



# ARM Group LLC

Engineers and Scientists

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November 11, 2020

Ms. Barbara Brown  
Project Coordinator  
Maryland Department of the Environment  
1800 Washington Boulevard  
Baltimore, MD 21230

Re: Excavation Completion Report (Revision 1)  
Area B: Parcel B17  
Tradepoint Atlantic  
Sparrows Point, MD 21219

Dear Ms. Brown,

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic (TPA), has prepared this Completion Report for the Maryland Department of the Environment (MDE) and United States Environmental Protection Agency (USEPA) to describe recent excavation activities completed inside Parcel B17 (the Site) on the TPA property located in Sparrows Point, Maryland. The excavations described herein were performed in accordance with the approved Excavation Work Plan for Parcel B17 (dated February 12, 2020) and modified through two subsequently approved Comment Response Letters (dated May 5, 2020 and May 15, 2020). This Completion Report summarizes the excavation activities, confirmation sample results, material handling and disposal, and post-excavation risk scenarios for both the Composite and Construction Worker.

## **Project Background**

ARM completed the Phase II Investigation of Parcel B17 in September 2017. A full description of the analytical results and soil conditions that were encountered within this parcel is provided in the associated Phase II Investigation Report (Revision 1 dated August 7, 2019), which was approved by the MDE on November 19, 2019.

The Phase II Investigation identified two shallow soil areas with elevated polynuclear aromatic hydrocarbons (PAHs), in particular benzo[a]pyrene, at concentrations above the applicable PALs. These PAH exceedances were identified in B17-008-SB-1.5 (covered by a concrete slab) and B17-016-SB-1. In both cases, the underlying subsurface soil samples had lower concentrations of PAHs, indicating that the shallow soil impacts do not extend to deeper soils. It is notable that both soil boring locations have previously been investigated for the potential presence of mobile non-aqueous phase liquid (NAPL) via the installation of temporary screening

piezometers. NAPL was not detected in either of the piezometers during any of the required gauging checks, and no additional installations or delineation were warranted.

In addition to the identified PAH impacts, a supplemental delineation investigation was completed in the vicinity of borings B17-014-SB and B17-019-SB to investigate the extent and severity of lead and arsenic contamination that had been identified in the soil. Following the delineation investigation, shallow soil samples B17-014A-SB-1 and B17-019-SB-2 exhibited elevated lead and arsenic concentrations. A full description of the analytical results and soil conditions that were encountered during the delineation investigation is provided in the associated Supplemental Investigation Report (dated August 7, 2019), which was approved by the MDE on August 13, 2019.

The presence of elevated PAHs or metals in shallow soils at locations B17-008-SB, B17-016-SB, B17-014A-SB, and B17-019-SB would likely necessitate the installation of a capping remedy in the future if the Site were to be occupied. However, in lieu of installing and maintaining a capping remedy (as has been used on other portions of the property), TPA elected to complete remedial excavation work to remove the impacted shallow soil. The objective of these remedial excavations was to allow the Site to be available for temporary vehicle parking due to the current over-supply of vehicles in the port area as a result of the interruption of regional sales due to the novel COVID-19 virus. The anticipated temporary vehicle parking is an interim use for this portion of the TPA property and is not considered to be the final development for this parcel. Future development would be formally described in a Response and Development Work Plan (RADWP) or similar document, as appropriate for the issuance of a No Further Action Letter (NFA) or a Certificate of Completion (COC).

Excavation of shallow soil from these four areas was proposed and approved by the agencies within the above-referenced Work Plan and associated Comment Response Letters. The soil boring locations with elevated PAHs or metals contamination are shown on **Figure 1** along with the originally proposed excavation boundaries. The MDE provided authorization to proceed with the proposed excavation work via email on May 18, 2020.

### **Excavation Activities**

Soil excavations were completed from May 29, 2020 to June 2, 2020 in four areas associated with borings B17-008-SB, B17-016-SB, B17-014A-SB, and B17-019-SB. The excavations were completed using heavy equipment operated by Erosion Control & Landscape Services, Inc. (ECLS). The final excavation boundaries and confirmation sample locations are shown on **Figure 2**. A photograph log of the implementation is included as **Attachment 1**. Bank volumes from the excavation areas were approximately 150 cubic yards for B17-008-SB, 65 cubic yards for B17-014A-SB, 25 cubic yards for B17-016-SB, and 80 cubic yards for B17-019-SB, with an estimated total weight of approximately 500 tons.



In order to be protective of future workers who could encounter surface soils on the Site, and in accordance with the Work Plan, each excavation was completed to a depth of at least 2 feet below ground surface (bgs) to remove the potentially impacted shallow material. EnviroAnalytics Group, LLC (EAG) directed the excavations at B17-008-SB and B17-016-SB to be over-excavated to remove additional material. The B17-008-SB excavation was completed to a total depth of approximately 8 feet bgs and encountered groundwater. The B17-016-SB excavation was completed to a total depth of approximately 4 feet bgs.

It should be noted that the excavation area associated with soil boring B17-016-SB was required to be shifted north by approximately 5 feet under the direction of EAG to avoid an underground water line. Additionally, a slightly rounded subgrade concrete structure was discovered at approximately 2 feet bgs in the southern portion of this excavation area.

During excavation, petroleum-impacted materials were identified with oily material and a faint odor in the northeastern portion of the B17-019-SB excavation. These materials were removed during the excavation. A slight sheen was also observed initially on the water surface in the bottom of the B17-008-SB excavation area but did not persist after the groundwater that initially accumulated was removed via a vacuum truck (further described below). No evidence of NAPL was identified at the other excavation areas.

### Confirmation Samples

The final excavation boundaries (as recorded with a hand-held GPS unit) and confirmation sample locations are shown on **Figure 2**. In general, confirmation samples were collected from the bottom of each excavation and from each sidewall. A confirmation sample was not able to be collected from the southern sidewall of the B17-016-SB excavation due to the presence of concrete along the sidewall. At B17-008-SB, two sets of sidewall samples were collected due to the increased depth of the excavation: subsurface sidewall samples were collected at 4 feet bgs and surface samples were collected just below the surrounding concrete slab. Groundwater infiltration precluded collection of a bottom confirmation sample at B17-008-SB.

In accordance with the Work Plan, the confirmation soil samples associated with excavation areas B17-008-SB and B17-016-SB were analyzed by Alpha Analytical for PAHs, while confirmation soil samples associated with excavation areas B17-014A-SB and B17-019-SB were analyzed for arsenic and lead by Pace Analytical Services, Inc. (PACE). The confirmation sample analytical laboratory reports are provided as electronic attachments.

The PAH confirmation sample results from the B17-008-SB and B17-016-SB excavation areas are shown on **Table 1**. The arsenic and lead confirmation sample results from the B17-014A-SB and B17-019-SB excavation areas are shown on **Table 2**. No lead results exceeded 10,000 mg/kg, which would have necessitated additional delineation (and possible further excavation).



Although several arsenic and lead concentrations exceeded the PALs in the confirmation samples, the PALs were not used to define the limits of excavation. The confirmation sample results have been incorporated into a site-specific quantitative risk evaluation (see below) to determine whether the acceptable risk criteria are met at the Site.

### **Excavated Material Handling and Disposal**

The protocols for handling of excavated materials were simplified from the original Excavation Work Plan because EAG and TPA elected to dispose of all excavated materials rather than proposing some materials for reuse. These changes were outlined in the Comment Response Letter dated May 5, 2020. As a result, no segregation of impacted versus non-impacted stockpiles was required. The materials removed from each excavation were stockpiled separately. All stockpiled materials were placed on top of concrete. All stockpiles were covered by polyethylene sheeting when they were not being used in order to minimize dust and prevent run-on/runoff. A weighted cover system was used to keep the covers in place.

Soil from each of the stockpiles was submitted to Caliber Analytical Services or PACE for laboratory testing at a rate of one sample for every 500 cubic yards (i.e., one sample per stockpile) for TCLP parameters (VOCs, SVOCs, and metals). The waste characterization composite sample collected from the B17-019-SB stockpile was additionally analyzed for PCBs. Each composite sample from the stockpiles consisted of 10 randomly selected grab aliquots. The analytical laboratory reports are provided as electronic attachments. **Table 3** summarizes the waste characterization results and shows that the B17-008-SB stockpile exceeded the TCLP criterion for lead.

