Vapor Intrusion Investigation and Mitigation Report – January through June 2017 for the Former Holley Automotive/ Coltec Industries Facility Water Valley, Mississippi

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FIRST ENVIRONMENT

CERTIFICATION STATEMENT

I, Bernard T. Delaney, Ph.D., P.E., BCEE, certify that I am currently a registered professional engineer in the State of Mississippi and had primary direct responsibility for the implementation of the subject vapor intrusion investigation and interim remedial measure activities. I certify that this Vapor Intrusion Investigation and Mitigation Report – January through June 2017 was completed in conformance with the laws and regulations of the State of Mississippi. I certify that all information and statements in this certification form are true.

11041	06/19 /2017	
Mississippi Professional Engineer No.	Date	B. Tod Delaney, Ph.D., P.E., BCEE

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1.0 Introduction

This Vapor Intrusion ("VI") Investigation and Mitigation Report January through June 2017 has been prepared by First Environment, Inc. ("First Environment") on behalf of EnPro Industries, Inc. ("EnPro") with respect to the former Holley Automotive/Coltec Industries Facility (hereinafter referred as the Plant"). The Plant is located at 600 State Highway 32 in Water Valley, Yalobusha County, Mississippi. Figure 1 depicts the location of the Plant on a United States Geologic Survey (USGS) 7.5-minute quadrangle map. Figure 2 depicts the features of the Plant.

In July 2016, GSI Environmental ("GSI") conducted an independent indoor air quality investigation at the Plant on behalf of BorgWarner, Inc., the current owner and operator of the Plant. GSI's gas chromatography/mass spectrometry ("GC/MS") analysis completed during its investigation detected trichloroethene ("TCE") and cis-1,2-dichloroethene ("cis-DCE") in bulk air samples in the Plant.

On behalf of EnPro, First Environment submitted a VI Investigation Workplan (the "Workplan") to the Mississippi Department of Environmental Quality ("MDEQ") on November 18, 2016. The MDEQ approved the Workplan on January 13, 2017. The Workplan and the MDEQ's approval letter are attached in Appendix A.

Between January 16 and 21, 2017, First Environment conducted an initial VI investigation of chlorinated solvent related vapors at the Plant. This VI investigation focused on the contaminants of concern ("CoCs") currently present in groundwater at the Plant that have a potential link to the former operations of Coltec Industries and its predecessors. The CoCs include TCE and its degradation products, cis-DCE and vinyl chloride ("VC").

Immediately following the initial VI investigation, First Environment implemented and/or provided oversight for Interim Remedial Measures ("IRMs") to address the immediate indoor air vapor concern detected within the Plant. The IRMs consisted of initial measures to seal VI pathways, increase ventilation and scrub indoor air, utilizing ultra violet ("UV") light destruction units for contaminant vapors. Additional measures were followed by installation of an Ambient Air Extraction System ("AAES") that captured and vented potential CoC vapors to the outside of the plant. During February through April 2017, First Environment conducted additional rounds of indoor air sampling in conjunction with the IRMs in order to monitor their progress and effectiveness. In May 2017, in order to provide long-term mitigation of CoC vapors, First Environment installed a sub-slab depressurization system (“SSDS”) at the Plant and collected additional indoor air samples.

This report is composed of the following principal sections:

- a description of the VI Investigation, including description and analysis of the ambient air, indoor air, and sub-slab soil gas sampling conducted in January 2017;
- a description of the initial remedial measures taken at the Plant;
- a description of the AAES;
- a description of the SSDS; and
- a discussion of indoor air monitoring conducted to the date of this report.

2.0 Vapor Intrusion Investigation

During the initial VI investigation, as an initial screening measure, First Environment conducted a real-time on-site sampling and analysis of CoC vapors at fifty (50) locations within the Plant to preliminarily assess potential areas of concern ("AOCs") and vapor risk to the employees. Subsequently, First Environment collected seventeen (17) sub-slab soil gas samples (SS-1 through SS-5, SS-7 through SS-18[1]), sixteen (16) indoor air samples (IA-1 through IA-16), and two (2) ambient air samples (AA-1 and AA-2). First Environment's Health and Safety Plan ("HASP") is attached in Appendix B.

The VI investigation was conducted in accordance with the following guidance documents:

1. Vapor Intrusion Technical Guidance, New Jersey Department of Environmental Protection (NJDEP), Site Remediation and Waste Management Program, Version 4, August 2016.
2. Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites, United States Environmental Protection Agency (USEPA), June 2015.
3. Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, USEPA, Office of Solid Waste and Emergency response (OSWER), June 2015.
4. Petroleum Vapor Intrusion Guidance Document, Interstate Technology and Regulatory Council (ITRC), October 2014.
5. Vapor Intrusion Pathway: A Practical Guidance, ITRC, January 2007.

