Revitalizing Auto Communities
Environmental Response Trust

February 13, 2020

U.S. EPA Region 5
Remediation and Reuse Branch
Land and Chemicals Division, LU-9J
77 West Jackson Blvd.
Chicago, IL 60604-3590
Attn: Molly Finn

RE: 2020 Corrective Measures Proposal Addendum
RACER Trust Moraine Facilities
Moraine, Ohio

Dear Ms. Finn:

The Revitalizing Auto Communities Environmental Response Trust (RACER Trust) is providing this 2020 Corrective Measures Proposal Addendum for the RACER Trust Moraine Facilities located in Moraine, Ohio (Site). This report details the current corrective measures objectives, summarizes site investigation activities completed following the submittal of the 2012 Corrective Measures Proposal, provides a revised groundwater model, includes a risk assessment summary, and proposes the refined corrective measures for the Site.

If you have any questions, please contact me at (937) 751-8635.

Sincerely,

Pamela L. Barnett

Pamela L. Barnett, PG
Cleanup Manager (DE, LA, MA, OH, PA, VA)
RACER Trust

cc: K. Baker, Montgomery County
R. Miller, Montgomery County
B. Moore, Montgomery County
P. Turnbull, Montgomery County
C. Brown, Copart Inc.
M. Carrocee, R&J Trucking
A. Hou, Fuyao Glass America Inc.
B. Gitzinger, Ohio EPA
V. Orr, Ohio EPA
C. Whittlesey, Ohio Realty Advisors
K. Hodnett, Ohio Department of Transportation
T. Scherack, West Carrollton Service Department
M. Davis, City of Moraine
M. Emery, GM
C. Grogan, Arcadis

ARCADIS Design & Consultancy for natural and built assets

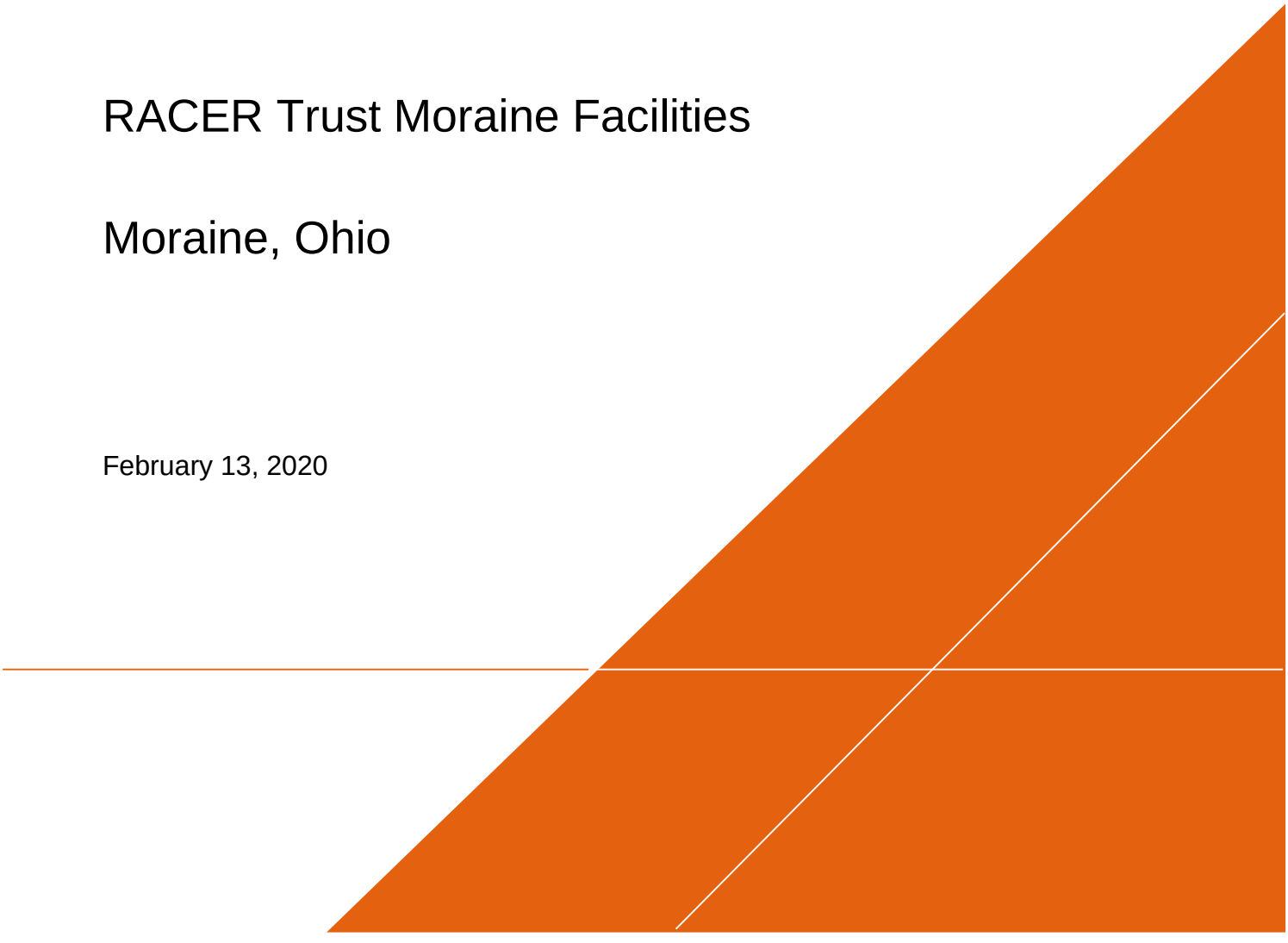
Revitalizing Auto Communities Environmental Response Trust (RACER Trust)

2020 CORRECTIVE MEASURES PROPOSAL ADDENDUM

RACER Trust Moraine Facilities

Moraine, Ohio

February 13, 2020



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1 INTRODUCTION AND PURPOSE

Arcadis U.S., Inc. (Arcadis) prepared this 2020 Corrective Measures Proposal Addendum (2020 CMP Addendum) on behalf of the Revitalizing Auto Communities Environmental Response Trust (RACER Trust) for the RACER Trust (formerly General Motors Corporation [former GM Corporation]) Moraine Facilities in Moraine, Ohio (Site; **Figures 1** and **2**). The facilities included:

- former Delphi Harrison Thermal Systems Moraine Plant (former Delphi Thermal Moraine)
- former General Motors Powertrain Group, Moraine Engine Plant (former Moraine Engine)
- former General Motors Truck Group, Moraine Assembly Plant (former Moraine Assembly)

Environmental investigations at the Site date back to the mid-1980s, including the collection of groundwater, soil, soil gas, and indoor air data. Through the multiple phases of assessment activities, the constituents of concern for the Site were identified as benzene, 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), ethylbenzene, tetrachloroethene (PCE), toluene, 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), vinyl chloride, and xylenes (site-specific volatile organic compounds [VOCs]).

Of the site-specific VOCs, concentrations of cis-1,2-DCE, PCE, TCE, and vinyl chloride in groundwater exceed the Maximum Contaminant Levels (MCLs) and/or the Vapor Intrusion Screening Levels (VISLs) for residential and commercial groundwater (Arcadis, Inc. 2019a). Concentrations of PCE and TCE in groundwater are the primary risk drivers at the Site. The primary PCE and TCE source area is in the upper aquifer groundwater below the former Process Sump Area (PSA). **Figures 3** through **6** show the extent of the upper and lower aquifer PCE and TCE plumes at the Site.

On December 31, 2012, RACER Trust submitted the 2012 Corrective Measures Proposal (2012 CMP; Arcadis, Inc. 2012) to the United States Environmental Protection Agency (U.S. EPA). The 2012 CMP included an updated conceptual site model (CSM) and a summary of the Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs), Supplemental RFI, and additional supplemental investigations completed after the approval of the RFI Report (Arcadis Geraghty & Miller, Inc. 2000a and ENVIRON 2000a) and Supplemental RFI Report (Arcadis Geraghty & Miller, Inc. 2000b and ENVIRON 2000b). The 2012 CMP recommended final corrective measures for the Site that provided an appropriate balance of efficacy, sustainability, and cost.

This 2020 CMP Addendum provides an overview of additional site investigations and interim measures completed since submittal of the 2012 CMP; includes an updated understanding of risk for the Site; presents the updated groundwater flow and solute transport model and the understanding of potential impacts to off-site receptors; and includes the proposed corrective measures for the Site. While the investigations completed since submittal of the 2012 CMP have provided a refined understanding of site conditions, the overall understanding of source location (i.e., the former PSA) and site conditions in relation to the CSM are consistent. Investigations completed since 2012 support the source remedy recommendation of enhance reductive dechlorination (ERD) that was included in the 2012 CMP. The proposed remedies included herein have been refined based on the data collected since 2012 and are generally consistent with the recommended remedial approach and objectives in 2012.

1.1 Site Background and Operational History

The Site has been used for industrial purposes since the property was acquired in the mid-1920s by former GM Corporation. The former Moraine Engine and Moraine Assembly facilities occupy approximately 282 acres, the adjacent former Delphi Thermal Moraine facility occupies approximately 143 acres, and the active diesel engine manufacturer, DMAX Ltd. (DMAX) is located north of former Delphi Thermal Moraine and occupies approximately 40 acres (Montgomery County Engineer's Office). The facilities are in the City of Moraine, Montgomery County, Ohio. A small portion of the Moraine Assembly facility is in the City of Kettering. **Figures 1** and **2** present the location of each facility, property boundaries, and site features.

Frigidaire (a former division of former GM Corporation) produced appliances from the late 1920s until 1979. Former GM Corporation announced the shutdown of all Frigidaire operations in January 1979. During 1980 and 1981, the majority of the former Frigidaire Plant 2 was converted to the former Moraine Engine facility, and the former Frigidaire Plant 3 and the northeast corner of former Frigidaire Plant 2 were converted to the Moraine Assembly facility. Since 1981, former Moraine Engine operations have included the machining, painting (this operation was discontinued in September 1995), and assembly of diesel truck engines. Operations at the former Moraine Engine facility ceased in the fall of 2000. The plant building has undergone decommissioning and demolition, and most of this site has been covered with a parking surface. Former GM Corporation operated a regional haulaway at the location of the former Moraine Engine plant, which was referred to as the Vehicle Distribution Center. Operations at the regional haulaway ceased in December 2008.

Beginning in 1981, former Moraine Assembly operations included the manufacturing, assembly, and painting of small trucks and later sport utility vehicles. Operations at the former Moraine Assembly ceased in December 2008. DMAX is a joint venture between General Motors and Isuzu. This area was historically associated with the former Moraine Assembly and Engine Plant operations.

Former Delphi Thermal Moraine's major operations, which began in 1941, included the machining and assembly of automotive air conditioning compressors, accumulator dehydrators, and miscellaneous air conditioning valves. Operations at the former Delphi Thermal Moraine Building 14 ceased in September 2003, and the building was decommissioned. Demolition of Building 14 was completed in 2005.

On June 1, 2009, former GM Corporation and certain subsidiaries filed voluntary petitions for relief under Chapter 11 of the Bankruptcy Code. An order was entered approving the sale of substantially all former GM Corporation's assets to a new and independent company (now known as General Motors Company, LLC) under Section 363 of the Bankruptcy Code on June 5, 2009. The sale closed on July 10, 2009. At that time, former GM Corporation changed its name to Motors Liquidation Company (MLC). RACER Trust was established on March 31, 2011 by a federal bankruptcy court to own, manage, remediate, and revitalize the properties from the 2009 former GM Corporation bankruptcy.

On June 30, 2011, RACER Trust sold former Delphi Thermal Moraine (except for the closed South Settling Lagoon), former Moraine Engine Plant, and former Moraine Assembly Plant to Industrial Realty Group Moraine, LLC (IRG). As part of the property transfer, RACER Trust retained environmental liability for these properties. The closed South Settling Lagoon was retained by RACER Properties LLC.

On September 29, 2011, the Administrative Order on Consent (AOC) for the Site was fully executed proceeding under Section 3008(h) of the RCRA, as amended, 42 United States Code (U.S.C.) Section

6928(h), U.S. EPA Docket No: RCRA-05-2011-0016. The performance–based AOC covers corrective action for past releases of hazardous contaminants at or from the Site.

1.1.1 Current Ownership

Current Site operations include multi-tenant use for commercial and industrial purposes. **Figure 2** provides details of the established parcels and current owners. The following list represents current ownership at the Site:

- IRG owns Lots 5458 which is currently a vacant area covered by pavement.
- Industrial Commercial Properties LLC (ICP) owns Lots #5418, 5435, 5437, 5439, and 5523:
  - Lot #5418 is currently comprised of a vacant industrial building and parking lot.
  - Lot #5435 is currently a vacant area covered by pavement and grass.
  - Lot #5437 is currently comprised of a vacant industrial building, paved surface, and wooded area.
  - Lot #5439 is currently occupied by Fuyao Glass America (Fuyao) and ICP.
  - Lot #5523 is currently comprised of a vacant industrial building, paved surface, and wooded area.
- Copart of Connecticut, Inc. (Copart) owns Lot #5433. Copart currently utilizes this lot to store cars for online auctions, and there is one structure on the lot.
- Fuyao owns Lots #1, #2, #5438. Fuyao currently produces and stores Original Equipment Manufacturer automotive glass at this facility. There are five structures at the Fuyao facility.
- Inland Property Management, Inc. owns Lot #5436. This lot is currently occupied by RJ Trucking, Inc., and there is one structure on the lot.
- Wright Warehousing, Inc. owns Lot #5459. There is an office building and mulch storage on this lot.
- The State of Ohio owns Lot #5460. A full-service Ohio Department of Transportation facility is on this lot and consists of two buildings and a salt storage structure.
- Norfolk Southern owns Lot #5524. This lot is currently occupied by rail spurs and used as an equipment storage area.

1.2 Corrective Measures Objectives

During a meeting with RACER Trust, the U.S. EPA, and Arcadis on November 13, 2019 in Chicago, Illinois, The Corrective Measures Objectives (CMOs) for the Site were established with the following timeframes:

- Short term – The CMO should be demonstrated approximately 1 year from the finalization of the Statement of Basis (SB).
- Intermediate – The CMO should be demonstrated approximately 2 to 5 years from the finalization of the SB.
- Long term – The CMO should be demonstrated at a time that is greater than 5 years from the finalization of the SB.

The CMOs are provided in the following subsections.

1.2.1 Soil

1.2.1.1 On-Site Soil

Short Term

- Demonstrate vadose zone soil concentrations are not contributing to an unacceptable risk to direct contact and groundwater leaching pathways

Short Term, Intermediate, and Long Term

- Prevent exposure to waste from the closed North and South Settling Lagoons

1.2.1.2 Off-Site Soil

Short Term, Intermediate, and Long Term

- Not applicable

1.2.2 Groundwater

1.2.2.1 On-Site Upper Aquifer Groundwater

Short Term

- Establish and maintain the Groundwater Environmental Indicator (i.e., groundwater migration under control – CA750)
- Prevent exposure to concentrations of site-specific VOCs in on-site groundwater exceeding MCLs
- Initiate source area treatment in the former PSA

Intermediate

- Maintain the Groundwater Environmental Indicator
- Prevent exposure to concentrations of site-specific VOCs in on-site groundwater exceeding MCLs
- Continue source area treatment in the former PSA

Long Term

- Reduce source area concentrations of site-specific VOCs in the former PSA in order to attain groundwater concentrations below residential VISLs for groundwater at property boundary
- Prevent exposure to concentrations of site-specific VOCs in on-site groundwater exceeding MCLs
- Prevent unacceptable vapor intrusion exposure until concentrations of site-specific VOCs in groundwater are below the industrial VISLs for groundwater throughout the site

1.2.2.2 Off-Site Upper Aquifer Groundwater

Short Term

- Prevent exposure to concentrations of site-specific VOCs in off-site groundwater exceeding MCLs / residential VISLs
- Demonstrate the site-specific VOC plume is delineated and stable and achieves the Groundwater Environmental Indicator

Intermediate

- Prevent exposure to concentrations of site-specific VOCs in off-site groundwater exceeding MCLs / residential VISLs
- Attain concentrations of site-specific VOCs in groundwater below MCLs / residential VISLs throughout off-site groundwater plume

Long Term

- Prevent exposure to concentrations of site-specific VOCs in off-site groundwater exceeding MCLs / residential VISLs
- Attain concentrations of site-specific VOCs in groundwater below MCLs / residential VISLs throughout off-site groundwater plume

1.2.2.3 On-Site Lower Aquifer Groundwater

Short Term and Intermediate

- Prevent drinking water and process water exposure to concentrations of site-specific VOCs exceeding MCLs

Long Term

- Demonstrate concentration reduction in site-specific VOCs beneath the source area
- Prevent drinking water and process water exposure to concentrations of site-specific VOCs exceeding MCLs
- Meet and maintain MCLs for site-specific VOCs at the property boundary

1.2.2.4 Off-Site Lower Aquifer Groundwater

Short Term

- Prevent off-site drinking water exposure to concentrations of site-specific VOCs exceeding MCLs

Intermediate

- Prevent off-site drinking water exposure to concentrations of site-specific VOCs exceeding MCLs
- Demonstrate the site-specific VOC groundwater plume is delineated and outside of drinking water well-fields

Long Term

- Demonstrate the site-specific VOC groundwater plume is delineated and stable and achieves the Groundwater Environmental Indicator
- Attain concentrations of site-specific VOCs in groundwater below MCLs throughout off-site groundwater plume

1.2.3 Indoor Air

1.2.3.1 On-Site Indoor Air

Short Term and Intermediate

- Prevent exposure to site-specific VOCs exceeding industrial indoor air criteria
- Attain concentrations of site-specific VOCs in indoor air below the industrial indoor air criteria

Long Term

- Verify concentrations of site-specific VOCs in sub-slab soil gas are below VISLs

1.2.3.2 Off-Site Indoor Air

Short Term and Intermediate

- Prevent exposure to site-specific VOCs exceeding residential indoor air criteria

Long Term

- Verify concentrations of site-specific VOCs in sub-slab soil gas are below VISLs

2 WORK COMPLETED POST-2012 CMP

The following subsections summarize the site activities that have been completed since the submittal of the 2012 CMP. Note that the corresponding risk assessment findings associated with these investigations was detailed in the 2019 Preliminary Human Health Risk Assessment Screening Evaluation (Arcadis, Inc. 2019c) and the Site-Wide Risk Assessment Summary (Arcadis, Inc. 2020).

2.1 Annual Groundwater Monitoring

Following the 2012 CMP, six annual groundwater monitoring events were completed at the Site (Arcadis, Inc. 2014, 2015, 2016, 2017a, 2018a, 2019a). From 2013 through 2016, the sampling program consisted of a site-wide groundwater monitoring well network. In 2017, 2018, and 2019, the monitoring well network was reduced in order to focus on pilot testing activities, groundwater remediation design and implementation, monitoring of interim measures, and compliance monitoring for the Site. The annual monitoring reports summarize the locations where groundwater samples were collected and provide the groundwater results.

2.2 Former PSA Assessment Activities

In 2014 and 2015, soil and groundwater sampling events were completed in the former PSA to further define the extent of site-specific VOCs in both the upper and lower aquifers (RACER Trust 2015 and 2016a). A total of 18 soil borings (PSA-11 through PSA-17 in 2014, PSA-18 through PSA-28 in 2015) and two monitoring wells (RMW-89 and RMW-90) were installed during the 2014 and 2015 former PSA investigations. The following samples were collected as part of these activities:

- 39 soil samples (PSA-12, PSA-14, PSA-16 through PSA-26, RMW-90) were collected and analyzed for site-specific VOCs
- Two soil samples (PSA-11 and PSA-22) were collected within the 0 to 10 feet (ft) below ground surface (bgs) interval and analyzed for site-specific VOCs
- 101 groundwater samples (PSA-11 through PSA-28, RMW-89, and RMW-90) were collected and analyzed for site-specific VOCs

In accordance with the Primary Groundwater Source Area Interim Measures Work Plan Addendum (Arcadis, Inc. 2017b), additional groundwater data from the former PSA were collected in 2017 as part of an ERD pilot test. This event included the installation of 10 upper aquifer wells (PW-1, PW-1S, PW-2S/D, PW-3S, PW-3D, PW-4S, PW-4D, PW-5S, PW-5D, PW-6S, and PW-6D). The sampling program included collection of 60 groundwater samples from new and select existing monitoring wells (GM-59 through GM-61 and RMW-85). The groundwater samples were analyzed for site-specific VOCs, Rhodamine WT tracer, total organic carbon, methane, ethane, and biogeochemical parameters.

The Enhanced Reductive Dechlorination Pilot Test Summary Report detailed the design basis, methodology, and results from the pilot test in the former PSA (Arcadis, Inc. 2019b). The overall objective of the source area treatment program is to limit or eliminate the transport of site-specific VOCs to the dilute, downgradient groundwater plume.

Based on field observations and analytical results collected as part of the pilot test, the following conclusions were made:

- The geology of the upper aquifer within the former PSA is highly heterogeneous, with interbedded and discontinuous lenses of silt and clay within a matrix of coarse sands and gravels.
- Hydraulic conductivity estimates confirm the heterogeneous nature with varying estimates on the order of three magnitudes from 1 foot/day to 601 feet/day.
- Even distribution of injected solution across the impacted sand and gravel zones requires installation of injection wells screened within specific geologic layers that exhibit elevated site-specific VOC concentrations.
- Overall, injection rates are adequate for injecting remedial amendments at sufficient volumes for the ERD remedy to be successful.
- Naturally occurring dechlorination of the target contaminants appears to be ongoing, but degradation rates are low due to the limited background aquifer TOC concentrations. Therefore, the distribution of TOC through injection wells will effectively increase reductive dechlorination rates. The pilot test results confirmed that ERD is an appropriate remedial technology for site-specific VOC impacts in the former PSA.
- The objectives of the pilot test were met. The results indicated that a radius of influence (ROI) greater than the targeted ROI of 10 feet is achievable. A target ROI for the full-scale system will balance implementability (i.e., limited injection well infrastructure) with the need to get consistent TOC delivery in relatively heterogeneous conditions. Analytical results also indicate that reducing site-specific VOC concentrations in the former PSA by one order of magnitude in areas where site-specific VOC concentrations are in excess of 1 ppm and by two orders of magnitude in areas where site-specific VOC concentrations are greater than 5 ppm is achievable.
- Additionally, it was determined that multiple well design options can adequately distribute the necessary volume of injectate into the formation. These options can be incorporated into a final remedial design, with field information used to determine the appropriate construction type based on the geology encountered.

2.3 1,4-Dioxane Soil and Groundwater Investigations

From 2014 through 2016, groundwater and soil samples were collected throughout the Site to evaluate 1,4-dioxane (RACER Trust 2015 and 2016a; Arcadis, Inc. 2015, 2016, and 2017a). Five groundwater sampling events were completed to characterize 1,4-dioxane groundwater concentrations in the upper and lower aquifer: October 2014, June 2015, August 2015, December 2015, and August 2016. In December 2014, October 2015, and December 2015, soil samples were collected from borings GM-35-B1 through GM-35-B4, PSA-11, PSA-22, PSA-24, and PSA-25.

The results of the 1,4-dioxane investigation activities provided insight into the distribution of 1,4-dioxane concentrations at the Site, including: delineation to the action level of 0.46 micrograms per liter (µg/L) in the upper aquifer, and identification of an apparent off-site 1,4-dioxane source in the lower aquifer emanating from the hydraulic upgradient direction (northwest). Microbial genetics results suggested that 1,4-dioxane attenuation in groundwater is primarily a physical process. Soil sampling results indicated that 1,4-dioxane was not detected in the soil samples, indicating that soil is not a source of 1,4-dioxane to groundwater in two key areas of the Site: adjacent to monitoring well GM-35 and in the former PSA.

Overall, results of these investigations provide insight into the distribution of 1,4-D concentrations at the Site, suggest that 1,4-dioxane attenuation in groundwater is occurring primarily via physical processes, and indicate that soil is not an identified source of 1,4-dioxane to groundwater. Consequently, no additional investigation or analysis is proposed. Detailed documentation of the methods and results associated with the 1,4-dioxane investigations are included in the 2015 Groundwater Monitoring Report (Arcadis, Inc. 2016) and the 2016 Groundwater Monitoring Report (Arcadis, Inc. 2017a).

2.4 Soil Excavation and Confirmation Sampling

In 2014, multiple Ohio Bureau of Underground Storage Tank Regulations (BUSTR) Tier 1 Source Investigations were completed at the West Tank Farm (RACER Trust 2014a), South Tank Farm (RACER Trust 2014b), and the Northwest Tank Farm (RACER Trust 2014c), including the installation of soil borings and monitoring wells. Soil samples were submitted to the laboratory for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE), polycyclic aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH) carbon ranges C6 to C12, C10 to C20, and C20 to C34. Groundwater samples were submitted for analysis of BTEX, MTBE, and PAHs.

Analytical results from the West Tank Farm and Northwest Tank Farm indicated soil and groundwater parameters were below the applicable BUSTR standards and required no further action (NFA). Corresponding NFA letters were issued for the West Tank Farm (BUSTR 2015a) and Northwest Tank Farm (BUSTR 2015b).

In March 2016, a soil excavation was completed to remove elevated petroleum hydrocarbons in the area of the South Tank Farm. A total of 135.48 tons of soil were removed from the Site and disposed of at an approved landfill facility. A total of six confirmation soil samples were analyzed for total petroleum hydrocarbons (TPH) - diesel range organics and TPH - oil range organics. The confirmation sampling results were below the applicable BUSTR standards (RACER Trust 2015b). BUSTR issued a letter indicating that NFA was needed (BUSTR 2016).

Based on the results of these investigations and activities, no additional investigation or analysis is proposed.

2.5 Waste Pile Staging Area Investigations

In November and December 2015, 11 soil samples (GM-35B-1 through GM-35B-4) and 11 groundwater samples (GM-35B-1 through GM-35B-3) were collected in the vicinity of monitoring well GM-35. The samples were analyzed for 1,4-dioxane and site-specific VOCs (Arcadis, Inc. 2016).

In 2017, a supplemental soil investigation was completed in the former Waste Pile Staging Area (WPSA) to evaluate if concentrations of site-specific VOCs in vadose zone soil have the potential to leach into the groundwater and result in concentrations migrating to the property boundary that may exceed the MCLs in groundwater. The investigation was completed in accordance with the Supplemental Vadose Zone Investigation Work Plan (Arcadis, Inc. 2017c). The historical data were evaluated, supplemental data were collected, and the applicable results were processed and modeled.

The quantitative evaluation indicated that groundwater concentrations at the property boundary are conservatively projected to be above the MCLs for TCE and PCE. However, the soil to groundwater

leaching model projected that any exceedance will be below MCLs for TCE and PCE within 8 to 10 years. This timeline aligns with the on-site remedial timeline; therefore, no additional investigation or analysis is proposed (Arcadis, Inc. 2018a).

2.6 Poly-and Perfluorinated Alkyl Substances Groundwater Investigations

Thirty groundwater samples were collected during two sampling events in 2018 at 22 locations in the upper aquifer and analyzed for poly- and perfluorinated alkyl substances (PFAS). These events were completed in accordance with the approved PFAS Sampling Plan - Revision No. 1 (Arcadis, Inc. 2018b) and the PFAS Sampling Plan – Second Groundwater Sampling Event (Arcadis, Inc. 2018c). The most applicable screening level for the Site is the U.S. EPA Health Advisory Level (HAL) of 70 nanograms per liter (ng/L) for a combined concentration of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). The combined concentrations of PFOA and PFOS from the August 2018 sampling event ranged from 1.8 ng/L to 217 ng/L at monitoring wells W-4-N and GM-35, respectively. The result from monitoring well GM-35 was the only combined PFOA and PFOS result that exceeded the HAL during the initial sampling event. The combined concentrations of PFOA and PFOS from the December 2018 sampling event ranged from 5.2 ng/L to 52 ng/L at GM-21 and GM-35, respectively. None of the combined PFOA and PFOS results from the December 2018 event exceeded the HAL.

Based on the results of this investigation, no additional investigation or analysis is proposed. Detailed documentation of the methods and results associated with the PFAS Investigation are included in the 2018 Groundwater Monitoring Report (Arcadis, Inc. 2019a).

2.7 Phase 1 Dynamic Groundwater Recirculation™

In 2017, the Phase 1 Dynamic Groundwater Recirculation (DGR™) Interim Measure Pilot Test Work Plan was submitted to the U.S. EPA and detailed the design basis and methodology for implementation of the DGR™ interim measure pilot test that was requested by the U.S. EPA in the Request for Interim Measures to Remediate Groundwater Contamination as Source of Vapor Intrusion Off-site (U.S. EPA 2017).

The DGR™ interim measure pilot test scope of work included well installation and hydraulic testing to determine extraction and injection influence and capacity. Additionally, the data collected was used to refine the understanding of hydraulic characteristics in the interim measure treatment area of the upper aquifer. The objective of the Phase 1 DGR™ interim measure is to reduce site-specific VOCs in groundwater within the Riverview Plat neighborhood (neighborhood) to concentrations below the MCLs within 5 years of initiating full-scale operation. The direct benefit of addressing total site-specific VOCs within the neighborhood is a reduced vapor intrusion risk for structures within the neighborhood that have not provided access for installation of a vapor intrusion mitigation system.

Results from the pilot test and associated quantitative analysis indicated that the targeted area of capture within the upper aquifer is hydraulically controlled and that the composite PCE/TCE plume will achieve the applicable corrective measures objectives in the Phase 1 DGR™ interim measure design area.

In 2019, the Phase 1 DGR™ system was installed. Preliminary system flows, start-up verification, and hydraulic monitoring data of nearby groundwater wells indicate that the system is functioning as designed. The system performance will continue to be monitored, evaluated, and reported to the U.S. EPA.

2.8 Supplemental Off-Site Groundwater Investigation

Three monitoring wells were installed between the Miami Shores neighborhood and the west bank of the Great Miami River to evaluate off-site shallow upper aquifer groundwater concentrations at the water table. From July 24 to August 2, 2017, Arcadis completed utility clearance, drilling, well installation and development, and groundwater monitoring activities associated with the Focused Off-Site Groundwater Investigation Work Plan (Arcadis Inc., 2017d).

In 2017 and 2018, groundwater samples were collected from select groundwater monitoring wells within the Miami Shores neighborhood. The data were screened against the applicable VISLs. The water table wells (RMW-95, RMW-96, and RMW-97), which represent conditions closest and upgradient to the receptor (i.e., residential properties), did not exceed the VISLs. Results from this screening assessment indicate that groundwater concentrations of site-specific VOCs do not present an unacceptable vapor intrusion risk in the Miami Shores neighborhood.

Groundwater from the Miami Shores well network will be monitored as part of the annual groundwater monitoring program. Detailed documentation of the methods and results associated with the Focused Off-Site Groundwater Investigation are included in the 2017 Groundwater Monitoring Report (Arcadis, Inc. 2018a) and 2018 Groundwater Monitoring Report (Arcadis, Inc. 2019a).

2.9 Vapor Intrusion – On-Site

Sub-slab soil gas and indoor air evaluations have been completed at several on-site buildings, including the former PSA, the existing Fuyao building, and the former Paint Building. The results of these evaluations indicated that concentrations of site-specific VOCs in sub-slab soil gas are above the commercial VISLs at some locations, and concentrations of site-specific VOCs in indoor air are below the commercial VISLs (RACER Trust 2019).

Based on these results, the building foundations and heating, ventilating, and air conditioning (HVAC) systems appear to be appropriately mitigating vapor intrusion. Inspections of the concrete slab foundations and collection of indoor air samples continue to be completed annually to confirm site-specific VOCs in indoor air remain at concentrations below the VISLs. Per the U.S. EPA's request, the indoor air sampling in 2020 will be completed in bathrooms at the Fuyao facility as these areas are generally prone to issues with vapor intrusion. Additionally, RACER Trust has requested that building tenants notify them of new penetrations through the foundation or modifications to the foundation. If construction activities associated with the foundation are anticipated, RACER Trust will coordinate with the property owner to minimize the potential for sub-slab soil gas to migrate into indoor air.

2.10 Vapor Intrusion – Off-Site

As presented in the 2012 CMP, an offsite vapor intrusion investigation in the Riverview Plat neighborhood indicated that vapor intrusion mitigation systems were needed to mitigate potentially unacceptable risk. Where access was provided, sub-slab and indoor air sampling was completed and if necessary, vapor intrusion mitigation systems were installed. The vapor intrusion assessment and mitigation program for the Riverview Plat neighborhood is ongoing. Additionally, groundwater remediation will mitigate the vapor intrusion risk for the neighborhood.

3 GROUNDWATER MODELING

In order to best represent groundwater flow conditions and solute transport, a groundwater flow model (model) with a solute transport component was developed in 2018 and 2019 that included significant modifications with data collected since 2008. The objectives of the groundwater flow and solute transport model were to:

- Provide a representative tool to evaluate capture from regional pumping wells and Site interim measure operations
- Run predictive solute transport simulations

Modifications from the previous model included an updated finite-difference grid; structural changes based on revised distributions of the upper and regional clay till and hydraulic conductivity; and updated boundary conditions. The model was updated with additional data collected to best represent current conditions by including the recently collected dissolved-phase site-specific VOC plume data. The updates also included the most current understanding of regional pumping flow rates; the operation of the Phase 1 DGR™ interim measure for control of the upper aquifer plume; and operation of DN-13 for off-site lower aquifer plume control. The model build was conducted using the numerical code MODFLOW and calibrated to 144 on-site and off-site water-level targets that represent average water levels over a four-year period.

The solute transport component was developed using a modular three-dimensional transport model code (MT3DMS). The solute transport was constructed using the known understanding of the mobile and immobile porosity, mass transfer coefficient, partition coefficients, degradation rates, and overall distribution of PCE and TCE groundwater concentrations in both the upper and lower aquifers.

The predictive modeling included a hydraulic capture assessment for the downgradient public water supply well-field for the City of West Carrollton (well-field). The hydraulic capture was assessed utilizing the volumetric flux model program MODALL with current regional pumping from other locations included. The analysis indicated that the well-field capture zone at the current average flow rate of pumping does not intercept the PCE or TCE groundwater plumes in either the upper or lower aquifers. The solute transport model was run and verified the hydraulic capture assessment, with the resulting migration of the PCE and TCE groundwater plumes not posing a risk to the well-field. The model results also verified successful restoration of upper aquifer groundwater quality for the River Plat neighborhood by operation of Phase I DGR™ within a 5-year period and DN-13 provides adequate hydraulic control of the lower aquifer plume migration.

The City of West Carrollton well-field will remain in operation for groundwater supply use near the Site. It should be noted that the 2012 CMP included different pumping scenarios, based on the available information at that time. The groundwater modeling data and information included in the 2012 CMP indicated potential potable water impacts to the lower aquifer at downgradient receptors (i.e., West Carrollton Well Field). As stated above, the revised analysis indicated that the well-field capture zone at the current average flow rate of pumping does not intercept the PCE or TCE groundwater plumes in either the upper or lower aquifers. Additional groundwater well-fields in proximity to the Site such as Dryden North, Dryden South, and Miami Shores, are currently not operational and are planned for abandonment (Taft, 2019). Therefore, hypothetical operation of these well-fields was not used in the

hydraulic capture assessment. A comprehensive summary of the groundwater model development is presented in **Appendix A**.

4 RISK ASSESSMENT SUMMARY

In 2019, the Site-Wide Risk Summary (Risk Summary; Arcadis, Inc. 2020) was submitted to the U.S. EPA and summarized the potential for exposure to site-related constituents in environmental media (i.e., soil, groundwater, and soil gas) by parcel (identified by lot No.) throughout the Site and for potential off-site receptors. Historic risk assessments for the Site were summarized and/or presented in the 2012 CMP (Arcadis, Inc. 2012) and the 2019 Preliminary Human Health Risk Assessment Screening Evaluation (Arcadis, Inc. 2019c). These historic risk assessments focused on the verified areas of interest (AOIs) and solid waste management units (SWMUs). The Risk Summary includes data collected after the 2012 CMP. These data were compared to applicable screening levels and further characterized, if needed.

The historic risk assessments were completed as site-wide evaluations. It should be noted that the Risk Summary was segregated and organized by Parcel to assist in the preparation of environmental covenants and to support communication with stakeholders.

Based on the current and historical evaluation of air, soil gas, soil, and groundwater data available at the Site and in off-site areas associated with the Site, the following exposure pathways were found to be unacceptable: direct contact to groundwater and vapor intrusion. It should be noted that direct contact to soil is not an unacceptable exposure pathway. Further, the soil concentrations are not a source of future groundwater impacts.

The following corrective actions are planned to address the potential exposure pathways and meet the CMOs for the Site:

- Implement the following controls through an environmental restrictive covenant for each parcel at the Site:
  - Except for fire well FW-1A, prohibit the use of groundwater for any purpose, including potable and non-potable uses.
  - Require a vapor evaluation for buildings or other enclosed structures that will be occupied and, if necessary, require the installation of appropriate vapor intrusion mitigation measures.
  - Prohibit residential redevelopment.
- Continue operation of interim measures to address and prevent site-specific VOC plume migration below the Riverview Plat neighborhood until implementation of source area remedy and monitored natural attention have sufficiently reduced concentrations of site-specific VOCs in upper aquifer groundwater.
- Implement source area remediation and monitored natural attenuation to reduce the concentrations of site-specific VOCs in soil gas and groundwater in order to meet the applicable CMOs for the Site.
- With access from the property owners and in coordination with the U.S. EPA, abandon and/or evaluate the private wells located at 3571/3573 Dryden Road, 2651 Blanchard Avenue, and 4000 Miller Valentine Court to verify the direct contact with groundwater pathway is incomplete.
- Verify appropriate institutional controls are in place to prevent installation of potable wells within the site-specific VOC plume.

The Risk Summary is included as **Appendix B**.

5 PROPOSED FINAL REMEDIES

A remedial technology screening evaluation was completed and summarized in the 2012 CMP, and based on that evaluation, remedial technologies capable of achieving the CMOs were proposed (Arcadis, Inc. 2012). The recommended remedies included herein are generally consistent with the recommendations in the 2012 CMP, and the conceptual design has been refined based on the current understanding of the Site. The final corrective measures program will be implemented following an adaptive design and implementation strategy to accommodate the potential for changes in environmental quality, site use and limitations, and risks to human health and the environment during the long-term operation of the recommended corrective measures. Future changes to the final remedy configuration will be made in a manner that will not affect the capacity of the final remedy to achieve the CMOs presented in **Section 1.2**. The components of the final corrective measures are presented in the following sections, and **Table 1** outlines the costs associated with the components of the final corrective measures described below.

5.1 Source Area Remediation – Former PSA

ERD has been selected as the preferred technology to remediate the site-specific VOC concentrations in the source area and facilitate compliance with the CMOs. In support of the 2012 CMP recommendation to use ERD for source area remediation, an ERD pilot test at the former PSA was completed and demonstrated the effectiveness of this technology. A conceptual layout of injection wells for a full-scale ERD system is provided on **Figure 7**.

As shown on **Figure 7**, approximately 40 well pairs are proposed with an assumed ROI of 15 feet. Wells will be installed to target relatively coarser grained intervals with high concentrations of total site-specific VOCs. Periodic injections of a carbon source (e.g., emulsified vegetable oil or molasses) will be completed to sustain an in-situ reactive zone (IRZ) capable of dechlorination of the target site-specific VOCs. Operation of the ERD system will be continued until the source area is sufficiently remediated such that CMOs would be met based on results of a revised fate and transport model. Operation of an ERD system for source zone remediation is expected to dechlorinate chlorinated VOCs to non-toxic end products with no long-term accumulation of daughter products such as vinyl chloride and to create a clean waterfront which would migrate downgradient and reduce plume concentrations. Implementation of ERD is not expected to result in an increase in vapor intrusion risk for site-specific VOCs; however, it will generate methane in the dissolved phase which has the potential to partition to the soil gas. A methane monitoring program will be incorporated into the full-scale ERD implementation plan.

It should be noted that the 2012 CMP included the Former Oil House as a source area and proposed ERD. However, the current understanding of the Site does not indicate the Former Oil House is a source area. Therefore, the source area remedy is focused on the former PSA.

5.2 On-Site Upper and Lower Aquifers

The following remedies and controls will be applied to achieve the CMOs for the on-site upper and lower aquifers:

- Remediation of the source area, as described above

- Monitored natural attenuation (MNA) and land and groundwater use restrictions (through property deed restrictions)

5.3 Off-Site Upper Aquifer

The following remedies and controls will be applied to achieve the CMOs for the off-site upper aquifer:

- Treatment of the source area, as described above
- Operation of the Phase 1 DGR™ interim measure
- Periodic molasses injections in IRZs along the southern property boundary, as needed, to prevent downgradient plume migration to the east of Phase 1 DGR™
- MNA following source area remediation
- Vapor monitoring and operation and maintenance of the existing vapor intrusion mitigation systems until groundwater no longer serves as a source of contamination to soil vapor (below VISLs)

5.4 Off-Site Lower Aquifer

The following remedies and controls will be applied to achieve the CMOs for the off-site lower aquifer:

- Treatment of the source area, as described above
- MNA following source area remediation
- Hydraulic containment through operation of existing well DN-13 - Operation of existing well DN-13 will continue until it can be demonstrated that treatment of the off-site plume through MNA alone is sufficient to reduce concentrations to below MCLs before reaching the downgradient receptors.
- Well abandonment at 3571/3573 Dryden Road and 2651 Blanchard Avenue will continue to be pursued as part of the final remedy.

5.5 Institutional Controls

It is assumed that the risk associated with site-specific VOCs in groundwater and soil gas across the Site is unacceptable, and the following risk mitigation measures are recommended through environmental restrictive covenants for each of the lots at the Site:

- The use of upper and lower aquifer groundwater for any purpose, including potable and non-potable uses, would be prohibited. It should be noted that the existing fire suppression well in Lot #5438, FW-1A, would be an exception to this restriction.
- Buildings or other enclosed structures that will be occupied would require a vapor intrusion evaluation and, if necessary, the installation of an appropriate vapor intrusion mitigation measures.
- Residential redevelopment would be prohibited.

5.6 Corrective Measures Conclusions

Based currently available information, the proposed corrective measures for the Site provide an appropriate balance of options with respect to the evaluation criteria, sustainability, and cost. With finalization of the SB and U.S. EPA approval of the proposed corrective measures, an ERD design report for the source area will be prepared and submitted to the U.S. EPA. Long-term success of the corrective

measures will be periodically evaluated through an adaptive design approach based on the results of long-term corrective measures groundwater monitoring. Additional corrective measures may be recommended based on these evaluations.

6 REFERENCES

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TABLES

Table 1
Corrective Measures Proposal Addendum
Cost Estimate
RACER Trust Moraine Facilities
Moraine, Ohio

Proposed Corrective Measure	Capital Costs [1]	Annual O&M Costs [1]	Years in Operation	Estimated Cost [1]
Source Area Corrective Measures (former Process Sump Area)				
ERD for Source Treatment[2][3]	$1,306,800	$308,400	5	**$2,848,800**
Neighborhood Upper Aquifer Diffuse Plume Remedy				
Phase 1 DGR™ [4][5]	$2,197,948	$314,417	20	**$8,486,288**
O&M Lagoons, Landfills, Groundwater Monitoring, and Reporting				
Groundwater Sampling for Upper and Lower Aquifers and Reporting[6]	--	$50,000	20	**$1,000,000**
Operation and Maintenance of the Lagoons and Landfills	--	$25,000	20	**$500,000**
In-Site Reactive Zones				
Operation of In-Situ Reactive Zones[7]	--	$46,000	5	**$230,000**
Vapor Intrusion Corrective Measures				
Operation of the Vapor Intrusion Mitigation Systems in Neighborhood for 10 Years[8]	--	$75,000	7	**$525,000**
On-Site Sampling and Mitigation[9]	--	$40,000	10	**$400,000**
Engineering/Institutional Controls				
Land and Groundwater Use Restrictions for 20 Years	$25,000	$3,500	20	**$95,000**
Lower Aquifer Hydraulic Containment				
Operation of DN-13 Recovery Well, Monthly Sampling, and Reporting	--	$95,000	20	**$1,900,000**
Private Well Abandonment				
Abandonment of Wells Located at 3571/3573 Dryden Road and 2651 Blanchard Avenue	$152,000	--	--	**$152,000**
Remedial Systems and Well Abandonment				
System and Wells (Remediation Wells) Abandonment[10]	--	--	--	**$359,000**
Total Corrective Measures Proposal Cost	$3,681,748	--	--	**$16,496,088**

Notes:
Capital costs include system design, well installation, equipment purchase, and system construction activities.
DGR - Dynamic Groundwater Recirculation.
O&M - Operation and maintenance.
(1) A contingency of +/-30% applies.
(2) Annual O&M costs for ERD assume injection of molasses solution/emulsified vegetable oil and performance monitoring.
(3) Costs for ERD assume carbon injections will occur once a year for 5 years for a total of 5 injection and related monitoring events.
(4) Phase 1 DGR capitol costs include replacement of the treatment systems after approximately 10 years. O&M costs for DGR system operation are based on projected 2020 costs.
(5) O&M costs for DGR system operation are based on projected 2020 costs.
(6) Costs for groundwater sampling is based on a modified sampling program that is focused on monitoring the final corrective measures.
(7) Costs for in-situ reactive zones includes operation of RZ-3 West every other year for 10 years to control plume migration to the east of the hydraulically controlled Phase 1 DGR™ system.
(8) Includes post-installation proficiency sampling, O&M, and reimbursement of electrical costs at appropriate properties within the Riverview Plat neighborhood.
(9) Assumes annual indoor air sampling and slab inspection at Fuyao, former Process Sump Area, and the Paint Building until the source area treatment is completed.
(10) Includes abandonment costs for remedial systems and wells on-site and in the neighborhood.

FIGURES

DRAFT

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LEGEND

- DRAINAGE DITCH
- FORMER BUILDING/SITE FEATURE
- CURRENT BUILDING
- PROPERTY BOUNDARY

Notes:
1. High-resolution orthomosaic developed using imagery collected by Arcadis US via DJI Zenmuse X4S camera mounted to a DJI Inspire 2 UAV during the dates of 10/09/2019-10/10/2019.
2. Additional Aerial Source: DigitalGlobe, dated 8/22/2018, serviced by ESRI World Imagery Service, accessed via ESRI ArcGIS Desktop on 2/10/2020.

RACER TRUST
MORAINE, OHIO
2020 CORRECTIVE MEASURES PROPOSAL ADDENDUM

SITE LAYOUT

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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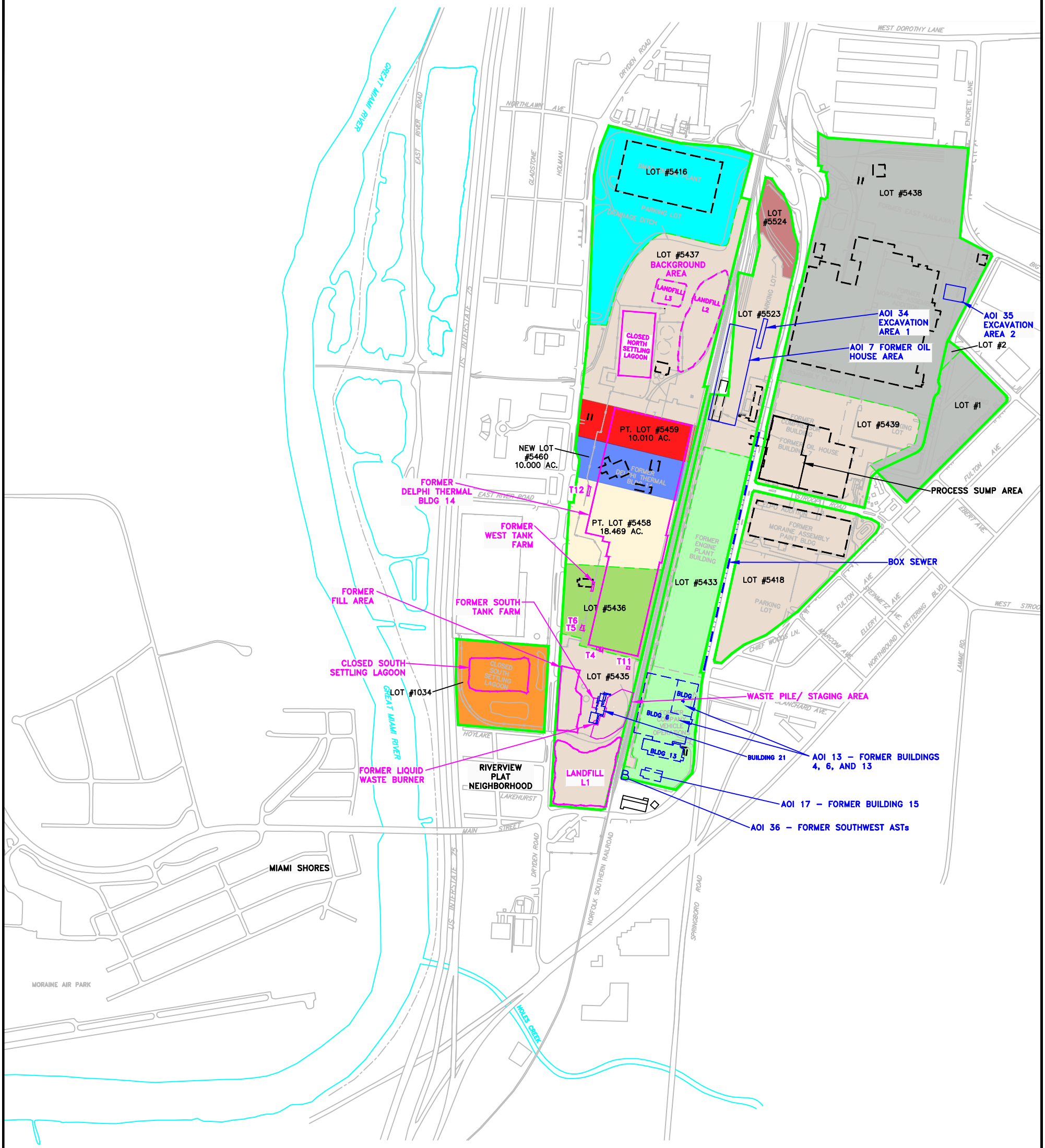

LEGEND

- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- CURRENT BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY

AOI AREA OF INTEREST INVESTIGATED DURING THE SUPPLEMENTAL RFI

SWMU SOLID WASTE MANAGEMENT UNIT INVESTIGATED DURING THE RFI

LOT INFORMATION		
LOT NUMBER	ACREAGE	LOT OWNER
LOT #1	15.568 Ac.	FUYAO ASSET MANAGEMENT A LLC
LOT #2	0.5585 Ac.	FUYAO ASSET MANAGEMENT A LLC
LOT #5438	94.060 Ac.	FUYAO ASSET MANAGEMENT A LLC
LOT #5524	6.659 Ac.	NORFOLK SOUTHERN RAILWAY FKA CONSOLIDATED RAIL CORPORATION
LOT #5418	31.576 Ac.	ICP MORAINE LLC
LOT #5437	47.065 Ac.	ICP MORAINE LLC
LOT #5439	30.580 Ac.	ICP MORAINE LLC
LOT #5523	20.254 Ac.	ICP MORAINE LLC
LOT #5435	25.020 Ac.	ICP MORAINE LLC
LOT #5458	18.469 Ac.	IRG MORAINE LLC
LOT #1034	18.174 Ac.	RACER PROPERTIES LLC
LOT #5433	41.145 Ac.	COPART OF CONNECTICUT INC.
LOT #5436	17.030 Ac.	INLAND PROPERTY MANAGEMENT INC. (RJ TRUCKING)
LOT #5416	38.612 Ac.	DMAX LTD
LOT #5459	10.010 Ac.	WRIGHT WAREHOUSE INC.
LOT #5460	10.000 Ac.	STATE OF OHIO

N

0 200 1000ft

RACER TRUST
MORAINE, OHIO
2020 CORRECTIVE MEASURES PROPOSAL ADDENDUM

30018090

SITE PARCEL MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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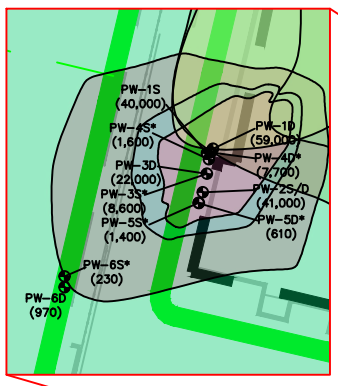

LEGEND

- MONITORING WELL (UPPER AQUIFER)
- INACTIVE EXTRACTION WELL (EW-1, EW-2, AND TW-2)
- STREAM GAUGE
- BORING LOCATION
- CITY OF MORAINE MONITORING WELL
- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- ug/L — MICROGRAMS PER LITER
- <1.0 — CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- MCL — MAXIMUM CONTAMINANT LEVEL
- <1.0 — 2019 CONCENTRATIONS
- (<1.0) — 2018-2013 CONCENTRATIONS
- (<1.0) — PRE-2013 CONCENTRATIONS
- **BOLD** — CONCENTRATION EXCEEDS MCL
- * — DATA NOT USED FOR CONTOURING PURPOSES

- >10000 ug/L
- 5000-10000 ug/L
- 1000-5000 ug/L
- 100-1000 ug/L
- 50-100 ug/L
- 5-50 ug/L

SITE-SPECIFIC VOLATILE ORGANIC COMPOUNDS	MCL (ug/L)
1,1,1-Trichloroethane	**200**
1,1-Dichloroethane	--
1,1-Dichloroethene	**7**
Benzene	**5**
cis-1,2-Dichloroethene	**70**
Ethylbenzene	**700**
Tetrachloroethene	**5**
Toluene	**1000**
trans-1,2-Dichloroethene	**100**
Trichloroethene	**5**
Vinyl chloride	**2**
Xylene (total)	**10,000**

NOTE:

1. CONCENTRATIONS POSTED REFLECT 2019 MONITORING WELL RESULTS, 2018 THROUGH 2013 MONITORING WELL RESULTS, PRE-2013 MONITORING WELL RESULTS, AND MAXIMUM CONCENTRATION FROM VERTICAL AQUIFER PROFILING FROM 2011 THROUGH 2015. THE INTERPRETATION OF THE ISOCONCENTRATION INCLUDES THE CONCEPTUAL SITE MODEL UNDERSTANDING (I.E. GROUNDWATER FLOW AND INTERIM MEASURES OPERATION).
2. WHEN SAMPLE RESULT IS NON-DETECT, HALF THE REPORTING LIMIT IS HONORED WITH THE CONTOURING.
3. RELATIVE UNDERSTANDING OF PRE-2013 CONCENTRATIONS (GRAY) WAS USED TO DEVELOP THE OVERALL PLUME GEOMETRY IN THE VICINITY OF THESE WELLS.

RACER TRUST
MORAINE, OHIO
2020 CORRECTIVE MEASURES PROPOSAL ADDENDUM

30018090

ISOCONCENTRATION MAP (UPPER AQUIFER) TETRACHLOROETHENE - 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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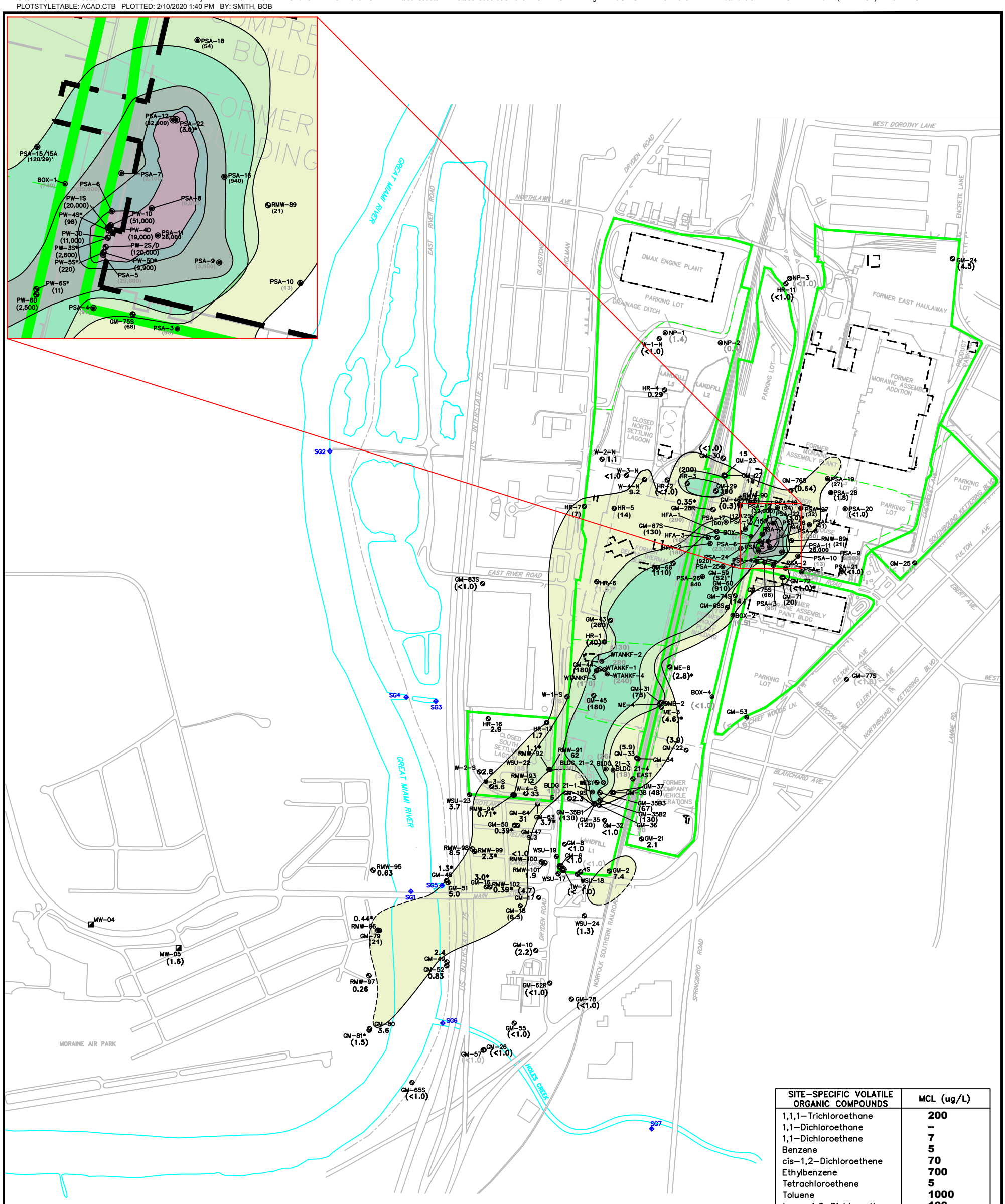

SITE-SPECIFIC VOLATILE ORGANIC COMPOUNDS	MCL (ug/L)
1,1,1-Trichloroethane	**200**
1,1-Dichloroethane	--
1,1-Dichloroethene	**7**
Benzene	**5**
cis-1,2-Dichloroethene	**70**
Ethylbenzene	**700**
Tetrachloroethene	**5**
Toluene	**1000**
trans-1,2-Dichloroethene	**100**
Trichloroethene	**5**
Vinyl chloride	**2**
Xylene (total)	**10,000**

LEGEND

- MONITORING WELL (UPPER AQUIFER)
- INACTIVE EXTRACTION WELL (EW-1, EW-2, AND TW-2)
- STREAM GAUGE
- BORING LOCATION
- CITY OF MORAINE MONITORING WELL
- RIVER LEVEE
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- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- ug/L — MICROGRAMS PER LITER
- <1.0 — CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- VISL — VAPOR INTRUSION SCREENING LEVEL
- <1.0 — 2019 CONCENTRATIONS
- (<1.0) — 2018-2013 CONCENTRATIONS
- (<1.0) — PRE-2013 CONCENTRATIONS
- **BOLD** — CONCENTRATION EXCEEDS SCREENING LEVEL
- * — DATA NOT USED FOR CONTOURING PURPOSES

- >10000 ug/L
- 5000-10000 ug/L
- 1000-5000 ug/L
- 100-1000 ug/L
- 50-100 ug/L
- 5-50 ug/L

NOTE:

1. CONCENTRATIONS POSTED REFLECT 2019 MONITORING WELL RESULTS, 2018 THROUGH 2013 MONITORING WELL RESULTS, PRE-2013 MONITORING WELL RESULTS, AND MAXIMUM CONCENTRATION FROM VERTICAL AQUIFER PROFILING FROM 2011 THROUGH 2015. THE INTERPRETATION OF THE ISOCONCENTRATION INCLUDES THE CONCEPTUAL SITE MODEL UNDERSTANDING (I.E. GROUNDWATER FLOW AND INTERIM MEASURES OPERATION).
2. WHEN SAMPLE RESULT IS NON-DETECT, HALF THE REPORTING LIMIT IS HONORED WITH THE CONTOURING.
3. RELATIVE UNDERSTANDING OF PRE-2013 CONCENTRATIONS (GRAY) WAS USED TO DEVELOP THE OVERALL PLUME GEOMETRY IN THE VICINITY OF THESE WELLS.
4. SCREENING LEVELS BASED ON OHIO EPA GUIDANCE DOCUMENT: RECOMMENDATIONS REGARDING RESPONSE ACTION LEVELS AND TIMEFRAMES FOR COMMON CONTAMINANTS OF CONCERN AT VAPOR INTRUSION SITES IN OHIO – AUGUST 2016. ASSUMES SANDY SOILS. SAME EXPOSURE PARAMETERS AS THE U.S. EPA VALUES; HOWEVER OHIO GUIDANCE INCORPORATES OLDER TOXICITY DATA.

N

0 200 1000ft

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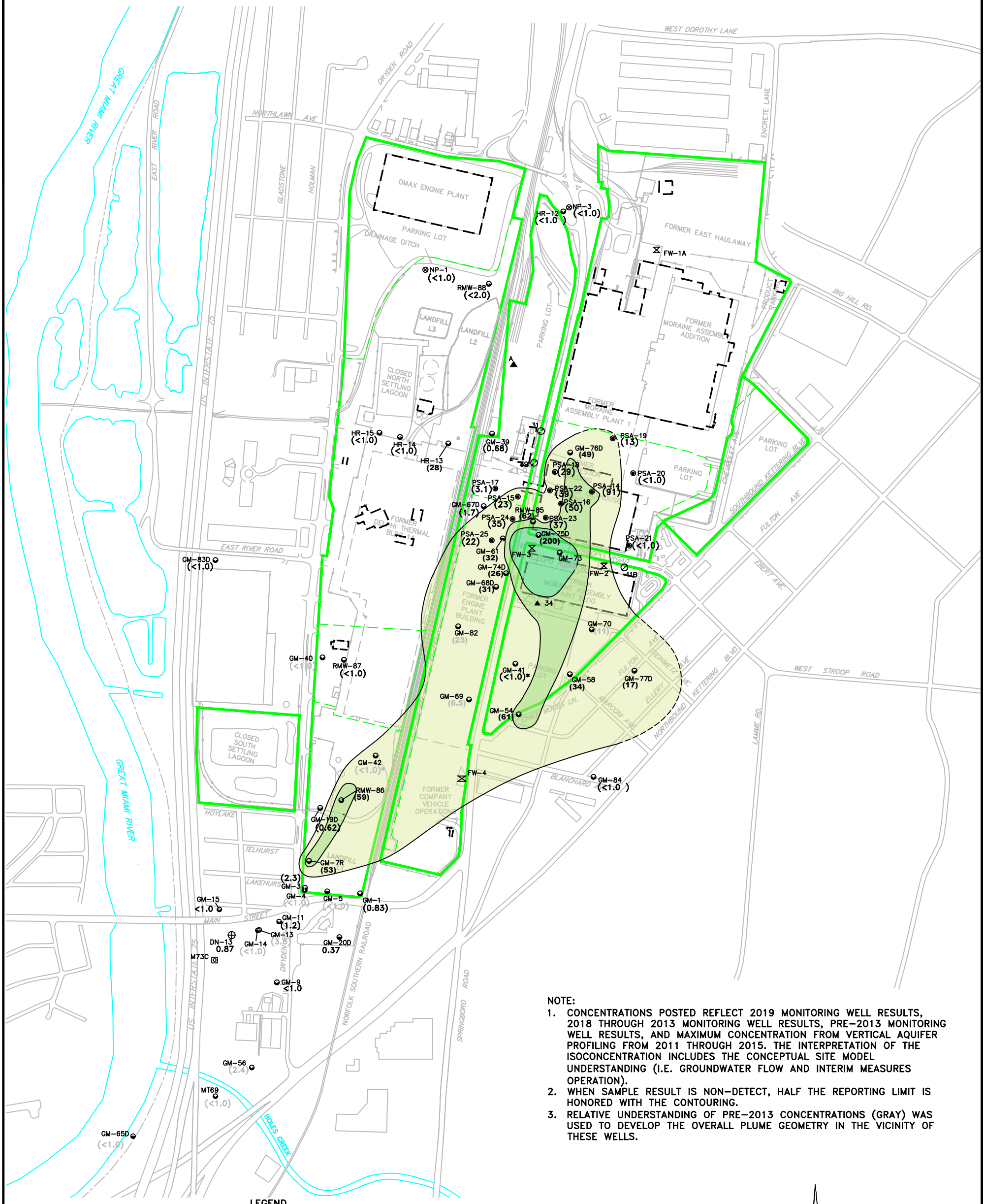
30018090

ISOCONCENTRATION MAP (UPPER AQUIFER) TRICHLOROETHENE - 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
C:\Users\bsmith\BIM 360\Arcadis\ANA - RACER TRUST\Project Files\RACER MORAINE OH\MORAINE OH 2020 ACTIVITIES\30018090\01-DWG\ANN294-03C-2019-PLUMES-LOWER.dwg LAYOUT: PCE 2019 SAVED: 2/6/2020 3:20 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ACAD.CTB PLOTTED: 2/10/2020 1:42 PM BY: SMITH, BOB



NOTE:
1. CONCENTRATIONS POSTED REFLECT 2019 MONITORING WELL RESULTS, 2018 THROUGH 2013 MONITORING WELL RESULTS, PRE–2013 MONITORING WELL RESULTS, AND MAXIMUM CONCENTRATION FROM VERTICAL AQUIFER PROFILING FROM 2011 THROUGH 2015. THE INTERPRETATION OF THE ISOCONCENTRATION INCLUDES THE CONCEPTUAL SITE MODEL UNDERSTANDING (I.E. GROUNDWATER FLOW AND INTERIM MEASURES OPERATION).
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3. RELATIVE UNDERSTANDING OF PRE–2013 CONCENTRATIONS (GRAY) WAS USED TO DEVELOP THE OVERALL PLUME GEOMETRY IN THE VICINITY OF THESE WELLS.

LEGEND

- MONITORING WELL (LOWER AQUIFER)
- PIEZOMETER
- FIRE WELL
- PRODUCTION WELL CONVERTED TO MONITORING WELL (A, 34)
- INACTIVE PRODUCTION WELL
- MONTGOMERY COUNTY WELL (USED BY RACER TRUST AS A LOWER AQUIFER RECOVERY WELL)
- BORING LOCATION
- PRIVATE WELL
- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- <1.0 CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- ug/L MICROGRAMS PER LITER
- >100 ug/L
- 50–100 ug/L
- 5–50 ug/L

MCL	MAXIMUM CONTAMINANT LEVEL
<1.0	2019 CONCENTRATIONS
(<1.0)	2018–2013 CONCENTRATIONS
(<1.0)	PRE–2013 CONCENTRATIONS
BOLD	CONCENTRATION EXCEEDS MCL
*	DATA NOT USED FOR CONTOURING PURPOSES

SITE–SPECIFIC VOLATILE ORGANIC COMPOUNDS	MCL (ug/L)
1,1,1–Trichloroethane	**200**
1,1–Dichloroethane	**--**
1,1–Dichloroethene	**7**
Benzene	**5**
cis–1,2–Dichloroethene	**70**
Ethylbenzene	**700**
Tetrachloroethene	**5**
Toluene	**1000**
trans–1,2–Dichloroethene	**100**
Trichloroethene	**5**
Vinyl chloride	**2**
Xylene (total)	**10,000**

0 100 850ft

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ISOCONCENTRATION MAP (LOWER AQUIFER) TETRACHLOROETHENE - 2019

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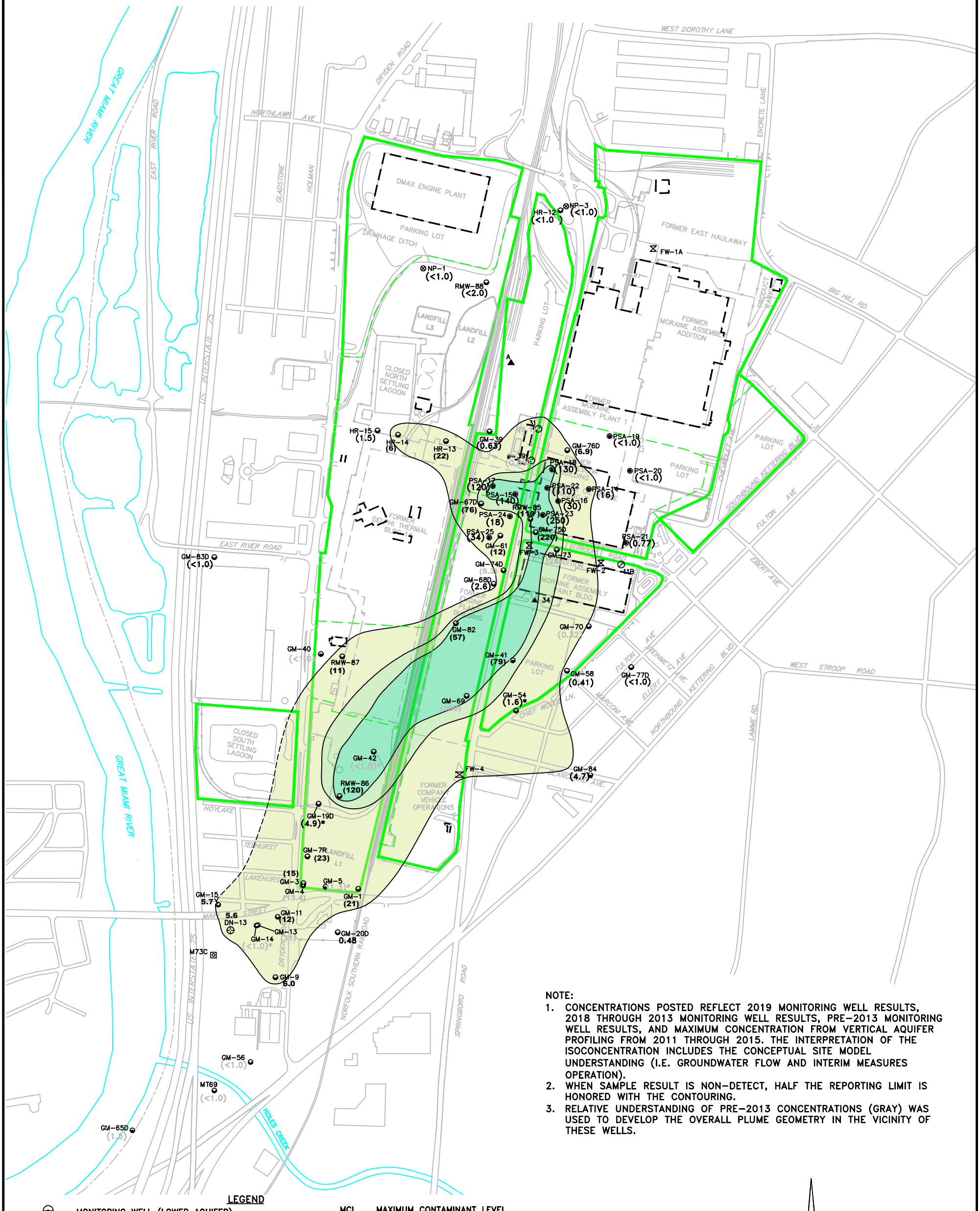
FIGURE 5

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
C:\Users\bsmith\BIM 360\Arcadis\ANA - RACER TRUST\Project Files\RACER MORAINE OH\MORAINE OH 2020 ACTIVITIES\30018090\01-DWG\ANN294-03C-2019-PLUMES-LOWER.dwg LAYOUT: TCE 2019 SAVED: 2/6/2020 3:20 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ACAD.CTB PLOTTED: 2/10/2020 1:42 PM BY: SMITH, BOB



NOTE:

1. CONCENTRATIONS POSTED REFLECT 2019 MONITORING WELL RESULTS, 2018 THROUGH 2013 MONITORING WELL RESULTS, PRE–2013 MONITORING WELL RESULTS, AND MAXIMUM CONCENTRATION FROM VERTICAL AQUIFER PROFILING FROM 2011 THROUGH 2015. THE INTERPRETATION OF THE ISOCONCENTRATION INCLUDES THE CONCEPTUAL SITE MODEL UNDERSTANDING (I.E. GROUNDWATER FLOW AND INTERIM MEASURES OPERATION).
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LEGEND

- MONITORING WELL (LOWER AQUIFER)
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- FIRE WELL
- PRODUCTION WELL CONVERTED TO MONITORING WELL (A, 34)
- INACTIVE PRODUCTION WELL
- MONTGOMERY COUNTY WELL (USED BY RACER TRUST AS A LOWER AQUIFER RECOVERY WELL)
- BORING LOCATION
- PRIVATE WELL
- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- <1.0 CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- ug/L MICROGRAMS PER LITER
- >100 ug/L
- 50–100 ug/L
- 5–50 ug/L

MCL	MAXIMUM CONTAMINANT LEVEL
<1.0	2019 CONCENTRATIONS
(<1.0)	2018–2013 CONCENTRATIONS
(<1.0)	PRE–2013 CONCENTRATIONS
BOLD	CONCENTRATION EXCEEDS MCL
*	DATA NOT USED FOR CONTOURING PURPOSES

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Ethylbenzene	**700**
Tetrachloroethene	**5**
Toluene	**1000**
trans–1,2–Dichloroethene	**100**
Trichloroethene	**5**
Vinyl chloride	**2**
Xylene (total)	**10,000**

0 100 850ft

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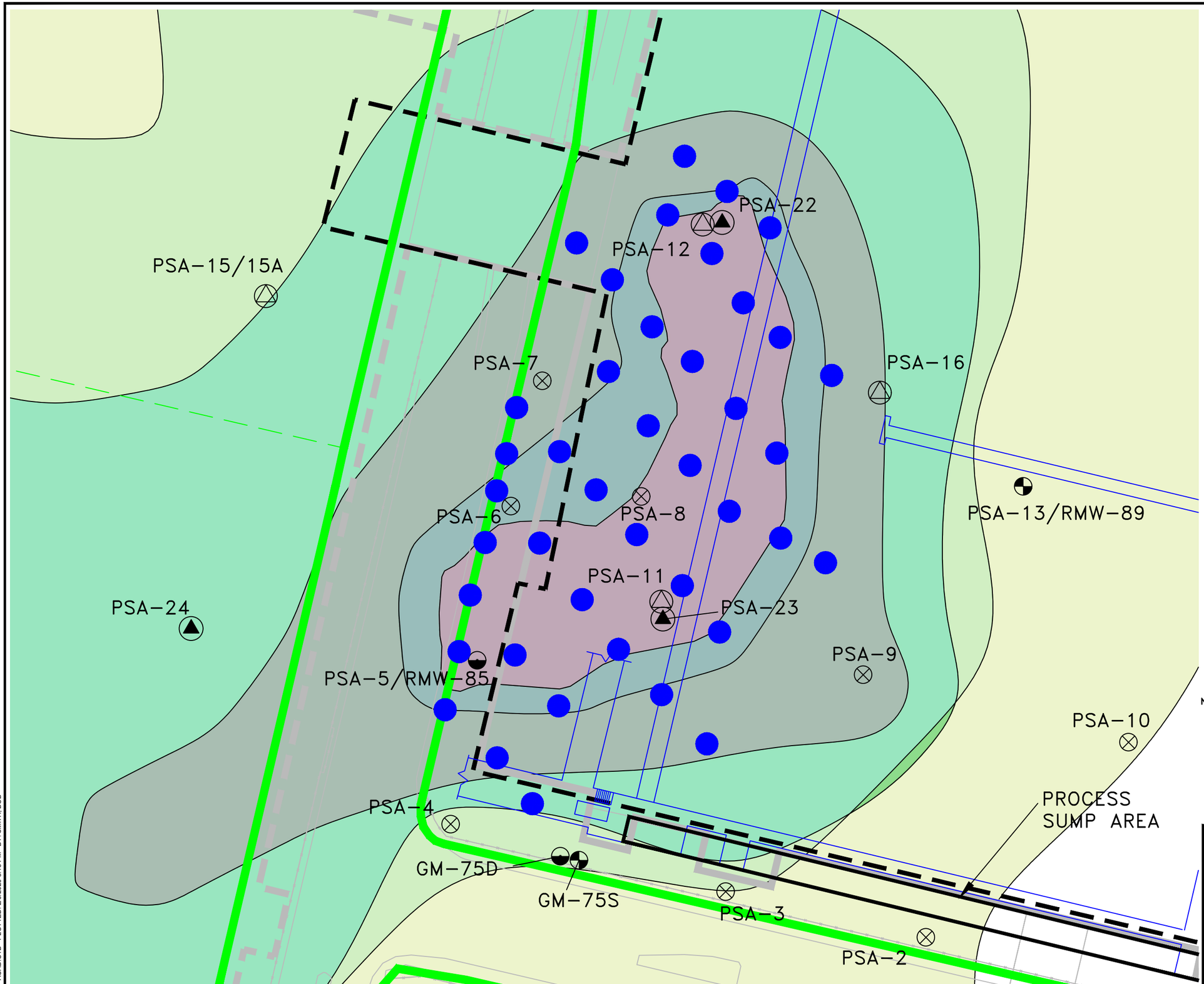
ISOCONCENTRATION MAP (LOWER AQUIFER) TRICHLOROETHENE - 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6



N

0 30 60 FT

LEGEND

- PROPERTY BOUNDARY (SOURCE: MONTGOMERY COUNTY AUDITOR'S WEBSITE, FEBRUARY 2015)
- PARCEL BOUNDARY (SOURCE: MONTGOMERY COUNTY AUDITOR'S WEBSITE, FEBRUARY 2015)
- UNDERGROUND TUNNEL
- BORING COMPLETED IN 2015
- BORING COMPLETED IN 2014
- PRE-DESIGN INVESTIGATION BORING LOCATION
- UPPER AQUIFER MONITORING WELL
- LOWER AQUIFER MONITORING WELL
- PROPOSED INJECTION WELL LOCATION
- CURRENT BUILDING FOOTPRINT

CVOCs CHLORINATED VOLATILE ORGANIC COMPOUNDS
ug/L MICROGRAMS PER LITER

- >10,000 ug/L
- 5,000-10,000 ug/L
- 1,000-5,000 ug/L
- 100-1,000 ug/L
- 50-100 ug/L
- 5-50 ug/L

NOTE: PLUME SHOWN REPRESENTS CONCENTRATIONS OF TOTAL CVOCs IN THE UPPER AQUIFER (2015).

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2020 CORRECTIVE MEASURES PROPOSAL ADDENDUM

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PROPOSED SOURCE AREA TREATMENT CONCEPTUAL LAYOUT

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

APPENDIX A

Groundwater Flow and Solute Transport Model Report

ARCADIS Design & Consultancy for natural and built assets

Revitalizing Auto Communities Environmental Response Trust (RACER Trust)

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL REPORT

RACER Trust Moraine Facilities

February 13, 2020

GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL REPORT

RACER Trust Moraine Facilities

Prepared for:

RACER Trust

Prepared by:

Arcadis U.S., Inc.

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Suite 230

Columbus

Ohio 43235-1447

Tel 614 985 9100

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Our Ref.:

30042873.0001

Date:

February 13, 2020

CONTENTS

TABLES

FIGURES

1 GROUNDWATER FLOW MODEL UPDATE

This report summarizes the updates made to the existing groundwater flow model (Model) for the RACER Trust Moraine Facilities located in Moraine, Ohio (Site). These updates were based on a review of the existing Model as compared to applicable new data from the conceptual site model (CSM). Review of the existing Model developed by Arcadis (2008) relative to recent water-level data collected from the Site indicated that some boundary conditions, the distribution of upper and regional clay till, the hydraulic conductivity, applied recharge, and the Model grid required adjustment to better represent groundwater flow conditions at the Site. This Model was used to demonstrate compliance with the applicable off-site groundwater corrective measures objectives (CMOs). Specifically, this Model indicates that potential receptors downgradient of the lower aquifer (LA) plume will not be exposed to unacceptable groundwater concentrations. Further, this Model indicates that the Phase 1 Dynamic Groundwater Recirculation (DGR™) interim measure will successfully mitigate potential risk to off-site receptors based on exposure to groundwater in the upper aquifer (UA) by hydraulically controlling the UA groundwater plume.