Stockpiled materials from B17-014A-SB, B17-016-SB, and B17-019-SB were characterized as non-hazardous and subsequently disposed of at Greys Landfill. As a result of the TCLP exceedance at B17-008-SB, these stockpiled materials were characterized as hazardous waste. The stockpile categorized as hazardous waste was ultimately disposed of at Envirite of Pennsylvania, a permitted offsite disposal facility, on July 28, 2020. The hazardous waste manifest is included as **Attachment 2**. A supplemental characterization sample from the B17-008-SB stockpile was requested by the disposal facility. The laboratory results from this supplemental sample (analyzed for VOCs and SVOCs) are included as an electronic attachment.

Water that accumulated in the vault located in the southeastern corner of the B17-019-SB excavation area was removed with a vacuum truck operated by ACE Environmental Holdings, LLC (ACE). Groundwater was encountered at the B17-008-SB excavation area, and the vacuum truck was used to extract three loads of groundwater (approximately 7,000 gallons in total). This decreased the water level to approximately 20 inches above the bottom of the excavated area, however the infiltration rate exceeded the vacuum truck removal rate. Clean stone (rip-rap) was then placed within the B17-008-SB excavation area to bridge the water table. The first load of



groundwater was transported as non-hazardous liquid waste to a local ACE facility (operating under an MDE Oil Operations Permit) for bulk storage pending final disposal. The following two loads of groundwater were disposed of at the Humphrey's Creek Wastewater Treatment Plant (HCWWTP) due to its proximity to the Site. The disposal of groundwater at the HCWWTP was completed under the direction of EAG and the plant operator.

### **Backfilling**

Under the direction of EAG, the excavations were backfilled by ECLS between June 2, 2020 (beginning with the placement of rip-rap in the B17-008-SB excavation) and June 19, 2020. The deepest B17-008-SB excavation was initially pumped out by ACE using vacuum trucks to remove approximately 7,000 gallons of accumulated groundwater. However, approximately 20 inches of water remained in the excavation bottom due to the high infiltration rate. Approximately 3 feet of rip-rap stone was placed in the bottom of the B17-008-SB excavation to bridge the water table. Each excavation was backfilled to the surrounding existing grade with clean fill aggregate (#57 stone). Photographs of the completed backfilling are provided in **Attachment 1**.

### **Screening Level Risk Assessment (SLRA)**

A SLRA has been completed to describe post-excavation conditions at the Site. The SLRA was completed in accordance with standard and accepted procedures and evaluated the Composite Worker and Construction Worker scenarios. The SLRA includes soil data obtained within Parcel B17 during the preceding Phase II Investigation (reported in the Parcel B17 Phase II Investigation Report dated August 7, 2019), data from the supplemental metals delineations conducted at soil borings B17-014-SB and B17-019-SB (reported in the Lead and Arsenic Impacted Soil Supplemental Investigation Report dated August 7, 2019), and data from the post-excavation confirmation samples presented in this report.

It should be noted that, since the excavation area associated with soil boring B17-016-SB was shifted northward from the original proposed location and did not encompass the location of the targeted boring, the Phase II Investigation soil data obtained from this location have been retained in the post-excavation SLRA. Additionally, because the excavation at soil boring B17-008-SB was extended vertically to an increased depth of approximately 8 feet bgs, the Phase II Investigation data from both the shallow soil sample (collected at 1.5 feet bgs) and intermediate soil sample (collected at 7.5 feet bgs) were removed from the post-excavation SLRA.

Parcel B17 was evaluated as a single site-wide Exposure Unit (EU) designated as EU1. A Constituent of Potential Concern (COPC) screening analysis is provided in **Table 4** to identify all compounds above the USEPA's Regional Screening Levels (RSLs) based on the full available dataset from the preceding investigations.



The lead averages for surface, subsurface, and pooled soils are presented and compared to the Adult Lead Model (ALM) risk-based screening levels in **Table 5**. Neither surface, subsurface, nor pooled soils in the site-wide EU exceeded an average lead value of 2,518 mg/kg based on the May 2017 updated ALM developed by the USEPA (corresponding to a 5% probability of a blood lead level of 10 ug/dL). A lead evaluation spreadsheet with the computations to determine average lead concentrations is included as an electronic attachment.

Soil Exposure Point Concentrations (EPCs) were calculated for each site-wide soil dataset. The calculated EPCs for the surface, subsurface, and pooled soil datasets are provided in **Table 6**. ProUCL input and output tables with the computed UCLs derived from the data for each COPC in soils are provided as electronic attachments.

Risk ratios for the estimates of potential EPCs for the Composite Worker following excavation are shown in **Table 7** (surface), **Table 8** (subsurface), and **Table 9** (pooled). The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Composite Worker	EU1 (9.8 acres)	Surface Soil	none	1E-5
		Subsurface Soil	none	3E-5
		Pooled Soil	none	2E-5

The SLRA assessing post-excavation conditions at the Site for surface soils indicates a carcinogenic risk level of 1E-5 for a future Composite Worker, equal to the acceptable threshold for no further action. Additionally, the non-carcinogenic Hazard Index (HI) values for the Composite Worker do not exceed 1 for any target organs, thus meeting the required thresholds. The subsurface materials exceed a carcinogenic risk level of 1E-5. The capping requirement will be a component of a future RADWP for Parcel B17 (which would include a SLRA specific to the proposed development area and activity).

A Construction Worker scenario has also been evaluated to assess risk to potential future Construction Workers that may need to perform ground intrusive work within Parcel B17. Site-specific risk-based evaluations were completed for a range of potential exposure frequencies to determine the maximum allowable exposure frequency for the site-wide EU that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for the individual target organs. This analysis indicated that the allowable exposure frequency before additional worker protections or more detailed job safety evaluations might be needed is 95 days.

Risk ratios for the Construction Worker scenario using the selected duration of 95 days are shown in **Table 10** (surface), **Table 11** (subsurface), and **Table 12** (pooled). The variables



entered for calculation of the site-specific Construction Worker SSLs (EU area, input assumptions, and exposure frequency) are indicated as notes on the tables. The spreadsheet used for computation of the site-specific Construction Worker SSLs is included in **Attachment 3**. The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Construction Worker	EU1 (9.8 acres) (95 exposure days)	Surface Soil	none	9E-7
		Subsurface Soil	none	2E-6
		Pooled Soil	none	1E-6

Using the selected exposure duration of 95 days, the carcinogenic risks were all less than 1E-5, and none of the non-carcinogens caused a cumulative HI to exceed 1 for any target organ system. These findings are within the acceptable limits for no further action established by the agencies.

### Conclusion

The objective of the remedial excavations was to allow the proposed temporary use of the Site for vehicle parking. Ground intrusive work will not be required to facilitate this proposed temporary use. The post-excavation SLRA incorporates the confirmation sidewall and bottom sample results and has verified that the required risk thresholds for the temporary parking use are met for the Composite Worker and Construction Worker (limited to the maximum exposure duration of 95 days). All excavations have subsequently been backfilled with clean stone, and no further action is recommended at this time to facilitate the proposed temporary use of Parcel B17 after approval of this Completion Report.

The proposed parking will begin in December 2020, and the tenant agreement provides for a two year tenancy with the ability to renew. TPA has the ability to relocate the tenant at any time, even during the first two years. TPA anticipates exercising this right to relocate once final development plans have been finalized for this area. Any future development proposed at the Site would be addressed in a RADWP which would include a SLRA specific to the proposed development area and activity.



If you have questions regarding any information covered in this document, please feel free to contact ARM Group LLC at (410) 290-7775.