2.1 Vapor Intrusion Screening

2.1.1 Instrumentation

On January 16 through 19, 2017, First Environment mobilized to the Plant with a hand-held vapor analyzer/photoionization detector ("PID") manufactured by Defiant Technologies and a hand-held PID manufactured by RAE Systems.

The Defiant instrument, FROG-4000TM, is a hand-held micro system for detection of volatile organic compounds (VOCs), including chlorinated solvent related constituents such as TCE and its degradation products, excluding vinyl chloride.

The FROG-4000TM is capable of detecting and identifying VOCs in soil, water, and air and can be used as a portable Gas Chromatograph ("GC") PID for real-time environmental testing in the

[1] There was refusal at SS-6.

field. The system has a micro pre-concentrator, micro GC column, and a PID all integrated into one portable and versatile unit. It uses ambient air as the carrier gas and is capable of storing field data onto SD cards. Although it utilizes generally accepted chromatography principles, since the FROG instrument is not certified by any regulatory agency, it can only be used as a screening tool. However, once calibrated properly, this instrument produces results that are comparable to conventional laboratory analyses.

The practical detection limits for the FROG-4000TM Silver Model used for this sampling event range between approximately 1 ppbv and 160 ppbv, depending upon the chemicals being tested. This range corresponds approximately to volumetric air concentrations for CoCs as follows:

- TCE: 5 – 860 $\mu g/m^3$,
- cis-DCE: 4 – 635 $\mu g/m^3$.

It should be noted that the FROG-4000TM is not capable of detecting vinyl chloride.

2.1.2 Methodology

The initial calibration of the FROG-4000TM performed by the vendor included PCE, TCE, cis-DCE, and trans-DCE. Before sampling each day, First Environment recalibrated the instrument based on the calibration gas supplied by the vendor. The retention time (in seconds) for each calibration is presented in Table 1. First Environment also calibrated the PID daily.

First Environment field technicians collected fifty (50) indoor air samples at the breathing zone (approximately three to four feet above ground) throughout the entire Plant. The indoor air samples were analyzed immediately upon collection with the FROG-4000TM instrument. In order to assess baseline conditions, First Environment also screened the ambient air from several locations outside the Plant, including upwind and downwind locations. Chlorinated compounds were monitored and logged with the FROG-4000TM. In addition to the FROG-4000TM screening samples, First Environment also assessed the indoor air quality with the RAE Systems PID, which was calibrated to isobutylene on a daily basis, and noted the PID measurements in parts per million at each sub-slab sampling location.

2.1.3 Results

The indoor air screening PID readings are presented in Table 2. FROG-4000TM indoor air screening concentrations are presented in Table 3. Each sample location is identified by the

Plant's nearest structural column locations to the sampling points (i.e., a letter and number on a grid form).

As a result of the indoor air screening, First Environment identified the following AOCs: the ATS Room, the Maintenance Room, and the Training Room.

2.2 Ambient and Indoor Air Sampling

2.2.1 Instrumentation

On January 18 through 19, 2017, First Environment collected ambient and indoor air samples by placing laboratory provided 6-liter capacity Summa® canisters under vacuum. The Summa® canisters were equipped with flow regulators to have continuous suction of ambient and indoor air for exactly 24 hours.

2.2.2 Methodology

In the absence of Mississippi guidance on indoor air sampling frequency, First Environment utilized recommended minimum number of samples based on the New Jersey's Vapor Intrusion Guidance Document. Based on the recommendation that at least two indoor air samples be collected per 1,500 ft^2 of an edifice, First Environment collected sixteen (16) indoor air samples at the locations depicted in Figure 3. To determine the baseline conditions, First Environment collected two (2) ambient air samples. Wherever possible, First Environment mounted the canisters on columns or secured them in an area above the floor. Photographs of the initial VI sampling are attached in Appendix C. First Environment sent the canisters of all ambient and indoor air samples to Alpha Analytical for USEPA TO-15 SIM analysis. The vacuum measurements in Summa canisters were noted before and after sampling to ensure that the flow restriction regulator at each canister was working properly. Those measurements are presented in Table 4.

2.2.3 Results

Table 5A presents the ambient and indoor air sampling results for TCE, cis-DCE, and VC and compares them with the applicable regulatory screening and action levels. Table 5B presents the ambient and indoor air sampling results for all TO-15 analytes. Alpha Analytical was not able to perform the SIM analysis for IA-1 and IA-7 due to dilution of significantly high concentrations. Alpha Analytical diluted those two samples, which are indicated in Tables 5A and 5B, with a "D" qualifier.

