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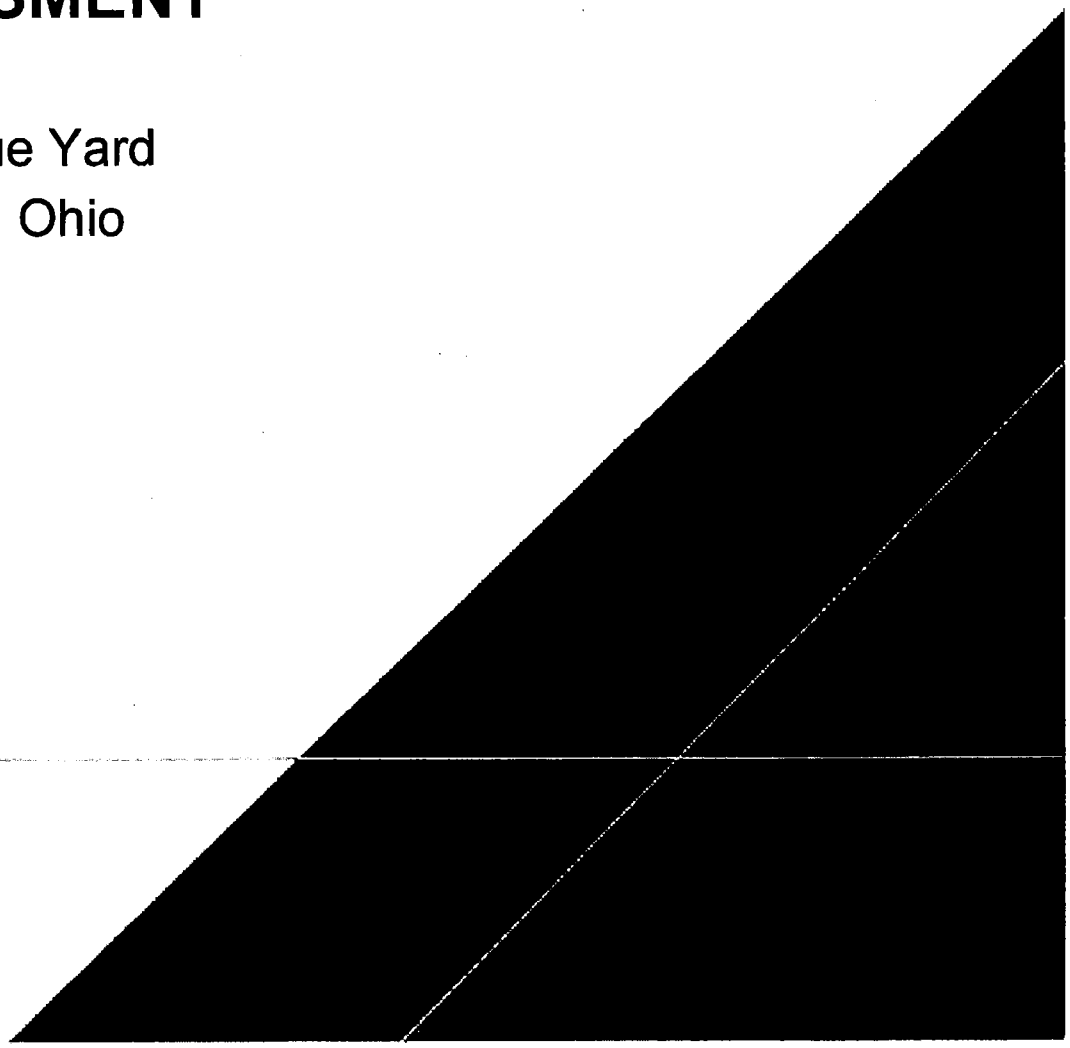
LIMITED PHASE II PROPERTY ASSESSMENT