Respectfully Submitted,  
ARM Group LLC



Joshua M. Barna, G.I.T.  
Staff Geologist



T. Neil Peters, P.E.  
Senior Vice President



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## **FIGURES**

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-  Phase II Soil Boring
-  Delineation Soil Boring
-  Proposed Excavation
-  Parcel Boundary



<b>Parcel B7</b> <b>Proposed Excavation Areas</b> July 14, 2020		<b>Figure</b> <b>1</b>
  <b>ARM Group LLC</b> Engineers and Scientists	Tradepoint Atlantic Ȯ] æi[, •Á[ ã c Baltimore County, MD ARM Project 20010217	
		

-  Phase II Soil Boring
-  Delineation Soil Boring

**Confirmation Sample**

-  Surface PAH
-  Sub-Surface PAH
-  Surface T^act
-  Sub-Surface T^act

-  Final Excavation Boundary
-  Parcel Boundary



<b>Parcel B17</b> <b>Excavation Areas and Confirmation Samples</b> July 14, 2020		<b>Figure</b> <b>2</b>
  <b>ARM Group LLC</b> Engineers and Scientists	Tradepoint Atlantic U] æi[, •Á[ ã c Baltimore County, MD ARM Project 20010217	
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## **TABLES**

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**Table 1 - Parcel B17**  
**Summary of PAHs Detected in Soil Confirmation Samples**  
**B17-008-SB and B17-016-SB Excavations**

Parameter	Units	PAL	B17-008-S1*	B17-008-S1-SHALLOW*	B17-008-S2*	B17-008-S2-SHALLOW*	B17-008-S3*	B17-008-S3-SHALLOW*	B17-008-S4*	B17-008-S4-SHALLOW*	B17-016-S1*	B17-016-S2*	B17-016-S3*	B17-016-B5*
			6/2/2020	6/3/2020	6/2/2020	6/3/2020	6/2/2020	6/3/2020	6/2/2020	6/3/2020	6/2/2020	6/3/2020	5/29/2020	5/29/2020
<b>Polynuclear Aromatic Hydrocarbons<sup>^</sup></b>														
2-Methylnaphthalene	mg/kg	3,000	<b>0.18</b>	<b>0.21</b>	<b>0.63</b>	<b>0.32</b>	<b>0.14</b>	<b>0.022</b>	<b>0.16</b>	<b>0.02</b>	<b>0.062</b>	<b>0.35</b>	<b>0.16</b>	<b>0.12</b>
Acenaphthene	mg/kg	45,000	0.076 U	<b>0.13</b>	0.08 U	<b>0.1</b>	0.0076 U	0.0078 U	<b>0.011</b>	0.0071 U	0.0074 U	0.0075 U	<b>0.016 J</b>	0.0079 U
Acenaphthylene	mg/kg	45,000	<b>0.055 J</b>	<b>0.31</b>	<b>0.087</b>	<b>0.12</b>	<b>0.0042 J</b>	<b>0.038</b>	<b>0.017</b>	<b>0.0096</b>	<b>0.011</b>	<b>0.24</b>	<b>0.44</b>	<b>0.024</b>
Anthracene	mg/kg	230,000	<b>0.067 J</b>	<b>0.88</b>	<b>0.15</b>	<b>0.3</b>	<b>0.023</b>	<b>0.034</b>	<b>0.029</b>	<b>0.021</b>	<b>0.011</b>	<b>0.1</b>	<b>0.23</b>	<b>0.015</b>
Benz[a]anthracene	mg/kg	21	<b>0.19</b>	<b>1.2</b>	0.08 U	<b>0.59</b>	<b>0.078</b>	<b>0.017</b>	<b>0.16</b>	<b>0.012</b>	<b>0.069</b>	<b>0.78</b>	<b>2.2</b>	<b>0.15</b>
Benzo[a]pyrene	mg/kg	2.1	0.076 U	<b>0.91</b>	<b>1.3</b>	<b>0.5</b>	<b>0.055</b>	<b>0.14</b>	<b>0.14</b>	<b>0.1</b>	<b>0.063</b>	<b>0.78</b>	<b>1.8</b>	<b>0.13</b>
Benzo[b]fluoranthene	mg/kg	21	0.076 U	<b>3.4</b>	<b>1.1</b>	<b>1.1</b>	<b>0.15</b>	<b>0.31</b>	<b>0.22</b>	<b>0.084</b>	<b>0.11</b>	<b>1.2</b>	<b>2.6</b>	<b>0.23</b>
Benzo[g,h,i]perylene	mg/kg		0.076 U	<b>0.98</b>	0.08 U	<b>0.44</b>	<b>0.059</b>	<b>0.094</b>	<b>0.11</b>	<b>0.021</b>	<b>0.06</b>	<b>0.94</b>	<b>1.3</b>	<b>0.11</b>
Benzo[k]fluoranthene	mg/kg	210	0.076 U	<b>0.88</b>	<b>0.46</b>	<b>0.31</b>	<b>0.014</b>	<b>0.032 J</b>	<b>0.072</b>	<b>0.011 J</b>	<b>0.026</b>	<b>0.33</b>	<b>0.89</b>	<b>0.051</b>
Chrysene	mg/kg	2,100	<b>0.51</b>	<b>1.8</b>	<b>3.3</b>	<b>0.61</b>	<b>0.31</b>	<b>0.078</b>	<b>0.26</b>	<b>0.11</b>	<b>0.13</b>	<b>0.84</b>	<b>1.7</b>	<b>0.22</b>
Dibenz[a,h]anthracene	mg/kg	2.1	0.076 U	<b>0.31</b>	0.08 U	<b>0.14</b>	<b>0.045</b>	<b>0.027</b>	<b>0.038</b>	0.0071 U	<b>0.019</b>	<b>0.26</b>	<b>0.36</b>	<b>0.035</b>
Fluoranthene	mg/kg	30,000	<b>0.22</b>	<b>2.4</b>	<b>0.94</b>	<b>1.4</b>	<b>0.099</b>	<b>0.029</b>	<b>0.2</b>	<b>0.022</b>	<b>0.091</b>	<b>0.58</b>	<b>2.6</b>	<b>0.15</b>
Fluorene	mg/kg	30,000	0.076 U	<b>0.19</b>	0.08 U	<b>0.11</b>	<b>0.0093</b>	0.0078 U	0.008 U	0.0071 U	0.0074 U	0.0075 U	<b>0.011 J</b>	0.0079 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.076 U	<b>1.1</b>	0.08 U	<b>0.53</b>	<b>0.042</b>	<b>0.13</b>	<b>0.11</b>	<b>0.023</b>	<b>0.059</b>	<b>0.9</b>	<b>1.5</b>	<b>0.12</b>
Naphthalene	mg/kg	17	<b>0.21</b>	<b>0.29</b>	<b>0.79</b>	<b>0.52</b>	<b>0.15</b>	<b>0.023</b>	<b>0.29</b>	<b>0.02</b>	<b>0.059</b>	<b>0.32</b>	<b>0.34</b>	<b>0.089</b>
Phenanthrene	mg/kg		<b>0.4</b>	<b>2.2</b>	<b>1.1</b>	<b>1.4</b>	<b>0.32</b>	<b>0.029</b>	<b>0.33</b>	<b>0.017</b>	<b>0.12</b>	<b>0.55</b>	<b>1.1</b>	<b>0.22</b>
Pyrene	mg/kg	23,000	<b>0.33</b>	<b>4.9</b>	<b>1</b>	<b>1.4</b>	<b>0.083</b>	<b>0.44</b>	<b>0.18</b>	<b>0.2</b>	<b>0.078</b>	<b>0.56</b>	<b>2.2</b>	<b>0.14</b>

**Detections in bold**

**Values in red indicate an exceedance of the Project Action Limit (PAL)**

\* Indicates non-validated data

<sup>^</sup> PAH compounds were analyzed via SIM

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

J: The positive result for this analyte is a quantitative estimate.