The VI investigation results revealed various CoCs (i.e., TCE and its degradation products such as cis-DCE, and VC). Figure 4 depicts the January 2017 indoor air sampling results for the CoCs. TCE concentrations in the indoor air exceeded the MDEQ action level of 26 µg/m^3 in the ATS and Maintenance Rooms, which are located in the vicinity of the former degreaser area. [2] The laboratory reports, including the Chain-of-Custody forms, are attached in Appendix D.

2.3 Sub-slab Soil Gas Sampling

2.3.1 Instrumentation

On January 20 through 21, 2017, First Environment collected sub-slab soil gas samples by placing a laboratory provided 2.7-liter Summa® canister with a flow regulator (regulating intake flow at 200 mL/min or less) to collect a "grab" sample from each sampling location.

2.3.2 Methodology

First Environment personnel utilized a Hammer drill to drill one-half inch holes through the concrete slab at each sampling location to collect the corresponding sub-slab soil gas sample. A temporary sampling port was installed in each sampling location to a depth of approximately six inches below the concrete slab within the underlying aggregate material to provide a preferential pathway for contaminant vapors and potential for vapor accumulation (i.e., build up). The sampling port consisted of flexible one-quarter inch Teflon tubing, appropriate wax seal, Swagelok nuts, T valve, and one-quarter inch SS tubing. Figure 5 is a schematic diagram of the sampling train construction.

The integrity of the seal was checked with the water dam method to ensure complete sealing and protection of fugitive emissions. For a description of the water dam method, see NJDEP's Vapor Intrusion Technical Guidance attached as Appendix E, at pages H-7 to H-8. After the integrity test, each sampling port was checked for pressure differential between the sub-slab and the indoor air via a hand-held magnehelic gauge. Table 6 presents sub-slab sampling parameters.

Each sampling port was then connected to a 2.7-liter Summa® canister with a flow regulator to collect a "grab" sample from the location. Upon completion of the sampling, First Environment sealed the sampling holes with Bentonite. Before demobilization from the Plant, First Environment re-inspected each sub-slab sample location and took corrective actions, if necessary. Table 7 presents the final inspection findings.

[2] The chlorinated compound concentrations were below OSHA Permissible Exposure Limits ("PELs").

First Environment collected seventeen (17) sub-slab soil gas samples (SS-1 through SS-5, SS-7 through SS-18). There was refusal at SS-6, located in the Training Room, due to the increased thickness of the slab. Upon completion of the sub-slab soil gas investigation, First Environment shipped the canisters of all ambient and indoor air samples to Alpha Analytical for USEPA TO-15 SIM analysis.

2.3.3 Results

Table 8A presents the sub-slab sampling results for TCE, cis-DCE, and VC. Table 8B presents the sub-slab sampling results for all TO-15 analytes. Figure 6 presents sub-slab sample locations and results for the CoCs. Alpha Analytical was not able to perform the SIM analysis for any of the sub-slab samples, due to high levels of TCE, cis-DCE, and VC. Alpha Analytical diluted the samples, which are indicated in Tables 8A and 8B, with a "D" qualifier.

Sub-slab soil gas samples revealed elevated concentrations of CoCs within the ATS and Maintenance Rooms in the vicinity of the former degreaser area. The laboratory reports, including the Chain-of-Custody forms, are attached in Appendix D.

2.4 Training Room Floor Drain and Sump Sampling

2.4.1 Methodology

On January 21, 2017, First Environment collected a water sample from a floor drain in the Training Room. First Environment was advised that Plant employees occasionally empty coolers into the floor drain in the Training Room. First Environment observed water in the floor drain.

On January 21, 2017, First Environment also collected water and sediment samples from a sump immediately outside the Maintenance Room. The sump is being used as a wash down area for temporary storage and disposal of Plant rinse water. Buckets of rinse water are discharged into the sump several times a day, which is subsequently pumped on a periodic basis out of the sump, through overhead piping, to the wastewater treatment area at the southeast side of the Plant. First Environment observed rinse water in the sump, as well as metal filings, shavings, and grease.

The water samples from the floor drain in the Training Room and the sump were analyzed by TestAmerica for VOCs. The solids sample from the sump was analyzed by TestAmerica for VOCs and SVOCs.