Neil Avenue Yard
Columbus, Ohio

January 13, 2017



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Neil Avenue Yard

Columbus, Ohio

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ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis U.S., Inc.
BaP	benzo(a)pyrene
bgs	below ground surface
COC	chemicals of concern
GDCS	generic direct contact standards
gpm	gallon per minute
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NAD	North American Datum
Ohio EPA	Ohio Environmental Protection Agency
PA	Property Assessment
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PIA	Preliminary Identified Area
PID	photoionization detector
PVC	polyvinyl chloride
RCRA	Resource and Conservation Recovery Act
SVOCs	semi-volatile organic compounds
TPH	total petroleum hydrocarbons
UPUS	unrestricted potable use standards
USD	Urban Setting Designation
USEPA	United States Environmental Protection Agency
VAP	Voluntary Action Program
VOCs	volatile organic compounds

1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) performed a Phase II Property Assessment (PA) in accordance with portions of the Ohio Voluntary Action Program (VAP) rule OAC 3745-300-07 at the approximately 13.3-acre CSX Neil Avenue Yard (Property) located at the southwest corner of the intersection of Neil Avenue and Vine Street, Columbus, Ohio in Franklin County (**Figure 1**). Arcadis performed a Phase I Property inspection on October 18, 2016, as documented in the Phase I PA report dated November 22, 2016 (Arcadis 2016). Sampling of environmental media for the Phase II Property assessment was performed between November 14 and December 9, 2016, and is documented in this Phase II PA report. This Phase II PA report describes the methodologies and results of the Phase II PA and provides an analysis of the existing data including an exposure pathway assessment and comparison to applicable standards to assist with remedial decision-making for the property. The Phase II project staff includes Eric Showalter (VAP Certified Professional #278), Mike Lutz (field manager), Terri Rubis (project manager), Travis Debnam, Taylor Runge, Angela Wish, and Lexi Crisp (all field personnel). Note that the Phase I and Phase II assessments were performed as part of a potential real estate transaction for the Property.

2 PHASE I PROPERTY ASSESSMENT

It has been less than 180 days since completion of the Phase I PA; therefore, no update or amendment to the Phase I is necessary. Results of the Phase I PA indicate the presence of the following Preliminary Identified Areas (PIAs, **Table 1**):

- **PIA-1: Former Rail Yard Operations**. Includes coach repair buildings, ice houses, coal storage and tipple, and multiple rail lines. Chemicals of concern (COCs) include: volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs) and creosote-related semi-volatile organic compounds (SVOCs), and the eight Resource and Conservation Recovery Act (RCRA) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver).
- **PIA-2: Former Roundhouse, Turntable, Maintenance Building and Oil House**. COCs include: VOCs, PAHs and creosote-related SVOCs, the eight RCRA metals, total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs).
- **PIA-3: Former ethylene glycol UST**. Removed in 2009, with ethylene glycol impacts confirmed in sidewall and bottom samples of excavation. COCs include: VOCs, PAHs and creosote-related SVOCs, the eight RCRA metals and ethylene glycol.

A map depicting these PIAs is included as **Figure 2.** Note that these were called "Identified Areas" in the November 2016 Phase I, but have been changed to "Preliminary Identified Areas" to indicate the potential for them to change as the Phase II progresses.

An evaluation of eligibility of the Property to enter the Ohio VAP was also conducted during the Phase I PA. No eligibility issues were identified that would prevent the Property from being entered into the VAP.

3 STATEMENT OF LIMITATIONS OR QUALIFICATIONS

The Phase II investigation work plan was completed as planned with the exception of the inability to install one of the proposed monitoring wells due to refusal of auger drilling equipment on a layer of densely packed silt at that location. The Phase II PA was completed in accordance with portions of the VAP Phase II rule OAC 3745-300-07. It can be relied on only as an initial Phase II assessment and is not intended to fulfill all the Phase II rule requirements.

4 CONCEPTUAL SITE MODEL

A conceptual site model was not developed as part of the Phase II effort. During development of the sampling scope for this investigation, it was assumed all direct contact exposure scenarios (residential, commercial/industrial, and construction/excavation worker) would be complete across the Property. It was also assumed that groundwater at the Property could be used for potable purposes. Note that there are no surface water bodies or sediment on, or adjacent to, the Property. Therefore, this Phase II scope of work did not include surface water or sediment sampling.