1.1 Conceptual Site Model

The comprehensive CSM was presented in the 2012 Corrective Measures Proposal (CMP; Arcadis Inc., 2012) that includes specifics on (1) site characteristics; (2) regional to local geology, hydrogeology, and regional pumping, and groundwater flow; (3) site-specific assessment (three-dimensional data analysis and detailed hydrostratigraphy); (4) hydrogeologic characteristics and parameters; (5) site-specific volatile organic compound (VOC) source area(s) and site-wide dissolved-phase plume understanding; and (6) risk assessment. Additional area specific CSMs for the former Process Sump Area (PSA) were presented in 2015 and 2016, facilitating the improved understanding of the Site geology, hydrogeology, and distribution of site-specific VOCs (Arcadis Inc., 2015 and 2016). Current information on the site-wide dissolved-phase VOC plume was based on the 2019 groundwater data. In addition, current information was included for precipitation from the National Oceanic and Atmospheric Administration (NOAA) and for groundwater use (regional pumping) from the Ohio Department of Natural Resources (ODNR).

Pilot testing was completed in 2017 for the Phase 1 DGR™ interim measure to address groundwater VOC concentrations within the River Plat neighborhood (Arcadis Inc., 2017). The pilot test objectives were to determine upper aquifer extraction and injection influence, capacity from the newly designed system wells, and refinement of area-specific upper aquifer hydraulic parameters. The results from the pilot test were included in the Model update (Arcadis Inc., 2018).

1.2 Hydrogeology

The groundwater flow system resides within the glacial buried valley complex of the Great Miami River valley. The Site hydrogeology can be divided into three main hydrostratigraphic units: UA, regional clay till (RCT), and LA. Two of these units are principle aquifers: UA and LA. The UA and LA consist of glacial outwash sand and gravel deposits (sand and gravel facies) and an area of the UA near the former Moraine Assembly and former PSA located in the northeastern portion of the Site consists of interbedded finer grained units within the sand and gravel (interbedded facies).

The UA has an approximate average saturated thickness of 30 feet. The upper clay till (UCT) and RCT units act as aquitards that transmit water at relatively low rates. The UCT and RCT were fully to partially eroded during the deposition of the UA, resulting in the discontinuous distribution of the UCT (primarily located east of the railroad). The RCT is distributed across the Site with some thinner areas near the former Moraine Assembly. Southwest and northeast of the Site, portions of the RCT have been eroded allowing direct communication between aquifers (Spieker, 1968 and Arcadis Inc., 2012). The RCT was also further characterized in 2019 for a Montgomery County sewer installation project. Borings and monitoring wells were installed in the vicinity of the Moraine Airpark and Great Miami River downgradient of the Site and till distribution information was used in the Model update (Montgomery County 2019).

The LA is mostly uniform sand or sand and gravel that underlies the RCT with thickness ranging from a few feet along the valley walls to greater than 200 feet in the central part of the valley. The base of the valley and valley walls are comprised of low permeability Ordovician shales and limestones of the Richmond Group (Slucher et al. 2006).

1.3 Model Code Selection and Description

The numerical code selected for this model was MODFLOW (McDonald and Harbaugh, 1988). The MODFLOW code was selected because it is widely used in both academia and industry, is familiar to and accepted by regulatory agencies, and has the flexibility to simulate the hydrologic and hydrogeologic stresses with boundary conditions.

MODFLOW simulates transient, three-dimensional groundwater flow through porous media described by the following partial differential equation for a constant density fluid (Freeze and Cherry, 1979):

$$\frac{\partial}{\partial x}\left(K_{xx}\frac{\partial h}{\partial x}\right)+\frac{\partial}{\partial y}\left(K_{yy}\frac{\partial h}{\partial y}\right)+\frac{\partial}{\partial z}\left(K_{zz}\frac{\partial h}{\partial z}\right)-W=S_s\frac{\partial h}{\partial t} \qquad (1)$$

where:

K_{xx}, K_{yy}, and K_{zz} are values of hydraulic conductivity along the x, y, and z coordinate axes, which are assumed to be parallel to the major axes of hydraulic conductivity [L/T]

h is the potentiometric head [L]

W is a volumetric flux and represents sources and/or sinks of water [1/T]

S_s is the specific storage of the porous material [1/L]

t is time [T]

In Equation 1, the hydraulic parameters (i.e., K_{xx}, K_{yy}, K_{zz}, and S_s) may vary in space but not in time, while the source/sink (W) terms may vary both in space and time. The Preconditioned Conjugate Gradient (PCG) solver (Hill, 1990) was used to solve the groundwater flow equation within MODFLOW.

1.4 Model Construction

The previous Model finite-difference grid was oriented due north, approximately parallel to the primary direction of groundwater flow, the Great Miami River, and the buried valley. The Model structure was

composed of five layers. Model layers 1 and 2 represent the UA and the RCT, respectively. The LA was divided into 3 separate model layers due to the thickness. The updated Model maintains the same north-south grid orientation; however, the number of rows and columns of the grid were increased to accurately incorporate the geologic data (elevations and thicknesses of hydrostratigraphic units) collected during investigations since 2008, representation of the details of the evaluated remediation systems, and to incorporate the current site-wide dissolved-phase VOC plume distribution. The updated finite-difference grid consists of 623 columns, 653 rows, and 5 layers for a total of 2,034,095 model cells (**Figure 2**). The updated model is significantly more detailed than the 2008 model which was composed of 282 columns, 301 rows, and 5 layers for a total of 424,410 model cells.

1.5 Boundary Conditions

Boundary conditions in the existing model included constant head boundaries (representing inflow/outflow), river boundaries (representing the Great Miami River, retention basins, ponds, and tributaries), no flow boundaries (bedrock), and regional pumping wells. The boundary conditions are presented on **Figure 3**. These boundary conditions were retained from the existing Model with updates from the current CSM and regional information. The no-flow boundary condition used to represent the limits of the bedrock valley was updated based on bedrock depth data from the Ohio Division of Geological Survey (2003) and adjusted with Site data points for bedrock depth. The river and constant head boundaries were updated using surface elevations obtained from the United States Geological Survey (USGS). Changes to the river and no-flow boundaries were also made to accommodate the refined finite-difference grid. River cell conductance was updated to accommodate the refined finite-difference grid, with conductance values for the Great Miami River ranging from 31.25 to 5,000 square feet per day (ft^2/day). The 2008 Model used conductance values ranging from 20 to 500 ft^2/day. Regional pumping rates obtained from the ODNR for regional groundwater pumping wells were updated from 2018 to align with most current Site conditions (**Table 1**).

1.6 Hydraulic Parameters

The hydraulic conductivity zones in the Model were refined based on collected data presented in the CMP and the Phase 1 DGR™ pilot test results and depths of the RCT (Arcadis Inc., 2012 and 2018). The UCT distribution was also updated, and in areas where the depth extends into the UA saturation, the Model was refined to reflect a local reduction of the UA transmissivity (**Figure 4**). The data were incorporated in the Model by spatially varying the hydraulic conductivity. The updated hydraulic conductivity values in the model are presented on **Figure 5**. The recharge distribution was simplified from two zones in the original Model, to a single recharge zone of 7.7 inches per year which represents 18.3% of the average annual precipitation of 42 inches per year recorded between 2013 and 2017 (NOAA, 2018).

1.7 Model Calibration

Calibration of a groundwater flow model refers to the iterative process of systematically adjusting the model boundary conditions and input parameters within a justifiable and generally accepted range of values to obtain as close a match between observed and simulated water-levels. The generally accepted process for comparison of simulated and observed water levels is summarized in ASTM Standard D-

5490-93 (ASTM, 1994), utilizing the concept of residuals (the differences between simulated and observed water levels).

The residuals are evaluated using standard statistical measures; residual sum-of-squares (RSS), variance, and mean. The standard deviation (the square root of the variance) is the median error and needs to be relatively small compared to the range in observed data. A well calibrated model will reproduce observed water levels with a maximum median error of less than 10% of the difference between the largest and smallest observed water-level (Anderson and Woessner, 1992).

The updated Model was calibrated to groundwater water-level data at 144 Site and regional locations representing average 2012 through 2015 conditions. The updated model was calibrated assuming steady-state conditions. The average water-levels from 2012 to 2015 used for model calibration are summarized in **Table 2**. The regional simulated UA groundwater elevation contour map is shown on **Figure 6**. A plot of observed versus simulated groundwater elevations for the 144 calibration targets is presented on **Figure 7**.

The calibration statistics for the Model indicate a good match between simulated and measured groundwater elevations. The residual mean, residual standard deviation, and RSS were calculated to be -0.13 feet, 0.44 feet, and 30.07 square feet (ft^2), respectively. The residual mean is close to zero and the residual standard deviation is less than 5% of the range in observed water levels. Simulated water level contours and residuals for each target are plotted by layer on **Figure 8** for layers 1 (UA), 3 and 4 (both LA). There are no targets in the RCT (layer 2) or at the bottom of the LA (layer 5). **Figure 8** indicates that the residuals are unbiased with positive and negative residuals relatively balanced throughout the Site. These statistics and observations indicate that the calibrated Model can be used as a critical tool for the evaluation of Site groundwater flow under different stress scenarios including remediation design.

2 SOLUTE TRANSPORT MODEL

In order to evaluate the potential impacts to regional pumping wells, a solute transport model was run to evaluate the fate and transport of the tetrachloroethene (PCE) and trichloroethene (TCE) groundwater plumes. The dissolved-phase PCE and TCE comprise site-specific VOC concentrations. The TCE plume has a greater magnitude of groundwater concentrations and spatial extent. Based on this, the TCE plume has a greater risk to potential downgradient receptors as compared to PCE.

2.1 Code Selection and Description

The solute transport modeling was performed using the modular three-dimensional transport model referred to as MT3D that was originally developed by Zheng (1990). The MT3D code uses the flows computed by MODFLOW in its transport calculations. MT3D also uses the same finite-difference grid structure and boundary conditions as MODFLOW, simplifying the effort to construct the solute transport model. MT3D is regularly updated (Zheng and Wang 1999), and the most recent version is referred to in the literature as MT3DMS, where MS denotes the Multi-Species structure for accommodating add-on reaction packages. MT3DMS has a comprehensive set of options and capabilities for simulating advection, dispersion/diffusion, and chemical reactions of contaminants in groundwater flow systems under a range of hydrogeologic conditions. Recent updates to MT3DMS have included the dual-domain formulation and the ability to incorporate site-specific processes.

The major inputs to MT3DMS for the modeling assessment are as follows:

- Mobile and Immobile Porosity: affecting the groundwater flow velocity and solute storage
- Mass Transfer Coefficient: affecting the exchange of mass between mobile and immobile portions of the aquifer
- Partition Coefficient: affecting the adsorption of PCE and TCE to soil particles
- Degradation Rate: reductive dechlorination of PCE and TCE in targeted interim measure in-situ remediation zones
- Initial Groundwater Concentrations: affecting the overall distribution and concentration of PCE and TCE

2.2 Mobile and Immobile Porosity

The mobile porosity is that fraction of the aquifer through which most of the groundwater is moving. While often conceptualized as solely a pore-scale concept, it also represents aquifer-scale behavior driven by hydraulic conductivity contrasts in different portions of the aquifer matrix. The immobile porosity is the remaining portion of the void space, where groundwater flows much slower or not at all, and the void space is primarily a storage reservoir for dissolved mass. Solute mass is exchanged between mobile and immobile portions of the aquifer by diffusion. This conceptualization of solute transport is the dual-domain formulation and is often referred to as advection-diffusion. There is extensive literature on the dual-domain model (Gillham et al. 1984; Molz et al. 2006; Flach et al. 2004; Harvey and Gorelick 2000; Feehley et al. 2000; Julian et al. 2001; Zheng and Bennet 2002) and it is generally considered the most accurate approach for simulating solute transport.

The total (combination of mobile and immobile) porosity of the aquifer is controlled by grain sizes, sorting, and post-depositional consolidation processes. The total porosity utilized in the solute transport model was 30%, with 10% attributed to the mobile fraction, and 20% attributed to the immobile fraction.

2.3 Mass Transfer Coefficient

An estimated mass transfer coefficient (MTC) value of 1.0×10^{-3} per day was utilized for all Model layers in the solute transport model. This MTC was developed based on a range of literature values and models of similar dimensions and aquifer properties (Gillham et al. 1984; Molz et al. 2006; Flach et al. 2004; Harvey and Gorelick, 2000; Feehley et al. 2000; Julian et al. 2001). The developed solute transport model was run with initialized current plumes to determine if the selected MTC produced reasonable results with the constituent distribution currently observed. It was recognized that variations in historic plume interpretations were not just a function of plume movement, but also improved delineation of the plume that developed over time as investigative data and the monitoring well network density evolved. The current plume interpretation is based on a much more advanced understanding of dissolved-phase VOC distribution from vertical aquifer profiling and increased number of monitoring wells. The MTC value for the solute transport model was systematically adjusted between 1.0×10^{-05} per day and 1.0 per day, and small-scale and short-term plume movements were evaluated until the solute transport model produced reasonable plume movement.

2.4 Sorption

The retardation factor (R_f) is used by the solute transport model to represent the amount of adsorption of a constituent from the dissolved or solute phase. The retardation factor used for PCE and TCE is based on the linear sorption isotherm and is calculated in MT3D using the bulk density (ρ_b), the total porosity (n) of the aquifer material, soil organic carbon-water partitioning coefficient (K_{oc}), and fraction of organic carbon (f_{oc}), according to the following equation:

$$R_f = 1 + \frac{\rho_b (K_{oc} * f_{oc})}{n}$$

The estimated total porosity of 30% yields a bulk density of 1.86 kilograms per liter (kg/L). The chemical specific K_{oc} values of 95 L/kg and 61 L/kg (U.S. EPA 2019) were used for PCE and TCE, respectively. The average site-specific f_{oc} value is 0.1%. These parameters yield retardation factors of 1.6 and 1.4 for PCE and TCE, respectively.

Elevated retardation factors for both PCE and TCE were simulated in the defined, upper aquifer source area to reflect the recalcitrant PCE and TCE groundwater concentrations that have been observed over time to allow for a persistent source.

2.5 Degradation

For portions of the plume where in-situ reactive zones are present in the upper aquifer (i.e., IRZ-1, IRZ-3 West and IRZ-4 East), discrete degradation zones were simulated. Although the reactive zones were shut down in 2017, conditions conducive to enhanced degradation is expected to persist. Based on pilot testing completed for the source area, a representative 30-day half-life was simulated for both PCE and TCE. No regional degradation of PCE or TCE was simulated in the solute transport model.

2.6 Initial Plumes

The initial PCE and TCE groundwater concentration distributions in the UA and LA were based on PCE and TCE data collected through 2019. The initialized PCE and TCE distributions are the same in both the mobile and immobile portions of the aquifers and are presented in **Figure 9**.

The selected solute transport model parameters were qualitatively calibrated to the understanding of historic plume development and plume migration and indicate the solute transport model is consistent with the evolution of the PCE and TCE groundwater plumes. As additional data is collected under future pumping conditions, the groundwater flow and solute transport model will be updated to reflect observed hydraulic responses and plume migration to continue to improve the use of the groundwater flow and solute transport model as a tool.

3 PREDICTIVE MODELING SCENARIO

3.1 Hydraulic Capture Assessment

An initial groundwater flow and capture zone assessment was performed for the closest potential downgradient public water supply well-field (the City of West Carrollton Well Field) to determine the extent

of the hydraulic capture zone for these wells. The capture zone was delineated using MODALL, by utilizing the volumetric flux model MODular flow ALLocation (MODALL) program (Potter et al., 2008). MODALL uses the same MODFLOW-calculated cell-by-cell flow output as MODPATH (Pollock, 1989), but rather than tracking individual particle paths, it tracks the movement of groundwater in the Model. This approach, also described as the volumetric-tracking method, is described in detail by Barlow et al (2018). For the purpose of this analysis, the recent active pumping rates from ODNR and the Site were evaluated as shown in **Table 3**. The resultant hydraulic capture zone for the City of West Carrollton Well Field is shown in **Figure 10**. This analysis indicates that at the current average rate of pumping, the West Carrollton Well Field does not intercept the PCE or TCE plumes associated with the Site.

3.2 Solute Transport Modeling

To further verify that the PCE and TCE plumes do not pose a risk to the City of West Carrollton Well Field or any other regional pumping wells, the solute transport model was run for a period of 10 years. This run assumes continued operation of the current regional pumping wells, the UA interim measure Phase 1 DGR™ system injection and extraction wells, and the interim measure LA extraction well DN-13 as summarized in **Table 3**. Given the variables associated with a phased approach for source remedy implementation and the timing of remedy implementation, this model conservatively assumes no treatment of the source area

The solute transport model simulation results for both PCE and TCE in the upper and lower aquifers for years 2, 5, and 10 are shown in **Figures 11, 12, and 13**, respectively.

As shown for the UA, the low concentration leading edges of the PCE and TCE plumes extend westward under the Great Miami River during the first 2 years. After year 2, both PCE and TCE plumes downgradient migration within the UA halts and retraction begins (**Figure 11**). By year 5, the Phase 1 DGR™ system has successfully contained the downgradient extents of the PCE and TCE plumes in the UA, and the groundwater quality within the area of the River Plat neighborhood downgradient has been restored (**Figure 12**). By year 10, both the PCE and TCE plumes in the UA are still hydraulically controlled and the Phase 1 DGR™ continues to reduce mass as there is no assumed source area treatment in this scenario (**Figure 13**). At no point in the simulated transport do the PCE and TCE plumes in the UA impact or are within vicinity of any of the regional wells.

In the LA, by year 2, the leading edge of the PCE plume approaches remediation well DN-13 and a small portion of the PCE plume from the UA has vertical migration to the LA within an erosional area of the RCT in the vicinity of the Great Miami River (**Figure 11**), although this small portion of the plume does not extend further. By year 2, the TCE plume slightly retracts in the vicinity of DN-13 (**Figure 11**). After 5 years of simulated transport, both the PCE and TCE plumes do not extend past DN-13 (**Figure 12**). By year 10, both the PCE and TCE plumes remain east of the Great Miami River (**Figure 13**). A portion of the TCE plume northwest of DN-13 extends slightly beyond DN-13. Similar to the UA results, at no point in the simulated transport do the PCE and TCE plumes in the LA impact or are within vicinity of any of the regional wells.

4 SUMMARY AND CONCLUSIONS

As stated above, this Model indicates that potential receptors downgradient of the LA plume will not be exposed to unacceptable groundwater concentrations. Further, this Model indicates that the Phase 1 DGR™ interim measure will successfully mitigate potential risk to off-site receptors based on exposure to groundwater in the UA by hydraulically controlling the UA groundwater plume.

The revised groundwater flow model with solute transport components was used to simulate future conditions of capture and migration of PCE and TCE in the UA and LA. The groundwater flow model is well-calibrated given the residual distribution and overall residual statistics, as well as qualitatively comparing to observed water-levels. This calibration indicates the groundwater flow model is a reasonable tool to use for understanding current conditions and as a predictive tool to evaluate future scenarios. Both the hydraulic capture analysis using MODALL and the solute transport analysis of PCE and TCE using MT3DMS indicate that regional wells in the vicinity of the Site, most notably the City of West Carrollton Well Field, are not at risk of being impacted by the dissolved-phase PCE and TCE plumes in both aquifers. The solute transport model also indicates that the Phase 1 DGR™ system successfully hydraulically controls the PCE and TCE plumes in the UA and restores the groundwater quality to downgradient River Plat neighborhood within a 5-year period. In the LA, the PCE and TCE plumes do not migrate under the Great Miami River after 10 years of simulated transport, and DN-13 provides adequate hydraulic control.

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TABLES

Table 1
Regional Pumping Wells
RACER Trust Moraine Facilities
Moraine, Ohio
Groundwater Flow Model Update

ARCADIS Design & Consultancy for natural and built assets

Extraction ODNR ID	Easting	Northing	Layer	2012-2015 Average Pumping Rate (gpm)
BarrettPaving-WestCarPlant	1,470,492	615,452	3, 4, 5	370
AppletonPapers	1,479,453	613,760	3, 4, 5	641
WestCarrolltonCityPWS	1,476,552	613,412	3, 4, 5	686
MoCo-GreaterMoraineSystem1	1,480,466	617,285	3, 4, 5	2,180
MoraineCoClub	1,490,483	618,105	3, 4, 5	48
PointWest	1,489,072	626,227	3, 4, 5	0
Miller-ValentineGr	1,483,270	629,373	3, 4, 5	1,033
MoCo-WestRegWWPlant	1,485,252	630,853	3, 4, 5	21
DPL-TaitElecGenStn	1,487,892	634,042	3, 4, 5	2
DN-13	1,482,252	619,198	3	621

Notes and Abbreviations

East and Northing are in feet, State Plane North American Datum of 1983, Ohio South
ODNR = Ohio Department of Natural Resources
ft = feet
gpm = gallons per minute
DN-13 = Montgomery County owned former public suppy well currently used by RACER Trust as an interim measure lower aquifer recovery well
Layers 3, 4, and 5 are Lower Aquifer
Pumping rates obtained from the ODNR

Table 2
Groundwater Targets and Residuals
RACER Trust Moraine Facilities
Moraine, Ohio
Groundwater Flow Model Update

ARCADIS Design & Consultancy for natural and built assets

Well ID	Easting	Northing	Layer	2012-2015 Average Observed Water Level (ft amsl)	Simulated Water Level (ft amsl)	Residual (ft)
W-1-N	1,483,947	625,116	1	709.27	709.68	-0.41
W-2-N	1,483,352	623,866	1	708.61	708.99	-0.38
W-3-N	1,483,607	623,696	1	708.62	708.98	-0.36
W-4-N	1,483,795	623,652	1	708.20	709.01	-0.81
HR-1	1,483,378	621,968	1	707.78	708.03	-0.25
HR-2	1,484,031	623,649	1	708.76	709.08	-0.32
HR-3	1,484,238	623,612	1	708.78	709.11	-0.33
HR-4	1,484,004	624,582	1	709.08	709.47	-0.40
HR-5	1,483,479	623,355	1	708.50	708.77	-0.27
HR-6	1,483,299	622,589	1	707.90	708.33	-0.43
HR-7	1,483,169	623,374	1	708.30	708.70	-0.40
HR-11	1,485,263	625,682	1	709.68	710.17	-0.49
HR-16	1,482,172	621,168	1	707.07	707.34	-0.28
HR-17	1,482,781	621,128	1	707.37	707.47	-0.10
W-1-S	1,482,990	621,396	1	707.60	707.64	-0.04
W-2-S	1,482,079	620,619	1	706.58	707.06	-0.49
W-3-S	1,482,167	620,461	1	706.66	707.00	-0.34
W-4-S	1,482,551	620,364	1	706.96	707.05	-0.09
GM-2	1,483,428	619,586	1	707.08	706.97	0.12
4S	1,483,130	619,578	1	706.78	706.85	-0.07
GM-6	1,482,931	619,628	1	706.32	706.80	-0.48
GM-8	1,482,966	619,866	1	706.52	706.94	-0.42
GM-10	1,482,668	618,763	1	706.27	706.22	0.05
GM-16	1,482,149	619,421	1	706.20	706.47	-0.27
GM-17	1,482,697	619,312	1	706.43	706.56	-0.13
GM-18	1,482,505	619,230	1	706.28	706.46	-0.18
GM-19S	1,483,017	620,340	1	707.18	707.18	0.01
GM-21	1,483,765	619,921	1	707.57	707.24	0.33
GM-22	1,484,227	620,840	1	708.05	707.76	0.28
GM-23	1,484,620	623,699	1	708.96	709.25	-0.29
GM-24	1,486,992	625,945	1	710.30	710.53	-0.23
GM-25	1,486,600	622,786	1	708.72	709.31	-0.59
GM-26	1,482,129	617,730	1	705.89	705.48	0.41
GM-27	1,484,631	623,697	1	708.99	709.25	-0.27
GM-28	1,484,437	623,392	1	708.79	709.06	-0.27
GM-29	1,484,535	623,534	1	709.74	709.15	0.59
GM-30	1,484,610	623,876	1	708.94	709.33	-0.39
GM-31	1,483,965	621,337	1	707.73	707.88	-0.15
GM-32	1,483,380	620,114	1	707.17	707.19	-0.03
GM-33	1,483,641	620,731	1	707.67	707.54	0.13
GM-34	1,483,650	620,730	1	707.11	707.54	-0.43
GM-35	1,483,276	620,275	1	707.11	707.23	-0.12
GM-36	1,483,301	620,383	1	707.24	707.28	-0.04
GM-37	1,483,456	620,407	1	707.49	707.34	0.14
GM-38	1,483,472	620,403	1	707.24	707.35	-0.11
GM-43	1,483,441	622,192	1	707.84	708.16	-0.32
GM-44	1,483,332	621,686	1	707.58	707.86	-0.28
GM-45	1,483,267	621,409	1	708.18	707.72	0.46
GM-46	1,484,777	623,394	1	709.47	709.15	0.32
GM-47	1,482,479	620,061	1	706.45	706.88	-0.44
GM-48	1,481,741	619,488	1	705.94	706.44	-0.50
GM-49	1,481,743	618,644	1	705.68	705.93	-0.26
GM-50	1,482,446	620,065	1	706.41	706.88	-0.46
GM-51	1,481,753	619,465	1	705.99	706.42	-0.43
GM-52	1,481,741	618,605	1	705.57	705.91	-0.34
GM-53	1,484,856	621,185	1	708.09	708.16	-0.06
GM-55	1,482,442	618,008	1	705.90	705.75	0.15
GM-57	1,482,132	617,724	1	705.72	705.48	0.24
GM-59	1,484,696	622,767	1	708.58	708.77	-0.19
GM-60	1,484,696	622,767	1	708.54	708.77	-0.24
GM-62	1,482,818	618,397	1	706.44	706.06	0.38
GM-63	1,482,671	620,288	1	706.71	707.05	-0.34
GM-64	1,482,666	620,289	1	706.67	707.05	-0.38
GM-65S	1,481,382	617,392	1	705.10	704.85	0.25
GM-66	1,484,092	622,780	1	708.33	708.62	-0.29
GM-67S	1,484,547	623,050	1	707.88	708.89	-1.01
GM-68S	1,484,653	622,326	1	708.22	708.57	-0.35
GM-71	1,485,206	622,640	1	708.72	708.85	-0.13

Table 2
Groundwater Targets and Residuals
RACER Trust Moraine Facilities
Moraine, Ohio
Groundwater Flow Model Update

ARCADIS Design & Consultancy for natural and built assets

Well ID	Easting	Northing	Layer	2012-2015 Average Observed Water Level (ft amsl)	Simulated Water Level (ft amsl)	Residual (ft)
GM-72	1,485,218	622,639	1	708.71	708.85	-0.14
GM-74S	1,484,734	622,445	1	708.56	708.65	-0.09
GM-75S	1,485,022	622,797	1	708.66	708.87	-0.21
GM-76S	1,485,297	623,545	1	709.18	709.36	-0.18
GM-77S	1,485,876	621,583	1	708.73	708.65	0.08
GM-78	1,483,036	618,258	1	706.47	706.12	0.35
GM-79	1,481,032	618,974	1	705.29	705.79	-0.50
GM-80	1,480,926	617,956	1	705.01	704.77	0.23
GM-81	1,480,921	617,939	1	704.96	704.76	0.21
EAST	1,483,674	620,546	1	707.58	707.47	0.10
WEST	1,483,299	620,510	1	707.41	707.34	0.07
WSU-17	1,482,899	619,558	1	706.18	706.75	-0.58
WSU-18	1,483,097	619,555	1	706.73	706.82	-0.09
WSU-19	1,482,880	619,737	1	704.91	706.84	-1.93
WSU-23	1,481,979	620,381	1	706.22	706.93	-0.71
WSU-24	1,483,169	619,124	1	706.78	706.63	0.15
TW-2	1,482,943	619,568	1	707.54	706.77	0.77
ME-2	1,484,015	621,327	1	707.18	707.89	-0.71
ME-3	1,483,970	621,288	1	707.63	707.86	-0.23
ME-4	1,483,952	621,321	1	707.69	707.87	-0.19
ME-6	1,484,057	621,707	1	707.64	708.09	-0.45
MW-4	1,478,050	619,035	1	701.21	703.15	-1.94
MW-5	1,478,958	618,790	1	702.94	703.93	-1.00
GM-1	1,483,422	619,571	3	706.82	706.57	0.25
GM-3	1,482,926	619,622	3	706.37	706.25	0.11
GM-5	1,483,127	619,589	3	706.51	706.38	0.12
GM-7R	1,482,962	619,864	3	706.84	706.40	0.44
GM-9	1,482,674	618,772	3	706.02	705.86	0.15
GM-11	1,482,694	619,319	3	706.01	705.90	0.11
GM-13	1,482,502	619,239	3	705.61	705.57	0.04
GM-15	1,482,157	619,428	3	705.37	705.47	-0.10
GM-20D	1,483,237	619,178	3	706.97	706.34	0.63
GM-39	1,484,609	623,706	3	708.95	709.16	-0.21
GM-41	1,484,818	621,636	3	708.21	708.26	-0.05
GM-54	1,484,849	621,182	3	708.21	708.05	0.16
GM-56	1,482,449	618,006	3	705.89	705.72	0.17
GM-58	1,485,309	621,542	3	708.53	708.43	0.09
GM-61	1,484,707	622,763	3	708.62	708.75	-0.13
GM-65D	1,481,380	617,390	3	705.08	704.77	0.31
GM-67D	1,484,533	623,054	3	708.67	708.83	-0.16
GM-68D	1,484,646	622,328	3	708.46	708.52	-0.06
GM-69	1,484,402	621,315	3	707.84	707.91	-0.07
GM-70	1,485,506	621,944	3	708.72	708.68	0.04
GM-73	1,485,217	622,636	3	709.11	708.87	0.24
GM-74D	1,484,736	622,450	3	708.51	708.62	-0.11
GM-75D	1,485,028	622,793	3	708.82	708.88	-0.06
GM-76D	1,485,312	623,535	3	709.44	709.29	0.15
GM-77D	1,485,889	621,574	3	708.78	708.66	0.12
RMW-85	1,484,978	622,914	3	708.86	708.92	-0.06
RMW-86	1,483,253	620,410	3	706.91	706.87	0.05
RMW-87	1,483,277	621,672	3	707.43	707.57	-0.14
RMW-88	1,484,581	625,052	3	709.62	709.78	-0.16
HR-12	1,485,250	625,702	3	709.67	710.18	-0.51
HR-13	1,484,215	623,617	3	708.85	708.99	-0.14
HR-14	1,483,782	623,675	3	708.65	708.88	-0.23
HR-15	1,483,596	623,713	3	708.50	708.84	-0.34
M73C	1,482,114	618,973	3	705.58	705.32	0.26
MT576M	1,487,799	622,940	3	710.58	709.62	0.96
MT596M	1,488,849	624,057	3	711.00	710.12	0.87
31	1,485,049	623,727	3	709.96	709.30	0.66
A	1,484,806	624,325	3	710.69	709.51	1.18
FW-1A	1,486,090	625,358	3	708.49	710.19	-1.71
FW-2	1,485,617	622,516	3	708.94	708.95	-0.01
FW-3	1,484,969	622,675	3	708.92	708.81	0.11
FW-4	1,484,338	620,605	3	707.54	707.53	0.01
MW-1	1,480,209	621,421	3	705.84	705.84	0.01
MW-9	1,478,734	617,171	3	702.16	703.40	-1.25
GM-4	1,482,923	619,603	4	706.35	706.24	0.11

Table 2
Groundwater Targets and Residuals
RACER Trust Moraine Facilities
Moraine, Ohio
Groundwater Flow Model Update

Well ID	Easting	Northing	Layer	2012-2015 Average Observed Water Level (ft amsl)	Simulated Water Level (ft amsl)	Residual (ft)
GM-14	1,482,516	619,244	4	705.59	705.65	-0.05
GM-19D	1,483,064	620,340	4	707.21	706.72	0.49
GM-40	1,483,085	621,694	4	707.20	707.49	-0.29
GM-42	1,483,563	620,810	4	707.06	707.24	-0.18
12A	1,485,913	622,838	4	708.60	709.17	-0.57
11B	1,485,800	622,501	4	709.10	709.00	0.10
34	1,485,018	622,178	4	708.56	708.60	-0.04
39	1,484,988	623,442	4	709.17	709.15	0.01

Residual Statistics	
Residual Mean (ft)	-0.128
Residual Std. Deviation (ft)	0.44
Sum of Squares (ft^2)	30.07
Number of Observations	144
Range in Observations (ft)	9.79
Scaled Residual Std. Deviation	4.48%

Notes and Abbreviations
East and Northing are in feet, State Plane North American Datum of 1983, Ohio South
ft = feet
gpm = gallons per minute
ft amsl = feet above mean sea level

date	RW-1	RW-2	RW-3	RW-4
Jan-13	31.2	66.4	75.4	31.8
Feb-13	31.3	62.6	73.1	30.8
Mar-13	31.7	77.8	72.7	31.3
Apr-13	32.3	70.2	65.7	32.4
May-13	31.7	66.1	60.8	32.3
Jun-13	31.4	76.9	78.6	30.9
Jul-13	31.2	74.9	82.6	31.3
Aug-13	33.6	82.5	81.2	31.6
Sep-13	31.3	78.4	79.4	31.3
Oct-13	34	75	78.5	31.8
Nov-13	30.4	81.2	76.5	30.3
Dec-13	30.8	78	77	30.3
Average	31.74167	74.16667	75.125	31.34167

Table 3
Current Regional Pumping Well and Remediation Well Pumping Rates
RACER Trust Moraine Facilities
Moraine, Ohio
Groundwater Flow Model Update

ARCADIS Design & Consultancy for natural and built assets

Well ID	Easting	Northing	Layer	Pumping Rate (gpm)	Source
BarrettPaving-WestCarPlant	1,470,492	615,452	3, 4, 5	45.2	2018 average, ODNR
AppletonPapers	1,479,453	613,760	3, 4, 5	83.5	2018 average, ODNR
WestCarrolltonCityPWS	1,476,552	613,412	3, 4, 5	829.6	2018 average, ODNR
MoCo-GreaterMoraineSystem1	1,480,466	617,285	3, 4, 5	0.0	Shutdown, Montgomery County*
MoraineCoClub	1,490,483	618,105	3, 4, 5	47.8	2018 average, ODNR
PointWest	1,489,072	626,227	3, 4, 5	0.0	2017 average, ODNR
Miller-ValentineGr	1,483,270	629,373	3, 4, 5	891.4	2018 average, ODNR
MoCo-WestRegWWPlant	1,485,252	630,853	3, 4, 5	26.7	2018 average, ODNR
DPL-TaitElecGenStn	1,487,892	634,042	3, 4, 5	12.5	2018 average, ODNR
DN-13	1,482,252	619,198	3	643.0	2019 average, Site Records
EW-1	1,482,283	620,644	1	92.0	
EW-2	1,482,500	620,645	1	86.0	
EW-3	1,482,721	620,646	1	79.0	
IW-1	1,482,239	620,405	1	46.5	
IW-2	1,482,502	620,370	1	46.5	
IW-3	1,482,637	620,367	1	86.0	
IW-4	1,482,785	620,353	1	80.0	

Notes and Abbreviations

East and Northing are in feet, State Plane North American Datum of 1983, Ohio South

ft = feet

gpm = gallons per minute

DN-13 = Montgomery County owned former public suppy well currently used by RACER Trust as an interim measure lower aquifer recovery well

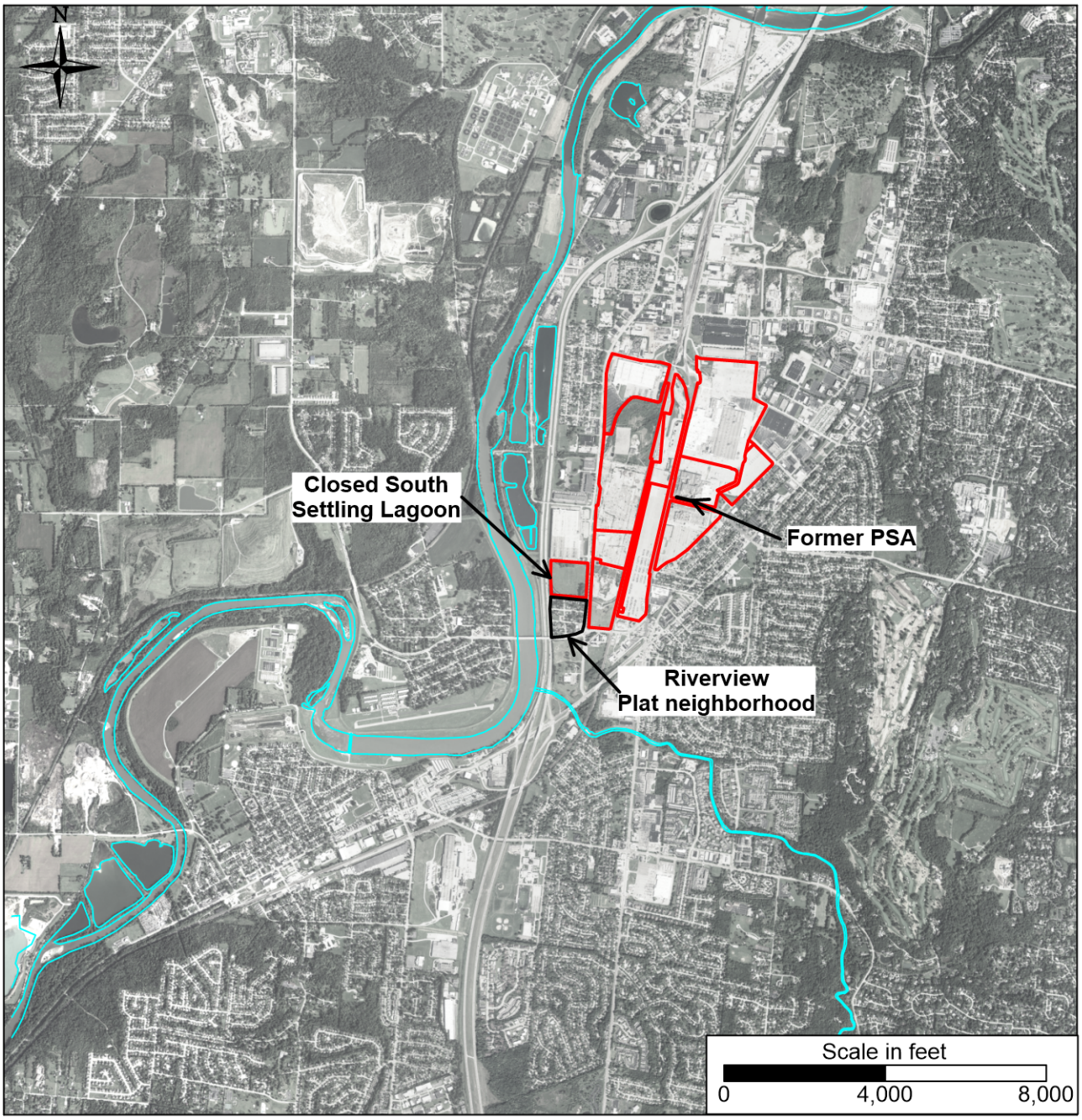
Phase I DGR^{TM} = interim measure EW and IW wells for upper aquifer

Layers 3, 4, and 5 are Lower Aquifer.

Ohio Department of Natural Resources (ODNR)

*The Miami Shores Well Field is currently understood to be inactive with no continuous pumping. Flow rates presented to the ODNR are assumed to be total flow from periodic maintenance activities for the well field over the year.

FIGURES



Legend

- Site Property Line
- Great Miami River, tributaries, and surface water features in the model.

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

SITE LOCATION

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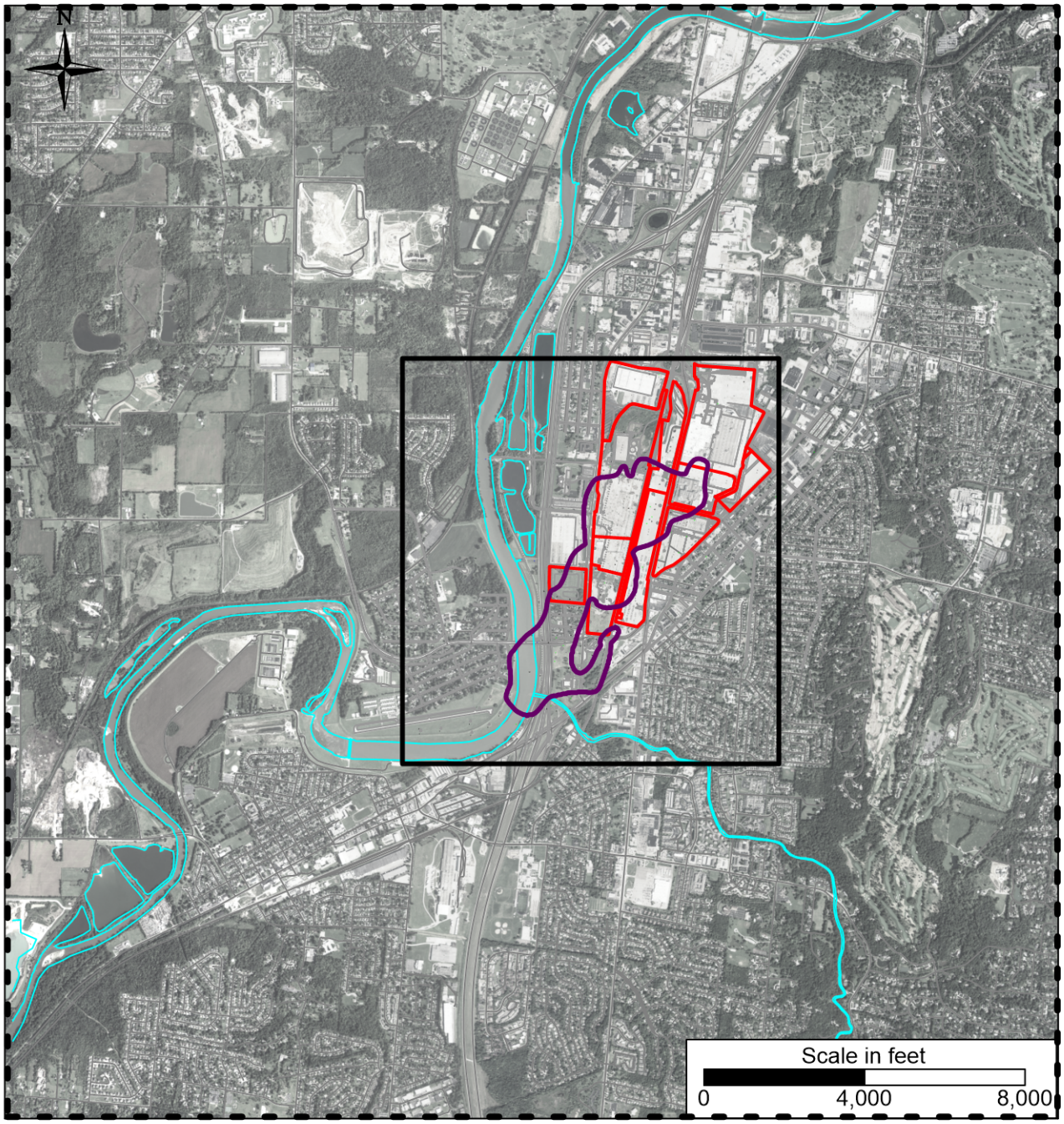
FIGURE
1



Legend

- Area of uniform 25 ft x 25 ft grid cells
- Model Extent
- Site Property Line
- Great Miami River, tributaries, and surface water features in the model
- Composite PCE/TCE Upper Aquifer Plume greater than 5 μg/L

Notes:

1. The grid cells expand to 100 ft x 100 ft at the model extents.
2. PCE - Tetrachloroethene
3. TCE - Trichloroethene
4. μg/L - micrograms per liter

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

MODEL GRID EXTENTS

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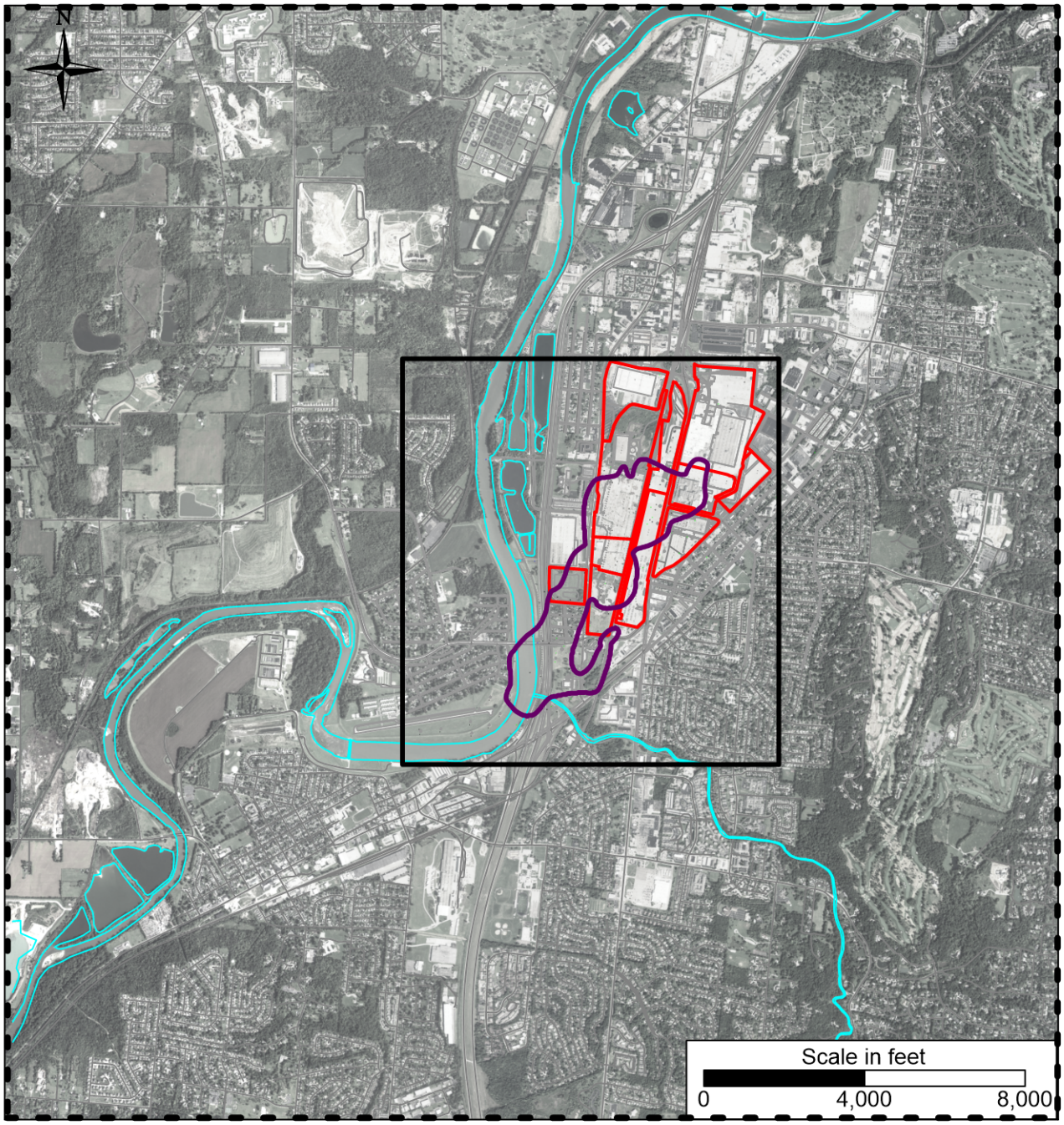
FIGURE
2



Legend

- Area of uniform 25 ft x 25 ft grid cells
- Model Extent
- Site Property Line
- Great Miami River, tributaries, and surface water features in the model
- Composite PCE/TCE Upper Aquifer Plume (2019) greater than 5 µg/L

Notes:

1. The grid cells expand to 100 ft x 100 ft at the model extents.
2. PCE - Tetrachloroethene
3. TCE - Trichloroethene
4. µg/L - micrograms per liter

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

MODEL GRID EXTENTS

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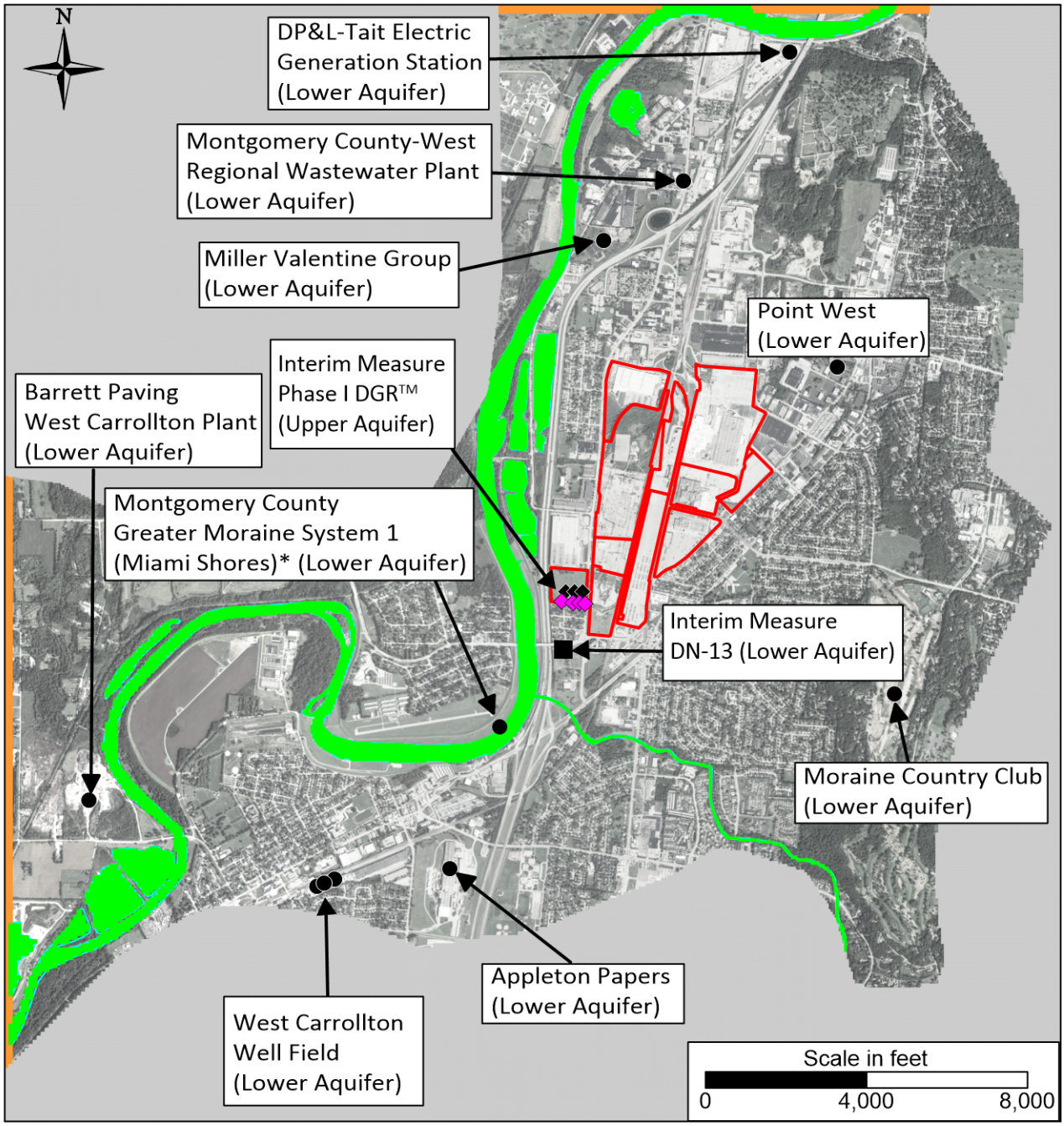
FIGURE
2



*The Miami Shores Well Field is currently understood to be inactive with no continuous pumping. Flow rates presented to the ODNR are assumed to be total flow from periodic maintenance activities for the well field over the year.

Legend

- Constant Head Boundary
- River Boundary
- No Flow Boundary
- Site Property Line
- Regional Extraction Well
- Phase I DGR Extraction Well
- Phase I DGR Injection Well
- Interim Measure DN-13 (lower aquifer)

Notes:

1. River boundaries are located in layer 1 only.
2. Regional Pumping Wells are summarized on Table 1.

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

BOUNDARY CONDITIONS

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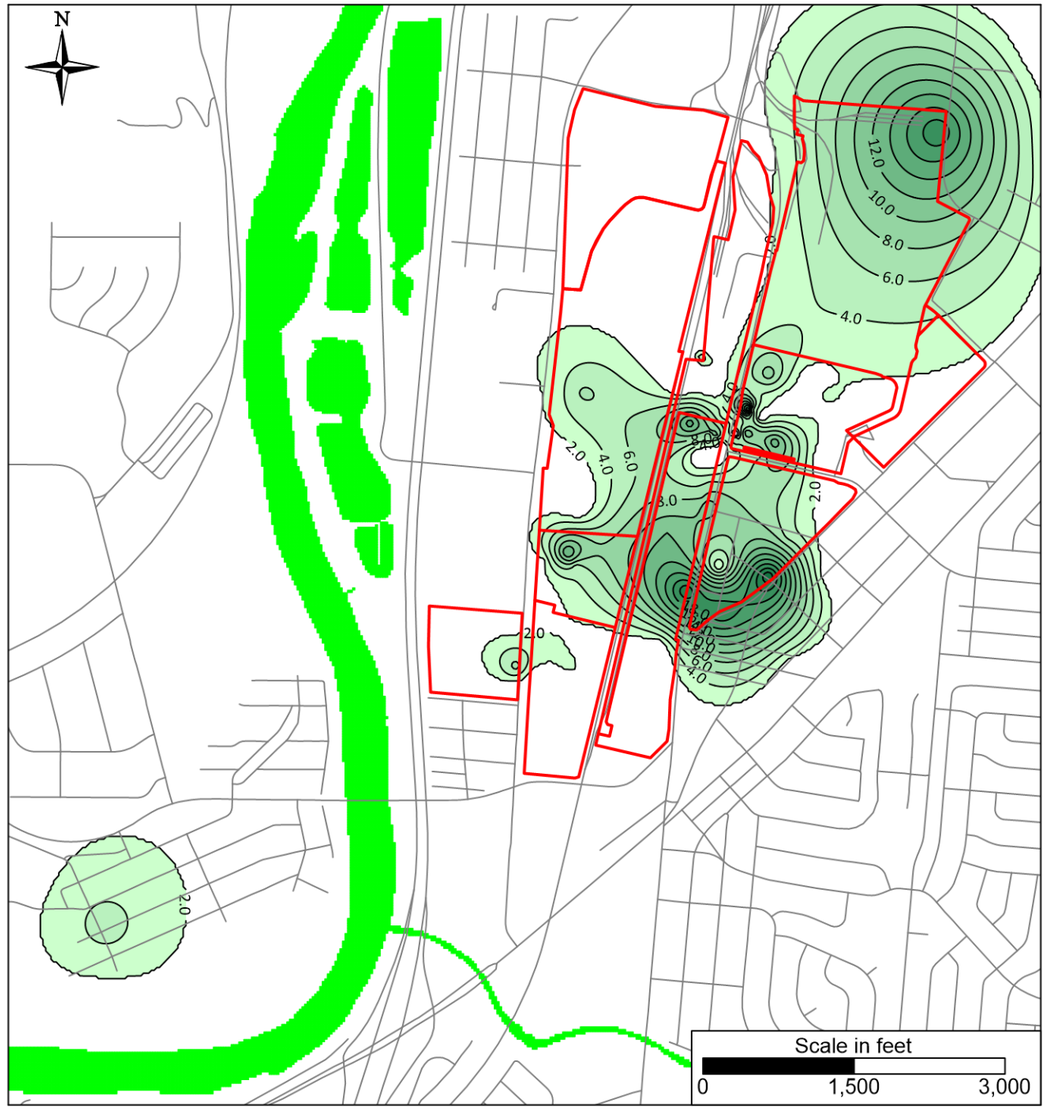
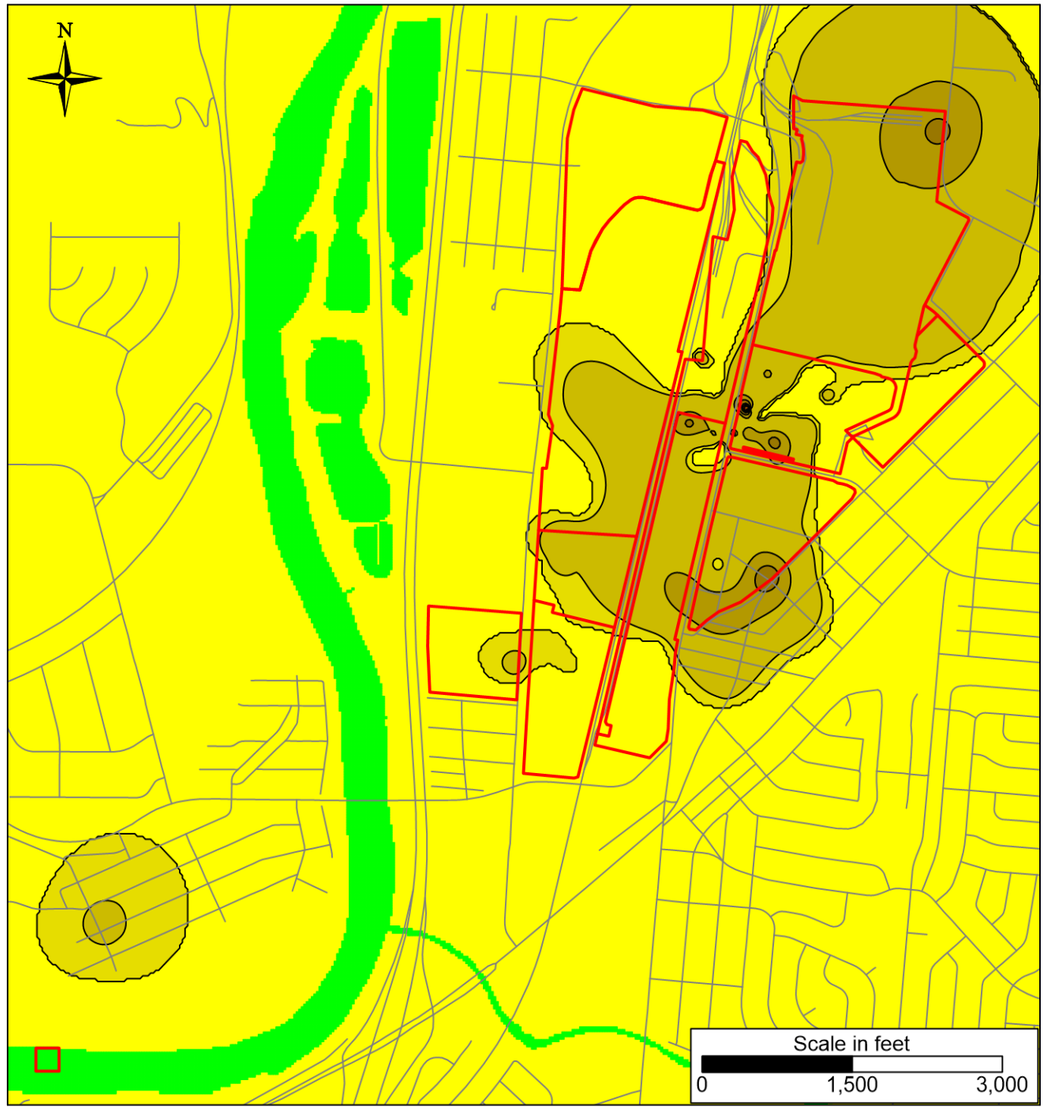
FIGURE 3

Upper Clay Till Thickness (ft)



Layer 1 (Upper Aquifer) Hydraulic Conductivity Distribution



Legend

Upper Clay Till Thickness (ft)

0 2 4 6 8 10 12 14 16 18 20 22 24

River Boundary

Site Property Line

Hydraulic Conductivity (ft/day)

100 250 400 500 750 1,000 1,500 1,700

Notes:
1. Hydraulic conductivity in the area of upper clay till reflects a reduction in upper aquifer saturated thickness.
2. ft/day = feet per day

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

UPPER CLAY TILL THICKNESS AND LAYER 1 HYDRAULIC CONDUCTIVITY DISTRIBUTION

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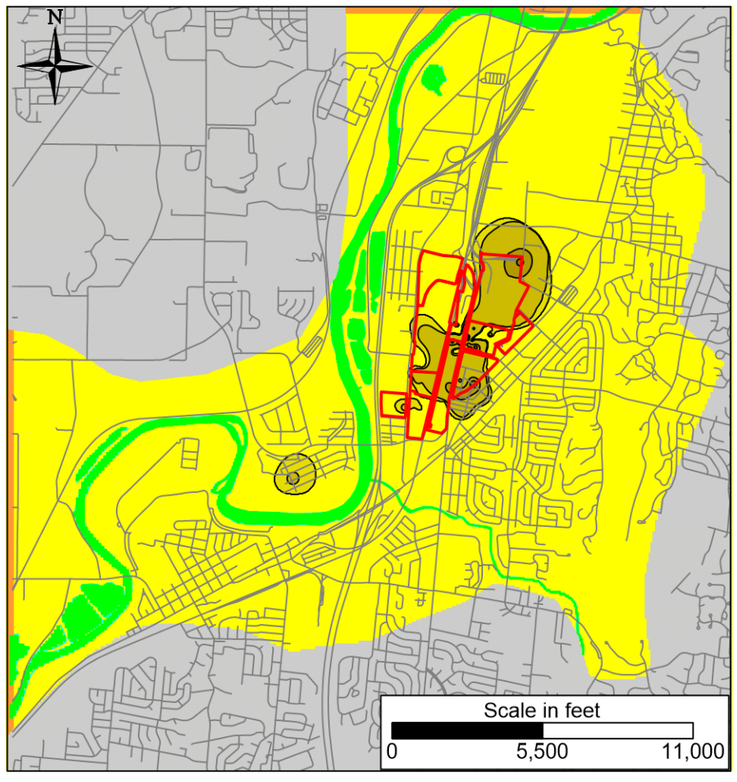
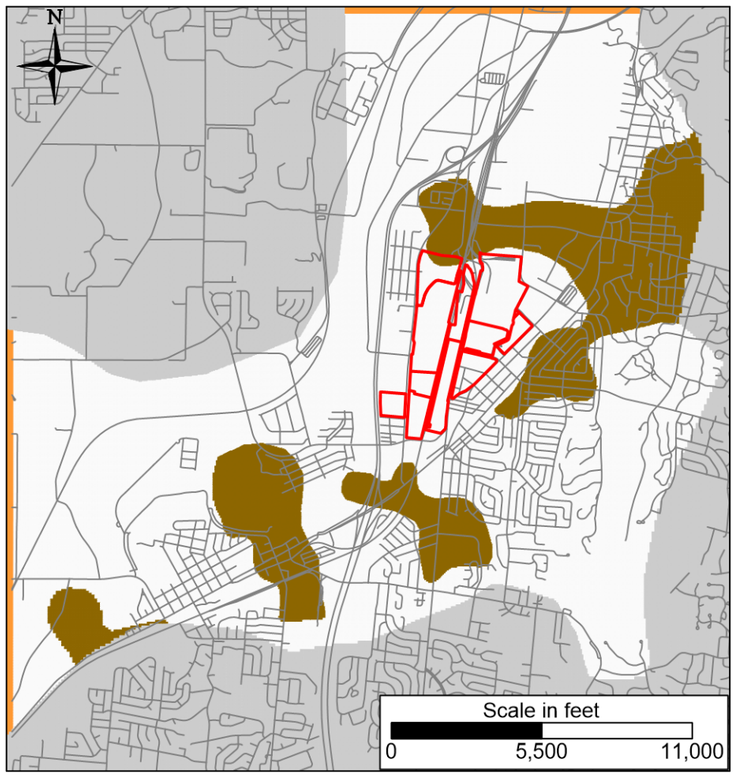
FIGURE 4

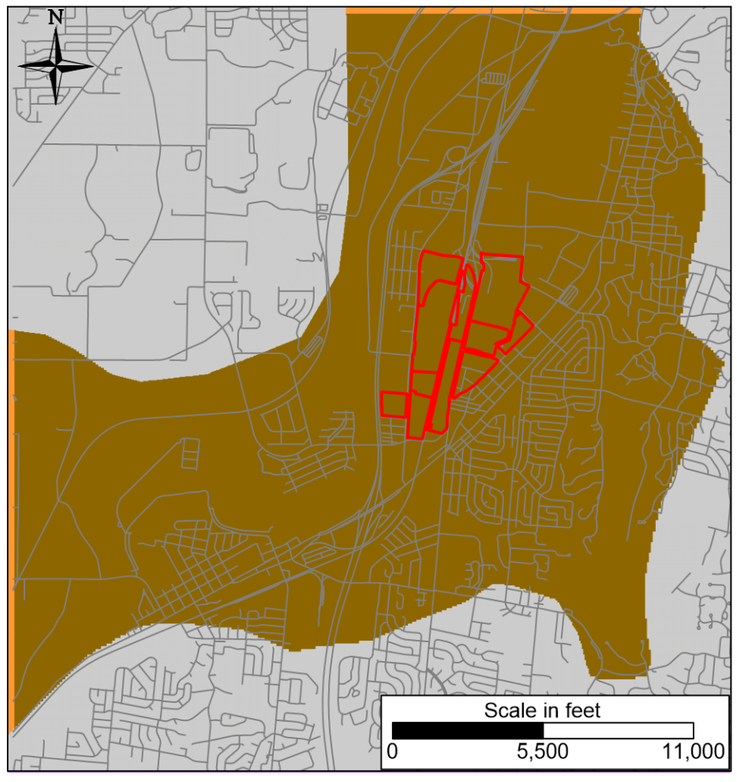
Layer 1 (Upper Aquifer)



Layer 2 (Regional Clay Till)



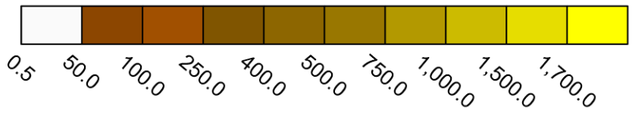
Layers 3-5 (Lower Aquifer)



Legend

- Constant Head Boundary
- River Boundary
- No Flow Boundary
- Site Property Line

Horizontal Hydraulic Conductivity (ft/day)



Note:

1. Vertical hydraulic conductivity is ten times lower (anisotropy ratio of 0.1) than horizontal hydraulic conductivity.
2. ft/day = feet per day

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

SIMULATED HYDRAULIC CONDUCTIVITY

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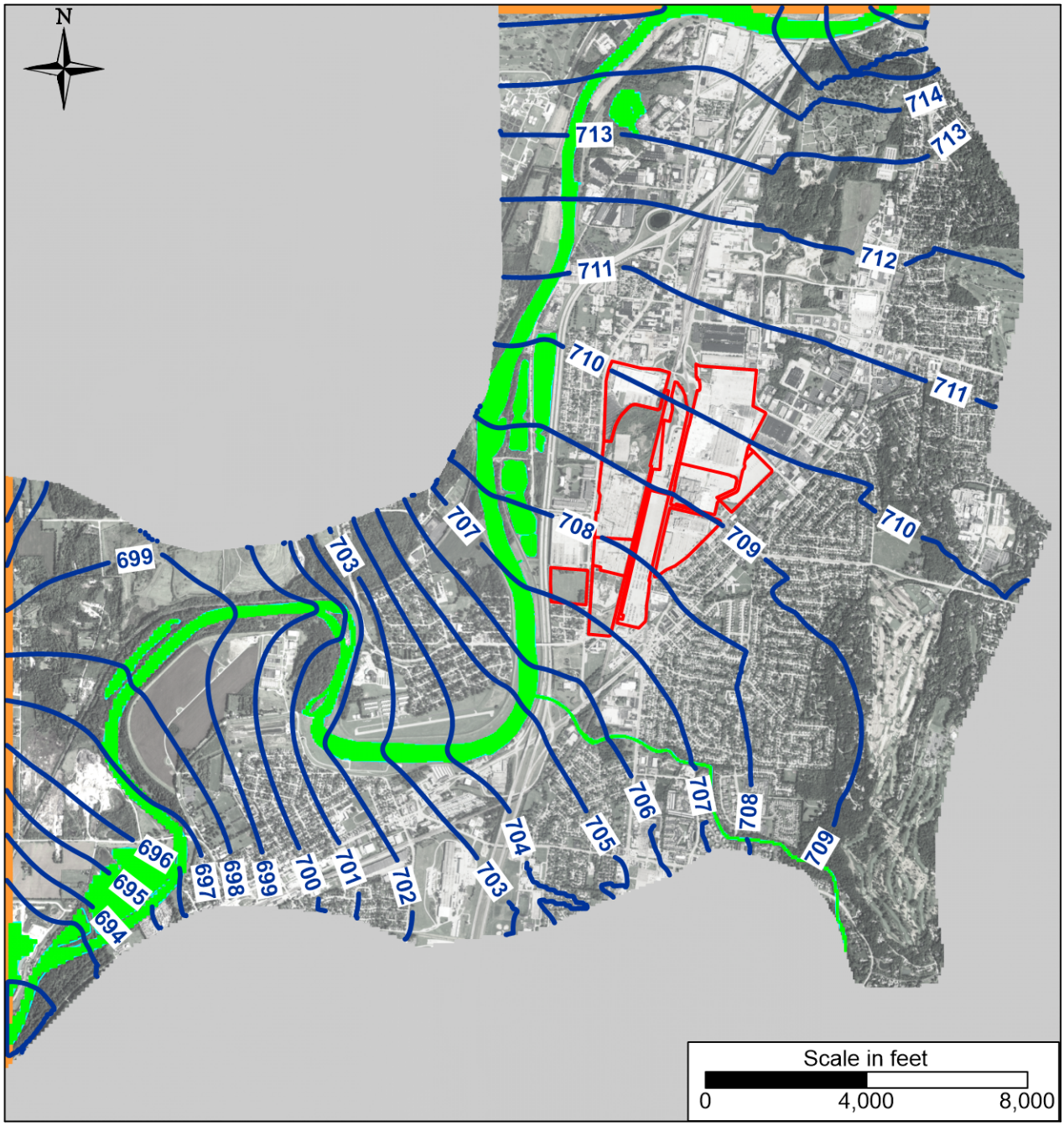
FIGURE 5



Legend

- Constant Head Boundary
- River Boundary
- No Flow Boundary
- Site Property Line
- 700 Simulated Groundwater Contours (ft amsl)

Notes:
1. River boundaries are located in layer 1 only.
2. Regional Pumping Wells are summarized on Table 1.

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

REGIONAL SIMULATED WATER TABLE

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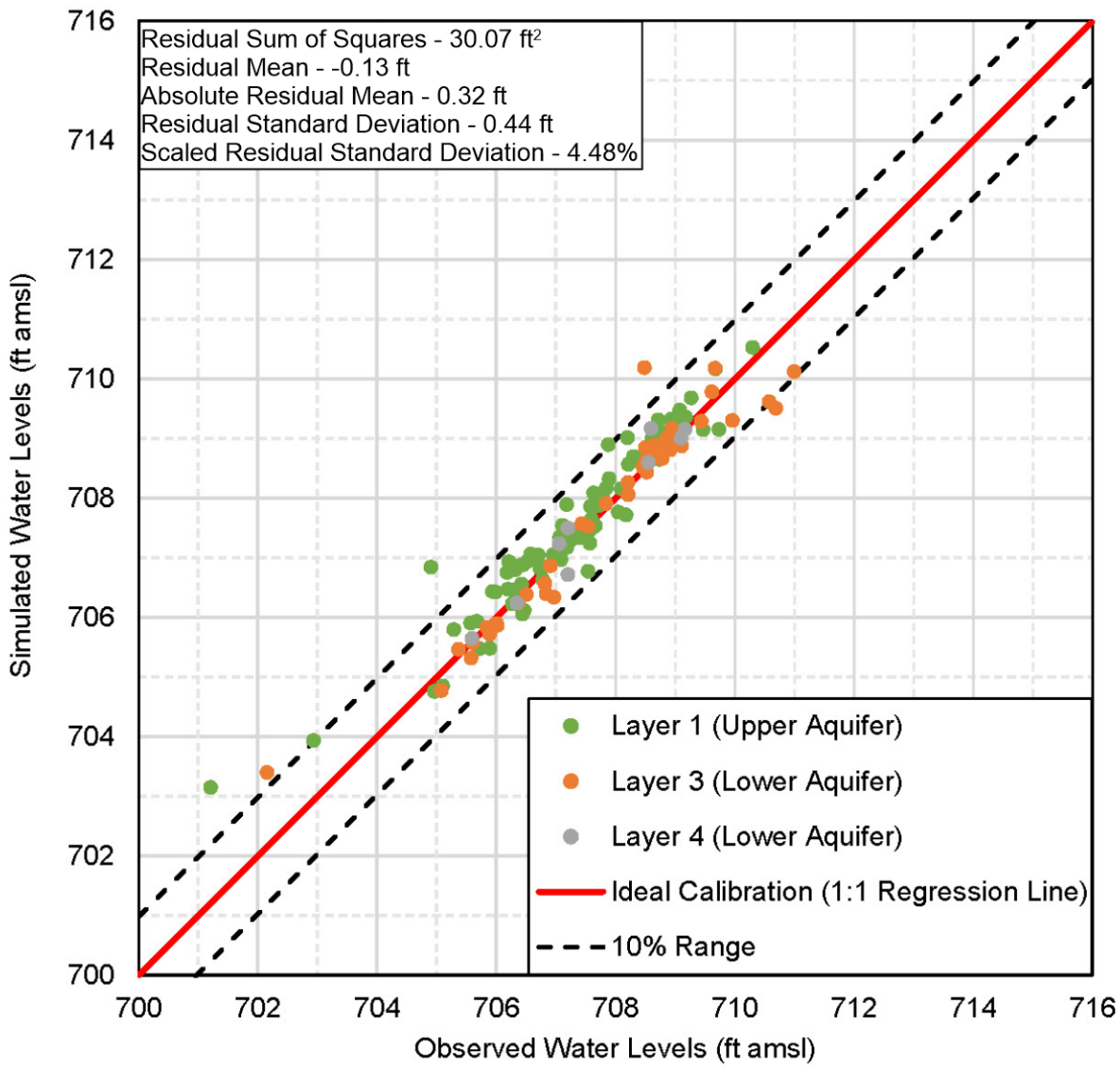
FIGURE
6



RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

MODEL CALIBRATION TARGETS: OBSERVED VS SIMULATED GROUNDWATER ELEVATIONS

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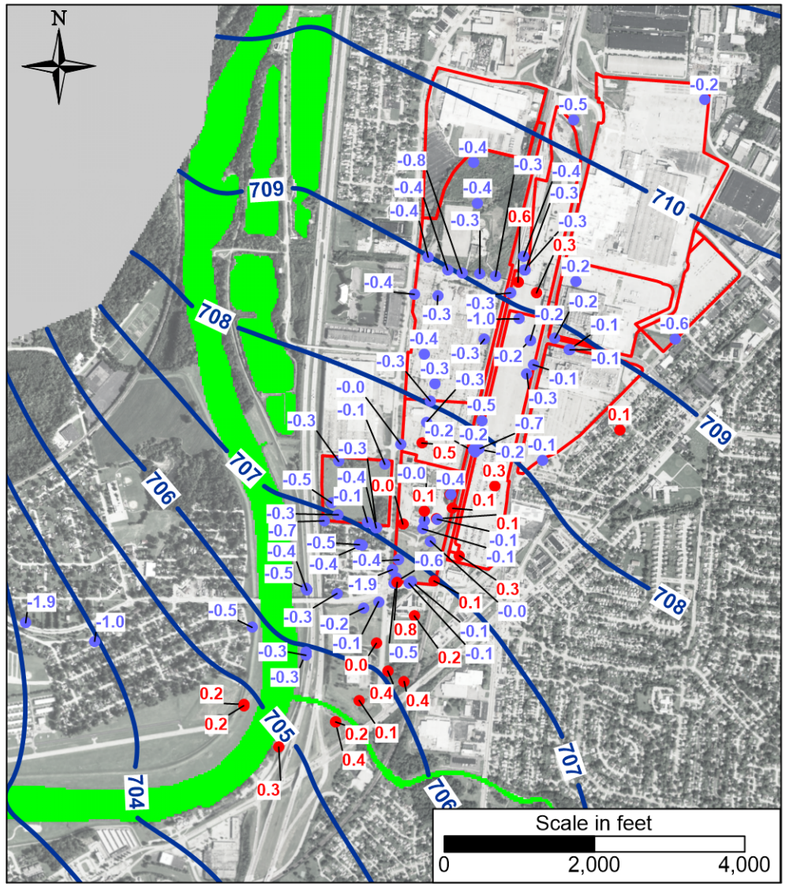
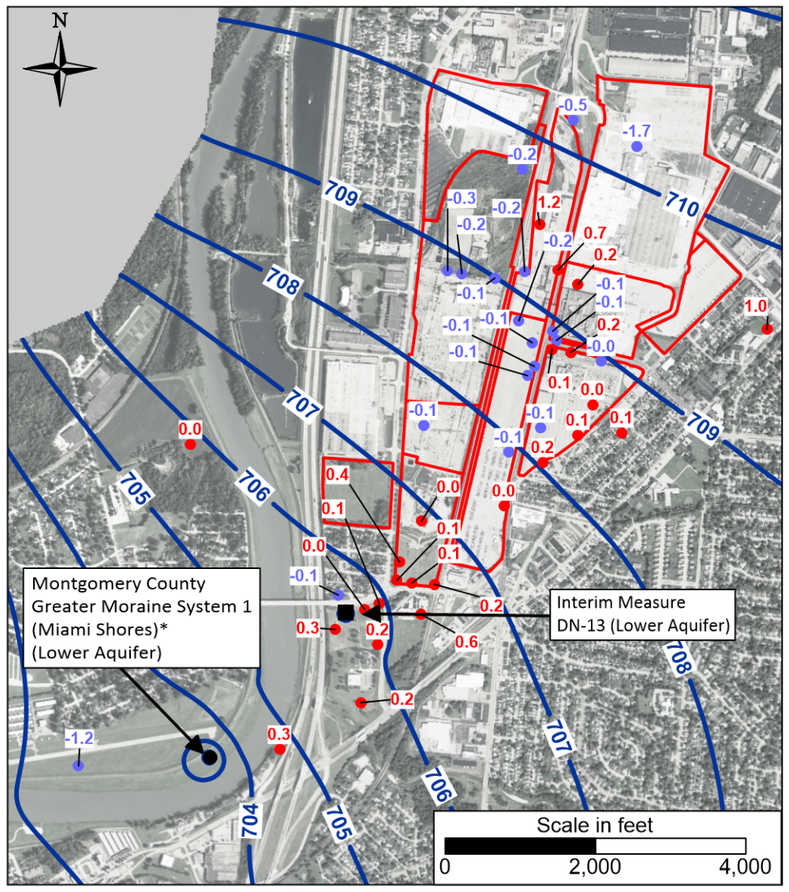
FIGURE
7

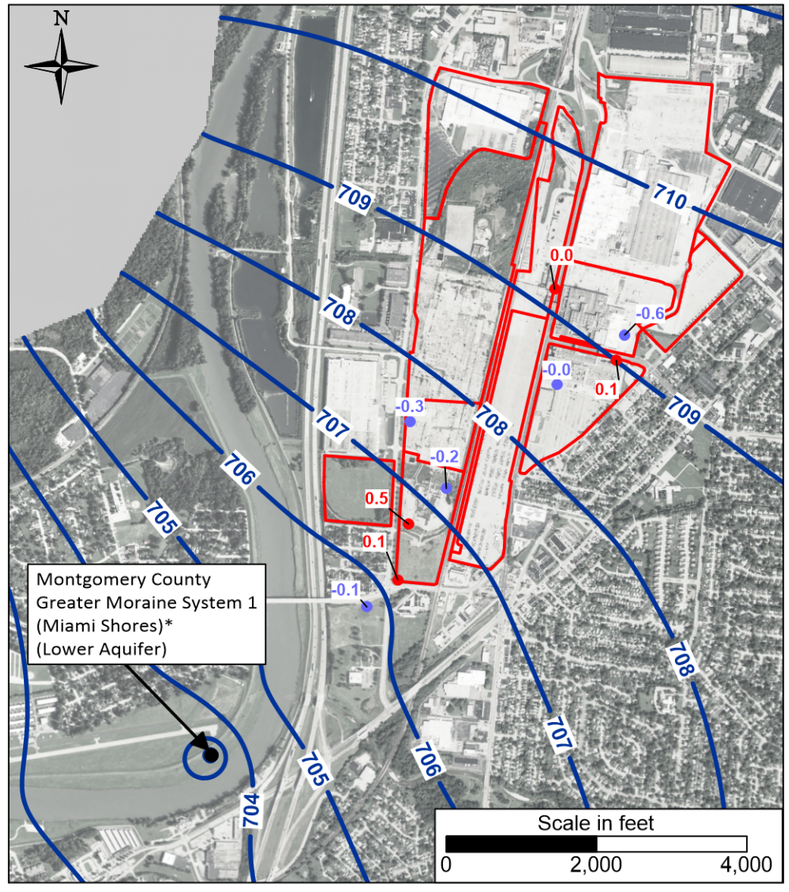
Layer 1 (Upper Aquifer)



Layer 3 (Lower Aquifer)



Layer 4 (Lower Aquifer)



Legend

- Regional Pumping Well (Lower Aquifer)
- Interim Measure DN-13 (lower aquifer)
- River Boundary
- No Flow Boundary
- Site Property Line
- —700— Simulated Groundwater Elevation (ft amsl)
- 0.1 -0.1 Residual (ft)
  (Residual = Observed Water Level - Simulated Water Level)

Notes:

Blue circles represent over simulation
(simulated water levels are greater than observed water levels).