2.4.2 Results

Table 9A presents the water sampling results for VOCs in the floor drain and the sump. Table 9B presents the sediment sampling results for VOCs in the sump. Table 9C presents the sediment sampling results for SVOCs in the sump. cis-DCE and TCE were detected in the floor drain at 53 µg/L and 110 µg/L, respectively. TCE was also detected in the sump sediment at 0.040 mg/Kg. However, no CoCs, including TCE, were detected above laboratory reported detection limits in the water sample collected from the sump. Several SVOCs were detected in the sump sediment, including benzaldehyde, bis(2-ethylhexyl)phthalate, and butyl benzyl phthalate. The laboratory reports, including the Chain-of-Custody forms, are attached in Appendix D.

3.0 Initial Remedial Measures for Indoor Air Impacts

Indoor air and sub-slab soil gas sampling revealed a vapor intrusion pathway and triggered the implementation initial remedial measures for the Plant as detailed in the table below. These initial remedial measures were implemented by multiple parties, including First Environment and EnPro.

INITIAL REMEDIAL MEASURE	LOCATION(S) OR DESCRIPTION	IMPLEMENTATION DATE	COMPLETION DATE
Turn on fans in areas that tested above screening levels	-Various locations in the Plant	02/06/2017	02/06/2017
Turn on Smog Hogs already in place	-Low Maintenance Machining Area (NW quadrant of the Plant)	02/06/2017	02/06/2017
Keep fans and Smog Hogs operating 24-hours in NW quadrant of plant even when area is shutdown	-Near IA/SS-11 & IA/SS-12	02/06/2017	02/06/2017
Identification and assessment of cracks and separations in Plant floor and existing sewer vents for sealing	-Throughout the Plant	02/06/2017	02/10/2017
Seal manhole/sewer cover	-Near IA/SS-7	02/06/2017	02/11/2017
Communications to BorgWarner employees re: current air quality conditions	-Final written communication to employees and MDEQ fact sheet posted at Plant	02/06/2017	02/15/2017
Due to air samples above action level in areas of concern (AOC), restrict access to three (3) enclosed rooms	-Maintenance Room [IA-1 & SS-1] -ATS Maintenance Shop [IA-2 & SS-2] -Training Room [IA-6]	02/07/2017	02/07/2017
Confer with Toxicologist re: TCE, action levels, risk analysis, time allowed in enclosed rooms, availability for Q/A with employees	-IA/SS-1 -IA/SS-2 -IA-6	02/07/2017	02/09/2017
Seal cracks in plant floor	-Throughout the Plant	02/07/2017	02/11/2017
Seal unused Floor Drain permanently (conduit)	-Training Room	02/10/2017	02/11/2017
Install air scrubbing units, with UV treatment	-Training Room [IA-6] -ATS Shop [IA/SS-2]	02/13/2017	02/13/2017
Install vent	-Between Maintenance Room [IA/SS-1] and ATS Shop [IA/SS-2]	02/13/2017	02/13/2017
Begin sampling event 24 hours after scrubbing units installed	-Training Room [IA-6] -ATS Shop [IA/SS-2]	02/14/2017	02/14/2017
Collect 24-hour canister for sample – overnight to lab for expedited analysis (6-liter Summa® canisters), as described in Section 3 above	-Training Room [IA-6] -ATS Shop [IA/SS-2]	2/15/2017	2/15/2017

INITIAL REMEDIAL MEASURE	LOCATION(S) OR DESCRIPTION	IMPLEMENTATION DATE	COMPLETION DATE
Install fans	-Along south wall of the Plant - near and around IA/SS-9 & IA/SS-10 -In cafeteria corner east of IA/SS-4, blowing east -In cafeteria corner near IA/SS-5	02/22/2017	02/24/2017

4.0 Ambient Air Extraction System ("AAES")

As noted in the table in Section 3.0, in order to address immediate indoor air impacts, First Environment installed air scrubbers equipped with UV treatment units in the Plant's ATS and Training Rooms on February 13, 2017. After installation, First Environment assessed the performance of the scrubbers. Based on the February 15, 2017, February 23, 2017, and March 9, 2017 indoor air sampling events (discussed below), First Environment proposed the installation of an Ambient Air Extraction System ("AAES") as an additional IRM for indoor air impacts detected. The AAES creates a vacuum point at the end of a suction pipe in close proximity to the slab surface (floor) of the impacted rooms, thus capturing and venting CoC vapors. The ventilation of the air in those rooms is accomplished by an inline electrical fan (typical in radon mitigation systems) that vents air to the outside of the Plant.