**Table 2 - Parcel B17**  
**Summary of Metals Detected in Soil Confirmation Samples**  
**B17-014A-SB and B17-019-SB Excavations**

Parameter	Units	PAL	B17-014-S1*	B17-014-S2*	B17-014-S3*	B17-014-S4*	B17-014-B5*
			6/2/2020	6/2/2020	6/2/2020	6/2/2020	6/2/2020
<b>Metals</b>							
Arsenic	mg/kg	3	<b>10.6</b>	<b>11.7</b>	2.1 U	<b>25</b>	<b>125</b>
Lead	mg/kg	800	<b>628</b>	<b>416</b>	<b>321</b>	<b>1,170</b>	<b>6,990</b>

Parameter	Units	PAL	B17-019-S1*	B17-019-S2*	B17-019-S3*	B17-019-S4*	B17-019-B5*
			6/2/2020	6/2/2020	6/2/2020	6/2/2020	6/2/2020
<b>Metals</b>							
Arsenic	mg/kg	3	<b>10.6</b>	<b>12.1</b>	<b>21.2</b>	<b>54.5</b>	<b>51.8</b>
Lead	mg/kg	800	<b>246</b>	<b>519</b>	<b>1,200</b>	<b>948</b>	<b>1,270</b>

**Detections in bold**

**Values in red indicate an exceedance of the Project Action Limit (PAL)**

\* Indicates non-validated data

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

**Table 3 - Parcel B17  
Stockpile Waste Characterization Results**

<u>Sample ID</u>	<u>Parameter</u>	<u>Result (mg/L)</u>	<u>Laboratory Flag</u>	<u>TCLP Limit (mg/L)</u>	<u>TCLP Exceedance</u>	<u>Laboratory LOQ (mg/L)</u>
B17-008- Waste (6/2/2020)	1,1-Dichloroethene	0.05	U	0.7	no	0.05
	1,2-Dichloroethane	0.05	U	0.5	no	0.05
	1,4-Dichlorobenzene	0.5	U	7.5	no	0.5
	2,4,5-Trichlorophenol	5	U	400	no	5
	2,4,6-Trichlorophenol	0.1	U	2	no	0.1
	2,4-Dinitrotoluene	0.1	U	0.13	no	0.1
	2-Butanone (MEK)	0.1	U	200	no	0.1
	2-Methylphenol	2	U	200	no	2
	3&4-Methylphenol(m&p Cresol)	2	U	200	no	2
	Arsenic	0.025	U	5	no	0.025
	Barium	0.65		100	no	0.05
	Benzene	0.05	U	0.5	no	0.05
	Cadmium	0.075		1	no	0.015
	Carbon tetrachloride	0.05	U	0.5	no	0.05
	Chlorobenzene	0.05	U	100	no	0.05
	Chloroform	0.05	U	6	no	0.05
	Chromium	0.025	U	5	no	0.025
	Hexachlorobenzene	0.1	U	0.13	no	0.1
	Hexachloroethane	0.2	U	3	no	0.2
	Lead	10.2	B	5	YES	0.25
	Mercury	0.001	U	0.2	no	0.001
	Nitrobenzene	0.1	U	2	no	0.1
	Pentachlorophenol	5	U	100	no	5
	Selenium	0.04	U	1	no	0.04
	Silver	0.03	U	5	no	0.03
	Tetrachloroethene	0.05	U	0.7	no	0.05
	Trichloroethene	0.05	U	0.5	no	0.05
	Vinyl chloride	0.05	U	0.2	no	0.05

**Table 3 - Parcel B17  
Stockpile Waste Characterization Results**

<u>Sample ID</u>	<u>Parameter</u>	<u>Result</u> <u>(mg/L)</u>	<u>Laboratory</u> <u>Flag</u>	<u>TCLP Limit</u> <u>(mg/L)</u>	<u>TCLP</u> <u>Exceedance</u>	<u>Laboratory</u> <u>LOQ (mg/L)</u>
B17-014- Waste (6/2/2020)	1,1-Dichloroethene	0.05	U	0.7	no	0.05
	1,2-Dichloroethane	0.05	U	0.5	no	0.05
	1,4-Dichlorobenzene	0.5	U	7.5	no	0.5
	2,4,5-Trichlorophenol	5	U	400	no	5
	2,4,6-Trichlorophenol	0.1	U	2	no	0.1
	2,4-Dinitrotoluene	0.1	U	0.13	no	0.1
	2-Butanone (MEK)	0.1	U	200	no	0.1
	2-Methylphenol	2	U	200	no	2
	3&4-Methylphenol(m&p Cresol)	2	U	200	no	2
	Arsenic	0.025	U	5	no	0.025
	Barium	0.44		100	no	0.05
	Benzene	0.05	U	0.5	no	0.05
	Cadmium	0.0039	J	1	no	0.015
	Carbon tetrachloride	0.05	U	0.5	no	0.05
	Chlorobenzene	0.05	U	100	no	0.05
	Chloroform	0.05	U	6	no	0.05
	Chromium	0.0083	J	5	no	0.025
	Hexachlorobenzene	0.1	U	0.13	no	0.1
	Hexachloroethane	0.2	U	3	no	0.2
	Lead	0.025	U	5	no	0.025
	Mercury	0.001	U	0.2	no	0.001
	Nitrobenzene	0.1	U	2	no	0.1
	Pentachlorophenol	5	U	100	no	5
	Selenium	0.04	U	1	no	0.04
	Silver	0.03	U	5	no	0.03
	Tetrachloroethene	0.05	U	0.7	no	0.05
	Trichloroethene	0.05	U	0.5	no	0.05
	Vinyl chloride	0.05	U	0.2	no	0.05

**Table 3 - Parcel B17  
Stockpile Waste Characterization Results**

<u>Sample ID</u>	<u>Parameter</u>	<u>Result</u> <u>(mg/L)</u>	<u>Laboratory</u> <u>Flag</u>	<u>TCLP Limit</u> <u>(mg/L)</u>	<u>TCLP</u> <u>Exceedance</u>	<u>Laboratory</u> <u>LOQ (mg/L)</u>
B17-016- Waste (5/29/2020)	1,1-Dichloroethene	0.05	U	0.7	no	0.05
	1,2-Dichloroethane	0.05	U	0.5	no	0.05
	1,4-Dichlorobenzene	0.5	U	7.5	no	0.5
	2,4,5-Trichlorophenol	5	U	400	no	5
	2,4,6-Trichlorophenol	0.1	U	2	no	0.1
	2,4-Dinitrotoluene	0.1	U	0.13	no	0.1
	2-Butanone (MEK)	0.1	U	200	no	0.1
	2-Methylphenol	2	U	200	no	2
	3&4-Methylphenol(m&p Cresol)	2	U	200	no	2
	Arsenic	0.025	U	5	no	0.025
	Barium	0.41	U	100	no	0.05
	Benzene	0.05	U	0.5	no	0.05
	Cadmium	0.0089	J	1	no	0.015
	Carbon tetrachloride	0.05	U	0.5	no	0.05
	Chlorobenzene	0.05	U	100	no	0.05
	Chloroform	0.05	U	6	no	0.05
	Chromium	0.0035	J	5	no	0.025
	Hexachlorobenzene	0.1	U	0.13	no	0.1
	Hexachloroethane	0.2	U	3	no	0.2
	Lead	0.13	U	5	no	0.025
	Mercury	0.001	U	0.2	no	0.001
	Nitrobenzene	0.1	U	2	no	0.1
	Pentachlorophenol	5	U	100	no	5
	Selenium	0.04	U	1	no	0.04
	Silver	0.03	U	5	no	0.03
	Tetrachloroethene	0.05	U	0.7	no	0.05
	Trichloroethene	0.05	U	0.5	no	0.05
	Vinyl chloride	0.05	U	0.2	no	0.05

**Table 3 - Parcel B17  
Stockpile Waste Characterization Results**

<u>Sample ID</u>	<u>Parameter</u>	<u>Result</u> <u>(mg/L)</u>	<u>Laboratory</u> <u>Flag</u>	<u>TCLP Limit</u> <u>(mg/L)</u>	<u>TCLP</u> <u>Exceedance</u>	<u>Laboratory</u> <u>LOQ (mg/L)</u>	
B17-019- Waste (6/3/2020)	1,1-Dichloroethene	0.02	U	0.7	no	0.02	
	1,2-Dichloroethane	0.02	U	0.5	no	0.02	
	1,4-Dichlorobenzene	0.02	U	7.5	no	0.02	
	2,4,5-Trichlorophenol	0.1	U	400	no	0.1	
	2,4,6-Trichlorophenol	0.1	U	2	no	0.1	
	2,4-Dinitrotoluene	0.1	U	0.13	no	0.1	
	2-Butanone (MEK)	0.039	U	200	no	0.039	
	2-Methylphenol	0.1	U	200	no	0.1	
	3&4-Methylphenol(m&p Cresol)	0.2	U	200	no	0.2	
	Arsenic	0.5	U	5	no	0.5	
	Barium	10	U	100	no	10	
	Benzene	0.02	U	0.5	no	0.02	
	Cadmium	0.1	U	1	no	0.1	
	Carbon tetrachloride	0.02	U	0.5	no	0.02	
	Chlorobenzene	0.02	U	100	no	0.02	
	Chloroform	0.02	U	6	no	0.02	
	Chromium	0.5	U	5	no	0.5	
	Hexachlorobenzene	0.1	U	0.13	no	0.1	
	Hexachloroethane	0.1	U	3	no	0.1	
	Lead	0.5	U	5	no	0.5	
	Mercury	0.02	U	0.2	no	0.02	
	Nitrobenzene	0.1	U	2	no	0.1	
	Pentachlorophenol	0.5	U	100	no	0.5	
	Selenium	0.1	U	1	no	0.1	
	Silver	0.5	U	5	no	0.5	
	Tetrachloroethene	0.02	U	0.7	no	0.02	
	Trichloroethene	0.02	U	0.5	no	0.02	
	Vinyl chloride	0.02	U	0.2	no	0.02	
		<u>PCB Parameter</u>	<u>Result</u> <u>(mg/kg)</u>	<u>Laboratory</u> <u>Flag</u>	<u>TSCA Limit</u> <u>(mg/kg)</u>	<u>TSCA</u> <u>Exceedance</u>	<u>Laboratory</u> <u>LOQ (mg/kg)</u>
		Aroclor 1016	0.09	U	50	no	0.09
		Aroclor 1221	0.09	U	50	no	0.09
		Aroclor 1232	0.09	U	50	no	0.09
		Aroclor 1242	0.09	U	50	no	0.09
	Aroclor 1248	0.09	U	50	no	0.09	
	Aroclor 1254	0.09	U	50	no	0.09	
	Aroclor 1260	0.09	U	50	no	0.09	
	Aroclor 1262	0.86		50	no	0.09	
	Aroclor 1268	0.09	U	50	no	0.09	

