



VIA ELECTRONIC MAIL

February 2, 2022

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**Subject: Quarterly Progress Report No. 21
Former Kop-Flex Facility Site, Hanover, Maryland
USEPA ID No. MDD043373935
Administrative Order on Consent, Docket No. RCRA-03-2016-0170 CA**

Dear John:

On behalf of EMERSUB 16, LLC, a subsidiary of Emerson Electric Co., WSP USA, Inc. (WSP) is submitting this quarterly progress report describing the activities conducted in the fourth quarter of calendar year 2021 (October 1st through December 31st) as part of the corrective measures implementation at the former Kop-Flex, Inc. facility property located at 7555 Harmans Road (Site) in Hanover, Maryland. The Site is identical to the area described as the “Facility” in the Administrative Order on Consent, Docket No. RCRA-03-2016-0170 CA (Consent Order). The report also describes the activities planned for the first quarter of calendar year 2022 (January 1st through March 31st).

This progress report is being submitted to the U.S. Environmental Protection Agency (EPA) pursuant to Section VI.C.3 of the Consent Order. Please note that, in addition to performing the work conducted under the Consent Order, EMERSUB 16 continues to perform the remedial activities specified in the October 2015 Response Action Plan (RAP) approved by the Maryland Department of the Environment (MDE) Voluntary Cleanup Program, and that EMERSUB 16 copies USEPA on all submittals required under that program.

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

Kind regards,

Robert E. Johnson
Director, Geological Sciences – Earth & Environment

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Encl.

cc: Mr. Stephen Clarke, EMERSUB 16 LLC
Ms. Richelle Hanson, Maryland Department of the Environment

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CERTIFICATION

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

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

Signature:

A handwritten signature in blue ink, appearing to read 'Stephen L. Clarke', written over a horizontal line.

Name:

Stephen L. Clarke

Title:

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Quarterly Progress Report No. 21
Former Kop-Flex Facility Site
October 2021 through December 2021

Site Name: Former Kop-Flex Facility
Site Address: 7555 Harmans Road
Hanover, Maryland 21077

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

Project Coordinator: Eric Johnson
Alternate: Lisa Kelly

1.0 ACTIVITIES COMPLETED DURING OCTOBER 2021 – DECEMBER 2021 REPORTING PERIOD

1.1 HYDRAULIC CONTAINMENT SYSTEM OPERATION

- The hydraulic containment system (System) operated for 37 of the 92 days during the fourth quarter of 2021, which equates to a 40% run-time efficiency over this 3-month period. The system resumed normal operation on October 6th following a planned shutdown on September 21st to perform *ex-situ* cleaning of the specialty treatment resin. The system was manually shut down on November 8, 2021 and remained nonoperational for 7 weeks due to the discovery the pH of the blowdown water from the small boiler, which is used to generate steam for the onsite regeneration of the treatment resin, exceeded the upper limit specified in the Wastewater Discharge Permit recently issued by the Anne Arundel County (County) Pre-treatment Program. (Additional information regarding the monitoring of discharge to the sanitary sewer system is provided in Section 1.3 below.) With the approval of the County, normal operation of the System resumed on December 27, 2021.
- A total of approximately 3.61 million gallons of impacted groundwater were extracted by the recovery wells and treated by the System during the fourth quarter of 2021, with the combined average monthly withdrawal rate during full-scale operation ranging from 65 gallons per minute (GPM) to 70 GPM. To monitor and evaluate concentrations of volatile organic compounds (VOCs) and 1,4-dioxane in the untreated and treated water, samples of both the System influent and effluent were collected and analyzed during the reporting period. An influent water sample was collected for chemical analysis in November, while monthly effluent samples were collected in October, November, and December. The effluent samples were collected for chemical analysis in accordance with National Pollutant Discharge Elimination System (NPDES) Permit MD 0069094, which corresponds to Maryland State Discharge Permit Number 15-DP-3442, issued by the MDE (Discharge Permit).
 - The total concentration of chlorinated VOCs (CVOCs) and 1,4-dioxane in the influent sample was 349 micrograms per liter (µg/L), which is slightly higher than the previous (September 2021) sample results. As of the end of December 2021, an estimated total of 407.2 pounds of CVOCs and 172.1 pounds of 1,4-dioxane have been recovered from the affected portion of the Lower Patapsco aquifer.
 - Analysis of the effluent samples indicated non-detect concentrations of CVOCs and 1,4-dioxane. The analytical results for the other monitoring parameters complied with the effluent limitations specified in the Discharge Permit, with the exception of total nickel in the sample collected in early November.
- As mentioned above, an elevated concentration of total nickel (995 µg/L) that exceeded the effluent limit of 470 µg/L was detected in the discharge sample collected in early November 2021. WSP provided the appropriate verbal and written