Construction of the AAES commenced in the week of March 20, 2017 and system start-up occurred on March 23, 2017. The suction pipe consists of a four-inch diameter, schedule 40 PVC pipe. It runs from the ATS Room at the ceiling height, through the Maintenance Room, and exits to the outside of the Plant. The pipe exits the exterior wall of the Plant (horizontally) at a point above the Plant's lower roof line, and then turns 90 degrees (vertically) and vents several feet above the Plant's highest point. To assist in capturing and venting air from the rooms, a small duct-vent (approximately four inches in diameter) was constructed with PVC pipe (slab grade – above floor surface) between the ATS and Maintenance Rooms.

Photographs of the AAES, including at the Plant's roof line, are attached in Appendix F.

5.0 Sub-Slab Depressurization System ("SSDS")

On March 8, 2017, First Environment submitted an Interim Sub-Slab Depressurization System ("SSDS") Installation Scope-of-Work ("SOW"). On March 15, 2017, the MDEQ approved the SOW. The Workplan and the MDEQ's approval letter are attached in Appendix G. Construction of the SSDS commenced the first week in April of 2017 and was completed on May 2, 2017, becoming fully operational on May 4, 2017. Photographs of the SSDS are attached in Appendix F.

5.1 Objectives

The design objective of the SSDS is to prevent soil gases from infiltrating into the central area of the Plant, where the highest concentrations of TCE and its degradation products were detected, at the former degreaser area. Even though remediation is not the design objective of the SSDS, the SSDS' ancillary effect will be to reduce the concentrations of the sub-slab vapors, as well as elevated vapor concentrations in the indoor air at the degreaser area. Specifically, by venting soil gases, the SSDS facilitates the removal of any contaminants, on a mass basis, from the subsurface media. Moreover, every volume of vented soil gas has to be replaced by an equal volume of air, resulting in an influx of oxygen into impacted areas, which may facilitate the aerobic biodegradation of contaminants.

5.2 System Components

The SSDS SOW provided for the installation of one extraction point ("EP") in the Maintenance Room (EP#1). That extraction point was not installed in that location. Instead, based on field observations and measurements and in consultation with MDEQ during a site visit to the Plant on March 27, 2017, First Environment modified the SSDS as follows: (1) relocation of EP#1 to the ATS Room; and (2) installation of a second extraction point (EP#2), located near column line G12, as depicted in Figure 7. First Environment implemented these modifications in May 2017. Historical documentation indicates the selected location of the EPs is in the vicinity of the Plant's former degreaser area.

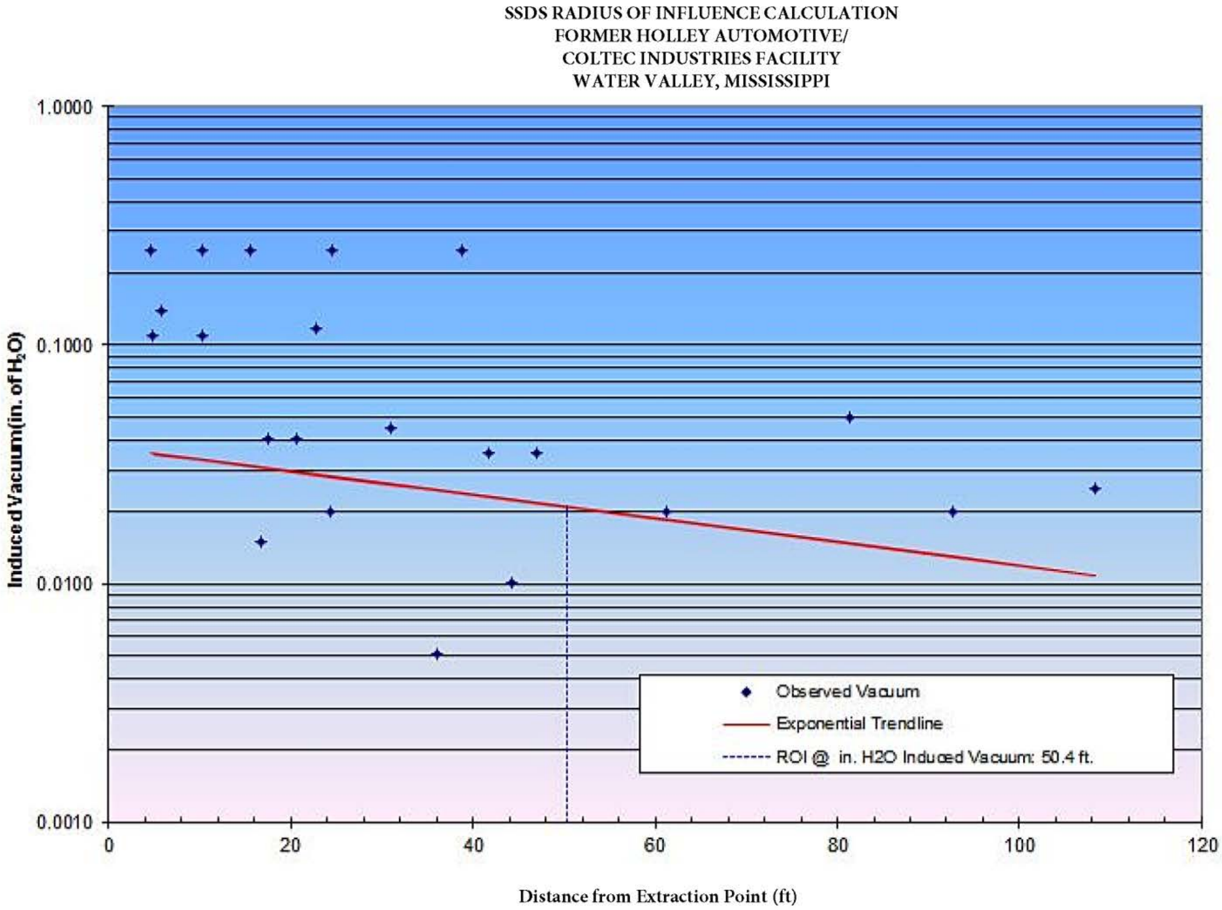
The following summarizes the construction and operation of the SSDS. Figure 8 depicts features of the SSDS.