Red circles represent under simulation
(simulated water levels are less than observed water levels).

*The Miami Shores Well Field is currently understood to be inactive with no continuous pumping. Flow rates presented to the ODNR are assumed to be total flow from periodic maintenance activities for the well field over the year.

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

SIMULATED GROUNDWATER ELEVATIONS AND RESIDUALS

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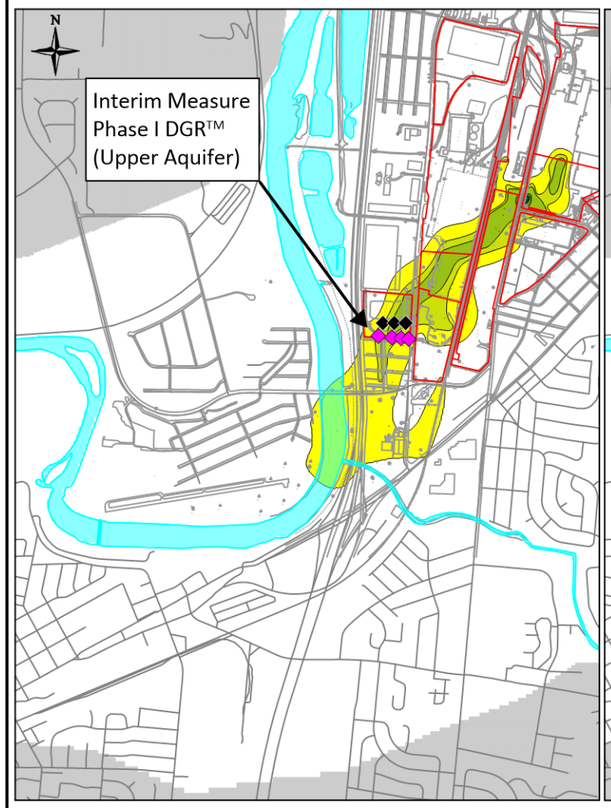
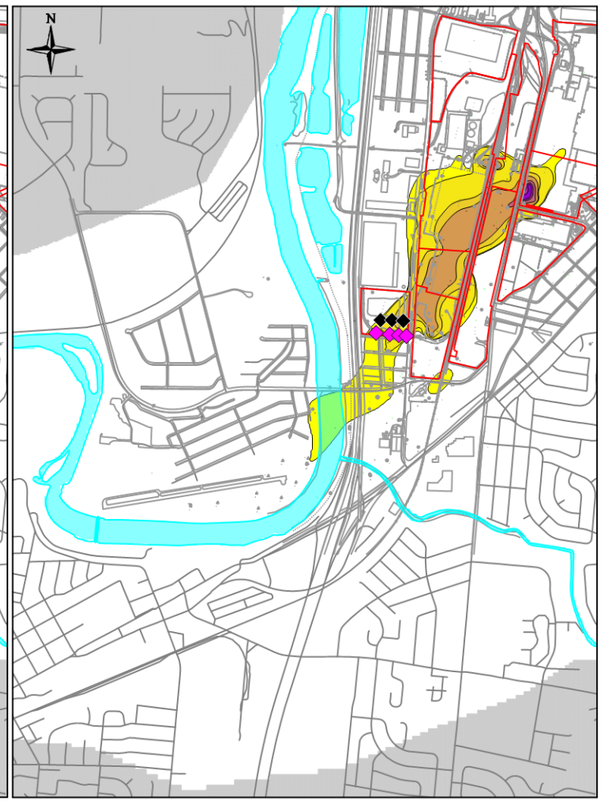
FIGURE 8

Upper Aquifer

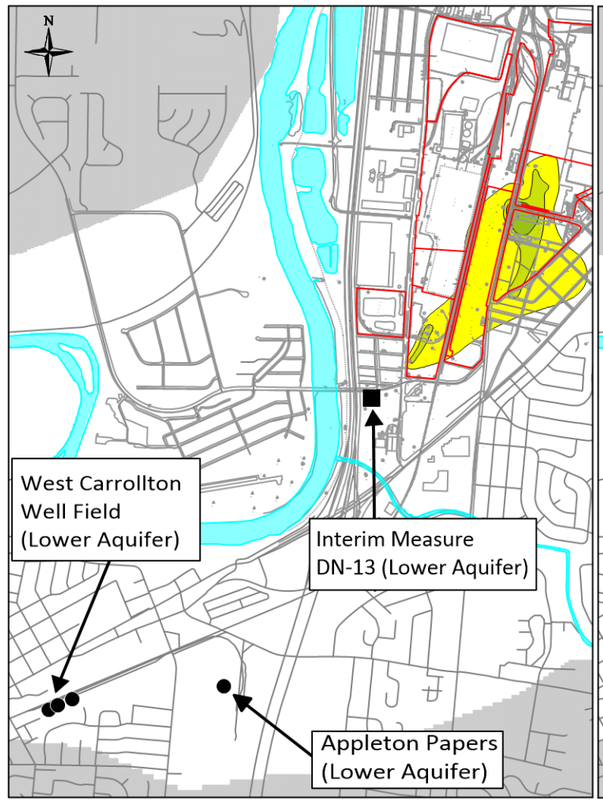


PCE Plume

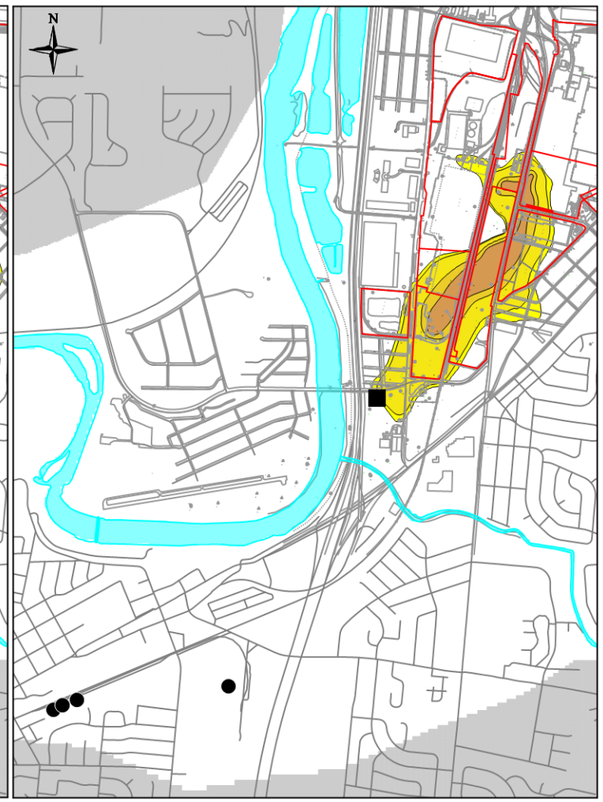


TCE Plume

Lower Aquifer



PCE Plume



TCE Plume

LEGEND:

- River Boundary
- No Flow Boundary
- Site Property Line
- Regional Extraction Well
- Phase I DGR Extraction Well
- Phase I DGR Injection Well
- Interim Measure DN-13 (lower aquifer)

PCE Concentration (µg/L)

5 | 50 | 100 | 1,000 | 5,000 | 10,000

TCE Concentration (µg/L)

5 | 10 | 50 | 100 | 1,000 | 5,000 | 10,000

Notes:

1. River boundaries are located in layer 1 only.
2. Regional Pumping and Phase I DGR Remediation Wells are summarized in Table 3.
3. µg/L - micrograms per liter
4. PCE - Tetrachloroethene
5. TCE - Trichloroethene

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

INITIALIZED PCE AND TCE PLUMES IN 2019 IN THE UPPER AND LOWER AQUIFERS

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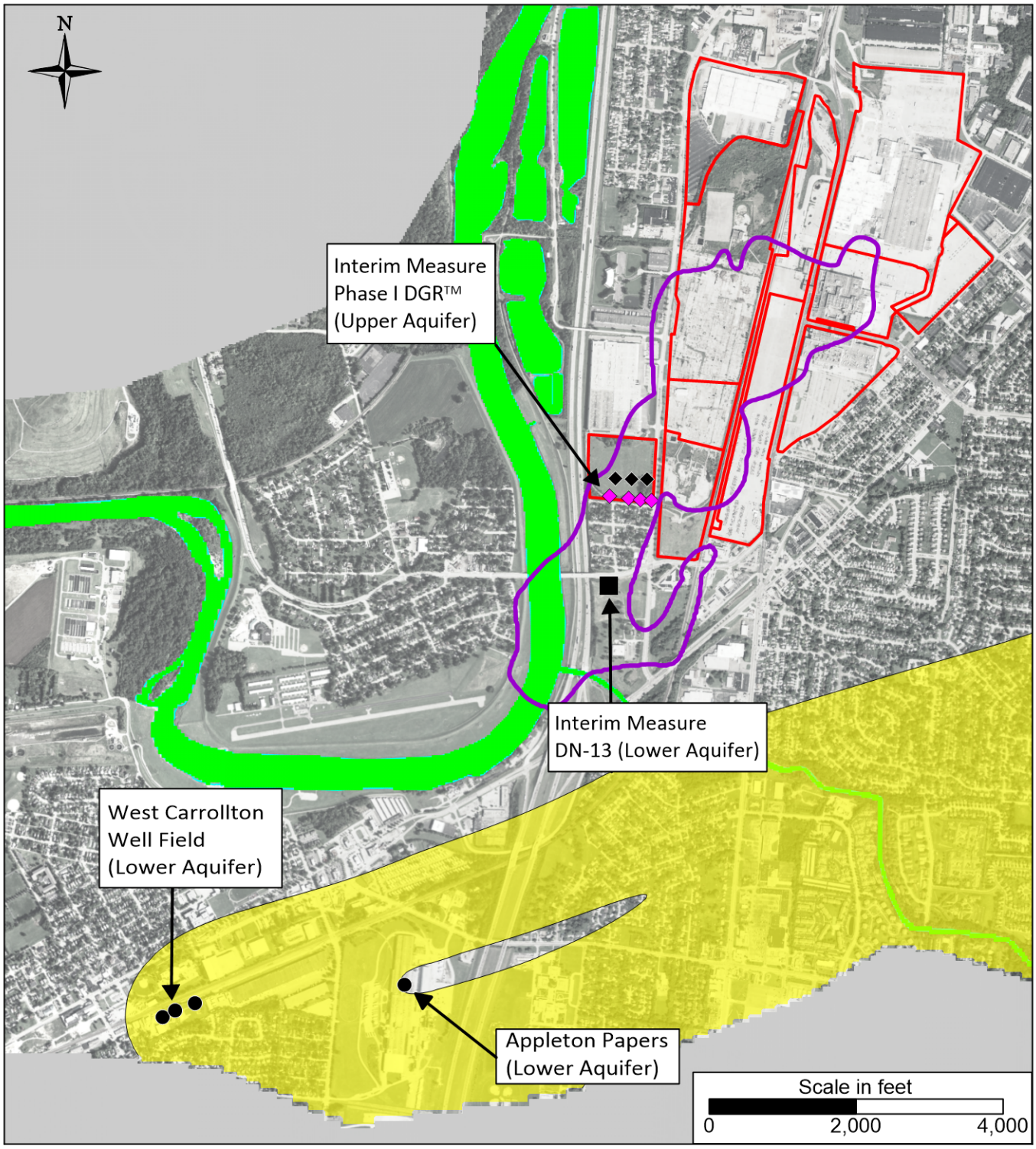
FIGURE 9



Legend

- Constant Head Boundary
- River Boundary
- No Flow Boundary
- Site Property Line
- Simulated West Carrollton Well Field Capture Zone (combined all layers for upper and lower aquifer)
- Composite PCE and TCE Plume in Upper Aquifer
- Regional Extraction Well
- Phase I DGR Extraction Well
- Phase I DGR Injection Well
- Interim Measure DN-13 (lower aquifer)

Notes:
1. River boundaries are located in layer 1 only.
2. Regional Pumping Wells are summarized on Table 1.

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

SIMULATED HYDRAULIC CAPTURE OF THE WEST CARROLLTON WELL FIELD

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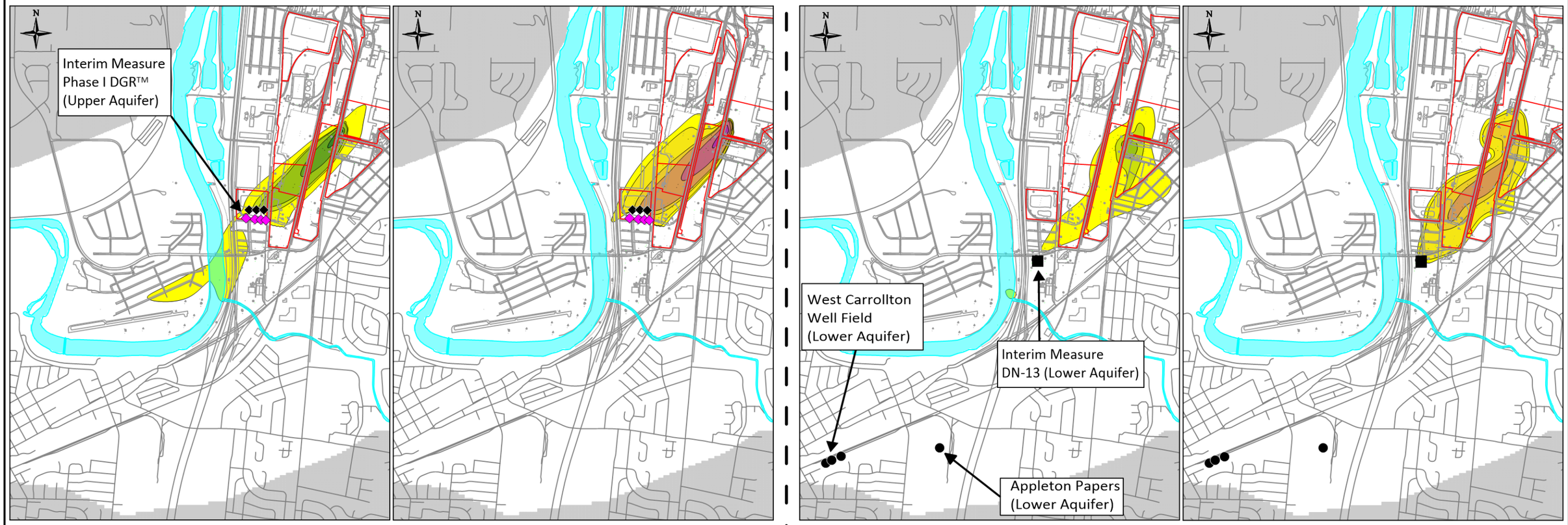
FIGURE
10

Upper Aquifer

Lower Aquifer



PCE Plume | **TCE Plume** | **PCE Plume** | **TCE Plume**

LEGEND:

- River Boundary
- No Flow Boundary
- Site Property Line
- Regional Extraction Well
- Phase I DGR Extraction Well
- Phase I DGR Injection Well
- Interim Measure DN-13 (lower aquifer)

PCE Concentration (µg/L): 5 | 50 | 100 | 1,000 | 5,000 | 10,000

TCE Concentration (µg/L): 5 | 10 | 50 | 100 | 1,000 | 5,000 | 10,000

Notes:

1. River boundaries are located in layer 1 only.
2. Regional Pumping, Interim Measure Phase I DGR™ (upper aquifer), and Interim Measure DN-13 (lower aquifer) are summarized in Table 3.
3. µg/L - micrograms per liter
4. PCE - Tetrachloroethylene
5. TCE - Trichloroethylene

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

SIMULATED PCE AND TCE PLUMES IN THE UPPER AND LOWER AQUIFERS AFTER 2 YEARS

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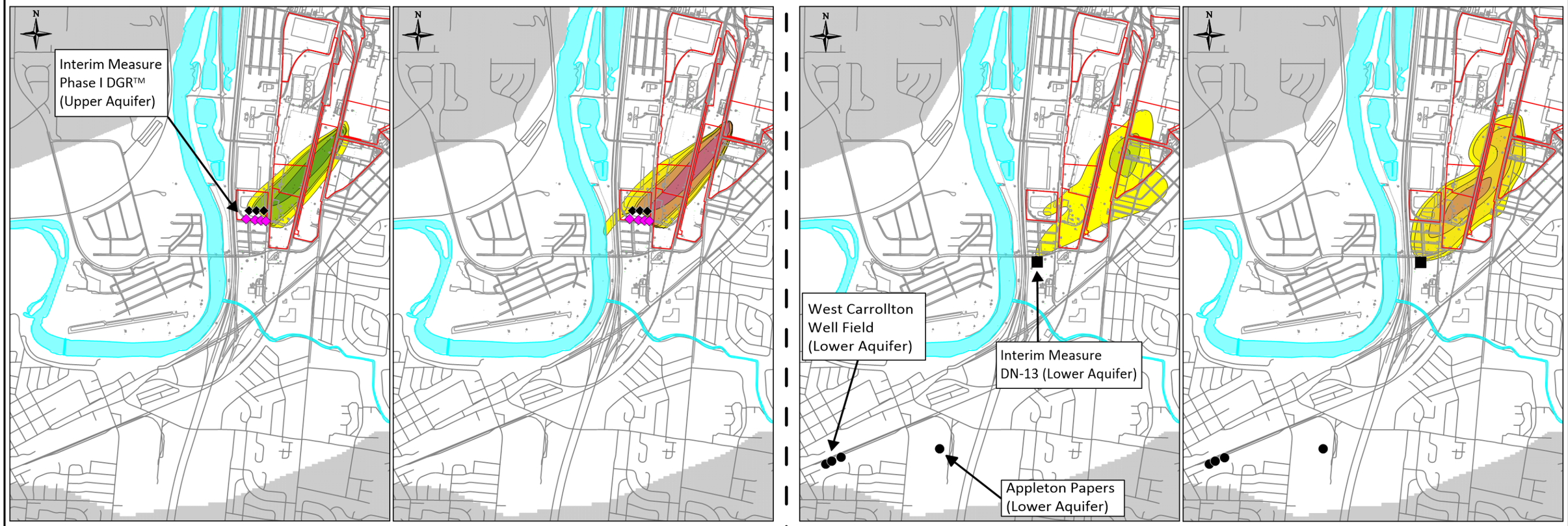
FIGURE 11

Upper Aquifer

Lower Aquifer



PCE Plume | **TCE Plume** | **PCE Plume** | **TCE Plume**

LEGEND:

- River Boundary
- No Flow Boundary
- Site Property Line
- Regional Extraction Well
- Phase I DGR Extraction Well
- Phase I DGR Injection Well
- Interim Measure DN-13 (lower aquifer)

PCE Concentration (µg/L): 5 | 50 | 100 | 1,000 | 5,000 | 10,000

TCE Concentration (µg/L): 5 | 10 | 50 | 100 | 1,000 | 5,000 | 10,000

Notes:

1. River boundaries are located in layer 1 only.
2. Regional Pumping, Interim Measure Phase I DGR™ (upper aquifer), and Interim Measure DN-13 (lower aquifer) are summarized in Table 3.
3. µg/L - micrograms per liter
4. PCE - Tetrachloroethylene
5. TCE - Trichloroethylene

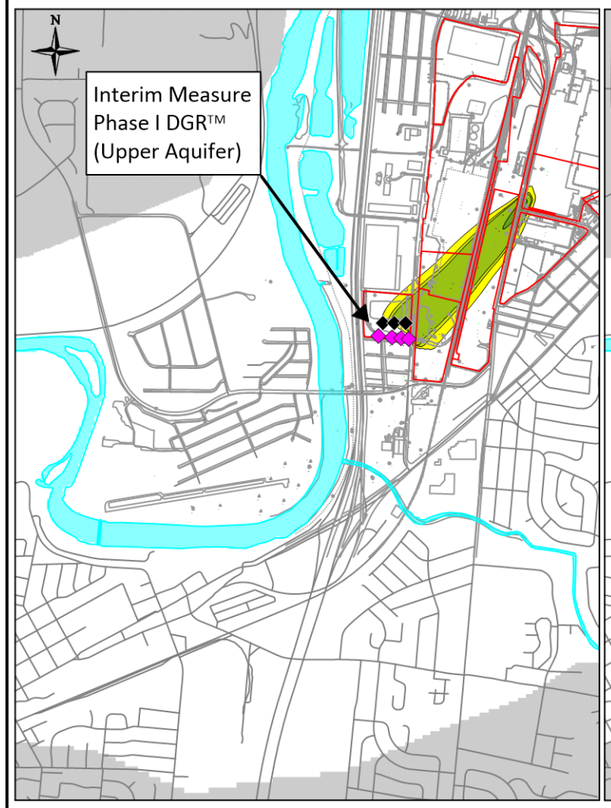
RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

SIMULATED PCE AND TCE PLUMES IN THE UPPER AND LOWER AQUIFERS AFTER 5 YEARS

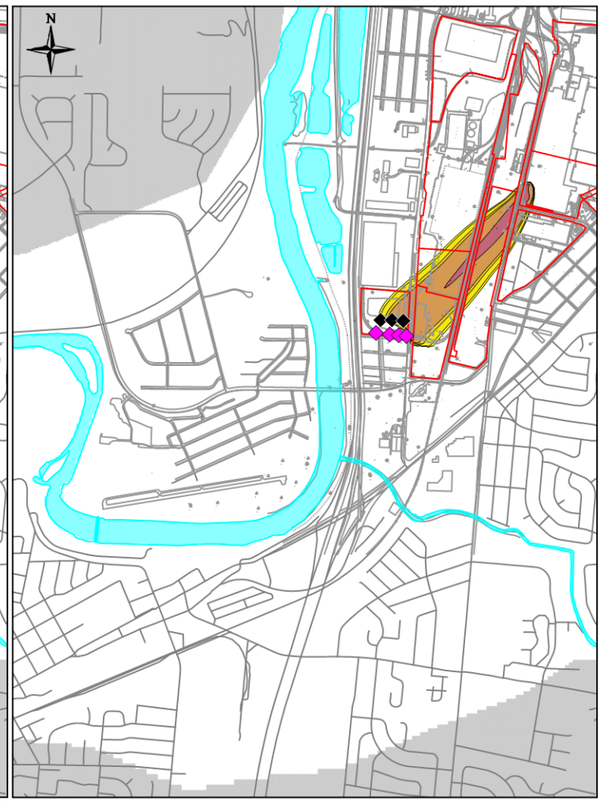
ARCADIS Design & Consultancy for natural and built assets

FIGURE 12

Upper Aquifer

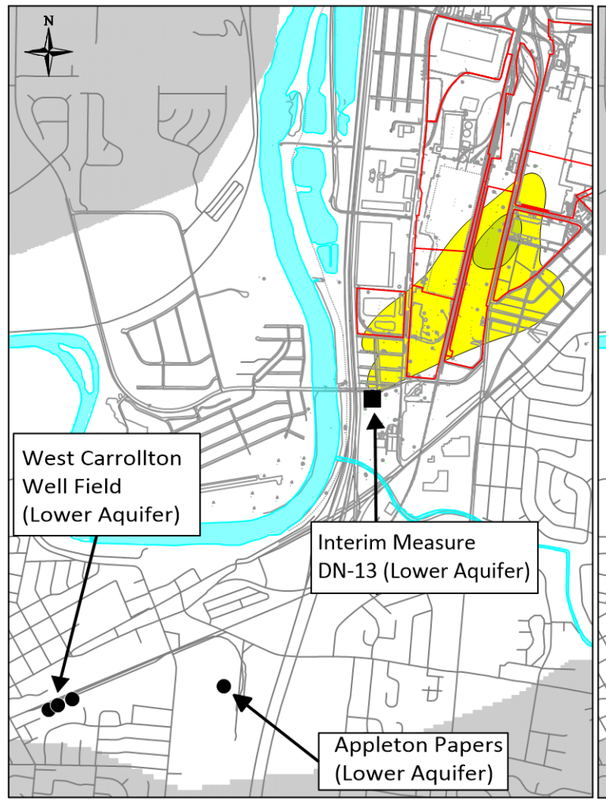


PCE Plume

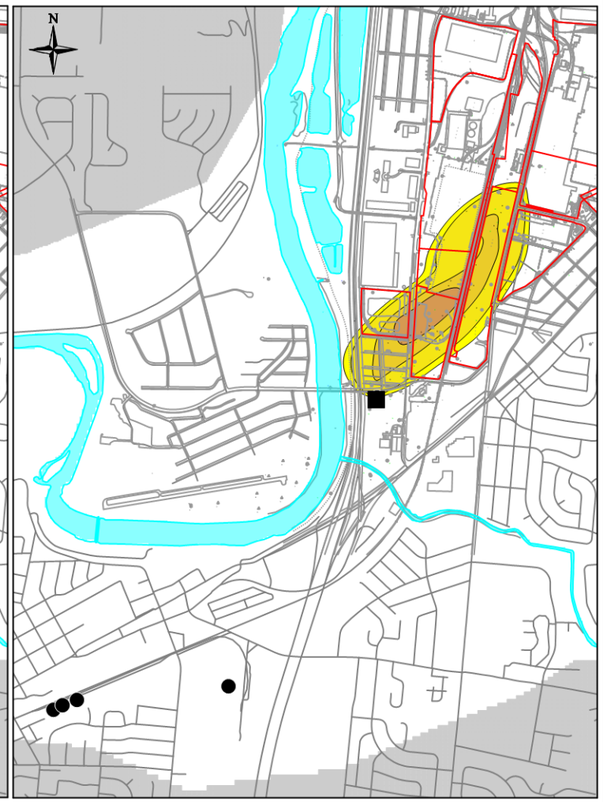


TCE Plume

Lower Aquifer



PCE Plume



TCE Plume

LEGEND:

- River Boundary
- No Flow Boundary
- Site Property Line
- Regional Extraction Well
- Phase I DGR Extraction Well
- Phase I DGR Injection Well
- Interim Measure DN-13 (lower aquifer)

PCE Concentration (µg/L)

5 50 100 1,000 5,000 10,000

TCE Concentration (µg/L)

5 10 50 100 1,000 5,000 10,000

Notes:

1. River boundaries are located in layer 1 only.
2. Regional Pumping, Interim Measure Phase I DGR™ (upper aquifer), and Interim Measure DN-13 (lower aquifer) are summarized in Table 3.
3. µg/L - micrograms per liter
4. PCE - Tetrachloroethylene
5. TCE - Trichloroethylene

RACER TRUST MORAINE FACILITIES
MORAINE, OHIO
GROUNDWATER FLOW AND SOLUTE TRANSPORT MODEL

SIMULATED PCE AND TCE PLUMES IN THE UPPER AND LOWER AQUIFERS AFTER 10 YEARS

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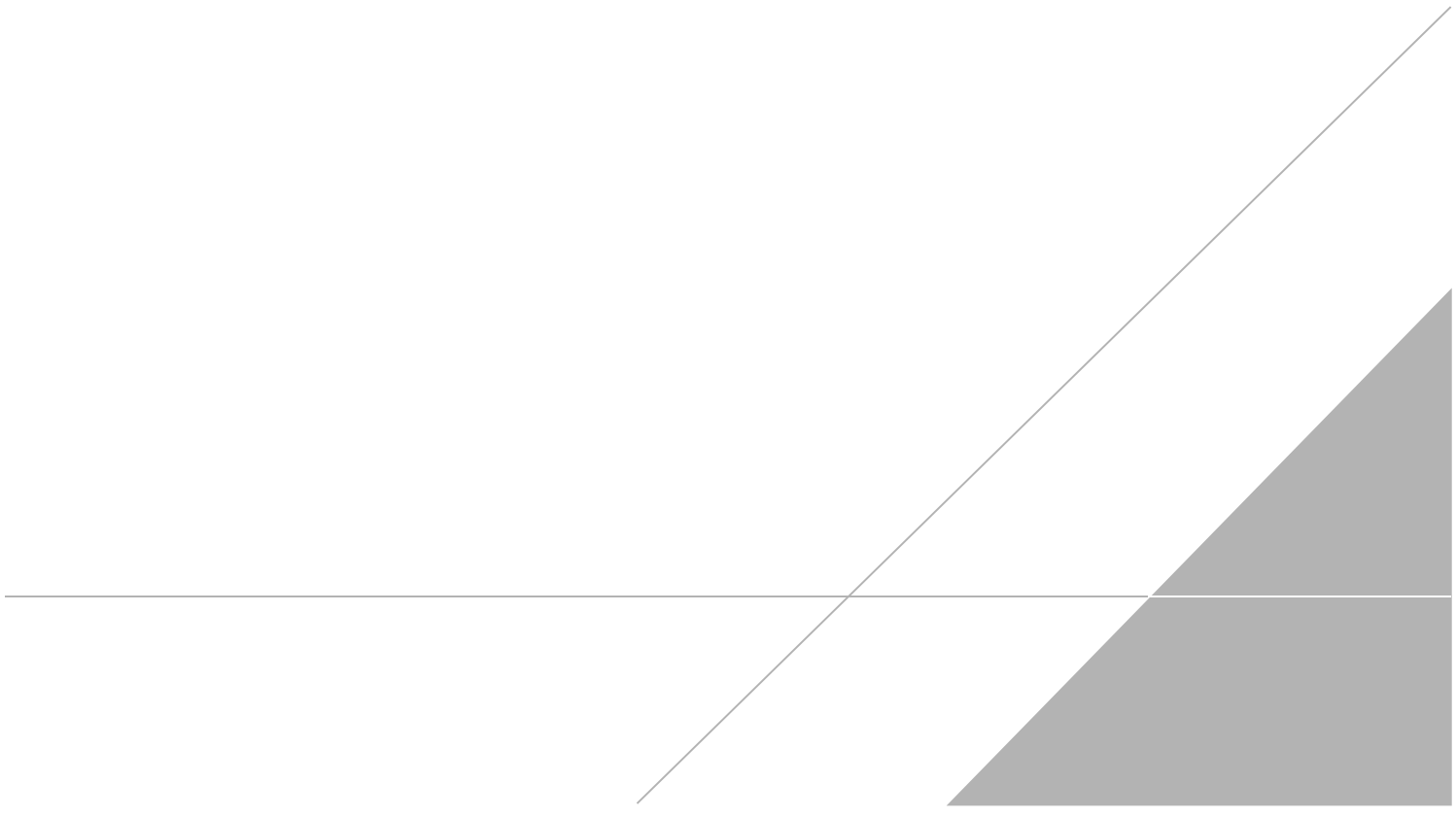
FIGURE 13

APPENDIX B

Risk Summary



ARCADIS Design & Consultancy for natural and built assets

Former Delphi Harrison Thermal Systems, Moraine Plant
Former General Motors Powertrain Group, Moraine Engine Plant
Former General Motors Truck Group, Moraine Assembly Plant

SITE-WIDE RISK ASSESSMENT SUMMARY

Revitalizing Auto Communities Environmental Response Trust (RACER Trust)

Moraine, Ohio

January 2020

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1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) prepared this Site-Wide Risk Assessment Summary (Risk Summary) on behalf of the Revitalizing Auto Communities Environmental Response Trust (RACER Trust) for the RACER Trust (formerly General Motors Corporation [former GM Corporation]) Moraine Facilities in Moraine, Ohio (Site; **Figure 1**). The facilities included:

- former Delphi Harrison Thermal Systems Moraine Plant (former Delphi Thermal Moraine)
- former General Motors Powertrain Group, Moraine Engine Plant (former Moraine Engine)
- former General Motors Truck Group, Moraine Assembly Plant (former Moraine Assembly)

The objective of this Risk Summary is to summarize the potential for exposure to site-related constituents in environmental media (i.e., soil, groundwater, and soil gas) by parcel (identified by lot number) throughout the Site and for potential off-site receptors. Historic risk assessments for the Site were summarized and/or presented in the 2012 Corrective Measures Proposal (2012 CMP; Arcadis 2012a). These historic risk assessments focused on the verified areas of interest (AOIs) and solid waste management units (SWMUs). Note that preliminary AOIs were historically evaluated but subsequently eliminated as AOIs based on the findings of the site assessment. This Risk Summary includes data collected after the 2012 CMP. These data were compared to applicable screening levels and further characterized, where necessary. Additionally, the results of previous risk assessments that were presented and summarized in the 2012 CMP are summarized in this Risk Summary, as appropriate. The information provided in the Risk Summary will be included in the forthcoming Corrective Measures Proposal Addendum (CMP Addendum).

The historic risk assessments were completed as site-wide evaluations. It should be noted that this Risk Summary was segregated and organized by Parcel to assist in the preparation of environmental covenants and communications with stakeholders.

Since the 2012 CMP was submitted, soil and groundwater assessments of 1,4-dioxane (RACER Trust 2015a and 2016a; Arcadis 2015, 2016, and 2017) and groundwater assessment of poly- and perfluorinated alkyl substances (PFAS) were completed at the request of the U.S. EPA. Summaries of these investigations and other investigations completed since the 2012 CMP submittal were provided in the 2019 Preliminary Human Health Risk Assessment Screening Evaluation (Arcadis 2019a) and will be included in the CMP Addendum. The results of these investigations indicated that 1,4-dioxane and PFAS are not currently risk drivers for the Site, and additional investigation is not warranted at this time.

1.1 Corrective Measures Objectives

During a meeting with RACER Trust, the United States Environmental Protection Agency (U.S. EPA), and Arcadis on November 13, 2019 in Chicago, Illinois, the Corrective Measures Objectives (CMOs) for the Site were established with the following timeframes:

- Short term – The CMO should be demonstrated approximately 1 year from the finalization of the Statement of Basis (SB).

- Intermediate – The CMO should be demonstrated approximately 2 to 5 years from the finalization of the SB.
- Long term – The CMO should be demonstrated at a time that is greater than 5 years from the finalization of the SB.

The CMOs are provided in the following sections for reference during review of this Risk Summary.

1.1.1 Soil

1.1.1.1.1 On-site Soil

Short Term

- Demonstrate vadose zone soil concentrations are not contributing to an unacceptable risk to direct contact and groundwater leaching pathways

Short Term, Intermediate, and Long Term

- Prevent exposure to waste from the closed North and South Settling Lagoons

1.1.1.1.2 Off-site Soil

Short Term, Intermediate, and Long Term

- Not applicable

1.1.1.2 On-site Upper Aquifer Groundwater

Short Term

- Establish and maintain the Groundwater Environmental Indicator (i.e., groundwater migration under control – CA750)
- Prevent exposure to concentrations of site-specific volatile organic compounds (VOCs)1 in on-site groundwater exceeding Maximum Contaminant Levels (MCLs)
- Initiate source area treatment in the former Process Sump Area

Intermediate

- Maintain the Groundwater Environmental Indicator
- Prevent exposure to concentrations of site-specific VOCs in on-site groundwater exceeding MCLs
- Continue source area treatment in the former Process Sump Area

[1] Site-specific VOCs are further defined in Section 2.

Long Term

- Reduce source area concentrations of site-specific VOCs in the former Process Sump Area in order to attain groundwater concentrations below residential Vapor Intrusion Screening Levels (VISLs) for groundwater at property boundary
- Prevent exposure to concentrations of site-specific VOCs in on-site groundwater exceeding MCLs
- Prevent unacceptable vapor intrusion exposure until concentrations of site-specific VOCs in groundwater are below the industrial VISLs for groundwater throughout the site

1.1.1.3 Off-site Upper Aquifer Groundwater

Short Term

- Prevent exposure to concentrations of site-specific VOCs in off-site groundwater exceeding MCLs / residential VISLs
- Demonstrate the site-specific VOC plume is delineated and stable and achieves the Groundwater Environmental Indicator

Intermediate

- Prevent exposure to concentrations of site-specific VOCs in off-site groundwater exceeding MCLs / residential VISLs
- Attain concentrations of site-specific VOCs in groundwater below MCLs / residential VISLs throughout off-site groundwater plume

Long Term

- Prevent exposure to concentrations of site-specific VOCs in off-site groundwater exceeding MCLs / residential VISLs
- Attain concentrations of site-specific VOCs in groundwater below MCLs / residential VISLs throughout off-site groundwater plume

1.1.2 Lower Aquifer Groundwater

1.1.2.1 On-site Lower Aquifer Groundwater

Short Term

- Prevent drinking water and process water exposure to concentrations of site-specific VOCs exceeding MCLs

Intermediate

- Prevent drinking water and process water exposure to concentrations of site-specific VOCs exceeding MCLs

Long Term

- Demonstrate concentration reduction in site-specific VOCs beneath the source area
- Prevent drinking water and process water exposure to concentrations of site-specific VOCs exceeding MCLs
- Meet and maintain MCLs for site-specific VOCs at the property boundary

1.1.2.2 Off-site Lower Aquifer Groundwater

Short Term

- Prevent off-site drinking water exposure to concentrations of site-specific VOCs exceeding MCLs

Intermediate

- Prevent off-site drinking water exposure to concentrations of site-specific VOCs exceeding MCLs
- Demonstrate the site-specific VOC groundwater plume is delineated and outside of drinking water wellfields

Long Term

- Demonstrate the site-specific VOC groundwater plume is delineated and stable and achieves the Groundwater Environmental Indicator
- Attain concentrations of site-specific VOCs in groundwater below MCLs throughout off-site groundwater plume

1.1.3 Indoor Air

1.1.3.1 On-site Indoor Air

Short Term and Intermediate

- Prevent exposure to site-specific VOCs exceeding industrial indoor air criteria
- Attain concentrations of site-specific VOCs in indoor air below the industrial indoor air criteria

Long Term

- Verify concentrations of site-specific VOCs in sub-slab soil gas are below VISLs

2 RISK SUMMARY

Environmental investigations at the Site date back to the mid-1980's, including the collection of groundwater, soil, soil gas, and indoor air data. Through the multiple phases of assessment activities, the constituents of concern for the Site were identified as benzene, 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), ethylbenzene, tetrachloroethene (PCE), toluene, 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), vinyl chloride, and xylenes (site-specific volatile organic compounds [VOCs]).

Of the site-specific VOCs, concentrations of cis-1,2-DCE, PCE, TCE, and vinyl chloride in groundwater exceed the MCLs and/or the VISLs for residential and commercial groundwater (Arcadis 2019b). Concentrations of PCE and TCE in groundwater are the primary risk drivers at the Site, and the primary source area at the Site is upper aquifer groundwater below the former Process Sump Area. **Figures 2** through **5** show the extent of the upper and lower aquifer PCE and TCE plumes at the Site.

Groundwater at the Site appears to be the source of commercial VISL exceedances in sub-slab soil gas below the Fuyao Glass of America (Fuyao) building on Lot #5438 and the buildings owned by ICP Moraine LLC (ICP) on Lot #5439 and Lot #5418. Concentrations of site-specific VOCs in indoor air within the aforementioned buildings were below commercial VISLs (RACER Trust 2018a, 2019a, 2019b).

It is assumed that the risk associated with site-specific VOCs in groundwater and soil gas across the Site is unacceptable, and the following risk mitigation measures are recommended through environmental restrictive covenants for each of the lots at the Site:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited. It should be noted that the existing fire suppression well in Lot #5438, FW-1A, will be an exception to this restriction. Additional detail is provided below.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of an appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

To assist in risk communication to stakeholders and the development of environmental covenants and per the U.S. EPA's request during a November 13, 2019 meeting, the following sections summarize risk evaluations by lot at the Site. Each lot includes background and current conditions, an assessment summary, and suggested risk mitigation measures. If present, a summary of the SWMUs and/or AOIs is provided (**Figure 1**).

The key takeaways of the on-site and off-site risk assessments completed for the Site are:

- There are no unacceptable direct contact exposures to soil at the Site.
- The migration of constituents from soil to groundwater does not contribute an unacceptable risk to groundwater at the property boundary.
- Constituents in groundwater (primarily PCE and TCE) contribute unacceptable risk through direct contact and vapor intrusion.

2.1 Lot #1

2.1.1 Background

Lot #1 was historically used for industrial purposes and is within the area of the former Moraine Assembly. Currently owned and operated by Fuyao, Lot #1 is 15.568 acres and used as a parking lot. Lot #1 is side gradient of the source area. There are no structures on this lot. Lot #1 is in the City of Kettering in Montgomery County, Ohio.

2.1.2 Assessment Summary

2.1.2.1 Solid Waste Management Units

There are no SWMUs in Lot #1.

2.1.2.2 Areas of Investigation

There are no AOIs in Lot #1.

2.1.2.3 Other Investigations

There is one upper aquifer monitoring well on this lot (GM-25), and concentrations of site-specific VOCs in this well were not detected (Arcadis 2019b).

2.1.3 Conclusions and Path Forward

The groundwater data collected at Lot #1 do not pose unacceptable risk. However, as a conservative measure, it is recommended that following restrictions be applied to Lot #1 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #1. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.2 Lot #2

2.2.1 Background

Lot #2 was historically used for industrial purposes and is within the area of the former Moraine Assembly. Currently owned by Fuyao, Lot #2 is 0.5585 acres and used as a parking lot. Lot #2 is side gradient of the source area. There are no structures on this lot. Lot #2 is in the City of Kettering in Montgomery County, Ohio.

2.2.2 Assessment Summary

2.2.2.1 Solid Waste Management Units

There are no SWMUs in Lot #2.

2.2.2.2 Areas of Investigation

There are no AOIs in Lot #2.

2.2.2.3 Other Investigations

No other investigations were completed at this lot.

2.2.3 Conclusions and Path Forward

Due to the relative proximity of this lot to the source area, it is conservatively recommended that following the restrictions be applied to Lot #2 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #2. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.3 Lot #5438

2.3.1 Background

Lot #5438 was historically used for industrial purposes and is within the area of the former Moraine Assembly. Currently owned by Fuyao, Lot #5438 is 94.060 acres and is the primary operating facility for Fuyao. Lot #5438 is upgradient of the source area. There are five occupied structures on this lot. It should

be noted that one active well associated with the fire suppression system (FW-1A; see **Figures 4** and **5**) is located on this lot. Lot #5438 is in the City of Moraine in Montgomery County, Ohio.

2.3.2 Assessment Summary

2.3.2.1 Solid Waste Management Units

There are no SWMUs in Lot #5438.

2.3.2.2 Areas of Investigation

AOI 35 was on Lot #5438 and was an excavation area north of the former Moraine Assembly Plant and was approximately 200-feet long by 150-feet wide. This area was identified by historical aerial photographs but covered as a parking lot prior to environmental investigations. No information is available about the nature of this excavation, but an investigation was conservatively completed to assess potential impacts. One soil boring was advanced to a depth of 24 feet below ground surface (bgs) at AOI 35. Two soil samples were collected from the boring and sent for analysis of VOCs, semi-volatile organic compounds (SVOCs), and metals (ENVIRON 2000a).

The screening of the soil data collected during the approved Supplemental Resource Conservation and Recovery Act Facility Investigation Report (Supplemental RFI) indicated that no hazardous constituents in the soil would be expected to pose a threat to human health or the environment (ENVIRON 2000a). Consequently, no additional investigation or assessment was completed.

2.3.2.3 Other Investigations

2.3.2.3.1 Soil Gas and Indoor Air

Sub-slab soil gas and indoor air evaluations were completed in the Fuyao manufacturing building on Lot #5438. The results of the evaluations indicated that concentrations of site-specific VOCs in sub-slab soil gas are above the commercial VISLs at some locations, and concentrations of site-specific VOCs in indoor air are below the commercial VISLs (RACER Trust 2019a).

Based on these results, the building foundation and heating, ventilating, and air conditioning (HVAC) system appears to appropriately mitigating vapor intrusion. Inspections of the concrete slab foundation and collection of indoor air samples continue to be completed annually to confirm site-specific VOCs in indoor air remain at concentrations below the VISLs. Per the U.S. EPA's request, the indoor air sampling in 2020 will be completed in bathrooms at the Fuyao facility as these areas are generally prone to issues with vapor intrusion. Additionally, RACER Trust has requested that Fuyao notify them of new penetrations through the foundation or modifications to the foundation. If construction activities associated with the foundation are anticipated, RACER Trust will coordinate with Fuyao to minimize the potential for sub-slab soil gas to migrate into indoor air.

The four other structures on Lot #5458 are located north of the Fuyao manufacturing building and upgradient of the upper aquifer PCE and TCE plumes at the Site. The northern most sub-slab soil gas samples (SS-7 and SS-8) collected from the Fuyao manufacturing building and closest to the four other

structures on Lot #5438 indicate site-specific VOCs in sub-slab soil gas are below the VISLs (RACER Trust 2019a). Given the upgradient orientation of these structures to the plume and the sub-slab soil gas data collected from the northern portion of the Fuyao manufacturing building, additional assessment and/or vapor intrusion mitigation associated with the four other structures on Lot #5458 is not warranted.

2.3.2.3.2 Groundwater

There is one upper aquifer monitoring well on this lot (GM-24), and concentrations of site-specific VOCs in groundwater were below the MCLs (Arcadis 2019b).

Fire suppression well FW-1A was sampled once in 1996 and analyzed for select metals and four times in 2000 and analyzed for bromodichloromethane, bromoform, chloroform, and dibromochloromethane. None of the results exceeded applicable groundwater screening levels. It should be noted that this is a lower aquifer well and is not expected to exhibit unacceptable concentrations of site-specific VOCs due to the relative upgradient location of the well. The groundwater isoconcentration details for the lower aquifer are presented in **Figures 4** and **5**.

2.3.3 Conclusions and Path Forward

The soil, groundwater, and indoor air data collected from Lot #5438 do not pose unacceptable risk. However, due to the relative proximity of this lot to the source area and the elevated concentrations of site-specific VOCs in sub-slab soil gas, it is recommended that following restrictions be applied to Lot #5438 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited except for FW-1A.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring and ongoing vapor intrusion monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5438. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.4 Lot #5524

2.4.1 Background

Lot #5524 was historically used as a railroad and is within the area of the former Moraine Engine. Currently owned by Norfolk Southern Railway FKA Consolidated Rail Corporation (NS), Lot #5524 is 6.659 acres and continues to be used as a railroad. Lot #5438 is upgradient of the source area. There are no structures on this lot. Lot #5524 is in the City of Moraine in Montgomery County, Ohio.

2.4.2 Assessment Summary

2.4.2.1 Solid Waste Management Units

There are no SWMUs in Lot #5524.

2.4.2.2 Areas of Investigation

There are no AOIs in Lot #5524.

2.4.2.3 Other Investigations

There is one upper aquifer monitoring well (HR-11) and one lower aquifer monitoring well (HR-12) located immediately upgradient of Lot #5524. Concentrations of site-specific VOCs in these two wells were below the MCLs (Arcadis 2019b).

2.4.3 Conclusions and Path Forward

The groundwater data collected near Lot #5524 do not pose an unacceptable risk. However, as a conservative measure, it is recommended that following restrictions be applied to Lot #5524 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5524. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater to meet the applicable CMOs for the Site.

2.5 Lot #5418

2.5.1 Background

Lot #5418 was historically used for industrial purposes and is within the area of the former Moraine Assembly. Currently owned by ICP, Lot #5418 is 31.576 acres and is side gradient of the source area. There is one structure on Lot #5418, known as the Former Moraine Assembly Paint Building (Paint Building). The Paint Building is currently vacant. There are two inactive fire suppression wells screened in the lower aquifer (FW-2 and FW-3; see **Figures 4** and **5**). Lot #5418 is in the City of Moraine in Montgomery County, Ohio.

2.5.2 Assessment Summary

2.5.2.1 Solid Waste Management Units

There are no SWMUs in Lot #5418.

2.5.2.2 Areas of Investigation

There are no AOIs in Lot #5418.

2.5.2.3 Other Investigations

2.5.2.3.1 Soil Gas and Indoor Air

An initial sub-slab soil gas and indoor air evaluation was completed in the Paint Building on Lot #5418. The results of the evaluation indicated that concentrations of site-specific VOCs in sub-slab soil gas are above the commercial VISLs, and concentrations of site-specific VOCs in indoor air are below the commercial VISLs (RACER Trust 2018a).

Based on these results, the building foundation appears to appropriately mitigating vapor intrusion. Once renovation activities at the Paint Building are complete, two additional sub-slab and indoor air sampling events will be completed during the heating season (i.e., October through March). Additionally, RACER Trust has requested that ICP notify them of new penetrations through the foundation or modifications to the foundation. If construction activities associated with the foundation are anticipated, RACER Trust will coordinate with ICP to minimize the potential for sub-slab soil gas to migrate into indoor air.

2.5.2.3.2 Groundwater

There are several upper and lower aquifer monitoring wells on Lot #5418. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5418 exceed the MCLs (Arcadis 2019b).

Fire suppression wells FW-2 and FW-3 were sampled several times between 1992 and 2000 and analyzed for select site-specific VOCs. Note that these wells are within or proximal to the lower aquifer plume, and the historic results are consistent with the current understanding of the plume. The groundwater isoconcentration details for the lower aquifer are presented in **Figures 4** and **5**.

2.5.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in sub-slab soil gas and groundwater, it is recommended that the following restrictions be applied to Lot #5418 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring and ongoing vapor intrusion monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5418. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.6 Lot #5437

2.6.1 Background

Lot #5437 was historically used for industrial purposes and is within the area of the former Delphi Thermal Moraine. Currently owned by ICP, Lot #5437 is 47.065 acres and is side gradient of the source area. There is one structure on Lot #5437, the former wastewater treatment plant (WWTP). The WWTP is currently vacant. Lot #5437 is in the City of Moraine in Montgomery County, Ohio.

2.6.2 Assessment Summary

2.6.2.1 Solid Waste Management Units

2.6.2.1.1 Closed North Settling Lagoon

The closed North Settling Lagoon is located east of Dryden Road, west of the WWTP, north of former Building 14, and south of Northlawn Avenue. The North Settling Lagoon covers approximately 4.6 acres. As detailed at length in the Closure Certification Report (Conestoga-Rovers & Associates 2001) and summarized in the 2012 CMP (Arcadis 2012a), the North Settling Lagoon was closed after extensive soil and groundwater data evaluation. This includes stabilizing the waste, importing at least 10 feet of certified clean fill, and installing an asphalt cap.

A risk assessment detailed in the Closure Certification Report indicates that there is no unacceptable risk based on potential exposure to soil in the North Settling Lagoon. No further assessment is needed for this SWMU.

2.6.2.1.2 Landfills L2 and L3

Landfill L2 is located north of former Building 14, east of the WWTP, and covers an area of approximately 3.7 acres. Landfill L2 was used for the collection and disposal of waste generated by Frigidaire from 1950 to 1975. Landfill L3 is located immediately northeast of the closed North Settling Lagoon, northwest of Landfill L2, and covers an area of approximately 1.6 acres. Landfill L3 was used for the collection and disposal of sludge from the closed North Settling Lagoon. An estimated 25,000 cubic yards of sludge were placed in Landfill L3 from 1972 to 1979 (Arcadis 2012).

During the RFI geophysical surveys were conducted at the landfills to delineate the waste boundary. Surficial soil samples were collected for waste characterization and groundwater samples were collected from monitoring wells in the vicinity of the landfills to characterize groundwater quality (Arcadis 2012). A risk assessment provided in the Supplemental RFI indicated that no hazardous constituents in soil at the

landfills would be expected to pose a threat to human health or the environment (Arcadis 2000b). No further assessment is needed for these SWMUs.

2.6.2.2 Areas of Investigation

There are no AOIs on Lot #5437.

2.6.2.3 Other Investigations

There are several upper and lower aquifer monitoring wells on Lot #5418. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5418 exceed the MCLs (Arcadis 2019b).

2.6.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that following restrictions be applied to Lot #5437 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5437. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.7 Lot #5439

2.7.1 Background

Lot #5439 was historically used for industrial purposes and is within the area of the former Moraine Assembly. Currently owned by ICP, Lot #5439 is 30.580 acres and the majority of the main structure is occupied by Fuyao. There is one enclosed structure and a covered storage area (not enclosed) on Lot #5439. The former Process Sump Area was located within the enclosed structure, and the source of groundwater impacts at the Site appears to be from the former Process Sump Area. Lot #5439 is in the City of Moraine in Montgomery County, Ohio.

2.7.2 Assessment Summary

2.7.2.1 Solid Waste Management Units

There are no SWMUs in Lot #5439.

2.7.2.2 Areas of Investigation

There are no AOIs in Lot #5439.

2.7.2.3 Other Investigations

2.7.2.3.1 Soil Gas and Indoor Air

Sub-slab soil gas and indoor air evaluations were completed in the former Process Sump Area manufacturing building on Lot #5439. The results of the evaluations indicated that concentrations of site-specific VOCs in sub-slab soil gas are above the commercial VISLs, and concentrations of site-specific VOCs in indoor air are below the commercial VISLs (RACER Trust 2019a). Based on these results, the building foundation and HVAC system appears to appropriately mitigating vapor intrusion. Inspections of the concrete slab foundation and collection of indoor air samples continue to be completed annually to confirm site-specific VOCs in indoor air remain at concentrations below the VISLs. Per the U.S. EPA's request, the indoor air sampling in 2020 will be completed in bathrooms at the former Process Sump Area facility as these areas are generally prone to issues with vapor intrusion. Additionally, RACER Trust has requested that ICP notify them of new penetrations through the foundation or modifications to the foundation. If construction activities associated with the foundation are anticipated, RACER Trust will coordinate with ICP and Fuyao to minimize the potential for sub-slab soil gas to migrate into indoor air.

2.7.2.3.2 Soil and Groundwater

There have been multiple environmental investigations associated with Lot #5439, focusing on groundwater, soil, and soil gas media. The investigations were reported in the following documents: RCRA Facility Investigation Final Report (RFI; ENVIRON 2000b), the Supplemental RFI (ENVIRON 2000a), Pre-Design Investigation Summary Report (Arcadis 2012b), 2012 CMP (Arcadis 2012a), Former Process Sump Area Draft Data Package (RACER Trust 2015b), Updated Former Process Sump Area Draft Data Package (RACER Trust 2016a), and the Enhanced Reductive Dechlorination Pilot Test Summary Report (Arcadis 2019c).

Risk assessments provided in the 2012 CMP (Arcadis 2012a) and the Preliminary Human Health Risk Assessment Screening Evaluation (Arcadis 2019a) indicated that no hazardous constituents in vadose zone soil samples collected from Lot #5439 would be expected to pose a threat to human health or the environment.

There are several upper and lower aquifer monitoring wells on Lot #5439. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5439 exceed the MCLs (Arcadis 2019b).

2.7.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in sub-slab soil gas and groundwater, it is recommended that the following restrictions be applied to Lot #5439 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.

- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

As will be discussed in more detail in the forthcoming CMP Addendum, active groundwater remediation is proposed for Lot #5439 to reduce site-specific VOC concentrations in the source area. Routine groundwater monitoring and ongoing vapor intrusion monitoring will continue. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.8 Lot #5458

2.8.1 Background

Lot #5458 was historically used for industrial purposes and is within the area of the former Delphi Thermal Moraine. Currently owned by Industrial Realty Group (IRG), Lot #5458 is 18.469 acres and is vacant. Lot #5458 is downgradient of the source area. There are no structures on this lot. Lot #5458 is in the City of Moraine in Montgomery County, Ohio.

2.8.2 Assessment Summary

2.8.2.1 Solid Waste Management Units

2.8.2.1.1 T12

T12 was used collect waste fluid consisting of wash water or spent detergent solution from a process that used polyester resins or potting compounds. T12 was removed during the RFI and corresponding soil and groundwater investigations were summarized in the RFI. A risk assessment indicated that there were no unacceptable risks associated with potential exposure to soil in this SWMU (Arcadis 2000a). Consequently, no further assessment is needed.

2.8.2.1.1 Former Building 14

As part of the former Building 14 demolition, former GM Corporation implemented an investigation of conditions beneath the former Building 14 area in August 2004. Soil and groundwater data collected as part of this investigation were assessed in comparison with risk-based screening values. Based on the risk-based data screening, no soil or groundwater concentrations were identified which would present a significant risk to the receptors and pathways identified under current and reasonably expected future land and groundwater use scenarios (Arcadis 2012a). Consequently, no further assessment is needed.

2.8.2.2 Areas of Investigation

There are no AOIs in Lot #5458.

2.8.2.3 Other Investigations

There are several upper and lower aquifer monitoring wells on Lot #5458. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5458 exceed the MCLs (Arcadis 2019b).

2.8.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #5458 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5458. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.9 Lot #5523

2.9.1 Background

Lot #5523 was historically used for industrial purposes and is within the area of the former Moraine Engine. Currently owned by ICP, Lot #5523 is 20.254 acres and is vacant. Lot #5523 is side gradient to the source area. There two inactive, vacant structures on Lot #5523. Lot #5523 is in the City of Moraine in Montgomery County, Ohio. **Figure 1** shows the location of each facility, property boundaries, and Site features.

2.9.2 Assessment Summary

2.9.2.1 Solid Waste Management Units

There are no SWMUs in Lot #5523.

2.9.2.2 Areas of Investigation

There are two AOIs in Lot #5523: AOI 7 Former Oil House Area and AOI 34 Excavation Area 1.

2.9.2.2.1 AOI 7 Former Oil House Area

The Former Oil House Area (Building 7) was located north of the Moraine Engine Plant 3 (former Frigidaire Plant 2) and was built at least as early as 1949. The Former Oil House Area consisted of the Oil House (Building 7) and an outdoor area that contained underground storage tanks (USTs), above ground storage tanks (ASTs), and a drum storage area. This AOI was removed from service in 1979 when three

buildings were demolished, and the tanks were removed and either replaced or reused. AOI 7 is currently covered by an asphalt parking lot and a vacant, unused building.

There have been multiple soil and groundwater evaluations, which are detailed more fully in the 2012 CMP. Previously thought the be the groundwater source area, this area is no longer understood to function as the source, but still exhibits groundwater impacts that will be reduced as a result of the source area remediation. As documented in the 2012 CMP, risk assessments completed for AOI 7 did not identify unacceptable risk associated with soil. However, groundwater constituents at the former Oil House Area were found to have the potential to migrate to the extent that future use of the lower aquifer may be affected. No further assessment is needed for this AOI.

2.9.2.2.2 AOI 34 Excavation Area 1

AOI 34 was located north of the Moraine Engine Plant 3, west of Springboro Road, and was identified from a 1956 aerial photograph. The excavation area was approximately 300 feet long by 40 feet wide, with the southern end containing a depression that was possibly filled with liquid. This area was covered with grass at the time the Supplemental Description of Current Conditions (Supplemental DOCC; Geraghty & Miller, Inc. 1997) was completed and during the Supplemental RFI sampling (conducted in August 1997). No information was available regarding the types of materials that may have been handled in this area and their potential for releasing hazardous constituents. As concluded in the Supplemental DOCC, no specific basis existed for further investigation at AOI 34; however, a limited investigation to assess the potential presence of contamination was recommended. AOI 34 is currently covered with an asphalt parking lot constructed in 1998. Soil samples were collected for release determination and characterization purposes. The corresponding risk assessment provided in the Supplemental RFI indicated that there was not an unacceptable risk to receptors based on the concentration of constituents in soil at AOI 34 (Arcadis 2000a). Consequently, no further assessment is needed.

2.9.2.3 Other Investigations

There are several upper and lower aquifer monitoring wells on Lot #5523. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5523 exceed the MCLs (Arcadis 2019b).

2.9.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #5523 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment or risk assessment are recommended at Lot #5523. A portion of the source area remediation network may be installed on Lot-#5523. Implementation of source area remediation and monitored natural attenuation are expected to

reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.10 Lot #5435

2.10.1 Site Description and Background

Lot #5435 was historically used for industrial purposes and is within the area of the former Delphi Thermal Moraine. Currently owned by ICP, Lot #5435 is 25.020 acres and is vacant with no structures. Lot #5435 is downgradient of the source area and in the City of Moraine in Montgomery County, Ohio.

2.10.2 Assessment Summary

2.10.2.1 Solid Waste Management Units

2.10.2.1.1 WPSA

The Waste Pile/Staging Area (WPSA) is located north of Landfill L1 and east of Building 21. This SWMU consists of a three-sided sludge bunker (90 feet by 30 feet by 5 feet high), a concrete staging area, and a drainage system. The sludge bunker and staging area were originally constructed in 1976, and the entire WPSA covered approximately 2 acres. This SWMU was used to manage grinding sludge from aluminum, steel, and cast-iron machinery operations; steel and aluminum turnings; and empty drums. Soil samples were collected for release determination and characterization and groundwater samples were collected for characterization purposes at the WPSA (Arcadis 2012a).

To mitigate potential unacceptable exposure, former GM Corporation performed a limited soil removal at the WPSA between September 26 and October 4, 2005.

In 2017, a supplemental soil investigation was completed to evaluate if concentrations of site-specific VOCs in vadose zone soil have the potential to leach into the groundwater and result in concentrations exceeding the MCLs in groundwater at the property boundary. The investigation was completed in accordance with the Supplemental Vadose Zone Investigation Work Plan (Arcadis 2017a). The historical data were evaluated, supplemental data were collected, and the applicable results were processed and modeled.

For a complete history of the WPSA, refer to the 2012 CMP. A risk summary that includes assessments of the WPSA is detailed in **Section 2.10.3** below. No further assessment is needed for this SWMU.

2.10.2.1.2 Former South Tank Farm

The Former South Tank Farm contained eight USTs that were removed between 1986 and 1992. Five of the USTs were regulated by the Ohio Department of Commerce Bureau of Underground Storage Tank Regulations (BUSTR; Facility ID Nos. 57000002-N00004), and three of the USTs were RFI SWMUs. Closure activities, including tank removal, excavation, soil sample collection, and backfilling with clean fill were completed in this SWMU (Arcadis 2012a; RACER Trust 2014a, 2014b, 2014c, and 2016b). BUSTR has issued no further action status for the USTs that they regulated. A risk summary that includes

assessments of the Former South Tank Farm is detailed in **Section 2.10.3** below. No further assessment is needed for this SWMU.

2.10.2.1.3 Former Fill Area

Before the south parking lot was constructed, fill material was used to bring the area up to grade level. The fill material consisted of approximately 75 percent bottom ash (clinkers) from two solid waste incinerators (burned combustible solid waste, such as wood, paper, and cardboard) and approximately 25 percent porcelain sludge from an on-site manufacturing process. Soil samples were collected for waste delineation, release determination and characterization, and groundwater samples were collected for characterization purposes (Arcadis 2012a).

Between 2010 and 2012, a series of pre-design investigations were conducted and included the area around the former Fill Area. Very little fill material was observed during drilling at the former Fill Area and the soil concentrations do not indicate the presence of source material (Arcadis 2012). The corresponding risk assessment provided in the 2012 CMP indicated that there was not an unacceptable risk to receptors based on the concentrations of constituents in soil at the former Fill Area.

A risk summary that includes assessments of the Former Fill Area is detailed in **Section 2.10.3** below. No further assessment is needed for this SWMU.

2.10.2.1.4 Former Liquid Waste Burner

The Former Liquid Waste Burner was in operation from approximately 1957 to 1970 to incinerate spent solvents and oils. The liquids were transferred from on-site locations to the Former Liquid Waste Burner in 55-gallon drums and emptied into two adjacent underground holding tanks for temporary storage. The liquids were then fed to the Former Liquid Waste Burner and incinerated. Surface and subsurface soil samples were collected from the Former Liquid Waste Burner for release determination and characterization (Arcadis 2012a). A risk summary that includes assessments of the Former Liquid Waste Burner is detailed in **Section 2.10.3** below. No further assessment is needed for this SWMU.

2.10.2.1.5 Landfill L1

Landfill L1 was an unlined disposal area located on the former Delphi Thermal Moraine facility and was investigated during the RFI. Landfill L1 is located at the southern end of the facility and covers an area of approximately 7.8 acres. It was used for the collection and disposal of wastes generated by the previous plant operator, Frigidaire, for more than 20 years (i.e., prior to 1950 to approximately 1973). Investigations in Landfill L1 have focused on soil, groundwater, and soil gas data (Arcadis 2012a).

As detailed in the 2012 CMP, the following assessment conclusions have been reached for Landfill L1:

- The waste within the landfill has been characterized and is not considered a source of dissolved impacts.
- The horizontal and vertical extent of the waste in Landfill L1 has been delineated.

A screening level vapor intrusion evaluation was conducted for Landfill L1 using available soil gas data. Several site-specific VOCs in soil gas exceeded the VISLs; however, Landfill L1 will not likely be

developed in the future and if it is, vapor barriers would be used to mitigate potential exposures (Arcadis 2012a).

A risk summary that includes assessments of the Landfill L1 is detailed in **Section 2.10.3** below. No further assessment is needed for this SWMU.

2.10.2.1.6 T11

UST T11 was used as part of the oily waste collection system associated with the WPSA. Soil and groundwater investigations were summarized in the RFI (ENVIRON 2000b). A risk summary that includes assessments of the Former Liquid Waste Burner is detailed in **Section 2.10.3** below. No further assessment is needed for this SWMU.

2.10.2.2 Areas of Investigation

There are no AOIs in Lot #5435.

2.10.2.3 Other investigations

2.10.2.3.1 Former Building 21

Former Building 21 was located south of former Building 14. Based on a review of historic aerial photographs, former Building 21 was present during the time period from approximately the late 1940's to 1996, when the building was demolished. No releases were documented, or historical environmental investigations completed at the former Building 21 area until 2010.

Between 2010 and 2012, a series of pre-design investigations were conducted and included the area around the former Building 21. Soil at the former Building 21 area did not indicate the presence of source material. The corresponding risk assessment provided in the 2012 CMP indicated that there was not an unacceptable risk to receptors based on the concentrations of constituents in soil at former Building 21.

A risk summary that includes assessments of former Building 21 is detailed in **Section 2.10.3** below. No further assessment is needed for this area.

2.10.2.3.2 Groundwater

There are several upper and lower aquifer monitoring wells on Lot #5435. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5435 exceed the MCLs (Arcadis 2019b).

2.10.3 Risk Assessment Summary

2.10.3.1 RFI Baseline Risk Assessment (2000)

A risk assessment was conducted for former Delphi Thermal Moraine (ENVIRON 200b), which focused on the following SWMUs in Lot #5435: WPSA; Former South Tank Farm; Former Fill Area; Former Liquid Waste Burner; Landfill L1; T11. Potential exposures to constituents in soil and waste at the SWMUs via direct contact and airborne transport to ambient air and groundwater transport were evaluated to identify

whether soil/waste at the SWMUs (and transport to groundwater) posed a human health risk that warranted corrective measures. The risk assessment concluded:

- No unacceptable risks for all soil- and air-related pathways
- No unacceptable risks for groundwater under current use conditions
- No unacceptable risks for surface water/sediment

The RFI Baseline Risk Assessment was approved by the U.S.EPA.

2.10.3.2 WPSA Investigation (2004 and 2006)

In 2004, soil and groundwater investigations and associated data evaluations were completed in the WPSA (Arcadis 2004). The calculated risks based on soil concentrations prompted a limited soil removal in September/October 2005 (Arcadis 2006). The post-excavation risk evaluation concluded the following:

- No unacceptable risks were identified for direct contact pathways by a routine worker or construction worker.
- No unacceptable risks were identified for soil and groundwater pathways.

Due to the ongoing operational status of former GM Corporation at the time of the evaluations, it was assumed that the asphalt cover over the area would be maintained in perpetuity, and the cover was considered an additional conservative measure to prevent contact with soil. An institutional control requiring a cover or cap is not required based on the results of this or other risk assessments.

2.10.3.3 Supplemental Risk Evaluation (2008)

A supplemental risk evaluation was conducted for the Site (ENVIRON 2008a) which built upon the RFI Baseline Risk Assessment (ENVIRON 2000b), the Supplemental RFI (ENVIRON 2008), the Box Sewer Investigation (Arcadis 2002), the Waste Pile/Staging Area Investigation (Arcadis 2004, 2006), and the former Building 14 Investigation (Arcadis 2005). Specifically, the risk analysis included an updated evaluation of potential risks and hazards associated with on-site and off-site groundwater exposures based on data collected since the RFI/Supplemental RFI and evaluation of potential soil and groundwater exposure pathways and receptors identified since the completion of the RFI/Supplemental RFI.

The 2008 supplemental risk evaluation identified the following exposure scenarios as having excess lifetime cancer risks and/or non-cancer hazards above U.S. EPA benchmarks:

- On-site construction worker contact with soil in Landfill L1 and WPSA
    - It should be noted that exposure to soil in Landfill L1 was re-evaluated in the Updated Human Health Risk Assessment (2012 HHRA; see **Section 2.10.3.4**).
    - It should be noted that exposure to soil in the WPSA was re-evaluated in the Risk Assessment Update (see **Section 2.10.3.5**).
- On-site and off-site potable groundwater use

The other exposure pathways evaluated in the 2008 supplemental risk evaluation were less than the acceptable U.S. EPA benchmarks.

2.10.3.4 Updated HHRA (2012)

The 2012 HHRA (Arcadis 2012a) focused on investigation areas that were not previously evaluated for potential human exposures and those areas for which recent soil and groundwater data were collected. These areas included: Landfill L1, West Tank Farm, Box Sewer, former Process Sump Area, Historic Fill Area, and former Building 21. The following items summarize the portions of this evaluation that pertain to the SWMUs on Lot #5435:

- The selection of receptors mirrored those receptor groups that were evaluated in previous risk assessments and included on-site routine workers, on-site maintenance workers, on-site construction workers, off-site residents exposed to potable groundwater at public wells, and off-site routine workers at several properties with private wells.
- The Adult Lead Model (ALM) was used to evaluate potential exposure to lead for receptors at Landfill L1, and the results of the ALM indicated that lead concentrations in soil were acceptable.
- The following exposure scenario resulted in predicted excess lifetime cancer risks and/or non-cancer hazards above U.S. EPA benchmarks of 1×10^{-5} or 1, respectively:
    - Direct contact with groundwater at Landfill L1 for on-site construction workers (*incomplete pathway due to depth to groundwater greater than the typical excavation depth*)
- A screening level vapor intrusion evaluation was conducted for Landfill L1 using available soil gas data. Several site-specific VOCs exceeded soil gas screening levels; however, Landfill L1 will not likely be developed in the future and if it is, vapor barriers would be used to mitigate potential exposures.
- The site-wide vapor intrusion evaluation was conducted using groundwater data. PCE, TCE, and vinyl chloride exceeded target groundwater concentrations for the protection of indoor air. To address this issue, vapor barriers with engineering controls will be used in future on-site construction to mitigate exposures.

2.10.3.5 Soil to Groundwater Evaluation (2018)

The results of the December 2017 Supplemental Vadose Zone Investigation were incorporated into the SEVIEW 7.1 leaching model to determine if PCE and TCE in vadose zone soil have the potential to leach into the groundwater and result in concentrations exceeding the MCLs in groundwater at the property boundary (Arcadis 2018). The results of the model update indicate the following:

- Concentrations of PCE in vadose zone soil in the WPSA may result in property boundary (i.e., point of compliance [POC]) groundwater concentrations ranging from 2.4 to 11 micrograms per liter (µg/L). However, POC well concentrations are expected to remain below or fall below the 5 µg/L MCL within 10 years.
- Concentrations of TCE in vadose zone soil in the WPSA may result in POC groundwater concentrations ranging from 2.4 to 5.3 µg/L. However, POC well concentrations are expected to remain below or fall below the 5 µg/L MCL within 8 years.

Based on these results, the vadose zone will not contribute to future unacceptable groundwater impacts after the anticipated remedial timeframe. Consequently, no further quantitative evaluation is proposed.

2.10.3.6 Risk Assessment Update (2019)

A Risk Assessment Update was completed to assess risk for Lot #5435 using data collected since the HHRA. Additionally, during the November 13, 2019 meeting with RACER Trust, the U.S. EPA, and Arcadis, the U.S. EPA requested that the adult lead model (ALM) be updated. The following sections summarize the Risk Assessment Update, which is included as **Appendix A**.

2.10.3.6.1 WPSA

Soil data collected in 2017 were used to supplement areas without prior data or replace older data collected in the same area. The results of the risk assessment indicate that the predicted cancer risks for receptors fall within or are below the U.S. EPA risk management range of $1x10^{-4}$ to $1x10^{-6}$. The calculated non-cancer hazards for on-site routine workers and on-site maintenance workers did not exceed the target non-cancer hazard of 1. The calculated non-cancer hazard for on-site construction workers exceed 1 under both exposure scenarios. When non-cancer hazards for construction workers were summed by target organs, the calculated hazards for developmental and musculoskeletal endpoints exceed the limit of 1 under the reasonable maximum exposure (RME) scenario. However, under the central tendency exposure (CTE) scenario, calculated hazards for all target organ endpoints do not exceed the hazard limit of 1. Based on these results, no further assessment, remediation, or institutional controls are needed in the WPSA.

2.10.3.6.2 Landfill L1

The ALM presented in the 2012 CMP was updated using the U.S. EPA ALM (2017a and 2017b). The ALM estimates the probability that fetal blood lead concentrations exceed the target blood lead concentration of 5 micrograms per deciliter (µg/dL).

The average concentration of lead in soil and RME and CTE ingestion rates and exposure frequencies were input into the model for each receptor. The results indicated that exposure to average lead concentrations in soil would not pose an unacceptable risk to human health. Therefore, no additional assessment is needed. The outputs of the ALM for the exposure scenarios are presented in **Appendix A**.

2.10.4 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #5435 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, or risk assessment are recommended at Lot #5435. Periodic introduction of a carbon source (i.e., molasses) maybe introduced into the in-situ remediation zones on Lot #5435 to prevent downgradient migration of the site-specific VOC, upper aquifer plume. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.11 Lot #1034

2.11.1 Background

Lot #1034 was historically used for industrial purposes and is within the area of former Delphi Thermal Moraine. Currently owned by RACER Properties LLC, Lot #1034 is 18.174 acres and is vacant. The lot is downgradient of the source area. The only structures on the lot are three conex boxes that contain the groundwater treatment systems to support operation of Phase 1 Dynamic Groundwater Recirculation (Phase 1 DGR™). Lot #1034 is in the City of Moraine in Montgomery County, Ohio.

2.11.2 Assessment Summary

2.11.2.1 Solid Waste Management Units

2.11.2.1.1 South Settling Lagoon

The closed South Settling Lagoon is located east of Interstate 75, west of Dryden Road, north of Main Street, and south of East River Road. This lagoon covers an estimated area of 7.9 acres. As detailed at length in the Closure Certification Report (Conestoga-Rovers & Associates 2001) and summarized in the 2012 CMP, this SWMU was closed after extensive soil and groundwater data evaluation. This included stabilizing the waste, importing at least 10 feet of certified clean fill, and installing a clay cap.

A risk assessment detailed in the Closure Certification Report indicates that there is no unacceptable risk based on potential exposure to soil in the closed South Settling Lagoon. No further investigation or assessment is needed for this SWMU.

2.11.2.2 Areas of Investigation

There are no AOIs on Lot #1034.

2.11.2.3 Other Investigations

2.11.2.3.1 Closed South Settling Lagoon Vapor Intrusion Verification Investigation

In January and February 2012, an evaluation of soil gas at the closed South Settling Lagoon was completed. The site-specific VOCs detected in soil gas at the closed South Settling Lagoon were similar to the site-specific VOCs detected in soil gas at the Riverview Plat neighborhood. However, the concentrations at the closed South Settling Lagoon were lower. The difference in the site-specific VOC

soil gas concentrations between the closed South Settling Lagoon and the Riverview Plat neighborhood could be attributed to the lack of foundations, asphalt roads, and/or other impervious structures along the perimeter of the closed South Settling Lagoon. Conceptually, soil gas along the perimeter of the closed South Settling Lagoon is more likely to migrate to the surface where it can dissipate into the atmosphere and not collect underneath an impervious structure (e.g., basement).

In 2019, the Phase 1 DGR™ interim measure was implemented at the Site. The objective of this system is to reduce site-specific VOCs in groundwater within the Riverview Plat neighborhood to concentrations below the MCLs within 5 years of initiating full-scale operation. The Phase 1 DGR™ remedy is a modification to traditional hydraulic containment methods and employs groundwater recirculation to enhance advective flushing by creating the dynamic gradients required to reverse the processes of plume development, with routine optimization to achieve optimal performance. Extracted groundwater is treated with aboveground granular activated carbon treatment systems housed in conex boxes. Treated groundwater is then reinjected into injection wells to promote enhanced groundwater flushing within the upper aquifer treatment area.

2.11.2.3.2 Groundwater

There are several upper aquifer monitoring wells on Lot #1034. Concentrations of site-specific VOCs in the upper aquifer below Lot #1034 exceed the MCLs (Arcadis 2019b).

2.11.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #1034 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment or risk assessment are recommended at Lot #1034. The Phase 1 DGR™ groundwater remediation system will continue to operate until groundwater concentrations upgradient of the system are within acceptable levels for potential off-site vapor intrusion exposure and operation of Phase 1 DGR™ is not necessary to prevent off-site migration of unacceptable concentrations of groundwater. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.12 Lot #5433

2.12.1 Background

Lot #5433 was historically used for industrial purposes and is within the area of the former Moraine Engine. Currently owned and operated by Copart of Connecticut Inc, Lot #5433 is 41.145 acres. Lot

#5433 is downgradient of the source area. There is one occupied structure on Lot #5433 that which includes vapor intrusion mitigation measures. It should be noted that one inactive well associated with the fire suppression system (FW-4; see **Figures 4** and **5**) is located on this lot. Lot #5433 is in the City of Moraine in Montgomery County, Ohio.

2.12.2 Assessment Summary

2.12.2.1 Solid Waste Management Units

There are no SWMUs in Lot #5433.

2.12.2.2 Areas of Investigation

2.12.2.2.1 AOI 13 Former Buildings 4, 6, and 13

Buildings 4, 6, and 13 of the Frigidaire facilities were located south of the Moraine Engine Plant 3. Buildings 4 and 6 (also known as Moraine Engine Plant 4) were approximately 300,000 square feet. Buildings 4 and 6 were constructed in 1917 and 1926, respectively, and the buildings had many previous uses including manufacturing of service parts, chemical storage, storage for oil recovery, and offices. Frigidaire discontinued operations in 1979, and by late 1981 these buildings were unoccupied.

AOI 13 is currently covered with an asphalt parking lot constructed in 1998. As detailed in the 2012 CMP, there was a potential for AOI 13 to have been a potentially significant source for soil and groundwater contamination, and further investigation was warranted under the Supplemental RFI. Soil samples were collected for release determination and characterization purposes (Arcadis 2012a).

The corresponding risk assessment provided in the Supplemental RFI indicated that there was not an unacceptable risk to receptors based on the concentration of constituents in soil at AOI 13 (ENVIRON 2000b). Consequently, no further assessment is needed.