5 SAMPLING PROCEDURES

The Phase II assessment consisted of the advancement of 43 soil borings across the Property. Fifteen of these soil borings were converted to ground water monitoring wells. **Figure 3** shows the locations of the soil borings and monitoring wells. All borings were advanced using a stainless-steel hand auger, direct-push and/or hollow stem auger drilling techniques.

5.1 Soil Sample Collection

In accordance with Arcadis utility clearance procedure, each soil boring was first scanned with a ground-penetrating radar, then hand-cleared to a depth of 5 feet below ground surface (bgs) using a stainless-steel hand auger to clear subsurface utilities at each location. Soil samples were collected from the hand auger in 2-foot intervals to the 5-foot utility clearance depth. The hand auger was washed in an Alconox solution and rinsed with distilled water between sample intervals. Following hand clearing, a direct push drilling rig (Geoprobe Model 7822DT) was used to collect soil samples to target depths at each boring location. Drilling rods were decontaminated between each borehole using an Alconox solution and distilled water rinse. Because soil was collected in disposable acetate sleeves, no decontamination was necessary for the sleeves. **Appendix A** contains the boring logs.

Samples were collected in 4-foot long acetate sleeves. The soil in each sleeve was divided into 2-foot intervals for sampling purposes. A portion of each interval was placed into laboratory-supplied jars and stored in iced coolers for possible laboratory analysis. Another portion of each interval was placed into re-sealable plastic baggies and allowed to warm to room temperature for field screening with a MiniRAE 2000 photoionization detector (PID). The PID was calibrated at the start of each day using a 100 parts per million isobutylene calibration gas. Samples selected for analysis were shipped in an iced cooler for transport to TestAmerica Labs, Inc. (TestAmerica) located in North Canton, Ohio. TestAmerica is an Ohio VAP Certified Laboratory (CL 0024). Duplicate and matrix spike/matrix spike duplicate soil samples were submitted at the rate of one per 20 samples collected (total of five samples). Additionally, six trip blanks included with the coolers were analyzed for VOCs.

5.2 Monitoring Well Installation

Following collection of unsaturated soil samples at each designated monitoring well location, a Diedrich D-50 drilling rig was used to over drill the hole (using 4.25-inch inside diameter hollow-stem augers) to a depth 5 feet into the saturated zone, where the bottom of the wells were set. Typical monitoring well construction consisted of 10-feet of two-inch inner diameter polyvinyl chloride (PVC) 10-slot screen and PVC casing. A sand pack (#4 sand) was placed in the annular space between the well and borehole wall to a depth 2 feet above the top of the screen. Bentonite pellets were then placed from the top of the sand pack to approximately 1 foot bgs. Concrete was then placed up to ground surface and metal stick-up protector pipes were set in the concrete. Each well was then secured with a padlock. Well construction diagrams are included on the boring logs in **Appendix A**.

All monitoring wells were surveyed by a licensed professional surveyor using the North American Datum (NAD) 83 (horizontal) and NAD 88 (vertical) coordinate system. The survey included latitude, longitude, ground-surface elevations at each boring location, as well as monitoring well top-of-casing elevations.

5.3 Monitoring Well Development

Each monitoring well was developed by first surging using surge blocks, followed by purging using a submersible pump. Field parameters, including temperature, specific conductance, pH, total dissolved solids, dissolved oxygen, and turbidity were measured during the well development activities. Wells were purged until a minimum of 10 well volumes were removed, or the well went dry, whichever came first. Purge water was containerized in 55-gallon drums to await analysis of groundwater samples. The pumps and water level meter were decontaminated between wells using an Alconox solution with distilled water rinse. Monitoring well development logs are included in **Appendix B**.