- Two (2) five-inch diameter EPs were advanced in the concrete slab by a coring machine. A proper seal was established around the EPs. Four-inch diameter PVC riser pipes were inserted into the EPs. The PVC riser pipes extend vertically to the Plant's ceiling. From the ceiling, the riser pipes are connected to a six-inch diameter manifold (trunk line) that runs along the Plant's existing piping infrastructure where it exits out the Plant's exterior south wall into the SSDS blower enclosure.

- The suction lines are equipped with mitigation system alarms to alert when a lack of vacuum is detected. Signage was also constructed and placed adjacent to each of the alarm systems at each EP depicting contact information if the alarm is triggered.
- A 7.5-HP variable speed radial blower was installed in the blower enclosure and connected inline to the SSDS piping. The blower creates the vacuum for the system.
- An inline UV system box was constructed and placed in the blower enclosure, on the suction side of the blower. The UV box consists of two (2) UV units (supplied by Sanuvox) equipped with four (4) 18-inch UVV lamps (total of eight (8) lamps).
- A 10-inch diameter vent pipe was constructed on the discharge side of the blower that extends vertically out of the blower enclosure to the Plant's roof, venting the system. The effluent vent piping terminates approximately six-feet above the Plant's roof and is equipped with a vent cap.
- Sampling ports were installed in each of the riser pipes, the influent side of the UV box, and the discharge side of the blower. The ports were constructed to monitor the system's flow rate and extracted vapor concentrations.

5.3 Performance

On May 2-4, 2017, First Environment conducted communication tests to assess the induced vacuum underneath the slab at various locations. Sub-slab sampling points utilized in the January VI Investigation were re-drilled and utilized as observation points to determine the lateral extent of the vacuum (i.e., radius of influence ["ROI"]). Handheld magnehelic gauges were utilized to quantify the vacuum measurements at the observation points. Additional observation points were advanced to further evaluate the system's ROI. The location of the additional observation points was determined during the implementation of the communication tests. A representative from MDEQ was present during all communication tests of the system. The location of the sampling points and the results of the communication test are depicted in Figures 9 and 10. Based on the vacuum measurements, First Environment calculated the effective ROI of the SSDS to be approximately 50 feet, as depicted in the figure below.



As of June 13, 2017, the discharge flow rate measured at the stack of the SSDS was about 300 cubic feet per minute ("cfm"). The effluent TCE concentration measured at the stack was 3,700 µg/m^3 as of June 8, 2017. Based on these measurements, the discharge of TCE vapors to the atmosphere utilizing UV treatment would be approximately 36.4 pounds/year, which is equivalent to approximately 0.02 tons/year.