2.12.2.2.2 AOI 17 Former Building 15

AOI 17 includes Building 15 and a former Frigidaire Plant 2 used oil UST. Building 15 covered an area of approximately 17,000 square feet, and based on a review of aerial photographs, it was constructed prior to 1949. The building was used for maintenance purposes and included a truck maintenance repair area, an equipment steam booth area and a maintenance spray booth area located in the center of the building. The 900-gallon steel UST located south of Building 13 and north of Building 15 was used to store used oil from garage operations. It is unknown when this tank began operation. The used oil present in the UST at the time of closure contained VOCs (ethylbenzene, PCE, toluene, and xylenes), but no VOCs were detected in the soil tested during closure activities. The UST was removed and clean closed under the BUSTR in 1994.

AOI 17 is currently covered with an asphalt parking lot constructed in 1998 (Building 15 was demolished and removed as part of the parking lot construction). Due to the potential for AOI 17 to have served as a historical source of VOCs detected in monitoring well GM-21, further investigation was warranted under

the Supplemental RFI. Soil samples were collected for release determination and characterization purposes (Arcadis 2012a).

The corresponding risk assessment provided in the Supplemental RFI indicated that there was not an unacceptable risk to receptors based on the concentration of constituents in soil at AOI 17 (ENVIRON 2000A). Consequently, no further assessment is needed.

2.12.2.2.3 AOI 36 Former Southwest Aboveground Storage Tanks

AOI 36 was located in the southwest corner of the Moraine Engine facility and consisted of four sets of concrete AST saddles. The two southern-most sets of saddles consisted of four larger saddles per tank and were contained in an earthen dike area approximately that was 50 feet by 70 feet. The two northern-most sets of saddles consisted of two saddles per tank and were contained in a separate 40-foot by 55-foot earthen dike area. These tank saddles and earthen berms were identified during a site walk in June 1997. A review of aerial photographs indicated that the two southern-most tanks were installed prior to 1949. One tank was installed on the northern-most set of saddles between 1949 and 1956. These three tanks were present in the 1975 aerial photograph but had been removed prior to the 1990 aerial photograph. There was no evidence that the fourth set of saddles was ever used. Use of these tanks was thought to have ceased prior to the early 1970's; however, the tank saddles and earthen berms were still present during the Supplemental RFI investigation. No information was available regarding the types of materials which may have been handled in this area and their potential for releasing hazardous constituents.

AOI 36 is currently covered with an asphalt parking lot constructed in 1998. As detailed in the 2012 CMP, no specific basis existed for further investigation at AOI 36; however, given the probable use of the area for storage of liquid materials, a limited investigation to determine if a release had occurred was recommended under the Supplemental RFI. Soil samples were collected for release determination and characterization purposes (Arcadis 2012A).

The corresponding risk assessment provided in the Supplemental RFI indicated that there was not an unacceptable risk to receptors based on the concentration of constituents in soil at AOI 36 (Arcadis 2000a). Consequently, no further assessment is needed.

2.12.2.3 Other Investigations

2.12.2.3.1 Box Sewer Investigation

The Box Sewer was used by Frigidaire to convey process water before former GM Corporation converted Plants 2 and 3 into the Moraine Engine and Moraine Assembly facilities in 1979 to 1980. Prior to and as part of the conversion, all process waste connections to the Box Sewer were terminated. The Box Sewer investigation activities were conducted in November 2001 to determine if a release of hazardous constituents had occurred and, if so, delineate the extent of impacts.

The risk-based assessment of the Box Sewer investigation data indicated that the presence of hazardous constituents in soils do not present a significant risk via the pathways identified under current and reasonably expected future land and groundwater use scenarios. As a result, former GM Corporation proposed no further assessment for the Box Sewer (Arcadis 2002).

Between 2010 and 2012, a series of pre-design investigations were conducted and included the Box Sewer area. The results of the investigation indicated that the soil concentrations at the Box Sewer, as compared to the previous investigations, were significantly lower. The groundwater profiling data at the Box Sewer indicated that concentrations increased with depth. The presence of PCE and TCE at elevated concentrations in the deeper portion of the upper aquifer is likely due to the presence of historic releases from the presence of source material near the former Process Sump Area. The corresponding risk assessment provided in the 2012 CMP indicated that there was not an unacceptable risk to receptors based on the concentrations of constituents in soil at the Box Sewer.

2.12.2.3.2 Groundwater

There are several upper and lower aquifer monitoring wells on Lot #5433. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5433 exceed the MCLs (Arcadis 2019b).

Fire suppression well FW-4 was sampled several times between 1992 and 1996 and analyzed for select site-specific VOCs. Note that this well is within or proximal to the lower aquifer plume, and the historic results are consistent with the current understanding of the plume. The groundwater isoconcentration details for the lower aquifer are presented in **Figures 4** and **5**.

2.12.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #5433 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5433. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.13 Lot #5436

2.13.1 Background

Lot #5436 was historically used for industrial purposes and is within the area of the former Delphi Thermal Moraine. Currently owned and operated by Inland Property Management Inc. (RJ Trucking), Lot #5436 is 17.030 acres. Lot #5436 is downgradient of the source area. There is one occupied structure on Lot #5436, which includes vapor intrusion mitigation measures. Lot #5436 is in the City of Moraine in Montgomery County, Ohio.

2.13.2 Assessment Summary

2.13.2.1 Solid Waste Management Units

2.13.2.1.1 Former West Tank Farm

The West Tank Farm contained 14 USTs that were removed between 1986 and 1992. Five of the USTs were regulated by BUSTR, and nine of the USTs were investigated during the RFI and referred to as SWMUs. A report summarizing the closure activities, including tank removal, soil sample collection, and backfilling with clean soil was submitted to BUSTR in 1993 for the West Tank Farm. The corresponding risk assessment provided in the RFI indicated that there was not an unacceptable risk to receptors based on the concentration of constituents in soil at the Former West Tank Farm (ENVIRON 2000b).

Between 2010 and 2012, a series of pre-design investigations were conducted and included the West Tank Farm area. The results of the investigation indicated that the soil concentrations at the West Tank Farm, as compared to the previous investigations, were significantly lower. The groundwater profiling data at the West Tank Farm indicated that concentrations are similar with depth. The corresponding risk assessment provided in the 2012 CMP indicated that there was not an unacceptable risk to receptors based on the concentrations of constituents in soil at the Former West Tank Farm.

2.13.2.1.2 T4, T5, and T6

Historical documentation does not indicate the contents of USTs T4, T5, and T6, but soil samples were collected for release determination and characterization during the RFI. The risk assessment for these areas indicated that there were no unacceptable risks associated with potential exposure to soil in this SWMU (ENVIRON 2000b). Consequently, no further assessment is needed.

2.13.2.1.3 Former Building 14

As part of the former Building 14 demolition, former GM Corporation implemented an investigation of conditions beneath the former Building 14 area in August 2004. Soil and groundwater data collected as part of this investigation were assessed in comparison with risk-based screening values. Based on the risk-based data screening, no soil or groundwater concentrations were identified which would present a significant risk to the receptors and pathways identified under current and reasonably expected future land and groundwater use scenarios (Arcadis 2012a). Consequently, no further assessment is needed.

2.13.2.2 Areas of Investigation

There are no AOIs in Lot #5436.

2.13.2.3 Other Investigations

There are several upper and lower aquifer monitoring wells on Lot #5436. Concentrations of site-specific VOCs in the upper and lower aquifers below Lot #5433 exceed the MCLs (Arcadis 2019b).

2.13.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #5433 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5433. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.14 Lot #5416

2.14.1 Background

Lot #5416 was historically used for industrial purposes and is within the area of the former Moraine Assembly. Currently owned and operated by DMAX Engine Plant (DMAX), Lot #5416 is 38.612 acres. Lot #5416 is upgradient of the groundwater plume. There is one occupied structure on Lot #5416. Lot #5416 is in the City of Moraine in Montgomery County, Ohio.

2.14.2 Assessment Summary and Conclusions

Prior to the formation of RACER Trust, the northern portion of the former Moraine Assembly property located at 3100 Dryden Road (now referred to as DMAX) was transferred to General Motors Company, LLC. On March 4, 2010, BOW provided the U.S. EPA a letter (BOW 2010) providing documentation of the former West Haulaway UST investigations and closure reports for the DMAX lot. No further action has been approved for all BUSTR incident numbers associated with DMAX, and no further action has been approved for RCRA Corrective Action by the U.S. EPA. As outlined in the 2011 Administrative Order on Consent (AOC; U.S. EPA 2011), the DMAX property is not a respondent to the current AOC (U.S. EPA 2011), and corrective actions associated with the Site do not apply to Lot #5416.

2.15 Lot #5459

2.15.1 Background

Lot #5459 was historically used for industrial purposes and is within the area of the former Delphi Thermal Moraine. Currently owned and operated by Wright Warehouse, Inc, Lot #5459 is 10.010 acres and is currently used to store and distribute mulch. This lot is side gradient of the source area. There is one occupied structure on Lot #5459, which includes vapor intrusion mitigation measures. Lot #5459 is in the City of Moraine in Montgomery County, Ohio.

2.15.2 Assessment Summary

2.15.2.1 Solid Waste Management Units

2.15.2.1.1 Former Building 14

As part of the former Building 14 demolition, former GM Corporation implemented an investigation of conditions beneath the former Building 14 area in August 2004. Soil and groundwater data collected as part of this investigation were assessed in comparison with risk-based screening values. Based on the risk-based data screening, no soil or groundwater concentrations were identified which would present a significant risk to the receptors and pathways identified under current and reasonably expected future land and groundwater use scenarios (Arcadis 2012a). Consequently, no further assessment is needed.

2.15.2.2 Areas of Investigation

There are no AOIs in Lot #5459.

2.15.2.3 Other Investigations

There are several upper aquifer monitoring wells on Lot #5459. Concentrations of site-specific VOCs in the upper aquifer below Lot #5459 exceed the MCLs (Arcadis 2019b).

2.15.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #5459 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5459. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.16 Lot #5460

2.16.1 Background

Lot #5460 was historically used for industrial purposes and is within the area of the former Delphi Thermal Moraine. Currently owned and operated by the State of Ohio, Lot #5460 is 10.000 acres and serves as the Ohio Department of Transportation, District 7, Moraine Outpost. There are two occupied structures on

Lot #5460, which includes vapor intrusion mitigation measures. There is also a salt barn. This lot is downgradient of the source area. Lot #5460 is in the City of Moraine in Montgomery County, Ohio.

2.16.2 Assessment Summary

2.16.2.1.1 Former Building 14

As part of the former Building 14 demolition, former GM Corporation implemented an investigation of conditions beneath the former Building 14 area in August 2004. Soil and groundwater data collected as part of this investigation were assessed in comparison with risk-based screening values. Based on the risk-based data screening, no soil or groundwater concentrations were identified which would present a significant risk to the receptors and pathways identified under current and reasonably expected future land and groundwater use scenarios (Arcadis 2012a). Consequently, no further assessment is needed.

2.16.2.2 Areas of Investigation

There are no AOIs in Lot #5460.

2.16.2.3 Other Investigations

There is one upper aquifer monitoring well on Lot #5460 (GM-66). Concentrations of site-specific VOCs in the upper aquifer below Lot #5460 exceed the MCLs (Arcadis 2019b).

2.16.3 Conclusions and Path Forward

Due to the elevated concentrations of site-specific VOCs in groundwater, it is recommended that the following restrictions be applied to Lot #5460 through an environmental restrictive covenant:

- The use of groundwater for any purpose, including potable and non-potable uses, is prohibited.
- Buildings or other enclosed structures that will be occupied require a vapor intrusion evaluation and, if necessary, the installation of appropriate vapor intrusion mitigation measures.
- Residential redevelopment is prohibited.

Other than routine groundwater monitoring, no additional site assessment, remediation, or risk assessment are recommended at Lot #5460. Implementation of source area remediation and monitored natural attenuation are expected to reduce the concentrations of site-specific VOCs in soil gas and groundwater and meet the applicable CMOs for the Site.

2.17 Off-Site

2.17.1 Vapor Intrusion

2.17.1.1 Off-Site Vapor Intrusion Investigation and Mitigation

An off-site field investigation was completed in October and November 2010 and March 2011 to evaluate the potential for a complete vapor intrusion pathway using a phased approach. During the field investigation, soil gas and groundwater table samples were collected near potential off-site receptors (residential and commercial structures) located in proximity to the Site. The areas of the investigation were the areas located to the east and southwest (the Riverview Plat neighborhood) of the Site. The groundwater and soil gas data were used as part of the overall weight of evidence for evaluating the vapor intrusion pathway. Based on the results of this vapor intrusion verification investigation, the following conclusions were made:

- PCE and TCE were the primary chemicals of concern identified in soil gas.
- Concentrations of PCE and TCE in soil gas increased with depth which indicated that groundwater was the primary source of the PCE and TCE detected in soil gas.
- Based on the concentrations of PCE and TCE in soil gas, indoor air and sub-slab sampling at properties in the Riverview Plat neighborhood was completed.
- Based on the lack of a site-specific VOC source in soil or groundwater and confirmation that VOCs were not detected above the VISLs in the samples collected, a future phase of investigation to the east of the Site was not warranted.

Beginning in March 2011, sub-slab and indoor air sampling was completed at properties where an access agreement was signed by the property owner. Since concentrations of PCE, TCE, and 1,1-DCA were detected in the sub-slab and indoor air samples collected from the properties in the Riverview Plat neighborhood at concentrations that were greater than or equal to the VISLs, mitigation systems were offered to the property owners. Beginning in September 2011, mitigation systems were installed at properties where an access agreement was signed by the property owner (Arcadis 2012a). The following is a summary of the vapor intrusion activities in the Riverview Plat neighborhood:

- 63 properties in Riverview Plat Neighborhood (60 residential; 3 commercial)
- One property south of Dryden Road included in investigation (commercial – City of Moraine Municipal Building)
- 46 properties sampled, and validated results received
- 41 of 46 properties with sample results require mitigation based on U.S. EPA recommendation
- 29 systems installed
- Five properties were recommended for confirmation sampling (4 residential and the City of Moraine Municipal Building). Confirmation sampling verified mitigation was not necessary.

Operation and maintenance activities association with vapor intrusion mitigation are ongoing where access continues to be provided. Given the lack of access into some properties within the groundwater plume for vapor intrusion assessment and mitigation, an active groundwater interim measure was implemented to eliminate the off-site vapor intrusion pathway. As detailed in **Section 2.11**, the Phase 1 DGR™ system was installed on Lot #1034 in 2019. It is expected that operation of Phase 1 DGR™ for five years or less will reduce concentrations of site-specific VOCs in groundwater to below the VISLs for residential groundwater.

2.17.2 Sediment, Surface Water, and Ecological Risk Assessment

Groundwater concentrations from monitoring wells adjacent to the Great Miami River are below associated waste load allocations (WLAs), which are derived using both ecological and human health benchmarks (i.e., Ohio Surface Water Criteria, U.S. EPA Region 5 Ecological Screening Levels (ESLs), and EPA MCLs). Therefore, even under a conservative scenario, off-site groundwater concentrations are not expected to result in surface water or pore-water concentrations in the Great Miami River that would pose a risk to human health or the environment. Additionally, the fish consumption pathway is not expected to be of significant concern in the Great Miami River because the site-specific constituents (primarily PCE and TCE) in groundwater are not expected to bioaccumulate. Similarly, there are no data to suggest that either of these constituents would accumulate in sediment over time. Further, fish consumption in these water bodies is not expected to be a significant pathway because a subsistence fishing population does not likely exist in the City of Moraine and the current fish consumption advisory would be expected to mitigate potential fish consumption in the area (Arcadis 2012a).

2.17.3 Potable Groundwater Wells

Montgomery County has indicated that they plan to abandon the Dryden North and Miami Shores wellfield (Taft 2019). The West Carrollton wellfield is located approximately 8,700 feet to the south of the Site. The groundwater model for the site was updated in 2019, and a preliminary evaluation indicated that the upper and lower site-specific VOC plumes at the Site are outside of the West Carrollton capture zone. The updated groundwater model and the capture evaluation will be provided in the CMP Addendum.

The 2012 CMP included an evaluation of off-site routine workers at properties with private wells including a comparison of groundwater data to MCLs. Groundwater concentrations at the property location of 3571/3573 Dryden Road had a slight exceedance of the vinyl chloride MCL. Concentrations of site-specific VOCs at the 2651 Blanchard Avenue property and the 4000 Miller Valentine Court property were below MCLs (Arcadis 2012a). RACER Trust is continuing to pursue confirmation of the well status, well sampling, and well abandonment, where applicable. An access agreement was recently signed by the owner of 3571/3573 Dryden Road, and coordination of well abandonment and connection to municipal sewer and water services is in progress.

Potable water is available at residential and commercial properties throughout the extent of the groundwater plume. RACER Trust will verify at appropriate jurisdictional levels that additional institutional controls are not needed to mitigate potential off-site risk through the installation of new potable wells within the off-site groundwater plume.

2.17.4 Miami Shores

2.17.4.1 Vapor Intrusion Evaluation

Three monitoring wells were installed between the Miami Shores neighborhood and the west bank of the Great Miami River to evaluate off-site shallow groundwater concentrations at the upper aquifer water table in accordance with the Focused Off-Site Groundwater Investigation Work Plan (Arcadis 2017b). Sampling has been completed at the previously existing wells in the Miami Shores area and the new wells.

The groundwater data were screened against the applicable VISLs for residential groundwater. The water table wells (RMW-95, RMW-96, and RMW-97), which represent conditions closest to the receptor (i.e., residential properties), do not exceed the VISLs (Arcadis 2019b; RACER Trust 2019c).

2.17.4.2 Construction Worker Evaluation

In order to estimate potential risk from exposure to groundwater by a construction worker, an off-site risk evaluation was completed. The maximum historical results from the groundwater monitoring wells within the vicinity of the Miami Shores neighborhood were used as the representative concentrations for the assessment. The exposure parameters from the 2012 CMP were used in this assessment, including an exposure frequency of 250 days. The toxicity values were based on the current values promulgated by the U.S. EPA. Using this data, the risk from potential dermal, inhalation, and incidental ingestion exposure was characterized. The results indicate that there is not an unacceptable risk to an off-site construction worker in the Miami Shores neighborhood. Specifically, an excess lifetime cancer risk (ELCR) of $7x10^{-8}$ and a hazard index (HI) of 0.1 were calculated. These results are well below the U.S. EPA ECLR target of $1x10^{-6}$ and an HI target of 1, respectively (RACER Trust 2018b). Consequently, no further assessment is needed in this area.

3 CONCLUSIONS

Based on an evaluation of air, soil gas, soil, and groundwater data available for the parcels that comprise the Site and off-site areas associated with the Site, the unacceptable exposure pathways identified are direct contact to groundwater and vapor intrusion. The following corrective actions are planned to address the potential exposure pathways and meet the CMOs for the Site:

- Implement the following controls through an environmental restrictive covenant for each parcel at the Site:
    - With the exception of fire well FW-1A, prohibit the use of groundwater for any purpose, including potable and non-potable uses.
    - Require a vapor evaluation for buildings or other enclosed structures that will be occupied and, if necessary, require the installation of appropriate vapor intrusion mitigation measures.
    - Prohibit residential redevelopment.
- Continue operation of interim measures to address and prevent site-specific VOC plume migration below the Riverview Plat neighborhood until implementation of source area remedy and monitored natural attention have sufficiently reduced concentrations of site-specific VOCs in upper aquifer groundwater.
- Implement source area remediation and monitored natural attenuation to reduce the concentrations of site-specific VOCs in soil gas and groundwater in order to meet the applicable CMOs for the Site.
- With access from the property owners and in coordination with the U.S. EPA, abandon and/or evaluate the private wells located at 3571/3573 Dryden Road, 2651 Blanchard Avenue, and 4000 Miller Valentine Court to verify the direct contact with groundwater pathway is incomplete.
- Verify appropriate institutional controls are in place to prevent installation of potable wells within the site-specific VOC plume.

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TABLES

Table 1
Corrective Action Framework
Sitewide Risk Assessment Summary
RACER Trust Moraine Facilities
Moraine, Ohio

Lot No.	Owner	SWMUs / AOIs / Target Area on the Parcel	Identified Potential Exposure Pathway[1]	Corrective Actions
1	Fuyao Asset Management A LLC	None	Direct Contact to Groundwater Vapor Intrusion	Land use restriction Groundwater use restriction Groundwater remediation / MNA VI evaluation and mitigation (if necessary) requirement
2		None		
5438		AOI 35 - Excavation Area 2		
5524	Norfolk Southern Railway FKY Consolidated Rail Corporation	None		
5418	ICP Moraine LLC	None		
5437	ICP Moraine LLC	Closed North Settling Lagoon Landfill L2 Landfill L3		
5439	ICP Moraine LLC	Former Process Sump area		
5523	ICP Moraine LLC	AOI 7 Former Oil House Area AOI 34 Excavation Area 1 Waste Pile/Staging Area Former South Tank Farm Former Fill Area Former Liquid Waste Burner Landfill L1 Underground Storage Tank T11		
5435	ICP Moraine LLC			
5458	IRG Moraine LLC	Underground Storage Tank T12 Former Delphi Thermal Building 14		
1034	RACER Properties LLC	Closed South Settling Lagoon		
5433	Copart of Connecticut Inc.	AOI 13 Former Buildings 4, 6, and 13 AOI 17 Former Building 15 AOI 36 Former Southwest Aboveground Storage Tanks Box Sewer		
5436	Inland Property Management Inc. (RJ Trucking)	Former West Tank Farm Underground Storage Tanks T4, T5, and T6 Former Building 14		
5416	DMAX Ltd.	None		
5459	Wright Warehouse Inc.	Former Building 14		
5460	State of Ohio	Former Building 14		
Off-Site	Multiple	None		Groundwater use restriction Groundwater remediation / MNA VI evaluation and mitigation (if necessary) requirement

Notes:
1 - The results of the risk assessments completed for the Site indicate no unacceptable risk to soil via direct contact (due to depth of impacts/waste or acceptable calculated risk) or migration to groundwater.
AOIs - Areas of Concern
SWMUs - Solid Waste Management Units
The Corrective Measures Objectives for the Site are included in the Site-Wide Risk Assessment Summary and include applicable clean-up goals and timeframes for the Site.

FIGURES

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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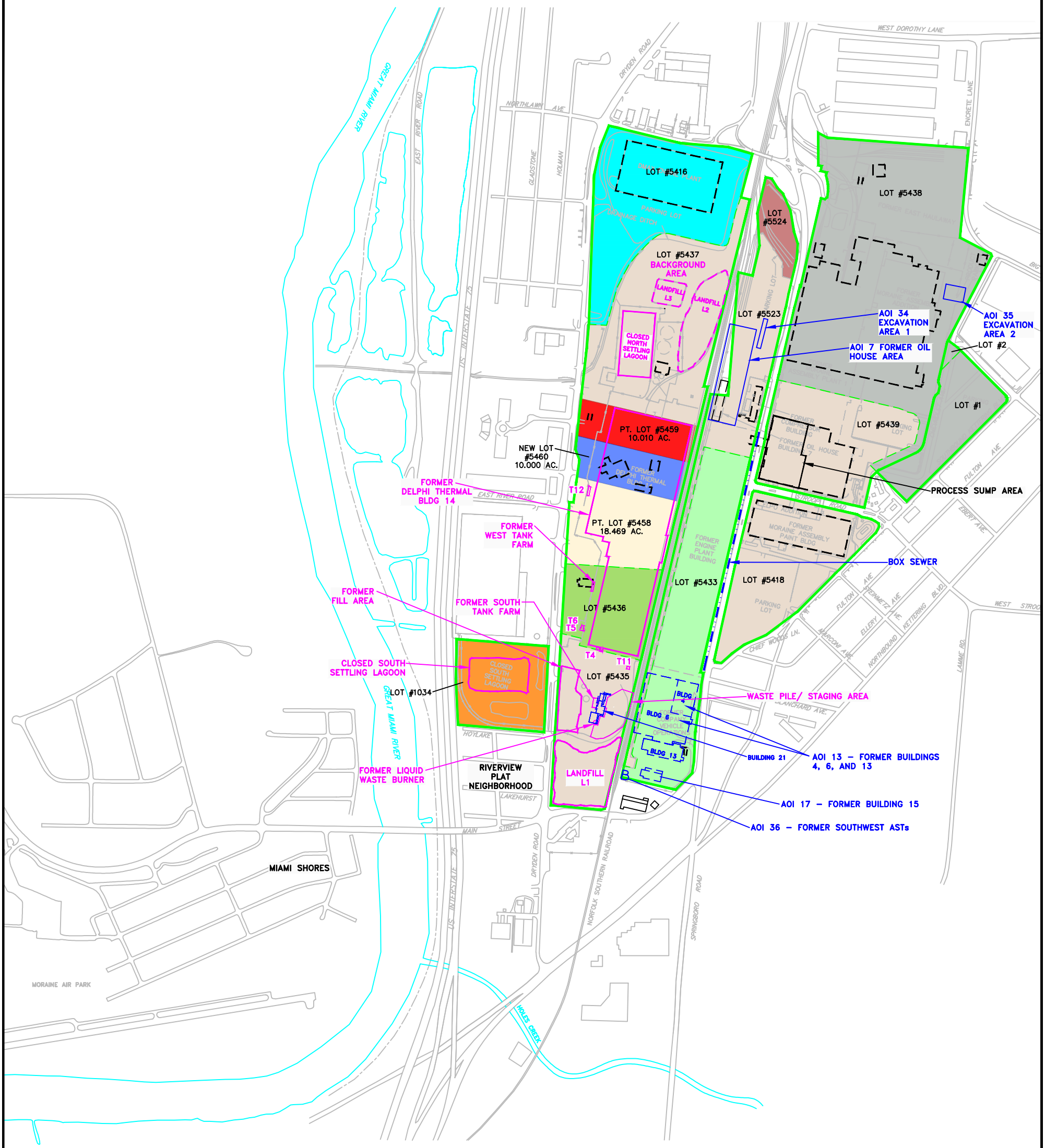

LEGEND

- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- CURRENT BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY

AOI AREA OF INTEREST INVESTIGATED DURING THE SUPPLEMENTAL RFI

SWMU SOLID WASTE MANAGEMENT UNIT INVESTIGATED DURING THE RFI

LOT INFORMATION		
LOT NUMBER	ACREAGE	LOT OWNER
LOT #1	15.568 Ac.	FUYAO ASSET MANAGEMENT A LLC
LOT #2	0.5585 Ac.	FUYAO ASSET MANAGEMENT A LLC
LOT #5438	94.060 Ac.	FUYAO ASSET MANAGEMENT A LLC
LOT #5524	6.659 Ac.	NORFOLK SOUTHERN RAILWAY FKA CONSOLIDATED RAIL CORPORATION
LOT #5418	31.576 Ac.	ICP MORAINE LLC
LOT #5437	47.065 Ac.	ICP MORAINE LLC
LOT #5439	30.580 Ac.	ICP MORAINE LLC
LOT #5523	20.254 Ac.	ICP MORAINE LLC
LOT #5435	25.020 Ac.	ICP MORAINE LLC
LOT #5458	18.469 Ac.	IRG MORAINE LLC
LOT #1034	18.174 Ac.	RACER PROPERTIES LLC
LOT #5433	41.145 Ac.	COPART OF CONNECTICUT INC.
LOT #5436	17.030 Ac.	INLAND PROPERTY MANAGEMENT INC. (RJ TRUCKING)
LOT #5416	38.612 Ac.	DMAX LTD
LOT #5459	10.010 Ac.	WRIGHT WAREHOUSE INC.
LOT #5460	10.000 Ac.	STATE OF OHIO

N

0 200 1000ft

RACER TRUST
MORAINE, OHIO

30018090

SITE FEATURES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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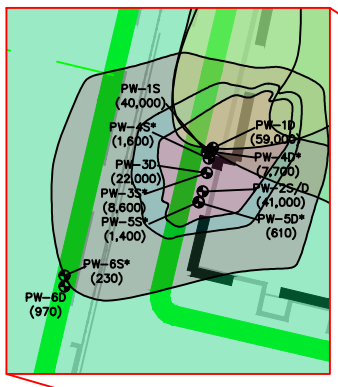

LEGEND

- MONITORING WELL (UPPER AQUIFER)
- INACTIVE EXTRACTION WELL (EW-1, EW-2, AND TW-2)
- STREAM GAUGE
- BORING LOCATION
- CITY OF MORAINE MONITORING WELL
- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- ug/L — MICROGRAMS PER LITER
- <1.0 — CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- MCL — MAXIMUM CONTAMINANT LEVEL
- <1.0 — 2019 CONCENTRATIONS
- (<1.0) — 2018–2013 CONCENTRATIONS
- (<1.0) — PRE–2013 CONCENTRATIONS
- **BOLD** — CONCENTRATION EXCEEDS MCL
- * — DATA NOT USED FOR CONTOURING PURPOSES

- >10000 ug/L
- 5000–10000 ug/L
- 1000–5000 ug/L
- 100–1000 ug/L
- 50–100 ug/L
- 5–50 ug/L

SITE–SPECIFIC VOLATILE ORGANIC COMPOUNDS	MCL (ug/L)
1,1,1–Trichloroethane	**200**
1,1–Dichloroethane	--
1,1–Dichloroethene	**7**
Benzene	**5**
cis–1,2–Dichloroethene	**70**
Ethylbenzene	**700**
Tetrachloroethene	**5**
Toluene	**1000**
trans–1,2–Dichloroethene	**100**
Trichloroethene	**5**
Vinyl chloride	**2**
Xylene (total)	**10,000**

NOTE:

1. CONCENTRATIONS POSTED REFLECT 2019 MONITORING WELL RESULTS, 2018 THROUGH 2013 MONITORING WELL RESULTS, PRE–2013 MONITORING WELL RESULTS, AND MAXIMUM CONCENTRATION FROM VERTICAL AQUIFER PROFILING FROM 2011 THROUGH 2015. THE INTERPRETATION OF THE ISOCONCENTRATION INCLUDES THE CONCEPTUAL SITE MODEL UNDERSTANDING (I.E. GROUNDWATER FLOW AND INTERIM MEASURES OPERATION).
2. WHEN SAMPLE RESULT IS NON–DETECT, HALF THE REPORTING LIMIT IS HONORED WITH THE CONTOURING.
3. RELATIVE UNDERSTANDING OF PRE–2013 CONCENTRATIONS (GRAY) WAS USED TO DEVELOP THE OVERALL PLUME GEOMETRY IN THE VICINITY OF THESE WELLS.

RACER TRUST
MORAINE, OHIO

30018090

ISOCONCENTRATION MAP (UPPER AQUIFER) TETRACHLOROETHENE - 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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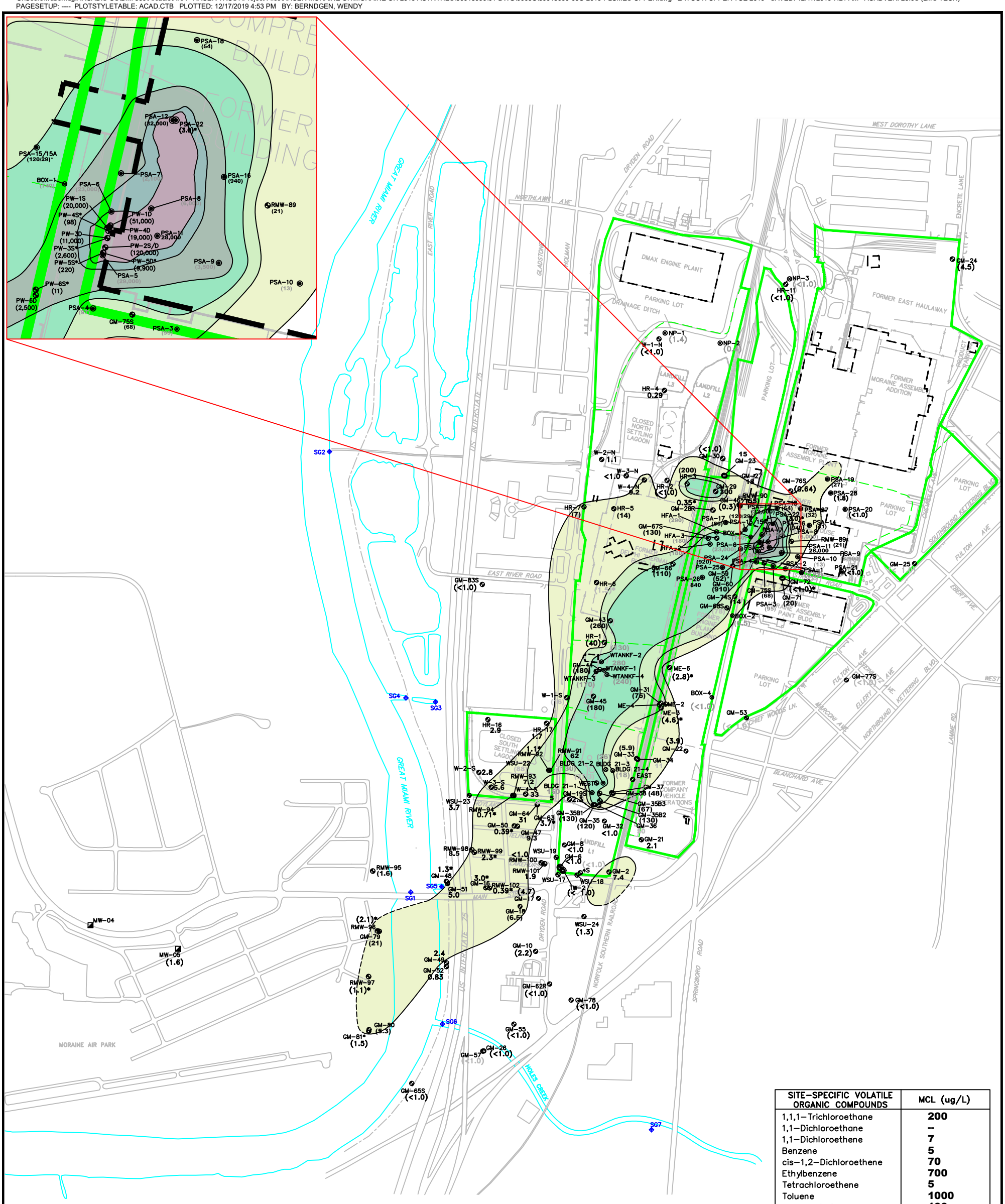

SITE-SPECIFIC VOLATILE ORGANIC COMPOUNDS	MCL (ug/L)
1,1,1-Trichloroethane	200
1,1-Dichloroethane	--
1,1-Dichloroethene	7
Benzene	5
cis-1,2-Dichloroethene	70
Ethylbenzene	700
Tetrachloroethene	5
Toluene	1000
trans-1,2-Dichloroethene	100
Trichloroethene	5
Vinyl chloride	2
Xylene (total)	10,000

LEGEND

- MONITORING WELL (UPPER AQUIFER)
- INACTIVE EXTRACTION WELL (EW-1, EW-2, AND TW-2)
- STREAM GAUGE
- BORING LOCATION
- CITY OF MORAINE MONITORING WELL
- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- ug/L — MICROGRAMS PER LITER
- <1.0 — CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- VISL — VAPOR INTRUSION SCREENING LEVEL
- <1.0 — 2019 CONCENTRATIONS
- (<1.0) — 2018-2013 CONCENTRATIONS
- (<1.0) — PRE-2013 CONCENTRATIONS
- **BOLD** — CONCENTRATION EXCEEDS SCREENING LEVEL
- * — DATA NOT USED FOR CONTOURING PURPOSES

- >10000 ug/L
- 5000-10000 ug/L
- 1000-5000 ug/L
- 100-1000 ug/L
- 50-100 ug/L
- 5-50 ug/L

NOTE:

1. CONCENTRATIONS POSTED REFLECT 2019 MONITORING WELL RESULTS, 2018 THROUGH 2013 MONITORING WELL RESULTS, PRE-2013 MONITORING WELL RESULTS, AND MAXIMUM CONCENTRATION FROM VERTICAL AQUIFER PROFILING FROM 2011 THROUGH 2015. THE INTERPRETATION OF THE ISOCONCENTRATION INCLUDES THE CONCEPTUAL SITE MODEL UNDERSTANDING (I.E. GROUNDWATER FLOW AND INTERIM MEASURES OPERATION).
2. WHEN SAMPLE RESULT IS NON-DETECT, HALF THE REPORTING LIMIT IS HONORED WITH THE CONTOURING.
3. RELATIVE UNDERSTANDING OF PRE-2013 CONCENTRATIONS (GRAY) WAS USED TO DEVELOP THE OVERALL PLUME GEOMETRY IN THE VICINITY OF THESE WELLS.
4. SCREENING LEVELS BASED ON OHIO EPA GUIDANCE DOCUMENT: RECOMMENDATIONS REGARDING RESPONSE ACTION LEVELS AND TIMEFRAMES FOR COMMON CONTAMINANTS OF CONCERN AT VAPOR INTRUSION SITES IN OHIO – AUGUST 2016. ASSUMES SANDY SOILS. SAME EXPOSURE PARAMETERS AS THE U.S. EPA VALUES; HOWEVER OHIO GUIDANCE INCORPORATES OLDER TOXICITY DATA.

N

0 200 1000ft

RACER TRUST
MORAINE, OHIO

30018090

ISOCONCENTRATION MAP (UPPER AQUIFER) TRICHLOROETHENE - 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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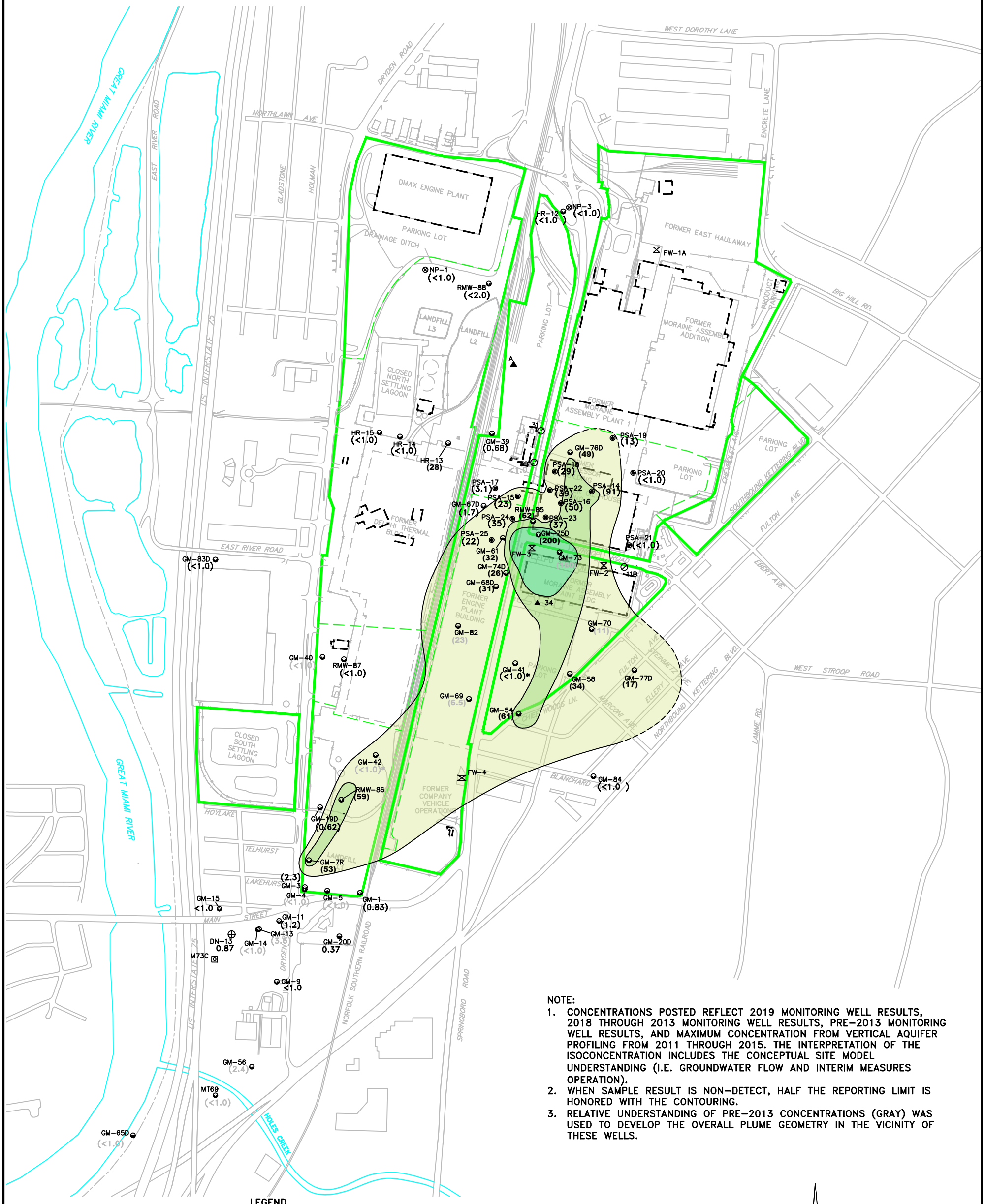

NOTE:

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3. RELATIVE UNDERSTANDING OF PRE–2013 CONCENTRATIONS (GRAY) WAS USED TO DEVELOP THE OVERALL PLUME GEOMETRY IN THE VICINITY OF THESE WELLS.

LEGEND

- MONITORING WELL (LOWER AQUIFER)
- PIEZOMETER
- FIRE WELL
- PRODUCTION WELL CONVERTED TO MONITORING WELL (A, 34)
- INACTIVE PRODUCTION WELL
- MONTGOMERY COUNTY WELL (USED BY RACER TRUST AS A LOWER AQUIFER RECOVERY WELL)
- BORING LOCATION
- PRIVATE WELL
- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- <1.0 CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- ug/L MICROGRAMS PER LITER
- >100 ug/L
- 50–100 ug/L
- 5–50 ug/L

MCL	MAXIMUM CONTAMINANT LEVEL
<1.0	2019 CONCENTRATIONS
(<1.0)	2018–2013 CONCENTRATIONS
(<1.0)	PRE–2013 CONCENTRATIONS
BOLD	CONCENTRATION EXCEEDS MCL
*	DATA NOT USED FOR CONTOURING PURPOSES

SITE–SPECIFIC VOLATILE ORGANIC COMPOUNDS	MCL (ug/L)
1,1,1–Trichloroethane	**200**
1,1–Dichloroethane	**--**
1,1–Dichloroethene	**7**
Benzene	**5**
cis–1,2–Dichloroethene	**70**
Ethylbenzene	**700**
Tetrachloroethene	**5**
Toluene	**1000**
trans–1,2–Dichloroethene	**100**
Trichloroethene	**5**
Vinyl chloride	**2**
Xylene (total)	**10,000**

N

0 100 850ft

RACER TRUST
MORAINE, OHIO

30018090

ISOCONCENTRATION MAP (LOWER AQUIFER) TETRACHLOROETHENE - 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY:DUBLIN DIV/GROUP:SER2 DB:R. SMITH LD:(Opt) PIC:(Opt) PM:N. GILLOTTI TM:T. FORTNER LYR:(Opt)ON=*;OFF=*REF*
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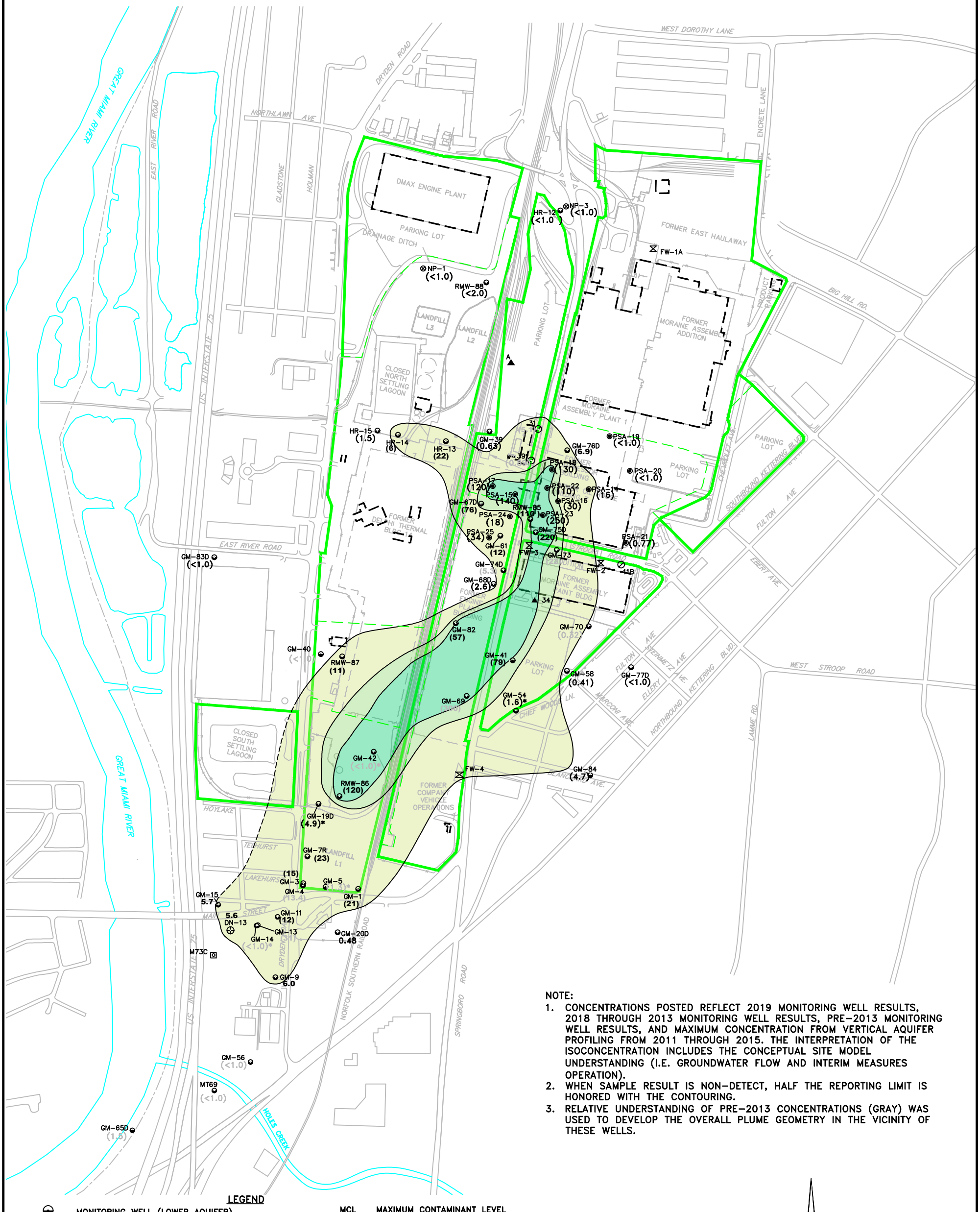

NOTE:

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3. RELATIVE UNDERSTANDING OF PRE–2013 CONCENTRATIONS (GRAY) WAS USED TO DEVELOP THE OVERALL PLUME GEOMETRY IN THE VICINITY OF THESE WELLS.

LEGEND

- MONITORING WELL (LOWER AQUIFER)
- PIEZOMETER
- FIRE WELL
- PRODUCTION WELL CONVERTED TO MONITORING WELL (A, 34)
- INACTIVE PRODUCTION WELL
- MONTGOMERY COUNTY WELL (USED BY RACER TRUST AS A LOWER AQUIFER RECOVERY WELL)
- BORING LOCATION
- PRIVATE WELL
- RIVER LEVEE
- FORMER BUILDING FOOTPRINT
- SURFACE WATER FEATURE
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- <1.0 CONSTITUENT NOT DETECTED ABOVE LABORATORY LIMIT SHOWN
- ug/L MICROGRAMS PER LITER
- >100 ug/L
- 50–100 ug/L
- 5–50 ug/L

MCL	MAXIMUM CONTAMINANT LEVEL
<1.0	2019 CONCENTRATIONS
(<1.0)	2018–2013 CONCENTRATIONS
(<1.0)	PRE–2013 CONCENTRATIONS
BOLD	CONCENTRATION EXCEEDS MCL
*	DATA NOT USED FOR CONTOURING PURPOSES

SITE–SPECIFIC VOLATILE ORGANIC COMPOUNDS	MCL (ug/L)
1,1,1–Trichloroethane	**200**
1,1–Dichloroethane	--
1,1–Dichloroethene	**7**
Benzene	**5**
cis–1,2–Dichloroethene	**70**
Ethylbenzene	**700**
Tetrachloroethene	**5**
Toluene	**1000**
trans–1,2–Dichloroethene	**100**
Trichloroethene	**5**
Vinyl chloride	**2**
Xylene (total)	**10,000**

N

0 100 850ft

RACER TRUST
MORAINE, OHIO

30018090

ISOCONCENTRATION MAP (LOWER AQUIFER) TRICHLOROETHENE - 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

APPENDIX A

Risk Assessment Update

MEMO

ARCADIS Design & Consultancy for natural and built assets

To:

Molly Finn, U.S. EPA

Bhooma Sundar, U.S. EPA

Copies:

Pam Barnett, RACER Trust

From:

Katie Dally

Shawn Sager

Arcadis U.S., Inc.
Wade I
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North Carolina 27607
Tel 919 854 1282
Fax 919 233 1125

ARCADIS G&M of North Carolina, Inc.

NC Engineering License # C-1869
NC Surveying License # C-1869

Date:

January 16, 2020

Arcadis Project No.:

30018090

Subject:

Risk Assessment Update, RACER Trust, Moraine, Ohio

This memo summarizes the approach and results of an updated risk assessment based on potential exposure to surface and subsurface soil collected from the Waste Pile Staging Area (WPSA) and Landfill L1 at the RACER Trust (formerly General Motors Corporation [former GM Corporation]) Moraine Facilities located in Moraine, Ohio (the "Site"). This memo was prepared as an update to the risk assessment included in the Corrective Measures Proposal (2012 CMP; Arcadis 2012). This risk assessment evaluates potential exposure to site workers and construction workers to constituents detected in site soils. The risk assessment is comprised of a discussion of the data collected, potential receptors and exposure assumptions, toxicity assessment, and the results of the risk characterization. This risk assessment draws upon the previous risk assessments conducted for the former RACER Moraine Facility.

DATA EVALUATION AND COPC SELECTION

Table 1 presents data for soil samples collected from the former WPSA at the Site from 0 to 10 feet below ground surface (bgs) between 1992 and 2017 and which still remain on-site following limited soil excavations. The soil screening levels used for the assessment were the November 2019 U.S. EPA Industrial Soil RSLs (target hazard quotient [THQ]=0.1). Several metals, volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), pesticides, and semi-volatile organic compounds (SVOCs) were detected in soil. Since the Site has been used for industrial purposes since the property was acquired, residential screening levels are generally not appropriate for identifying constituents of potential concern (COPCs).

As shown in **Table 2**, the following twenty-three constituents were detected at concentrations above their respective industrial soil RSLs: trichloroethene (TCE), antimony, arsenic, cadmium, cobalt, copper, lead, manganese, nickel, thallium, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, 1,1-biphenyl, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, and naphthalene.

EXPOSURE ASSESSMENT

The purpose of the exposure assessment is to estimate the way(s) in which people could potentially be exposed to constituents at a site. This typically involves measuring or estimating concentrations along potential pathways between sources and potential receptors. Exposure can occur only when the potential exists for a potential receptor to directly contact COPCs, or when there is a mechanism for COPCs to be transported to a potential receptor. Without exposure, there is no risk; therefore, the exposure assessment is a critical component of the risk assessment.

Exposure pathways identify likely points where potential human receptors could contact soil during routine site activities, maintenance, and construction. The on-site routine worker, on-site maintenance worker, and on-site construction worker could contact COPCs in soil 0 to 10 ft bgs through incidental ingestion, dermal contact, and inhalation of dust and volatiles.

Exposure points are defined as locations where contact with COPCs could occur, generally with equal probability across the entire Site. The exposure point concentration (EPC) is a representative constituent concentration that a potential receptor may contact at an exposure point over the exposure period (U.S. EPA 1989). Consistent with U.S. EPA methodology, the lower of the maximum concentration and the upper confidence limit (UCL) on the mean will be identified as the EPC (USEPA 1989, 2014). The UCL is a statistical number calculated to represent the mean concentration with high level of confidence (95 percent [%] or higher) that the true arithmetic mean concentration will be less than the UCL. Consistent with U.S. EPA methodology (U.S. EPA 2016a), both the mean and 95% UCL concentrations were calculated using ProUCL, the statistical software available from the USEPA (version 5.1.002; U.S. EPA 2016a). Non-detected values were treated following the ProUCL software technical guide (U.S. EPA 2016b). The UCL concentrations were selected using the output from the ProUCL software. EPCs are presented in **Table 3**, and ProUCL outputs are presented in **Attachment A**.

Exposure assumptions are used to evaluate individual exposure for those persons who might be at the Site. A combination of default assumptions and site-specific assumptions were used to evaluate potential exposures under both Reasonable Maximum Exposure (RME) and Central Tendency Exposure (CTE) scenarios. Exposure assumptions for the three receptors and described further below and presented in **Table 4** and **Table 5** for the RME and CTE scenarios, respectively. Both RME and CTE estimates were calculated because of the variability in factors affecting exposure within a potentially exposed population. The RME represents a high-end estimate of potential exposure and potential risk through the use of conservative estimates of exposure point concentrations and high-end exposure factors. The CTE represents estimates through the use of typical exposure factors. Based on the likely current and future exposure conditions at the Site, typical (CTE) exposure factors are considered appropriate for this assessment. These assumptions were the USEPA (2014) revised default exposure assumptions, or based on the 2012 CMP risk assessment, as applicable.

On-Site Routine Worker

Under the RME scenario, the exposure duration was assumed to be 25 years, and routine workers were assumed to contact soil 250 days per year. Under the CTE scenario, the exposure duration was assumed to be 9 years, and routine workers were assumed to contact soil 125 days per year. The dermal contact, incidental ingestion, and inhalation exposure routes are assumed to be independent of the time spent at the Site during a given exposure event (e.g., a routine worker is assumed to incidentally ingest 50 milligrams of soil each day regardless of the time spent on that day). U.S. EPA default AFs and skin SAs were used to calculate soil dermal contact rates.

On-Site Maintenance Worker

Under the RME scenario, the exposure duration was assumed to be 25 years, and routine workers were assumed to contact soil 10 days per year. Under the CTE scenario, the exposure duration was assumed to be 9 years, and routine workers were assumed to contact soil 5 days per year. The dermal contact, incidental ingestion, and inhalation exposure routes are assumed to be independent of the time spent at the Site during a given exposure event (e.g., a routine worker is assumed to incidentally ingest 100 milligrams of soil each day regardless of the time spent on that day). U.S. EPA default AFs and skin SAs were used to calculate soil dermal contact rates.

On-Site Construction Worker

Under the RME scenario, the exposure duration was assumed to be 1 years, and routine workers were assumed to contact soil 250 days per year. Under the CTE scenario, the exposure duration was assumed to be 1 year, and routine workers were assumed to contact soil 125 days per year. The dermal contact, incidental ingestion, and inhalation exposure routes are assumed to be independent of the time spent at the Site during a given exposure event (e.g., a routine worker is assumed to incidentally ingest the same amount of soil each day regardless of the time spent on that day). U.S. EPA default AFs and skin SAs were used to calculate soil dermal contact rates.

Exposure to Lead

Exposure to lead is evaluated differently than other constituents because U.S. EPA has not derived toxicity values as has been done for other constituents. Rather, exposure to lead is best evaluated by measuring or predicting blood lead levels. Lead exposures are evaluated using central tendency values because they achieve health-protectiveness by evaluating estimates of the predicted blood lead concentration at the upper tail of a lognormal probability distribution. The inputs to the lead model are selected in order to yield the best estimate of the central tendency (geometric mean). The high-end estimate of risk is achieved by applying a lognormal distribution assumption as a post-processing step. Therefore, inputs to the models should be central tendency values (e.g., arithmetic means or medians) rather than the high-end values that are typically selected to estimate reasonable maximum exposure doses and risks for other constituents.

TOXICITY ASSESSMENT

Toxicity assessment is the process of assessing the hazards of the COPCs in a risk assessment and using the existing toxicity information from human or animal studies to quantify potential health risks at various dose levels in exposed populations (U.S. EPA 1989). The identified COPCs have toxicity values for potential noncarcinogenic and carcinogenic effects. These toxicity values were obtained from the U.S.

EPA's Integrated Risk Information System (IRIS) (U.S. EPA 2019b). If toxicity values were not available in IRIS, they were therefore obtained from the U.S. EPA Regional Screening Level (RSL) tables, which provide values from USEPA's Provisional Peer-Reviewed Toxicity Values (PPRTV) Assessments and Appendix Screening Levels (SCREEN), the USEPA Superfund program's Health Effects Assessment Summary Tables (HEAST), the Agency for Toxic Substances and Disease Registry (ATSDR), and the California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment. Toxicity values are not available for lead, and as such, risks from exposure to lead in soil were evaluated using the U.S. EPA Adult Lead Model (ALM). **Table 6** through **Table 9** provide the non-cancer and cancer toxicity values used in this risk assessment.

Noncarcinogenic Effects

The potential for noncarcinogenic effects is estimated by comparing a reference dose (RfD) for oral and dermal exposure and the reference concentration (RfC) for inhalation exposure for each individual constituent. The RfD and RfC represent a daily exposure level that is designed to be protective of human health, even for sensitive individuals or subpopulations.

For a given constituent, the dose or concentration that elicits no adverse effect when evaluating the most sensitive response in the most sensitive species is referred to as the "no observed adverse effect level." This level is used to establish non-cancer toxicity values (called RfDs and RfCs). The RfD and RfC represent a daily exposure level that is not expected to cause adverse noncarcinogenic health effects. Subchronic RfDs and RfCs are used to assess the short-term construction worker exposures.

Carcinogenic Effects

Cancer induction in humans and animals by constituents proceeds through a complex series of reactions and processes. For chemicals that are known or suspected to cause cancer, the toxicity assessment defines the relationship between the dose of the chemical or agent and the probability of induction of carcinogenic effects in humans or animal species of interest. Carcinogenic constituents may produce tumors at the point of application or contact, or they may produce tumors in other tissues after they have been distributed throughout the body. Some constituents are associated only with one or two tumor types, while others may cause tumors at many different sites. Toxicity values to evaluate carcinogenic effects are the cancer slope factor (CSF) and inhalation unit risk (IUR).

Dermal Exposure

Whenever possible, route-specific toxicity values have been used; however, the U.S. EPA has not yet developed toxicity values for dermal exposures. For this reason, the oral toxicity values (RfDo and CSFo) and a gastrointestinal absorption efficiency factor (ABSGI) were used to derive adjusted toxicity values (RfDa and CSFa) (adjusted to the absorbed dose) for use in assessing dermal exposure (USEPA 1989):

$$RfDa = RfDo \times ABS_{GI}$$

$$CSFa = CSFo / ABS_{GI}$$

The adjusted toxicity values represent the theoretical toxicity of the orally absorbed dose of the constituent. The U.S. EPA guidance recommends that the oral toxicity values for organic constituents should not be adjusted to assess dermal exposure (i.e., oral absorption efficiency = 1) (U.S. EPA 2004). Uncertainty is associated with the adjusted toxicity values and with the dermal risks derived using these values due to the uncertainty in the oral toxicity values combined with the uncertainty in the ABSGI.

However, the calculated dermal risks are expected to be very conservative and, therefore, will overestimate human health risks.

Lead Toxicity

Although exposures to lead are known to cause adverse health effects, neither a CSF nor an RfD has been developed for this constituent. Rather, the method used to evaluate the potential risks associated with exposure to lead in soil, is based on calculating lead concentrations in the blood, since chronic health effects associated with lead exposure have been related to chronic elevated blood-lead levels. Blood-lead level estimates are compared to a target blood-lead level of between 5 and 8 micrograms per deciliter (µg/dL), based on the U.S. EPA adult lead model (AM;(2010c) IEUBK for young children.

RISK CHARACTERIZATION

Risk characterization is the final step in the risk assessment process. In this step, the results of the data evaluation, exposure assessment, and toxicity assessment are integrated to yield a quantitative measure of carcinogenic risk and non-carcinogenic hazard. Potential carcinogenic risks and non-carcinogenic hazards were quantitatively calculated for the on-Site routine worker, maintenance worker, and construction worker scenarios outlined above.

Constituent-specific excess lifetime cancer risk (ELCR) estimates and non-cancer hazard quotients (HQs) were calculated for each of the COPCs. Constituent-specific ELCRs and HQs were then summed to get an additive cancer risk (total ELCR) and an additive non-cancer hazard index (HI). The target non-cancer HIs were compared to the target level of 1 while the total ELCR were compared to U.S. EPA's target risk range of 1×10^{-4} to 1×10^{-6}. For receptors with cumulative non-cancer hazards that exceed the target level of 1, individual target organ HQs were calculated and were summed for those with the same effect into target organ HIs.

Table 10 through **Table 15** provide the risk calculation tables for receptor exposures to soil. The calculated risk estimates for the three receptors are summarized below.

Summary of Risks and Hazards for Exposure to Soil in the Former WPSA

Receptor		RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
On-Site Routine Worker	Ingestion	3E-05	1	6E-06	0.6
	Dermal	2E-06	0.03	7E-07	0.03
	Inhalation	5E-07	0.06	2E-07	0.06
Total Risk/Hazard		**3E-05**	**1**	**7E-06**	**0.7**
On-Site Maintenance Worker	Ingestion	3E-06	0.09	5E-07	0.05
	Dermal	8E-08	0.02	1E-08	0.0005
	Inhalation	2E-07	0.02	1E-08	0.005
Total Risk/Hazard		**3E-06**	**0.1**	**5E-07**	**0.05**
On-Site Construction Worker	Ingestion	8E-06	9	1E-06	1
	Dermal	8E-08	0.3	4E-08	0.01
	Inhalation	7E-07	1	2E-07	0.4
Total Risk/Hazard		**9E-06**	**10**	**1E-06**	**2**

HI – hazard index

Given that the non-cancer hazard estimates for the construction workers exceed 1 under the RME and CTE scenarios, individual target organ HQs were calculated and were summed for those with the same effect into target organ HIs. The calculated non-cancer hazard estimates by target organ are summarized below.

Summary of Target-Organ Hazard Indices for Construction Worker Exposure to Soil in the Former WPSA

Target Organ	RME Non-Cancer Hazards	CTE Non-Cancer Hazards
Cardiovascular	0.4	0.06
Dermal	0.4	0.06
Developmental	2	0.4
Gastrointestinal	0.5	0.08
Immune	0.3	0.07
Liver	0.06	0.01
Lung/Respiratory	0.2	0.04
Musculoskeletal	5	0.7
Nervous	0.1	0.03
Neurological	2	0.2
Other	0.1	0.02
Renal	0.07	0.02
Thyroid	0.03	0.005
Whole Body	1	0.2

Adult Lead Model

Exposure to lead in soil in Landfill L1 was evaluated using the U.S. EPA ALM (2017a,b). The ALM uses a simplified representation of lead biokinetics to predict quasi-steady state blood lead concentrations among adults who have relatively steady patterns of site exposures (i.e., workers) and focuses on estimating fetal blood lead concentration in women exposed to lead contaminated soils. The baseline blood lead concentration (PbB_0) input parameter of the ALM represents the geometric mean blood lead concentration in women of child-bearing age and the geometric standard deviation (GSD) input parameter is a measure of the inter-individual variability in these concentrations. The current estimates for the ALM model (PbB_0 = 0.6 and GSD = 1.8) are based on the most recent six years of blood lead data (2009-2014) from the National Health and Nutrition Examination Survey (NHANES) and were used according to U.S. EPA Guidance (U.S. EPA 2017a). The fetal/maternal blood lead ratio ($R_{fetal/maternal}$), biokinetic slope factor (BKSF), and the soil absorption fraction (AF_S) were all set at U.S. EPA default values. Blood lead level estimates are compared to a target blood lead level of 5 micrograms per deciliter (µg/dL). In accordance with U.S. EPA guidance for assessing intermittent lead exposures, averaging time for the trespasser was based on the smallest time period in which the exposures repeat (1 day/7days) (U.S. EPA 2003). Unlike short-term exposures averaged over the entire year, this conservative strategy allows for the consideration of possible adverse health effects from acutely elevated PbB concentrations that could occur over a period of a few months.

The output of the ALM presents the probability that fetal blood lead concentrations exceed the target blood lead concentration of 5 micrograms per deciliter (µg/dL).

The average concentration of lead from the soil dataset, as well as the RME and CTE ingestion rates and exposure frequencies were input into the model for each receptor. The outputs of the ALM for the exposure scenarios are presented in **Table 16** and **Table 17** for the RME and CTE scenarios, respectively. The results indicated that exposure to average lead concentrations in soil would not pose an unacceptable risk to human health.

RISK ASSESSMENT CONCLUSIONS

The risk assessment was conducted to evaluate potential exposure to COPCs in surface and subsurface soils (0-10 ft bgs) in the WPSA following the collection of new soil data in 2017. The results of the risk assessment indicate that the predicted cancer risks for all receptors fall within or are below the U.S. EPA risk management range of 1×10^{-4} to 1×10^{-6}. The CTE risk calculation results for all receptors and the RME risk calculation results for the on-site maintenance worker and on-site construction worker were below the Ohio EPA benchmark of 1×10^{-5} indicating no significant risk for these exposure scenarios and these receptors. The RME risk calculation results for the on-site routine workers slightly exceeded the Ohio EPA benchmark of 1×10^{-5} but this exposure scenario represents a high-end risk and one that is unlikely to occur under typical situations. The calculated non-cancer hazards for on-site routine workers and on-site maintenance workers did not exceed the U.S. EPA and Ohio EPA benchmark of 1. The calculated non-cancer hazard for on-site construction workers exceed 1 under both exposure scenarios. When non-cancer hazards for construction workers were summed by target organs, the calculated hazards for developmental and musculoskeletal endpoints exceed the limit of 1 under the RME scenario, however under the CTE scenario, calculated hazards for all target organ endpoints do not exceed the hazard limit of 1.

In addition, the revised ALM results indicated that exposure to average lead concentrations in in soil Landfill L1 would not pose an unacceptable risk to human health.

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Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

			Location ID	WPSA-BH01	WPSA-BH01	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH02	WPSA-BH02	WPSA-BH02-02SL
			Date	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992
			Type	N	N	N	N	N	N	N
			Sample Code	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH01-02SL(2)	WPSA-BH01-08SL(8)	WPSA-BH02-02SL	WPSA-BH02-08SL	WPSA-BH02-02SL(2)
			Sample Depth	2	8	2	8	2	8	2
			Code	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated
Chemical	CAS	Ind. Soil RSL THQ=0.1	Units							
1,1,1,2-Tetrachloroethane	630-20-6	8.8	mg/kg	--	--	--	--	--	--	--
1,1,1-Trichloroethane	71-55-6	3600	mg/kg	< 0.026 U	0.18	--	0.18	0.066	< 0.03 U	0.066
1,1,2,2-Tetrachloroethane	79-34-5	2.7	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
1,1,2-Trichloroethane	79-00-5	0.63	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
1,1-Dichloroethane	75-34-3	16	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
1,1-Dichloroethene	75-35-4	100	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
1,1-Dichloropropene	563-58-6	NA	mg/kg	--	--	--	--	--	--	--
1,2,3-Trichloropropane	96-18-4	0.11	mg/kg	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	120-82-1	26	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
1,2,4-Trimethylbenzene	95-63-6	180	mg/kg	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	0.064	mg/kg	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	106-93-4	0.16	mg/kg	--	--	--	--	--	--	--
1,2-Dichlorobenzene	95-50-1	930	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
1,2-Dichloroethane	107-06-2	2	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
1,2-Dichloroethene (total)	540-59-0	NA	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
1,2-Dichloropropane	78-87-5	6.6	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
1,3,5-Trimethylbenzene	108-67-8	150	mg/kg	--	--	--	--	--	--	--
1,3-Dichlorobenzene	541-73-1	NA	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
1,3-Dichloropropane	142-28-9	2300	mg/kg	--	--	--	--	--	--	--
1,4-Dichlorobenzene	106-46-7	11	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
1,4-Dioxane	123-91-1	24	mg/kg	--	--	--	--	--	--	--
2,2-Dichloropropane	594-20-7	NA	mg/kg	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	78-93-3	19000	mg/kg	< 0.26 UJ	< 0.31 UJ	--	--	< 0.27 UJ	< 0.3 UJ	--
2-Chlorotoluene	95-49-8	2300	mg/kg	--	--	--	--	--	--	--
2-Hexanone	591-78-6	130	mg/kg	< 0.26 UJ	< 0.31 UJ	--	--	< 0.27 UJ	< 0.3 UJ	--
2-Phenylbutane (sec-Butylbenzene)	135-98-8	12000	mg/kg	--	--	--	--	--	--	--
4-Chlorotoluene	106-43-4	2300	mg/kg	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	108-10-1	14000	mg/kg	< 0.26 UJ	< 0.31 UJ	--	--	< 0.27 UJ	< 0.3 UJ	--
Acetone	67-64-1	67000	mg/kg	< 0.51 U	3.4 J	--	3.4 J	1.9	< 0.6 U	1.9
Benzene	71-43-2	5.1	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Bromobenzene	108-86-1	180	mg/kg	--	--	--	--	--	--	--
Bromodichloromethane	75-27-4	1.3	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Bromoform	75-25-2	86	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Bromomethane (Methyl bromide)	74-83-9	3	mg/kg	< 0.13 U	< 0.16 U	--	--	< 0.13 U	< 0.15 U	--
Carbon disulfide	75-15-0	350		< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Carbon tetrachloride	56-23-5	2.9	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Chlorobenzene	108-90-7	130	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Chlorobromomethane	74-97-5	63	mg/kg	--	--	--	--	--	--	--
Chloroethane	75-00-3	5700	mg/kg	< 0.26 U	< 0.31 U	--	--	< 0.27 U	< 0.3 U	--
Chloroform (Trichloromethane)	67-66-3	1.4	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Chloromethane (Methyl chloride)	74-87-3	46	mg/kg	< 0.26 U	< 0.31 U	--	--	< 0.27 U	< 0.3 U	--
cis-1,2-Dichloroethene	156-59-2	230	mg/kg	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	10061-01-5	NA	mg/kg	< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Cyclohexane	110-82-7	2700	mg/kg	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	99-87-6	NA	mg/kg	--	--	--	--	--	--	--

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RACER Trust, Moraine, Ohio

				Location ID	WPSA-BH01	WPSA-BH01	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH02	WPSA-BH02	WPSA-BH02-02SL
				Date	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992
				Type	N	N	N	N	N	N	N
				Sample Code	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH01-02SL(2)	WPSA-BH01-08SL(8)	WPSA-BH02-02SL	WPSA-BH02-08SL	WPSA-BH02-02SL(2)
				Sample Depth	2	8	2	8	2	8	2
				Code	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated
Dibromochloromethane	124-48-1	39	mg/kg		< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Dibromomethane	74-95-3	9.9	mg/kg		--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	75-71-8	37	mg/kg		--	--	--	--	--	--	--
Ethylbenzene	100-41-4	25	mg/kg		< 0.026 U	0.065	--	0.065	< 0.027 U	< 0.03 U	--
Hexachlorobutadiene	87-68-3	5.3	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
Hexane	110-54-3	250	mg/kg		--	--	--	--	--	--	--
Isopropyl benzene	98-82-8	990	mg/kg		--	--	--	--	--	--	--
Methyl acetate	79-20-9	120000	mg/kg		--	--	--	--	--	--	--
Methyl cyclohexane	108-87-2	NA	mg/kg		--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	1634-04-4	210	mg/kg		--	--	--	--	--	--	--
Methylene chloride	75-09-2	320	mg/kg		< 0.26 U	< 0.31 U	--	--	< 0.27 U	< 0.3 U	--
Naphthalene	91-20-3	17	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
N-Butylbenzene	104-51-8	5800	mg/kg		--	--	--	--	--	--	--
N-Propylbenzene	103-65-1	2400	mg/kg		--	--	--	--	--	--	--
Styrene	100-42-5	3500	mg/kg		< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
tert-Butylbenzene	98-06-6	12000	mg/kg		--	--	--	--	--	--	--
Tetrachloroethene	127-18-4	39	mg/kg		0.2	0.084	0.2	0.084	0.054	0.13	0.054
Toluene	108-88-3	4700	mg/kg		< 0.026 U	0.052	--	0.052	< 0.027 U	< 0.03 U	--
Total VOCS	TOTALVOCS	NA	mg/kg		--	--	--	--	--	--	--
trans-1,2-Dichloroethene	156-60-5	2300	mg/kg		--	--	--	--	--	--	--
trans-1,3-Dichloropropene	10061-02-6	NA	mg/kg		< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Trichloroethene	79-01-6	1.9	mg/kg		< 0.026 U	< 0.031 U	--	--	< 0.027 U	< 0.03 U	--
Trichlorofluoromethane (CFC-11)	75-69-4	35000	mg/kg		--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	76-13-1	2800	mg/kg		--	--	--	--	--	--	--
Vinyl acetate	108-05-4	380	mg/kg		--	--	--	--	--	--	--
Vinyl chloride	75-01-4	1.7	mg/kg		< 0.13 U	< 0.16 U	--	--	< 0.13 U	< 0.15 U	--
Xylene (total)	1330-20-7	250	mg/kg		< 0.026 U	0.13	--	0.13	< 0.027 U	< 0.03 U	--
Aluminum	7429-90-5	110000	mg/kg		**3240**	**12400**	--	--	**2300**	**18900**	--
Antimony	7440-36-0	47	mg/kg		**26.1**	**23.1**	--	--	**38**	**294**	--
Arsenic	7440-38-2	3	mg/kg		**2.8**	**7.5**	--	--	**3.4**	**9.1**	--
Barium	7440-39-3	22000	mg/kg		**18.3**	**64.6**	--	--	**18.8**	**90.8**	--
Beryllium	7440-41-7	230	mg/kg		**0.26 J**	**0.58**	--	--	**0.25 J**	**0.85**	--
Cadmium	7440-43-9	98	mg/kg		**3.9 J**	**7**	--	--	**1.8 J**	**8.4**	--
Calcium	7440-70-2	NA	mg/kg		**113000**	**61100**	--	--	**172000**	**4560**	--
Chromium	7440-47-3	180000	mg/kg		**6.9**	**17.6**	--	--	**4.9**	**24.9**	--
Cobalt	7440-48-4	35	mg/kg		**9.9 J**	**12.8**	--	--	**10.1 J**	**14.6**	--
Copper	7440-50-8	4700	mg/kg		**13.4**	**12.3**	--	--	**5.4**	**25.7**	--
Cyanide (total)	57-12-5	15	mg/kg		--	--	--	--	--	--	--
Iron	7439-89-6	82000	mg/kg		**9780 J**	**19200 J**	--	--	**5470 J**	**25400 J**	--
Lead	7439-92-1	800	mg/kg		**16.3 J**	**20.1 J**	--	--	**4.6 J**	**26.9 J**	--
Magnesium	7439-95-4	NA	mg/kg		**32500**	**33200**	--	--	**53800**	**4330**	--
Manganese	7439-96-5	2600	mg/kg		**445 J**	**900 J**	--	--	**370 J**	**363 J**	--
Mercury	7439-97-6	4.6	mg/kg		< 0.11 U	< 0.13 U	--	--	< 0.1 U	< 0.12 U	--
Nickel	7440-02-0	2200	mg/kg		**11.3**	**16.9**	--	--	**6.5**	**43.1**	--
Potassium	9/7/7440	NA	mg/kg		**723**	**1230**	--	--	**505**	**1920**	--
Selenium	7782-49-2	580	mg/kg		< 0.42 UJ	< 0.51 UJ	--	--	< 0.42 UJ	< 0.5 UJ	--
Silver	7440-22-4	580	mg/kg		< 0.63 UJ	< 0.77 UJ	--	--	< 0.63 UJ	< 0.75 UJ	--
Sodium	7440-23-5	NA	mg/kg		**148**	**162**	--	--	**187**	**1120**	--

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				Location ID	WPSA-BH01	WPSA-BH01	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH02	WPSA-BH02	WPSA-BH02-02SL
				Date	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992
				Type	N	N	N	N	N	N	N
				Sample Code	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH01-02SL(2)	WPSA-BH01-08SL(8)	WPSA-BH02-02SL	WPSA-BH02-08SL	WPSA-BH02-02SL(2)
				Sample Depth	2	8	2	8	2	8	2
				Code	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated
Thallium	7440-28-0	1.2	mg/kg		< 0.42 UJ	< 0.51 UJ	--	--	< 0.42 UJ	< 0.5 UJ	--
Vanadium	7440-62-2	580	mg/kg		**7.4**	**24.8**	--	--	**7.8**	**43.9**	--
Zinc	7440-66-6	35000	mg/kg		**40.1**	**55.7**	--	--	**19.5**	**115**	--
Aroclor-1016 (PCB-1016)	12674-11-2	5.1	mg/kg		< 10 U	< 0.6 U	--	--	< 0.5 U	< 0.6 U	--
Aroclor-1221 (PCB-1221)	11104-28-2	0.83	mg/kg		< 10 U	< 0.6 U	--	--	< 0.5 U	< 0.6 U	--
Aroclor-1232 (PCB-1232)	11141-16-5	0.72	mg/kg		< 10 U	< 0.6 U	--	--	< 0.5 U	< 0.6 U	--
Aroclor-1242 (PCB-1242)	53469-21-9	0.95	mg/kg		< 10 U	< 0.6 U	--	--	< 0.5 U	< 0.6 U	--
Aroclor-1248 (PCB-1248)	12672-29-6	0.94	mg/kg		< 10 U	< 0.6 U	--	--	< 0.5 U	< 0.6 U	--
Aroclor-1254 (PCB-1254)	11097-69-1	0.97	mg/kg		< 10 U	< 0.6 U	--	--	< 0.5 U	< 0.6 U	--
Aroclor-1260 (PCB-1260)	11096-82-5	0.99	mg/kg		< 10 U	< 0.6 U	--	--	< 0.5 U	< 0.6 U	--
Aroclor-1262 (PCB-1262)	37324-23-5	NA	mg/kg		--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	11100-14-4	NA	mg/kg		--	--	--	--	--	--	--
Total PCBs	1336-36-3	0.94	mg/kg		--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	108-60-1	4700	mg/kg		--	--	--	--	--	--	--
2,4,5-Trichlorophenol	95-95-4	8200	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2,4,6-Trichlorophenol	88-06-2	82	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2,4-Dichlorophenol	120-83-2	250	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2,4-Dimethylphenol	105-67-9	1600	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2,4-Dinitrophenol	51-28-5	160	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2,4-Dinitrotoluene	121-14-2	7.4	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2,6-Dinitrotoluene	606-20-2	1.5	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2-Chloronaphthalene	91-58-7	6000	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2-Chlorophenol	95-57-8	580	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2-Methylnaphthalene	91-57-6	300	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2-Methylphenol	95-48-7	4100	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
2-Nitroaniline	88-74-4	800	mg/kg		< 25 U	< 6.2 U	--	--	< 0.53 U	< 0.59 U	--
2-Nitrophenol	88-75-5	NA	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
3&4-Methylphenol	3/4-Cresol	NA	mg/kg		--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	91-94-1	5.1	mg/kg		< 34 U	< 8.3 U	--	--	< 0.7 U	< 0.79 U	--
3-Nitroaniline	99-09-2	NA	mg/kg		< 25 U	< 6.2 U	--	--	< 0.53 U	< 0.59 U	--
4,6-Dinitro-2-methylphenol	534-52-1	6.6	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
4-Bromophenyl phenyl ether	101-55-3	NA	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
4-Chloro-3-methylphenol	59-50-7	8200	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
4-Chloroaniline	106-47-8	11	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
4-Chlorophenyl phenyl ether	7005-72-3	NA	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
4-Methylphenol	106-44-5	8200	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
4-Nitroaniline	100-01-6	110	mg/kg		< 25 U	< 6.2 U	--	--	< 0.53 U	< 0.59 U	--
4-Nitrophenol	100-02-7	NA	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
Acenaphthene	83-32-9	4500	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
Acenaphthylene	208-96-8	NA	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
Acetophenone	98-86-2	12000	mg/kg		--	--	--	--	--	--	--
Anthracene	120-12-7	23000	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
Atrazine	1912-24-9	10	mg/kg		--	--	--	--	--	--	--
Benzaldehyde	100-52-7	820	mg/kg		--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	21	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
Benzo(a)pyrene	50-32-8	2.1	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--
Benzo(b)fluoranthene	205-99-2	21	mg/kg		< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