U: The analyte was not detected in the sample. The numeric value represents the sample LOQ.

J: The positive result for this analyte is a quantitative estimate.

B: The analyte was not detected substantially above the level of the associated method blank or field blank.

TCLP: Toxicity Characteristic Leaching Procedure

TSCA: Toxic Substances Control Act

LOQ: Limit of Quantitation

**Table 4 - Parcel B17 Post-Excavation Conditions  
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
1,1-Biphenyl	92-52-4	B17-021-SB-1.5	4.9		0.016	0.44	36	33.33	410	20	no
2,4-Dimethylphenol	105-67-9	B17-011-SB-5	0.02	J	0.02	0.02	33	3.03		1,600	no
2,4-Dinitrophenol	51-28-5	B17-006-SB-4	0.067	J	0.067	0.07	33	3.03		160	no
2-Butanone (MEK)	78-93-3	B17-021-SB-1.5	0.063		0.012	0.04	21	9.52		19,000	no
2-Chloronaphthalene	91-58-7	B17-011-SB-5	0.25		0.078	0.15	36	11.11		6,000	no
2-Hexanone	591-78-6	B17-021-SB-1.5	0.014		0.0021	0.008	21	9.52		130	no
2-Methylnaphthalene	91-57-6	B17-021-SB-1.5	14.5		0.0035	0.56	48	100.00		300	no
2-Methylphenol	95-48-7	B17-011-SB-5	0.026	J	0.026	0.03	33	3.03		4,100	no
4-Methyl-2-pentanone (MIBK)	108-10-1	B17-021-SB-1.5	0.0054	J	0.0054	0.005	21	4.76		14,000	no
Acenaphthene	83-32-9	B17-021-SB-1.5	5.8		0.0015	0.25	48	77.08		4,500	no
Acenaphthylene	208-96-8	B17-016-SB-1	6.9		0.00056	0.34	48	97.92			no
Acetone	67-64-1	B17-021-SB-1.5	0.26	J	0.023	0.08	21	57.14		67,000	no
Acetophenone	98-86-2	B17-011-SB-5	0.069	J	0.02	0.04	36	36.11		12,000	no
Aluminum	7429-90-5	B17-010-SB-2	53,700		3,570	18,937	36	100.00		110,000	no
Anthracene	120-12-7	B17-016-SB-1	5.4		0.00099	0.48	48	100.00		23,000	no
Antimony	7440-36-0	B17-009-SB-4	34.2	J	1.2	8.83	36	33.33		47	no
Aroclor 1254	11097-69-1	B17-020-SB-1.5	2.3		0.095	1.20	18	11.11	0.97	1.5	YES (C/NC)
Aroclor 1260	11096-82-5	B17-015-SB-1	0.48	J	0.48	0.48	18	5.56	0.99		no
Arsenic	7440-38-2	B17-019H-SB-9	750		2.5	42.4	116	93.10	3	48	YES (C/NC)
Barium	7440-39-3	B17-019-SB-4	968		60.3	312	36	100.00		22,000	no
Benz[a]anthracene	56-55-3	B17-016-SB-1	27.1		0.004	1.66	48	97.92	21		YES (C)
Benzaldehyde	100-52-7	B17-012-SB-4	0.13	J	0.017	0.05	28	50.00	820	12,000	no
Benzene	71-43-2	B17-005-SB-2	0.023		0.002	0.01	21	19.05	5.1	42	no
Benzo[a]pyrene	50-32-8	B17-016-SB-1	22		0.0034	1.33	48	95.83	2.1	22	YES (C/NC)
Benzo[b]fluoranthene	205-99-2	B17-016-SB-1	55.2		0.0091	3.20	48	97.92	21		YES (C)
Benzo[g,h,i]perylene	191-24-2	B17-016-SB-1	10.2		0.0014	0.63	48	95.83			no
Benzo[k]fluoranthene	207-08-9	B17-016-SB-1	38.3		0.0064	2.09	48	97.92	210		no
Beryllium	7440-41-7	B17-015-SB-5	6.8		0.36	1.47	36	94.44	6,900	230	no
bis(2-Ethylhexyl)phthalate	117-81-7	B17-018-SB-1.5	0.065	J	0.065	0.07	36	2.78	160	1,600	no
Cadmium	7440-43-9	B17-012-SB-4	11.8		0.62	2.47	36	80.56	9,300	98	no
Caprolactam	105-60-2	B17-009-SB-1.5	0.2		0.029	0.09	36	16.67		40,000	no
Carbazole	86-74-8	B17-020-SB-1.5	5.5		0.017	0.55	36	41.67			no
Carbon disulfide	75-15-0	B17-021-SB-1.5	0.042	J	0.004	0.02	21	23.81		350	no
Chromium	7440-47-3	B17-009-SB-4	11,200		2.8	594	36	100.00		180,000	no
Chromium VI	18540-29-9	B17-004-SB-1	3.5	J-	2.6	3.05	36	5.56	6.3	350	no
Chrysene	218-01-9	B17-016-SB-1	22.5		0.0077	1.56	48	100.00	2,100		no
Cobalt	7440-48-4	B17-001-SB-1	180		0.5	18.5	36	100.00	1,900	35	YES (NC)
Copper	7440-50-8	B17-019-SB-4	786		2.1	186	36	100.00		4,700	no
Cyanide	57-12-5	B17-010-SB-2	7	J-	0.13	1.18	36	86.11		120	no
Cyclohexane	110-82-7	B17-005-SB-2	0.0037	J	0.0037	0.004	21	4.76		2,700	no

**Table 4 - Parcel B17 Post-Excavation Conditions  
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Dibenz[a,h]anthracene	53-70-3	B17-016-SB-1	4		0.0016	0.27	48	87.50	2.1		YES (C)
Fluoranthene	206-44-0	B17-016-SB-1	62.4		0.012	3.81	48	100.00		3,000	no
Fluorene	86-73-7	B17-021-SB-1.5	5.4		0.00077	0.23	48	77.08		3,000	no
Hexachloroethane	67-72-1	B17-005-SB-2	0.027	J	0.019	0.02	36	5.56	8	46	no
Indeno[1,2,3-c,d]pyrene	193-39-5	B17-016-SB-1	12.1		0.0016	0.70	48	95.83	21		no
Iron	7439-89-6	B17-014-SB-5	375,000		5,210	99,742	36	100.00		82,000	YES (NC)
Lead <sup>^</sup>	7439-92-1	B17-019D-SB-5	10,400		5.9	1,124	116	99.14		800	YES (NC)
Manganese	7439-96-5	B17-009-SB-4	36,900		123	7,521	36	100.00		2,600	YES (NC)
Mercury	7439-97-6	B17-001-SB-1	4.9		0.0044	0.22	36	97.22		35	no
Naphthalene	91-20-3	B17-021-SB-1.5	8.8		0.0033	0.51	48	97.92	8.6	59	YES (C)
Nickel	7440-02-0	B17-021-SB-1.5	491		1.6	50.5	36	100.00	64,000	2,200	no
N-Nitrosodiphenylamine	86-30-6	B17-010-SB-8	0.021	J	0.021	0.02	36	2.78	470		no
PCBs (total)*	1336-36-3	B17-020-SB-1.5	2.3	J	0.095	0.68	18	27.78	0.94		YES (C)
Phenanthrene	85-01-8	B17-021-SB-1.5	62.6		0.014	3.67	48	100.00			no
Phenol	108-95-2	B17-008-SB-7.5	0.46	J	0.045	0.25	34	5.88		25,000	no
Pyrene	129-00-0	B17-016-SB-1	44.6		0.0079	2.98	48	100.00		2,300	no
Selenium	7782-49-2	B17-018-SB-4	8.2		1.8	3.62	36	33.33		580	no
Silver	7440-22-4	B17-009-SB-4	84		2.3	13.2	36	100.00		580	no
Toluene	108-88-3	B17-017-SB-6	0.0036	J	0.0028	0.003	21	14.29		4,700	no
Vanadium	7440-62-2	B17-007-SB-1	522		8.4	103	36	100.00		580	no
Zinc	7440-66-6	B17-012-SB-4	7,040		13.6	842	36	100.00		35,000	no