5.4 Proposed Expansion of the SSDS

A third extraction point (EP #3) is proposed to be installed adjacent to the sump area (depicted in Figure 11), which is located adjacent to the Maintenance Room. This location was selected based on continued evaluations of the SSDS, which includes the sump area and the Maintenance Room. The highest sub-slab sampling results, collected during the January VI Investigation event, were collected from this area. In addition, historical documentation indicates the proposed selected location of EP#3 is in the vicinity of former ASTs, TCE return lines, and the plant's former wastewater discharge location. EP#3 is located between the former degreaser locations. Evaluation of the sub-slab region in the sump area has indicated high moisture readings and saturated conditions, likely as a result of the wash down operations at the sump. TCE has been detected in the sediments of the sump, as previously mentioned in this Report. Thus, based on the stated reasons and rationale, it is believed that this area is a continued VI source of elevated indoor air sampling results. The proposed installation of EP#3 will assist in addressing the saturated conditions of the sub-region by drying out the area and also capturing the sub-slab vapors.

6.0 Indoor Air Monitoring - February through June 2017

6.1 Instrumentation

First Environment collected indoor air samples by placing laboratory provided 6-liter capacity 24-hour Summa® canisters, equipped with flow regulators.

6.2 Methodology

First Environment collected the following indoor air samples:

- on February 15, 2017 - three (3) indoor air samples;
- on February 23, 2017 - four (4) indoor air samples;
- on March 9, 2017 - four (4) indoor air samples;
- on March 26, 2017 - four (4) indoor air samples;
- on April 26, 2017 - eight (8) indoor air samples, and one (1) ambient air sample;
- on May 14, 2017 - seven (7) indoor air samples, including at the two EPs;
- on May 25, 2017 - fourteen (14) indoor air samples[3], and one (1) ambient air sample; and
- on June 7, 2017 - twelve (12) indoor air samples[4], and one (1) ambient air sample.

The indoor air samples were taken at various locations within the Plant, including in the maintenance room, the ATS room, and the training room. First Environment shipped the canisters of all ambient and indoor air samples to ESC Lab Sciences for USEPA TO-15 analysis. Table 10 presents the vacuum measurements collected from the Summa® canisters before and after sampling events.

6.3 Results

Table 11 presents a comparison of all nine rounds of indoor air sampling results for TCE, cis-DCE, and VC, including the initial VI sampling conducted in January 2017. Tables 12 through 19 present all results of indoor air sampling conducted subsequent to initial VI investigation for TO-15 analytes.[5] Figure 11 presents the June 7, 2017 sample locations and results for TCE.

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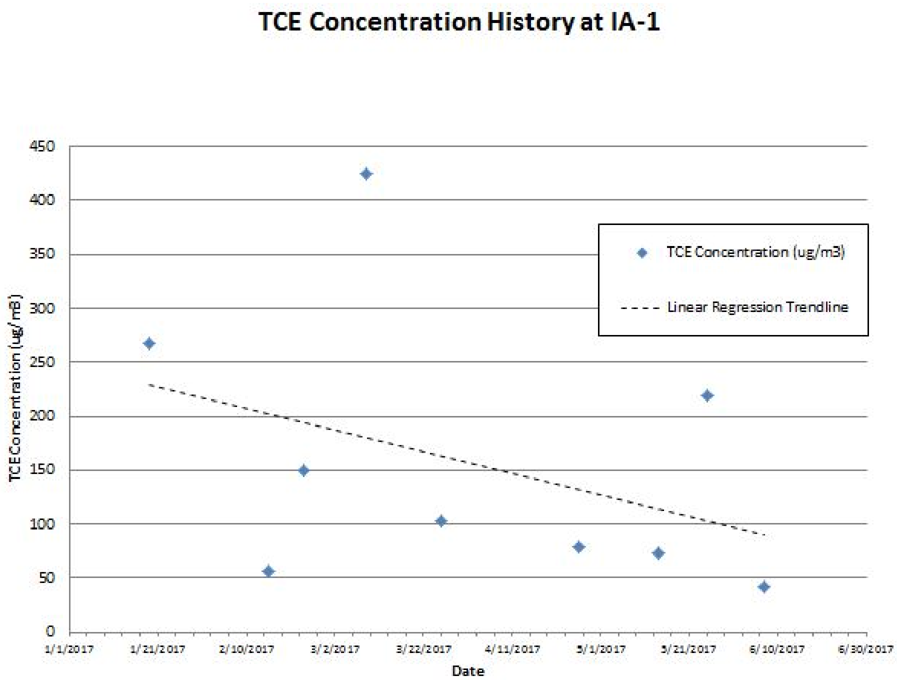
[3] As noted in First Environment's June 8, 2017 letter to MDEQ, the results for sample "IA-SUMP" did not meet the project's data quality objectives for reproducibility due to an equipment error with the flow controller. Therefore, only the results for sample "IA-SUMP-DUP" are presented in the summary table.