5.4 Monitoring Well Sampling

Monitoring well sampling occurred between 24 and 48 hours after development was completed. Each well was gauged for depth to groundwater prior to sampling. Groundwater samples were collected using low-flow sampling techniques and a Proactive Mega-Typhoon pump with flow controller except at wells where a bailer was used for sample collection due to an insufficient water column (MW-3 and MW-16). The pumps and water level meter were decontaminated between wells using an Alconox solution with distilled water rinse. Field parameters, including temperature, specific conductance, pH, dissolved oxygen, and turbidity were measured during the groundwater sampling activities. Samples were placed into appropriate sample containers and placed in an iced cooler for transport to TestAmerica in North Canton. Duplicate groundwater samples were submitted at the rate of one per 20 samples collected (total of one sample). Purge water from the sampling was placed in 55-gallon drums to await receipt of sample results. Well sampling logs are included in **Appendix C**.

6 DATA COLLECTION ACTIVITIES

6.1 Phase I Findings

The Property was previously operated as a railyard from the late 1800s to approximately 1980. Throughout this history, several operations occurred at the Property that could lead to potential releases of hazardous substances and/or petroleum. These operations included:

- Oil house;
- Coal tipple;
- Coach repair shops;
- Multiple rail lines;
- A roundhouse; and
- The former presence of an ethylene glycol underground storage tank (UST). This UST was removed in 2009 and ethylene glycol was detected (below VAP direct contact standards) in samples collected from the sidewalls and bottom of the excavation.

Figure 2 shows the approximate locations of these operations based on historic Sanborn Fire Insurance maps.

6.2 Sample Collection and Analysis

6.2.1 Soil

A total of 43 soil borings were advanced across the Property to assess three PIAs between November 14 and November 22, 2016. Soil boring and monitoring well locations are shown in **Figure 3**. Thirty-one soil borings were advanced throughout PIA-1 11 soil borings were advanced throughout PIA-2, and one soil boring was advanced in PIA-3 near the assumed location of the former ethylene glycol UST. The boring locations for each PIA include:

- PIA-1: MW-1 through MW-6, MW-11, MW-14, MW-15, SB-1 through SB-21, SB-26, and SB-27;
- PIA-2: MW-7, MW-8, MW-9, MW-10, MW-12, MW-13, and SB-22 through SB-26; and
- PIA-3: MW-16.

Soil samples were collected utilizing procedures described in Section 5.1. Because the ultimate end use of the Property is not currently known, soil samples were assessed for all three direct contact exposure scenarios in the VAP: residential, commercial/industrial, and excavation/construction worker. For the direct contact exposure pathway, the following vertical points of compliance were used for each scenario:

- Residential – 10 feet bgs;
- Commercial/Industrial – 2 feet bgs; and
- Construction/Excavation Worker – 16 feet bgs (based on assumed depth of sewers at the Property).

To assess each of these vertical points of compliance, the sample interval from ground surface to 2 feet bgs was submitted for analysis from each boring location, except at borings MW-8, MW-12, and MW-15 where concrete was present from ground surface to approximately 1.5 feet bgs. The 2- to 4-foot sample intervals were submitted from these locations. A second sample between 2 feet and 16 feet bgs was selected for analysis from each boring to assess for the residential and/or construction/excavation worker scenarios. All samples were biased to the depth of highest suspected impact based on either PID readings or visual observations of potential impact.

Based on the COCs identified during the Phase I PA, the following analyses were performed for each PIA:

- PIA-1: VOCs by United States Environmental Protection Agency (USEPA) Method 8260A, PAHs and creosote-related SVOCs by USEPA Method 8270C, and the eight RCRA metals by 6010B and 7471A (mercury) (**Table 2**). Note that creosote related SVOCs included:
  - m&p cresol,
  - 2-cresol,
  - 2,4-dichlorophenol,
  - 2,4-dimethylphenol,
  - 2,4-dinitrophenol,
  - Pentachlorophenol,
  - Phenol,
  - 2,3,4,6-tetrachlorophenol, and
  - 2,4,6-trichlorophenol.
- PIA-2: Same analyses as PIA-1 plus TPH (carbon ranges C_6 to C_{12}, C_{10} to C_{20} and C_{20} to C_{34}) by USEPA Method 8015A and B, and PCBs by USEPA Method 8082.
- PIA-3: Same analyses as PIA-1 plus ethylene glycol by USEPA Method 8015B.