J: The positive result reported for this analyte is a quantitative estimate.

J-: The positive result reported for this analyte is a quantitative estimate but may be biased low

COPA = Constituent of Potential Concern

TR = Target Risk

HQ = Hazard Quotient

C = Compound was identified as a cancer COPC

NC = Compound was identified as a non-cancer COPC

\*PCBs (total) include the sum of all detected aroclor mixtures, including those without regional screening levels (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.

<sup>^</sup>The COPC screening level for lead was not adjusted to the HQ=0.1 because lead is not assessed in the SLRA. The 800 mg/kg PAL is relevant to the Adult Lead Model procedure.

**Table 5 - Parcel B17 Post-Excavation Conditions  
Assessment of Lead**

<b>Exposure Unit</b>	<b>Surface/Sub-Surface</b>	<b>Arithmetic Mean (mg/kg)</b>
Site-Wide EU (9.8 ac.)	Surface	518
	Sub-Surface	1,519
	Pooled	1,114

<b>Adult Lead Model (ALM) Risk Levels</b>	
<b>Soil Concentration (mg/kg)</b>	<b>Probability of Blood Concentration of 10 ug/dL</b>
2,518	5%
3,216	10%

Scenarios account for the removal of surface soil data (0 to 2 feet) associated with B17-008-SB, B17-014A-SB, and B17-019-SB, and sub-surface soil data associated with B17-008-SB.

**Table 6 - Parcel B17 Post-Excavation Conditions  
Soil Exposure Point Concentrations**

			Site-Wide EU (9.8 ac.)					
			EPCs - Surface Soils		EPCs - Sub-Surface Soils		EPCs - Pooled Soils	
Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Arsenic	3.00	48.0	95% GROS Adjusted Gamma UCL	<b>21.1</b>	KM H-UCL	<b>78.3</b>	KM H-UCL	<b>49.7</b>
Cobalt	1,900	35.0	95% Chebyshev (Mean, Sd) UCL	<b>68.1</b>	95% Student's-t UCL	16.6	95% H-UCL	29.0
Iron		82,000	95% Adjusted Gamma UCL	<b>135,200</b>	95% Adjusted Gamma UCL	<b>182,662</b>	95% Adjusted Gamma UCL	<b>133,515</b>
Manganese		2,600	95% Adjusted Gamma UCL	<b>11,135</b>	95% Adjusted Gamma UCL	<b>14,738</b>	95% Adjusted Gamma UCL	<b>10,573</b>
PCBs (total)	0.94		Gamma Adjusted KM-UCL	0.76	N/A	N/A	Gamma Adjusted KM-UCL	0.76
Aroclor 1254	NE	1.50	Maximum Value	<b>2.30</b>	N/A	N/A	Maximum Value	<b>2.30</b>
Benz[a]anthracene	21.0		97.5% Chebyshev (Mean, Sd) UCL	9.55	95% Adjusted Gamma UCL	0.89	95% KM (Chebyshev) UCL	4.20
Benzo[a]pyrene	2.10	22.0	95% Chebyshev (Mean, Sd) UCL	<b>5.95</b>	Gamma Adjusted KM-UCL	0.73	95% KM (Chebyshev) UCL	<b>3.39</b>
Benzo[b]fluoranthene	21.0		95% Chebyshev (Mean, Sd) UCL	14.9	95% Adjusted Gamma UCL	1.73	95% KM (Chebyshev) UCL	8.40
Dibenz[a,h]anthracene	21.0		Gamma Adjusted KM-UCL	0.96	Gamma Adjusted KM-UCL	0.19	95% KM (Chebyshev) UCL	0.63
Naphthalene	8.60	59.0	95% KM (Chebyshev) UCL	2.25	95% Adjusted Gamma UCL	0.27	95% KM (Chebyshev) UCL	1.29

**Bold indicates EPC higher than lowest COPC Screening Level**

COPC = Constituent of Potential Concern

NE = Not Evaluated

N/A = No Detections

Scenarios account for the removal of surface soil data (0 to 2 feet) associated with B17-008-SB, B17-014A-SB, and B17-019-SB, and sub-surface soil data associated with B17-008-SB.

**Table 7 - Parcel B17 Post-Excavation Conditions  
Surface Soils  
Composite Worker Risk Ratios**

Parameter	Target Organs	Site-Wide EU1 (9.8 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	21.1	3.00	480	7.0E-06	0.04
Cobalt	Thyroid	68.1	1,900	350	3.6E-08	0.2
Iron	Gastrointestinal	135,200		820,000		0.2
Manganese	Nervous	11,135		26,000		0.4
PCBs (total)		0.76	0.94		8.1E-07	
Aroclor 1254	Dermal; Immune; Ocular	<b>2.30</b>	NE	15.0		0.2
Benz[a]anthracene		9.55	21.0		4.5E-07	
Benzo[a]pyrene	Developmental	5.95	2.10	220	2.8E-06	0.03
Benzo[b]fluoranthene		14.9	21.0		7.1E-07	
Dibenz[a,h]anthracene		0.96	2.10		4.6E-07	
Naphthalene	Nervous; Respiratory	2.25	8.60	590	2.6E-07	0.004
					<b>1E-05</b>	<b>↓</b>

RSLs were obtained from the EPA Regional Screening Levels at [https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl\\_search](https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search)

**Bold indicates maximum value**

NE = Not Evaluated

Surface scenario accounts for the removal of surface soil data associated with B17-008-SB, B17-014A-SB, and B17-019-SB.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Ocular	0
	Developmental	0
Respiratory	0	

**Table 8 - Parcel B17 Post-Excavation Conditions  
Sub-Surface Soils  
Composite Worker Risk Ratios**

Parameter	Target Organs	Site-Wide EU1 (9.8 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	78.3	3.00	480	2.6E-05	0.2
Cobalt	Thyroid	16.6	1,900	350	8.7E-09	0.05
Iron	Gastrointestinal	182,662		820,000		0.2
Manganese	Nervous	14,738		26,000		0.6
PCBs (total)		N/A	0.94			
Aroclor 1254	Dermal; Immune; Ocular	N/A	NE	15.0		
Benz[a]anthracene		0.89	21.0		4.2E-08	
Benzo[a]pyrene	Developmental	0.73	2.10	220	3.5E-07	0.003
Benzo[b]fluoranthene		1.73	21.0		8.2E-08	
Dibenz[a,h]anthracene		0.19	2.10		9.0E-08	
Naphthalene	Nervous; Respiratory	0.27	8.60	590	3.1E-08	0.0005
					<b>3E-05</b>	<b>↓</b>

RSLs were obtained from the EPA Regional Screening Levels at [https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl\\_search](https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search)  
 NE = Not Evaluated  
 N/A = No Detections

Sub-surface scenario accounts for the removal of sub-surface soil data associated with B17-008-SB.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Ocular	0
	Developmental	0
Respiratory	0	