				Location ID	WPSA-BH01	WPSA-BH01	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH02	WPSA-BH02	WPSA-BH02-02SL
				Date	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992
				Type	N	N	N	N	N	N	N
				Sample Code	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH01-02SL(2)	WPSA-BH01-08SL(8)	WPSA-BH02-02SL	WPSA-BH02-08SL	WPSA-BH02-02SL(2)
				Sample Depth	2	8	2	8	2	8	2
				Code	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	ARC-BbkF	NA	mg/kg	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	191-24-2	NA	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Benzo(k)fluoranthene	207-08-9	210	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Biphenyl (1,1-Biphenyl)	92-52-4	20	mg/kg	--	--	--	--	--	--	--	
bis(2-Chloroethoxy)methane	111-91-1	250	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
bis(2-Chloroethyl)ether	111-44-4	1	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	160	mg/kg	< 17 U	< 4.2 U	--	--	**0.39**	< 0.39 U	**0.39**	
Butyl benzylphthalate (BBP)	85-68-7	1200	mg/kg	**28**	< 4.2 U	**28**	--	< 0.35 U	< 0.39 U	--	
Caprolactam	105-60-2	40000	mg/kg	--	--	--	--	--	--	--	
Carbazole	86-74-8	NA	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Chrysene	218-01-9	2100	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Dibenz(a,h)anthracene	53-70-3	2.1	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Dibenzofuran	132-64-9	100	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Diethyl phthalate	84-66-2	66000	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Dimethyl phthalate	131-11-3	NA	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Di-n-butylphthalate (DBP)	84-74-2	8200	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Di-n-octyl phthalate (DnOP)	117-84-0	820	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Fluoranthene	206-44-0	3000	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Fluorene	86-73-7	3000	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Hexachlorobenzene	118-74-1	0.96	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Hexachlorocyclopentadiene	77-47-4	0.75	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Hexachloroethane	67-72-1	8	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Indeno(1,2,3-cd)pyrene	193-39-5	21	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Isophorone	78-59-1	2400	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Nitrobenzene	98-95-3	22	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
N-Nitrosodiethylamine	55-18-5	0.015	mg/kg	--	--	--	--	--	--	--	
N-Nitrosodimethylamine	62-75-9	0.034	mg/kg	--	--	--	--	--	--	--	
N-Nitrosodi-n-propylamine	621-64-7	0.33	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
N-Nitrosodiphenylamine	86-30-6	470	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Pentachlorophenol	87-86-5	4	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Phenanthrene	85-01-8	NA	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Phenol	108-95-2	25000	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
Pyrene	129-00-0	2300	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--	
4,4'-DDD	72-54-8	2.5	mg/kg	--	--	--	--	--	--	--	
4,4'-DDE	72-55-9	9.3	mg/kg	--	--	--	--	--	--	--	
4,4'-DDT	50-29-3	8.5	mg/kg	--	--	--	--	--	--	--	
Aldrin	309-00-2	0.18	mg/kg	--	--	--	--	--	--	--	
alpha-BHC	319-84-6	0.36	mg/kg	--	--	--	--	--	--	--	
alpha-Chlordane	5103-71-9	NA	mg/kg	--	--	--	--	--	--	--	
beta-BHC	319-85-7	1.3	mg/kg	--	--	--	--	--	--	--	
delta-BHC	319-86-8	NA	mg/kg	--	--	--	--	--	--	--	
Dieldrin	60-57-1	0.14	mg/kg	--	--	--	--	--	--	--	
Endosulfan I	959-98-8	NA	mg/kg	--	--	--	--	--	--	--	
Endosulfan II	33213-65-9	NA	mg/kg	--	--	--	--	--	--	--	
Endosulfan sulfate	1031-07-8	490	mg/kg	--	--	--	--	--	--	--	
Endrin	72-20-8	25	mg/kg	--	--	--	--	--	--	--	
Endrin aldehyde	7421-93-4	NA	mg/kg	--	--	--	--	--	--	--	
Endrin ketone	53494-70-5	NA	mg/kg	--	--	--	--	--	--	--	

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

			Location ID	WPSA-BH01	WPSA-BH01	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH02	WPSA-BH02	WPSA-BH02-02SL
			Date	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992	11/9/1992
			Type	N	N	N	N	N	N	N
			Sample Code	WPSA-BH01-02SL	WPSA-BH01-08SL	WPSA-BH01-02SL(2)	WPSA-BH01-08SL(8)	WPSA-BH02-02SL	WPSA-BH02-08SL	WPSA-BH02-02SL(2)
			Sample Depth	2	8	2	8	2	8	2
			Code	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated	Not Excavated
gamma-BHC (lindane)	58-89-9	2.5	mg/kg	--	--	--	--	--	--	--
gamma-Chlordane	5103-74-2	NA	mg/kg	--	--	--	--	--	--	--
Heptachlor	76-44-8	0.63	mg/kg	--	--	--	--	--	--	--
Heptachlor epoxide	1024-57-3	0.33	mg/kg	--	--	--	--	--	--	--
Methoxychlor	72-43-5	410	mg/kg	--	--	--	--	--	--	--
Toxaphene	8001-35-2	2.1	mg/kg	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	FOC	NA	g/g	--	--	--	--	--	--	--
Percent Dry	PercentDry	NA	mg/kg	--	--	--	--	--	--	--
Total organic carbon (TOC)	TOC	NA	mg/kg	--	--	--	--	--	--	--
Total solids	TSOLIDS	NA	mg/kg	--	--	--	--	--	--	--
2,2'-Oxybis(2-chloropropane)	39638-32-9	NA	mg/kg	< 17 U	< 4.2 U	--	--	< 0.35 U	< 0.39 U	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH02-08SL 11/9/1992 N WPSA-BH02-08SL(8) 8 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-02SL 2 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-08SL 8 Not Excavated	WPSA-BH03-02SL 11/9/1992 N WPSA-BH03-02SL(2) 2 Not Excavated	WPSA-BH03-08SL 11/9/1992 N WPSA-BH03-08SL(8) 8 Not Excavated	WPSA-BH04-09SL 11/9/1992 N WPSA-BH04-09SL(9) 9 Not Excavated	WPSA-BH05-02SL 11/9/1992 N WPSA-BH05-02SL(2) 2 Not Excavated	WPSA-BH05-10SL 11/9/1992 N WPSA-BH05-10SL(10) 10 Not Excavated	WPSA-BH06-02SL 11/9/1992 N WPSA-BH06-02SL(2) 2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	0.13	2.1	0.13	2.1	--	--	--	--
1,1,2,2-Tetrachloroethane	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
1,1,2-Trichloroethane	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
1,1-Dichloroethane	--	3 J	< 0.31 U	3 J	--	--	--	--	--
1,1-Dichloroethene	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	< 18 U	< 41 U	--	--	--	--	--	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	< 18 U	< 41 U	--	--	--	--	--	--
1,2-Dichloroethane	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
1,2-Dichloroethene (total)	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
1,2-Dichloropropane	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	< 18 U	< 41 U	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	< 18 U	< 41 U	--	--	--	--	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	< 0.24 UJ	< 3.1 UJ	--	--	--	--	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	< 0.24 U	< 3.1 U	--	--	--	--	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	< 0.24 U	< 3.1 U	--	--	--	--	--	--
Acetone	--	12 J	< 6.2 U	12 J	--	--	--	--	0.297
Benzene	--	0.025	< 0.31 U	0.025	--	--	--	--	0.012
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Bromoform	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Bromomethane (Methyl bromide)	--	< 0.12 U	< 1.6 U	--	--	--	--	--	--
Carbon disulfide	--	< 0.025 U	< 0.31 U	--	--	--	--	--	0.0277
Carbon tetrachloride	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Chlorobenzene	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	< 0.24 U	< 3.1 U	--	--	--	--	--	--
Chloroform (Trichloromethane)	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Chloromethane (Methyl chloride)	--	< 0.24 U	< 3.1 U	--	--	--	--	--	--
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH02-08SL 11/9/1992 N WPSA-BH02-08SL(8) 8 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-02SL 2 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-08SL 8 Not Excavated	WPSA-BH03-02SL 11/9/1992 N WPSA-BH03-02SL(2) 2 Not Excavated	WPSA-BH03-08SL 11/9/1992 N WPSA-BH03-08SL(8) 8 Not Excavated	WPSA-BH04-09SL 11/9/1992 N WPSA-BH04-09SL(9) 9 Not Excavated	WPSA-BH05-02SL 11/9/1992 N WPSA-BH05-02SL(2) 2 Not Excavated	WPSA-BH05-10SL 11/9/1992 N WPSA-BH05-10SL(10) 10 Not Excavated	WPSA-BH06-02SL 11/9/1992 N WPSA-BH06-02SL(2) 2 Not Excavated
Dibromochloromethane	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	--	0.046	1.6	0.046	1.6	--	--	--	--
Hexachlorobutadiene	--	< 18 U	< 41 U	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	< 0.24 U	< 3.1 U	--	--	--	--	--	--
Naphthalene	--	< 18 U	< 41 U	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	0.13	0.087	< 0.31 U	0.087	--	--	--	--	--
Toluene	--	0.52	16	0.52	16	0.0076	--	--	0.0159
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Trichloroethene	--	< 0.025 U	< 0.31 U	--	--	--	--	--	--
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	< 0.12 U	< 1.6 U	--	--	--	--	--	--
Xylene (total)	--	0.23	19	0.23	19	--	--	--	0.0494
Aluminum	--	**5510**	**10500**	--	--	--	--	--	--
Antimony	--	**21.8**	**7.3**	--	--	--	--	--	--
Arsenic	--	**10**	**9.6**	--	--	--	--	--	--
Barium	--	**2620**	**886**	--	--	--	--	--	--
Beryllium	--	< 0.22 U	**0.68**	--	--	--	--	--	--
Cadmium	--	**21.9**	**7.7**	--	--	--	--	--	--
Calcium	--	**50100**	**2660**	--	--	--	--	--	--
Chromium	--	**111**	**20.4**	--	--	--	--	--	--
Cobalt	--	**22.1**	**17.4**	--	--	--	--	--	--
Copper	--	**339**	**169**	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	**51700 J**	**18000 J**	--	--	--	--	--	--
Lead	--	**174 J**	**50.7 J**	--	--	--	--	--	--
Magnesium	--	**17400**	**1790**	--	--	--	--	--	--
Manganese	--	**400 J**	**938 J**	--	--	--	--	--	--
Mercury	--	< 0.11 U	< 0.12 U	--	--	--	--	--	--
Nickel	--	**106**	**25.5**	--	--	--	--	--	--
Potassium	--	**801**	**1160**	--	--	--	--	--	--
Selenium	--	< 0.43 UJ	< 0.48 UJ	--	--	--	--	--	--
Silver	--	< 0.65 UJ	< 0.71 UJ	--	--	--	--	--	--
Sodium	--	**1590**	**1500**	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH02-08SL 11/9/1992 N WPSA-BH02-08SL(8) 8 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-02SL 2 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-08SL 8 Not Excavated	WPSA-BH03-02SL 11/9/1992 N WPSA-BH03-02SL(2) 2 Not Excavated	WPSA-BH03-08SL 11/9/1992 N WPSA-BH03-08SL(8) 8 Not Excavated	WPSA-BH04-09SL 11/9/1992 N WPSA-BH04-09SL(9) 9 Not Excavated	WPSA-BH05-02SL 11/9/1992 N WPSA-BH05-02SL(2) 2 Not Excavated	WPSA-BH05-10SL 11/9/1992 N WPSA-BH05-10SL(10) 10 Not Excavated	WPSA-BH06-02SL 11/9/1992 N WPSA-BH06-02SL(2) 2 Not Excavated
Thallium	--	< 0.43 UJ	< 0.48 UJ	--	--	--	--	--	--
Vanadium	--	**19.5**	**27.6**	--	--	--	--	--	--
Zinc	--	**689**	**707**	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	< 0.5 U	< 0.6 U	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	< 0.5 U	< 0.6 U	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	< 0.5 U	< 0.6 U	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	2.5	< 0.6 U	2.5	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	< 0.5 U	< 0.6 U	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	< 0.5 U	< 0.6 U	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	0.6	< 0.6 U	0.6	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
2,4,6-Trichlorophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
2,4-Dichlorophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
2,4-Dimethylphenol	--	< 18 U	< 41 U	--	--	--	--	--	--
2,4-Dinitrophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
2,4-Dinitrotoluene	--	< 18 U	< 41 U	--	--	--	--	--	--
2,6-Dinitrotoluene	--	< 18 U	< 41 U	--	--	--	--	--	--
2-Chloronaphthalene	--	< 18 U	< 41 U	--	--	--	--	--	--
2-Chlorophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
2-Methylnaphthalene	--	< 18 U	< 41 U	--	--	--	--	--	--
2-Methylphenol	--	< 18 U	< 41 U	--	--	--	--	--	--
2-Nitroaniline	--	< 26 U	< 62 U	--	--	--	--	--	--
2-Nitrophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	< 35 U	< 82 U	--	--	--	--	--	--
3-Nitroaniline	--	< 26 U	< 62 U	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	--	< 18 U	< 41 U	--	--	--	--	--	--
4-Bromophenyl phenyl ether	--	< 18 U	< 41 U	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	< 18 U	< 41 U	--	--	--	--	--	--
4-Chloroaniline	--	< 18 U	< 41 U	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	--	< 18 U	< 41 U	--	--	--	--	--	--
4-Methylphenol	--	< 18 U	< 41 U	--	--	--	--	--	--
4-Nitroaniline	--	< 26 U	< 62 U	--	--	--	--	--	--
4-Nitrophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
Acenaphthene	--	< 18 U	< 41 U	--	--	--	--	--	--
Acenaphthylene	--	< 18 U	< 41 U	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	< 18 U	< 41 U	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	< 18 U	< 41 U	--	--	--	--	--	--
Benzo(a)pyrene	--	< 18 U	**47**	--	**47**	--	--	--	--
Benzo(b)fluoranthene	--	< 18 U	**90**	--	--	--	--	--	--

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RACER Trust, Moraine, Ohio

	WPSA-BH02-08SL 11/9/1992 N WPSA-BH02-08SL(8) 8 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-02SL 2 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-08SL 8 Not Excavated	WPSA-BH03-02SL 11/9/1992 N WPSA-BH03-02SL(2) 2 Not Excavated	WPSA-BH03-08SL 11/9/1992 N WPSA-BH03-08SL(8) 8 Not Excavated	WPSA-BH04-09SL 11/9/1992 N WPSA-BH04-09SL(9) 9 Not Excavated	WPSA-BH05-02SL 11/9/1992 N WPSA-BH05-02SL(2) 2 Not Excavated	WPSA-BH05-10SL 11/9/1992 N WPSA-BH05-10SL(10) 10 Not Excavated	WPSA-BH06-02SL 11/9/1992 N WPSA-BH06-02SL(2) 2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	**90**	--	--	--	**6.92**
Benzo(g,h,i)perylene	--	< 18 U	< 41 U	--	--	--	--	--	--
Benzo(k)fluoranthene	--	< 18 U	< 41 U	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	< 18 U	< 41 U	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	< 18 U	< 41 U	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	< 18 U	< 41 U	--	--	--	**1.9**	**0.71**	--
Butyl benzylphthalate (BBP)	--	< 18 U	< 41 U	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	< 18 U	< 41 U	--	--	--	--	--	--
Chrysene	--	< 18 U	**44**	--	**44**	--	--	--	--
Dibenz(a,h)anthracene	--	< 18 U	< 41 U	--	--	--	--	--	--
Dibenzofuran	--	< 18 U	< 41 U	--	--	--	--	--	--
Diethyl phthalate	--	< 18 U	< 41 U	--	--	--	--	--	--
Dimethyl phthalate	--	< 18 U	< 41 U	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	--	< 18 U	< 41 U	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	--	< 18 U	< 41 U	--	--	--	--	--	--
Fluoranthene	--	< 18 U	**86**	--	**86**	--	--	--	**5.65**
Fluorene	--	< 18 U	< 41 U	--	--	--	--	--	--
Hexachlorobenzene	--	< 18 U	< 41 U	--	--	--	--	--	--
Hexachlorocyclopentadiene	--	< 18 U	< 41 U	--	--	--	--	--	--
Hexachloroethane	--	< 18 U	< 41 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	< 18 U	< 41 U	--	--	--	--	--	--
Isophorone	--	< 18 U	< 41 U	--	--	--	--	--	--
Nitrobenzene	--	< 18 U	< 41 U	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	< 18 U	< 41 U	--	--	--	--	--	--
N-Nitrosodiphenylamine	--	< 18 U	< 41 U	--	--	--	--	--	--
Pentachlorophenol	--	< 18 U	< 41 U	--	--	--	--	--	--
Phenanthrene	--	< 18 U	**84**	--	**84**	--	--	--	**5.45**
Phenol	--	< 18 U	< 41 U	--	--	--	--	--	--
Pyrene	--	< 18 U	**83**	--	**83**	--	--	--	**5.18**
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH02-08SL 11/9/1992 N WPSA-BH02-08SL(8) 8 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-02SL 2 Not Excavated	WPSA-BH03 11/9/1992 N WPSA-BH03-08SL 8 Not Excavated	WPSA-BH03-02SL 11/9/1992 N WPSA-BH03-02SL(2) 2 Not Excavated	WPSA-BH03-08SL 11/9/1992 N WPSA-BH03-08SL(8) 8 Not Excavated	WPSA-BH04-09SL 11/9/1992 N WPSA-BH04-09SL(9) 9 Not Excavated	WPSA-BH05-02SL 11/9/1992 N WPSA-BH05-02SL(2) 2 Not Excavated	WPSA-BH05-10SL 11/9/1992 N WPSA-BH05-10SL(10) 10 Not Excavated	WPSA-BH06-02SL 11/9/1992 N WPSA-BH06-02SL(2) 2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(2-chloropropane)	--	< 18 U	< 41 U	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH06-06SL 11/9/1992 N WPSA-BH06-06SL(6) 6 Not Excavated	WPSA-BH07-02SL 11/9/1992 N WPSA-BH07-02SL(2) 2 Not Excavated	WPSA-BH07-06SL 11/9/1992 N WPSA-BH07-06SL(6) 6 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(0)-20010412 0-2 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(2)-20010412 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(0)-20010417 0-2 Not Excavated	WPSA-BH9 4/17/2001 N SA-BH09 (DUP)(2)-20010 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(2)-20010417 2-4 Not Excavated	WPSA/BH10F 9/28/2005 N BH10F/092805/ 2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	0.549	< 0.0056 UJ	< 0.044 U	0.0774	0.146 J	0.0309 J	--
1,1,2,2-Tetrachloroethane	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
1,1,2-Trichloroethane	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
1,1-Dichloroethane	--	0.187	0.141	< 0.0056 UJ	0.0508	5.45	3.77 J	1.51 J	--
1,1-Dichloroethene	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	**0.0099**	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
1,2-Dichloroethane	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
1,2-Dichloroethene (total)	--	1.06	1.09	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	2.47 J	-- R	-- R	-- R	-- R	-- R	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	--	< 0.0559 UJ	< 0.44 U	< 0.452 U	< 0.0566 U	< 0.0587 U	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	--	< 0.0559 UJ	< 0.44 U	< 0.452 U	< 0.0566 U	< 0.0587 U	--
Acetone	--	--	1.95	< 0.112 UJ	< 0.881 U	< 0.903 U	0.318	0.239	--
Benzene	--	--	--	< 0.0056 UJ	0.0918	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Bromoform	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Bromomethane (Methyl bromide)	--	--	--	< 0.0112 UJ	< 0.088 U	< 0.09 U	< 0.0113 UJ	< 0.0117 U	--
Carbon disulfide	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Carbon tetrachloride	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	**0.0221 J**	< 0.0059 UJ	--
Chlorobenzene	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	< 0.0112 UJ	< 0.088 U	< 0.09 U	**0.0733 J**	**0.0299 J**	--
Chloroform (Trichloromethane)	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Chloromethane (Methyl chloride)	--	--	--	< 0.0112 UJ	< 0.088 U	< 0.09 U	< 0.0113 U	< 0.0117 U	--
cis-1,2-Dichloroethene	--	--	--	< 0.0056 UJ	**0.201**	**2.54**	**0.812 J**	**0.107 J**	--
cis-1,3-Dichloropropene	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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	WPSA-BH06-06SL 11/9/1992 N WPSA-BH06-06SL(6) 6 Not Excavated	WPSA-BH07-02SL 11/9/1992 N WPSA-BH07-02SL(2) 2 Not Excavated	WPSA-BH07-06SL 11/9/1992 N WPSA-BH07-06SL(6) 6 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(0)-20010412 0-2 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(2)-20010412 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(0)-20010417 0-2 Not Excavated	WPSA-BH9 4/17/2001 N SA-BH09 (DUP)(2)-20010 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(2)-20010417 2-4 Not Excavated	WPSA/BH10F 9/28/2005 N BH10F/092805/ 2 Not Excavated
Dibromochloromethane	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	--	0.148	0.543	< 0.0056 UJ	0.047	< 0.045 U	0.0207 J	0.0066 J	--
Hexachlorobutadiene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	--	--	< 0.0112 UJ	< 0.088 U	< 0.09 U	< 0.0113 U	< 0.0117 U	--
Naphthalene	--	--	--	0.404	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	0.237	0.209	0.138 J	1.36	0.477	0.0494 J	0.0223 J	--
Toluene	--	0.116	0.128	< 0.0056 UJ	0.0482	0.0829	0.0484 J	0.0142 J	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	--	< 0.0056 UJ	< 0.044 U	**0.0912**	**0.0212 J**	**0.0123 J**	--
trans-1,3-Dichloropropene	--	--	--	< 0.0056 UJ	< 0.044 U	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Trichloroethene	--	0.12	0.142	0.0376 J	4.45	0.414	0.033 J	0.01 J	--
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	--	--	< 0.0022 UJ	< 0.018 U	**1.45**	**1.44 J**	**0.709 J**	--
Xylene (total)	0.332	--	--	0.006 J	0.296	< 0.045 U	< 0.0057 U	< 0.0059 U	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	< 7.4 U	< 6.8 U	**86.7**	**7.8**	< 7.6 U	**226**
Arsenic	--	--	--	**6.78**	**3.13**	**3.05**	**7.54 J**	**2.05**	--
Barium	--	--	--	**183**	**86.2**	**32.5**	**60.7**	**79**	--
Beryllium	--	--	--	**1.2**	< 0.3 U	< 0.3 U	**0.6**	**0.6**	--
Cadmium	--	--	--	< 2.2 U	< 2 U	< 2.2 U	< 2.3 U	< 2.2 U	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	**13.9**	**8.2**	**6.1**	**10**	**11**	--
Cobalt	--	--	--	**3**	**2.2**	**3.1**	**6.8**	**7.7**	--
Copper	--	--	--	**34.6**	**126**	**28.4**	**18.2**	**14.8**	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	**45**	**947**	**16 J**	**12.5 J**	**13.6 J**	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	**157**	**215**	**518**	**309**	**250**	--
Mercury	--	--	--	**0.292**	**0.73**	**0.035**	**0.039**	**0.038**	--
Nickel	--	--	--	**9.26**	**26.9**	**33.2**	**15.7**	**14.6**	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	< 0.183 UJ	< 0.174 UJ	< 0.506 U	< 0.537 U	< 0.567 U	--
Silver	--	--	--	< 3 U	< 2.7 U	< 2.9 U	< 2.9 U	< 3.1 U	--
Sodium	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
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RACER Trust, Moraine, Ohio

	WPSA-BH06-06SL 11/9/1992 N WPSA-BH06-06SL(6) 6 Not Excavated	WPSA-BH07-02SL 11/9/1992 N WPSA-BH07-02SL(2) 2 Not Excavated	WPSA-BH07-06SL 11/9/1992 N WPSA-BH07-06SL(6) 6 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(0)-20010412 0-2 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(2)-20010412 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(0)-20010417 0-2 Not Excavated	WPSA-BH9 4/17/2001 N SA-BH09 (DUP)(2)-20010 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(2)-20010417 2-4 Not Excavated	WPSA/BH10F 9/28/2005 N BH10F/092805/ 2 Not Excavated
Thallium	--	--	--	< 0.367 U	< 0.348 U	< 0.338 UJ	< 0.359 UJ	< 0.379 UJ	--
Vanadium	--	--	--	**9.6**	**9.1**	**11.7**	**18.9**	**22.5**	--
Zinc	--	--	--	**72.3**	**295**	**44.1**	**54.4**	**48.5**	--
Aroclor-1016 (PCB-1016)	--	--	--	< 0.56 U	< 0.52 U	< 5.4 UJ	< 0.57 U	< 0.59 U	--
Aroclor-1221 (PCB-1221)	--	--	--	< 0.56 U	< 0.52 U	< 5.4 UJ	< 0.57 U	< 0.59 U	--
Aroclor-1232 (PCB-1232)	--	--	--	< 0.56 U	< 0.52 U	< 5.4 UJ	< 0.57 U	< 0.59 U	--
Aroclor-1242 (PCB-1242)	--	--	--	< 0.56 U	< 0.52 U	< 5.4 UJ	< 0.57 U	< 0.59 U	--
Aroclor-1248 (PCB-1248)	--	--	--	< 0.56 U	< 0.52 U	< 5.4 UJ	< 0.57 U	< 0.59 U	--
Aroclor-1254 (PCB-1254)	--	--	--	< 0.56 U	< 0.52 U	< 5.4 UJ	< 0.57 U	< 0.59 U	--
Aroclor-1260 (PCB-1260)	--	--	--	< 0.56 U	< 0.52 U	< 5.4 UJ	< 0.57 U	< 0.59 U	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2,4,5-Trichlorophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2,4,6-Trichlorophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2,4-Dichlorophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2,4-Dimethylphenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2,4-Dinitrophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2,4-Dinitrotoluene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2,6-Dinitrotoluene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2-Chloronaphthalene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2-Chlorophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2-Methylnaphthalene	--	--	--	**0.522**	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2-Methylphenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
2-Nitroaniline	--	--	--	< 0.554 U	< 10.4 UJ	< 1.06 U	< 0.561 U	< 0.581 U	--
2-Nitrophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
3&4-Methylphenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	**0.439**	--
3,3'-Dichlorobenzidine	--	--	--	< 0.738 UJ	< 13.6 UJ	< 1.4 U	< 0.747 UJ	< 0.775 UJ	--
3-Nitroaniline	--	--	--	< 0.554 U	< 10.4 UJ	< 1.06 U	< 0.561 U	< 0.581 U	--
4,6-Dinitro-2-methylphenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
4-Bromophenyl phenyl ether	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
4-Chloro-3-methylphenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
4-Chloroaniline	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
4-Chlorophenyl phenyl ether	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	< 0.554 U	< 10.4 UJ	< 1.06 U	< 0.561 U	< 0.581 U	--
4-Nitrophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Acenaphthene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Acenaphthylene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	< 0.369 UJ	< 6.92 UJ	< 0.71 U	< 0.374 UJ	< 0.387 UJ	--
Benzo(a)pyrene	--	--	--	< 0.185 UJ	**11.9 J**	**0.431 J**	< 0.187 UJ	< 0.194 UJ	--
Benzo(b)fluoranthene	--	--	--	< 0.369 UJ	< 69.2 UJ	< 0.71 UJ	< 0.374 UJ	< 0.387 UJ	--

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	WPSA-BH06-06SL 11/9/1992 N WPSA-BH06-06SL(6) 6 Not Excavated	WPSA-BH07-02SL 11/9/1992 N WPSA-BH07-02SL(2) 2 Not Excavated	WPSA-BH07-06SL 11/9/1992 N WPSA-BH07-06SL(6) 6 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(0)-20010412 0-2 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(2)-20010412 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(0)-20010417 0-2 Not Excavated	WPSA-BH9 4/17/2001 N SA-BH09 (DUP)(2)-20010 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(2)-20010417 2-4 Not Excavated	WPSA/BH10F 9/28/2005 N BH10F/092805/ 2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	< 0.369 UJ	**21.3 J**	< 0.71 UJ	< 0.374 UJ	< 0.387 UJ	--
Benzo(k)fluoranthene	--	--	--	< 0.369 UJ	< 69.2 UJ	< 0.71 UJ	< 0.374 UJ	< 0.387 UJ	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
bis(2-Chloroethyl)ether	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	**0.487 J**	< 6.92 UJ	< 0.71 U	< 0.374 UJ	< 0.387 UJ	--
Butyl benzylphthalate (BBP)	--	--	--	< 0.369 UJ	< 6.92 UJ	< 0.71 U	< 0.374 UJ	< 0.387 UJ	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Chrysene	--	--	--	< 0.369 UJ	< 6.92 UJ	< 0.71 U	< 0.374 UJ	< 0.387 UJ	--
Dibenz(a,h)anthracene	--	--	--	< 0.185 UJ	< 34.6 UJ	< 0.355 UJ	< 0.187 UJ	< 0.194 UJ	--
Dibenzofuran	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Diethyl phthalate	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Dimethyl phthalate	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Di-n-butylphthalate (DBP)	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Di-n-octyl phthalate (DnOP)	--	--	--	< 0.369 UJ	< 69.2 UJ	< 0.71 UJ	< 0.374 UJ	< 0.387 UJ	--
Fluoranthene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Fluorene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Hexachlorobenzene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Hexachlorocyclopentadiene	--	--	--	< 0.738 U	< 13.6 UJ	< 1.4 U	< 0.747 U	< 0.775 U	--
Hexachloroethane	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Indeno(1,2,3-cd)pyrene	--	--	--	< 0.369 UJ	< 69.2 UJ	< 0.71 UJ	< 0.374 UJ	< 0.387 UJ	--
Isophorone	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Nitrobenzene	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
N-Nitrosodiphenylamine	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Pentachlorophenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Phenanthrene	**8.46**	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	**0.906 J**	**0.602**	--
Phenol	--	--	--	< 0.369 U	< 6.92 UJ	< 0.71 U	< 0.374 U	< 0.387 U	--
Pyrene	--	--	--	< 0.369 UJ	**53.6 J**	**3.95**	< 0.374 UJ	< 0.387 UJ	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

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	WPSA-BH06-06SL 11/9/1992 N WPSA-BH06-06SL(6) 6 Not Excavated	WPSA-BH07-02SL 11/9/1992 N WPSA-BH07-02SL(2) 2 Not Excavated	WPSA-BH07-06SL 11/9/1992 N WPSA-BH07-06SL(6) 6 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(0)-20010412 0-2 Not Excavated	WPSA-BH8 4/12/2001 N WPSA-BH08(2)-20010412 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(0)-20010417 0-2 Not Excavated	WPSA-BH9 4/17/2001 N SA-BH09 (DUP)(2)-20010 2-4 Not Excavated	WPSA-BH9 4/17/2001 N WPSA-BH09(2)-20010417 2-4 Not Excavated	WPSA/BH10F 9/28/2005 N BH10F/092805/ 2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	--	--	--	--	--	--	--	**86.5**
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

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	WPSA/BH10W 9/28/2005 N BH10W/092805/ 0-2 Not Excavated	WPSA/BH10W 9/28/2005 FD DUP2/092805/ 0-2 Not Excavated	WPSA-BH10 4/17/2001 N WPSA-BH10(2)-20010417 2-4 Not Excavated	WPSA-BH12 4/18/2001 N WPSA-BH12(0)-20010418 0-2 Not Excavated	WPSA-BH12 4/18/2001 N WPSA-BH12(8)-20010418 8-10 Not Excavated	WPSA-BH14 4/19/2001 N WPSA-BH14(10)-20010419 10-12 Not Excavated	WPSA-BH15 4/16/2001 N WPSA-BH15(10)-20010416 10-12 Not Excavated	WPSA-BH15A 5/1/2001 N WPSA-BH15A(4)-20010501 4-6 Not Excavated	WPSA-BH15B 5/1/2001 N WPSA-BH15B(4)-20010501 4-6 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
1,1,2,2-Tetrachloroethane	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
1,1,2-Trichloroethane	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
1,1-Dichloroethane	--	--	0.576	6.33	0.0441 J	< 0.0055 U	< 0.0056 U	--	--
1,1-Dichloroethene	--	--	**0.0094**	**0.0159**	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
1,2-Dichloroethane	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	-- R	-- R	-- R	-- R	-- R	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	< 0.0588 U	< 0.0834 U	< 0.0528 U	< 0.0554 U	< 0.0557 U	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	< 0.0588 U	< 0.0834 U	< 0.0528 U	< 0.0554 U	< 0.0557 U	--	--
Acetone	--	--	0.636	< 0.167 U	< 0.106 U	< 0.111 U	< 0.111 U	--	--
Benzene	--	--	< 0.0059 U	0.0091	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Bromoform	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Bromomethane (Methyl bromide)	--	--	< 0.0118 U	< 0.0167 U	< 0.0106 U	< 0.0111 U	< 0.0111 U	--	--
Carbon disulfide	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Carbon tetrachloride	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Chlorobenzene	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	**0.113**	**4.29**	< 0.0106 U	< 0.0111 U	< 0.0111 U	--	--
Chloroform (Trichloromethane)	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Chloromethane (Methyl chloride)	--	--	< 0.0118 U	< 0.0167 U	< 0.0106 U	< 0.0111 U	< 0.0111 U	--	--
cis-1,2-Dichloroethene	--	--	**0.548**	**18**	**0.0068 J**	< 0.0055 U	< 0.0056 U	--	--
cis-1,3-Dichloropropene	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA/BH10W 9/28/2005 N BH10W/092805/ 0-2 Not Excavated	WPSA/BH10W 9/28/2005 FD DUP2/092805/ 0-2 Not Excavated	WPSA-BH10 4/17/2001 N WPSA-BH10(2)-20010417 2-4 Not Excavated	WPSA-BH12 4/18/2001 N WPSA-BH12(0)-20010418 0-2 Not Excavated	WPSA-BH12 4/18/2001 N WPSA-BH12(8)-20010418 8-10 Not Excavated	WPSA-BH14 4/19/2001 N WPSA-BH14(10)-20010419 10-12 Not Excavated	WPSA-BH15 4/16/2001 N WPSA-BH15(10)-20010416 10-12 Not Excavated	WPSA-BH15A 5/1/2001 N WPSA-BH15A(4)-20010501 4-6 Not Excavated	WPSA-BH15B 5/1/2001 N WPSA-BH15B(4)-20010501 4-6 Not Excavated
Dibromochloromethane	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	--	--	0.0236	2.04	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Hexachlorobutadiene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	--	**0.0179**	**0.0604**	< 0.0106 UJ	< 0.0111 UJ	< 0.0111 UJ	--	--
Naphthalene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	--	0.0096	12.2	0.0064 J	0.0081	0.01	--	--
Toluene	--	--	0.0248	0.105	< 0.0053 U	< 0.0055 U	0.0066	--	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	< 0.0059 U	**0.064**	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
trans-1,3-Dichloropropene	--	--	< 0.0059 U	< 0.0083 U	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Trichloroethene	--	--	0.0385	17.6	0.0088 J	< 0.0055 U	0.0058	--	--
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	--	**0.032**	**0.232**	< 0.0021 U	< 0.0022 U	< 0.0022 U	--	--
Xylene (total)	--	--	< 0.0059 U	0.0275	< 0.0053 U	< 0.0055 U	< 0.0056 U	--	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	**562**	**908 EJ**	**241**	**47.8**	< 6.8 U	**22.8**	**23.9**	--	--
Arsenic	--	--	**6.49**	**138**	**11.6**	**6.88**	**4.45**	--	--
Barium	--	--	**44.5**	**1200**	**32.8**	**151**	**331**	--	--
Beryllium	--	--	**0.5**	**1.33**	< 0.3 U	< 0.35 U	< 0.3 U	--	--
Cadmium	--	--	< 2.4 U	**20.4**	< 2 U	< 2.16 U	**5.5**	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	**8.9**	**47.5**	< 348 U	**21.6**	**18.6**	--	--
Cobalt	--	--	**7.3**	**35.2**	**3.2**	**15.5**	**13**	--	--
Copper	--	--	**31**	**4990**	**43**	**293**	**375**	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	**13.7 J**	**325**	**17**	**40.2**	**392**	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	**376**	**549**	**216**	**358**	**331**	--	--
Mercury	--	--	**0.165**	**0.333**	**0.051**	**0.032**	**0.062**	--	--
Nickel	--	--	**18**	**175**	**7.81**	**26.1**	**34.5**	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	< 0.557 U	< 0.184 U	< 0.171 U	< 0.184 U	< 0.185 U	--	--
Silver	--	--	< 3.1 U	< 7.3 U	< 2.7 U	< 2.88 U	< 3 U	--	--
Sodium	--	--	--	--	--	--	--	--	--

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	WPSA/BH10W 9/28/2005 N BH10W/092805/ 0-2 Not Excavated	WPSA/BH10W 9/28/2005 FD DUP2/092805/ 0-2 Not Excavated	WPSA-BH10 4/17/2001 N WPSA-BH10(2)-20010417 2-4 Not Excavated	WPSA-BH12 4/18/2001 N WPSA-BH12(0)-20010418 0-2 Not Excavated	WPSA-BH12 4/18/2001 N WPSA-BH12(8)-20010418 8-10 Not Excavated	WPSA-BH14 4/19/2001 N WPSA-BH14(10)-20010419 10-12 Not Excavated	WPSA-BH15 4/16/2001 N WPSA-BH15(10)-20010416 10-12 Not Excavated	WPSA-BH15A 5/1/2001 N WPSA-BH15A(4)-20010501 4-6 Not Excavated	WPSA-BH15B 5/1/2001 N WPSA-BH15B(4)-20010501 4-6 Not Excavated
Thallium	--	--	< 0.373 UJ	**2.08**	**0.431**	< 0.367 U	< 0.37 U	--	--
Vanadium	--	--	**15.7**	**12.9**	**7.34**	**7.55**	**7.1**	--	--
Zinc	--	--	**56.1**	**2430**	**52.1**	**419**	**1160**	--	--
Aroclor-1016 (PCB-1016)	--	--	< 0.59 U	< 0.58 U	< 0.53 U	< 0.55 U	< 0.56 U	--	--
Aroclor-1221 (PCB-1221)	--	--	< 0.59 U	< 0.58 U	< 0.53 U	< 0.55 U	< 0.56 U	--	--
Aroclor-1232 (PCB-1232)	--	--	< 0.59 U	< 0.58 U	< 0.53 U	< 0.55 U	< 0.56 U	--	--
Aroclor-1242 (PCB-1242)	--	--	< 0.59 U	< 0.58 U	< 0.53 U	< 0.55 U	< 0.56 U	--	--
Aroclor-1248 (PCB-1248)	--	--	< 0.59 U	< 0.58 U	< 0.53 U	< 0.55 U	< 0.56 U	--	--
Aroclor-1254 (PCB-1254)	--	--	< 0.59 U	< 0.58 U	< 0.53 U	< 0.55 U	< 0.56 U	--	--
Aroclor-1260 (PCB-1260)	--	--	< 0.59 U	< 0.58 U	< 0.53 U	< 0.55 U	< 0.56 U	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2,4,5-Trichlorophenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2,4,6-Trichlorophenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2,4-Dichlorophenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2,4-Dimethylphenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2,4-Dinitrophenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2,4-Dinitrotoluene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2,6-Dinitrotoluene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2-Chloronaphthalene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2-Chlorophenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2-Methylnaphthalene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2-Methylphenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
2-Nitroaniline	--	--	< 0.582 U	< 1.14 U	< 0.523 U	< 0.548 U	< 0.551 UJ	< 0.607 UJ	< 0.616 UJ
2-Nitrophenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
3&4-Methylphenol	--	--	**0.435 J**	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
3,3'-Dichlorobenzidine	--	--	< 0.776 UJ	< 1.5 U	< 0.697 U	< 0.731 UJ	< 0.735 UJ	< 0.809 UJ	< 0.822 UJ
3-Nitroaniline	--	--	< 0.582 U	< 1.14 U	< 0.523 U	< 0.548 U	< 0.551 UJ	< 0.607 UJ	< 0.616 UJ
4,6-Dinitro-2-methylphenol	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
4-Bromophenyl phenyl ether	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
4-Chloro-3-methylphenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
4-Chloroaniline	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
4-Chlorophenyl phenyl ether	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	< 0.582 U	< 1.14 U	< 0.523 U	< 0.548 U	< 0.551 UJ	< 0.607 UJ	< 0.616 UJ
4-Nitrophenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Acenaphthene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Acenaphthylene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Benzo(a)pyrene	--	--	< 1.88 UJ	**0.567 J**	< 0.174 U	< 0.183 UJ	< 0.184 UJ	< 0.202 UJ	< 0.205 UJ
Benzo(b)fluoranthene	--	--	< 3.88 UJ	**1.61 J**	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ

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Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	< 3.88 UJ	< 0.759 UJ	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Benzo(k)fluoranthene	--	--	< 3.88 UJ	**0.807 J**	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
bis(2-Chloroethyl)ether	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Butyl benzylphthalate (BBP)	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Chrysene	--	--	< 0.388 UJ	**0.961**	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Dibenz(a,h)anthracene	--	--	< 1.88 UJ	< 0.38 UJ	< 0.174 U	< 0.365 UJ	< 0.184 UJ	< 0.202 UJ	< 0.205 UJ
Dibenzofuran	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Diethyl phthalate	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Dimethyl phthalate	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Di-n-butylphthalate (DBP)	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Di-n-octyl phthalate (DnOP)	--	--	< 3.88 UJ	< 0.759 UJ	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Fluoranthene	--	--	< 0.388 UJ	**1.24**	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Fluorene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Hexachlorobenzene	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Hexachlorocyclopentadiene	--	--	< 0.776 U	< 1.5 U	< 0.697 U	< 0.731 U	< 0.735 UJ	< 0.809 UJ	< 0.822 UJ
Hexachloroethane	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Indeno(1,2,3-cd)pyrene	--	--	< 3.88 UJ	< 0.759 UJ	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Isophorone	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Nitrobenzene	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
N-Nitrosodiethylamine	--	--	--	--	--	< 0.365 U	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	< 0.365 U	--	--	--
N-Nitrosodi-n-propylamine	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
N-Nitrosodiphenylamine	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Pentachlorophenol	--	--	< 0.388 UJ	< 0.759 U	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Phenanthrene	--	--	**0.787 J**	**0.808**	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Phenol	--	--	< 0.388 U	< 0.759 U	< 0.348 U	< 0.365 U	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
Pyrene	--	--	< 0.388 UJ	**1.93**	< 0.348 U	< 0.365 UJ	< 0.367 UJ	< 0.404 UJ	< 0.411 UJ
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

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gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	**85.7**	**87.4**	--	--	--	--	--	--	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

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	WPSA/BH16F 9/28/2005 N BH16F/092805/ 2 Not Excavated	WPSA/BH16F 9/28/2005 N BH16F/092805/DL 2 Not Excavated	WPSA/BH16W 9/28/2005 N BH16W/092805/ 0-2 Not Excavated	WPSA/BH16W 9/28/2005 N BH16W/092805/DL 0-2 Not Excavated	WPSA/BH16W 9/28/2005 FD DUP1/092805/ 0-2 Not Excavated	WPSA/BH16W 9/28/2005 FD DUP1/092805/DL 0-2 Not Excavated	WPSA-BH16 4/11/2001 N WPSA-BH16(2)-20010411 2-4 Not Excavated	WPSA-BH17 4/10/2001 N A-BH17 (DUP-99)(0)-2001 0-2 Not Excavated	WPSA-BH17 4/10/2001 N WPSA-BH17(0)-20010410 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
1,1,2-Trichloroethane	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
1,1-Dichloroethane	--	--	--	--	--	--	0.011	< 0.0053 UJ	< 0.005 UJ
1,1-Dichloroethene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
1,2-Dichloroethane	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	--	--	--	--	< 0.132 UJ	-- R	-- R
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	--	--	--	--	< 0.0658 U	< 0.0529 UJ	< 0.0503 UJ
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	--	--	--	--	< 0.0658 U	< 0.0529 UJ	< 0.0503 UJ
Acetone	--	--	--	--	--	--	5.96	< 0.106 UJ	< 0.101 UJ
Benzene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Bromoform	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Bromomethane (Methyl bromide)	--	--	--	--	--	--	< 0.0132 U	< 0.0106 UJ	< 0.0101 UJ
Carbon disulfide	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Carbon tetrachloride	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Chlorobenzene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	--	--	< 0.0132 U	< 0.0106 UJ	< 0.0101 UJ
Chloroform (Trichloromethane)	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Chloromethane (Methyl chloride)	--	--	--	--	--	--	< 0.0132 UJ	< 0.0106 UJ	< 0.0101 UJ
cis-1,2-Dichloroethene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
cis-1,3-Dichloropropene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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	WPSA/BH16F 9/28/2005 N BH16F/092805/ 2 Not Excavated	WPSA/BH16F 9/28/2005 N BH16F/092805/DL 2 Not Excavated	WPSA/BH16W 9/28/2005 N BH16W/092805/ 0-2 Not Excavated	WPSA/BH16W 9/28/2005 N BH16W/092805/DL 0-2 Not Excavated	WPSA/BH16W 9/28/2005 FD DUP1/092805/ 0-2 Not Excavated	WPSA/BH16W 9/28/2005 FD DUP1/092805/DL 0-2 Not Excavated	WPSA-BH16 4/11/2001 N WPSA-BH16(2)-20010411 2-4 Not Excavated	WPSA-BH17 4/10/2001 N A-BH17 (DUP-99)(0)-2001 0-2 Not Excavated	WPSA-BH17 4/10/2001 N WPSA-BH17(0)-20010410 0-2 Not Excavated
Dibromochloromethane	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Hexachlorobutadiene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	--	--	--	--	--	< 0.0132 UJ	< 0.0106 UJ	< 0.0101 UJ
Naphthalene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	--	--	--	--	--	< 0.0066 U	0.0082 J	< 0.005 UJ
Toluene	--	--	--	--	--	--	0.011	< 0.0053 UJ	< 0.005 UJ
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
trans-1,3-Dichloropropene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Trichloroethene	--	--	--	--	--	--	< 0.0066 U	< 0.0053 UJ	< 0.005 UJ
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	--	--	--	--	--	< 0.0026 U	< 0.0021 UJ	< 0.002 UJ
Xylene (total)	--	--	--	--	--	--	0.0292	< 0.0053 UJ	< 0.005 UJ
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	**232**	< 14 U	< 13 U
Arsenic	--	--	--	--	--	--	**10.4**	**5.2 J**	**5.75 J**
Barium	--	--	--	--	--	--	**174**	**106 J**	**111 J**
Beryllium	--	--	--	--	--	--	< 4 U	< 0.7 U	< 0.6 U
Cadmium	--	**149**	--	**3600**	--	**4150**	< 26 U	< 4.1 U	< 3.8 U
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	**3410**	**15.6 J**	**10 J**
Cobalt	--	--	--	--	--	--	**55**	**5**	**4.8**
Copper	--	--	--	--	--	--	**1470**	**63 J**	**57 J**
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	**3810**	**27.6**	**26.8**
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	**2990**	**204**	**231**
Mercury	--	--	--	--	--	--	**0.063**	**0.072 J**	**0.055 J**
Nickel	--	--	--	--	--	--	**1910**	**14 J**	**11 J**
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	< 0.213 U	< 0.698 UJ	< 0.635 UJ
Silver	--	--	--	--	--	--	< 34 U	< 5.5 U	< 5 U
Sodium	--	--	--	--	--	--	--	--	--

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Thallium	--	--	--	--	--	--	< 0.425 U	< 0.37 U	< 0.318 U
Vanadium	--	--	--	--	--	--	< 43 U	**7.6**	< 6.3 U
Zinc	--	--	--	--	--	--	**387**	**114 J**	**96.4 J**
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	< 0.66 U	< 0.53 U	< 0.5 U
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	< 0.66 U	< 0.53 U	< 0.5 U
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	< 0.66 U	< 0.53 U	< 0.5 U
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	< 0.66 U	< 0.53 U	< 0.5 U
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	< 0.66 U	< 0.53 U	< 0.5 U
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	< 0.66 U	< 0.53 U	0.81
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	< 0.66 U	< 0.53 U	< 0.5 U
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2,4,5-Trichlorophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2,4,6-Trichlorophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2,4-Dichlorophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2,4-Dimethylphenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2,4-Dinitrophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2,4-Dinitrotoluene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2,6-Dinitrotoluene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2-Chloronaphthalene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2-Chlorophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2-Methylnaphthalene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2-Methylphenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
2-Nitroaniline	--	--	--	--	--	--	< 0.651 U	< 0.523 U	< 0.518 U
2-Nitrophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
3&4-Methylphenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
3,3'-Dichlorobenzidine	--	--	--	--	--	--	< 0.868 UJ	< 0.698 UJ	< 0.691 UJ
3-Nitroaniline	--	--	--	--	--	--	< 0.651 U	< 0.523 U	< 0.518 U
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
4-Bromophenyl phenyl ether	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
4-Chloro-3-methylphenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
4-Chloroaniline	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	--	--	< 0.651 U	< 0.523 U	< 0.518 U
4-Nitrophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Acenaphthene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Acenaphthylene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	< 0.434 UJ	< 0.349 UJ	< 0.346 UJ
Benzo(a)pyrene	--	--	--	--	--	--	< 0.217 UJ	< 1.69 UJ	< 1.68 UJ
Benzo(b)fluoranthene	--	--	--	--	--	--	< 0.434 UJ	< 3.49 UJ	< 3.46 UJ

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Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	< 0.434 UJ	< 3.49 UJ	< 3.46 UJ
Benzo(k)fluoranthene	--	--	--	--	--	--	< 0.434 UJ	< 3.49 UJ	< 3.46 UJ
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
bis(2-Chloroethyl)ether	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	< 0.434 UJ	< 0.349 UJ	< 0.346 UJ
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	< 0.434 UJ	< 0.349 UJ	< 0.346 UJ
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Chrysene	--	--	--	--	--	--	< 0.434 UJ	< 0.349 UJ	< 0.346 UJ
Dibenz(a,h)anthracene	--	--	--	--	--	--	< 0.217 UJ	< 1.69 UJ	< 1.68 UJ
Dibenzofuran	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Diethyl phthalate	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Dimethyl phthalate	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	< 0.434 UJ	< 3.49 UJ	< 3.46 UJ
Fluoranthene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Fluorene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Hexachlorobenzene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Hexachlorocyclopentadiene	--	--	--	--	--	--	< 0.868 U	< 0.698 U	< 0.691 U
Hexachloroethane	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	< 0.434 UJ	< 3.49 UJ	< 3.46 UJ
Isophorone	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Nitrobenzene	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
N-Nitrosodiphenylamine	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Pentachlorophenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Phenanthrene	--	--	--	--	--	--	**1.16**	< 0.349 U	< 0.346 U
Phenol	--	--	--	--	--	--	< 0.434 U	< 0.349 U	< 0.346 U
Pyrene	--	--	--	--	--	--	**0.709 J**	< 0.349 UJ	< 0.346 UJ
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

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Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA/BH16F 9/28/2005 N BH16F/092805/ 2 Not Excavated	WPSA/BH16F 9/28/2005 N BH16F/092805/DL 2 Not Excavated	WPSA/BH16W 9/28/2005 N BH16W/092805/ 0-2 Not Excavated	WPSA/BH16W 9/28/2005 N BH16W/092805/DL 0-2 Not Excavated	WPSA/BH16W 9/28/2005 FD DUP1/092805/ 0-2 Not Excavated	WPSA/BH16W 9/28/2005 FD DUP1/092805/DL 0-2 Not Excavated	WPSA-BH16 4/11/2001 N WPSA-BH16(2)-20010411 2-4 Not Excavated	WPSA-BH17 4/10/2001 N A-BH17 (DUP-99)(0)-2001 0-2 Not Excavated	WPSA-BH17 4/10/2001 N WPSA-BH17(0)-20010410 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	**72.0**	--	**78.6**	--	**82.9**	--	--	--	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH17 4/10/2001 N WPSA-BH17(4)-20010410 4-6 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(0)-20010418 0-2 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(2)-20010418 2-4 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/ 2 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/DL 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FD 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FDDL 2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/ 0-2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/DL 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
1,1,2-Trichloroethane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
1,1-Dichloroethane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
1,1-Dichloroethene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
1,2-Dichloroethane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	-- R	-- R	-- R	--	--	--	--	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	< 0.0557 U	< 0.0528 U	< 0.0643 U	--	--	--	--	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	< 0.0557 U	< 0.0528 U	< 0.0643 U	--	--	--	--	--	--
Acetone	< 0.111 UJ	< 0.106 U	< 0.129 U	--	--	--	--	--	--
Benzene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Bromoform	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Bromomethane (Methyl bromide)	< 0.0111 U	< 0.0106 U	< 0.0129 U	--	--	--	--	--	--
Carbon disulfide	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Carbon tetrachloride	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Chlorobenzene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	< 0.0111 U	< 0.0106 UJ	< 0.0129 U	--	--	--	--	--	--
Chloroform (Trichloromethane)	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Chloromethane (Methyl chloride)	< 0.0111 U	< 0.0106 U	< 0.0129 UJ	--	--	--	--	--	--
cis-1,2-Dichloroethene	< 0.0056 U	**0.0192**	< 0.0064 U	--	--	--	--	--	--
cis-1,3-Dichloropropene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

Table 1
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Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH17 4/10/2001 N WPSA-BH17(4)-20010410 4-6 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(0)-20010418 0-2 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(2)-20010418 2-4 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/ 2 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/DL 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FD 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FDDL 2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/ 0-2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/DL 0-2 Not Excavated
Dibromochloromethane	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Hexachlorobutadiene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	< 0.0111 UJ	< 0.0106 U	< 0.0129 U	--	--	--	--	--	--
Naphthalene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0056 U	0.0088	< 0.0064 U	--	--	--	--	--	--
Toluene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
trans-1,3-Dichloropropene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Trichloroethene	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0022 U	< 0.0021 U	< 0.0026 U	--	--	--	--	--	--
Xylene (total)	< 0.0056 U	< 0.0053 U	< 0.0064 U	--	--	--	--	--	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	**22**	< 14 U	< 35 U	--	--	--	--	--	--
Arsenic	**4.77 J**	**6.42**	**16.5**	--	--	--	--	--	--
Barium	**256 J**	**40.3**	**279**	--	--	--	--	--	--
Beryllium	< 0.8 U	< 0.7 U	< 1 U	--	--	--	--	--	--
Cadmium	**8.2**	**29.6**	**98.6**	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	**434 J**	**21.5**	**4340**	--	--	--	--	--	--
Cobalt	**9.1**	**4.2**	**41**	--	--	--	--	--	--
Copper	**720 J**	**47**	**5720**	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	**2240**	**111**	**1360**	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	**278**	**284**	**1580**	--	--	--	--	--	--
Mercury	**0.067 J**	**0.039**	**0.093**	--	--	--	--	--	--
Nickel	**312 J**	**41.6**	**1360**	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	< 0.176 UJ	< 0.173 U	< 0.207 U	--	--	--	--	--	--
Silver	**8**	< 5.6 U	< 14 U	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

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	WPSA-BH17 4/10/2001 N WPSA-BH17(4)-20010410 4-6 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(0)-20010418 0-2 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(2)-20010418 2-4 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/ 2 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/DL 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FD 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FDDL 2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/ 0-2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/DL 0-2 Not Excavated
Thallium	< 0.353 U	**0.498**	< 0.415 U	--	--	--	--	--	--
Vanadium	< 7.3 U	< 7.1 U	**175**	--	--	--	--	--	--
Zinc	**178 J**	**63.3**	**1200**	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	< 0.56 U	< 0.53 U	< 0.64 U	--	< 7.5 U	--	< 7.4 U	--	< 0.75 U
Aroclor-1221 (PCB-1221)	< 0.56 U	< 0.53 U	< 0.64 U	--	< 7.5 U	--	< 7.4 U	--	< 0.75 U
Aroclor-1232 (PCB-1232)	< 0.56 U	< 0.53 U	< 0.64 U	--	< 7.5 U	--	< 7.4 U	--	< 0.75 U
Aroclor-1242 (PCB-1242)	< 0.56 U	< 0.53 U	< 0.64 U	--	< 7.5 U	--	< 7.4 U	--	< 0.75 U
Aroclor-1248 (PCB-1248)	< 0.56 U	< 0.53 U	< 0.64 U	--	15	--	15	--	< 0.75 U
Aroclor-1254 (PCB-1254)	< 0.56 U	< 0.53 U	< 0.64 U	--	< 7.5 U	--	< 7.4 U	--	< 0.75 U
Aroclor-1260 (PCB-1260)	< 0.56 U	< 0.53 U	< 0.64 U	--	22	--	22	--	2.3
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2,4,5-Trichlorophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2,4,6-Trichlorophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2,4-Dichlorophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2,4-Dimethylphenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2,4-Dinitrophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2,4-Dinitrotoluene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2,6-Dinitrotoluene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2-Chloronaphthalene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2-Chlorophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2-Methylnaphthalene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2-Methylphenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
2-Nitroaniline	< 0.551 U	< 0.523 U	< 0.636 U	--	--	--	--	--	--
2-Nitrophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
3&4-Methylphenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
3,3'-Dichlorobenzidine	< 0.735 UJ	< 0.697 UJ	< 0.848 UJ	--	--	--	--	--	--
3-Nitroaniline	< 0.551 U	< 0.523 U	< 0.636 U	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
4-Bromophenyl phenyl ether	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
4-Chloro-3-methylphenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
4-Chloroaniline	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	< 0.551 U	< 0.523 U	< 0.636 U	--	--	--	--	--	--
4-Nitrophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Acenaphthene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Acenaphthylene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	< 0.367 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Benzo(a)pyrene	< 1.78 UJ	< 0.174 UJ	< 0.212 U	--	--	--	--	--	--
Benzo(b)fluoranthene	< 3.67 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--

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	WPSA-BH17 4/10/2001 N WPSA-BH17(4)-20010410 4-6 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(0)-20010418 0-2 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(2)-20010418 2-4 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/ 2 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/DL 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FD 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FDDL 2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/ 0-2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/DL 0-2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	< 3.67 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Benzo(k)fluoranthene	< 3.67 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
bis(2-Chloroethyl)ether	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	< 0.367 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	< 0.367 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Chrysene	< 0.367 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	< 1.78 UJ	< 0.174 UJ	< 0.212 U	--	--	--	--	--	--
Dibenzofuran	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Diethyl phthalate	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Dimethyl phthalate	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	< 3.67 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Fluoranthene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Fluorene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Hexachlorobenzene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Hexachlorocyclopentadiene	< 0.735 U	< 0.697 U	< 0.848 U	--	--	--	--	--	--
Hexachloroethane	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	< 3.67 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
Isophorone	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Nitrobenzene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
N-Nitrosodiphenylamine	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Pentachlorophenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Phenanthrene	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Phenol	< 0.367 U	< 0.348 U	< 0.424 U	--	--	--	--	--	--
Pyrene	< 0.367 UJ	< 0.348 UJ	< 0.424 U	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH17 4/10/2001 N WPSA-BH17(4)-20010410 4-6 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(0)-20010418 0-2 Not Excavated	WPSA-BH18 4/18/2001 N WPSA-BH18(2)-20010418 2-4 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/ 2 Not Excavated	WPSA/BH19F 10/4/2005 N BH19F/100405/DL 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FD 2 Not Excavated	WPSA/BH19F 10/4/2005 FD DUP3/100405/FDDL 2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/ 0-2 Not Excavated	WPSA/BH19W 10/4/2005 N BH19W/100405/DL 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	--	--	**87.8**	--	**89.3**	--	**88.2**	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH19 4/19/2001 N WPSA-BH19(6)-20010419 6-8 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SL 2-4 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SLDL 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2) 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2)DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4) 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4)DL 2-4 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
1,1,2,2-Tetrachloroethane	< 0.0061 U	--	--	--	< 0.0095 UJ	--	< 0.0077 UJ	--	< 0.0051 U
1,1,2-Trichloroethane	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
1,1-Dichloroethane	0.0177	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
1,1-Dichloroethene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	< 0.402 U	--	--	--	< 0.0095 UJ	--	< 0.0077 UJ	--	< 0.0051 U
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	< 0.019 UJ	--	< 0.015 UJ	--	< 0.01 U
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
1,2-Dichlorobenzene	< 0.402 U	--	--	--	< 0.0095 UJ	--	< 0.0077 UJ	--	< 0.0051 U
1,2-Dichloroethane	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	< 0.402 U	--	--	--	< 0.0095 UJ	--	< 0.0077 UJ	--	< 0.0051 U
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	< 0.402 U	--	--	--	< 0.0095 UJ	--	< 0.0077 U	--	< 0.0051 U
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	-- R	--	--	--	< 0.038 U	--	< 0.031 U	--	< 0.021 U
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	< 0.061 U	--	--	--	< 0.038 U	--	< 0.031 U	--	< 0.021 U
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	< 0.061 U	--	--	--	< 0.038 U	--	< 0.031 U	--	< 0.021 U
Acetone	< 0.122 U	--	--	--	< 0.038 U	--	< 0.031 U	--	< 0.021 U
Benzene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Bromoform	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Bromomethane (Methyl bromide)	< 0.0122 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Carbon disulfide	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Carbon tetrachloride	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Chlorobenzene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	< 0.0122 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Chloroform (Trichloromethane)	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Chloromethane (Methyl chloride)	< 0.0122 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
cis-1,2-Dichloroethene	< 0.0061 U	--	--	--	< 0.0048 U	--	< 0.0038 U	--	< 0.0026 U
cis-1,3-Dichloropropene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Cyclohexane	--	--	--	--	< 0.019 U	--	< 0.015 U	--	< 0.01 U
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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RACER Trust, Moraine, Ohio

	WPSA-BH19 4/19/2001 N WPSA-BH19(6)-20010419 6-8 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SL 2-4 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SLDL 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2) 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2)DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4) 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4)DL 2-4 Not Excavated
Dibromochloromethane	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Ethylbenzene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Hexachlorobutadiene	< 0.402 U	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Methyl acetate	--	--	--	--	< 0.019 U	--	< 0.015 U	--	< 0.01 U
Methyl cyclohexane	--	--	--	--	**0.0011 J**	--	**0.001 J**	--	< 0.01 U
Methyl tert butyl ether (MTBE)	--	--	--	--	< 0.038 U	--	< 0.031 U	--	< 0.021 U
Methylene chloride	< 0.0122 UJ	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Naphthalene	< 0.402 U	--	--	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Toluene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0061 U	--	--	--	< 0.0048 U	--	< 0.0038 U	--	< 0.0026 U
trans-1,3-Dichloropropene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Trichloroethene	< 0.0061 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Trichlorofluoromethane (CFC-11)	--	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Trifluorotrichloroethane (Freon 113)	--	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0024 U	--	--	--	< 0.0095 U	--	< 0.0077 U	--	< 0.0051 U
Xylene (total)	< 0.0061 U	--	--	--	< 0.019 U	--	< 0.015 U	--	< 0.01 U
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	< 7.65 U	--	--	--	--	--	--	--	--
Arsenic	**7.12**	--	--	--	--	--	--	--	--
Barium	**95.6**	--	--	--	--	--	--	--	--
Beryllium	**0.57**	--	--	--	--	--	--	--	--
Cadmium	< 2.29 U	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	**10.7**	--	--	--	--	--	--	--	--
Cobalt	**8.34**	--	--	--	--	--	--	--	--
Copper	**11.9**	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	**19.8**	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	**254**	--	--	--	--	--	--	--	--
Mercury	**0.021**	--	--	--	--	--	--	--	--
Nickel	**11.7**	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	**0.322**	--	--	--	--	--	--	--	--
Silver	< 3.06 U	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

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	WPSA-BH19 4/19/2001 N WPSA-BH19(6)-20010419 6-8 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SL 2-4 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SLDL 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2) 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2)DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4) 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4)DL 2-4 Not Excavated
Thallium	< 0.404 U	--	--	--	--	--	--	--	--
Vanadium	**19.8**	--	--	--	--	--	--	--	--
Zinc	**36**	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	< 0.61 U	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	< 0.61 U	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	< 0.61 U	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	< 0.61 U	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	< 0.61 U	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	< 0.61 U	--	80 J	0.12	--	0.15	--	< 0.039 U	--
Aroclor-1260 (PCB-1260)	< 0.61 U	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	< 0.402 U	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	< 0.402 U	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	< 0.402 U	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	< 0.402 U	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	< 0.402 U	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	< 0.402 U	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	< 0.402 U	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	< 0.402 U	--	--	--	--	--	--	--	--
2-Chloronaphthalene	< 0.402 U	--	--	--	--	--	--	--	--
2-Chlorophenol	< 0.402 U	--	--	--	--	--	--	--	--
2-Methylnaphthalene	< 0.402 U	--	--	--	--	--	--	--	--
2-Methylphenol	< 0.402 U	--	--	--	--	--	--	--	--
2-Nitroaniline	< 0.604 U	--	--	--	--	--	--	--	--
2-Nitrophenol	< 0.402 U	--	--	--	--	--	--	--	--
3&4-Methylphenol	< 0.402 U	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	< 0.805 UJ	--	--	--	--	--	--	--	--
3-Nitroaniline	< 0.604 U	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	< 0.402 U	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	< 0.402 U	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	< 0.402 U	--	--	--	--	--	--	--	--
4-Chloroaniline	< 0.402 U	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	< 0.402 U	--	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	< 0.604 U	--	--	--	--	--	--	--	--
4-Nitrophenol	< 0.402 U	--	--	--	--	--	--	--	--
Acenaphthene	< 0.402 U	--	--	--	--	--	--	--	--
Acenaphthylene	< 0.402 U	--	--	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	< 0.402 U	--	--	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	< 0.402 U	--	--	--	--	--	--	--	--
Benzo(a)pyrene	< 0.201 UJ	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	< 0.402 UJ	--	--	--	--	--	--	--	--

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	WPSA-BH19 4/19/2001 N WPSA-BH19(6)-20010419 6-8 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SL 2-4 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SLDL 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2) 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2)DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4) 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4)DL 2-4 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	< 0.402 UJ	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	< 0.402 UJ	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	< 0.402 U	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	< 0.402 U	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	< 0.402 U	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	< 0.402 U	--	--	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	< 0.402 U	--	--	--	--	--	--	--	--
Chrysene	< 0.402 U	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	< 0.201 UJ	--	--	--	--	--	--	--	--
Dibenzofuran	< 0.402 U	--	--	--	--	--	--	--	--
Diethyl phthalate	< 0.402 U	--	--	--	--	--	--	--	--
Dimethyl phthalate	< 0.402 U	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	< 0.402 U	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	< 0.402 UJ	--	--	--	--	--	--	--	--
Fluoranthene	< 0.402 U	--	--	--	--	--	--	--	--
Fluorene	< 0.402 U	--	--	--	--	--	--	--	--
Hexachlorobenzene	< 0.402 U	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	< 0.805 U	--	--	--	--	--	--	--	--
Hexachloroethane	< 0.402 U	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	< 0.402 UJ	--	--	--	--	--	--	--	--
Isophorone	< 0.402 U	--	--	--	--	--	--	--	--
Nitrobenzene	< 0.402 U	--	--	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	< 0.402 U	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	< 0.402 U	--	--	--	--	--	--	--	--
Pentachlorophenol	< 0.402 U	--	--	--	--	--	--	--	--
Phenanthrene	< 0.402 U	--	--	--	--	--	--	--	--
Phenol	< 0.402 U	--	--	--	--	--	--	--	--
Pyrene	< 0.402 U	--	--	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH19 4/19/2001 N WPSA-BH19(6)-20010419 6-8 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SL 2-4 Not Excavated	WPSA-BH22 8/8/2002 N WPSA-BH22/2-4/SLDL 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2) 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(0-2)DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125 0-2 Not Excavated	WPSA-BH23 3/20/2003 FD DUP-125DL 0-2 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4) 2-4 Not Excavated	WPSA-BH23 3/20/2003 N WPSA-BH23/(2-4)DL 2-4 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	**84.6**	--	**82**	--	**83.4**	--	**83.6**	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2DL 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FD 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FDDL 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3 2-3 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3DL 2-3 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SLDL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SL 6-8 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,1,2,2-Tetrachloroethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,1,2-Trichloroethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,1-Dichloroethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,1-Dichloroethene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	**0.00052 J**	--	< 0.22 U	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	< 0.01 UJ	--	< 0.01 UJ	--	< 0.0098 UJ	--	< 0.44 U	--
1,2-Dibromoethane (Ethylene dibromide)	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,2-Dichlorobenzene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,2-Dichloroethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	0.0026 J	--	< 0.0051 UJ	--	0.0013 J	--	< 0.22 U	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	0.02 J	--	0.014 J	--	0.016 J	--	< 0.88 U	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	**0.0031 J**	--	< 0.021 UJ	--	< 0.02 UJ	--	< 0.88 UJ	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	< 0.02 UJ	--	< 0.021 UJ	--	< 0.02 UJ	--	< 0.88 U	--
Acetone	--	0.082 J	--	0.059 J	--	0.09 J	--	< 0.88 U	--
Benzene	--	0.00064 J	--	< 0.0051 UJ	--	0.00049 J	--	0.043 J	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Bromoform	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Bromomethane (Methyl bromide)	--	< 0.0051 R	--	< 0.0051 R	--	< 0.0049 R	--	< 0.22 U	--
Carbon disulfide	--	< 0.0051 UJ	--	< 0.0051 UJ	--	0.001 J	--	< 0.22 U	--
Carbon tetrachloride	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Chlorobenzene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Chloroform (Trichloromethane)	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Chloromethane (Methyl chloride)	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
cis-1,2-Dichloroethene	--	< 0.0026 UJ	--	< 0.0026 UJ	--	< 0.0025 UJ	--	**0.074 J**	--
cis-1,3-Dichloropropene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Cyclohexane	--	**0.0017 J**	--	< 0.01 UJ	--	**0.0011 J**	--	< 0.44 U	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2DL 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FD 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FDDL 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3 2-3 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3DL 2-3 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SLDL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SL 6-8 Not Excavated
Dibromochloromethane	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Ethylbenzene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Hexachlorobutadiene	--	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Methyl acetate	--	**0.024 J**	--	**0.0074 J**	--	**0.02 J**	--	< 0.44 U	--
Methyl cyclohexane	--	**0.0021 J**	--	**0.00051 J**	--	**0.0018 J**	--	< 0.44 U	--
Methyl tert butyl ether (MTBE)	--	< 0.02 UJ	--	< 0.021 UJ	--	< 0.02 UJ	--	< 0.88 U	--
Methylene chloride	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Naphthalene	--	--	--	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	0.0013 J	--	< 0.0051 UJ	--	0.00086 J	--	< 0.22 U	--
Toluene	--	0.0015 J	--	0.00042 J	--	0.0012 J	--	0.04 J	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	< 0.0026 UJ	--	< 0.0026 UJ	--	< 0.0025 UJ	--	< 0.11 U	--
trans-1,3-Dichloropropene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Trichloroethene	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	0.36	--
Trichlorofluoromethane (CFC-11)	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Trifluorotrichloroethane (Freon 113)	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	< 0.0051 UJ	--	< 0.0051 UJ	--	< 0.0049 UJ	--	< 0.22 U	--
Xylene (total)	--	< 0.01 UJ	--	< 0.01 UJ	--	< 0.0098 UJ	--	0.17 J	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--
Barium	**38.8 J**	--	**45.8 J**	--	**28.6 J**	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	**35.9**	--	**0.24**
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	**79.6 J**	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2DL 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FD 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FDDL 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3 2-3 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3DL 2-3 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SLDL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SL 6-8 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2-Chloronaphthalene	--	--	--	--	--	--	--	--	--
2-Chlorophenol	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--
2-Methylphenol	--	--	--	--	--	--	--	--	--
2-Nitroaniline	--	--	--	--	--	--	--	--	--
2-Nitrophenol	--	--	--	--	--	--	--	--	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	--	--
3-Nitroaniline	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--
4-Chloroaniline	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	--	--	--	--	--
4-Nitrophenol	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2DL 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FD 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FDDL 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3 2-3 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3DL 2-3 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SLDL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SL 6-8 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--	--	--
Diethyl phthalate	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
Isophorone	--	--	--	--	--	--	--	--	--
Nitrobenzene	--	--	--	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--
Phenol	--	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/0-2DL 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FD 0-2 Not Excavated	WPSA-BH24 11/1/2002 FD DUP-124FDDL 0-2 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3 2-3 Not Excavated	WPSA-BH24 11/1/2002 N WPSA-BH24/2-3DL 2-3 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/0-2/SLDL 0-2 Not Excavated	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SL 6-8 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	**84 J**	--	**82.7 J**	--	**87.5 J**	--	**93.3**	--	**81.2**
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SLDL 6-8 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SLDL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SL 2-4 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SLDL 2-4 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SL 0-2 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SLDL 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121DL 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,1,2,2-Tetrachloroethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,1,2-Trichloroethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,1-Dichloroethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,1-Dichloroethene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	< 0.01 U	--	< 0.0092 U	--	< 0.016 U	--	< 0.01 U	--	< 0.011 U
1,2-Dibromoethane (Ethylene dibromide)	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,2-Dichlorobenzene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,2-Dichloroethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	0.0048 J	--	< 0.018 U	--	< 0.032 U	--	< 0.02 U	--	< 0.023 U
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	< 0.02 U	--	< 0.018 U	--	< 0.032 U	--	< 0.02 U	--	< 0.023 U
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	< 0.02 U	--	< 0.018 U	--	< 0.032 U	--	< 0.02 U	--	< 0.023 U
Acetone	< 0.02 U	--	< 0.018 U	--	< 0.032 U	--	< 0.02 U	--	< 0.023 U
Benzene	0.0022 J	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Bromoform	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Bromomethane (Methyl bromide)	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Carbon disulfide	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Carbon tetrachloride	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Chlorobenzene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Chloroform (Trichloromethane)	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Chloromethane (Methyl chloride)	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
cis-1,2-Dichloroethene	< 0.0026 U	--	< 0.0023 U	--	< 0.004 U	--	< 0.0025 U	--	< 0.0029 U
cis-1,3-Dichloropropene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Cyclohexane	< 0.01 U	--	< 0.0092 U	--	< 0.016 U	--	< 0.01 U	--	< 0.011 U
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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RACER Trust, Moraine, Ohio

	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SLDL 6-8 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SLDL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SL 2-4 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SLDL 2-4 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SL 0-2 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SLDL 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121DL 0-2 Not Excavated
Dibromochloromethane	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Ethylbenzene	0.0024 J	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Hexachlorobutadiene	--	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	**0.0031 J**	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Methyl acetate	< 0.01 U	--	< 0.0092 U	--	< 0.016 U	--	< 0.01 U	--	< 0.011 U
Methyl cyclohexane	**0.0025 J**	--	< 0.0092 U	--	< 0.016 U	--	< 0.01 U	--	< 0.011 U
Methyl tert butyl ether (MTBE)	< 0.02 U	--	< 0.018 U	--	< 0.032 U	--	< 0.02 U	--	< 0.023 U
Methylene chloride	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Naphthalene	--	--	--	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0051 U	--	0.0027 J	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Toluene	0.0026 J	--	0.00063 J	--	0.0013 J	--	< 0.0051 U	--	< 0.0057 U
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0026 U	--	< 0.0023 U	--	< 0.004 U	--	< 0.0025 U	--	< 0.0029 U
trans-1,3-Dichloropropene	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Trichloroethene	< 0.0051 U	--	0.0016 J	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Trichlorofluoromethane (CFC-11)	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Trifluorotrichloroethane (Freon 113)	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0051 U	--	< 0.0046 U	--	< 0.008 U	--	< 0.0051 U	--	< 0.0057 U
Xylene (total)	0.022	--	< 0.0092 U	--	< 0.016 U	--	< 0.01 U	--	< 0.011 U
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	**6.2**	--	**5.7**	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	**13.9 J**	**43.1 J**	--	--	**1300 J**	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

Table 1
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RACER Trust, Moraine, Ohio

	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SLDL 6-8 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SLDL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SL 2-4 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SLDL 2-4 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SL 0-2 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SLDL 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121DL 0-2 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2-Chloronaphthalene	--	--	--	--	--	--	--	--	--
2-Chlorophenol	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--
2-Methylphenol	--	--	--	--	--	--	--	--	--
2-Nitroaniline	--	--	--	--	--	--	--	--	--
2-Nitrophenol	--	--	--	--	--	--	--	--	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	--	--
3-Nitroaniline	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--
4-Chloroaniline	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	--	--	--	--	--
4-Nitrophenol	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--

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	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SLDL 6-8 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SLDL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SL 2-4 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SLDL 2-4 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SL 0-2 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SLDL 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121DL 0-2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--	--	--
Diethyl phthalate	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
Isophorone	--	--	--	--	--	--	--	--	--
Nitrobenzene	--	--	--	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--
Phenol	--	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH25 8/9/2002 N WPSA-BH25/6-8/SLDL 6-8 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/0-2/SLDL 0-2 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SL 2-4 Not Excavated	WPSA-BH26 8/7/2002 N WPSA-BH26/2-4/SLDL 2-4 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SL 0-2 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/0-2/SLDL 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121 0-2 Not Excavated	WPSA-BH27 8/7/2002 FD DUP-121DL 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	**93.4**	--	**75.9**	--	**91**	--	**90.6**	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SL 6-8 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SLDL 6-8 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SLDL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SL 4-6 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SLDL 4-6 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SLDL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SL 8-10 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	< 0.26 U	--	0.079 J	--	0.021	--	< 0.27 U	--
1,1,2,2-Tetrachloroethane	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,1,2-Trichloroethane	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,1-Dichloroethane	--	< 0.26 U	--	0.092 J	--	0.043	--	0.31	--
1,1-Dichloroethene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	**0.051 J**	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	< 0.53 U	--	< 0.9 U	--	< 0.0089 U	--	< 0.54 U	--
1,2-Dibromoethane (Ethylene dibromide)	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,2-Dichlorobenzene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,2-Dichloroethane	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	< 1.1 U	--	< 1.8 U	--	0.0025 J	--	< 1.1 U	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	< 1.1 U	--	< 1.8 U	--	< 0.018 U	--	< 1.1 U	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	< 1.1 U	--	< 1.8 U	--	< 0.018 U	--	< 1.1 U	--
Acetone	--	< 1.1 U	--	< 1.8 U	--	< 0.018 U	--	< 1.1 U	--
Benzene	--	< 0.26 U	--	0.35 J	--	< 0.0045 U	--	0.054 J	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Bromoform	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Bromomethane (Methyl bromide)	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Carbon disulfide	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Carbon tetrachloride	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Chlorobenzene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	**0.18 J**	--
Chloroform (Trichloromethane)	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Chloromethane (Methyl chloride)	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
cis-1,2-Dichloroethene	--	**0.065 J**	--	< 0.22 U	--	**0.018**	--	**6.7**	--
cis-1,3-Dichloropropene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Cyclohexane	--	< 0.53 U	--	**0.99**	--	< 0.0089 U	--	**0.031 J**	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

Table 1
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	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SL 6-8 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SLDL 6-8 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SLDL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SL 4-6 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SLDL 4-6 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SLDL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SL 8-10 Not Excavated
Dibromochloromethane	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	**0.047 J**	--
Ethylbenzene	--	< 0.26 U	--	0.18 J	--	< 0.0045 U	--	0.22 J	--
Hexachlorobutadiene	--	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Methyl acetate	--	< 0.53 U	--	< 0.9 U	--	< 0.0089 U	--	**0.083 J**	--
Methyl cyclohexane	--	< 0.53 U	--	**2.7**	--	< 0.0089 U	--	**0.088 J**	--
Methyl tert butyl ether (MTBE)	--	< 1.1 U	--	< 1.8 U	--	< 0.018 U	--	< 1.1 U	--
Methylene chloride	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Naphthalene	--	--	--	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	1.4	--	2.1	--	0.13	--	1.2	--
Toluene	--	< 0.26 U	--	2.1	--	< 0.0045 U	--	0.46	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	< 0.13 U	--	< 0.22 U	--	< 0.0022 U	--	**0.1 J**	--
trans-1,3-Dichloropropene	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Trichloroethene	--	0.3	--	1.5	--	0.017	--	1.1	--
Trichlorofluoromethane (CFC-11)	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Trifluorotrichloroethane (Freon 113)	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	< 0.27 U	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	< 0.26 U	--	< 0.45 U	--	< 0.0045 U	--	**0.35**	--
Xylene (total)	--	< 0.53 U	--	2.7	--	< 0.0089 U	--	0.19 J	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	**8.2**	--	**4.1**
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
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	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SL 6-8 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SLDL 6-8 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SLDL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SL 4-6 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SLDL 4-6 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SLDL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SL 8-10 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2-Chloronaphthalene	--	--	--	--	--	--	--	--	--
2-Chlorophenol	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--
2-Methylphenol	--	--	--	--	--	--	--	--	--
2-Nitroaniline	--	--	--	--	--	--	--	--	--
2-Nitrophenol	--	--	--	--	--	--	--	--	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	--	--
3-Nitroaniline	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--
4-Chloroaniline	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	--	--	--	--	--
4-Nitrophenol	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--