6.2.2 Groundwater

Fifteen groundwater monitoring wells MW-1 through MW-6 and MW-8 through MW-16 were installed across the Property. A well was not installed at the location designated for MW-7 due to auger refusal prior to reaching saturation at that location. Based on the COCs identified during the Phase I PA, the following analyses were performed for each IA:

- PIA-1: VOCs by USEPA Method 8260A, PAHs and creosote-related SVOCs by USEPA Method 8270C, and the eight RCRA metals by 6010B and 7471A (mercury).
- PIA-2: Same analyses as PIA-1 plus PCBs by USEPA Method 8082.
- PIA-3: Same analyses as PIA-1 plus ethylene glycol by USEPA Method 8015B.

Nine monitoring wells (MW-1 through MW-6, MW-11, MW-14, and MW-15) were sampled for the PIA-1 COCs; five wells (MW-8, MW-9, MW-10, MW-12, and MW-13) were sampled for the PIA-2 COCs, and MW-16 was sampled for the PIA-3 COCs (**Table 2**).

6.3 Results

6.3.1 Soil

Based on observations during drilling activities, the geology beneath the Property is generally fill material consisting of sand, cinders, coal, slag, brick, and glass from ground surface to depths ranging from eight to 12 feet bgs. Beneath the fill is silty clay and silty sand to depths of approximately 28 feet bgs. Beneath 28 feet, the geology tends to coarsen, with sand and gravel containing varying amounts of silt. It should be noted that at many locations, the silt encountered at approximately 20 feet bgs is very stiff (appearing almost cemented at certain locations) to the point that direct-push equipment had difficulty penetrating it. In most cases, hollow-stem augers could penetrate it. However, at the site of proposed well MW-7, augers were also not able to penetrate it. An east-west cross section is included as **Figure 4**.

Note that the observed geology underlying the fill is similar to geology noted in logs for nearby dewatering wells north of the Property, showing interbedded clays and sands and gravels from ground surface to approximately 48 feet bgs. Limestone bedrock was observed to be present at a depth of 78 feet bgs based on a log for a well located approximately 500 feet west of the Property. Bedrock in this portion of Franklin County consists primarily of Devonian limestone and dolomite with some shale and minor amounts of sandstone (Ohio Department of Geological Survey, 2006).

Full analytical results of soil samples are presented in **Table 3**. Analytical results for soil samples exceeding VAP single chemical generic direct contact standards (GDCS) are presented on **Figure 5**. Note that on figure 5, for the residential direct contact exposure pathway, the arsenic results were compared to the background arsenic concentration for Franklin County, as described in Section 8.0. Comparison of the arsenic concentrations to the VAP GDCS are presented below. No multiple chemical adjustments were performed.

Laboratory analytical reports are included in **Appendix D**. The analytical results are summarized below. Note that results showing exceedances of the GDCS reflect the vertical points of compliance summarized in Section 6.2.1.

- Arsenic was detected in 50 samples at concentrations exceeding the residential VAP GDCS of 12 milligrams per kilogram (mg/kg). Concentrations range from 2.4 mg/kg at MW-8 (2-4') to 220 mg/kg at SB-4 (8-10'). None of the arsenic detections exceed the commercial/industrial or excavation/construction worker GDCSs.
- Lead was detected at concentrations above the residential GDCS of 400 mg/kg in seven samples, and the construction/excavation worker GDCS (also 400 mg/kg) in eight samples (due to one sample below 10 feet bgs). Lead concentrations range from 3.3 mg/kg at SB-11(2-4') to 1,400 mg/kg at MW-10(12-14'). Lead was not detected above the commercial/industrial GDCS of 800 mg/kg in the top 2 feet across the Property.

- Mercury was detected at concentrations above both the residential and construction/excavation worker GDCS of 3.1 mg/kg. Mercury concentrations range from non-detect in many samples to 18 mg/kg at MW-12(2-4'). Mercury was not detected above the commercial/industrial GDCS of 3.1 mg/kg in the top 2 feet across the Property.
- PAHs (primarily benzo(a)pyrene [BaP]) were detected in nine samples at concentrations above the VAP residential GDCSs. Three locations (SB-6, SB-16 and SB-23) have exceedances of the commercial/industrial GDCS for BaP (5.8 mg/kg) in the top 2 feet. BaP concentrations range from non-detect at several locations to 15 mg/kg at SB-23(0-2'). No PAHs were detected above construction/excavation worker GDCSs.
- There were no exceedances of any of the VAP GDCSs for VOCs, phenol-related SVOCs, TPH, PCBs or ethylene glycol.