**Table 9 - Parcel B17 Post-Excavation Conditions  
Pooled Soils  
Composite Worker Risk Ratios**

Parameter	Target Organs	Site-Wide EU1 (9.8 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	49.7	3.00	480	1.7E-05	0.1
Cobalt	Thyroid	29.0	1,900	350	1.5E-08	0.08
Iron	Gastrointestinal	133,515		820,000		0.2
Manganese	Nervous	10,573		26,000		0.4
PCBs (total)		0.76	0.94		8.1E-07	
Aroclor 1254	Dermal; Immune; Ocular	<b>2.30</b>	NE	15.0		0.2
Benz[a]anthracene		4.20	21.0		2.0E-07	
Benzo[a]pyrene	Developmental	3.39	2.10	220	1.6E-06	0.02
Benzo[b]fluoranthene		8.40	21.0		4.0E-07	
Dibenz[a,h]anthracene		0.63	2.10		3.0E-07	
Naphthalene	Nervous; Respiratory	1.29	8.60	590	1.5E-07	0.002
					<b>2E-05</b>	<b>↓</b>

RSLs were obtained from the EPA Regional Screening Levels at [https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl\\_search](https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search)

**Bold indicates maximum value**

NE = Not Evaluated

Pooled scenario accounts for the removal of surface soil data associated with B17-008-SB, B17-014A-SB, and B17-019-SB and sub-surface soil data associated with B17-008-SB.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Ocular	0
	Developmental	0
Respiratory	0	

**Table 10 - Parcel B17 Post-Excavation Conditions  
Surface Soils  
Construction Worker Risk Ratios**

95 Day		Site-Wide EU1 (9.8 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	21.1	39.8	252	5.3E-07	0.08
Cobalt	Thyroid	68.1	7,054	2,360	9.7E-09	0.03
Iron	Gastrointestinal	135,200		633,004		0.2
Manganese	Nervous	11,135		9,966		1
PCBs (total)		0.76	12.8		5.9E-08	
Aroclor 1254	Dermal; Immune; Ocular	<b>2.30</b>	NE	19.7		0.1
Benzo[a]anthracene		9.55	390		2.4E-08	
Benzo[a]pyrene	Developmental	5.95	45.2	18.9	1.3E-07	0.3
Benzo[b]fluoranthene		14.9	450		3.3E-08	
Dibenz[a,h]anthracene		0.96	46.9		2.0E-08	
Naphthalene	Nervous; Respiratory	2.25	37.9	60.9	5.9E-08	0.04
					<b>9E-07</b>	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumptions:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

**Bold indicates maximum value**

NE = Not Evaluated

Surface scenario accounts for the removal of surface soil data associated with B17-008-SB, B17-014A-SB, and B17-019-SB.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Ocular	0
	Developmental	0
Respiratory	0	

**Table 11 - Parcel B17 Post-Excavation Conditions  
Sub-Surface Soils  
Construction Worker Risk Ratios**

95 Day		Site-Wide EU1 (9.8 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	78.3	39.8	252	2.0E-06	0.3
Cobalt	Thyroid	16.6	7,054	2,360	2.4E-09	0.007
Iron	Gastrointestinal	182,662		633,004		0.3
Manganese	Nervous	14,738		9,966		1
PCBs (total)		N/A	12.8			
Aroclor 1254	Dermal; Immune; Ocular	N/A	NE	19.7		
Benzo[a]anthracene		0.89	390		2.3E-09	
Benzo[a]pyrene	Developmental	0.73	45.2	18.9	1.6E-08	0.04
Benzo[b]fluoranthene		1.73	450		3.8E-09	
Dibenz[a,h]anthracene		0.19	46.9		4.1E-09	
Naphthalene	Nervous; Respiratory	0.27	37.9	60.9	7.1E-09	0.004
					<b>2E-06</b>	<b>↓</b>

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumptions:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

NE = Not Evaluated

N/A = No Detections

Sub-surface scenario accounts for the removal of sub-surface soil data associated with B17-008-SB.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Ocular	0
	Developmental	0
Respiratory	0	

**Table 12 - Parcel B17 Post-Excavation Conditions  
Pooled Soils  
Construction Worker Risk Ratios**

95 Day		Site-Wide EU1 (9.8 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	49.7	39.8	252	1.2E-06	0.2
Cobalt	Thyroid	29.0	7,054	2,360	4.1E-09	0.01
Iron	Gastrointestinal	133,515		633,004		0.2
Manganese	Nervous	10,573		9,966		1
PCBs (total)		0.76	12.8		5.9E-08	
Aroclor 1254	Dermal; Immune; Ocular	<b>2.30</b>	NE	19.7		0.1
Benzo[a]anthracene		4.20	390		1.1E-08	
Benzo[a]pyrene	Developmental	3.39	45.2	18.9	7.5E-08	0.2
Benzo[b]fluoranthene		8.40	450		1.9E-08	
Dibenz[a,h]anthracene		0.63	46.9		1.3E-08	
Naphthalene	Nervous; Respiratory	1.29	37.9	60.9	3.4E-08	0.02
					<b>1E-06</b>	<b>↓</b>

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumptions:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

**Bold indicates maximum value**

NE = Not Evaluated

Pooled scenario accounts for the removal of surface soil data associated with B17-008-SB, B17-014A-SB, and B17-019-SB and sub-surface soil data associated with B17-008-SB.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Ocular	0
	Developmental	0
Respiratory	0	

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**ATTACHMENT 1**

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**Excavation of Impacted Media  
Area B: Parcel B17 Excavation Area  
Sparrows Point, Maryland**



052920-1: B17-008-SB excavation area was excavated to approximately 8 ft bgs. Groundwater observed with a depth of 2-3 ft from the bottom of the excavated area.



060220-1: B17-008-SB excavation area during groundwater removal with a vacuum truck. Groundwater was observed to be tide-dependent. Approximately 7,000 gallons of groundwater was removed from the excavation to bring the water level down to approximately 20" above the bottom of the excavation.

**Excavation of Impacted Media  
Area B: Parcel B17 Excavation Area  
Sparrows Point, Maryland**



052920-2: B17-016-SB excavation area excavated to approximately 2 ft bgs, where a concrete structure was revealed.



052920-3: B17-016-SB excavation area was excavated to approximately 4 ft bgs. Concrete pipe observed at 2 ft bgs.

**Excavation of Impacted Media  
Area B: Parcel B17 Excavation Area  
Sparrows Point, Maryland**



052920-4: A vault uncovered in the southeast corner of the B17-019-SB excavation area. Water in the vault was removed with a vacuum truck.



052920-5: Petroleum impacts observed in the northeastern corner of the B17-019-SB excavation area. Impacted material had a faint odor and was removed from the excavation.

**Excavation of Impacted Media  
Area B: Parcel B17 Excavation Area  
Sparrows Point, Maryland**



060220-2: B17-014A-SB excavation area.



060220-3: B17-014A-SB excavation area was excavated to approximately 2 ft bgs. Rebar from the removed concrete foundations was observed around the excavation.

**Excavation of Impacted Media  
Area B: Parcel B17 Excavation Area  
Sparrows Point, Maryland**



061920-1: B17-016-SB excavation area with concrete pipe.



061920-2: Backfilling of B17-016-SB excavation area.

**Excavation of Impacted Media  
Area B: Parcel B17 Excavation Area  
Sparrows Point, Maryland**



061920-3: Backfilling of B17-008-SB excavation area.



061920-4: Backfilling of B17-014A-SB excavation area.

**Excavation of Impacted Media  
Area B: Parcel B17 Excavation Area  
Sparrows Point, Maryland**



062620-1: Backfilling of B17-019-SB excavation area.



062620-2: Backfilling of B17-019-SB excavation area.

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**ATTACHMENT 2**

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Please print or type.