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	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SL 6-8 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SLDL 6-8 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SLDL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SL 4-6 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SLDL 4-6 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SLDL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SL 8-10 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--	--	--
Diethyl phthalate	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
Isophorone	--	--	--	--	--	--	--	--	--
Nitrobenzene	--	--	--	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--
Phenol	--	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

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Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SL 6-8 Not Excavated	WPSA-BH27 8/7/2002 N WPSA-BH27/6-8/SLDL 6-8 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/0-2/SLDL 0-2 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SL 4-6 Not Excavated	WPSA-BH28 8/7/2002 N WPSA-BH28/4-6/SLDL 4-6 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/0-2/SLDL 0-2 Not Excavated	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SL 8-10 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	**84.1**	--	**90.3**	--	**87.6**	--	**91.2**	--	**94.5**
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
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	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SLDL 8-10 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SLDL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SL 4-6 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SLDL 4-6 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/0-2/SLDL 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120DL 0-2 Not Excavated	WPSA-BH31 8/9/2002 N WPSA-BH31/0-2/SL 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,1,2,2-Tetrachloroethane	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,1,2-Trichloroethane	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,1-Dichloroethane	0.0025 J	--	2.7	--	2.4	0.24 J	--	0.1 J	--
1,1-Dichloroethene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	**0.024 J**	--	< 0.24 UJ	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	< 0.0088 U	--	< 0.53 U	--	< 0.52 U	< 0.59 U	--	< 0.48 U	--
1,2-Dibromoethane (Ethylene dibromide)	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,2-Dichlorobenzene	0.0032 J	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,2-Dichloroethane	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	< 0.018 U	--	< 1.1 U	--	< 1 U	< 1.2 U	--	< 0.95 U	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	< 0.018 U	--	< 1.1 U	--	< 1 U	< 1.2 U	--	< 0.95 U	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	< 0.018 U	--	< 1.1 U	--	< 1 U	< 1.2 U	--	< 0.95 U	--
Acetone	< 0.018 U	--	< 1.1 UJ	--	< 1 UJ	< 1.2 UJ	--	< 0.95 U	--
Benzene	0.00072 J	--	0.19 J	--	0.2 J	0.032 J	--	< 0.24 UJ	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Bromoform	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Bromomethane (Methyl bromide)	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Carbon disulfide	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Carbon tetrachloride	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Chlorobenzene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	**0.0026 J**	--	**1.3**	--	**1.5**	< 0.29 U	--	< 0.24 U	--
Chloroform (Trichloromethane)	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Chloromethane (Methyl chloride)	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
cis-1,2-Dichloroethene	**0.0091**	--	**0.43**	--	**0.65**	**0.47 J**	--	**0.14 J**	--
cis-1,3-Dichloropropene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Cyclohexane	< 0.0088 U	--	**0.13 J**	--	**0.1 J**	**0.05 J**	--	**0.04 J**	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SLDL 8-10 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SLDL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SL 4-6 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SLDL 4-6 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/0-2/SLDL 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120DL 0-2 Not Excavated	WPSA-BH31 8/9/2002 N WPSA-BH31/0-2/SL 0-2 Not Excavated
Dibromochloromethane	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Ethylbenzene	0.031	--	0.42	--	0.66	0.1 J	--	0.032 J	--
Hexachlorobutadiene	--	--	--	--	--	--	--	--	< 0.35 U
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	**0.0012 J**	--	**0.49**	--	**0.64**	< 0.29 U	--	< 0.24 U	--
Methyl acetate	< 0.0088 U	--	**0.15 J**	--	**0.26 J**	**0.13 J**	--	**0.11 J**	--
Methyl cyclohexane	**0.00096 J**	--	**0.52 J**	--	**0.39 J**	**0.056 J**	--	**0.044 J**	--
Methyl tert butyl ether (MTBE)	< 0.018 U	--	< 1.1 U	--	< 1 U	< 1.2 U	--	< 0.95 U	--
Methylene chloride	**0.0016 J**	--	**0.055 J**	--	**0.1 J**	< 0.29 UJ	--	< 0.24 U	--
Naphthalene	--	--	--	--	--	--	--	--	< 0.35 U
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Toluene	0.0064	--	3.9	--	5.3	1.4 J	--	0.42 J	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0022 U	--	< 0.13 U	--	< 0.13 U	**0.12 J**	--	**0.037 J**	--
trans-1,3-Dichloropropene	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Trichloroethene	0.0007 J	--	0.26 J	--	0.22 J	2 J	--	0.57 J	--
Trichlorofluoromethane (CFC-11)	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Trifluorotrichloroethane (Freon 113)	< 0.0044 U	--	< 0.27 U	--	< 0.26 U	< 0.29 U	--	< 0.24 U	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0044 U	--	**0.13 J**	--	**0.086 J**	**0.22 J**	--	**0.078 J**	--
Xylene (total)	0.013	--	3.9	--	5.9	0.43 J	--	0.21 J	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	**223**	--	**18**	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	**72**	--	**155 J**
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

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	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SLDL 8-10 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SLDL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SL 4-6 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SLDL 4-6 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/0-2/SLDL 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120DL 0-2 Not Excavated	WPSA-BH31 8/9/2002 N WPSA-BH31/0-2/SL 0-2 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	**1210 J**	--	**651 J**	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	--	--	< 0.35 U
2,4,5-Trichlorophenol	--	--	--	--	--	--	--	--	< 0.35 U
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	< 0.35 U
2,4-Dichlorophenol	--	--	--	--	--	--	--	--	< 0.35 U
2,4-Dimethylphenol	--	--	--	--	--	--	--	--	< 0.35 U
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	< 1.7 U
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	< 0.35 U
2,6-Dinitrotoluene	--	--	--	--	--	--	--	--	< 0.35 U
2-Chloronaphthalene	--	--	--	--	--	--	--	--	< 0.35 U
2-Chlorophenol	--	--	--	--	--	--	--	--	< 0.35 U
2-Methylnaphthalene	--	--	--	--	--	--	--	--	< 0.35 U
2-Methylphenol	--	--	--	--	--	--	--	--	< 0.35 U
2-Nitroaniline	--	--	--	--	--	--	--	--	< 1.7 U
2-Nitrophenol	--	--	--	--	--	--	--	--	< 0.35 U
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	--	< 1.7 U
3-Nitroaniline	--	--	--	--	--	--	--	--	< 1.7 U
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	--	< 1.7 U
4-Bromophenyl phenyl ether	--	--	--	--	--	--	--	--	< 0.35 U
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	< 0.35 U
4-Chloroaniline	--	--	--	--	--	--	--	--	< 0.35 U
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	--	--	< 0.35 U
4-Methylphenol	--	--	--	--	--	--	--	--	< 0.35 U
4-Nitroaniline	--	--	--	--	--	--	--	--	< 1.7 U
4-Nitrophenol	--	--	--	--	--	--	--	--	< 1.7 U
Acenaphthene	--	--	--	--	--	--	--	--	< 0.35 U
Acenaphthylene	--	--	--	--	--	--	--	--	< 0.35 U
Acetophenone	--	--	--	--	--	--	--	--	< 0.35 U
Anthracene	--	--	--	--	--	--	--	--	< 0.35 UJ
Atrazine	--	--	--	--	--	--	--	--	< 0.35 U
Benzaldehyde	--	--	--	--	--	--	--	--	< 0.35 U
Benzo(a)anthracene	--	--	--	--	--	--	--	--	**0.15 J**
Benzo(a)pyrene	--	--	--	--	--	--	--	--	**0.27 J**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	**0.36 J**

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Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	**0.15 J**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	**0.17 J**
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	< 0.35 U
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	< 0.35 U
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	--	< 0.35 U
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	--	--	**0.053 J**
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	--	--	< 0.35 U
Caprolactam	--	--	--	--	--	--	--	--	< 0.35 U
Carbazole	--	--	--	--	--	--	--	--	< 0.35 U
Chrysene	--	--	--	--	--	--	--	--	**0.22 J**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	**0.043 J**
Dibenzofuran	--	--	--	--	--	--	--	--	< 0.35 U
Diethyl phthalate	--	--	--	--	--	--	--	--	< 0.35 U
Dimethyl phthalate	--	--	--	--	--	--	--	--	< 0.35 U
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	--	--	< 0.35 U
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	--	--	< 0.35 U
Fluoranthene	--	--	--	--	--	--	--	--	**0.25 J**
Fluorene	--	--	--	--	--	--	--	--	< 0.35 U
Hexachlorobenzene	--	--	--	--	--	--	--	--	< 0.35 U
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	--	< 1.7 U
Hexachloroethane	--	--	--	--	--	--	--	--	< 0.35 U
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	**0.13 J**
Isophorone	--	--	--	--	--	--	--	--	< 0.35 U
Nitrobenzene	--	--	--	--	--	--	--	--	< 0.35 U
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	--	< 0.35 U
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	--	< 0.35 U
Pentachlorophenol	--	--	--	--	--	--	--	--	< 0.35 U
Phenanthrene	--	--	--	--	--	--	--	--	**0.093 J**
Phenol	--	--	--	--	--	--	--	--	< 0.35 U
Pyrene	--	--	--	--	--	--	--	--	**0.2 J**
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH29 8/6/2002 N WPSA-BH29/8-10/SLDL 8-10 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/0-2/SLDL 0-2 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SL 4-6 Not Excavated	WPSA-BH30 8/6/2002 N WPSA-BH30/4-6/SLDL 4-6 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/0-2/SLDL 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120 0-2 Not Excavated	WPSA-BH31 8/6/2002 FD DUP-120DL 0-2 Not Excavated	WPSA-BH31 8/9/2002 N WPSA-BH31/0-2/SL 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	**90.4**	--	**82.3**	--	--	**90.1**	--	**81.9 95.4**
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH31 8/9/2002 FD DUP-122 0-2 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SL 8-10 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SLDL 8-10 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SLDL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDLR2 4-6 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SL 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,1,2,2-Tetrachloroethane	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,1,2-Trichloroethane	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,1-Dichloroethane	--	--	0.048	--	0.17 J	--	0.013	--	--
1,1-Dichloroethene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	< 0.01 U	--	< 0.5 U	--	< 0.01 U	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,2-Dichlorobenzene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,2-Dichloroethane	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	< 0.0051 U	--	< 0.25 U	--	0.00069 J	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	< 0.02 U	--	< 1 U	--	0.0055 J	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	< 0.02 U	--	< 1 U	--	< 0.02 U	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	< 0.02 U	--	< 1 U	--	< 0.02 U	--	--
Acetone	--	--	< 0.02 U	--	< 1 UJ	--	< 0.02 U	--	--
Benzene	--	--	0.00083 J	--	0.024 J	--	0.0011 J	--	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Bromoform	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Bromomethane (Methyl bromide)	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Carbon disulfide	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Carbon tetrachloride	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Chlorobenzene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	**0.0037 J**	--	< 0.25 U	--	< 0.0051 U	--	--
Chloroform (Trichloromethane)	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Chloromethane (Methyl chloride)	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
cis-1,2-Dichloroethene	--	--	< 0.0025 U	--	**0.035 J**	--	**0.002 J**	--	--
cis-1,3-Dichloropropene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Cyclohexane	--	--	< 0.01 U	--	< 0.5 U	--	< 0.01 U	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

Table 1
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RACER Trust, Moraine, Ohio

	WPSA-BH31 8/9/2002 FD DUP-122 0-2 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SL 8-10 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SLDL 8-10 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SLDL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDLR2 4-6 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SL 0-2 Not Excavated
Dibromochloromethane	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Ethylbenzene	--	--	< 0.0051 U	--	0.055 J	--	< 0.0051 U	--	--
Hexachlorobutadiene	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Methyl acetate	--	--	< 0.01 U	--	**0.07 J**	--	< 0.01 U	--	--
Methyl cyclohexane	--	--	< 0.01 U	--	**0.026 J**	--	< 0.01 U	--	--
Methyl tert butyl ether (MTBE)	--	--	< 0.02 U	--	< 1 U	--	< 0.02 U	--	--
Methylene chloride	--	--	< 0.0051 UJ	--	< 0.25 UJ	--	< 0.0051 UJ	--	--
Naphthalene	< 0.35 U	< 0.41 U	--	--	0.8 J	--	100 J	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Toluene	--	--	0.0016 J	--	0.075 J	--	0.0015 J	--	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	< 0.0025 U	--	< 0.13 U	--	< 0.0026 U	--	--
trans-1,3-Dichloropropene	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Trichloroethene	--	--	< 0.0051 U	--	0.036 J	--	0.00087 J	--	--
Trichlorofluoromethane (CFC-11)	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Trifluorotrichloroethane (Freon 113)	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	--	< 0.0051 U	--	< 0.25 U	--	< 0.0051 U	--	--
Xylene (total)	--	--	< 0.01 U	--	0.084 J	--	< 0.01 U	--	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	**16.5 J**	--	**152 J**	--	**47.4 J**	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

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	WPSA-BH31 8/9/2002 FD DUP-122 0-2 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SL 8-10 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SLDL 8-10 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SLDL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDLR2 4-6 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SL 0-2 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	**61.8**	--	**106**	--	**89.4**	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2,4,5-Trichlorophenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2,4,6-Trichlorophenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2,4-Dichlorophenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2,4-Dimethylphenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2,4-Dinitrophenol	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
2,4-Dinitrotoluene	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2,6-Dinitrotoluene	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2-Chloronaphthalene	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2-Chlorophenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2-Methylnaphthalene	< 0.35 U	< 0.41 U	--	--	**0.29 J**	--	**83 J**	--	--
2-Methylphenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
2-Nitroaniline	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
2-Nitrophenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
3-Nitroaniline	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
4,6-Dinitro-2-methylphenol	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
4-Bromophenyl phenyl ether	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
4-Chloro-3-methylphenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
4-Chloroaniline	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
4-Chlorophenyl phenyl ether	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
4-Methylphenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
4-Nitroaniline	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
4-Nitrophenol	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
Acenaphthene	< 0.35 U	< 0.41 U	--	--	**0.6 J**	--	**300 J**	--	--
Acenaphthylene	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Acetophenone	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Anthracene	**0.093 J**	< 0.41 U	--	--	**1.2**	--	**600 J**	--	--
Atrazine	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Benzaldehyde	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Benzo(a)anthracene	**0.55 J**	< 0.41 U	--	--	**2.9**	--	**520 J**	--	--
Benzo(a)pyrene	**1.5 J**	< 0.41 U	--	--	**3.6**	--	**380 J**	--	--
Benzo(b)fluoranthene	**2.1 J**	< 0.41 U	--	--	**5.1**	--	**580 J**	--	--

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	WPSA-BH31 8/9/2002 FD DUP-122 0-2 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SL 8-10 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SLDL 8-10 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SLDL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDLR2 4-6 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SL 0-2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	**0.81 J**	< 0.41 U	--	--	**2.1**	--	--	**150 J**	--
Benzo(k)fluoranthene	**0.89 J**	< 0.41 U	--	--	**2.3**	--	**260 J**	--	--
Biphenyl (1,1-Biphenyl)	< 0.35 U	< 0.41 U	--	--	**0.11 J**	--	**26 J**	--	--
bis(2-Chloroethoxy)methane	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
bis(2-Chloroethyl)ether	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	< 0.35 UJ	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Butyl benzylphthalate (BBP)	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Caprolactam	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Carbazole	< 0.35 U	< 0.41 U	--	--	**0.63 J**	--	**270 J**	--	--
Chrysene	**1.1 J**	< 0.41 U	--	--	**3.2**	--	**650 J**	--	--
Dibenz(a,h)anthracene	**0.28 J**	< 0.41 U	--	--	**0.55 J**	--	**56 J**	--	--
Dibenzofuran	< 0.35 U	< 0.41 U	--	--	**0.71 J**	--	**270 J**	--	--
Diethyl phthalate	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Dimethyl phthalate	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Di-n-butylphthalate (DBP)	< 0.35 U	< 0.41 U	--	--	**0.098 J**	--	< 150 U	--	--
Di-n-octyl phthalate (DnOP)	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Fluoranthene	**0.43 J**	< 0.41 U	--	--	**7.9**	--	**1800 J**	--	--
Fluorene	< 0.35 U	< 0.41 U	--	--	**0.96**	--	**500 J**	--	--
Hexachlorobenzene	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Hexachlorocyclopentadiene	< 1.7 U	< 2 U	--	--	< 4.5 U	--	< 710 U	--	--
Hexachloroethane	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Indeno(1,2,3-cd)pyrene	**0.72 J**	< 0.41 U	--	--	**1.8**	--	**130 J**	--	--
Isophorone	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Nitrobenzene	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
N-Nitrosodiphenylamine	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Pentachlorophenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Phenanthrene	**0.15 J**	< 0.41 U	--	--	**5.9**	--	**3000 EJ**	--	--
Phenol	< 0.35 U	< 0.41 U	--	--	< 0.93 U	--	< 150 U	--	--
Pyrene	**0.6 J**	< 0.41 U	--	--	**5.5**	--	**1100 J**	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH31 8/9/2002 FD DUP-122 0-2 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SL 8-10 Not Excavated	WPSA-BH31 8/6/2002 N WPSA-BH31/8-10/SLDL 8-10 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/0-2/SLDL 0-2 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDL 4-6 Not Excavated	WPSA-BH32 8/6/2002 N WPSA-BH32/2-4/SLDLR2 4-6 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SL 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	**94.2**	**81.1**	--	**88.8**	--	**89.8**	--	--	**97**
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLDL 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLR2 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118DL 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118R2 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLDL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLR2 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SL 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,1,2,2-Tetrachloroethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,1,2-Trichloroethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,1-Dichloroethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,1-Dichloroethene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	< 0.0091 U	--	--	< 0.0091 UJ	--	--	< 0.011 U	--	--
1,2-Dibromoethane (Ethylene dibromide)	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,2-Dichlorobenzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,2-Dichloroethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	< 0.018 U	--	--	< 0.018 UJ	--	--	< 0.022 U	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	< 0.018 UJ	--	--	< 0.018 UJ	--	--	< 0.022 UJ	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	< 0.018 U	--	--	< 0.018 UJ	--	--	< 0.022 U	--	--
Acetone	< 0.018 U	--	--	< 0.018 U	--	--	< 0.022 U	--	--
Benzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Bromoform	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Bromomethane (Methyl bromide)	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Carbon disulfide	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Carbon tetrachloride	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Chlorobenzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Chloroform (Trichloromethane)	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Chloromethane (Methyl chloride)	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
cis-1,2-Dichloroethene	**0.0011 J**	--	--	**0.0024 J**	--	--	**0.022**	--	--
cis-1,3-Dichloropropene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Cyclohexane	< 0.0091 U	--	--	< 0.0091 UJ	--	--	< 0.011 U	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLDL 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLR2 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118DL 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118R2 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLDL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLR2 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SL 0-2 Not Excavated
Dibromochloromethane	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Ethylbenzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Hexachlorobutadiene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Methyl acetate	< 0.0091 U	--	--	< 0.0091 UJ	--	--	< 0.011 U	--	--
Methyl cyclohexane	< 0.0091 U	--	--	< 0.0091 UJ	--	--	< 0.011 U	--	--
Methyl tert butyl ether (MTBE)	< 0.018 U	--	--	< 0.018 UJ	--	--	< 0.022 U	--	--
Methylene chloride	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Naphthalene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Toluene	< 0.0045 UJ	--	--	0.00079 J	--	--	< 0.0055 U	--	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0023 U	--	--	< 0.0023 UJ	--	--	**0.0014 J**	--	--
trans-1,3-Dichloropropene	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Trichloroethene	0.00081 J	--	--	0.0019 J	--	--	0.0063	--	--
Trichlorofluoromethane (CFC-11)	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Trifluorotrichloroethane (Freon 113)	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0045 U	--	--	< 0.0045 UJ	--	--	< 0.0055 U	--	--
Xylene (total)	< 0.0091 U	--	--	< 0.0091 UJ	--	--	< 0.011 U	--	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	**0.032 B**
Sodium	--	--	--	--	--	--	--	--	--

Table 1
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	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLDL 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLR2 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118DL 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118R2 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLDL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLR2 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SL 0-2 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2,4,5-Trichlorophenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2,4,6-Trichlorophenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2,4-Dichlorophenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2,4-Dimethylphenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2,4-Dinitrophenol	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
2,4-Dinitrotoluene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2,6-Dinitrotoluene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2-Chloronaphthalene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2-Chlorophenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2-Methylnaphthalene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2-Methylphenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
2-Nitroaniline	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
2-Nitrophenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
3-Nitroaniline	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
4,6-Dinitro-2-methylphenol	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
4-Bromophenyl phenyl ether	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
4-Chloro-3-methylphenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
4-Chloroaniline	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
4-Chlorophenyl phenyl ether	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
4-Methylphenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
4-Nitroaniline	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
4-Nitrophenol	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
Acenaphthene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Acenaphthylene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Acetophenone	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Anthracene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Atrazine	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Benzaldehyde	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Benzo(a)anthracene	--	**0.05 J**	--	--	< 0.34 U	--	--	< 0.39 U	--
Benzo(a)pyrene	--	**0.054 J**	--	--	< 0.34 U	--	--	< 0.39 U	--
Benzo(b)fluoranthene	--	**0.084 J**	--	--	< 0.34 U	--	--	**0.058 J**	--

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	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLDL 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLR2 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118DL 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118R2 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLDL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLR2 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SL 0-2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	**0.053 J**	--	--	< 0.34 U	--	--	< 0.39 U	--
Benzo(k)fluoranthene	--	**0.048 J**	--	--	< 0.34 U	--	--	< 0.39 U	--
Biphenyl (1,1-Biphenyl)	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
bis(2-Chloroethoxy)methane	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
bis(2-Chloroethyl)ether	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	**0.091 J**	--	--	**0.05 J**	--	--	< 0.39 U	--
Butyl benzylphthalate (BBP)	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Caprolactam	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Carbazole	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Chrysene	--	**0.056 J**	--	--	< 0.34 U	--	--	**0.058 J**	--
Dibenz(a,h)anthracene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Dibenzofuran	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Diethyl phthalate	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Dimethyl phthalate	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Di-n-butylphthalate (DBP)	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Di-n-octyl phthalate (DnOP)	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Fluoranthene	--	**0.098 J**	--	--	< 0.34 U	--	--	**0.069 J**	--
Fluorene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Hexachlorobenzene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Hexachlorocyclopentadiene	--	< 1.6 U	--	--	< 1.6 U	--	--	< 1.9 U	--
Hexachloroethane	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Indeno(1,2,3-cd)pyrene	--	**0.045 J**	--	--	< 0.34 U	--	--	< 0.39 U	--
Isophorone	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Nitrobenzene	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
N-Nitrosodiphenylamine	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Pentachlorophenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Phenanthrene	--	**0.053 J**	--	--	< 0.34 U	--	--	**0.071 J**	--
Phenol	--	< 0.34 U	--	--	< 0.34 U	--	--	< 0.39 U	--
Pyrene	--	**0.09 J**	--	--	< 0.34 U	--	--	**0.042 J**	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLDL 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/0-2/SLR2 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118DL 0-2 Not Excavated	WPSA-BH33 8/5/2002 FD DUP-118R2 0-2 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLDL 6-8 Not Excavated	WPSA-BH33 8/5/2002 N WPSA-BH33/6-8/SLR2 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SL 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	--	**97.2**	--	--	**85.4**	--	--	**96.4**
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
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RACER Trust, Moraine, Ohio

	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SLDL 0-2 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SL 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SLDL 6-8 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/0-2/SL 0-2 Not Excavated	WPSA-BH35 10/23/2003 FD DUP-132 0-2 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/8-10/SL 8-10 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/0-2/SL 0-2 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/8-10/SL 8-10 Not Excavated	WPSA-BH37 10/23/2003 N WPSA-BH37/0-2/SL 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,1,2-Trichloroethane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,1-Dichloroethane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,1-Dichloroethene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	< 0.0094 U	--	< 0.015 U	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,2-Dichlorobenzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,2-Dichloroethane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	< 0.019 U	--	< 0.029 U	--	--	--	--	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	< 0.019 U	--	< 0.029 U	--	--	--	--	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	< 0.019 U	--	< 0.029 U	--	--	--	--	--	--
Acetone	< 0.019 U	--	< 0.029 U	--	--	--	--	--	--
Benzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Bromoform	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Bromomethane (Methyl bromide)	< 0.0047 UJ	--	< 0.0073 UJ	--	--	--	--	--	--
Carbon disulfide	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Carbon tetrachloride	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Chlorobenzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	< 0.0047 UJ	--	< 0.0073 UJ	--	--	--	--	--	--
Chloroform (Trichloromethane)	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Chloromethane (Methyl chloride)	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
cis-1,2-Dichloroethene	< 0.0024 U	--	**0.039**	--	--	--	--	--	--
cis-1,3-Dichloropropene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Cyclohexane	< 0.0094 U	--	< 0.015 U	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

Table 1
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RACER Trust, Moraine, Ohio

	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SLDL 0-2 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SL 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SLDL 6-8 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/0-2/SL 0-2 Not Excavated	WPSA-BH35 10/23/2003 FD DUP-132 0-2 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/8-10/SL 8-10 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/0-2/SL 0-2 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/8-10/SL 8-10 Not Excavated	WPSA-BH37 10/23/2003 N WPSA-BH37/0-2/SL 0-2 Not Excavated
Dibromochloromethane	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Ethylbenzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Hexachlorobutadiene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Methyl acetate	< 0.0094 U	--	< 0.015 U	--	--	--	--	--	--
Methyl cyclohexane	< 0.0094 U	--	< 0.015 U	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	< 0.019 U	--	< 0.029 U	--	--	--	--	--	--
Methylene chloride	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Toluene	0.0009 J	--	0.0021 J	--	--	--	--	--	--
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0024 U	--	**0.0061**	--	--	--	--	--	--
trans-1,3-Dichloropropene	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Trichloroethene	0.0013 J	--	0.076	--	--	--	--	--	--
Trichlorofluoromethane (CFC-11)	< 0.0047 UJ	--	< 0.0073 UJ	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0047 U	--	< 0.0073 U	--	--	--	--	--	--
Xylene (total)	< 0.0094 U	--	< 0.015 U	--	--	--	--	--	--
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	**7.8**	**10.1**	**16.1**	--	--	--
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	**10.2**
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	**6550 J**
Lead	--	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	**87.2**	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

Table 1
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	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SLDL 0-2 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SL 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SLDL 6-8 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/0-2/SL 0-2 Not Excavated	WPSA-BH35 10/23/2003 FD DUP-132 0-2 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/8-10/SL 8-10 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/0-2/SL 0-2 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/8-10/SL 8-10 Not Excavated	WPSA-BH37 10/23/2003 N WPSA-BH37/0-2/SL 0-2 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2,4,5-Trichlorophenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2,4,6-Trichlorophenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2,4-Dichlorophenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2,4-Dimethylphenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2,4-Dinitrophenol	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
2,4-Dinitrotoluene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2,6-Dinitrotoluene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2-Chloronaphthalene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2-Chlorophenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2-Methylnaphthalene	--	--	--	--	--	--	**0.02 J**	< 0.39 U	--
2-Methylphenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
2-Nitroaniline	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
2-Nitrophenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
3-Nitroaniline	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
4-Bromophenyl phenyl ether	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
4-Chloroaniline	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
4-Methylphenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
4-Nitroaniline	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
4-Nitrophenol	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
Acenaphthene	--	--	--	--	--	--	**0.031 J**	< 0.39 U	--
Acenaphthylene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Acetophenone	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Anthracene	--	--	--	--	--	--	**0.098 J**	< 0.39 U	--
Atrazine	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Benzaldehyde	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Benzo(a)anthracene	--	--	--	--	--	--	**0.48**	< 0.39 U	--
Benzo(a)pyrene	--	--	--	--	--	--	**0.56**	< 0.39 U	--
Benzo(b)fluoranthene	--	--	--	--	--	--	**0.75**	< 0.39 U	--

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	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SLDL 0-2 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SL 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SLDL 6-8 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/0-2/SL 0-2 Not Excavated	WPSA-BH35 10/23/2003 FD DUP-132 0-2 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/8-10/SL 8-10 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/0-2/SL 0-2 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/8-10/SL 8-10 Not Excavated	WPSA-BH37 10/23/2003 N WPSA-BH37/0-2/SL 0-2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	**0.34 J**	< 0.39 U	--
Benzo(k)fluoranthene	--	--	--	--	--	--	**0.38**	< 0.39 U	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Caprolactam	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Carbazole	--	--	--	--	--	--	**0.042 J**	< 0.39 U	--
Chrysene	--	--	--	--	--	--	**0.63**	< 0.39 U	--
Dibenz(a,h)anthracene	--	--	--	--	--	--	**0.13 J**	< 0.39 U	--
Dibenzofuran	--	--	--	--	--	--	**0.024 J**	< 0.39 U	--
Diethyl phthalate	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Dimethyl phthalate	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Fluoranthene	--	--	--	--	--	--	**1.3**	< 0.39 U	--
Fluorene	--	--	--	--	--	--	**0.029 J**	< 0.39 U	--
Hexachlorobenzene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Hexachlorocyclopentadiene	--	--	--	--	--	--	< 1.8 U	< 1.9 U	--
Hexachloroethane	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	**0.35 J**	< 0.39 U	--
Isophorone	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Nitrobenzene	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
N-Nitrosodiphenylamine	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Pentachlorophenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Phenanthrene	--	--	--	--	--	--	**0.54**	< 0.39 U	--
Phenol	--	--	--	--	--	--	< 0.37 U	< 0.39 U	--
Pyrene	--	--	--	--	--	--	**0.92**	< 0.39 U	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH34 8/5/2002 N WPSA-BH34/0-2/SLDL 0-2 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SL 6-8 Not Excavated	WPSA-BH34 8/5/2002 N WPSA-BH34/6-8/SLDL 6-8 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/0-2/SL 0-2 Not Excavated	WPSA-BH35 10/23/2003 FD DUP-132 0-2 Not Excavated	WPSA-BH35 10/23/2003 N WPSA-BH35/8-10/SL 8-10 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/0-2/SL 0-2 Not Excavated	WPSA-BH36 10/23/2003 N WPSA-BH36/8-10/SL 8-10 Not Excavated	WPSA-BH37 10/23/2003 N WPSA-BH37/0-2/SL 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	**81.9**	--	**84.2**	**91.1**	**81.5**	**88.5**	**85.0**	**94.6**
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH37 10/23/2003 N WPSA-BH37/8-10/SL 8-10 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (1-2)-S/121217 1-2 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (6-8)-S/121217 6-8 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (1-2)-S/121317 1-2 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (6-8)-S/121317 6-8 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (1-2)-S/121217 1-2 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (6-8)-S/121217 6-8 Not Excavated	BLDG21-8 12/12/2017 N BLDG 21-8 (1-2)-S/121217 1-2 Not Excavated	BLDG21-8 12/13/2017 N BLDG 21-8 (6-8)-S/121317 6-8 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	< 0.0052 U	< 0.015 U	< 0.0044 U	0.062 J	< 0.0054 U	0.27	< 0.0045 U	< 0.0039 U
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	--	< 0.0052 U	< 0.015 U	< 0.0044 U	< 0.29 U	< 0.0054 U	< 0.27 U	< 0.0045 U	< 0.0039 U
1,1-Dichloroethene	--	< 0.0052 U	< 0.015 U	< 0.0044 U	< 0.29 U	< 0.0054 U	< 0.27 U	< 0.0045 U	< 0.0039 U
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--	--	--	--	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	--	--	--	--	--	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	--	--	--	--	--	--	--
Acetone	--	--	--	--	--	--	--	--	--
Benzene	--	< 0.0052 U	< 0.015 U	< 0.0044 U	< 0.29 U	< 0.0054 U	0.043 J	0.00053 J	< 0.0039 U
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	--	--	--	--	--	--
Bromoform	--	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	--	--	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	--	--	--	--	--	--	--	--	--
Chlorobenzene	--	--	--	--	--	--	--	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	--	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	--	< 0.0052 U	< 0.015 U	< 0.0044 U	**0.17 J**	< 0.0054 U	**0.06 J**	< 0.0045 U	< 0.0039 U
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
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RACER Trust, Moraine, Ohio

	WPSA-BH37 10/23/2003 N WPSA-BH37/8-10/SL 8-10 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (1-2)-S/121217 1-2 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (6-8)-S/121217 6-8 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (1-2)-S/121317 1-2 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (6-8)-S/121317 6-8 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (1-2)-S/121217 1-2 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (6-8)-S/121217 6-8 Not Excavated	BLDG21-8 12/12/2017 N BLDG 21-8 (1-2)-S/121217 1-2 Not Excavated	BLDG21-8 12/13/2017 N BLDG 21-8 (6-8)-S/121317 6-8 Not Excavated
Dibromochloromethane	--	--	--	--	--	--	--	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	--	< 0.0052 U	< 0.015 U	0.00036 J	< 0.29 U	< 0.0054 U	< 0.27 U	0.00033 J	< 0.0039 U
Hexachlorobutadiene	--	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	0.0016 J	0.014 J	0.00038 J	9	0.00075 J	2	< 0.0045 U	0.0032 J
Toluene	--	< 0.0052 U	< 0.015 U	0.00080 J	0.12 J	0.00066 J	0.28 U	0.0018 J	0.00039 J
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	< 0.0052 U	< 0.015 U	< 0.0044 U	< 0.29 U	< 0.0054 U	< 0.27 U	< 0.0045 U	< 0.0039 U
trans-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--
Trichloroethene	--	< 0.0052 U	0.0013 J	< 0.0044 U	0.67	< 0.0054 U	0.4	0.0045	0.0010 J
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	< 0.0052 U	< 0.015 U	< 0.0044 U	< 0.29 U	< 0.0054 U	< 0.27 U	< 0.0045 U	< 0.0039 U
Xylene (total)	--	< 0.01 U	< 0.03 U	0.0024 J	0.29 J	< 0.011 U	0.27 J	0.0017 J	< 0.0077 U
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	**26.3**	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	**15400 J**	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

Table 1
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Human Health Risk Assessment
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	WPSA-BH37 10/23/2003 N WPSA-BH37/8-10/SL 8-10 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (1-2)-S/121217 1-2 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (6-8)-S/121217 6-8 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (1-2)-S/121317 1-2 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (6-8)-S/121317 6-8 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (1-2)-S/121217 1-2 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (6-8)-S/121217 6-8 Not Excavated	BLDG21-8 12/12/2017 N BLDG 21-8 (1-2)-S/121217 1-2 Not Excavated	BLDG21-8 12/13/2017 N BLDG 21-8 (6-8)-S/121317 6-8 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2-Chloronaphthalene	--	--	--	--	--	--	--	--	--
2-Chlorophenol	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--
2-Methylphenol	--	--	--	--	--	--	--	--	--
2-Nitroaniline	--	--	--	--	--	--	--	--	--
2-Nitrophenol	--	--	--	--	--	--	--	--	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	--	--
3-Nitroaniline	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--
4-Chloroaniline	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	--	--	--	--	--
4-Nitrophenol	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--

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	WPSA-BH37 10/23/2003 N WPSA-BH37/8-10/SL 8-10 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (1-2)-S/121217 1-2 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (6-8)-S/121217 6-8 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (1-2)-S/121317 1-2 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (6-8)-S/121317 6-8 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (1-2)-S/121217 1-2 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (6-8)-S/121217 6-8 Not Excavated	BLDG21-8 12/12/2017 N BLDG 21-8 (1-2)-S/121217 1-2 Not Excavated	BLDG21-8 12/13/2017 N BLDG 21-8 (6-8)-S/121317 6-8 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--	--	--
Diethyl phthalate	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
Isophorone	--	--	--	--	--	--	--	--	--
Nitrobenzene	--	--	--	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--
Phenol	--	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	WPSA-BH37 10/23/2003 N WPSA-BH37/8-10/SL 8-10 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (1-2)-S/121217 1-2 Not Excavated	BLDG21-5 12/12/2017 N BLDG 21-5 (6-8)-S/121217 6-8 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (1-2)-S/121317 1-2 Not Excavated	BLDG21-6 12/13/2017 N BLDG 21-6 (6-8)-S/121317 6-8 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (1-2)-S/121217 1-2 Not Excavated	BLDG21-7 12/12/2017 N BLDG 21-7 (6-8)-S/121217 6-8 Not Excavated	BLDG21-8 12/12/2017 N BLDG 21-8 (1-2)-S/121217 1-2 Not Excavated	BLDG21-8 12/13/2017 N BLDG 21-8 (6-8)-S/121317 6-8 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	**0.0073**
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	**80.6**	--	--	--	--	--	--	--	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	BLDG21-9 12/13/2017 N BLDG 21-9 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-9 12/13/2017 N BLDG 21-9 (6-8)-S/121317/ 6-8 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (1-2)-S/121417/ 1-2 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (2-4)-S/121417/ 2-4 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (6-8)-S/121417/ 6-8 Not Excavated	BLDG21-10 12/14/2017 FD DUP-02-121417 6-8 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-11 12/13/2017 FD DUP-01-121317 1-2 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (6-8)-S/121317/ 6-8 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	< 0.32 U	< 0.0037 U	< 0.31 U
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	< 0.32 U	< 0.0037 U	< 0.31 U
1,1-Dichloroethene	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	< 0.32 U	**0.00079 J**	< 0.31 U
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--	--	--	--	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	--	--	--	--	--	--	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	--	--	--	--	--	--	--
Acetone	--	--	--	--	--	--	--	--	--
Benzene	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	0.12 J	0.0019 J	< 0.31 U
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	--	--	--	--	--	--
Bromoform	--	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	--	--	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	--	--	--	--	--	--	--	--	--
Chlorobenzene	--	--	--	--	--	--	--	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	--	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	**0.21 J**	**0.0049 J**	**0.31 J**
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	BLDG21-9 12/13/2017 N BLDG 21-9 (1-2)-S/121317 1-2 Not Excavated	BLDG21-9 12/13/2017 N BLDG 21-9 (6-8)-S/121317 6-8 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (1-2)-S/121417/ 1-2 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (2-4)-S/121417/ 2-4 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (6-8)-S/121417/ 6-8 Not Excavated	BLDG21-10 12/14/2017 FD DUP-02-121417 6-8 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-11 12/13/2017 FD DUP-01-121317 1-2 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (6-8)-S/121317/ 6-8 Not Excavated
Dibromochloromethane	--	--	--	--	--	--	--	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	< 0.32 U	< 0.0037 U	< 0.31 U
Hexachlorobutadiene	--	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	0.00044 J	< 0.26 U	< 0.0059 U	--	0.0023 J	0.0031 J	< 0.32 U	< 0.0037 U	0.027 J
Toluene	0.00056 J	< 0.26 U	< 0.0059 U	--	< 0.0037 U	0.00039 J	0.6 J	0.0030 J	2 J
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	**0.084 J**	**0.0013 J**	< 0.31 U
trans-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--
Trichloroethene	0.00040 J	< 0.26 U	< 0.0059 U	--	0.00087 J	0.0010 J	0.53 J	0.0032 J	< 0.31 U
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0044 U	< 0.26 U	< 0.0059 U	--	< 0.0037 U	< 0.0039 U	< 0.32 U	**0.0034 J**	< 0.31 U
Xylene (total)	< 0.0087 U	< 0.51 U	< 0.012 U	--	< 0.0073 U	< 0.0078 U	0.15 J	0.00086 J	< 0.62 U
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--
Beryllium	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--
Cobalt	--	--	--	--	--	--	--	--	--
Copper	--	--	--	--	--	--	--	--	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--
Nickel	--	--	--	--	--	--	--	--	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--
Sodium	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	BLDG21-9 12/13/2017 N BLDG 21-9 (1-2)-S/121317 1-2 Not Excavated	BLDG21-9 12/13/2017 N BLDG 21-9 (6-8)-S/121317 6-8 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (1-2)-S/121417/ 1-2 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (2-4)-S/121417/ 2-4 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (6-8)-S/121417/ 6-8 Not Excavated	BLDG21-10 12/14/2017 FD DUP-02-121417 6-8 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-11 12/13/2017 FD DUP-01-121317 1-2 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (6-8)-S/121317/ 6-8 Not Excavated
Thallium	--	--	--	--	--	--	--	--	--
Vanadium	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	--	--	--	--	--	--	--	--	--
2-Chloronaphthalene	--	--	--	--	--	--	--	--	--
2-Chlorophenol	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--
2-Methylphenol	--	--	--	--	--	--	--	--	--
2-Nitroaniline	--	--	--	--	--	--	--	--	--
2-Nitrophenol	--	--	--	--	--	--	--	--	--
3&4-Methylphenol	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	--	--
3-Nitroaniline	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--
4-Chloroaniline	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	--	--	--	--	--
4-Nitrophenol	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--

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Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	BLDG21-9 12/13/2017 N BLDG 21-9 (1-2)-S/121317 1-2 Not Excavated	BLDG21-9 12/13/2017 N BLDG 21-9 (6-8)-S/121317 6-8 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (1-2)-S/121417/ 1-2 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (2-4)-S/121417/ 2-4 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (6-8)-S/121417/ 6-8 Not Excavated	BLDG21-10 12/14/2017 FD DUP-02-121417 6-8 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-11 12/13/2017 FD DUP-01-121317 1-2 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (6-8)-S/121317/ 6-8 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	--	--	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--	--	--
Diethyl phthalate	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	--	--
Hexachloroethane	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
Isophorone	--	--	--	--	--	--	--	--	--
Nitrobenzene	--	--	--	--	--	--	--	--	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--
Phenol	--	--	--	--	--	--	--	--	--
Pyrene	--	--	--	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

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	BLDG21-9 12/13/2017 N BLDG 21-9 (1-2)-S/121317 1-2 Not Excavated	BLDG21-9 12/13/2017 N BLDG 21-9 (6-8)-S/121317 6-8 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (1-2)-S/121417/ 1-2 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (2-4)-S/121417/ 2-4 Not Excavated	BLDG21-10 12/14/2017 N BLDG 21-10 (6-8)-S/121417/ 6-8 Not Excavated	BLDG21-10 12/14/2017 FD DUP-02-121417 6-8 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-11 12/13/2017 FD DUP-01-121317 1-2 Not Excavated	BLDG21-11 12/13/2017 N BLDG 21-11 (6-8)-S/121317/ 6-8 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	**0.042**	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

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	BLDG21-12 12/13/2017 N BLDG 21-12 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-12 12/13/2017 N BLDG 21-12 (6-8)-S/121317/ 6-8 Not Excavated	BLDG21-13 12/13/2017 N BLDG 21-13 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-13 12/13/2017 N BLDG 21-13 (6-8)-S/121317/ 6-8 Not Excavated	GM-33 4/2/2001 N GM-33(0)-20010402 0-2 Not Excavated	GM-34 4/3/2001 N GM-34(0)-20010403 0-2 Not Excavated	GM-35 4/4/2001 N GM-35(0)-20010404 0-2 Not Excavated	GM-35 4/4/2001 N GM-35(8)-20010404 8-10 Not Excavated	GM-35B-1 11/12/2015 N GM-35B1(0-2)-S/11122015 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0060 U	< 0.0042 U	< 0.0071 U	0.00049 J	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	< 0.0046 U
1,1,2,2-Tetrachloroethane	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
1,1,2-Trichloroethane	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
1,1-Dichloroethane	< 0.0060 U	0.0072	< 0.0071 U	0.0082	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	< 0.0046 U
1,1-Dichloroethene	< 0.0060 U	< 0.0042 U	< 0.0071 U	< 0.0042 U	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	< 0.0046 U
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
1,2-Dichloroethane	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
1,4-Dioxane	--	--	--	--	--	--	--	--	< 0.23 U
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	--	--	< 0.113 U	< 0.113 U	< 0.104 UJ	< 0.118 U	--
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	--	--	< 0.0567 U	< 0.0567 U	< 0.052 UJ	< 0.0588 U	--
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	--	--	< 0.0567 U	< 0.0567 U	< 0.052 UJ	< 0.0588 U	--
Acetone	--	--	--	--	< 0.113 UJ	< 0.113 UJ	< 0.104 UJ	< 0.118 UJ	--
Benzene	0.00057 J	< 0.0042 U	0.0019 J	0.00077 J	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	< 0.0046 U
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Bromoform	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Bromomethane (Methyl bromide)	--	--	--	--	< 0.0113 U	< 0.0113 U	< 0.0104 UJ	< 0.0118 U	--
Carbon disulfide	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Carbon tetrachloride	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Chlorobenzene	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	< 0.0113 U	< 0.0113 U	< 0.0104 UJ	< 0.0118 U	--
Chloroform (Trichloromethane)	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Chloromethane (Methyl chloride)	--	--	--	--	< 0.0113 U	< 0.0113 U	< 0.0104 UJ	< 0.0118 U	--
cis-1,2-Dichloroethene	< 0.0060 U	**0.0041 J**	< 0.0071 U	**0.0027 J**	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	**0.0554**	**0.00074 J**
cis-1,3-Dichloropropene	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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Dibromochloromethane	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	0.00053 J	< 0.0042 U	0.00069 J	< 0.0042 U	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	< 0.0046 U
Hexachlorobutadiene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	--	--	--	< 0.0113 U	< 0.0113 U	< 0.0104 UJ	< 0.0118 U	--
Naphthalene	--	--	--	--	0.398	< 0.374 U	< 0.343 U	1.05	--
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0060 U	0.0032 J	< 0.0071 U	0.0083	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	< 0.0046 U
Toluene	0.0015 J	< 0.0042 U	0.0029 J	0.00090 J	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	0.00056 J
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	< 0.0060 U	< 0.0042 U	< 0.0071 U	< 0.0042 U	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	**0.011**	< 0.0046 U
trans-1,3-Dichloropropene	--	--	--	--	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	--
Trichloroethene	0.00055 J	0.0014 J	0.0019 J	0.0020 J	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	0.0066
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0060 U	< 0.0042 U	< 0.0071 U	**0.00041 J**	< 0.0023 U	< 0.0023 U	< 0.0021 UJ	< 0.0024 U	< 0.0046 U
Xylene (total)	0.0013 J	< 0.0084 U	0.0030 J	0.00097 J	< 0.0057 U	< 0.0057 U	< 0.0052 UJ	< 0.0059 U	< 0.0093 U
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	**6.5 J**	< 7.5 U	< 17 U	**16.1**	--
Arsenic	--	--	--	--	**6.24**	**5.1**	**5.73**	**7.54**	--
Barium	--	--	--	--	**145**	**84.7**	**4.3**	**966**	--
Beryllium	--	--	--	--	**0.5**	**0.5**	< 0.8 U	< 38.6 U	--
Cadmium	--	--	--	--	< 1.1 U	< 2.3 U	< 5.1 U	< 2.4 U	--
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	**13.5**	**9.2**	< 6.8 U	**66.9**	--
Cobalt	--	--	--	--	**11.7**	**8.5**	< 3.4 U	**248**	--
Copper	--	--	--	--	**55.1 J**	**12**	< 3.4 U	**1410**	--
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	**55.8**	**22.7**	**4.46**	**488**	--
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	**518**	**876**	**126**	**553**	--
Mercury	--	--	--	--	**0.078**	**0.034**	**0.011**	**2.58**	--
Nickel	--	--	--	--	**26 J**	**11**	< 1.7 U	**368**	--
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	**0.253**	**0.338**	< 0.339 U	< 0.193 U	--
Silver	--	--	--	--	< 1.5 U	< 2.9 U	< 6.8 U	**31.9**	--
Sodium	--	--	--	--	--	--	--	--	--

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Thallium	--	--	--	--	< 0.361 U	< 0.359 U	< 0.339 U	< 0.385 U	--
Vanadium	--	--	--	--	**16.9**	**18.3**	< 8.5 U	**13.1**	--
Zinc	--	--	--	--	**214**	**47.1**	< 8.5 U	**4810**	--
Aroclor-1016 (PCB-1016)	--	--	--	--	< 0.57 U	< 0.57 U	< 0.52 U	< 2.9 UJ	--
Aroclor-1221 (PCB-1221)	--	--	--	--	< 0.57 U	< 0.57 U	< 0.52 U	< 2.9 UJ	--
Aroclor-1232 (PCB-1232)	--	--	--	--	< 0.57 U	< 0.57 U	< 0.52 U	< 2.9 UJ	--
Aroclor-1242 (PCB-1242)	--	--	--	--	< 0.57 U	< 0.57 U	< 0.52 U	< 2.9 UJ	--
Aroclor-1248 (PCB-1248)	--	--	--	--	< 0.57 U	< 0.57 U	< 0.52 U	< 2.9 UJ	--
Aroclor-1254 (PCB-1254)	--	--	--	--	< 0.57 U	< 0.57 U	< 0.52 U	4.6 J	--
Aroclor-1260 (PCB-1260)	--	--	--	--	< 0.57 U	< 0.57 U	< 0.52 U	< 2.9 UJ	--
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2,4,5-Trichlorophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2,4,6-Trichlorophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2,4-Dichlorophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2,4-Dimethylphenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2,4-Dinitrophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2,4-Dinitrotoluene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2,6-Dinitrotoluene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2-Chloronaphthalene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2-Chlorophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2-Methylnaphthalene	--	--	--	--	**0.435**	< 0.374 U	< 0.343 U	**0.495**	--
2-Methylphenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
2-Nitroaniline	--	--	--	--	< 0.561 U	< 0.561 U	< 0.515 U	< 0.582 U	--
2-Nitrophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
3&4-Methylphenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
3,3'-Dichlorobenzidine	--	--	--	--	< 0.748 U	< 0.748 UJ	< 0.686 U	< 0.776 UJ	--
3-Nitroaniline	--	--	--	--	< 0.561 U	< 0.561 U	< 0.515 U	< 0.582 U	--
4,6-Dinitro-2-methylphenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
4-Bromophenyl phenyl ether	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
4-Chloro-3-methylphenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
4-Chloroaniline	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
4-Chlorophenyl phenyl ether	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	< 0.561 U	< 0.561 U	< 0.515 U	< 0.582 U	--
4-Nitrophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Acenaphthene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	**1.53**	--
Acenaphthylene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	**0.502**	**0.441**	< 0.343 U	**5.55 J**	--
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	**1.85**	**1.94 J**	< 0.343 U	**11.1 J**	--
Benzo(a)pyrene	--	--	--	--	**1.52 J**	**1.43 J**	< 0.172 U	**8.93 J**	--
Benzo(b)fluoranthene	--	--	--	--	**3.24 J**	**3.3 J**	< 0.343 U	**17.2 J**	--

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Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	**0.423 J**	**0.449 J**	< 0.343 U	**1.69 J**	--
Benzo(k)fluoranthene	--	--	--	--	**0.593 J**	< 0.374 UJ	< 0.343 U	**5.39 J**	--
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
bis(2-Chloroethyl)ether	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	< 0.374 U	< 0.374 UJ	< 0.343 U	< 0.388 UJ	--
Butyl benzylphthalate (BBP)	--	--	--	--	< 0.374 U	< 0.374 UJ	< 0.343 U	< 0.388 UJ	--
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	**0.407**	< 0.374 U	< 0.343 U	**1.91**	--
Chrysene	--	--	--	--	**1.71**	**1.47 J**	< 0.343 U	**11.3 J**	--
Dibenz(a,h)anthracene	--	--	--	--	< 0.187 UJ	< 0.187 UJ	< 0.172 U	**0.84 J**	--
Dibenzofuran	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	**1.31**	--
Diethyl phthalate	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Dimethyl phthalate	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Di-n-butylphthalate (DBP)	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Di-n-octyl phthalate (DnOP)	--	--	--	--	< 0.374 UJ	< 0.374 UJ	< 0.343 U	< 0.388 UJ	--
Fluoranthene	--	--	--	--	**0.45 J**	**3.27**	< 0.343 U	**21.5 J**	--
Fluorene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	**2.09**	--
Hexachlorobenzene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Hexachlorocyclopentadiene	--	--	--	--	< 0.748 U	< 0.748 U	< 0.686 U	< 0.776 U	--
Hexachloroethane	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	**0.44 J**	**0.467 J**	< 0.343 U	**1.85 J**	--
Isophorone	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Nitrobenzene	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
N-Nitrosodiphenylamine	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Pentachlorophenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Phenanthrene	--	--	--	--	**2.65**	**2.34**	< 0.343 U	**22.8 J**	--
Phenol	--	--	--	--	< 0.374 U	< 0.374 U	< 0.343 U	< 0.388 U	--
Pyrene	--	--	--	--	**3.87 J**	**3.88 J**	< 0.343 U	**20.7 J**	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
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RACER Trust, Moraine, Ohio

	BLDG21-12 12/13/2017 N BLDG 21-12 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-12 12/13/2017 N BLDG 21-12 (6-8)-S/121317/ 6-8 Not Excavated	BLDG21-13 12/13/2017 N BLDG 21-13 (1-2)-S/121317/ 1-2 Not Excavated	BLDG21-13 12/13/2017 N BLDG 21-13 (6-8)-S/121317/ 6-8 Not Excavated	GM-33 4/2/2001 N GM-33(0)-20010402 0-2 Not Excavated	GM-34 4/3/2001 N GM-34(0)-20010403 0-2 Not Excavated	GM-35 4/4/2001 N GM-35(0)-20010404 0-2 Not Excavated	GM-35 4/4/2001 N GM-35(8)-20010404 8-10 Not Excavated	GM-35B-1 11/12/2015 N GM-35B1(0-2)-S/11122015 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
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	GM-35B-1 12/10/2015 N GM-35B-1(8-10)-S/121015 8-10 Not Excavated	GM-35B-2 11/12/2015 N GM-35B2(0-2)-S/11122015 0-2 Not Excavated	GM-35B-2 12/7/2015 N GM-35B-2(8-10)-S/120715 8-10 Not Excavated	GM-35B-3 12/10/2015 N GM-35B-3(0-2)-S/121015 0-2 Not Excavated	GM-35B-3 12/29/2015 N GM-35B-3(8-10)-S/122915 8-10 Not Excavated	GM-35B-4 11/12/2015 N GM-35B4(0-2)-S/11122015 0-3 Not Excavated	GM-36 4/3/2001 N GM-36(0)-20010403 0-2 Not Excavated	GM-36 4/3/2001 N GM-36(6)-20010403 6-8 Not Excavated	GM-37 4/9/2001 N GM-37(0)-20010409 0-2 Not Excavated
Chemical									
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	< 0.0053 U	< 0.0051 U	< 0.0049 U	< 0.0045 U	0.034 J	< 0.0047 U	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	**0.0173 J**
1,1,2-Trichloroethane	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
1,1-Dichloroethane	< 0.0053 U	< 0.0051 U	< 0.0049 U	< 0.0045 U	0.035 J	< 0.0047 U	< 0.0052 U	< 0.0058 U	0.0067 J
1,1-Dichloroethene	< 0.0053 U	< 0.0051 U	< 0.0049 U	< 0.0045 U	< 0.23 U	< 0.0047 U	< 0.0052 U	< 0.0058 U	< 0.0058 U
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
1,2-Dichloroethane	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 U
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
1,4-Dioxane	< 0.0060 U	< 0.25 U	< 0.0063 U	< 0.0056 U	< 0.0056 U	< 0.23 U	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	--	--	--	--	--	--	< 0.104 U	< 0.116 U	-- R
2-Chlorotoluene	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	--	--	--	--	< 0.0521 U	< 0.0578 U	< 0.0579 UJ
2-Phenylbutane (sec-Butylbenzene)	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	--	--	--	--	--	< 0.0521 U	< 0.0578 U	< 0.0579 UJ
Acetone	--	--	--	--	--	--	< 0.104 UJ	< 0.116 UJ	< 0.116 UJ
Benzene	< 0.0053 U	< 0.0051 U	< 0.0049 U	< 0.0045 U	< 0.23 U	< 0.0047 U	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
Bromobenzene	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
Bromoform	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
Bromomethane (Methyl bromide)	--	--	--	--	--	--	< 0.0104 U	< 0.0116 U	< 0.0116 U
Carbon disulfide	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 U
Carbon tetrachloride	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
Chlorobenzene	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 U
Chlorobromomethane	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	--	--	< 0.0104 U	< 0.0116 U	< 0.0116 U
Chloroform (Trichloromethane)	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 U
Chloromethane (Methyl chloride)	--	--	--	--	--	--	< 0.0104 U	< 0.0116 U	< 0.0116 U
cis-1,2-Dichloroethene	**0.011**	**0.00039 J**	**0.00030 J**	< 0.0045 U	**0.15 J**	**0.0011 J**	< 0.0052 U	**0.0146**	< 0.0058 U
cis-1,3-Dichloropropene	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
Cyclohexane	--	--	--	--	--	--	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--

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	GM-35B-1 12/10/2015 N GM-35B-1(8-10)-S/121015 8-10 Not Excavated	GM-35B-2 11/12/2015 N GM-35B2(0-2)-S/11122015 0-2 Not Excavated	GM-35B-2 12/7/2015 N GM-35B-2(8-10)-S/120715 8-10 Not Excavated	GM-35B-3 12/10/2015 N GM-35B-3(0-2)-S/121015 0-2 Not Excavated	GM-35B-3 12/29/2015 N GM-35B-3(8-10)-S/122915 8-10 Not Excavated	GM-35B-4 11/12/2015 N GM-35B4(0-2)-S/11122015 0-3 Not Excavated	GM-36 4/3/2001 N GM-36(0)-20010403 0-2 Not Excavated	GM-36 4/3/2001 N GM-36(6)-20010403 6-8 Not Excavated	GM-37 4/9/2001 N GM-37(0)-20010409 0-2 Not Excavated
Dibromochloromethane	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
Dibromomethane	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--	--	--	--	--	--	--
Ethylbenzene	< 0.0053 U	< 0.0051 U	< 0.0049 U	< 0.0045 U	< 0.23 U	< 0.0047 U	< 0.0052 U	< 0.0058 U	0.0074 J
Hexachlorobutadiene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
Hexane	--	--	--	--	--	--	--	--	--
Isopropyl benzene	--	--	--	--	--	--	--	--	--
Methyl acetate	--	--	--	--	--	--	--	--	--
Methyl cyclohexane	--	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--	--	--	--	--	--	--
Methylene chloride	--	--	--	--	--	--	< 0.0104 U	< 0.0116 U	< 0.0116 UJ
Naphthalene	--	--	--	--	--	--	< 0.344 U	1.09	< 0.382 U
N-Butylbenzene	--	--	--	--	--	--	--	--	--
N-Propylbenzene	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
tert-Butylbenzene	--	--	--	--	--	--	--	--	--
Tetrachloroethene	< 0.0053 U	0.0025 J	< 0.0049 U	< 0.0045 U	0.12 J	0.0019 J	< 0.0052 U	0.0677	0.0064 J
Toluene	< 0.0053 U	0.00029 J	< 0.0049 U	< 0.0045 U	< 0.23 U	< 0.0047 U	< 0.0052 U	< 0.0058 U	0.0074 J
Total VOCS	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	**0.00095 J**	< 0.0051 U	< 0.0049 U	< 0.0045 U	< 0.23 U	**0.00044 J**	< 0.0052 U	< 0.0058 U	< 0.0058 U
trans-1,3-Dichloropropene	--	--	--	--	--	--	< 0.0052 U	< 0.0058 U	< 0.0058 UJ
Trichloroethene	0.0094	0.0045 J	< 0.0049 U	0.0034 J	1.1	0.038	< 0.0052 U	0.0209	< 0.0058 UJ
Trichlorofluoromethane (CFC-11)	--	--	--	--	--	--	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--
Vinyl chloride	< 0.0053 U	< 0.0051 U	**0.00055 J**	< 0.0045 U	< 0.23 U	< 0.0047 U	< 0.0021 U	< 0.0023 U	< 0.0023 U
Xylene (total)	< 0.011 U	< 0.01 U	< 0.0099 U	< 0.0090 U	< 0.47 U	< 0.0093 U	< 0.0052 U	< 0.0058 U	0.0341 J
Aluminum	--	--	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	< 14 U	**27.7**	**35**
Arsenic	--	--	--	--	--	--	**2.38**	**3.73**	**10.8**
Barium	--	--	--	--	--	--	**4.8**	**596**	**613**
Beryllium	--	--	--	--	--	--	< 0.7 U	< 33 U	< 0.9 U
Cadmium	--	--	--	--	--	--	< 4.1 U	< 2.1 U	**14**
Calcium	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	< 5.5 U	**45.4**	**1160**
Cobalt	--	--	--	--	--	--	< 2.7 U	**86.9**	**28.4**
Copper	--	--	--	--	--	--	< 2.7 U	**210**	**3200**
Cyanide (total)	--	--	--	--	--	--	--	--	--
Iron	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	**2.08**	**150**	**929**
Magnesium	--	--	--	--	--	--	--	--	--
Manganese	--	--	--	--	--	--	**116**	**187**	**920**
Mercury	--	--	--	--	--	--	< 0.01 U	**0.301**	**0.433 J**
Nickel	--	--	--	--	--	--	< 1.4 U	**119**	**1020**
Potassium	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	< 0.344 U	< 0.044 U	**0.423**
Silver	--	--	--	--	--	--	< 5.5 U	**82.6**	**24.4**
Sodium	--	--	--	--	--	--	--	--	--

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	GM-35B-1 12/10/2015 N GM-35B-1(8-10)-S/121015 8-10 Not Excavated	GM-35B-2 11/12/2015 N GM-35B2(0-2)-S/11122015 0-2 Not Excavated	GM-35B-2 12/7/2015 N GM-35B-2(8-10)-S/120715 8-10 Not Excavated	GM-35B-3 12/10/2015 N GM-35B-3(0-2)-S/121015 0-2 Not Excavated	GM-35B-3 12/29/2015 N GM-35B-3(8-10)-S/122915 8-10 Not Excavated	GM-35B-4 11/12/2015 N GM-35B4(0-2)-S/11122015 0-3 Not Excavated	GM-36 4/3/2001 N GM-36(0)-20010403 0-2 Not Excavated	GM-36 4/3/2001 N GM-36(6)-20010403 6-8 Not Excavated	GM-37 4/9/2001 N GM-37(0)-20010409 0-2 Not Excavated
Thallium	--	--	--	--	--	--	< 0.344 U	< 0.358 U	< 0.378 U
Vanadium	--	--	--	--	--	--	< 6.9 U	**10**	**18.9**
Zinc	--	--	--	--	--	--	< 6.9 U	**7760**	**950**
Aroclor-1016 (PCB-1016)	--	--	--	--	--	--	< 0.52 U	< 0.56 U	< 0.58 U
Aroclor-1221 (PCB-1221)	--	--	--	--	--	--	< 0.52 U	< 0.56 U	< 0.58 U
Aroclor-1232 (PCB-1232)	--	--	--	--	--	--	< 0.52 U	< 0.56 U	< 0.58 U
Aroclor-1242 (PCB-1242)	--	--	--	--	--	--	< 0.52 U	< 0.56 U	< 0.58 U
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	< 0.52 U	< 0.56 U	< 0.58 U
Aroclor-1254 (PCB-1254)	--	--	--	--	--	--	< 0.52 U	< 0.56 U	< 0.58 U
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	< 0.52 U	< 0.56 U	< 0.58 U
Aroclor-1262 (PCB-1262)	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--	--	--	--	--	--	--
Total PCBs	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
2,4,5-Trichlorophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 UJ
2,4,6-Trichlorophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 UJ
2,4-Dichlorophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
2,4-Dimethylphenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
2,4-Dinitrophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 UJ
2,4-Dinitrotoluene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
2,6-Dinitrotoluene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
2-Chloronaphthalene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
2-Chlorophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
2-Methylnaphthalene	--	--	--	--	--	--	< 0.344 U	**0.404**	< 0.382 U
2-Methylphenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
2-Nitroaniline	--	--	--	--	--	--	< 0.516 U	< 0.551 U	< 0.574 UJ
2-Nitrophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
3&4-Methylphenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
3,3'-Dichlorobenzidine	--	--	--	--	--	--	< 0.688 U	< 0.734 UJ	< 7.65 UJ
3-Nitroaniline	--	--	--	--	--	--	< 0.516 U	< 0.551 U	< 0.574 UJ
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 UJ
4-Bromophenyl phenyl ether	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
4-Chloro-3-methylphenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
4-Chloroaniline	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
4-Methylphenol	--	--	--	--	--	--	--	--	--
4-Nitroaniline	--	--	--	--	--	--	< 0.516 U	< 0.551 U	< 0.574 UJ
4-Nitrophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 UJ
Acenaphthene	--	--	--	--	--	--	< 0.344 U	**0.434**	< 0.382 UJ
Acenaphthylene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
Acetophenone	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	< 0.344 U	**0.834**	< 0.382 UJ
Atrazine	--	--	--	--	--	--	--	--	--
Benzaldehyde	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	< 0.344 U	**2.38 J**	**0.465 J**
Benzo(a)pyrene	--	--	--	--	--	--	< 0.172 U	**3.84 J**	**0.525 J**
Benzo(b)fluoranthene	--	--	--	--	--	--	< 0.344 U	**5.09 J**	**1.04 J**

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Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	GM-35B-1 12/10/2015 N GM-35B-1(8-10)-S/121015 8-10 Not Excavated	GM-35B-2 11/12/2015 N GM-35B2(0-2)-S/11122015 0-2 Not Excavated	GM-35B-2 12/7/2015 N GM-35B-2(8-10)-S/120715 8-10 Not Excavated	GM-35B-3 12/10/2015 N GM-35B-3(0-2)-S/121015 0-2 Not Excavated	GM-35B-3 12/29/2015 N GM-35B-3(8-10)-S/122915 8-10 Not Excavated	GM-35B-4 11/12/2015 N GM-35B4(0-2)-S/11122015 0-3 Not Excavated	GM-36 4/3/2001 N GM-36(0)-20010403 0-2 Not Excavated	GM-36 4/3/2001 N GM-36(6)-20010403 6-8 Not Excavated	GM-37 4/9/2001 N GM-37(0)-20010409 0-2 Not Excavated
Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	< 0.344 U	**1.36 J**	< 3.82 UJ
Benzo(k)fluoranthene	--	--	--	--	--	--	< 0.344 U	**1.06 J**	< 3.82 UJ
Biphenyl (1,1-Biphenyl)	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
bis(2-Chloroethyl)ether	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
bis(2-Ethylhexyl)phthalate (DEHP)	--	--	--	--	--	--	< 0.344 U	< 0.367 UJ	< 3.82 UJ
Butyl benzylphthalate (BBP)	--	--	--	--	--	--	< 0.344 U	< 0.367 UJ	< 3.82 UJ
Caprolactam	--	--	--	--	--	--	--	--	--
Carbazole	--	--	--	--	--	--	< 0.344 U	**0.527**	< 0.382 UJ
Chrysene	--	--	--	--	--	--	< 0.344 U	< 0.367 UJ	**0.76 J**
Dibenz(a,h)anthracene	--	--	--	--	--	--	< 0.172 U	**0.341 J**	< 1.85 UJ
Dibenzofuran	--	--	--	--	--	--	< 0.344 U	**0.437**	< 0.382 UJ
Diethyl phthalate	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
Dimethyl phthalate	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
Di-n-butylphthalate (DBP)	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
Di-n-octyl phthalate (DnOP)	--	--	--	--	--	--	< 0.344 U	< 0.367 UJ	< 3.82 UJ
Fluoranthene	--	--	--	--	--	--	< 0.344 U	**5.84 J**	**0.454 J**
Fluorene	--	--	--	--	--	--	< 0.344 U	**0.389**	< 0.382 UJ
Hexachlorobenzene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
Hexachlorocyclopentadiene	--	--	--	--	--	--	< 0.688 U	< 0.734 U	< 0.765 UJ
Hexachloroethane	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	< 0.344 U	**1.2 J**	< 3.82 UJ
Isophorone	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
Nitrobenzene	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
N-Nitrosodiethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 U
N-Nitrosodiphenylamine	--	--	--	--	--	--	< 0.344 U	< 0.367 U	< 0.382 UJ
Pentachlorophenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 UJ
Phenanthrene	--	--	--	--	--	--	< 0.344 U	**4.36 J**	< 0.382 UJ
Phenol	--	--	--	--	--	--	< 0.344 UJ	< 0.367 U	< 0.382 U
Pyrene	--	--	--	--	--	--	< 0.344 U	**6.21 J**	**3.3 >J**
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--	--	--	--
alpha-BHC	--	--	--	--	--	--	--	--	--
alpha-Chlordane	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	GM-35B-1 12/10/2015 N GM-35B-1(8-10)-S/121015 8-10 Not Excavated	GM-35B-2 11/12/2015 N GM-35B2(0-2)-S/11122015 0-2 Not Excavated	GM-35B-2 12/7/2015 N GM-35B-2(8-10)-S/120715 8-10 Not Excavated	GM-35B-3 12/10/2015 N GM-35B-3(0-2)-S/121015 0-2 Not Excavated	GM-35B-3 12/29/2015 N GM-35B-3(8-10)-S/122915 8-10 Not Excavated	GM-35B-4 11/12/2015 N GM-35B4(0-2)-S/11122015 0-3 Not Excavated	GM-36 4/3/2001 N GM-36(0)-20010403 0-2 Not Excavated	GM-36 4/3/2001 N GM-36(6)-20010403 6-8 Not Excavated	GM-37 4/9/2001 N GM-37(0)-20010409 0-2 Not Excavated
gamma-BHC (lindane)	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	--	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
Fraction organic carbon (FOC)	--	--	--	--	--	--	--	--	--
Percent Dry	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	--	--	--	--	--	--	--	--	--
Total solids	--	--	--	--	--	--	--	--	--
2,2'-Oxybis(2-chloropropane)	--	--	--	--	--	--	--	--	--

Table 1
Soil Analytical Data for Waste Pile Staging Area
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

	GM-37 4/9/2001 N GM-37(4)-20010409 4-6 Not Excavated	GM-38 4/10/2001 N GM-38(0)-20010410 0-2 Not Excavated	GM-38 4/10/2001 N GM-38(8)-20010410 8-10 Not Excavated
Chemical			
1,1,1,2-Tetrachloroethane	--	--	--
1,1,1-Trichloroethane	< 0.0062 U	< 0.0052 U	< 0.0058 U
1,1,2,2-Tetrachloroethane	< 0.0062 U	< 0.0052 UJ	< 0.0058 U
1,1,2-Trichloroethane	< 0.0062 U	< 0.0052 U	< 0.0058 U
1,1-Dichloroethane	< 0.0062 U	< 0.0052 U	< 0.0058 U
1,1-Dichloroethene	< 0.0062 U	< 0.0052 U	< 0.0058 U
1,1-Dichloropropene	--	--	--
1,2,3-Trichloropropane	--	--	--
1,2,4-Trichlorobenzene	< 0.406 U	< 0.68 U	< 0.383 U
1,2,4-Trimethylbenzene	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	--	--	--
1,2-Dichlorobenzene	< 0.406 U	< 0.68 U	< 0.383 U
1,2-Dichloroethane	< 0.0062 U	< 0.0052 U	< 0.0058 U
1,2-Dichloroethene (total)	--	--	--
1,2-Dichloropropane	< 0.0062 U	< 0.0052 U	< 0.0058 U
1,3,5-Trimethylbenzene	--	--	--
1,3-Dichlorobenzene	< 0.406 U	< 0.68 U	< 0.383 U
1,3-Dichloropropane	--	--	--
1,4-Dichlorobenzene	< 0.406 U	< 0.68 U	< 0.383 U
1,4-Dioxane	--	--	--
2,2-Dichloropropane	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	-- R	-- R	< 0.116 UJ
2-Chlorotoluene	--	--	--
2-Hexanone	< 0.0616 U	< 0.0515 UJ	< 0.0581 U
2-Phenylbutane (sec-Butylbenzene)	--	--	--
4-Chlorotoluene	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	< 0.0616 U	< 0.0515 U	< 0.0581 U
Acetone	< 0.123 UJ	< 0.103 UJ	< 0.116 UJ
Benzene	< 0.0062 U	< 0.0052 U	< 0.0058 U
Bromobenzene	--	--	--
Bromodichloromethane	< 0.0062 U	< 0.0052 U	< 0.0058 U
Bromoform	< 0.0062 U	< 0.0052 U	< 0.0058 U
Bromomethane (Methyl bromide)	< 0.0123 U	< 0.0103 U	< 0.0116 U
Carbon disulfide	< 0.0062 U	< 0.0052 U	< 0.0058 U
Carbon tetrachloride	< 0.0062 U	< 0.0052 U	< 0.0058 U
Chlorobenzene	< 0.0062 U	< 0.0052 UJ	< 0.0058 U
Chlorobromomethane	--	--	--
Chloroethane	< 0.0123 U	< 0.0103 U	< 0.0116 U
Chloroform (Trichloromethane)	< 0.0062 U	< 0.0052 U	< 0.0058 U
Chloromethane (Methyl chloride)	< 0.0123 U	< 0.0103 U	< 0.0116 U
cis-1,2-Dichloroethene	< 0.0062 U	< 0.0052 U	< 0.0058 U
cis-1,3-Dichloropropene	< 0.0062 U	< 0.0052 U	< 0.0058 U
Cyclohexane	--	--	--
Cymene (p-Isopropyltoluene)	--	--	--

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Dibromochloromethane	< 0.0062 U	< 0.0052 U	< 0.0058 U
Dibromomethane	--	--	--
Dichlorodifluoromethane (CFC-12)	--	--	--
Ethylbenzene	< 0.0062 U	< 0.0052 UJ	< 0.0058 U
Hexachlorobutadiene	< 0.406 U	< 0.68 U	< 0.383 U
Hexane	--	--	--
Isopropyl benzene	--	--	--
Methyl acetate	--	--	--
Methyl cyclohexane	--	--	--
Methyl tert butyl ether (MTBE)	--	--	--
Methylene chloride	< 0.0123 UJ	< 0.0103 UJ	< 0.0116 U
Naphthalene	< 0.406 U	< 0.68 U	< 0.383 U
N-Butylbenzene	--	--	--
N-Propylbenzene	--	--	--
Styrene	< 0.0062 U	< 0.0052 UJ	< 0.0058 U
tert-Butylbenzene	--	--	--
Tetrachloroethene	< 0.0062 U	< 0.0052 UJ	< 0.0058 U
Toluene	< 0.0062 U	< 0.0052 U	< 0.0058 U
Total VOCS	--	--	--
trans-1,2-Dichloroethene	< 0.0062 U	< 0.0052 U	< 0.0058 U
trans-1,3-Dichloropropene	< 0.0062 U	< 0.0052 U	< 0.0058 U
Trichloroethene	< 0.0062 U	< 0.0052 U	< 0.0058 U
Trichlorofluoromethane (CFC-11)	--	--	--
Trifluorotrichloroethane (Freon 113)	--	--	--
Vinyl acetate	--	--	--
Vinyl chloride	< 0.0025 U	< 0.0021 U	< 0.0023 U
Xylene (total)	< 0.0062 U	< 0.0052 UJ	< 0.0058 U
Aluminum	--	--	--
Antimony	**62**	< 6.8 U	**33**
Arsenic	**13.1**	**3.49 J**	**11 J**
Barium	**1070**	**36.8 J**	**520 J**
Beryllium	< 2 U	< 0.3 U	< 0.8 U
Cadmium	< 12 U	< 2.1 U	**9.3**
Calcium	--	--	--
Chromium	**2000**	**13.4 J**	**557 J**
Cobalt	**53.3**	**3**	**38.4**
Copper	**2040**	**39.7 J**	**5260 J**
Cyanide (total)	--	--	--
Iron	--	--	--
Lead	**1490**	**40.9**	**538**
Magnesium	--	--	--
Manganese	**1600**	**290**	**1240**
Mercury	**0.034 J**	**0.027 J**	**0.034 J**
Nickel	**3350**	**14.8 J**	**1630 J**
Potassium	--	--	--
Selenium	**0.608**	< 0.66 UJ	**0.374 J**
Silver	< 16 U	< 2.7 U	**8.9**
Sodium	--	--	--

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Thallium	< 0.398 U	< 0.33 U	< 0.377 U
Vanadium	< 20 U	**6.1**	**15**
Zinc	**20600**	**54.5 J**	**1460 J**
Aroclor-1016 (PCB-1016)	< 0.62 U	< 0.52 U	< 0.58 U
Aroclor-1221 (PCB-1221)	< 0.62 U	< 0.52 U	< 0.58 U
Aroclor-1232 (PCB-1232)	< 0.62 U	< 0.52 U	< 0.58 U
Aroclor-1242 (PCB-1242)	< 0.62 U	< 0.52 U	< 0.58 U
Aroclor-1248 (PCB-1248)	< 0.62 U	< 0.52 U	< 0.58 U
Aroclor-1254 (PCB-1254)	< 0.62 U	< 0.52 U	< 0.58 U
Aroclor-1260 (PCB-1260)	< 0.62 U	< 0.52 U	< 0.58 U
Aroclor-1262 (PCB-1262)	--	--	--
Aroclor-1268 (PCB-1268)	--	--	--
Total PCBs	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	< 0.406 U	< 0.68 U	< 0.383 U
2,4,5-Trichlorophenol	< 0.406 U	< 0.68 U	< 0.383 U
2,4,6-Trichlorophenol	< 0.406 U	< 0.68 U	< 0.383 U
2,4-Dichlorophenol	< 0.406 U	< 0.68 U	< 0.383 U
2,4-Dimethylphenol	< 0.406 U	< 0.68 U	< 0.383 U
2,4-Dinitrophenol	< 0.406 U	< 0.68 U	< 0.383 U
2,4-Dinitrotoluene	< 0.406 U	< 0.68 U	< 0.383 U
2,6-Dinitrotoluene	< 0.406 U	< 0.68 U	< 0.383 U
2-Chloronaphthalene	< 0.406 U	< 0.68 U	< 0.383 U
2-Chlorophenol	< 0.406 U	< 0.68 U	< 0.383 U
2-Methylnaphthalene	< 0.406 U	< 0.68 U	< 0.383 U
2-Methylphenol	< 0.406 U	< 0.68 U	< 0.383 U
2-Nitroaniline	< 0.61 U	< 1.02 U	< 0.575 U
2-Nitrophenol	< 0.406 U	< 0.68 U	< 0.383 U
3&4-Methylphenol	< 0.406 U	< 0.68 U	< 0.383 U
3,3'-Dichlorobenzidine	< 0.813 U	< 13.4 UJ	< 0.767 UJ
3-Nitroaniline	< 0.61 U	< 1.02 U	< 0.575 U
4,6-Dinitro-2-methylphenol	< 0.406 U	< 0.68 UJ	< 0.383 UJ
4-Bromophenyl phenyl ether	< 0.406 U	< 0.68 UJ	< 0.383 UJ
4-Chloro-3-methylphenol	< 0.406 U	< 0.68 U	< 0.383 U
4-Chloroaniline	< 0.406 U	< 0.68 U	< 0.383 U
4-Chlorophenyl phenyl ether	< 0.406 U	< 0.68 U	< 0.383 U
4-Methylphenol	--	--	--
4-Nitroaniline	< 0.61 U	< 1.02 U	< 0.575 U
4-Nitrophenol	< 0.406 U	< 0.68 U	< 0.383 U
Acenaphthene	< 0.406 U	< 0.68 U	< 0.383 U
Acenaphthylene	< 0.406 U	< 0.68 U	< 0.383 U
Acetophenone	--	--	--
Anthracene	< 0.406 U	< 0.68 UJ	< 0.383 UJ
Atrazine	--	--	--
Benzaldehyde	--	--	--
Benzo(a)anthracene	< 0.406 U	< 6.8 UJ	< 0.383 UJ
Benzo(a)pyrene	< 0.203 U	< 3.4 UJ	< 0.192 UJ
Benzo(b)fluoranthene	< 0.406 U	< 6.8 UJ	< 0.383 UJ