notifications to the Compliance Program of the MDE Water Management Administration in accordance with the reporting requirements in the Discharge Permit. (A copy of the written notification of noncompliance submitted to MDE on November 22, 2021 is provided as Enclosure A.) WSP reviewed the certified analytical report provided by the laboratory, including the summary of the quality control results, and did not identify any issues with the nickel analysis in the aqueous samples. In addition, a thorough assessment of the System operational data did not identify any problems that would have resulted in the total nickel exceedance. Subsequent sampling of the effluent on November 19, 2021 detected a total nickel concentration of 24.4 µg/L, which is more than an order of magnitude below the level in the early November sample and consistent with the historical data for total nickel in the treated water. Based on evaluation of the System operation and subsequent effluent sample result, the elevated nickel concentration in the November 2021 sample is believed to have been caused by an isolated, transient “slug” of water with elevated nickel concentrations entering the treatment system, perhaps caused by ongoing site development activities performed by the current occupant of the Property. EMERSUB 16 and WSP plan to inform the occupant – Catalent Cell and Gene Therapy – of the occurrence of this slug of nickel-containing water so as to raise awareness that activities being conducted on the property could potentially have an impact on the System operation.

1.2 SPECIALTY RESIN CLEANING ACTIVITIES

- Following the completion of the specialty resin cleaning event, normal System operation resumed on October 6, 2021. Wastewater generated during the resin cleaning event was held onsite in a double-walled frac tank pending characterization. A sample of the wastewater was collected on October 7, 2021, and submitted to the Phase Separation Science, Inc. laboratory located in Catonsville, Maryland for analysis of the effluent parameters listed in the Wastewater Discharge Permit for the treatment system. Field parameters (pH and temperature) were measured onsite using a calibrated water quality meter at the time of the sampling activities.
- A discharge request was submitted to the County Pre-treatment Program on November 1, 2021 and is included as Enclosure B. Upon receipt of approval from the County, the resin cleaning wastewater contained in the frac tank was discharged to the sanitary sewer system between November 17 and November 21, 2021 under EMERSUB 16’s Wastewater Discharge Permit.

1.3 WASTEWATER DISCHARGE MONITORING TO PUBLICLY OWNED TREATMENT WORKS

- A sample of the boiler blowdown discharge to the sanitary sewer was collected on November 3, 2021, to characterize this wastewater in accordance with the effluent limits specified in the Wastewater Discharge Permit issued to EMERSUB 16. Laboratory analysis was conducted by the Phase Separation Science, Inc. laboratory located in Catonsville, Maryland and field parameters were measured onsite using a calibrated water quality meter. The measured pH of the boiler blowdown water at the time of sample collection was 10.76 standard units (SU), which exceeded the upper pH limit of 10 SU specified in the Wastewater Discharge Permit. Verbal notification of the pH exceedance was provided to the County by phone on November 5, 2021. Based on the elevated pH measurement, WSP temporarily shut down operation of the System and disabled the automatic blowdown mechanism for the boiler on November 8, 2021 while evaluating a solution for maintaining the pH within the permitted range.
- On November 9, 2021, WSP contacted the County Pre-treatment Program to inquire about the possibility of obtaining a variance for the upper pH limit of 10 SU in the Wastewater Discharge Permit. In a December 1, 2021 email to WSP, the County indicated that a variance to the specified pH limit may be granted after completing a small study of the System. A Discharge Monitoring Report containing the results of the early November 2021 boiler blowdown sampling and recommendations for conducting the boiler blowdown pH study was submitted to the County on December 9, 2021 and is included as Enclosure C. The County approved performance of the pH study following the upgrade/replacement of the conductivity-based automatic surface blowdown assembly for the boiler. In addition, this communication also provided approval to restart the System while awaiting receipt and installation of the new assembly.