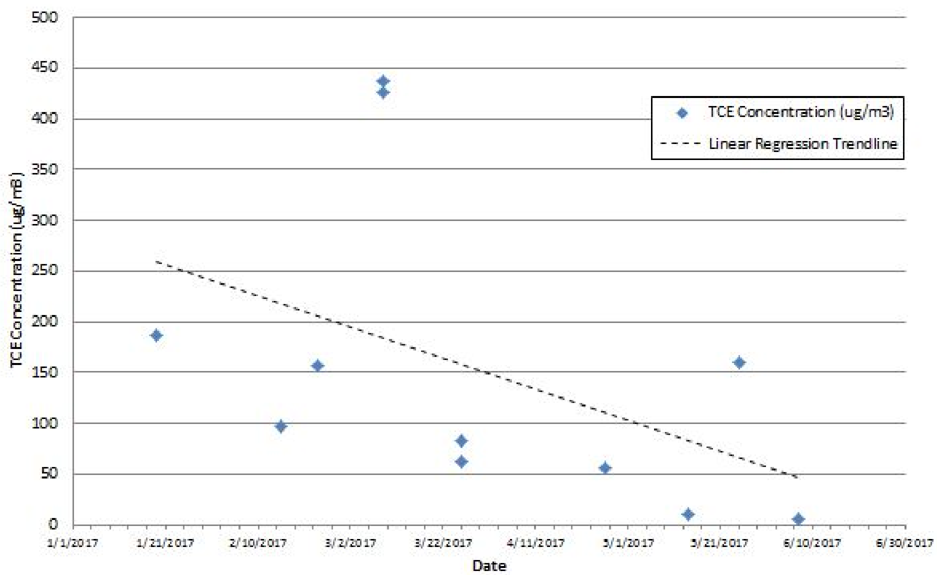
[4] Sample IA-17 was mislabeled "OA-17" in the laboratory report. It is correctly labeled as IA-17 in the summary table.

[5] The first round of indoor air sampling in is labeled IA-1(1), IA-2(1); the second round, IA-1(2), IA-2(2); the third round, IA-1(3), IA-2(3), etc.

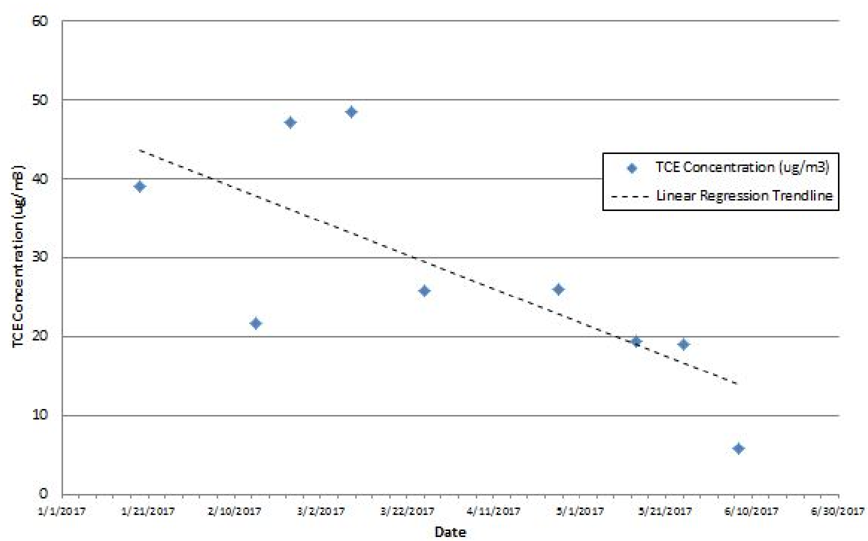
First Environment analyzed the concentration history in the samples IA-1, IA-2, and IA-6 by linear regression. As shown in the following figures, there is a decreasing trend of TCE concentrations in those sampling locations (i.e., Maintenance Room, Training Room, and ATS Room).



TCE Concentration History at IA-2



TCE Concentration History at IA-6



The laboratory reports, including the Chain-of-Custody forms, are attached in Appendix D.

7.0 Summary

Based upon the results of the vapor intrusion investigation and mitigation activities described above, First Environment provides the following summary:

1. Several constituents, including TCE in both soil gas and indoor air samples, are present at concentrations above the MDEQ action levels in the central area of the Plant (the former degreaser area).
2. First Environment is operating a long-term mitigation system, the SSDS, to address vapor intrusion in the central area of the Plant.
3. First Environment will expand the SSDS as described in Section 5.4, and will continue to evaluate the effectiveness of the SSDS. If necessary, additional modifications will be made to the system.