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Benzo(b)fluoranthene/benzo(k)fluoranthene	--	--	--
Benzo(g,h,i)perylene	< 0.406 U	< 6.8 UJ	< 0.383 UJ
Benzo(k)fluoranthene	< 0.406 U	< 6.8 UJ	< 0.383 UJ
Biphenyl (1,1-Biphenyl)	--	--	--
bis(2-Chloroethoxy)methane	< 0.406 U	< 0.68 U	< 0.383 U
bis(2-Chloroethyl)ether	< 0.406 U	< 0.68 U	< 0.383 U
bis(2-Ethylhexyl)phthalate (DEHP)	< 0.406 U	**1.68 J**	< 0.383 UJ
Butyl benzylphthalate (BBP)	< 0.406 U	< 6.8 UJ	< 0.383 UJ
Caprolactam	--	--	--
Carbazole	< 0.406 U	< 0.68 UJ	< 0.383 UJ
Chrysene	< 0.406 U	< 6.8 UJ	< 0.383 UJ
Dibenz(a,h)anthracene	< 0.203 U	< 3.4 UJ	< 0.192 UJ
Dibenzofuran	< 0.406 U	< 0.68 U	< 0.383 U
Diethyl phthalate	< 0.406 U	< 0.68 U	< 0.383 U
Dimethyl phthalate	< 0.406 U	< 0.68 U	< 0.383 U
Di-n-butylphthalate (DBP)	< 0.406 U	< 0.68 UJ	< 0.383 UJ
Di-n-octyl phthalate (DnOP)	< 0.406 U	**0.748 J**	< 0.383 UJ
Fluoranthene	< 0.406 U	< 0.68 UJ	< 0.383 UJ
Fluorene	< 0.406 U	< 0.68 U	< 0.383 U
Hexachlorobenzene	< 0.406 U	< 0.68 UJ	< 0.383 UJ
Hexachlorocyclopentadiene	< 0.813 U	< 1.34 U	< 0.767 U
Hexachloroethane	< 0.406 U	< 0.68 U	< 0.383 U
Indeno(1,2,3-cd)pyrene	< 0.406 U	< 6.8 UJ	< 0.383 UJ
Isophorone	< 0.406 U	< 0.68 U	< 0.383 U
Nitrobenzene	< 0.406 U	< 0.68 U	< 0.383 U
N-Nitrosodiethylamine	--	--	--
N-Nitrosodimethylamine	--	--	--
N-Nitrosodi-n-propylamine	< 0.406 U	< 0.68 U	< 0.383 U
N-Nitrosodiphenylamine	< 0.406 U	< 0.68 U	< 0.383 U
Pentachlorophenol	< 0.406 U	< 0.68 UJ	< 0.383 UJ
Phenanthrene	< 0.406 U	< 0.68 UJ	< 0.383 UJ
Phenol	< 0.406 U	< 0.68 U	< 0.383 U
Pyrene	< 0.406 U	**2.12 J**	< 0.383 UJ
4,4'-DDD	--	--	--
4,4'-DDE	--	--	--
4,4'-DDT	--	--	--
Aldrin	--	--	--
alpha-BHC	--	--	--
alpha-Chlordane	--	--	--
beta-BHC	--	--	--
delta-BHC	--	--	--
Dieldrin	--	--	--
Endosulfan I	--	--	--
Endosulfan II	--	--	--
Endosulfan sulfate	--	--	--
Endrin	--	--	--
Endrin aldehyde	--	--	--
Endrin ketone	--	--	--

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	GM-37 4/9/2001 N GM-37(4)-20010409 4-6 Not Excavated	GM-38 4/10/2001 N GM-38(0)-20010410 0-2 Not Excavated	GM-38 4/10/2001 N GM-38(8)-20010410 8-10 Not Excavated
gamma-BHC (lindane)	--	--	--
gamma-Chlordane	--	--	--
Heptachlor	--	--	--
Heptachlor epoxide	--	--	--
Methoxychlor	--	--	--
Toxaphene	--	--	--
Fraction organic carbon (FOC)	--	--	--
Percent Dry	--	--	--
Total organic carbon (TOC)	--	--	--
Total solids	--	--	--
2,2'-Oxybis(2-chloropropane)	--	--	--

Table 2

Selection of Constituents of Potential Concern

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future

Medium: Soil (0-10 ft bgs)

Investigation Area: Waste Pile Staging Area

Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening [1]	RSL [2]	COPC Flag (Y/N)	Rationale for COPC Flag [3]
VOCs											
1,1,1-Trichloroethane	mg/kg	18/94	0.00049	2.1	0.0029	0.0843	0.309	2.1	3600	N	BRSL
1,1,2,2-Tetrachloroethane	mg/kg	1/62	0.0173	0.0173	0.0029	0.0269	0.0521	0.0173	2.7	N	BRSL
1,1-Dichloroethane	mg/kg	28/92	0.0025	6.33	0.00315	0.343	1.09	6.33	16	N	BRSL
1,1-Dichloroethene	mg/kg	7/89	0.00052	0.051	0.00285	0.0266	0.0512	0.051	100	N	BRSL
1,2-Dichlorobenzene	mg/kg	1/64	0.0032	0.0032	0.174	0.797	2.96	0.0032	930	N	BRSL
1,2-Dichloroethene (total)	mg/kg	2/8	1.06	1.09	0.0153	0.297	0.483	1.09	NA	NA	NRSL
1,4-Dichlorobenzene	mg/kg	3/64	0.00069	0.0026	0.174	0.797	2.96	0.0026	11	N	BRSL
2-Butanone	mg/kg	7/44	0.0025	2.47	0.0543	0.238	0.461	2.47	19000	N	BRSL
2-Hexanone	mg/kg	1/62	0.0031	0.0031	0.0281	0.14	0.269	0.0031	130	N	BRSL
Acetone	mg/kg	15/67	0.059	12	0.059	0.824	2.22	12	67000	N	BRSL
Benzene	mg/kg	25/91	0.00049	0.35	0.00285	0.0265	0.0577	0.35	5.1	N	BRSL
Carbon disulfide	mg/kg	2/63	0.001	0.0277	0.0029	0.0266	0.0518	0.0277	350	N	BRSL
Carbon tetrachloride	mg/kg	1/62	0.0221	0.0221	0.0029	0.027	0.0521	0.0221	2.9	N	BRSL
Chloroethane	mg/kg	9/62	0.0026	4.29	0.00563	0.175	0.616	4.29	5700	N	BRSL
cis-1,2-Dichloroethene	mg/kg	38/83	0.0003	18	0.0029	0.388	2.11	18	230	N	BRSL
Cyclohexane	mg/kg	8/29	0.0011	0.99	0.0055	0.0752	0.192	0.99	2700	N	BRSL
Dichlorodifluoromethane (CFC-12	mg/kg	1/29	0.047	0.047	0.00275	0.0422	0.0645	0.047	37	N	BRSL
Ethylbenzene	mg/kg	27/94	0.00033	2.04	0.00288	0.0985	0.321	2.04	25	N	BRSL
Isopropyl benzene	mg/kg	4/29	0.0012	0.64	0.00285	0.075	0.151	0.64	990	N	BRSL
Methyl acetate	mg/kg	9/29	0.0074	0.26	0.0075	0.065	0.109	0.26	120000	N	BRSL
Methyl cyclohexane	mg/kg	14/29	0.00051	2.7	0.005	0.151	0.506	2.7	NA	NA	NRSL
Methylene chloride	mg/kg	5/62	0.0016	0.1	0.00563	0.0603	0.2	0.1	320	N	BRSL
Tetrachloroethene	mg/kg	49/96	0.00038	12.2	0.00375	0.347	1.56	12.2	39	N	BRSL
Toluene	mg/kg	54/96	0.00029	16	0.0029	0.53	2.38	16	4700	N	BRSL
trans-1,2-Dichloroethene	mg/kg	14/83	0.00044	0.12	0.00265	0.0218	0.0402	0.12	2300	N	BRSL
Trichloroethene	mg/kg	50/91	0.0004	17.6	0.0033	0.36	1.91	17.6	1.9	Y	ARSL
Vinyl chloride	mg/kg	13/89	0.00041	1.45	0.00255	0.0836	0.243	1.45	1.7	N	BRSL
Xylene (total)	mg/kg	32/94	0.00086	19	0.005	0.587	2.84	19	250	N	BRSL
Metals											
Aluminum	mg/kg	6/6	2300	18900	8010	8810	6350	18900	110000	N	BRSL
Antimony	mg/kg	23/36	6.5	908	21.9	84.7	182	908	47	Y	ARSL
Arsenic	mg/kg	40/40	2.05	223	7	16.1	39.6	223	3	Y	ARSL
Barium	mg/kg	36/36	4.3	2620	93.2	309	512	2620	22000	N	BRSL
Beryllium	mg/kg	13/33	0.25	1.33	0.45	1.57	4.25	1.33	230	N	BRSL
Cadmium	mg/kg	20/40	0.24	4150	3.23	206	855	4150	98	Y	ARSL
Calcium	mg/kg	6/6	2660	172000	55600	67200	65600	172000	NA	NA	NRSL

Table 2

Selection of Constituents of Potential Concern

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future

Medium: Soil (0-10 ft bgs)

Investigation Area: Waste Pile Staging Area

Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening [1]	RSL [2]	COPC Flag (Y/N)	Rationale for COPC Flag [3]
Chromium	mg/kg	34/37	4.9	4340	18.6	380	953	4340	180000	N	BRSL
Cobalt	mg/kg	31/33	2.2	248	9.9	24	44.5	248	35	Y	ARSL
Copper	mg/kg	33/35	5.4	5720	47	768	1570	5720	4700	Y	ARSL
Iron	mg/kg	8/8	5470	51700	16700	18900	14900	51700	82000	N	BRSL
Lead	mg/kg	38/38	2.08	3810	46.2	365	757	3810	800	Y	ARSL
Magnesium	mg/kg	6/6	1790	53800	25000	23800	19800	53800	NA	NA	NRSL
Manganese	mg/kg	33/33	116	2990	363	574	582	2990	2600	Y	ARSL
Mercury	mg/kg	26/33	0.011	2.58	0.055	0.184	0.456	2.58	4.6	N	BRSL
Nickel	mg/kg	31/33	6.5	3350	26	326	733	3350	2200	Y	ARSL
Potassium	mg/kg	6/6	505	1920	981	1060	503	1920	NA	NA	NRSL
Selenium	mg/kg	6/33	0.253	0.608	0.215	0.217	0.127	0.608	580	N	BRSL
Silver	mg/kg	7/35	0.032	87.2	1.53	8.95	20.2	87.2	580	N	BRSL
Sodium	mg/kg	6/6	148	1590	654	785	696	1590	NA	NA	NRSL
Thallium	mg/kg	3/33	0.431	2.08	0.189	0.267	0.333	2.08	1.2	Y	ARSL
Vanadium	mg/kg	26/33	6.1	175	11.7	18.3	29.4	175	580	N	BRSL
Zinc	mg/kg	36/38	19.5	20600	110	1220	3550	20600	35000	N	BRSL
PCBs											
Aroclor-1242 (PCB-1242)	mg/kg	2/37	2.5	2.5	0.29	0.816	1.21	2.5	0.95	Y	ARSL
Aroclor-1248 (PCB-1248)	mg/kg	2/36	15	15	0.288	1.33	3.48	15	0.94	Y	ARSL
Aroclor-1254 (PCB-1254)	mg/kg	5/40	0.12	80	0.288	2.74	12.6	80	0.97	Y	ARSL
Aroclor-1260 (PCB-1260)	mg/kg	5/37	0.6	22	0.29	1.75	4.99	22	0.99	Y	ARSL
SVOCs											
2-Methylnaphthalene	mg/kg	7/45	0.02	83	0.195	3.01	12.7	83	300	N	BRSL
3&4-Methylphenol	mg/kg	2/29	0.435	0.439	0.191	0.336	0.606	0.439	NA	NA	NRSL
Acenaphthene	mg/kg	5/45	0.031	300	0.194	7.85	44.7	300	4500	N	BRSL
Anthracene	mg/kg	8/45	0.093	600	0.195	14.6	89.3	600	23000	N	BRSL
Benzo(a)anthracene	mg/kg	11/45	0.05	520	0.202	13.2	77.4	520	21	Y	ARSL
Benzo(a)pyrene	mg/kg	16/46	0.054	380	0.238	11.7	56.4	380	2.1	Y	ARSL
Benzo(b)fluoranthene	mg/kg	14/45	0.058	580	0.217	17.3	87	580	21	Y	ARSL
Benzo(b)fluoranthene/ benzo(k)fluoranthene	mg/kg	2/2	6.92	90	48.5	48.5	58.7	90	NA	NA	NRSL
Benzo(g,h,i)perylene	mg/kg	11/45	0.053	150	0.212	5.25	22.5	150	NA	NA	NRSL
Benzo(k)fluoranthene	mg/kg	10/45	0.048	260	0.206	8.08	38.9	260	210	Y	ARSL
Biphenyl (1,1-Biphenyl)	mg/kg	2/10	0.11	26	0.18	2.76	8.17	26	20	Y	ARSL
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	9/48	0.05	1.9	0.195	2.77	11.2	1.9	160	N	BRSL
Butyl benzylphthalate (BBP)	mg/kg	2/46	28	28	0.194	3.89	12.5	28	1200	N	BRSL
Carbazole	mg/kg	6/45	0.042	270	0.195	7.2	40.2	270	NA	NA	NRSL

Table 2

Selection of Constituents of Potential Concern

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future

Medium: Soil (0-10 ft bgs)

Investigation Area: Waste Pile Staging Area

Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening [1]	RSL [2]	COPC Flag (Y/N)	Rationale for COPC Flag [3]
Chrysene	mg/kg	14/46	0.056	650	0.203	17.2	95.8	650	2100	N	BRSL
Dibenz(a,h)anthracene	mg/kg	7/45	0.043	56	0.178	2.78	9.14	56	2.1	Y	ARSL
Dibenzofuran	mg/kg	5/45	0.024	270	0.194	7.18	40.2	270	100	Y	ARSL
Di-n-butylphthalate (DBP)	mg/kg	1/45	0.098	0.098	0.192	2.81	11.5	0.098	8200	N	BRSL
Di-n-octyl phthalate (DnOP)	mg/kg	1/45	0.748	0.748	0.195	3.7	12.4	0.748	820	N	BRSL
Fluoranthene	mg/kg	16/47	0.069	1800	0.205	43.6	262	1800	3000	N	BRSL
Fluorene	mg/kg	5/45	0.029	500	0.194	12.3	74.4	500	3000	N	BRSL
Indeno(1,2,3-cd)pyrene	mg/kg	10/45	0.045	130	0.212	5.09	20	130	21	Y	ARSL
Naphthalene	mg/kg	6/45	0.398	100	0.195	3.43	15.1	100	17	Y	ARSL
Phenanthrene	mg/kg	20/48	0.053	3000	0.205	67.8	433	3000	NA	NA	NRSL
Pyrene	mg/kg	20/47	0.042	1100	0.203	29.80	161	1100	2300	N	BRSL

Notes:
NA = not applicable or not available
Table contains detected constituents only.
[1] Maximum concentration was used as the screening concentration.
[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table based on a THQ of 0.1 (November 2019).
[3] Rationale codes:
ARSL = Retained because screening concentration is above RSL.
BRSL = Excluded because screening concentration is below RSL.

Table 3

Exposure Point Concentrations - Soil

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future

Medium: Soil

Receptor: Worker

Investigation Area COPC	EPC [1] Units	Waste Pile Staging Area	EPC type [2]
VOCs			
Trichloroethene	mg/kg	1.231	U
Metals			
Antimony	mg/kg	135.1	U
Arsenic	mg/kg	43.4	U
Cadmium	mg/kg	802.3	U
Cobalt	mg/kg	35.82	U
Copper	mg/kg	1928	U
Lead	mg/kg	900.6	U
Manganese	mg/kg	748.3	U
Nickel	mg/kg	883.3	U
Thallium	mg/kg	2.08	X
PCBs			
Aroclor-1242 (PCB-1242)	mg/kg	2.5	X
Aroclor-1248 (PCB-1248)	mg/kg	15	X
Aroclor-1254 (PCB-1254)	mg/kg	14.56	U
Aroclor-1260 (PCB-1260)	mg/kg	3.23	U
SVOCs			
Benzo(a)anthracene	mg/kg	64.36	U
Benzo(a)pyrene	mg/kg	48.23	U
Benzo(b)fluoranthene	mg/kg	74	U
Benzo(k)fluoranthene	mg/kg	32.4	U
Biphenyl (1,1-Biphenyl)	mg/kg	26	X
Dibenz(a,h)anthracene	mg/kg	7.165	U
Dibenzofuran	mg/kg	46.11	U
Indeno(1,2,3-cd)pyrene	mg/kg	16.28	U
Naphthalene	mg/kg	13.06	U

Notes:
EPC = Exposure Point Concentration
mg/kg = milligrams per kilogram
NA = not applicable or not available
Table contains selected COPCs only.
UCL calculations were performed using ProUCL version 5.1.
[1] The EPC is the ProUCL recommended 95%UCL, or the maximum detected value when a UCL could not be calculated.
[2] EPC type: U = 95% UCL, X = Maximum, M = Mean

Table 4

Values Used for Daily Intake Equations - Reasonable Maximum Exposure

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	On-Site Routine Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	50	mg/day	USEPA 2014	
				EF	Exposure Frequency	250	days/year	USEPA 2014	
				ED	Exposure Duration	25	years	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989	
	On-Site Maintenance Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	100	mg/day	USEPA 2014	
				EF	Exposure Frequency	10	days/year	Professional judgment [a]	
				ED	Exposure Duration	25	years	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989	
	On-Site Construction Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	330	mg/day	USEPA 2014	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	1	years	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	365	days	USEPA 1989	

Table 4

Values Used for Daily Intake Equations - Reasonable Maximum Exposure

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	On-Site Routine Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
				CF	Conversion Factor	1.00E-06	kg/mg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AFs	Skin Adherence Factor	0.12	mg/cm^2-event	USEPA 2014	DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	250	days/year	USEPA 2014	DAevent (mg/cm^2-event) =
				ED	Exposure Duration	25	years	USEPA 2014	CS x CF x AFs x ABSd
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,527	cm^2	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989	
	On-Site Maintenance Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
				CF	Conversion Factor	1.00E-06	kg/mg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AFs	Skin Adherence Factor	0.12	mg/cm^2-event	USEPA 2014	DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	10	days/year	Professional judgment [a]	DAevent (mg/cm^2-event) =
				ED	Exposure Duration	25	years	USEPA 2014	CS x CF x AFs x ABSd
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,527	cm^2	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989	
	On-Site Construction Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
				CF	Conversion Factor	1.00E-06	kg/mg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AFs	Skin Adherence Factor	0.12	mg/cm^2-event	USEPA 2014	DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	250	days/year	USEPA 2002	DAevent (mg/cm^2-event) =
				ED	Exposure Duration	1	years	USEPA 2014	CS x CF x AFs x ABSd
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,527	cm^2	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	365	days	USEPA 1989	

Table 4

Values Used for Daily Intake Equations - Reasonable Maximum Exposure

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation (dust and volatiles)	On-Site Routine Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m^3) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	1	hr/day	Professional judgment [b]	
				EF	Exposure Frequency	250	days/year	USEPA 2014	
				ED	Exposure Duration	25	years	USEPA 2014	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA 2002	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	[c]	
				ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d	
				ATnc	Averaging Time - Noncancer	219,000	hours	365 d/yr x ED x 24 hr/d	
	On-Site Maintenance Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m^3) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	8	hr/day	Typical workday	
				EF	Exposure Frequency	10	days/year	Professional judgment [a]	
				ED	Exposure Duration	25	years	USEPA 2014	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA 2002	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	[c]	
				ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d	
				ATnc	Averaging Time - Noncancer	219,000	hours	365 d/yr x ED x 24 hr/d	
	On-Site Construction Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m^3) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	8	hr/day	Typical workday	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	1	years	USEPA 2014	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA 2002	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	[c]	
				ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d	
				ATnc	Averaging Time - Noncancer	8,760	hours	365 d/yr x ED x 24 hr/d	

Notes:

[a] Assumes 10 days per year spent doing outdoor maintenance work.

[b] Assumes a routine worker would only spend one hour per day outdoors, e.g., during lunch hour.

[c] VF calculations presented in Attachment B.

Table 5

Values Used for Daily Intake Equations - Central Tendency Exposure

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	On-Site Routine Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	50	mg/day	USEPA 2002	
				EF	Exposure Frequency	125	days/year	USEPA 2002	
				ED	Exposure Duration	9	years	USEPA 1989	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989	
	On-Site Maintenance Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	100	mg/day	USEPA 2002	
				EF	Exposure Frequency	5	days/year	Professional judgment [a]	
				ED	Exposure Duration	9	years	USEPA 1989	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989	
	On-Site Construction Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	100	mg/day	USEPA 2002	
				EF	Exposure Frequency	125	days/year	Professional judgment	
				ED	Exposure Duration	1	years	USEPA 2002	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	365	days	USEPA 1989	

Table 5

Values Used for Daily Intake Equations - Central Tendency Exposure

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	On-Site Routine Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
				CF	Conversion Factor	1.00E-06	kg/mg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AFs	Skin Adherence Factor	0.12	mg/cm^2-event	USEPA 2014	DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	250	days/year	USEPA 2002	DAevent (mg/cm^2-event) =
				ED	Exposure Duration	9	years	USEPA 1989	CS x CF x AFs x ABSd
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,527	cm^2	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989	
	On-Site Maintenance Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
				CF	Conversion Factor	1.00E-06	kg/mg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AFs	Skin Adherence Factor	0.12	mg/cm^2-event	USEPA 2014	DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	5	days/year	Professional judgment [a]	DAevent (mg/cm^2-event) =
				ED	Exposure Duration	9	years	USEPA 1989	CS x CF x AFs x ABSd
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,527	cm^2	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989	
	On-Site Construction Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
				CF	Conversion Factor	1.00E-06	kg/mg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AFs	Skin Adherence Factor	0.12	mg/cm^2-event	USEPA 2014	DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	125	days/year	Professional judgment	DAevent (mg/cm^2-event) =
				ED	Exposure Duration	1	years	USEPA 2002	CS x CF x AFs x ABSd
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,527	cm^2	USEPA 2014	
				BW	Body Weight	80	kg	USEPA 2014	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	365	days	USEPA 1989	

Table 5

Values Used for Daily Intake Equations - Central Tendency Exposure

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation (dust and volatiles)	On-Site Routine Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m^3) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	1	hr/day	Professional judgment [b]	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	9	years	USEPA 1989	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA 2002	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	[c]	
				ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d	
				ATnc	Averaging Time - Noncancer	78,840	hours	365 d/yr x ED x 24 hr/d	
	On-Site Maintenance Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m^3) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	4	hr/day	Professional judgment	
				EF	Exposure Frequency	5	days/year	Professional judgment [a]	
				ED	Exposure Duration	9	years	USEPA 1989	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA 2002	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	[c]	
				ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d	
				ATnc	Averaging Time - Noncancer	78,840	hours	365 d/yr x ED x 24 hr/d	
	On-Site Construction Worker	Adult	Waste Pile Staging Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m^3) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	4	hr/day	Professional judgment	
				EF	Exposure Frequency	125	days/year	Professional judgment	
				ED	Exposure Duration	1	years	USEPA 2002	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA 2002	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	[c]	
				ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d	
				ATnc	Averaging Time - Noncancer	8,760	hours	365 d/yr x ED x 24 hr/d	

Notes:

[a] Assumes 5 days per year spent doing outdoor maintenance work.

[b] Assumes a routine worker would only spend one hour per day outdoors, e.g., during lunch hour.

[c] VF calculations presented in Attachment B.

Table 6

Non-Cancer Toxicity Data - Oral/Dermal

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal [2]		Primary Target Organ(s) [3]	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units	[1]	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Aroclor-1242 (PCB-1242)	Chronic	NA		1	NA		--	--	--	--
Aroclor-1242 (PCB-1242)	Subchronic	NA		1	NA		--	--	--	--
Aroclor-1248 (PCB-1248)	Chronic	NA		1	NA		--	--	--	--
Aroclor-1248 (PCB-1248)	Subchronic	NA		1	NA		--	--	--	--
Aroclor-1254 (PCB-1254)	Chronic	2.0E-05	mg/kg-day	1	2.0E-05	mg/kg-day	Immune, Dermal, Ocular	300	IRIS	11/2019
Aroclor-1254 (PCB-1254)	Subchronic	3.0E-05	mg/kg-day	1	3.0E-05	mg/kg-day	Neurological	300	ATSDR	11/2019
Aroclor-1260 (PCB-1260)	Chronic	NA		1	NA		--	--	--	--
Aroclor-1260 (PCB-1260)	Subchronic	NA		1	NA		--	--	--	--
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Hematologic, Other	1000	IRIS	11/2019
Antimony	Subchronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Whole body	1000	PPRTV	11/2019
Arsenic	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Cardiovascular, Dermal	3	IRIS	11/2019
Arsenic	Subchronic	NA		1	NA		--	--	--	--
Benzo(a)anthracene	Chronic	NA		1	NA		--	--	--	--
Benzo(a)anthracene	Subchronic	NA		1	NA		--	--	--	--
Benzo(a)pyrene	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Developmental	3.0E+02	IRIS	11/2019
Benzo(a)pyrene	Subchronic	NA		1	NA		--	--	--	--
Benzo(b)fluoranthene	Chronic	NA		1	NA		--	--	--	--
Benzo(b)fluoranthene	Subchronic	NA		1	NA		--	--	--	--
Benzo(k)fluoranthene	Chronic	NA		1	NA		--	--	--	--
Benzo(k)fluoranthene	Subchronic	NA		1	NA		--	--	--	--
Biphenyl (1,1-Biphenyl)	Chronic	5.0E-01	mg/kg-day	1	5.0E-01	mg/kg-day	Urinary	30	IRIS	11/2019
Biphenyl (1,1-Biphenyl)	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	Developmental	100	PPRTV	11/2019
Cadmium	Chronic	1.0E-03	mg/kg-day	0.025	2.5E-05	mg/kg-day	Urinary	10	IRIS	11/2019
Cadmium	Subchronic	5.0E-04	mg/kg-day	0.025	1.3E-05	mg/kg-day	Musculoskeletal	100	ATSDR	11/2019
Cobalt	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Thyroid	3000	PPRTV	11/2019
Cobalt	Subchronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Thyroid	300	PPRTV	11/2019
Copper	Chronic	4.0E-02	mg/kg-day	1	4.0E-02	mg/kg-day	Gastrointestinal	--	HEAST	11/2019
Copper	Subchronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Gastrointestinal	3	ATSDR	11/2019
Dibenz(a,h)anthracene	Chronic	NA		1	NA		--	--	--	--
Dibenz(a,h)anthracene	Subchronic	NA		1	NA		--	--	--	--
Dibenzofuran	Chronic	1.0E-03	mg/kg-day	1	1.0E-03	mg/kg-day	Whole body	10000	PPRTV Screen	11/2019
Dibenzofuran	Subchronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Whole body	3000	PPRTV	11/2019
Indeno(1,2,3-cd)pyrene	Chronic	NA		1	NA		--	--	--	--
Indeno(1,2,3-cd)pyrene	Subchronic	NA		1	NA		--	--	--	--

Table 6

Non-Cancer Toxicity Data - Oral/Dermal

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal [2]		Primary Target Organ(s) [3]	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units	[1]	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Lead	Chronic	NA		1	NA		--	--	--	--
Lead	Subchronic	NA		1	NA		--	--	--	--
Manganese	Chronic	1.4E-01	mg/kg-day	1	1.4E-01	mg/kg-day	Nervous	1.0E+00	IRIS	11/2019
Manganese	Subchronic	NA		1	NA		--	--	--	--
Nickel	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Whole body	300	IRIS	11/2019
Nickel	Subchronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Whole body	300	HEAST	11/2019
Naphthalene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Whole body	3000	IRIS	11/2019
Naphthalene	Subchronic	6.0E-01	mg/kg-day	1	6.0E-01	mg/kg-day	Neurological	90	ATSDR	11/2019
Thallium	Chronic	1.0E-05	mg/kg-day	1	1.0E-05	mg/kg-day	Other	3000	PPRTV Screen	11/2019
Thallium	Subchronic	4.0E-05	mg/kg-day	1	4.0E-05	mg/kg-day	Other	1000	PPRTV Screen	11/2019
Trichloroethene	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Developmental, Immune	10	IRIS	11/2019
Trichloroethene	Subchronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Developmental, Immune, Immune	10, 100, 1000	ATSDR	11/2019

Notes:

[1] The Oral Absorption Efficiency for Dermal is the adjustment for gastrointestinal absorption efficiency presented in USEPA (2004), Exhibit 4-1.

[2] The absorbed dermal RfD is derived by multiplying the oral RfD by the oral absorption efficiency.

[3] Primary target(s) listed are those associated with the critical effect(s) on which the RfD was based.

[4] Date is the date the database was searched.

Abbreviations:

NA = not available

mg/kg-day = milligrams per kilogram per day

RfD = chronic reference dose

IRIS = USEPA Integrated Risk Information System, http://www.epa.gov/iris/index.html

ATSDR = Agency for Toxic Substances and Disease Registry

PPRTV = Provisional Peer-Reviewed Toxicity Values, http://hhpprtv.ornl.gov

HEAST = Health Effects Assessment Summary Tables

Table 7

Non-Cancer Toxicity Data - Inhalation

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s) [1]	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) [2] (MM/DD/YYYY)
Aroclor-1242 (PCB-1242)	Chronic	NA		--	--	--	--
Aroclor-1242 (PCB-1242)	Subchronic	NA		--	--	--	--
Aroclor-1248 (PCB-1248)	Chronic	NA		--	--	--	--
Aroclor-1248 (PCB-1248)	Subchronic	NA		--	--	--	--
Aroclor-1254 (PCB-1254)	Chronic	NA		--	--	--	--
Aroclor-1254 (PCB-1254)	Subchronic	NA		--	--	--	--
Aroclor-1260 (PCB-1260)	Chronic	NA		--	--	--	--
Aroclor-1260 (PCB-1260)	Subchronic	NA		--	--	--	--
Antimony	Chronic	NA		--	--	--	--
Antimony	Subchronic	NA		--	--	--	--
Arsenic	Chronic	1.5E-05	mg/m3	Developmental	30	CalEPA	11/2019
Arsenic	Subchronic	NA		--	--	--	--
Benzo(a)anthracene	Chronic	NA		--	--	--	--
Benzo(a)anthracene	Subchronic	NA		--	--	--	--
Benzo(a)pyrene	Chronic	2.0E-06	mg/m3	Developmental	3000	IRIS	11/2019
Benzo(a)pyrene	Subchronic	NA		--	--	--	--
Benzo(b)fluoranthene	Chronic	NA		--	--	--	--
Benzo(b)fluoranthene	Subchronic	NA		--	--	--	--
Benzo(k)fluoranthene	Chronic	NA		--	--	--	--
Benzo(k)fluoranthene	Subchronic	NA		--	--	--	--
Biphenyl (1,1-Biphenyl)	Chronic	4.0E-04	mg/m3	Lung, Liver, Renal	3000	PPRTV Screen	11/2019
Biphenyl (1,1-Biphenyl)	Subchronic	4.0E-03	mg/m3	Lung, Liver, Renal	300	PPRTV Screen	11/2019
Cadmium	Chronic	1.0E-05	mg/m3	Renal	9	ATSDR	11/2019
Cadmium	Subchronic	NA		--	--	--	--
Cobalt	Chronic	6.0E-06	mg/m3	Lung, Respiratory	300	PPTRV	11/2019
Cobalt	Subchronic	2.0E-05	mg/m3	Lung, Respiratory	100	PPRTV	11/2019
Copper	Chronic	NA		--	--	--	--
Copper	Subchronic	NA		--	--	--	--
Dibenz(a,h)anthracene	Chronic	NA		--	--	--	--
Dibenz(a,h)anthracene	Subchronic	NA		--	--	--	--
Dibenzofuran	Chronic	NA		--	--	--	--
Dibenzofuran	Subchronic	NA		--	--	--	--
Indeno(1,2,3-cd)pyrene	Chronic	NA		--	--	--	--
Indeno(1,2,3-cd)pyrene	Subchronic	NA		--	--	--	--

Table 7

Non-Cancer Toxicity Data - Inhalation

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s) [1]	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) [2] (MM/DD/YYYY)
Lead	Chronic	NA		--	--	--	--
Lead	Subchronic	NA		--	--	--	--
Manganese	Chronic	5.0E-05	mg/m3	Nervous	1000	IRIS	11/2019
Manganese	Subchronic	NA		--	--	--	--
Nickel	Chronic	9.0E-05	mg/m3	Respiratory	30	ATSDR	11/2019
Nickel	Subchronic	2.0E-04	mg/m3	Respiratory	30	ATSDR	11/2019
Naphthalene	Chronic	3.0E-03	mg/m3	Nervous, Respiratory	3000	IRIS	11/2019
Naphthalene	Subchronic	NA		--	--	--	--
Thallium	Chronic	NA		--	--	--	--
Thallium	Subchronic	NA		--	--	--	--
Trichloroethene	Chronic	2.0E-03	mg/m3	Developmental, Immune	10, 100	IRIS	11/28/2012
Trichloroethene	Subchronic	2.2E-03	mg/m3	Developmental, Immune	10, 100	ATSDR	11/2019

Notes:

[1] Primary target(s) listed are those associated with the critical effect(s) on which the RfC was based.

[2] Date is the date the database was searched.

Abbreviations:

NA = not available

mg/m3 = milligrams per cubic meter

RfC = chronic reference concentration

IRIS = USEPA Integrated Risk Information System, http://www.epa.gov/iris/index.html

CalEPA = California Environmental Protection Agency

PPRTV = Provisional Peer-Reviewed Toxicity Values, http://hhpprtv.ornl.gov

ATSDR = Agency for Toxic Substances and Disease Registry

Table 8

Cancer Toxicity Data - Oral/Dermal

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Chemical of Potential Concern	Mutagen	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal [1]	Absorbed Cancer Slope Factor for Dermal [2]		Weight of Evidence/ Cancer Guideline Description [3]	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s) [4] (MM/DD/YYYY)
Aroclor-1242 (PCB-1242)		2.0E+00	$(mg/kg\text{-}day)^{-1}$	1	2.0E+00	$(mg/kg\text{-}day)^{-1}$	[b]	User's Guide	11/2019
Aroclor-1248 (PCB-1248)		2.0E+00	$(mg/kg\text{-}day)^{-1}$	1	2.0E+00	$(mg/kg\text{-}day)^{-1}$	[b]	User's Guide	11/2019
Aroclor-1254 (PCB-1254)		2.0E+00	$(mg/kg\text{-}day)^{-1}$	1	2.0E+00	$(mg/kg\text{-}day)^{-1}$	[b]	User's Guide	11/2019
Aroclor-1260 (PCB-1260)		2.0E+00	$(mg/kg\text{-}day)^{-1}$	1	2.0E+00	$(mg/kg\text{-}day)^{-1}$	[b]	User's Guide	11/2019
Antimony		NA		0.15	NA			--	--
Arsenic		1.5E+00	$(mg/kg\text{-}day)^{-1}$	1	1.5E+00	$(mg/kg\text{-}day)^{-1}$	[a]	IRIS	11/2019
Benzo(a)anthracene	M	1.0E-01	$(mg/kg\text{-}day)^{-1}$	1	1.0E-01	$(mg/kg\text{-}day)^{-1}$	[b]	IRIS	11/2019
Benzo(a)pyrene	M	1.0E+00	$(mg/kg\text{-}day)^{-1}$	1	1.0E+00	$(mg/kg\text{-}day)^{-1}$	[a]	IRIS	11/2019
Benzo(b)fluoranthene	M	1.0E-01	$(mg/kg\text{-}day)^{-1}$	1	1.0E-01	$(mg/kg\text{-}day)^{-1}$	[b]	IRIS	11/2019
Benzo(k)fluoranthene	M	1.0E-02	$(mg/kg\text{-}day)^{-1}$	1	1.0E-02	$(mg/kg\text{-}day)^{-1}$	[b]	IRIS	11/2019
Biphenyl (1,1-Biphenyl)		8.0E-03	$(mg/kg\text{-}day)^{-1}$	1	8.0E-03	$(mg/kg\text{-}day)^{-1}$	[c]	IRIS	11/2019
Cadmium		NA		0.025	NA		[b]	--	--
Cobalt		NA		1	NA		NA	--	--
Copper		NA		1	NA		NA	--	--
Dibenz(a,h)anthracene	M	1.0E+00	$(mg/kg\text{-}day)^{-1}$	1	1.0E+00	$(mg/kg\text{-}day)^{-1}$	[b]	IRIS	11/2019
Dibenzofuran		NA		1	NA		[d]	--	--
Indeno(1,2,3-cd)pyrene	M	1.0E-01	$(mg/kg\text{-}day)^{-1}$	1	1.0E-01	$(mg/kg\text{-}day)^{-1}$	[b]	IRIS	11/2019
Lead		NA		1	NA		[b]	--	--
Manganese		NA		1	NA		[d]	--	--
Nickel		NA		0.04	NA		NA	--	--
Naphthalene		NA		1	NA		[d]	--	--
Thallium		NA		1	NA		[d]	--	--
Trichloroethene	M	4.6E-02	$(mg/kg\text{-}day)^{-1}$	1	4.6E-02	$(mg/kg\text{-}day)^{-1}$	[a]	IRIS	11/2019

Notes:

[1] The Oral Absorption Efficiency for Dermal is the adjustment for gastrointestinal absorption efficiency presented in USEPA (2004), Exhibit 4-1.

[2] The absorbed cancer slope factor is derived by dividing the oral CSF by the oral absorption efficiency.

[3] USEPA (2005) hazard identification for carcinogens:

[a] Carcinogenic to humans

[b] Likely to be carcinogenic to humans

[c] Suggestive evidence of carcinogenic potential

[d] Inadequate information to assess carcinogenic potential

[e] Not likely to be carcinogenic to humans

[4] Date is the date the database was searched.

Abbreviations:

NA = not available, not applicable, or not assessed

mg/kg-day = milligrams per kilogram per day

CSF = cancer slope factor

IRIS = USEPA Integrated Risk Information System, http://www.epa.gov/iris/index.html

CalEPA = California Environmental Protection Agency

Table 9

Cancer Toxicity Data - Inhalation

Human Health Risk Assessment

RACER Trust, Moraine, Ohio

Chemical of Potential Concern	Mutagen	Unit Risk		Weight of Evidence/ Cancer Guideline Description [1]	Unit Risk	
		Value	Units		Source(s)	Date(s) [2] (MM/DD/YYYY)
Aroclor-1242 (PCB-1242)		5.7E-01	$(mg/m^3)^{-1}$	[b]	User's Guide	11/2019
Aroclor-1248 (PCB-1248)		5.7E-01	$(mg/m^3)^{-1}$	[b]	User's Guide	11/2019
Aroclor-1254 (PCB-1254)		5.7E-01	$(mg/m^3)^{-1}$	[b]	User's Guide	11/2019
Aroclor-1260 (PCB-1260)		5.7E-01	$(mg/m^3)^{-1}$	[b]	User's Guide	11/2019
Antimony		NA				11/2019
Arsenic		4.3E+00	$(mg/m^3)^{-1}$	[a]	IRIS	11/2019
Benzo(a)anthracene	M	6.0E-02	$(mg/m^3)^{-1}$	[b]	IRIS	11/2019
Benzo(a)pyrene	M	6.0E-01	$(mg/m^3)^{-1}$	[a]	IRIS	11/2019
Benzo(b)fluoranthene	M	6.0E-02	$(mg/m^3)^{-1}$	[b]	IRIS	11/2019
Benzo(k)fluoranthene	M	6.0E-03	$(mg/m^3)^{-1}$	[b]	IRIS	11/2019
Biphenyl (1,1-Biphenyl)		NA		[c]		11/2019
Cadmium		1.8E+00	$(mg/m^3)^{-1}$	[b]	IRIS	11/2019
Cobalt		9.0E+00	$(mg/m^3)^{-1}$	NA	PPRTV	11/2019
Copper		NA		NA		11/2019
Dibenz(a,h)anthracene	M	6.0E-01	$(mg/m^3)^{-1}$	[b]	IRIS	11/2019
Dibenzofuran		NA		[d]		11/2019
Indeno(1,2,3-cd)pyrene	M	6.0E-02	$(mg/m^3)^{-1}$	[b]	IRIS	11/2019
Lead		NA		[b]		11/2019
Manganese		NA		[d]		11/2019
Nickel		2.6E-01	$(mg/m^3)^{-1}$	NA	CalEPA	11/2019
Naphthalene		3.4E-02	$(mg/m^3)^{-1}$	[d]	CalEPA	11/2019
Thallium		NA		[d]		11/2019
Trichloroethene	M	4.1E-03	$(mg/m^3)^{-1}$	[a]	IRIS	11/2019

Notes:
[1] USEPA (2005) hazard identification for carcinogens:
[a] Carcinogenic to humans
[b] Likely to be carcinogenic to humans
[c] Possible carcinogen to humans
[d] Inadequate information to assess carcinogenic potential
[e] Not likely to be carcinogenic to humans
[2] Date is the date the database was searched.

Abbreviations:
NA = not available
mg/m3 = milligrams per cubic meter
URF = unit risk factor
IRIS = USEPA Integrated Risk Information System, http://www.epa.gov/iris/index.html
CalEPA = California Environmental Protection Agency
PPRTV = Provisional Peer-Reviewed Toxicity Values, http://hhpprtv.ornl.gov

Table 10
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Routine Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Surface & Subsurface Soil	Surface & Subsurface Soil	Waste Pile Staging Area	Ingestion														
				Trichloroethene	1.231	mg/kg	1.9E-07	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	9.E-09	5.3E-07	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune	1.E-03
				Antimony	135.1	mg/kg	2.1E-05	mg/kg/day	NA		NA	5.8E-05	mg/kg/day	4.0E-04	mg/kg/day	Hematologic, Other	1.E-01
				Arsenic	43.4	mg/kg	6.6E-06	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	1.E-05	1.9E-05	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	6.E-02
				Cadmium	802.3	mg/kg	1.2E-04	mg/kg/day	NA		NA	3.4E-04	mg/kg/day	1.0E-03	mg/kg/day	Urinary	3.E-01
				Cobalt	35.8	mg/kg	5.5E-06	mg/kg/day	NA		NA	1.5E-05	mg/kg/day	3.0E-04	mg/kg/day	Thyroid	5.E-02
				Copper	1928.0	mg/kg	2.9E-04	mg/kg/day	NA		NA	8.3E-04	mg/kg/day	4.0E-02	mg/kg/day	Gastrointestinal	2.E-02
				Lead	900.6	mg/kg	1.4E-04	mg/kg/day	NA		NA	3.9E-04	mg/kg/day	NA		--	NA
				Manganese	748.3	mg/kg	1.1E-04	mg/kg/day	NA		NA	3.2E-04	mg/kg/day	1.4E-01	mg/kg/day	Nervous	2.E-03
				Nickel	883.3	mg/kg	1.4E-04	mg/kg/day	NA		NA	3.8E-04	mg/kg/day	2.0E-02	mg/kg/day	Whole body	2.E-02
				Thallium	2.1	mg/kg	3.2E-07	mg/kg/day	NA		NA	8.9E-07	mg/kg/day	1.0E-05	mg/kg/day	Other	9.E-02
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	3.8E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	8.E-07	1.1E-06	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	2.3E-06	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	5.E-06	6.4E-06	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	2.2E-06	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-06	6.2E-06	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	3.E-01
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	4.9E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-06	1.4E-06	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	9.8E-06	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	1.E-06	2.8E-05	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	7.4E-06	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	7.E-06	2.1E-05	mg/kg/day	3.0E-04	mg/kg/day	Developmental	7.E-02
				Benzo(b)fluoranthene	74.0	mg/kg	1.1E-05	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	1.E-06	3.2E-05	mg/kg/day	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	5.0E-06	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	5.E-08	1.4E-05	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	4.0E-06	mg/kg/day	8.0E-03	$(mg/kg/day)^{-1}$	3.E-08	1.1E-05	mg/kg/day	5.0E-01	mg/kg/day	Urinary	2.E-05
				Dibenz(a,h)anthracene	7.2	mg/kg	1.1E-06	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	1.E-06	3.1E-06	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	7.0E-06	mg/kg/day	NA		NA	2.0E-05	mg/kg/day	1.0E-03	mg/kg/day	Whole body	2.E-02
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	2.5E-06	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-07	7.0E-06	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	2.0E-06	mg/kg/day	NA		NA	5.6E-06	mg/kg/day	2.0E-02	mg/kg/day	Whole body	3.E-04
			Exp. Route Total								3.E-05						1.E+00
			Dermal														
				Trichloroethene	1.231	mg/kg	NA		4.6E-02	$(mg/kg/day)^{-1}$	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune	NA
				Antimony	135.1	mg/kg	NA		NA		NA	NA	mg/kg/day	6.0E-05	mg/kg/day	Hematologic, Other	NA
				Arsenic	43.4	mg/kg	3.9E-08	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	6.E-08	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	4.E-04
				Cadmium	802.3	mg/kg	1.3E-09	mg/kg/day	NA		NA	3.6E-09	mg/kg/day	2.5E-05	mg/kg/day	Urinary	1.E-04
				Cobalt	35.8	mg/kg	NA		NA		NA	NA	mg/kg/day	3.0E-04	mg/kg/day	Thyroid	NA
				Copper	1928.0	mg/kg	NA		NA		NA	NA	mg/kg/day	4.0E-02	mg/kg/day	Gastrointestinal	NA
				Lead	900.6	mg/kg	NA		NA		NA	NA	mg/kg/day	NA		--	NA
				Manganese	748.3	mg/kg	NA		NA		NA	NA	mg/kg/day	1.4E-01	mg/kg/day	Nervous	NA
				Nickel	883.3	mg/kg	NA		NA		NA	NA	mg/kg/day	8.0E-04	mg/kg/day	Whole body	NA
				Thallium	2.1	mg/kg	NA		NA		NA	NA	mg/kg/day	1.0E-05	mg/kg/day	Other	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.8E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-07	5.1E-07	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	1.8E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-07	5.1E-07	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	1.8E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-07	5.1E-07	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	3.E-02
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	1.8E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-07	5.1E-07	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	1.7E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-08	4.7E-07	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	1.7E-07	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	2.E-07	4.7E-07	mg/kg/day	3.0E-04	mg/kg/day	Developmental	2.E-03
				Benzo(b)fluoranthene	74.0	mg/kg	1.7E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-08	4.7E-07	mg/kg/day	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	1.7E-07	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	2.E-09	4.7E-07	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	NA		8.0E-03	$(mg/kg/day)^{-1}$	NA	NA	mg/kg/day	5.0E-01	mg/kg/day	Urinary	NA

Table 10
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Routine Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
				Dibenz(a,h)anthracene	7.2	mg/kg	1.7E-07	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	2.E-07	4.7E-07	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	3.9E-08	mg/kg/day	NA		NA	1.1E-07	mg/kg/day	1.0E-03	mg/kg/day	Whole body	1.E-04
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	1.7E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-08	4.7E-07	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	1.7E-07	mg/kg/day	NA	$(mg/kg/day)^{-1}$	NA	4.7E-07	mg/kg/day	2.0E-02	mg/kg/day	Whole body	2.E-05
			Exp. Route Total								2.E-06						3.E-02
	Outdoor Air	Waste Pile Staging Area	Inhalation	Trichloroethene	1.231	mg/kg	5.8E-06	mg/m^3	4.1E-03	$(mg/m^3)^{-1}$	2.E-08	1.6E-05	mg/m^3	2.0E-03	mg/m^3	Developmental, Immune	8.E-03
				Antimony	135.1	mg/kg	1.0E-09	mg/m^3	NA		NA	2.8E-09	mg/m^3	NA		--	NA
				Arsenic	43.4	mg/kg	3.3E-10	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	1.E-09	9.1E-10	mg/m^3	1.5E-05	mg/m^3	Developmental	6.E-05
				Cadmium	802.3	mg/kg	6.0E-09	mg/m^3	1.8E+00	$(mg/m^3)^{-1}$	1.E-08	1.7E-08	mg/m^3	1.0E-05	mg/m^3	Renal	2.E-03
				Cobalt	35.8	mg/kg	2.7E-10	mg/m^3	9.0E+00	$(mg/m^3)^{-1}$	2.E-09	7.5E-10	mg/m^3	6.0E-06	mg/m^3	Lung, Respiratory	1.E-04
				Copper	1928.0	mg/kg	1.4E-08	mg/m^3	NA		NA	4.0E-08	mg/m^3	NA		--	NA
				Lead	900.6	mg/kg	6.7E-09	mg/m^3	NA		NA	1.9E-08	mg/m^3	NA		--	NA
				Manganese	748.3	mg/kg	5.6E-09	mg/m^3	NA		NA	1.6E-08	mg/m^3	5.0E-05	mg/m^3	Nervous	3.E-04
				Nickel	883.3	mg/kg	6.6E-09	mg/m^3	2.6E-01	$(mg/m^3)^{-1}$	2.E-09	1.9E-08	mg/m^3	9.0E-05	mg/m^3	Respiratory	2.E-04
				Thallium	2.1	mg/kg	1.6E-11	mg/m^3	NA		NA	4.4E-11	mg/m^3	NA		--	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	4.4E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	3.E-08	1.2E-07	mg/m^3	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	3.0E-07	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	2.E-07	8.5E-07	mg/m^3	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	1.8E-07	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	1.E-07	5.0E-07	mg/m^3	NA		--	NA
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	2.6E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	1.E-08	7.2E-08	mg/m^3	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	1.5E-07	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	9.E-09	4.3E-07	mg/m^3	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	2.1E-08	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	1.E-08	6.0E-08	mg/m^3	2.0E-06	mg/m^3	Developmental	3.E-02
				Benzo(b)fluoranthene	74.0	mg/kg	3.6E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	2.E-09	1.0E-07	mg/m^3	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	1.5E-08	mg/m^3	6.0E-03	$(mg/m^3)^{-1}$	9.E-11	4.3E-08	mg/m^3	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	2.4E-06	mg/m^3	NA		NA	6.6E-06	mg/m^3	4.0E-04	mg/m^3	Lung, Liver, Renal	2.E-02
				Dibenz(a,h)anthracene	7.2	mg/kg	1.4E-09	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	8.E-10	3.8E-09	mg/m^3	NA		--	NA
				Dibenzofuran	46.1	mg/kg	3.1E-06	mg/m^3	NA		NA	8.6E-06	mg/m^3	NA		--	NA
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	3.6E-09	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	2.E-10	1.0E-08	mg/m^3	NA		--	NA
				Naphthalene	13.1	mg/kg	2.9E-06	mg/m^3	3.4E-02	$(mg/m^3)^{-1}$	1.E-07	8.2E-06	mg/m^3	3.0E-03	mg/m^3	Nervous, Respiratory	3.E-03
			Exp. Route Total								5.E-07						6.E-02
		Exposure Point Total									3.E-05						1.E+00
	Exposure Medium Total										3.E-05						1.E+00
Surface/Subsurface Soil Total											3.E-05						1.E+00

Notes:

NA = Not available

Total Cardiovascular HI Across All Media =	6.E-02
Total Dermal HI Across All Media =	4.E-01
Total Developmental HI Across All Media =	1.E-01
Total Gastrointestinal HI Across All Media =	2.E-02
Total Hematologic HI Across All Media =	1.E-01
Total Immune HI Across All Media =	3.E-01
Total Renal HI Across All Media =	2.E-02
Total Liver HI Across All Media =	2.E-02
Total Lung/Respiratory HI Across All Media =	2.E-02
Total Nervous HI Across All Media =	5.E-03
Total Ocular HI Across All Media =	3.E-01
Total Other HI Across All Media =	2.E-01
Total Thyroid HI Across All Media =	5.E-02
Total Urinary HI Across All Media =	3.E-01
Total Whole body HI Across All Media =	4.E-02

Table 11
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Routine Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
							Intake/Exposure Concentration		CSF/Unit Risk			Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
					Value	Units	Value	Units	Value	Units	Cancer Risk	Value	Units	Value	Units	target organ	
Surface & Subsurface Soil	Surface & Subsurface Soil	Waste Pile Staging Area	Ingestion														
				Trichloroethene	1.231	mg/kg	3.4E-08	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	2.E-09	2.6E-07	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune	5.E-04
				Antimony	135.1	mg/kg	3.7E-06	mg/kg/day	NA		NA	2.9E-05	mg/kg/day	4.0E-04	mg/kg/day	Hematologic, Other	7.E-02
				Arsenic	43.4	mg/kg	1.2E-06	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	2.E-06	9.3E-06	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	3.E-02
				Cadmium	802.3	mg/kg	2.2E-05	mg/kg/day	NA		NA	1.7E-04	mg/kg/day	1.0E-03	mg/kg/day	Urinary	2.E-01
				Cobalt	35.8	mg/kg	9.9E-07	mg/kg/day	NA		NA	7.7E-06	mg/kg/day	3.0E-04	mg/kg/day	Thyroid	3.E-02
				Copper	1928.0	mg/kg	5.3E-05	mg/kg/day	NA		NA	4.1E-04	mg/kg/day	4.0E-02	mg/kg/day	Gastrointestinal	1.E-02
				Lead	900.6	mg/kg	2.5E-05	mg/kg/day	NA		NA	1.9E-04	mg/kg/day	NA		--	NA
				Manganese	748.3	mg/kg	2.1E-05	mg/kg/day	NA		NA	1.6E-04	mg/kg/day	1.4E-01	mg/kg/day	Nervous	1.E-03
				Nickel	883.3	mg/kg	2.4E-05	mg/kg/day	NA		NA	1.9E-04	mg/kg/day	2.0E-02	mg/kg/day	Whole body	9.E-03
				Thallium	2.1	mg/kg	5.7E-08	mg/kg/day	NA		NA	4.5E-07	mg/kg/day	1.0E-05	mg/kg/day	Other	4.E-02
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	6.9E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-07	5.4E-07	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	4.1E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	8.E-07	3.2E-06	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	4.0E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	8.E-07	3.1E-06	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	2.E-01
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	8.9E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	2.E-07	6.9E-07	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	1.8E-06	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-07	1.4E-05	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	1.3E-06	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	1.E-06	1.0E-05	mg/kg/day	3.0E-04	mg/kg/day	Developmental	3.E-02
				Benzo(b)fluoranthene	74.0	mg/kg	2.0E-06	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-07	1.6E-05	mg/kg/day	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	8.9E-07	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	9.E-09	6.9E-06	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	7.2E-07	mg/kg/day	8.0E-03	$(mg/kg/day)^{-1}$	6.E-09	5.6E-06	mg/kg/day	5.0E-01	mg/kg/day	Urinary	1.E-05
				Dibenz(a,h)anthracene	7.2	mg/kg	2.0E-07	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	2.E-07	1.5E-06	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	1.3E-06	mg/kg/day	NA		NA	9.9E-06	mg/kg/day	1.0E-03	mg/kg/day	Whole body	1.E-02
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	4.5E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	4.E-08	3.5E-06	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	3.6E-07	mg/kg/day	NA		NA	2.8E-06	mg/kg/day	2.0E-02	mg/kg/day	Whole body	1.E-04
			Exp. Route Total								6.E-06						6.E-01
			Dermal														
				Trichloroethene	1.231	mg/kg	NA		4.6E-02	$(mg/kg/day)^{-1}$	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune	NA
				Antimony	135.1	mg/kg	NA		NA		NA	NA		6.0E-05	mg/kg/day	Hematologic, Other	NA
				Arsenic	43.4	mg/kg	1.4E-08	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	2.E-08	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	4.E-04
				Cadmium	802.3	mg/kg	4.7E-10	mg/kg/day	NA		NA	3.6E-09	mg/kg/day	2.5E-05	mg/kg/day	Urinary	1.E-04
				Cobalt	35.8	mg/kg	NA		NA		NA	NA		3.0E-04	mg/kg/day	Thyroid	NA
				Copper	1928.0	mg/kg	NA		NA		NA	NA		4.0E-02	mg/kg/day	Gastrointestinal	NA
				Lead	900.6	mg/kg	NA		NA		NA	NA		NA		--	NA
				Manganese	748.3	mg/kg	NA		NA		NA	NA		1.4E-01	mg/kg/day	Nervous	NA
				Nickel	883.3	mg/kg	NA		NA		NA	NA		8.0E-04	mg/kg/day	Whole body	NA
				Thallium	2.1	mg/kg	NA		NA		NA	NA		1.0E-05	mg/kg/day	Other	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	6.5E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-07	5.1E-07	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	6.5E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-07	5.1E-07	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	6.5E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-07	5.1E-07	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	3.E-02
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	6.5E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-07	5.1E-07	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	6.1E-08	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	6.E-09	4.7E-07	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	6.1E-08	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	6.E-08	4.7E-07	mg/kg/day	3.0E-04	mg/kg/day	Developmental	2.E-03
				Benzo(b)fluoranthene	74.0	mg/kg	6.1E-08	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	6.E-09	4.7E-07	mg/kg/day	NA		--	NA

Table 11
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Routine Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
							Intake/Exposure Concentration		CSF/Unit Risk			Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
					Value	Units	Value	Units	Value	Units	Cancer Risk	Value	Units	Value	Units	target organ	
				Benzo(k)fluoranthene	32.4	mg/kg	6.1E-08	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	6.E-10	4.7E-07	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	NA		8.0E-03	$(mg/kg/day)^{-1}$	NA	NA		5.0E-01	mg/kg/day	Urinary	NA
				Dibenz(a,h)anthracene	7.2	mg/kg	6.1E-08	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	6.E-08	4.7E-07	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	1.4E-08	mg/kg/day	NA		NA	1.1E-07	mg/kg/day	1.0E-03	mg/kg/day	Whole body	1.E-04
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	6.1E-08	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	6.E-09	4.7E-07	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	6.1E-08	mg/kg/day	NA		NA	4.7E-07	mg/kg/day	2.0E-02	mg/kg/day	Whole body	2.E-05
			Exp. Route Total								7.E-07						3.E-02
	Outdoor Air	Waste Pile Staging Area	Inhalation	Trichloroethene	1.231	mg/kg	2.1E-06	mg/m^3	4.1E-03	$(mg/m^3)^{-1}$	9.E-09	1.6E-05	mg/m^3	2.0E-03	mg/m^3	Developmental, Immune	8.E-03
				Antimony	135.1	mg/kg	3.6E-10	mg/m^3	NA		NA	2.8E-09	mg/m^3	NA		--	NA
				Arsenic	43.4	mg/kg	1.2E-10	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	5.E-10	9.1E-10	mg/m^3	1.5E-05	mg/m^3	Developmental	6.E-05
				Cadmium	802.3	mg/kg	2.2E-09	mg/m^3	1.8E+00	$(mg/m^3)^{-1}$	4.E-09	1.7E-08	mg/m^3	1.0E-05	mg/m^3	Renal	2.E-03
				Cobalt	35.8	mg/kg	9.7E-11	mg/m^3	9.0E+00	$(mg/m^3)^{-1}$	9.E-10	7.5E-10	mg/m^3	6.0E-06	mg/m^3	Lung, Respiratory	1.E-04
				Copper	1928.0	mg/kg	5.2E-09	mg/m^3	NA		NA	4.0E-08	mg/m^3	NA		--	NA
				Lead	900.6	mg/kg	2.4E-09	mg/m^3	NA		NA	1.9E-08	mg/m^3	NA		--	NA
				Manganese	748.3	mg/kg	2.0E-09	mg/m^3	NA		NA	1.6E-08	mg/m^3	5.0E-05	mg/m^3	Nervous	3.E-04
				Nickel	883.3	mg/kg	2.4E-09	mg/m^3	2.6E-01	$(mg/m^3)^{-1}$	6.E-10	1.9E-08	mg/m^3	9.0E-05	mg/m^3	Respiratory	2.E-04
				Thallium	2.1	mg/kg	5.6E-12	mg/m^3	NA		NA	4.4E-11	mg/m^3	NA		--	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.6E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	9.E-09	1.2E-07	mg/m^3	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	1.1E-07	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	6.E-08	8.5E-07	mg/m^3	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	6.5E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	4.E-08	5.0E-07	mg/m^3	NA		--	NA
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	9.2E-09	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	5.E-09	7.2E-08	mg/m^3	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	5.5E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	3.E-09	4.3E-07	mg/m^3	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	7.7E-09	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	5.E-09	6.0E-08	mg/m^3	2.0E-06	mg/m^3	Developmental	3.E-02
				Benzo(b)fluoranthene	74.0	mg/kg	1.3E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	8.E-10	1.0E-07	mg/m^3	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	5.6E-09	mg/m^3	6.0E-03	$(mg/m^3)^{-1}$	3.E-11	4.3E-08	mg/m^3	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	8.5E-07	mg/m^3	NA		NA	6.6E-06	mg/m^3	4.0E-04	mg/m^3	Lung, Liver, Renal	2.E-02
				Dibenz(a,h)anthracene	7.2	mg/kg	4.9E-10	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	3.E-10	3.8E-09	mg/m^3	NA		--	NA
				Dibenzofuran	46.1	mg/kg	1.1E-06	mg/m^3	NA		NA	8.6E-06	mg/m^3	NA		--	NA
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	1.3E-09	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	8.E-11	1.0E-08	mg/m^3	NA		--	NA
				Naphthalene	13.1	mg/kg	1.1E-06	mg/m^3	3.4E-02	$(mg/m^3)^{-1}$	4.E-08	8.2E-06	mg/m^3	3.0E-03	mg/m^3	Nervous, Respiratory	3.E-03
			Exp. Route Total								2.E-07						6.E-02
		Exposure Point Total									7.E-06						7.E-01
	Exposure Medium Total										7.E-06						7.E-01
Surface/Subsurface Soil Total											7.E-06						7.E-01

Notes:
NA = Not available

Total Cardiovascular HI Across All Media =	3.E-02
Total Dermal HI Across All Media =	2.E-01
Total Developmental HI Across All Media =	7.E-02
Total Gastrointestinal HI Across All Media =	1.E-02
Total Hematologic HI Across All Media =	7.E-02
Total Immune HI Across All Media =	2.E-01
Total Liver HI Across All Media =	2.E-02
Total Lung/Respiratory HI Across All Media =	2.E-02
Total Nervous HI Across All Media =	4.E-03
Total Ocular HI Across All Media =	2.E-01
Total Other HI Across All Media =	1.E-01
Total Renal HI Across All Media =	2.E-02
Total Thyroid HI Across All Media =	3.E-02
Total Urinary HI Across All Media =	2.E-01
Total Whole Body HI Across All Media =	2.E-02

Table 12
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Surface & Subsurface Soil	Surface & Subsurface Soil	Waste Pile Staging Area	Ingestion														
				Trichloroethene	1.231	mg/kg	1.5E-08	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	7.E-10	4.2E-08	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune	8.E-05
				Antimony	135.1	mg/kg	1.7E-06	mg/kg/day	NA		NA	4.6E-06	mg/kg/day	4.0E-04	mg/kg/day	Hematologic, Other	1.E-02
				Arsenic	43.4	mg/kg	5.3E-07	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	8.E-07	1.5E-06	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	5.E-03
				Cadmium	802.3	mg/kg	9.8E-06	mg/kg/day	NA		NA	2.7E-05	mg/kg/day	1.0E-03	mg/kg/day	Urinary	3.E-02
				Cobalt	35.8	mg/kg	4.4E-07	mg/kg/day	NA		NA	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	Thyroid	4.E-03
				Copper	1928.0	mg/kg	2.4E-05	mg/kg/day	NA		NA	6.6E-05	mg/kg/day	4.0E-02	mg/kg/day	Gastrointestinal	2.E-03
				Lead	900.6	mg/kg	1.1E-05	mg/kg/day	NA		NA	3.1E-05	mg/kg/day	NA		--	NA
				Manganese	748.3	mg/kg	9.2E-06	mg/kg/day	NA		NA	2.6E-05	mg/kg/day	1.4E-01	mg/kg/day	Nervous	2.E-04
				Nickel	883.3	mg/kg	1.1E-05	mg/kg/day	NA		NA	3.0E-05	mg/kg/day	2.0E-02	mg/kg/day	Whole body	2.E-03
				Thallium	2.1	mg/kg	2.5E-08	mg/kg/day	NA		NA	7.1E-08	mg/kg/day	1.0E-05	mg/kg/day	Other	7.E-03
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	3.1E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	6.E-08	8.6E-08	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	1.8E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-07	5.1E-07	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	1.8E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-07	5.0E-07	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	2.E-02
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	4.0E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	8.E-08	1.1E-07	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	7.9E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	8.E-08	2.2E-06	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	5.9E-07	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	6.E-07	1.7E-06	mg/kg/day	3.0E-04	mg/kg/day	Developmental	6.E-03
				Benzo(b)fluoranthene	74.0	mg/kg	9.1E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	9.E-08	2.5E-06	mg/kg/day	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	4.0E-07	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	4.E-09	1.1E-06	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	3.2E-07	mg/kg/day	8.0E-03	$(mg/kg/day)^{-1}$	3.E-09	8.9E-07	mg/kg/day	5.0E-01	mg/kg/day	Urinary	2.E-06
				Dibenz(a,h)anthracene	7.2	mg/kg	8.8E-08	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	9.E-08	2.5E-07	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	5.6E-07	mg/kg/day	NA		NA	1.6E-06	mg/kg/day	1.0E-03	mg/kg/day	Whole body	2.E-03
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	2.0E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-08	5.6E-07	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	1.6E-07	mg/kg/day	NA		NA	4.5E-07	mg/kg/day	2.0E-02	mg/kg/day	Whole body	2.E-05
			Exp. Route Total								3.E-06						9.E-02
			Dermal														
				Trichloroethene	1.231	mg/kg	NA		4.6E-02	$(mg/kg/day)^{-1}$	NA	NA		5.0E-04	mg/kg/day	Developmental, Immune	NA
				Antimony	135.1	mg/kg	NA		NA		NA	NA		6.0E-05	mg/kg/day	Hematologic, Other	NA
				Arsenic	43.4	mg/kg	1.6E-09	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	2.E-09	1.9E-07	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	6.E-04
				Cadmium	802.3	mg/kg	5.2E-11	mg/kg/day	NA		NA	1.2E-07	mg/kg/day	2.5E-05	mg/kg/day	Urinary	5.E-03
				Cobalt	35.8	mg/kg	NA		NA		NA	NA		3.0E-04	mg/kg/day	Thyroid	NA
				Copper	1928.0	mg/kg	NA		NA		NA	NA		4.0E-02	mg/kg/day	Gastrointestinal	NA
				Lead	900.6	mg/kg	NA		NA		NA	NA		NA		--	NA
				Manganese	748.3	mg/kg	NA		NA		NA	NA		1.4E-01	mg/kg/day	Nervous	NA
				Nickel	883.3	mg/kg	NA		NA		NA	NA		8.0E-04	mg/kg/day	Whole body	NA
				Thallium	2.1	mg/kg	NA		NA		NA	NA		1.0E-05	mg/kg/day	Other	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	5.1E-08	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	3.0E-07	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	3.0E-07	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	1.E-02
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	6.6E-08	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	6.7E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	7.E-10	1.2E-06	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	6.7E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	7.E-09	9.1E-07	mg/kg/day	3.0E-04	mg/kg/day	Developmental	3.E-03
				Benzo(b)fluoranthene	74.0	mg/kg	6.7E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	7.E-10	1.4E-06	mg/kg/day	NA		--	NA

Table 12
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
				Benzo(k)fluoranthene	32.4	mg/kg	6.7E-09	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	7.E-11	6.1E-07	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	NA		8.0E-03	$(mg/kg/day)^{-1}$	NA	NA		5.0E-01	mg/kg/day	Urinary	NA
				Dibenz(a,h)anthracene	7.2	mg/kg	6.7E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	7.E-09	1.4E-07	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	1.6E-09	mg/kg/day	NA		NA	2.0E-07	mg/kg/day	1.0E-03	mg/kg/day	Whole body	2.E-04
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	6.7E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	7.E-10	3.1E-07	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	6.7E-09	mg/kg/day	NA		NA	2.5E-07	mg/kg/day	2.0E-02	mg/kg/day	Whole body	1.E-05
			Exp. Route Total								8.E-08						2.E-02
	Outdoor Air	Waste Pile Staging Area	Inhalation	Trichloroethene	1.231	mg/kg	1.9E-06	mg/m^3	4.1E-03	$(mg/m^3)^{-1}$	8.E-09	5.2E-06	mg/m^3	2.0E-03	mg/m^3	Developmental, Immune	3.E-03
				Antimony	135.1	mg/kg	9.1E-10	mg/m^3	NA		NA	9.1E-10	mg/m^3	NA		--	NA
				Arsenic	43.4	mg/kg	2.9E-10	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	1.E-09	2.9E-10	mg/m^3	1.5E-05	mg/m^3	Developmental	2.E-05
				Cadmium	802.3	mg/kg	5.4E-09	mg/m^3	1.8E+00	$(mg/m^3)^{-1}$	1.E-08	5.4E-09	mg/m^3	1.0E-05	mg/m^3	Renal	5.E-04
				Cobalt	35.8	mg/kg	2.4E-10	mg/m^3	9.0E+00	$(mg/m^3)^{-1}$	2.E-09	2.4E-10	mg/m^3	6.0E-06	mg/m^3	Lung, Respiratory	4.E-05
				Copper	1928.0	mg/kg	1.3E-08	mg/m^3	NA		NA	1.3E-08	mg/m^3	NA		--	NA
				Lead	900.6	mg/kg	6.0E-09	mg/m^3	NA		NA	6.0E-09	mg/m^3	NA		--	NA
				Manganese	748.3	mg/kg	5.0E-09	mg/m^3	NA		NA	5.0E-09	mg/m^3	5.0E-05	mg/m^3	Nervous	1.E-04
				Nickel	883.3	mg/kg	5.9E-09	mg/m^3	2.6E-01	$(mg/m^3)^{-1}$	2.E-09	5.9E-09	mg/m^3	9.0E-05	mg/m^3	Respiratory	7.E-05
				Thallium	2.1	mg/kg	1.4E-11	mg/m^3	NA		NA	1.4E-11	mg/m^3	NA		--	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.4E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	8.E-09	3.9E-08	mg/m^3	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	9.7E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	6.E-08	2.7E-07	mg/m^3	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	5.7E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	3.E-08	1.6E-07	mg/m^3	NA		--	NA
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	8.2E-09	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	5.E-09	2.3E-08	mg/m^3	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	4.9E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	3.E-09	1.4E-07	mg/m^3	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	6.9E-09	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	4.E-09	1.9E-08	mg/m^3	2.0E-06	mg/m^3	Developmental	1.E-02
				Benzo(b)fluoranthene	74.0	mg/kg	1.2E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	7.E-10	3.3E-08	mg/m^3	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	5.0E-09	mg/m^3	6.0E-03	$(mg/m^3)^{-1}$	3.E-11	1.4E-08	mg/m^3	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	7.6E-07	mg/m^3	NA		NA	2.1E-06	mg/m^3	4.0E-04	mg/m^3	Lung, Liver, Renal	5.E-03
				Dibenz(a,h)anthracene	7.2	mg/kg	4.3E-10	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	3.E-10	1.2E-09	mg/m^3	NA		--	NA
				Dibenzofuran	46.1	mg/kg	9.9E-07	mg/m^3	NA		NA	2.8E-06	mg/m^3	NA		--	NA
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	1.2E-09	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	7.E-11	3.3E-09	mg/m^3	NA		--	NA
				Naphthalene	13.1	mg/kg	9.4E-07	mg/m^3	3.4E-02	$(mg/m^3)^{-1}$	3.E-08	2.6E-06	mg/m^3	3.0E-03	mg/m^3	Nervous, Respiratory	9.E-04
			Exp. Route Total								2.E-07						2.E-02
		Exposure Point Total									3.E-06						1.E-01
	Exposure Medium Total										3.E-06						1.E-01
Surface/Subsurface Soil Total											3.E-06						1.E-01

Notes:

NA = Not available

Total Cardiovascular HI Across All Media =	6.E-03
Total Dermal HI Across All Media =	5.E-02
Total Developmental HI Across All Media =	2.E-02
Total Gastrointestinal HI Across All Media =	2.E-03
Total Hematologic HI Across All Media =	1.E-02
Total Immune HI Across All Media =	4.E-02
Total Renal HI Across All Media =	6.E-03
Total Liver HI Across All Media =	5.E-03
Total Lung/Respiratory HI Across All Media =	6.E-03
Total Nervous HI Across All Media =	1.E-03
Total Ocular HI Across All Media =	4.E-02
Total Other HI Across All Media =	2.E-02
Total Thyroid HI Across All Media =	4.E-03
Total Urinary HI Across All Media =	3.E-02
Total Whole body HI Across All Media =	3.E-03

Table 13
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
							Intake/Exposure Concentration		CSF/Unit Risk			Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Surface & Subsurface Soil	Surface & Subsurface Soil	Waste Pile Staging Area	Ingestion	Trichloroethene	1.231	mg/kg	2.7E-09	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	1.E-10	2.1E-08	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune	4.E-05
				Antimony	135.1	mg/kg	3.0E-07	mg/kg/day	NA		NA	2.3E-06	mg/kg/day	4.0E-04	mg/kg/day	Hematologic, Other	6.E-03
				Arsenic	43.4	mg/kg	9.6E-08	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	1.E-07	7.4E-07	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	2.E-03
				Cadmium	802.3	mg/kg	1.8E-06	mg/kg/day	NA		NA	1.4E-05	mg/kg/day	1.0E-03	mg/kg/day	Urinary	1.E-02
				Cobalt	35.8	mg/kg	7.9E-08	mg/kg/day	NA		NA	6.1E-07	mg/kg/day	3.0E-04	mg/kg/day	Thyroid	2.E-03
				Copper	1928.0	mg/kg	4.2E-06	mg/kg/day	NA		NA	3.3E-05	mg/kg/day	4.0E-02	mg/kg/day	Gastrointestinal	8.E-04
				Lead	900.6	mg/kg	2.0E-06	mg/kg/day	NA		NA	1.5E-05	mg/kg/day	NA		--	NA
				Manganese	748.3	mg/kg	1.6E-06	mg/kg/day	NA		NA	1.3E-05	mg/kg/day	1.4E-01	mg/kg/day	Nervous	9.E-05
				Nickel	883.3	mg/kg	1.9E-06	mg/kg/day	NA		NA	1.5E-05	mg/kg/day	2.0E-02	mg/kg/day	Whole body	8.E-04
				Thallium	2.1	mg/kg	4.6E-09	mg/kg/day	NA		NA	3.6E-08	mg/kg/day	1.0E-05	mg/kg/day	Other	4.E-03
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	5.5E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	4.3E-08	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	3.3E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	7.E-08	2.6E-07	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	3.2E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	6.E-08	2.5E-07	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	1.E-02
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	7.1E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	5.5E-08	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	1.4E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	1.E-08	1.1E-06	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	1.1E-07	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	1.E-07	8.3E-07	mg/kg/day	3.0E-04	mg/kg/day	Developmental	3.E-03
				Benzo(b)fluoranthene	74.0	mg/kg	1.6E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	2.E-08	1.3E-06	mg/kg/day	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	7.1E-08	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	7.E-10	5.5E-07	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	5.7E-08	mg/kg/day	8.0E-03	$(mg/kg/day)^{-1}$	5.E-10	4.5E-07	mg/kg/day	5.0E-01	mg/kg/day	Urinary	9.E-07
				Dibenz(a,h)anthracene	7.2	mg/kg	1.6E-08	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	2.E-08	1.2E-07	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	1.0E-07	mg/kg/day	NA		NA	7.9E-07	mg/kg/day	1.0E-03	mg/kg/day	Whole body	8.E-04
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	3.6E-08	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	4.E-09	2.8E-07	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	2.9E-08	mg/kg/day	NA		NA	2.2E-07	mg/kg/day	2.0E-02	mg/kg/day	Whole body	1.E-05
			Exp. Route Total								5.E-07						5.E-02
			Dermal														
				Trichloroethene	1.231	mg/kg	NA	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune	NA
				Antimony	135.1	mg/kg	NA	mg/kg/day	NA		NA	NA		6.0E-05	mg/kg/day	Hematologic, Other	NA
				Arsenic	43.4	mg/kg	2.8E-10	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	4.E-10	2.2E-09	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	7.E-06
				Cadmium	802.3	mg/kg	9.3E-12	mg/kg/day	NA		NA	7.2E-11	mg/kg/day	2.5E-05	mg/kg/day	Urinary	3.E-06
				Cobalt	35.8	mg/kg	NA	mg/kg/day	NA		NA	NA		3.0E-04	mg/kg/day	Thyroid	NA
				Copper	1928.0	mg/kg	NA	mg/kg/day	NA		NA	NA		4.0E-02	mg/kg/day	Gastrointestinal	NA
				Lead	900.6	mg/kg	NA	mg/kg/day	NA		NA	NA		NA		--	NA
				Manganese	748.3	mg/kg	NA	mg/kg/day	NA		NA	NA		1.4E-01	mg/kg/day	Nervous	NA
				Nickel	883.3	mg/kg	NA	mg/kg/day	NA		NA	NA		8.0E-04	mg/kg/day	Whole body	NA
				Thallium	2.1	mg/kg	NA	mg/kg/day	NA		NA	NA		1.0E-05	mg/kg/day	Other	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.3E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	3.E-09	1.0E-08	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	1.3E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	3.E-09	1.0E-08	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	1.3E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	3.E-09	1.0E-08	mg/kg/day	2.0E-05	mg/kg/day	Immune, Dermal, Ocular	5.E-04
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	1.3E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	3.E-09	1.0E-08	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	1.2E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	1.E-10	9.4E-09	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	1.2E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	1.E-09	9.4E-09	mg/kg/day	3.0E-04	mg/kg/day	Developmental	3.E-05
				Benzo(b)fluoranthene	74.0	mg/kg	1.2E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	1.E-10	9.4E-09	mg/kg/day	NA		--	NA

Table 13
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
				Benzo(k)fluoranthene	32.4	mg/kg	1.2E-09	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	1.E-11	9.4E-09	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	NA	mg/kg/day	8.0E-03	$(mg/kg/day)^{-1}$	NA	NA		5.0E-01	mg/kg/day	Urinary	NA
				Dibenz(a,h)anthracene	7.2	mg/kg	1.2E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	1.E-09	9.4E-09	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	2.8E-10	mg/kg/day	NA		NA	2.2E-09	mg/kg/day	1.0E-03	mg/kg/day	Whole body	2.E-06
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	1.2E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	1.E-10	9.4E-09	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	1.2E-09	mg/kg/day	NA		NA	9.4E-09	mg/kg/day	2.0E-02	mg/kg/day	Whole body	5.E-07
			Exp. Route Total								1.E-08						6.E-04
	Outdoor Air	Waste Pile Staging Area	Inhalation	Trichloroethene	1.231	mg/kg	1.7E-07	mg/m^3	4.1E-03	$(mg/m^3)^{-1}$	7.E-10	1.3E-06	mg/m^3	2.0E-03	mg/m^3	Developmental, Immune	6.E-04
				Antimony	135.1	mg/kg	2.9E-11	mg/m^3	NA		NA	2.3E-10	mg/m^3	NA		--	NA
				Arsenic	43.4	mg/kg	9.4E-12	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	4.E-11	7.3E-11	mg/m^3	1.5E-05	mg/m^3	Developmental	5.E-06
				Cadmium	802.3	mg/kg	1.7E-10	mg/m^3	1.8E+00	$(mg/m^3)^{-1}$	3.E-10	1.3E-09	mg/m^3	1.0E-05	mg/m^3	Renal	1.E-04
				Cobalt	35.8	mg/kg	7.7E-12	mg/m^3	9.0E+00	$(mg/m^3)^{-1}$	7.E-11	6.0E-11	mg/m^3	6.0E-06	mg/m^3	Lung, Respiratory	1.E-05
				Copper	1928.0	mg/kg	4.2E-10	mg/m^3	NA		NA	3.2E-09	mg/m^3	NA		--	NA
				Lead	900.6	mg/kg	1.9E-10	mg/m^3	NA		NA	1.5E-09	mg/m^3	NA		--	NA
				Manganese	748.3	mg/kg	1.6E-10	mg/m^3	NA		NA	1.3E-09	mg/m^3	5.0E-05	mg/m^3	Nervous	3.E-05
				Nickel	883.3	mg/kg	1.9E-10	mg/m^3	2.6E-01	$(mg/m^3)^{-1}$	5.E-11	1.5E-09	mg/m^3	9.0E-05	mg/m^3	Respiratory	2.E-05
				Thallium	2.1	mg/kg	4.5E-13	mg/m^3	NA		NA	3.5E-12	mg/m^3	NA		--	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.3E-09	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	7.E-10	9.9E-09	mg/m^3	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	8.7E-09	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	5.E-09	6.8E-08	mg/m^3	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	5.2E-09	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	3.E-09	4.0E-08	mg/m^3	NA		--	NA
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	7.4E-10	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	4.E-10	5.7E-09	mg/m^3	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	4.4E-09	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	3.E-10	3.4E-08	mg/m^3	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	6.2E-10	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	4.E-10	4.8E-09	mg/m^3	2.0E-06	mg/m^3	Developmental	2.E-03
				Benzo(b)fluoranthene	74.0	mg/kg	1.0E-09	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	6.E-11	8.1E-09	mg/m^3	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	4.5E-10	mg/m^3	6.0E-03	$(mg/m^3)^{-1}$	3.E-12	3.5E-09	mg/m^3	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	6.8E-08	mg/m^3	NA		NA	5.3E-07	mg/m^3	4.0E-04	mg/m^3	Lung, Liver, Renal	1.E-03
				Dibenz(a,h)anthracene	7.2	mg/kg	3.9E-11	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	2.E-11	3.0E-10	mg/m^3	NA		--	NA
				Dibenzofuran	46.1	mg/kg	8.9E-08	mg/m^3	NA		NA	6.9E-07	mg/m^3	NA		--	NA
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	1.0E-10	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	6.E-12	8.1E-10	mg/m^3	NA		--	NA
				Naphthalene	13.1	mg/kg	8.4E-08	mg/m^3	3.4E-02	$(mg/m^3)^{-1}$	3.E-09	6.6E-07	mg/m^3	3.0E-03	mg/m^3	Nervous, Respiratory	2.E-04
			Exp. Route Total								1.E-08						5.E-03
		Exposure Point Total									5.E-07						5.E-02
	Exposure Medium Total										5.E-07						5.E-02
Surface/Subsurface Soil Total											5.E-07						5.E-02