6.3.2 Groundwater

During drilling activities, saturated conditions were encountered at depths primarily below 30 feet bgs at most monitoring well locations. Perched saturated conditions shallower than 30 feet bgs were encountered at monitoring well locations MW-3, MW-6, and MW-14. Therefore, shallower wells were installed in those three locations.

A full round of static water levels were measured on December 9, 2016. Based on these groundwater elevations, groundwater flow appears to be to the west at the Property. **Figure 6** is a groundwater elevation map based on the December 9 data. **Table 4** provides monitoring well construction information along with groundwater elevation data. Note that due to the shallower nature of the saturated zones, wells MW-3, MW-6, and MW-14 were not used for the determination of groundwater flow direction.

Full analytical results of groundwater samples are presented in **Table 5**. Analytical results for groundwater samples exceeding VAP unrestricted potable use standards (UPUS) are presented on **Figure 7**. Laboratory analytical reports are included in **Appendix D**. Confirmatory groundwater sampling was not performed.

The following is a summary of analytical results.

- Arsenic was detected in the following samples at concentrations above the UPUS of 0.010 milligrams per liter (mg/L):
  - MW-2: 0.015 mg/L
  - MW-6: 0.014 mg/L
  - MW-13: 0.038 mg/L
  - MW-16: 0.052 mg/L
- Lead was detected in the following samples at concentrations above the UPUS of 0.015 mg/L:
  - MW-13: 0.034 mg/L
  - MW-16: 0.051 mg/L

There are no exceedances of any of the VAP UPUSs for VOCs, phenol-related SVOCs, PCBs, or ethylene glycol.

It should be noted that turbidities were elevated (300 to 1,000 Nephelometric Turbidity Unit) in the samples with UPUS exceedances. Therefore, suspended sediment may have contributed to the elevated concentrations of arsenic and lead in those samples.

Additionally, the following compounds had reporting limits that exceeded their respective UPUS:

- Dibenz(a,h)anthracene: reporting limit: 0.00019 mg/L; UPUS: 0.000092 mg/L;
- Pentachlorophenol: reporting limit: 0.0048 mg/L; UPUS: 0.001 mg/L;
- 1,2-Dibromo-3-chloropropane: reporting limit: 0.002 mg/L; UPUS: 0.0002 mg/L;
- Ethylene dibromide (aka 1,2-Dibromomethane): reporting limit: 0.001 mg/L; UPUS: 0.00005 mg/L
- 1,1,2,2-Tetrachloroethane: reporting limit: 0.001 mg/L; UPUS: 0.00066 mg/L;
- Aroclor-1221 and Aroclor 1232: reporting limit: 0.000095 mg/L; UPUS: 0.000061 mg/L

Note that method detection limits for pentachlorophenol, 1,1,2,2-tetrachloroethane, and dibenz(a,h)anthracene are below their respective UPUSs. Because there were no J-values (i.e., estimated concentrations between the reporting limits and the method detection limits) for any of these compounds in the groundwater samples, it is not likely that these compounds are present in the groundwater at the Property.

Additionally, the VAP rule in OAC 3745-300-07(D)(2)(c) states in part:

"An appropriate detection limit may be used to represent any applicable standard where the certified laboratory is not capable of detecting the chemicals of concern at or below the applicable standard until such time that a lower detection is achieved."

Because the elevated reporting limits appear to be due only to limitations of the analytical equipment (and not to dilution of the samples), the reporting limits will be used as UPUS for those compounds until lower detection limits can be achieved.