1.4 GROUNDWATER LEVEL MONITORING

- Groundwater level monitoring is conducted semi-annually to gather data to evaluate the hydraulic response to remedial pumping in both the shallow and deep zones of the Lower Patapsco aquifer at the Site. Based on historical water level data collected under non-remedial pumping conditions, groundwater in the shallow zone of the Lower Patapsco aquifer flows to the north and west toward Stony Run, while flow paths are to the south-southeast in the deep (confined) zone of the aquifer.

During the reporting period, water level measurements were collected from monitoring wells and recovery well piezometers the week of November 14, 2021, as part of the semi-annual groundwater monitoring event. The water level data for this and previous measurement rounds is provided in Table 1. Water levels collected during the November 2021 measurement event are representative of non-pumping conditions at the Site.

- Contour maps depicting the water table and hydraulic head in the lower portion of the shallow zone of the Lower Patapsco aquifer are provided in Figures 1 and 2, respectively. Evaluation of the groundwater elevations and gradients in the shallow zone are discussed separately below. Overall, the groundwater elevations in November 2021 were higher compared to the May 2021 elevations due to the recovery of the hydraulic heads to a pre-remedial pumping condition following shutdown of the System on November 8, 2021.

The water table contour map (Figure 1) indicates the northwestward flow of groundwater in the uppermost portion of the shallow zone of the Lower Patapsco aquifer across the Site, with the presence of a slight lowering in the groundwater surface around wells MW-5R and MW-38R that is associated with the former pumping from recovery wells RW-1S and RW-2S. The finer grained sediment in the vicinity of these wells would result in the slower equilibration of the groundwater elevation to the non-pumping condition compared to the surrounding areas (*e.g.*, MW-42). In the eastern portion of the Site, a slight mounding, or rise, in the water table was present in the area of wells MW-04 and MW-09. The water table mounding reflects enhanced recharge to the groundwater system associated with the routing of surface water runoff to the small storm water management area (SWMA) located in the east-central portion of the Site. The enhanced infiltration of runoff in this SWMA, compared to the surrounding paved area, causes the localized increase in the water table elevation in the immediate area.

The cessation of remedial pumping resulted in the disappearance of the pronounced head changes, or cone of depression, within the permeable sand deposits comprising the lower portion of the shallow zone in the eastern portion of the Site, with only minor residual drawdown effects present around the RW-2S location (Figure 2). Based on the head contours, groundwater in the eastern portion of the Site flows in a generally northwestward direction toward Stony Run. The northwestward flow of groundwater in the shallow zone differs from the southerly direction of groundwater movement in the deep confined zone.

- Figure 3 depicts the potentiometric surface for the deep, confined zone of the Lower Patapsco aquifer based the November 2021 water level measurements at the onsite deep wells and offsite wells MW-24D on the William-Scotsman property to the south and MW-46D on the Verizon property to the north. As with the shallow zone, the November 2021 data reflect the recovery of the hydraulic heads to a non-pumping condition following shutdown of the System. The hydraulic head contours generated from the data indicate south to south-southeast flow pathways for groundwater in this deep confined zone. The inferred southward groundwater flow direction is consistent with other potentiometric surface contour maps developed from water level data collected before the start of remedial pumping.