Form Approved. OMB No. 2050-0039

166101

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>	1. Generator ID Number <b>MCD 053 945 432</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>314-920-3056</b>	4. Manifest Tracking Number <b>021322673 JJK</b>
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5. Generator's Name and Mailing Address <b>Enviro Analytics Group, LLC 1050 De Peres Rd., Suite 203, St. Louis, MO 63131</b>	Generator's Site Address (if different than mailing address) <b>Enviro Analytics Group, LLC 1000 Sparrows Point Blvd. Sparrow Point, MD 21219</b>
Generator's Phone: <b>314-835-2813</b>	

6. Transporter 1 Company Name <b>Enviro of Pennsylvania, Inc</b>	U.S. EPA ID Number <b>PAD 010154045</b>
7. Transporter 2 Company Name	U.S. EPA ID Number

8. Designated Facility Name and Site Address <b>Enviro of PA 730 Vogelsgang Rd., York, PA 17404</b>	U.S. EPA ID Number <b>PAD 010 154 045</b>
Facility's Phone: <b>(717) 848-1900</b>	

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
		No.	Type					
X	1. <b>RQ, NA3077, Hazardous Waste Solid M.O.S., (lead), 9, PG III</b>	01	DT	20 <i>Est.</i>	T	D008		
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information <b>1: Appl# G203522EPA ERG 171 (lead contaminated soil)</b>  <b>Emergency response# 314-920-3056</b>
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15. <b>GENERATOR'S/OFFEROR'S CERTIFICATION:</b> I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.			
--	--	--	--

Generator's/Offoror's Printed/Typed Name <b>Ryan Clancy (EAG)</b>	Signature <i>Ryan Clancy</i>	Month <b>07</b>	Day <b>28</b>	Year <b>20</b>
--	---------------------------------	--------------------	------------------	-------------------

16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.	Port of entry/exit: _____
Transporter signature (for exports only): _____	Date leaving U.S.: _____

17. Transporter Acknowledgment of Receipt of Materials				
Transporter 1 Printed/Typed Name <b>Todd Thompson</b>	Signature <i>Todd Thompson</i>	Month <b>07</b>	Day <b>28</b>	Year <b>20</b>
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

18. Discrepancy					
18a. Discrepancy Indication Space	<input type="checkbox"/> Quantity	<input type="checkbox"/> Type	<input type="checkbox"/> Residue	<input type="checkbox"/> Partial Rejection	<input type="checkbox"/> Full Rejection
Manifest Reference Number: _____					

18b. Alternate Facility (or Generator)	U.S. EPA ID Number
Facility's Phone: _____	

18c. Signature of Alternate Facility (or Generator)	Month	Day	Year
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19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)			
1. <b>H110</b>	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a				
Printed/Typed Name <b>Amanda Prudgen</b>	Signature <i>Amanda Prudgen</i>	Month <b>07</b>	Day <b>28</b>	Year <b>20</b>

ENVIRITE OF PENNSYLVANIA, INC.  
730 VOGELSONG ROAD  
YORK CITY INDUSTRIAL PARK  
YORK, PA 17404  
PHONE (717) 846-1900

TICKET NUMBER 62784

TIME IN 9:48AM      DATE IN 7-28-2020  
TIME OUT 10:09AM    DATE OUT 7-28-2020

TRUCK ID 4002      COMMODITY - HAZ./RES. WASTE

57040 1b GROSS	ENVIRO ANALYTICS GROUP, LLC
32600 1b TARE	1600 SPARROWS POINT BLVD.
24440 1b NET	SPARROW POINT, MD 21219
12.22 TONS	MDD053945432

WEIGHMASTER# 69054      83554/81285      84302/84235

CUSTOMER COPY

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## Certificate of Disposal

*This certificate is to verify that the wastes specified on the following manifest numbers have been properly managed in accordance with all local, state and federal regulations.*

Facility: Enviroite of Pennsylvania (PAD010154045)

730 Vogelsong Road

York, PA 17404

Phone: 1-800-592-5489

Fax: 1-800-592-5329

Generator: Enviro Analytics Group, LLC (MDD053945432)

Manifest: 021322673JJK

I certify that the above information is true and correct to the best of my knowledge.

Authorized Signature: \_\_\_\_\_

*Barbara K. Little*

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**ATTACHMENT 3**

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**Construction Worker Soil Screening Levels  
Maximum Allowable Work Day Exposure  
Calculation Spreadsheet - Parcel B17**

Description	Variable	Value
Days worked per week	DW	5
Exposure duration (yr)	ED	1
Hours worked per day	ET	8
A/constant (unitless) - particulate emission factor	Aconst	12.9351
B/constant (unitless) - particulate emission factor	Bconst	5.7383
C/constant (unitless) - particulate emission factor	Cconst	71.7711
Dispersion correction factor (unitless)	FD	0.185
Days per year with at least .01" precipitation	P	130
Target hazard quotient (unitless)	THQ	1
Body weight (kg)	BW	80
Averaging time - noncancer (yr)	ATnc	1
Soil ingestion rate (mg/d)	IR	330
Skin-soil adherence factor (mg/cm <sup>2</sup> )	AF	0.3
Skin surface exposed (cm <sup>2</sup> )	SA	3300
Event frequency (ev/day)	EV	1
Target cancer risk (unitless)	TR	01E-06
Averaging time - cancer (yr)	ATc	70
A/constant (unitless) - volatilization	Aconstv	2.4538
B/constant (unitless) - volatilization	Bconstv	17.566
C/constant (unitless) - volatilization	Cconstv	189.0426
Dry soil bulk density (kg/L)	Pb	1.5
Average source depth (m)	ds	3
Soil particle density (g/cm <sup>3</sup> )	Ps	2.65
Total soil porosity	Lpore/Lsoil	0.43
Air-filled soil porosity	Lair/Lsoil	0.28

**Construction Worker Soil Screening Levels  
Maximum Allowable Work Day Exposure  
Calculation Spreadsheet - Parcel B17**

Area of site (ac)	Ac	9.8	→ EU1
Overall duration of construction (wk/yr)	EW	19	
Exposure frequency (day/yr)	EF	95	
Cars per day	Ca	5	
Tons per car	CaT	2	
Trucks per day	Tru	5	
Tons per truck	TrT	20	
Mean vehicle weight (tons)	w	11	
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	15.3	
Overall duration of construction (hr)	tc	3,192	
Overall duration of traffic (s)	Tt	2,736,000	
Surface area (m2)	AR	39,659	
Length (m)	LR	199	
Distance traveled (km)	ΣVKT	189	
Particulate emission factor (m3/kg)	PEFsc	78,681,908	
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	8.44	
Total time of construction (s)	Tcv	2,736,000	

Input
Calculation

Chemical	RfD & RfC Sources	<sup>1</sup> Ingestion SF (mg/kg-day)	<sup>1</sup> Inhalation Unit Risk (ug/m <sup>3</sup> ) <sup>-1</sup>	<sup>1</sup> Subchronic RfD (mg/kg-day)	<sup>1</sup> Subchronic RfC (mg/m <sup>3</sup> )	<sup>1</sup> GIABS	Dermally Adjusted RfD (mg/kg-day)	<sup>1</sup> ABS	<sup>1</sup> RBA	<sup>1</sup> Dia	<sup>1</sup> Diw	<sup>1</sup> Henry's Law Constant (unitless)	<sup>1</sup> Kd	<sup>1</sup> Koc	DA	Volatilization Factor - Unlimited Reservoir (m <sup>3</sup> /kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				39.9	14,764	39.8	256	13,604	252
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					7,054	7,054	2,713	18,138	2,360
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							633,004		633,004
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							12,774	45,346	9,966
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	2.06E+4	23.0	29.2	12.8			
Aroclor 1254	A/I	2.00E+00	5.71E-04	3.00E-05	-	1	3.00E-05	0.14	1	2.40E-02	6.10E-06	1.16E-02	7.80E+02	1.30E+05	1.91E-08	3.22E+4	23.0	45.5	NE	19.7		19.7
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	1.72E+5	469	2,309	390			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	9.16E+5	46.9	1,218	45.2	201	20.9	18.9
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	8.26E+5	469	10,994	450			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	2.19E+6	46.9	105,806	46.9			
Naphthalene	C//A	1.20E-01	3.40E-05	2.00E-02	3.00E-03	1	2.00E-02	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	1.77E+3	391	42.0	37.9	13,402	61.2	60.9

<sup>1</sup>chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls>  
<sup>1</sup>chemical specific parameters found in Unpaved Road Traffic calculator at [https://epa-prgs.oml.gov/cgi-bin/chemicals/csl\\_search](https://epa-prgs.oml.gov/cgi-bin/chemicals/csl_search)  
I: chemical specific parameters found in the IRIS at <https://www.epa.gov/iris>  
C: chemical specific parameters found in Cal EPA at <https://www.dtsc.ca.gov/AssessingRisk>  
A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at [https://www.atsdr.cdc.gov/mrls/pdfs/atsdr\\_mrls.pdf](https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf)  
P: chemical specific parameters found in the Database of EPA PPRTVs at <https://hhprrtv.oml.gov/quickview/pprtv.php>