7 DETERMINATIONS

7.1 Exposure Pathway Evaluation

7.1.1 Complete Exposure Pathways

The Property is currently vacant and was formerly used as a railyard. The only current human exposure are trespassers (based on the observations of former encampments at the Property) and transient construction workers who park their vehicles on the Property and work on the property to the north. Future land use is currently unknown. Due to this uncertainty, direct contact with soil for all three exposure scenarios (residential, commercial/industrial, and construction/excavation worker) is assumed to be a complete exposure pathway. Additionally, because there is currently no restriction on potable use of groundwater on the Property and there is no city code prohibiting the installation of potable wells, the groundwater exposure pathway is considered potentially complete. It should be noted that based on a water well search in the Phase I PA, there are no potable wells located within 0.5 mile of the Property. Additionally, there is a 164-acre Ohio Environmental Protection Agency (Ohio EPA) approved Urban Setting Designation (USD) area located immediately south of the railroad tracks present along the south boundary of the Property. By Ohio EPA's definition, the potable use pathway for groundwater within the USD is considered incomplete. Because the Property and surrounding properties have access to the City of Columbus water system, it is unlikely that potable wells will be installed on, or near the Property in the future.

7.1.2 Incomplete Exposure Pathways

Because there are no buildings currently present on the Property, the indoor air exposure pathway is incomplete. Additionally, there is no surface water or sediment present on, or adjacent to the Property. Therefore, exposure to surface water and sediments is incomplete. Leaching to groundwater was not evaluated because concentrations of COCs in the shallow groundwater exceed UPUS.

7.2 Groundwater Classification & Response Requirements

Yield testing to determine a groundwater classification in accordance with OAC 3745-300-10 was not conducted as part of this Phase II investigation. However, based on the observations that many wells easily produced 10 well volumes during well development activities, it is likely that the aquifer at the Property has a yield rate of at least one tenth of a gallon per minute (gpm) over a 24-hour period, which is the threshold for a Class A groundwater under the VAP rules. It is not likely that the aquifer could produce a sustainable yield of at least 100 gpm over a 24-hour period, which is the threshold for a "critical resource" groundwater. Therefore, the aquifer under the Property is tentatively classified as a Class A groundwater. Yield testing will be required to verify the groundwater classification.

Response requirements for each groundwater classification are included in OAC 3745-300-10 (E) (2). In accordance with this rule, the following are the response requirements for a Class A groundwater if contaminants originated at the Property:

- An institutional or engineering control that reliably prevents human exposure on the Property to groundwater that exceeds UPUS must be implemented, or the groundwater cleaned up to meet UPUS; and
- Groundwater on or from the Property must not exceed UPUS at the point of compliance. Typically, the point of compliance is the VAP Property boundary. However, because the Property is surrounded by transportation corridors (i.e., streets and rail lines), the point of compliance will be the most distant edges of those corridors.

7.3 Applicable Standards

Based on complete exposure pathways, the unknown future use of the Property, and the preliminary groundwater classification, applicable standards for the Property will include VAP GDCS for all three exposure scenarios (residential, commercial/industrial, and excavation/construction worker) and the VAP UPUS. Additionally, if a building is constructed on the Property in the future, a demonstration must be made that the VAP Generic Indoor Air Standards due to Vapor Intrusion are not exceeded. Due to the relative lack of VOCs detected at the Property, it is likely that this demonstration can be made.

8 BACKGROUND DETERMINATIONS

Because the entire Property is covered with fill material, there were no on-site areas suitable to collect soil samples for determination of background concentrations. In October 2013, the Ohio EPA published a document entitled *Evaluation of Background Metal Soil Concentrations in Franklin County – Columbus Area* (Ohio EPA 2013). According to Table 3 of the report, which summarized the background statistics for nine metals, the 95% upper predictive limit for arsenic is 20.7 mg/kg (the VAP residential GDCS is 12 mg/kg). It should be noted that this study collected samples from 11 sites throughout Franklin County, including Goodale Park (the closest location to the Property), which is located approximately 1,000 feet north of the Property. It should be noted that the samples collected from Goodale Park contained some of the highest arsenic concentrations (up to 38 mg/kg) of the 11 geographic areas sampled. Therefore, the background concentration for arsenic (20.7 mg/kg) will be the new residential GDCS for the Property. Note that background concentrations for lead and mercury were below the VAP residential GDCS. Therefore, the residential GDCSs will be retained for those metals.