1.5 GROUNDWATER QUALITY MONITORING

- In accordance with the Groundwater Monitoring Plan, groundwater quality samples were collected in mid-November 2021 from the onsite monitoring wells identified for semi-annual sampling. The shallow and deep recovery wells were not sampled during the November sampling activities due to the System being temporarily shut down. However, as discussed below, samples of the recovery well discharge were collected in late December 2021, a few days after the re-start of the System.



Therefore, the samples collected from the monitoring wells are representative of the groundwater quality a short time (approximately one week) after the cessation of remedial pumping in the aquifer system.

- Samples from the shallow and deep monitoring wells were collected using HydraSleeve™ passive samplers, which were deployed to the same depths as previous monitoring events. Groundwater samples were obtained by carefully removing the HydraSleeve™ sampler from the well and decanting a representative portion of the collected water into the laboratory-supplied containers. If a sufficient amount of groundwater remained in the HydraSleeve™ sampler after sample collection, selected field parameters, including temperature, pH, specific conductivity, and turbidity, were measured using a calibrated water quality meter. All water samples were submitted to the Pace Analytical Services laboratory in Huntersville, North Carolina, and analyzed for VOCs using EPA SW-846 Test Method 8260D and 1,4-dioxane using modified EPA Test Method 8260D with selected ion monitoring.
- Analytical results for the site-related CVOCs and 1,4-dioxane are summarized in Table 2 for the monitoring well samples. A copy of the certified laboratory analytical report for the samples is included in Enclosure D. Historical (December 2016 to present) data for the monitoring well samples are provided in Table 3.

The CVOC and 1,4-dioxane concentrations in the groundwater samples from the shallow zone monitoring wells are similar to levels detected in the May 2021 samples (Figure 4; Table 3). The only wells exhibiting discernable changes in COC levels between the May (pumping) and November (non-pumping) monitoring events were from wells MW-5R and MW-44, which are both located in the southwest portion of the Site. Groundwater samples from these wells had minor increases in 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), and 1,4-dioxane concentrations, with the 1,1-DCA and 1,1-DCE levels in the MW-44 sample being slightly above the Site Groundwater Cleanup Standards. Changes in the CVOC (1,1-DCA and 1,1-DCE) and 1,4-dioxane concentrations in the samples from wells MW-04 and MW-16 appear to reflect inherent fluctuations in the water quality in the eastern portion of the Site.

For the deep monitoring well samples, the CVOC and 1,4-dioxane concentrations for the November 2021 samples are generally similar to levels detected in the May 2021 samples (Figure 5; Table 3). The only exceptions were a slight increase in the CVOC (1,1-DCA and 1,1-DCE) and 1,4-dioxane concentrations in the samples from wells MW-1D and MW-21D, and a decrease in levels in the MW-16D sample. The increase in the CVOC and 1,4-dioxane concentrations in the MW-1D and MW-21D samples is not surprising due to the locations of these wells in proximity to the deep groundwater recovery wells (RW-1D and RW-2D). The reduction in the flow velocities around the recovery wells with cessation of pumping would cause the sample to ‘capture’ the presence of constituents diffusing from lower permeability layers into the groundwater seepage through the aquifer material. The concentration changes detected in these samples did result in 1,1-DCE exceeding the Site Groundwater Cleanup Standard at the MW-21D location, along with 1,1-DCA and 1,4-dioxane being above their respective cleanup standards at the MW-1D location. The presence of constituent concentrations at or below the applicable cleanup levels at the MW-22D and MW-40D locations indicates no apparent expansion in the width of the contaminant plumes in the deep confined zone of the Lower Patapsco aquifer shortly after the cessation of groundwater pumping from the deep recovery wells in the southern part of the Site.

