measurements indicate a similar or unanticipated pH exceedance, EMERSUB 16 and WSP will promptly evaluate and implement additional modifications to the System to ensure compliance with the permit requirements.

GENERAL CONDITION B.2.F. – A DESCRIPTION OF THE ACCELERATED OR ADDITIONAL MONITORING BY THE PERMITTEE TO DETERMINE THE NATURE AND IMPACT OF THE NONCOMPLYING DISCHARGE

WSP is continuing to monitor the pH recorded by the in-line probe and to periodically collect pH readings with the handheld meter to ensure compliance with the prescribed NPDES pH effluent range. As mentioned above, EMERSUB 16 and WSP will take immediate corrective action in the event of any future unanticipated exceedance. Based on the subsequent effluent pH measurements, WSP may collect additional surface water quality data to determine if an impact to the stream is occurring.

Please do not hesitate to contact me with any questions.

Sincerely,



Robert E. Johnson
Senior Technical Manager – Water & Environment

REJ:rlo
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cc: Steve Clarke, President, EMERSUB 16, LLC (via electronic mail)
Steve Kretschman, P.E., WSP USA Corp. (via electronic mail)