9 MODELING

Modeling was not completed as part of this Phase II investigation.

10 URBAN SETTING DESIGNATION

The Property does not have an USD for groundwater. Therefore, the potable use pathway is not eliminated for areas surrounding the Property. However, based on the presence of an approximate 164 acre USD (Pen West Site USD) adjacent to the rail line along the southern boundary of the Property, it is likely that a USD could be established for the Property as well.

11 PROPERTY-SPECIFIC RISK ASSESSMENT

A Property-specific risk assessment was not conducted as part of this Phase II investigation. Multiple chemical adjustments were not performed and may be required by the Ohio VAP.

12 REMEDIAL ACTIVITIES PRIOR TO NFA LETTER

There have been no remedial activities conducted at the Property to date.

13 COMPLIANCE WITH APPLICABLE STANDARDS

The Certified Professional has determined that the Property does not currently comply with all applicable standards through the collection and analysis of 86 bulk soil samples from the three identified areas and 15 groundwater samples from 15 permanent monitoring wells. Note however, that in accordance with VAP rules, the wells containing groundwater with concentrations exceeding UPUS must be re-sampled to verify the exceedance of UPUS at those wells. All chemical analysis was performed by Test America Laboratory, which is certified under the VAP for the analyses conducted. Resumes of key individuals involved in the Phase II assessment are included in **Appendix E**.

As discussed previously, the point of compliance for the direct contact soil pathway is 2 feet for commercial/industrial receptors, 10 feet for residential receptors, and 16 feet for construction/excavation workers. The point of compliance for potable groundwater and direct contact with groundwater is the uppermost saturated zone. Deeper groundwater zones were not encountered. If a deeper groundwater zone is present and there are no exceedances of potable use standards, a demonstration showing Protection of Potable Groundwater Meeting UPUS will be required.

The applicable standards for the direct contact soil and potable groundwater pathways are the VAP generic standards established under OAC 3745-300-08, with the following exceptions:

- The residential direct contact standard for arsenic is changed from the default 12 mg/kg in OAC 3745-300-08 to 20.7 mg/kg, which is the calculated background value for Franklin County per the Ohio EPA 2013 background metals study for Franklin County; and
- Due to limitations of the laboratory equipment, the following reporting limits will become the applicable standard (i.e., UPUS) for the potable groundwater pathway until such a time that the generic UPUS can be achieved:
    - Dibenz(a,h)anthracene: 0.00019 mg/L;
    - Pentachlorophenol: 0.0048 mg/L;
    - 1,2-Dibromo-3-chloropropane: 0.002 mg/L;
    - Ethylene dibromide (aka 1,2-Dibromomethane): 0.001 mg/L;
    - 1,1,2,2-Tetrachloroethane: 0.001 mg/L; and
    - Aroclor-1221 and Aroclor 1232 reporting limits: 0.000095 mg/L.

Soil analytical data indicate the following exceedances of standards at the Property:

- Arsenic exceeds residential direct contact soil standards within the point of compliance at nine locations in IA-1, six locations in IA-2, and one location in IA-3.
- Lead exceeds residential direct contact soil standards within the point of compliance at six locations in IA-1 and one location in IA-2. Lead exceeded the construction/excavation worker direct contact standard at the same locations, plus one additional location within IA-2.
- Mercury exceeds the direct contact standard for all three exposure scenarios at two locations in IA-1 and one location in IA-2.

- PAHs exceed residential direct contact soil standards within the point of compliance at six locations in IA-1 and two locations in IA-2. PAHs exceed the commercial/industrial worker direct contact standards at two locations in IA-1 and one location in IA-2.

Arsenic concentrations in groundwater exceeded the UPUS at two locations in IA-1 (MW-3 and MW-6), one location in IA-2 (MW-13) and one location in IA-3 (MW-16). The concentration of lead exceeded the UPUS at one location in IA-2 (MW-13) and one location in IA-3 (MW-16).

Based on the Phase II assessment data, the Property currently exceeds applicable VAP standards.

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