- Upon the re-start of the System, samples of the groundwater discharge from the shallow and deep recovery wells were collected on December 29, 2021. The recovery well water samples were collected directly from an in-line sampling port located at each well-head. The samples were submitted to the Pace Analytical Services laboratory in Huntersville, North Carolina, and analyzed for VOCs using EPA SW-846 Test Method 8260D and 1,4-dioxane using modified EPA Test Method 8260D with selected ion monitoring.

Analytical results for the site-related CVOCs and 1,4-dioxane in the December 2021 recovery well discharge samples are summarized in Table 4. A copy of the certified laboratory analytical report for these samples are included in Enclosure E.



Overall, the CVOC and 1,4-dioxane concentrations in the discharge from the shallow zone recovery wells are similar, albeit slightly lower, than the levels in the May 2021 samples. Total concentrations of detectable CVOCs and 1,4-dioxane in the samples from recovery wells RW-1S and RW-2S were 828 µg/l and 571 µg/l, respectively (Figure 6; Table 4). As with the historical data, the total CVOC and 1,4-dioxane concentration in the RW-3S sample (21.8 µg/l) remained noticeably lower relative to the other shallow recovery wells, with no detected concentrations above the Site Groundwater Cleanup Standards.

The COC concentrations in the deep recovery well samples were also comparable to the previous (May 2021) data, with 1,1-DCA, 1,1-DCE, and 1,4-dioxane detected at concentrations above the Site Groundwater Cleanup Standards (Table 4). As with previous sampling rounds, the sample results indicate higher levels of chlorinated CVOCs – primarily 1,1-DCA and 1,1-DCE – in the discharge from well RW-1D (264 µg/l) in the southwestern portion of the Site compared to RW-2D (145 µg/l) located near the southeastern corner. The 1,4-dioxane concentrations are very similar in the discharge samples from both deep recovery wells (Table 4).

2.0 PLANNED ONSITE ACTIVITIES FOR THE FIRST QUARTER OF 2022

- Replace the conductivity-based surface blowdown assembly for the boiler, and then perform of a short-term (2-week) study to monitor the pH of the boiler blowdown water being discharged to the sanitary sewer system to further evaluate compliance with the remediation system’s Wastewater Discharge Permit.
- Following completion of the boiler blowdown pH study and review of the results by the County, continue with the full-scale System operation, including the collection and assessment of System data to evaluate operational performance and conduct regular and as needed maintenance activities to optimize System performance and run-time.
- Conduct the required effluent monitoring and monthly reporting pursuant to the State Discharge/NPDES Permit.
- Submit the Five-Year (2017 through 2021) Corrective Measures Assessment Report for the hydraulic containment system to EPA and MDE.

3.0 KEY PERSONNEL/FACILITY CHANGES

The entity holding title to the former Kop-Flex, Inc. property at 7555 Harmans Road in Hanover, MD changed its name from Harmans Road Associates, LLC to Catalent Harmans Road, LLC. Since this was only a name change, there was no transfer of fee interest in the property. EMERSUB 16’s legal counsel informed the EPA of the change in the title holder name in a December 29, 2021, email communication.

FIGURES

TABLES

ENCLOSURE A - NOTIFICATION TO MDE OF NONCOMPLIANCE WITH NPDES
PERMIT NICKEL DISCHARGE LIMIT

ENCLOSURE B – REQUEST TO ANNE ARUNDEL COUNTY PRE-TREATMENT
PROGRAM FOR DISCHARGE OF RESIN CLEANING WATER

ENCLOSURE C – SUBMITTAL TO ANNE ARUNDEL COUNTY PRE-TREATMENT
PROGRAM OF NOVEMBER 2021 WASTEWATER DISCHARGE MONITORING
RESULTS

ENCLOSURE D – CERTIFIED LABORATORY ANALYTICAL REPORT FOR ONSITE
GROUNDWATER MONITORING WELL SAMPLES (NOVEMBER 2021)

ENCLOSURE E - CERTIFIED LABORATORY ANALYTICAL REPORT FOR
GROUNDWATER RECOVERY WELL DISCHARGE SAMPLES (DECEMBER 2021)