Notes:
NA = Not available

Total Cardiovascular HI Across All Media =	2.E-03
Total Dermal HI Across All Media =	2.E-02
Total Developmental HI Across All Media =	6.E-03
Total Gastrointestinal HI Across All Media =	8.E-04
Total Hematologic HI Across All Media =	6.E-03
Total Immune HI Across All Media =	1.E-02
Total Renal HI Across All Media =	1.E-03
Total Liver HI Across All Media =	1.E-03
Total Lung/Respiratory HI Across All Media =	2.E-03
Total Nervous HI Across All Media =	3.E-04
Total Ocular HI Across All Media =	1.E-02
Total Other HI Across All Media =	9.E-03
Total Thyroid HI Across All Media =	2.E-03
Total Urinary HI Across All Media =	1.E-02
Total Whole body HI Across All Media =	2.E-03

Table 14
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Surface & Subsurface Soil	Surface & Subsurface Soil	Waste Pile Staging Area	Ingestion	Trichloroethene	1.231	mg/kg	5.0E-08	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	2.E-09	3.5E-06	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune,	7.E-03
				Antimony	135.1	mg/kg	5.5E-06	mg/kg/day	NA		NA	3.8E-04	mg/kg/day	4.0E-04	mg/kg/day	Whole body	1.E+00
				Arsenic	43.4	mg/kg	1.8E-06	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	3.E-06	1.2E-04	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	4.E-01
				Cadmium	802.3	mg/kg	3.2E-05	mg/kg/day	NA		NA	2.3E-03	mg/kg/day	5.0E-04	mg/kg/day	Musculoskeletal	5.E+00
				Cobalt	35.8	mg/kg	1.4E-06	mg/kg/day	NA		NA	1.0E-04	mg/kg/day	3.0E-03	mg/kg/day	Thyroid	3.E-02
				Copper	1928.0	mg/kg	7.8E-05	mg/kg/day	NA		NA	5.4E-03	mg/kg/day	1.0E-02	mg/kg/day	Gastrointestinal	5.E-01
				Lead	900.6	mg/kg	3.6E-05	mg/kg/day	NA		NA	2.5E-03	mg/kg/day	NA		--	NA
				Manganese	748.3	mg/kg	3.0E-05	mg/kg/day	NA		NA	2.1E-03	mg/kg/day	1.4E-01	mg/kg/day	Nervous	2.E-02
				Nickel	883.3	mg/kg	3.6E-05	mg/kg/day	NA		NA	2.5E-03	mg/kg/day	2.0E-02	mg/kg/day	Whole body	1.E-01
				Thallium	2.1	mg/kg	8.4E-08	mg/kg/day	NA		NA	5.9E-06	mg/kg/day	4.0E-05	mg/kg/day	Other	1.E-01
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.0E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	2.E-07	7.1E-06	mg/kg/day	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	6.1E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-06	4.2E-05	mg/kg/day	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	5.9E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-06	4.1E-05	mg/kg/day	3.0E-05	mg/kg/day	Neurological	1.E+00
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	1.3E-07	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	3.E-07	9.1E-06	mg/kg/day	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	2.6E-06	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	3.E-07	1.8E-04	mg/kg/day	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	1.9E-06	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	2.E-06	1.4E-04	mg/kg/day	3.0E-04	mg/kg/day	Developmental	5.E-01
				Benzo(b)fluoranthene	74.0	mg/kg	3.0E-06	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	3.E-07	2.1E-04	mg/kg/day	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	1.3E-06	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	1.E-08	9.2E-05	mg/kg/day	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	1.0E-06	mg/kg/day	8.0E-03	$(mg/kg/day)^{-1}$	8.E-09	7.3E-05	mg/kg/day	1.0E-01	mg/kg/day	Developmental	7.E-04
				Dibenz(a,h)anthracene	7.2	mg/kg	2.9E-07	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	3.E-07	2.0E-05	mg/kg/day	NA		--	NA
				Dibenzofuran	46.1	mg/kg	1.9E-06	mg/kg/day	NA		NA	1.3E-04	mg/kg/day	4.0E-03	mg/kg/day	Whole body	3.E-02
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	6.6E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	7.E-08	4.6E-05	mg/kg/day	NA		--	NA
				Naphthalene	13.1	mg/kg	5.3E-07	mg/kg/day	NA		NA	3.7E-05	mg/kg/day	6.0E-01	mg/kg/day	Neurological	6.E-05
			Exp. Route Total								8.E-06						9.E+00
			Dermal														
				Trichloroethene	1.231	mg/kg	NA	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	NA	NA		5.0E-04	mg/kg/day	Developmental, Immune,	NA
				Antimony	135.1	mg/kg	NA		NA		NA	NA		6.0E-05	mg/kg/day	Whole body	NA
				Arsenic	43.4	mg/kg	1.6E-09	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	2.E-09	4.7E-06	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	2.E-02
				Cadmium	802.3	mg/kg	5.2E-11	mg/kg/day	NA		NA	2.9E-06	mg/kg/day	1.3E-05	mg/kg/day	Musculoskeletal	2.E-01
				Cobalt	35.8	mg/kg	NA		NA		NA	NA		3.0E-03	mg/kg/day	Thyroid	NA
				Copper	1928.0	mg/kg	NA		NA		NA	NA		1.0E-02	mg/kg/day	Gastrointestinal	NA
				Lead	900.6	mg/kg	NA		NA		NA	NA		NA	mg/kg/day	--	NA
				Manganese	748.3	mg/kg	NA		NA		NA	NA		1.4E-01	mg/kg/day	Nervous	NA
				Nickel	883.3	mg/kg	NA		NA		NA	NA		8.0E-04	mg/kg/day	Whole body	NA
				Thallium	2.1	mg/kg	NA		NA		NA	NA		4.0E-05	mg/kg/day	Other	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	1.3E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	7.6E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	7.4E-06	mg/kg/day	3.0E-05	mg/kg/day	Neurological	2.E-01
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	7.2E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	1.E-08	1.6E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(a)anthracene	64.4	mg/kg	6.7E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	7.E-10	3.0E-05	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(a)pyrene	48.2	mg/kg	6.7E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	7.E-09	2.3E-05	mg/kg/day	3.0E-04	mg/kg/day	Developmental	8.E-02
				Benzo(b)fluoranthene	74.0	mg/kg	6.7E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	7.E-10	3.5E-05	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	6.7E-09	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	7.E-11	1.5E-05	mg/kg/day	NA	mg/kg/day	--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	NA		8.0E-03	$(mg/kg/day)^{-1}$	NA	NA		1.0E-01	mg/kg/day	Developmental	NA

Table 14
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
							Intake/Exposure Concentration		CSF/Unit Risk			Intake/Exposure Concentration		RfD/RfC			
					Value	Units	Value	Units	Value	Units	Cancer Risk	Value	Units	Value	Units	target organ	Hazard Quotient
				Dibenz(a,h)anthracene	7.2	mg/kg	6.7E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	7.E-09	3.4E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Dibenzofuran	46.1	mg/kg	1.6E-09	mg/kg/day	NA		NA	5.0E-06	mg/kg/day	4.0E-03	mg/kg/day	Whole body	1.E-03
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	6.7E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	7.E-10	7.7E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Naphthalene	13.1	mg/kg	6.7E-09	mg/kg/day	NA		NA	6.2E-06	mg/kg/day	6.0E-01	mg/kg/day	Neurological	1.E-05
			Exp. Route Total								8.E-08						6.E-01
	Outdoor Air	Waste Pile Staging Area	Inhalation	Trichloroethene	1.231	mg/kg	8.2E-06	mg/m^3	4.1E-03	$(mg/m^3)^{-1}$	3.E-08	5.7E-04	mg/m^3	2.2E-03	mg/m^3	Developmental, Immune	3.E-01
				Antimony	135.1	mg/kg	3.2E-10	mg/m^3	NA		NA	2.3E-08	mg/m^3	NA	mg/m^3	--	NA
				Arsenic	43.4	mg/kg	1.0E-10	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	4.E-10	7.3E-09	mg/m^3	1.5E-05	mg/m^3	Developmental	5.E-04
				Cadmium	802.3	mg/kg	1.9E-09	mg/m^3	1.8E+00	$(mg/m^3)^{-1}$	3.E-09	1.3E-07	mg/m^3	1.0E-05	mg/m^3	Renal	1.E-02
				Cobalt	35.8	mg/kg	8.6E-11	mg/m^3	9.0E+00	$(mg/m^3)^{-1}$	8.E-10	6.0E-09	mg/m^3	2.0E-05	mg/m^3	Lung, Respiratory	3.E-04
				Copper	1928.0	mg/kg	4.6E-09	mg/m^3	NA		NA	3.2E-07	mg/m^3	NA	mg/m^3	--	NA
				Lead	900.6	mg/kg	2.2E-09	mg/m^3	NA		NA	1.5E-07	mg/m^3	NA	mg/m^3	--	NA
				Manganese	748.3	mg/kg	1.8E-09	mg/m^3	NA		NA	1.3E-07	mg/m^3	5.0E-05	mg/m^3	Nervous	3.E-03
				Nickel	883.3	mg/kg	2.1E-09	mg/m^3	2.6E-01	$(mg/m^3)^{-1}$	6.E-10	1.5E-07	mg/m^3	2.0E-04	mg/m^3	Respiratory	7.E-04
				Thallium	2.1	mg/kg	5.0E-12	mg/m^3	NA		NA	3.5E-10	mg/m^3	NA	mg/m^3	--	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	6.2E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	4.E-08	4.4E-06	mg/m^3	NA	mg/m^3	--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	4.3E-07	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	2.E-07	3.0E-05	mg/m^3	NA	mg/m^3	--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	2.5E-07	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	1.E-07	1.8E-05	mg/m^3	NA	mg/m^3	--	NA
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	3.6E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	2.E-08	2.5E-06	mg/m^3	NA	mg/m^3	--	NA
				Benzo(a)anthracene	64.4	mg/kg	2.1E-07	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	1.E-08	1.5E-05	mg/m^3	NA	mg/m^3	--	NA
				Benzo(a)pyrene	48.2	mg/kg	3.0E-08	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	2.E-08	2.1E-06	mg/m^3	2.0E-06	mg/m^3	Developmental	1.E+00
				Benzo(b)fluoranthene	74.0	mg/kg	5.1E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	3.E-09	3.6E-06	mg/m^3	NA	mg/m^3	--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	2.2E-08	mg/m^3	6.0E-03	$(mg/m^3)^{-1}$	1.E-10	1.5E-06	mg/m^3	NA	mg/m^3	--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	3.4E-06	mg/m^3	NA		NA	2.4E-04	mg/m^3	4.0E-03	mg/m^3	Lung, Liver, Renal	6.E-02
				Dibenz(a,h)anthracene	7.2	mg/kg	1.9E-09	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	1.E-09	1.3E-07	mg/m^3	NA	mg/m^3	--	NA
				Dibenzofuran	46.1	mg/kg	4.4E-06	mg/m^3	NA		NA	3.1E-04	mg/m^3	NA	mg/m^3	--	NA
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	5.0E-09	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	3.E-10	3.5E-07	mg/m^3	NA	mg/m^3	--	NA
				Naphthalene	13.1	mg/kg	4.1E-06	mg/m^3	3.4E-02	$(mg/m^3)^{-1}$	1.E-07	2.9E-04	mg/m^3	3.0E-03	mg/m^3	Nervous, Respiratory	1.E-01
			Exp. Route Total								7.E-07						1.E+00
		Exposure Point Total									9.E-06						1.E+01
	Exposure Medium Total										9.E-06						1.E+01
Surface/Subsurface Soil Total											9.E-06						1.E+01

Notes:
NA = Not available

Total Cardiovascular HI Across All Media =	4E-01
Total Dermal HI Across All Media =	4E-01
Total Developmental HI Across All Media =	2E+00
Total Gastrointestinal HI Across All Media =	5E-01
Total Immune HI Across All Media =	3E-01
Total Liver HI Across All Media =	6E-02
Total Lung/Respiratory HI Across All Media =	2E-01
Total Musculoskeletal HI Across All Media =	5E+00
Total Nervous HI Across All Media =	1E-01
Total Neurological HI Across All Media =	2E+00

Table 15
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Surface & Subsurface Soil	Surface & Subsurface Soil	Waste Pile Staging Area	Ingestion														
				Trichloroethene	1.231	mg/kg	7.5E-09	mg/kg/day	4.6E-02	$(mg/kg/day)^{-1}$	3.E-10	5.3E-07	mg/kg/day	5.0E-04	mg/kg/day	Developmental, Immune,	1E-03
				Antimony	135.1	mg/kg	8.3E-07	mg/kg/day	NA		NA	5.8E-05	mg/kg/day	4.0E-04	mg/kg/day	Whole body	1E-01
				Arsenic	43.4	mg/kg	2.7E-07	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	4.E-07	1.9E-05	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	6E-02
				Cadmium	802.3	mg/kg	4.9E-06	mg/kg/day	NA		NA	3.4E-04	mg/kg/day	5.0E-04	mg/kg/day	Musculoskeletal	7E-01
				Cobalt	35.8	mg/kg	2.2E-07	mg/kg/day	NA		NA	1.5E-05	mg/kg/day	3.0E-03	mg/kg/day	Thyroid	5E-03
				Copper	1928.0	mg/kg	1.2E-05	mg/kg/day	NA		NA	8.3E-04	mg/kg/day	1.0E-02	mg/kg/day	Gastrointestinal	8E-02
				Lead	900.6	mg/kg	5.5E-06	mg/kg/day	NA		NA	3.9E-04	mg/kg/day	NA	mg/kg/day	--	NA
				Manganese	748.3	mg/kg	4.6E-06	mg/kg/day	NA		NA	3.2E-04	mg/kg/day	1.4E-01	mg/kg/day	Nervous	2E-03
				Nickel	883.3	mg/kg	5.4E-06	mg/kg/day	NA		NA	3.8E-04	mg/kg/day	2.0E-02	mg/kg/day	Whole body	2E-02
				Thallium	2.1	mg/kg	1.3E-08	mg/kg/day	NA		NA	8.9E-07	mg/kg/day	4.0E-05	mg/kg/day	Other	2E-02
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.5E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	3.E-08	1.1E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	9.2E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	2.E-07	6.4E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	8.9E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	2.E-07	6.2E-06	mg/kg/day	3.0E-05	mg/kg/day	Neurological	2E-01
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	2.0E-08	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	4.E-08	1.4E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(a)anthracene	64.4	mg/kg	3.9E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	4.E-08	2.8E-05	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(a)pyrene	48.2	mg/kg	2.9E-07	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	3.E-07	2.1E-05	mg/kg/day	3.0E-04	mg/kg/day	Developmental	7E-02
				Benzo(b)fluoranthene	74.0	mg/kg	4.5E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	5.E-08	3.2E-05	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	2.0E-07	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	2.E-09	1.4E-05	mg/kg/day	NA	mg/kg/day	--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	1.6E-07	mg/kg/day	8.0E-03	$(mg/kg/day)^{-1}$	1.E-09	1.1E-05	mg/kg/day	1.0E-01	mg/kg/day	Developmental	1E-04
				Dibenz(a,h)anthracene	7.2	mg/kg	4.4E-08	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	4.E-08	3.1E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Dibenzofuran	46.1	mg/kg	2.8E-07	mg/kg/day	NA		NA	2.0E-05	mg/kg/day	4.0E-03	mg/kg/day	Whole body	5E-03
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	1.0E-07	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	1.E-08	7.0E-06	mg/kg/day	NA	mg/kg/day	--	NA
				Naphthalene	13.1	mg/kg	8.0E-08	mg/kg/day	NA		NA	5.6E-06	mg/kg/day	6.0E-01	mg/kg/day	Neurological	9E-06
			Exp. Route Total								1.E-06						1E+00
			Dermal														
				Trichloroethene	1.231	mg/kg	NA		4.6E-02	$(mg/kg/day)^{-1}$	NA	NA		5.0E-04	mg/kg/day	Developmental, Immune,	NA
				Antimony	135.1	mg/kg	NA		NA		NA	NA		6.0E-05	mg/kg/day	Whole body	NA
				Arsenic	43.4	mg/kg	7.8E-10	mg/kg/day	1.5E+00	$(mg/kg/day)^{-1}$	1.E-09	5.4E-08	mg/kg/day	3.0E-04	mg/kg/day	Cardiovascular, Dermal	2E-04
				Cadmium	802.3	mg/kg	2.6E-11	mg/kg/day	NA		NA	1.8E-09	mg/kg/day	1.3E-05	mg/kg/day	Musculoskeletal	1E-04
				Cobalt	35.8	mg/kg	NA		NA		NA	NA		3.0E-03	mg/kg/day	Thyroid	NA
				Copper	1928.0	mg/kg	NA		NA		NA	NA		1.0E-02	mg/kg/day	Gastrointestinal	NA
				Lead	900.6	mg/kg	NA		NA		NA	NA		NA	mg/kg/day	--	NA
				Manganese	748.3	mg/kg	NA		NA		NA	NA		1.4E-01	mg/kg/day	Nervous	NA
				Nickel	883.3	mg/kg	NA		NA		NA	NA		8.0E-04	mg/kg/day	Whole body	NA
				Thallium	2.1	mg/kg	NA		NA		NA	NA		4.0E-05	mg/kg/day	Other	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	3.6E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	7.E-09	2.5E-07	mg/kg/day	NA	mg/kg/day	--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	3.6E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	7.E-09	2.5E-07	mg/kg/day	NA	mg/kg/day	--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	3.6E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	7.E-09	2.5E-07	mg/kg/day	3.0E-05	mg/kg/day	Neurological	8E-03
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	3.6E-09	mg/kg/day	2.0E+00	$(mg/kg/day)^{-1}$	7.E-09	2.5E-07	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(a)anthracene	64.4	mg/kg	3.4E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	3.E-10	2.4E-07	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(a)pyrene	48.2	mg/kg	3.4E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	3.E-09	2.4E-07	mg/kg/day	3.0E-04	mg/kg/day	Developmental	8E-04
				Benzo(b)fluoranthene	74.0	mg/kg	3.4E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	3.E-10	2.4E-07	mg/kg/day	NA	mg/kg/day	--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	3.4E-09	mg/kg/day	1.0E-02	$(mg/kg/day)^{-1}$	3.E-11	2.4E-07	mg/kg/day	NA	mg/kg/day	--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	NA		8.0E-03	$(mg/kg/day)^{-1}$	NA	NA		1.0E-01	mg/kg/day	Developmental	NA

Table 15
Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE
Human Health Risk Assessment
RACER Trust, Moraine, Ohio

Scenario Timeframe: Future
Exposure Area: Waste Pile Staging Area
Receptor: On-site Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	target organ	
				Dibenz(a,h)anthracene	7.2	mg/kg	3.4E-09	mg/kg/day	1.0E+00	$(mg/kg/day)^{-1}$	3.E-09	2.4E-07		NA	mg/kg/day	--	NA
				Dibenzofuran	46.1	mg/kg	7.8E-10	mg/kg/day	NA		NA	5.4E-08		4.0E-03	mg/kg/day	Whole body	1E-05
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	3.4E-09	mg/kg/day	1.0E-01	$(mg/kg/day)^{-1}$	3.E-10	2.4E-07		NA	mg/kg/day	--	NA
				Naphthalene	13.1	mg/kg	3.4E-09	mg/kg/day	NA		NA	2.4E-07	mg/kg/day	6.0E-01	mg/kg/day	Neurological	4E-07
			Exp. Route Total								4.E-08						1E-02
	Outdoor Air	Waste Pile Staging Area	Inhalation	Trichloroethene	1.231	mg/kg	2.1E-06	mg/m^3	4.1E-03	$(mg/m^3)^{-1}$	8.E-09	1.4E-04	mg/m^3	2.2E-03	mg/m^3	Developmental, Immune	7E-02
				Antimony	135.1	mg/kg	8.1E-11	mg/m^3	NA		NA	5.7E-09	mg/m^3	NA		--	NA
				Arsenic	43.4	mg/kg	2.6E-11	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	1.E-10	1.8E-09	mg/m^3	1.5E-05	mg/m^3	Developmental	1E-04
				Cadmium	802.3	mg/kg	4.8E-10	mg/m^3	1.8E+00	$(mg/m^3)^{-1}$	9.E-10	3.4E-08	mg/m^3	1.0E-05	mg/m^3	Renal	3E-03
				Cobalt	35.8	mg/kg	2.1E-11	mg/m^3	9.0E+00	$(mg/m^3)^{-1}$	2.E-10	1.5E-09	mg/m^3	2.0E-05	mg/m^3	Lung, Respiratory	8E-05
				Copper	1928.0	mg/kg	1.2E-09	mg/m^3	NA		NA	8.1E-08	mg/m^3	NA		--	NA
				Lead	900.6	mg/kg	5.4E-10	mg/m^3	NA		NA	3.8E-08	mg/m^3	NA		--	NA
				Manganese	748.3	mg/kg	4.5E-10	mg/m^3	NA		NA	3.1E-08	mg/m^3	5.0E-05	mg/m^3	Nervous	6E-04
				Nickel	883.3	mg/kg	5.3E-10	mg/m^3	2.6E-01	$(mg/m^3)^{-1}$	1.E-10	3.7E-08	mg/m^3	2.0E-04	mg/m^3	Respiratory	2E-04
				Thallium	2.1	mg/kg	1.2E-12	mg/m^3	NA		NA	8.7E-11	mg/m^3	NA		--	NA
				Aroclor-1242 (PCB-1242)	2.5	mg/kg	1.6E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	9.E-09	1.1E-06	mg/m^3	NA		--	NA
				Aroclor-1248 (PCB-1248)	15.0	mg/kg	1.1E-07	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	6.E-08	7.5E-06	mg/m^3	NA		--	NA
				Aroclor-1254 (PCB-1254)	14.6	mg/kg	6.4E-08	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	4.E-08	4.5E-06	mg/m^3	NA		--	NA
				Aroclor-1260 (PCB-1260)	3.2	mg/kg	9.0E-09	mg/m^3	5.7E-01	$(mg/m^3)^{-1}$	5.E-09	6.3E-07	mg/m^3	NA		--	NA
				Benzo(a)anthracene	64.4	mg/kg	5.4E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	3.E-09	3.8E-06	mg/m^3	NA		--	NA
				Benzo(a)pyrene	48.2	mg/kg	7.5E-09	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	4.E-09	5.2E-07	mg/m^3	2.0E-06	mg/m^3	Developmental	3E-01
				Benzo(b)fluoranthene	74.0	mg/kg	1.3E-08	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	8.E-10	8.9E-07	mg/m^3	NA		--	NA
				Benzo(k)fluoranthene	32.4	mg/kg	5.4E-09	mg/m^3	6.0E-03	$(mg/m^3)^{-1}$	3.E-11	3.8E-07	mg/m^3	NA		--	NA
				Biphenyl (1,1-Biphenyl)	26.0	mg/kg	8.4E-07	mg/m^3	NA		NA	5.9E-05	mg/m^3	4.0E-03	mg/m^3	Lung, Liver, Renal	1E-02
				Dibenz(a,h)anthracene	7.2	mg/kg	4.7E-10	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	3.E-10	3.3E-08	mg/m^3	NA		--	NA
				Dibenzofuran	46.1	mg/kg	1.1E-06	mg/m^3	NA		NA	7.6E-05	mg/m^3	NA		--	NA
				Indeno(1,2,3-cd)pyrene	16.3	mg/kg	1.3E-09	mg/m^3	6.0E-02	$(mg/m^3)^{-1}$	8.E-11	8.8E-08	mg/m^3	NA		--	NA
				Naphthalene	13.1	mg/kg	1.0E-06	mg/m^3	3.4E-02	$(mg/m^3)^{-1}$	4.E-08	7.3E-05	mg/m^3	3.0E-03	mg/m^3	Nervous, Respiratory	2E-02
			Exp. Route Total								2.E-07						4E-01
		Exposure Point Total									1.E-06						2E+00
	Exposure Medium Total										1.E-06						2E+00
Surface/Subsurface Soil Total											1.E-06						2E+00

Notes:

NA = Not available

Total Cardiovascular HI Across All Media =	6E-02
Total Dermal HI Across All Media =	6E-02
Total Developmental HI Across All Media =	4E-01
Total Gastrointestinal HI Across All Media =	8E-02
Total Immune HI Across All Media =	7E-02
Total Liver HI Across All Media =	1E-02
Total Lung/Respiratory HI Across All Media =	4E-02
Total Musculoskeletal HI Across All Media =	7E-01
Total Nervous HI Across All Media =	3E-02
Total Neurological HI Across All Media =	2E-01
Total Other HI Across All Media =	2E-02
Total Renal HI Across All Media =	2E-02
Total Thyroid HI Across All Media =	5E-03
Total Whole body HI Across All Media =	2E-01

Table 16 - ALM Ouput, RME Scenario
Calculations of Blood Lead Concentrations (PbBs) and Risk in Nonresidential Areas
U.S. EPA Technical Review Workgroup for Lead
Version date 06/14/2017

			On-Site Routine Worker, WPSA	On-Site Maintenance Worker, WPSA	On-Site Construction Worker, WPSA
Variable	**Description of Variable**	**Units**	**GSDi and PbBo from Analysis of NHANES 2009-2014**	**GSDi and PbBo from Analysis of NHANES 2007-2010**	**GSDi and PbBo from Analysis of NHANES 2004-2007**
PbS	Soil lead concentration	µg/g or ppm	365.1	365.1	365.1
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.8	1.8
PbB_0	Baseline PbB	µg/dL	0.6	0.6	0.6
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.100	0.100
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	250	10	250
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365	14	365
PbB_{adult}	PbB of adult worker, geometric mean	µg/dL	1.2	1.9	1.8
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	µg/dL	2.8	4.4	4.3
PbB_t	Target PbB level of concern (e.g., 2-8 µg/dL)	µg/dL	**5.0**	**5.0**	**5.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB exceeds target PbB, assuming lognormal distribution**	**%**	**0.5%**	**3.1%**	**2.8%**

Notes:
[1] Lead was identified as a COPC in WPSA.
[2] Consistent with the ALM guidance (USEPA, 2003a; 2008), the arithmetic mean of lead concentrations was used in the ALM.
[a] Default value (USEPA, 2003a).
[b] Updated default central tendency estimate (CTE) for all U.S. populations (USEPA, 2009).
[c] Default CTE value for soil ingestion for contact-intensive adult scenarios (USEPA, 2011).
[d] Exposure frequency is the same value used to quantify potential exposures for other chemicals in the HHRA.
[e] Averaging time is based on EF to avoid diluting exposures over the entire year (e.g., 7 days per week x 26 weeks/year = 182 days/year) (USEPA, 2003b).
µg/dL = micrograms per deciliter
g/day = grams per day
ppm = parts per million

References:
USEPA. 2003a. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. EPA-540-R-03-001. January 2003.
USEPA. 2003b. Assessing Intermittent or Variable Exposures at Lead Sites. OSWER Directive #9285.7-76. EPA-540-R-03-008. November.
USEPA. 2009. Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. OSWER 9200.2-82. June 26.
USEPA. 2011. Frequent Questions from Risk Assessors on the ALM. http://www.epa.gov/superfund/health/contaminants/lead/almfaq.htm.

Notes - assumptions in lead model are 2017 updates.

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 17 - ALM Ouput, CTE Scenario
Calculations of Blood Lead Concentrations (PbBs) and Risk in Nonresidential Areas
U.S. EPA Technical Review Workgroup for Lead
Version date 06/14/2017

			On-Site Routine Worker, WPSA	On-Site Maintenance Worker, WPSA	On-Site Construction Worker, WPSA
Variable	**Description of Variable**	**Units**	**GSDi and PbBo from Analysis of NHANES 2009-2014**	**GSDi and PbBo from Analysis of NHANES 2007-2010**	**GSDi and PbBo from Analysis of NHANES 2004-2007**
PbS	Soil lead concentration	µg/g or ppm	365.1	365.1	365.1
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.8	1.8
PbB_0	Baseline PbB	µg/dL	0.6	0.6	0.6
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.100	0.100
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	125	5	125
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365	7	182
PbB_{adult}	PbB of adult worker, geometric mean	µg/dL	0.9	1.9	1.8
$PbB_{fetal,\ 0.95}$	95th percentile PbB among fetuses of adult workers	µg/dL	2.1	4.4	4.3
PbB_t	Target PbB level of concern (e.g., 2-8 µg/dL)	µg/dL	**5.0**	**5.0**	**5.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB exceeds target PbB, assuming lognormal distribution**	**%**	**0.1%**	**3.1%**	**2.8%**

Notes:
[1] Lead was identified as a COPC in WPSA.
[2] Consistent with the ALM guidance (USEPA, 2003a; 2008), the arithmetic mean of lead concentrations was used in the ALM.
[a] Default value (USEPA, 2003a).
[b] Updated default central tendency estimate (CTE) for all U.S. populations (USEPA, 2009).
[c] Default CTE value for soil ingestion for contact-intensive adult scenarios (USEPA, 2011).
[d] Exposure frequency is the same value used to quantify potential exposures for other chemicals in the HHRA.
[e] Averaging time is based on EF to avoid diluting exposures over the entire year (e.g., 7 days per week x 26 weeks/year = 182 days/year) (USEPA, 2003b).
µg/dL = micrograms per deciliter
g/day = grams per day
ppm = parts per million

References:
USEPA. 2003a. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. EPA-540-R-03-001. January 2003.
USEPA. 2003b. Assessing Intermittent or Variable Exposures at Lead Sites. OSWER Directive #9285.7-76. EPA-540-R-03-008. November.
USEPA. 2009. Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. OSWER 9200.2-82. June 26.
USEPA. 2011. Frequent Questions from Risk Assessors on the ALM. http://www.epa.gov/superfund/health/contaminants/lead/almfaq.htm.

Notes - assumptions in lead model are 2017 updates.

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Attachment A
ProUCL Output for WPSA Soil 0 to 10 feet bgs
RACER Trust, Moraine, Ohio

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.111/27/2019 3:41:13 PM
From File	WPSA Risk Soil Data_2019_proUCL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result (antimony)

General Statistics

Total Number of Observations	36	Number of Distinct Observations	31
Number of Detects	23	Number of Non-Detects	13
Number of Distinct Detects	23	Number of Distinct Non-Detects	9
Minimum Detect	6.5	Minimum Non-Detect	6.8
Maximum Detect	908	Maximum Non-Detect	35
Variance Detects	46723	Percent Non-Detects	36.11%
Mean Detects	129.2	SD Detects	216.2
Median Detects	33	CV Detects	1.674
Skewness Detects	2.676	Kurtosis Detects	7.657
Mean of Logged Detects	3.879	SD of Logged Detects	1.377

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.601	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.318	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	85.13	KM Standard Error of Mean	30.48
KM SD	178.8	95% KM (BCA) UCL	134.2
95% KM (t) UCL	136.6	95% KM (Percentile Bootstrap) UCL	136.7
95% KM (z) UCL	135.3	95% KM Bootstrap t UCL	186.8
90% KM Chebyshev UCL	176.6	95% KM Chebyshev UCL	218
97.5% KM Chebyshev UCL	275.5	99% KM Chebyshev UCL	388.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.594	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.794	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.248	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.19	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.625	k star (bias corrected MLE)	0.573
Theta hat (MLE)	206.6	Theta star (bias corrected MLE)	225.5
nu hat (MLE)	28.76	nu star (bias corrected)	26.35
Mean (detects)	129.2		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	82.52
Maximum	908	Median	21.9
SD	182.6	CV	2.212
k hat (MLE)	0.204	k star (bias corrected MLE)	0.205
Theta hat (MLE)	404.7	Theta star (bias corrected MLE)	401.7
nu hat (MLE)	14.68	nu star (bias corrected)	14.79
Adjusted Level of Significance (β)	0.0428		
Approximate Chi Square Value (14.79, α)	7.117	Adjusted Chi Square Value (14.79, β)	6.875
95% Gamma Approximate UCL (use when n>=50)	171.5	95% Gamma Adjusted UCL (use when n<50)	177.5

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	85.13	SD (KM)	178.8
Variance (KM)	31986	SE of Mean (KM)	30.48
k hat (KM)	0.227	k star (KM)	0.226
nu hat (KM)	16.31	nu star (KM)	16.29
theta hat (KM)	375.8	theta star (KM)	376.4
80% gamma percentile (KM)	118.9	90% gamma percentile (KM)	256.9
95% gamma percentile (KM)	424.2	99% gamma percentile (KM)	876

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (16.29, α)	8.164	Adjusted Chi Square Value (16.29, β)	7.902
95% Gamma Approximate KM-UCL (use when n>=50)	169.8	95% Gamma Adjusted KM-UCL (use when n<50)	175.4

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.914	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.18	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	83.98	Mean in Log Scale	2.94
SD in Original Scale	181.9	SD in Log Scale	1.699
95% t UCL (assumes normality of ROS data)	135.2	95% Percentile Bootstrap UCL	140.7
95% BCA Bootstrap UCL	157.8	95% Bootstrap t UCL	185.3
95% H-UCL (Log ROS)	205.8		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.178	KM Geo Mean	24
KM SD (logged)	1.431	95% Critical H Value (KM-Log)	2.915
KM Standard Error of Mean (logged)	0.245	95% H-UCL (KM -Log)	135.1
KM SD (logged)	1.431	95% Critical H Value (KM-Log)	2.915
KM Standard Error of Mean (logged)	0.245		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	84.7	Mean in Log Scale	3.081
SD in Original Scale	181.6	SD in Log Scale	1.561
95% t UCL (Assumes normality)	135.8	95% H-Stat UCL	166.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	135.1		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (aroclor-1254 (pcb-1254))

General Statistics

Total Number of Observations	40	Number of Distinct Observations	24
Number of Detects	5	Number of Non-Detects	35
Number of Distinct Detects	5	Number of Distinct Non-Detects	19
Minimum Detect	0.12	Minimum Non-Detect	0.039
Maximum Detect	80	Maximum Non-Detect	10
Variance Detects	1238	Percent Non-Detects	87.5%
Mean Detects	17.14	SD Detects	35.19
Median Detects	0.81	CV Detects	2.054
Skewness Detects	2.221	Kurtosis Detects	4.943
Mean of Logged Detects	0.336	SD of Logged Detects	2.697

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.592	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.439	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	2.245	KM Standard Error of Mean	2.206
KM SD	12.47	95% KM (BCA) UCL	6.366
95% KM (t) UCL	5.961	95% KM (Percentile Bootstrap) UCL	6.238
95% KM (z) UCL	5.873	95% KM Bootstrap t UCL	132.2
90% KM Chebyshev UCL	8.862	95% KM Chebyshev UCL	11.86
97.5% KM Chebyshev UCL	16.02	99% KM Chebyshev UCL	24.19

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.526	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.27	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.382	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.279	k star (bias corrected MLE)	0.245
Theta hat (MLE)	61.51	Theta star (bias corrected MLE)	70.01
nu hat (MLE)	2.786	nu star (bias corrected)	2.448
Mean (detects)	17.14		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	2.151
Maximum	80	Median	0.01
SD	12.65	CV	5.88
k hat (MLE)	0.16	k star (bias corrected MLE)	0.165
Theta hat (MLE)	13.43	Theta star (bias corrected MLE)	13.05
nu hat (MLE)	12.81	nu star (bias corrected)	13.18
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (13.18, α)	6.017	Adjusted Chi Square Value (13.18, β)	5.835
95% Gamma Approximate UCL (use when n>=50)	4.713	95% Gamma Adjusted UCL (use when n<50)	4.859

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	2.245	SD (KM)	12.47
Variance (KM)	155.6	SE of Mean (KM)	2.206
k hat (KM)	0.0324	k star (KM)	0.0466
nu hat (KM)	2.593	nu star (KM)	3.731
theta hat (KM)	69.29	theta star (KM)	48.14
80% gamma percentile (KM)	0.236	90% gamma percentile (KM)	3.116
95% gamma percentile (KM)	11.62	99% gamma percentile (KM)	50.18

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.73, α)	0.619	Adjusted Chi Square Value (3.73, β)	0.576
95% Gamma Approximate KM-UCL (use when n>=50)	13.55	95% Gamma Adjusted KM-UCL (use when n<50)	14.56
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	2.2	Mean in Log Scale	-2.918
SD in Original Scale	12.64	SD in Log Scale	1.919
95% t UCL (assumes normality of ROS data)	5.566	95% Percentile Bootstrap UCL	6.171
95% BCA Bootstrap UCL	8.448	95% Bootstrap t UCL	200.8
95% H-UCL (Log ROS)	1.047		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-2.079	KM Geo Mean	0.125
KM SD (logged)	1.389	95% Critical H Value (KM-Log)	2.898
KM Standard Error of Mean (logged)	0.418	95% H-UCL (KM -Log)	0.625
KM SD (logged)	1.389	95% Critical H Value (KM-Log)	2.898
KM Standard Error of Mean (logged)	0.418		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.736	Mean in Log Scale	-0.867
SD in Original Scale	12.59	SD in Log Scale	1.336
95% t UCL (Assumes normality)	6.091	95% H-Stat UCL	1.879
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	14.56		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (aroclor-1260 (pcb-1260))

General Statistics

Total Number of Observations	37	Number of Distinct Observations	18
Number of Detects	5	Number of Non-Detects	32
Number of Distinct Detects	3	Number of Distinct Non-Detects	16
Minimum Detect	0.6	Minimum Non-Detect	0.5
Maximum Detect	22	Maximum Non-Detect	10
Variance Detects	130.7	Percent Non-Detects	86.49%
Mean Detects	9.5	SD Detects	11.43
Median Detects	2.3	CV Detects	1.203
Skewness Detects	0.592	Kurtosis Detects	-3.311
Mean of Logged Detects	1.199	SD of Logged Detects	1.813

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.719	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.336	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.722	KM Standard Error of Mean	0.893
KM SD	4.857	95% KM (BCA) UCL	N/A
95% KM (t) UCL	3.23	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	3.191	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	4.401	95% KM Chebyshev UCL	5.614
97.5% KM Chebyshev UCL	7.298	99% KM Chebyshev UCL	10.61

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.618	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.277	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.37	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.589	k star (bias corrected MLE)	0.369
Theta hat (MLE)	16.14	Theta star (bias corrected MLE)	25.76
nu hat (MLE)	5.886	nu star (bias corrected)	3.688
Mean (detects)	9.5		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	1.292
Maximum	22	Median	0.01
SD	5.034	CV	3.895
k hat (MLE)	0.183	k star (bias corrected MLE)	0.186
Theta hat (MLE)	7.063	Theta star (bias corrected MLE)	6.942
nu hat (MLE)	13.54	nu star (bias corrected)	13.78
Adjusted Level of Significance (β)	0.0431		
Approximate Chi Square Value (13.78, α)	6.418	Adjusted Chi Square Value (13.78, β)	6.2
95% Gamma Approximate UCL (use when n>=50)	2.774	95% Gamma Adjusted UCL (use when n<50)	2.872
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.722	SD (KM)	4.857
Variance (KM)	23.59	SE of Mean (KM)	0.893
k hat (KM)	0.126	k star (KM)	0.134
nu hat (KM)	9.304	nu star (KM)	9.883
theta hat (KM)	13.7	theta star (KM)	12.9
80% gamma percentile (KM)	1.69	90% gamma percentile (KM)	5.006
95% gamma percentile (KM)	9.677	99% gamma percentile (KM)	23.57
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.88, α)	3.869	Adjusted Chi Square Value (9.88, β)	3.706
95% Gamma Approximate KM-UCL (use when n>=50)	4.399	95% Gamma Adjusted KM-UCL (use when n<50)	4.592
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.81	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.252	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.289	Mean in Log Scale	-5.374
SD in Original Scale	5.035	SD in Log Scale	3.196
95% t UCL (assumes normality of ROS data)	2.686	95% Percentile Bootstrap UCL	2.978
95% BCA Bootstrap UCL	3.605	95% Bootstrap t UCL	16.97
95% H-UCL (Log ROS)	14.86		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.431	KM Geo Mean	0.65
KM SD (logged)	0.881	95% Critical H Value (KM-Log)	2.259
KM Standard Error of Mean (logged)	0.163	95% H-UCL (KM -Log)	1.335
KM SD (logged)	0.881	95% Critical H Value (KM-Log)	2.259
KM Standard Error of Mean (logged)	0.163		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.753	Mean in Log Scale	-0.749
SD in Original Scale	4.992	SD in Log Scale	1.176
95% t UCL (Assumes normality)	3.138	95% H-Stat UCL	1.572

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	3.23

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (arsenic)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	39
		Number of Missing Observations	0
Minimum	2.05	Mean	16.12
Maximum	223	Median	7
SD	39.57	Std. Error of Mean	6.257

Coefficient of Variation	2.454	Skewness	4.628
Normal GOF Test			
Shapiro Wilk Test Statistic	0.324	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.431	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.139	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	26.67	95% Adjusted-CLT UCL (Chen-1995)	31.31
		95% Modified-t UCL (Johnson-1978)	27.43
Gamma GOF Test			
A-D Test Statistic	5.661	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.787	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.308	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.145	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.799	k star (bias corrected MLE)	0.756
Theta hat (MLE)	20.17	Theta star (bias corrected MLE)	21.32
nu hat (MLE)	63.96	nu star (bias corrected)	60.49
MLE Mean (bias corrected)	16.12	MLE Sd (bias corrected)	18.54
		Approximate Chi Square Value (0.05)	43.61
Adjusted Level of Significance	0.044	Adjusted Chi Square Value	43.07
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	22.37	95% Adjusted Gamma UCL (use when n<50)	22.65
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.819	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.173	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.139	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	0.718	Mean of logged Data	2.038
Maximum of Logged Data	5.407	SD of logged Data	0.902
Assuming Lognormal Distribution			

95% H-UCL	16.06	90% Chebyshev (MVUE) UCL	16.91
95% Chebyshev (MVUE) UCL	19.41	97.5% Chebyshev (MVUE) UCL	22.9
99% Chebyshev (MVUE) UCL	29.74		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	26.42	95% Jackknife UCL	26.67
95% Standard Bootstrap UCL	26.24	95% Bootstrap-t UCL	109.2
95% Hall's Bootstrap UCL	82.9	95% Percentile Bootstrap UCL	27.3
95% BCA Bootstrap UCL	33.18		
90% Chebyshev(Mean, Sd) UCL	34.89	95% Chebyshev(Mean, Sd) UCL	43.4
97.5% Chebyshev(Mean, Sd) UCL	55.2	99% Chebyshev(Mean, Sd) UCL	78.38

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	43.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(a)anthracene)

General Statistics

Total Number of Observations	45	Number of Distinct Observations	41
Number of Detects	11	Number of Non-Detects	34
Number of Distinct Detects	11	Number of Distinct Non-Detects	30
Minimum Detect	0.05	Minimum Non-Detect	0.34
Maximum Detect	520	Maximum Non-Detect	41
Variance Detects	24385	Percent Non-Detects	75.56%
Mean Detects	49.26	SD Detects	156.2
Median Detects	1.85	CV Detects	3.17
Skewness Detects	3.314	Kurtosis Detects	10.99
Mean of Logged Detects	0.444	SD of Logged Detects	2.439

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.359	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.506	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	12.17	KM Standard Error of Mean	11.97
KM SD	76.58	95% KM (BCA) UCL	35.4
95% KM (t) UCL	32.29	95% KM (Percentile Bootstrap) UCL	35.19
95% KM (z) UCL	31.87	95% KM Bootstrap t UCL	1369
90% KM Chebyshev UCL	48.09	95% KM Chebyshev UCL	64.36
97.5% KM Chebyshev UCL	86.94	99% KM Chebyshev UCL	131.3

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.82	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.857	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.387	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.281	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.211	k star (bias corrected MLE)	0.214
Theta hat (MLE)	233.2	Theta star (bias corrected MLE)	229.9
nu hat (MLE)	4.648	nu star (bias corrected)	4.714
Mean (detects)	49.26		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	12.05
Maximum	520	Median	0.01
SD	77.46	CV	6.429
k hat (MLE)	0.133	k star (bias corrected MLE)	0.139
Theta hat (MLE)	90.34	Theta star (bias corrected MLE)	86.5
nu hat (MLE)	12	nu star (bias corrected)	12.54
Adjusted Level of Significance (β)	0.0447		
Approximate Chi Square Value (12.54, α)	5.583	Adjusted Chi Square Value (12.54, β)	5.429
95% Gamma Approximate UCL (use when n>=50)	27.06	95% Gamma Adjusted UCL (use when n<50)	27.83

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	12.17	SD (KM)	76.58
Variance (KM)	5864	SE of Mean (KM)	11.97
k hat (KM)	0.0253	k star (KM)	0.0384
nu hat (KM)	2.274	nu star (KM)	3.456
theta hat (KM)	481.8	theta star (KM)	317

80% gamma percentile (KM)	0.55	90% gamma percentile (KM)	12.25
95% gamma percentile (KM)	56.99	99% gamma percentile (KM)	291.7
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.46, α)	0.519	Adjusted Chi Square Value (3.46, β)	0.486
95% Gamma Approximate KM-UCL (use when n>=50)	81	95% Gamma Adjusted KM-UCL (use when n<50)	86.58
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.905	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.218	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	12.08	Mean in Log Scale	-2.234
SD in Original Scale	77.46	SD in Log Scale	1.991
95% t UCL (assumes normality of ROS data)	31.48	95% Percentile Bootstrap UCL	35.15
95% BCA Bootstrap UCL	57.97	95% Bootstrap t UCL	1474
95% H-UCL (Log ROS)	2.34		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.658	KM Geo Mean	0.19
KM SD (logged)	1.788	95% Critical H Value (KM-Log)	3.386
KM Standard Error of Mean (logged)	0.42	95% H-UCL (KM -Log)	2.349
KM SD (logged)	1.788	95% Critical H Value (KM-Log)	3.386
KM Standard Error of Mean (logged)	0.42		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	13.21	Mean in Log Scale	-0.665
SD in Original Scale	77.36	SD in Log Scale	1.773
95% t UCL (Assumes normality)	32.59	95% H-Stat UCL	6.092
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Level			
Suggested UCL to Use			
97.5% KM (Chebyshev) UCL	86.94		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(a)pyrene)

General Statistics

Total Number of Observations	46	Number of Distinct Observations	41
Number of Detects	16	Number of Non-Detects	30
Number of Distinct Detects	15	Number of Distinct Non-Detects	26
Minimum Detect	0.054	Minimum Non-Detect	0.172
Maximum Detect	380	Maximum Non-Detect	18
Variance Detects	8858	Percent Non-Detects	65.22%
Mean Detects	31.82	SD Detects	94.12
Median Detects	1.51	CV Detects	2.958
Skewness Detects	3.827	Kurtosis Detects	14.96
Mean of Logged Detects	0.953	SD of Logged Detects	2.269

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.375	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.396	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.213	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	11.17	KM Standard Error of Mean	8.501
KM SD	55.82	95% KM (BCA) UCL	27.02
95% KM (t) UCL	25.45	95% KM (Percentile Bootstrap) UCL	26.91
95% KM (z) UCL	25.16	95% KM Bootstrap t UCL	86.52
90% KM Chebyshev UCL	36.68	95% KM Chebyshev UCL	48.23
97.5% KM Chebyshev UCL	64.26	99% KM Chebyshev UCL	95.76

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.459	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.848	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.259	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.234	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.278	k star (bias corrected MLE)	0.268
Theta hat (MLE)	114.3	Theta star (bias corrected MLE)	118.8
nu hat (MLE)	8.91	nu star (bias corrected)	8.573
Mean (detects)	31.82		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	11.07
Maximum	380	Median	0.01
SD	56.46	CV	5.098
k hat (MLE)	0.151	k star (bias corrected MLE)	0.156
Theta hat (MLE)	73.23	Theta star (bias corrected MLE)	71.06
nu hat (MLE)	13.91	nu star (bias corrected)	14.34
Adjusted Level of Significance (β)	0.0448		
Approximate Chi Square Value (14.34, α)	6.804	Adjusted Chi Square Value (14.34, β)	6.635
95% Gamma Approximate UCL (use when n>=50)	23.34	95% Gamma Adjusted UCL (use when n<50)	23.93
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	11.17	SD (KM)	55.82
Variance (KM)	3116	SE of Mean (KM)	8.501
k hat (KM)	0.0401	k star (KM)	0.0519
nu hat (KM)	3.686	nu star (KM)	4.779
theta hat (KM)	278.9	theta star (KM)	215.1
80% gamma percentile (KM)	1.729	90% gamma percentile (KM)	17.9
95% gamma percentile (KM)	60.22	99% gamma percentile (KM)	239.4
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (4.78, α)	1.052	Adjusted Chi Square Value (4.78, β)	0.997
95% Gamma Approximate KM-UCL (use when n>=50)	50.79	95% Gamma Adjusted KM-UCL (use when n<50)	53.54
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.156	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.213	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	11.09	Mean in Log Scale	-2.084
SD in Original Scale	56.45	SD in Log Scale	2.672
95% t UCL (assumes normality of ROS data)	25.07	95% Percentile Bootstrap UCL	27.48
95% BCA Bootstrap UCL	36.78	95% Bootstrap t UCL	185.3
95% H-UCL (Log ROS)	26.97		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.42	KM Geo Mean	0.242
KM SD (logged)	2.257	95% Critical H Value (KM-Log)	3.942
KM Standard Error of Mean (logged)	0.357	95% H-UCL (KM -Log)	11.63
KM SD (logged)	2.257	95% Critical H Value (KM-Log)	3.942
KM Standard Error of Mean (logged)	0.357		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	11.67	Mean in Log Scale	-0.593
SD in Original Scale	56.37	SD in Log Scale	2.061
95% t UCL (Assumes normality)	25.62	95% H-Stat UCL	14.26

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	64.26		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(b)fluoranthene)

General Statistics			
Total Number of Observations	45	Number of Distinct Observations	43
Number of Detects	14	Number of Non-Detects	31
Number of Distinct Detects	14	Number of Distinct Non-Detects	29
Minimum Detect	0.058	Minimum Non-Detect	0.34
Maximum Detect	580	Maximum Non-Detect	69.2
Variance Detects	23760	Percent Non-Detects	68.89%
Mean Detects	50.71	SD Detects	154.1
Median Detects	2.67	CV Detects	3.04
Skewness Detects	3.603	Kurtosis Detects	13.19
Mean of Logged Detects	0.997	SD of Logged Detects	2.468

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.374	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.443	**Lilliefors GOF Test**

5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	15.96	KM Standard Error of Mean	13.32
KM SD	86.08	95% KM (BCA) UCL	41.96
95% KM (t) UCL	38.33	95% KM (Percentile Bootstrap) UCL	41.5
95% KM (z) UCL	37.86	95% KM Bootstrap t UCL	468.4
90% KM Chebyshev UCL	55.91	95% KM Chebyshev UCL	74
97.5% KM Chebyshev UCL	99.12	99% KM Chebyshev UCL	148.5
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.513	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.859	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.341	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.251	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.244	k star (bias corrected MLE)	0.239
Theta hat (MLE)	208.2	Theta star (bias corrected MLE)	212.2
nu hat (MLE)	6.819	nu star (bias corrected)	6.691
Mean (detects)	50.71		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	15.78
Maximum	580	Median	0.01
SD	87.08	CV	5.517
k hat (MLE)	0.138	k star (bias corrected MLE)	0.144
Theta hat (MLE)	114.1	Theta star (bias corrected MLE)	109.7
nu hat (MLE)	12.45	nu star (bias corrected)	12.95
Adjusted Level of Significance (β)	0.0447		
Approximate Chi Square Value (12.95, α)	5.861	Adjusted Chi Square Value (12.95, β)	5.703
95% Gamma Approximate UCL (use when n>=50)	34.88	95% Gamma Adjusted UCL (use when n<50)	35.85
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	15.96	SD (KM)	86.08
Variance (KM)	7410	SE of Mean (KM)	13.32
k hat (KM)	0.0344	k star (KM)	0.0469

nu hat (KM)	3.092	nu star (KM)	4.219
theta hat (KM)	464.4	theta star (KM)	340.3
80% gamma percentile (KM)	1.709	90% gamma percentile (KM)	22.3
95% gamma percentile (KM)	82.77	99% gamma percentile (KM)	355.9
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (4.22, α)	0.81	Adjusted Chi Square Value (4.22, β)	0.764
95% Gamma Approximate KM-UCL (use when n>=50)	83.09	95% Gamma Adjusted KM-UCL (use when n<50)	88.13
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.185	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	15.83	Mean in Log Scale	-1.585
SD in Original Scale	87.07	SD in Log Scale	2.256
95% t UCL (assumes normality of ROS data)	37.64	95% Percentile Bootstrap UCL	40.47
95% BCA Bootstrap UCL	56.69	95% Bootstrap t UCL	509.7
95% H-UCL (Log ROS)	10.38		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.284	KM Geo Mean	0.277
KM SD (logged)	2.172	95% Critical H Value (KM-Log)	3.936
KM Standard Error of Mean (logged)	0.377	95% H-UCL (KM -Log)	10.63
KM SD (logged)	2.172	95% Critical H Value (KM-Log)	3.936
KM Standard Error of Mean (logged)	0.377		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	17.31	Mean in Log Scale	-0.217
SD in Original Scale	86.97	SD in Log Scale	1.998
95% t UCL (Assumes normality)	39.1	95% H-Stat UCL	17.96
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Level			
Suggested UCL to Use			
97.5% KM (Chebyshev) UCL	99.12		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (benzo(k)fluoranthene)

General Statistics

Total Number of Observations	45	Number of Distinct Observations	41
Number of Detects	10	Number of Non-Detects	35
Number of Distinct Detects	10	Number of Distinct Non-Detects	31
Minimum Detect	0.048	Minimum Non-Detect	0.34
Maximum Detect	260	Maximum Non-Detect	69.2
Variance Detects	6695	Percent Non-Detects	77.78%
Mean Detects	27.16	SD Detects	81.83
Median Detects	0.849	CV Detects	3.012
Skewness Detects	3.16	Kurtosis Detects	9.99
Mean of Logged Detects	0.151	SD of Logged Detects	2.306

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.38	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.505	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	6.185	KM Standard Error of Mean	6.015
KM SD	38.27	95% KM (BCA) UCL	17.99
95% KM (t) UCL	16.29	95% KM (Percentile Bootstrap) UCL	17.74
95% KM (z) UCL	16.08	95% KM Bootstrap t UCL	513.2
90% KM Chebyshev UCL	24.23	95% KM Chebyshev UCL	32.4
97.5% KM Chebyshev UCL	43.75	99% KM Chebyshev UCL	66.03

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.711	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.843	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.363	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.293	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.229	k star (bias corrected MLE)	0.227
Theta hat (MLE)	118.8	Theta star (bias corrected MLE)	119.8

nu hat (MLE)	4.573	nu star (bias corrected)	4.534
Mean (detects)	27.16		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.044
Maximum	260	Median	0.01
SD	38.73	CV	6.407
k hat (MLE)	0.145	k star (bias corrected MLE)	0.15
Theta hat (MLE)	41.83	Theta star (bias corrected MLE)	40.38
nu hat (MLE)	13.01	nu star (bias corrected)	13.47
Adjusted Level of Significance (β)	0.0447		
Approximate Chi Square Value (13.47, α)	6.211	Adjusted Chi Square Value (13.47, β)	6.048
95% Gamma Approximate UCL (use when n>=50)	13.11	95% Gamma Adjusted UCL (use when n<50)	13.46

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	6.185	SD (KM)	38.27
Variance (KM)	1465	SE of Mean (KM)	6.015
k hat (KM)	0.0261	k star (KM)	0.0392
nu hat (KM)	2.35	nu star (KM)	3.527
theta hat (KM)	236.9	theta star (KM)	157.8
80% gamma percentile (KM)	0.308	90% gamma percentile (KM)	6.464
95% gamma percentile (KM)	29.32	99% gamma percentile (KM)	147.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.53, α)	0.544	Adjusted Chi Square Value (3.53, β)	0.509
95% Gamma Approximate KM-UCL (use when n>=50)	40.08	95% Gamma Adjusted KM-UCL (use when n<50)	42.81

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.892	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.088	Mean in Log Scale	-2.171
SD in Original Scale	38.72	SD in Log Scale	1.695
95% t UCL (assumes normality of ROS data)	15.79	95% Percentile Bootstrap UCL	17.57

95% BCA Bootstrap UCL	23.56	95% Bootstrap t UCL	639.4
95% H-UCL (Log ROS)	1.102		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.681	KM Geo Mean	0.186
KM SD (logged)	1.62	95% Critical H Value (KM-Log)	3.15
KM Standard Error of Mean (logged)	0.438	95% H-UCL (KM -Log)	1.491
KM SD (logged)	1.62	95% Critical H Value (KM-Log)	3.15
KM Standard Error of Mean (logged)	0.438		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	8.081	Mean in Log Scale	-0.486
SD in Original Scale	38.88	SD in Log Scale	1.765
95% t UCL (Assumes normality)	17.82	95% H-Stat UCL	7.138

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	43.75		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (cadmium)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	33
Number of Detects	20	Number of Non-Detects	20
Number of Distinct Detects	20	Number of Distinct Non-Detects	13
Minimum Detect	0.24	Minimum Non-Detect	1.1
Maximum Detect	4150	Maximum Non-Detect	26
Variance Detects	1414199	Percent Non-Detects	50%
Mean Detects	409.2	SD Detects	1189
Median Detects	8.85	CV Detects	2.906
Skewness Detects	2.913	Kurtosis Detects	7.293
Mean of Logged Detects	2.903	SD of Logged Detects	2.286

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.378	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.487	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.192	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	205.1	KM Standard Error of Mean	137
KM SD	844.6	95% KM (BCA) UCL	430.4
95% KM (t) UCL	436	95% KM (Percentile Bootstrap) UCL	467.1
95% KM (z) UCL	430.5	95% KM Bootstrap t UCL	6196
90% KM Chebyshev UCL	616.1	95% KM Chebyshev UCL	802.3
97.5% KM Chebyshev UCL	1061	99% KM Chebyshev UCL	1568
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	3.287	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.878	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.356	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.213	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.231	k star (bias corrected MLE)	0.23
Theta hat (MLE)	1770	Theta star (bias corrected MLE)	1780
nu hat (MLE)	9.248	nu star (bias corrected)	9.194
Mean (detects)	409.2		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	204.6
Maximum	4150	Median	0.125
SD	855.5	CV	4.182
k hat (MLE)	0.127	k star (bias corrected MLE)	0.135
Theta hat (MLE)	1605	Theta star (bias corrected MLE)	1521
nu hat (MLE)	10.2	nu star (bias corrected)	10.76
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (10.76, α)	4.425	Adjusted Chi Square Value (10.76, β)	4.272
95% Gamma Approximate UCL (use when n>=50)	497.7	95% Gamma Adjusted UCL (use when n<50)	515.4
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	205.1	SD (KM)	844.6

Variance (KM)	713391	SE of Mean (KM)	137
k hat (KM)	0.059	k star (KM)	0.0712
nu hat (KM)	4.717	nu star (KM)	5.697
theta hat (KM)	3478	theta star (KM)	2880
80% gamma percentile (KM)	76.4	90% gamma percentile (KM)	448.5
95% gamma percentile (KM)	1182	99% gamma percentile (KM)	3835
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (5.70, α)	1.487	Adjusted Chi Square Value (5.70, β)	1.409
95% Gamma Approximate KM-UCL (use when n>=50)	785.8	95% Gamma Adjusted KM-UCL (use when n<50)	829.5
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.876	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.183	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.192	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Approximate Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	204.8	Mean in Log Scale	0.823
SD in Original Scale	855.5	SD in Log Scale	2.716
95% t UCL (assumes normality of ROS data)	432.7	95% Percentile Bootstrap UCL	426.9
95% BCA Bootstrap UCL	550.6	95% Bootstrap t UCL	6945
95% H-UCL (Log ROS)	758.5		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.114	KM Geo Mean	3.047
KM SD (logged)	2.501	95% Critical H Value (KM-Log)	4.542
KM Standard Error of Mean (logged)	0.494	95% H-UCL (KM -Log)	428.7
KM SD (logged)	2.501	95% Critical H Value (KM-Log)	4.542
KM Standard Error of Mean (logged)	0.494		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	205.6	Mean in Log Scale	1.652
SD in Original Scale	855.3	SD in Log Scale	2.096
95% t UCL (Assumes normality)	433.5	95% H-Stat UCL	174.8
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level			
Suggested UCL to Use			

97.5% KM (Chebyshev) UCL	1061		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (cobalt)

General Statistics

Total Number of Observations	33	Number of Distinct Observations	32
Number of Detects	31	Number of Non-Detects	2
Number of Distinct Detects	30	Number of Distinct Non-Detects	2
Minimum Detect	2.2	Minimum Non-Detect	2.7
Maximum Detect	248	Maximum Non-Detect	3.4
Variance Detects	2081	Percent Non-Detects	6.061%
Mean Detects	25.47	SD Detects	45.61
Median Detects	10.1	CV Detects	1.791
Skewness Detects	4.194	Kurtosis Detects	19.91
Mean of Logged Detects	2.519	SD of Logged Detects	1.113

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.494	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.929	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.305	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.156	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	24.08	KM Standard Error of Mean	7.757
KM SD	43.84	95% KM (BCA) UCL	37.77
95% KM (t) UCL	37.22	95% KM (Percentile Bootstrap) UCL	38.22
95% KM (z) UCL	36.84	95% KM Bootstrap t UCL	57.57
90% KM Chebyshev UCL	47.35	95% KM Chebyshev UCL	57.89
97.5% KM Chebyshev UCL	72.52	99% KM Chebyshev UCL	101.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.416	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.784	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.191	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.164	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.823	k star (bias corrected MLE)	0.765
Theta hat (MLE)	30.94	Theta star (bias corrected MLE)	33.29
nu hat (MLE)	51.03	nu star (bias corrected)	47.43
Mean (detects)	25.47		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	23.93
Maximum	248	Median	9.9
SD	44.59	CV	1.864
k hat (MLE)	0.572	k star (bias corrected MLE)	0.54
Theta hat (MLE)	41.82	Theta star (bias corrected MLE)	44.28
nu hat (MLE)	37.76	nu star (bias corrected)	35.66
Adjusted Level of Significance (β)	0.0419		
Approximate Chi Square Value (35.66, α)	23	Adjusted Chi Square Value (35.66, β)	22.47
95% Gamma Approximate UCL (use when n>=50)	37.1	95% Gamma Adjusted UCL (use when n<50)	37.97

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	24.08	SD (KM)	43.84
Variance (KM)	1922	SE of Mean (KM)	7.757
k hat (KM)	0.302	k star (KM)	0.294
nu hat (KM)	19.91	nu star (KM)	19.43
theta hat (KM)	79.81	theta star (KM)	81.77
80% gamma percentile (KM)	36.75	90% gamma percentile (KM)	71.17
95% gamma percentile (KM)	110.8	99% gamma percentile (KM)	214

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (19.43, α)	10.43	Adjusted Chi Square Value (19.43, β)	10.09
95% Gamma Approximate KM-UCL (use when n>=50)	44.84	95% Gamma Adjusted KM-UCL (use when n<50)	46.35

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.929	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0985	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.156	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	24.03	Mean in Log Scale	2.397

SD in Original Scale	44.54	SD in Log Scale	1.186
95% t UCL (assumes normality of ROS data)	37.17	95% Percentile Bootstrap UCL	37.83
95% BCA Bootstrap UCL	49.68	95% Bootstrap t UCL	58.9
95% H-UCL (Log ROS)	38.87		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.421	KM Geo Mean	11.26
KM SD (logged)	1.13	95% Critical H Value (KM-Log)	2.599
KM Standard Error of Mean (logged)	0.2	95% H-UCL (KM -Log)	35.82
KM SD (logged)	1.13	95% Critical H Value (KM-Log)	2.599
KM Standard Error of Mean (logged)	0.2		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	24.02	Mean in Log Scale	2.392
SD in Original Scale	44.55	SD in Log Scale	1.192
95% t UCL (Assumes normality)	37.15	95% H-Stat UCL	39.16

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	35.82

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (copper)

General Statistics

Total Number of Observations	35	Number of Distinct Observations	35
Number of Detects	33	Number of Non-Detects	2
Number of Distinct Detects	33	Number of Distinct Non-Detects	2
Minimum Detect	5.4	Minimum Non-Detect	2.7
Maximum Detect	5720	Maximum Non-Detect	3.4
Variance Detects	2591444	Percent Non-Detects	5.714%
Mean Detects	814.3	SD Detects	1610
Median Detects	55.1	CV Detects	1.977
Skewness Detects	2.267	Kurtosis Detects	4.089
Mean of Logged Detects	4.706	SD of Logged Detects	2.092

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.56	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.365	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.152	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	767.9	KM Standard Error of Mean	266.2
KM SD	1551	95% KM (BCA) UCL	1236
95% KM (t) UCL	1218	95% KM (Percentile Bootstrap) UCL	1225
95% KM (z) UCL	1206	95% KM Bootstrap t UCL	1471
90% KM Chebyshev UCL	1566	95% KM Chebyshev UCL	1928
97.5% KM Chebyshev UCL	2430	99% KM Chebyshev UCL	3416
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	2.468	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.847	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.251	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.165	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.339	k star (bias corrected MLE)	0.328
Theta hat (MLE)	2404	Theta star (bias corrected MLE)	2482
nu hat (MLE)	22.35	nu star (bias corrected)	21.65
Mean (detects)	814.3		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	767.7
Maximum	5720	Median	47
SD	1573	CV	2.049
k hat (MLE)	0.282	k star (bias corrected MLE)	0.277
Theta hat (MLE)	2722	Theta star (bias corrected MLE)	2772
nu hat (MLE)	19.74	nu star (bias corrected)	19.38
Adjusted Level of Significance (β)	0.0425		
Approximate Chi Square Value (19.38, α)	10.4	Adjusted Chi Square Value (19.38, β)	10.09
95% Gamma Approximate UCL (use when n>=50)	1431	95% Gamma Adjusted UCL (use when n<50)	1476

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	767.9	SD (KM)	1551
Variance (KM)	2404807	SE of Mean (KM)	266.2
k hat (KM)	0.245	k star (KM)	0.243
nu hat (KM)	17.16	nu star (KM)	17.03
theta hat (KM)	3132	theta star (KM)	3157
80% gamma percentile (KM)	1104	90% gamma percentile (KM)	2309
95% gamma percentile (KM)	3747	99% gamma percentile (KM)	7590
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (17.03, α)	8.691	Adjusted Chi Square Value (17.03, β)	8.408
95% Gamma Approximate KM-UCL (use when n>=50)	1504	95% Gamma Adjusted KM-UCL (use when n<50)	1555
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.182	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.152	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	767.8	Mean in Log Scale	4.426
SD in Original Scale	1573	SD in Log Scale	2.334
95% t UCL (assumes normality of ROS data)	1218	95% Percentile Bootstrap UCL	1210
95% BCA Bootstrap UCL	1372	95% Bootstrap t UCL	1460
95% H-UCL (Log ROS)	7472		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	4.494	KM Geo Mean	89.46
KM SD (logged)	2.178	95% Critical H Value (KM-Log)	4.17
KM Standard Error of Mean (logged)	0.374	95% H-UCL (KM -Log)	4549
KM SD (logged)	2.178	95% Critical H Value (KM-Log)	4.17
KM Standard Error of Mean (logged)	0.374		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	767.8	Mean in Log Scale	4.461
SD in Original Scale	1573	SD in Log Scale	2.267
95% t UCL (Assumes normality)	1218	95% H-Stat UCL	6045
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			

Suggested UCL to Use			
97.5% KM (Chebyshev) UCL	2430		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (dibenz(a,h)anthracene)

General Statistics			
Total Number of Observations	45	Number of Distinct Observations	38
Number of Detects	7	Number of Non-Detects	38
Number of Distinct Detects	7	Number of Distinct Non-Detects	31
Minimum Detect	0.043	Minimum Non-Detect	0.172
Maximum Detect	56	Maximum Non-Detect	41
Variance Detects	442.3	Percent Non-Detects	84.44%
Mean Detects	8.312	SD Detects	21.03
Median Detects	0.341	CV Detects	2.53
Skewness Detects	2.645	Kurtosis Detects	6.996
Mean of Logged Detects	-0.612	SD of Logged Detects	2.266

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.465	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.496	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.384	KM Standard Error of Mean	1.326
KM SD	8.235	95% KM (BCA) UCL	3.945
95% KM (t) UCL	3.612	95% KM (Percentile Bootstrap) UCL	3.874
95% KM (z) UCL	3.565	95% KM Bootstrap t UCL	66.42
90% KM Chebyshev UCL	5.363	95% KM Chebyshev UCL	7.165
97.5% KM Chebyshev UCL	9.667	99% KM Chebyshev UCL	14.58

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	1.22	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.8	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.429	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.338	Detected Data Not Gamma Distributed at 5% Significance Level
Detected Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.259	k star (bias corrected MLE)	0.243
Theta hat (MLE)	32.12	Theta star (bias corrected MLE)	34.19
nu hat (MLE)	3.623	nu star (bias corrected)	3.404
Mean (detects)	8.312		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	1.301
Maximum	56	Median	0.01
SD	8.341	CV	6.409
k hat (MLE)	0.177	k star (bias corrected MLE)	0.18
Theta hat (MLE)	7.369	Theta star (bias corrected MLE)	7.244
nu hat (MLE)	15.9	nu star (bias corrected)	16.17
Adjusted Level of Significance (β)	0.0447		
Approximate Chi Square Value (16.17, α)	8.081	Adjusted Chi Square Value (16.17, β)	7.891
95% Gamma Approximate UCL (use when n>=50)	2.604	95% Gamma Adjusted UCL (use when n<50)	2.667

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.384	SD (KM)	8.235
Variance (KM)	67.82	SE of Mean (KM)	1.326
k hat (KM)	0.0282	k star (KM)	0.0412
nu hat (KM)	2.541	nu star (KM)	3.705
theta hat (KM)	49.01	theta star (KM)	33.61
80% gamma percentile (KM)	0.0865	90% gamma percentile (KM)	1.578
95% gamma percentile (KM)	6.746	99% gamma percentile (KM)	32.37

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.70, α)	0.609	Adjusted Chi Square Value (3.70, β)	0.571
95% Gamma Approximate KM-UCL (use when n>=50)	8.422	95% Gamma Adjusted KM-UCL (use when n<50)	8.979
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.854	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.342	Mean in Log Scale	-2.604
SD in Original Scale	8.334	SD in Log Scale	1.29
95% t UCL (assumes normality of ROS data)	3.429	95% Percentile Bootstrap UCL	3.821
95% BCA Bootstrap UCL	5.088	95% Bootstrap t UCL	124.6
95% H-UCL (Log ROS)	0.289		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.197	KM Geo Mean	0.111
KM SD (logged)	1.238	95% Critical H Value (KM-Log)	2.653
KM Standard Error of Mean (logged)	0.404	95% H-UCL (KM -Log)	0.392
KM SD (logged)	1.238	95% Critical H Value (KM-Log)	2.653
KM Standard Error of Mean (logged)	0.404		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.782	Mean in Log Scale	-1.116
SD in Original Scale	9.137	SD in Log Scale	1.702
95% t UCL (Assumes normality)	5.071	95% H-Stat UCL	3.221

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	9.667		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (dibenzofuran)

General Statistics

Total Number of Observations	45	Number of Distinct Observations	35
Number of Detects	5	Number of Non-Detects	40
Number of Distinct Detects	5	Number of Distinct Non-Detects	31
Minimum Detect	0.024	Minimum Non-Detect	0.34
Maximum Detect	270	Maximum Non-Detect	41
Variance Detects	14513	Percent Non-Detects	88.89%
Mean Detects	54.5	SD Detects	120.5
Median Detects	0.71	CV Detects	2.211
Skewness Detects	2.236	Kurtosis Detects	5
Mean of Logged Detects	0.194	SD of Logged Detects	3.389

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.556	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.471	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	6.085	KM Standard Error of Mean	6.631
KM SD	39.79	95% KM (BCA) UCL	24.1
95% KM (t) UCL	17.23	95% KM (Percentile Bootstrap) UCL	18.14
95% KM (z) UCL	16.99	95% KM Bootstrap t UCL	1342
90% KM Chebyshev UCL	25.98	95% KM Chebyshev UCL	34.99
97.5% KM Chebyshev UCL	47.5	99% KM Chebyshev UCL	72.06
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.73	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.781	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.417	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.389	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.194	k star (bias corrected MLE)	0.211
Theta hat (MLE)	280.5	Theta star (bias corrected MLE)	258.2
nu hat (MLE)	1.943	nu star (bias corrected)	2.111
Mean (detects)	54.5		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	6.064
Maximum	270	Median	0.01
SD	40.24	CV	6.636
k hat (MLE)	0.133	k star (bias corrected MLE)	0.139
Theta hat (MLE)	45.56	Theta star (bias corrected MLE)	43.62
nu hat (MLE)	11.98	nu star (bias corrected)	12.51
Adjusted Level of Significance (β)	0.0447		
Approximate Chi Square Value (12.51, α)	5.567	Adjusted Chi Square Value (12.51, β)	5.413
95% Gamma Approximate UCL (use when n>=50)	13.63	95% Gamma Adjusted UCL (use when n<50)	14.02

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	6.085	SD (KM)	39.79
Variance (KM)	1583	SE of Mean (KM)	6.631
k hat (KM)	0.0234	k star (KM)	0.0366
nu hat (KM)	2.105	nu star (KM)	3.298
theta hat (KM)	260.2	theta star (KM)	166.1
80% gamma percentile (KM)	0.218	90% gamma percentile (KM)	5.593
95% gamma percentile (KM)	27.64	99% gamma percentile (KM)	148.1

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.30, α)	0.466	Adjusted Chi Square Value (3.30, β)	0.435
95% Gamma Approximate KM-UCL (use when n>=50)	43.07	95% Gamma Adjusted KM-UCL (use when n<50)	46.11
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.291	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	6.068	Mean in Log Scale	-4.126
SD in Original Scale	40.24	SD in Log Scale	2.047
95% t UCL (assumes normality of ROS data)	16.15	95% Percentile Bootstrap UCL	18.05
95% BCA Bootstrap UCL	24.11	95% Bootstrap t UCL	2325
95% H-UCL (Log ROS)	0.417		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-3.256	KM Geo Mean	0.0385
KM SD (logged)	1.623	95% Critical H Value (KM-Log)	3.156
KM Standard Error of Mean (logged)	0.278	95% H-UCL (KM -Log)	0.312
KM SD (logged)	1.623	95% Critical H Value (KM-Log)	3.156
KM Standard Error of Mean (logged)	0.278		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.18	Mean in Log Scale	-1.032
SD in Original Scale	40.22	SD in Log Scale	1.596
95% t UCL (Assumes normality)	17.25	95% H-Stat UCL	2.7
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	46.11		
When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test			
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Result (indeno(1,2,3-cd)pyrene)			
General Statistics			
Total Number of Observations	45	Number of Distinct Observations	41
Number of Detects	10	Number of Non-Detects	35
Number of Distinct Detects	10	Number of Distinct Non-Detects	32
Minimum Detect	0.045	Minimum Non-Detect	0.34
Maximum Detect	130	Maximum Non-Detect	69.2
Variance Detects	1670	Percent Non-Detects	77.78%
Mean Detects	13.7	SD Detects	40.87
Median Detects	0.594	CV Detects	2.983
Skewness Detects	3.161	Kurtosis Detects	9.993
Mean of Logged Detects	-0.185	SD of Logged Detects	2.117
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.38	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.514	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	3.176	KM Standard Error of Mean	3.006
KM SD	19.12	95% KM (BCA) UCL	9.037
95% KM (t) UCL	8.226	95% KM (Percentile Bootstrap) UCL	8.942
95% KM (z) UCL	8.12	95% KM Bootstrap t UCL	147.2
90% KM Chebyshev UCL	12.19	95% KM Chebyshev UCL	16.28
97.5% KM Chebyshev UCL	21.95	99% KM Chebyshev UCL	33.08
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.77	**Anderson-Darling GOF Test**	

5% A-D Critical Value	0.833	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.433	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.291	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.253	k star (bias corrected MLE)	0.244
Theta hat (MLE)	54.16	Theta star (bias corrected MLE)	56.21
nu hat (MLE)	5.06	nu star (bias corrected)	4.875
Mean (detects)	13.7		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	3.052
Maximum	130	Median	0.01
SD	19.36	CV	6.343
k hat (MLE)	0.161	k star (bias corrected MLE)	0.165
Theta hat (MLE)	19.01	Theta star (bias corrected MLE)	18.53
nu hat (MLE)	14.45	nu star (bias corrected)	14.82
Adjusted Level of Significance (β)	0.0447		
Approximate Chi Square Value (14.82, α)	7.138	Adjusted Chi Square Value (14.82, β)	6.961
95% Gamma Approximate UCL (use when n>=50)	6.338	95% Gamma Adjusted UCL (use when n<50)	6.499
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	3.176	SD (KM)	19.12
Variance (KM)	365.8	SE of Mean (KM)	3.006
k hat (KM)	0.0276	k star (KM)	0.0406
nu hat (KM)	2.482	nu star (KM)	3.65
theta hat (KM)	115.2	theta star (KM)	78.31
80% gamma percentile (KM)	0.186	90% gamma percentile (KM)	3.53
95% gamma percentile (KM)	15.36	99% gamma percentile (KM)	74.7
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.65, α)	0.589	Adjusted Chi Square Value (3.65, β)	0.552
95% Gamma Approximate KM-UCL (use when n>=50)	19.7	95% Gamma Adjusted KM-UCL (use when n<50)	21.01
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.874	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	

Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	3.097	Mean in Log Scale	-2.209
SD in Original Scale	19.35	SD in Log Scale	1.507
95% t UCL (assumes normality of ROS data)	7.944	95% Percentile Bootstrap UCL	8.832
95% BCA Bootstrap UCL	11.83	95% Bootstrap t UCL	211.3
95% H-UCL (Log ROS)	0.675		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.82	KM Geo Mean	0.162
KM SD (logged)	1.498	95% Critical H Value (KM-Log)	2.986
KM Standard Error of Mean (logged)	0.386	95% H-UCL (KM -Log)	0.978
KM SD (logged)	1.498	95% Critical H Value (KM-Log)	2.986
KM Standard Error of Mean (logged)	0.386		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.093	Mean in Log Scale	-0.545
SD in Original Scale	19.97	SD in Log Scale	1.686
95% t UCL (Assumes normality)	10.09	95% H-Stat UCL	5.485
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Level			
Suggested UCL to Use			
97.5% KM (Chebyshev) UCL	21.95		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Result (lead)			
General Statistics			
Total Number of Observations	38	Number of Distinct Observations	38
		Number of Missing Observations	0
Minimum	2.08	Mean	365.1
Maximum	3810	Median	46.2

SD	757.3	Std. Error of Mean	122.9
Coefficient of Variation	2.074	Skewness	3.239

Normal GOF Test

Shapiro Wilk Test Statistic	0.541	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.938	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.336	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.142	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	572.4	95% Adjusted-CLT UCL (Chen-1995)	636.1
		95% Modified-t UCL (Johnson-1978)	583.1

Gamma GOF Test

A-D Test Statistic	2.208	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.834	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.219	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.153	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.404	k star (bias corrected MLE)	0.389
Theta hat (MLE)	904.4	Theta star (bias corrected MLE)	937.6
nu hat (MLE)	30.68	nu star (bias corrected)	29.59
MLE Mean (bias corrected)	365.1	MLE Sd (bias corrected)	585.1
		Approximate Chi Square Value (0.05)	18.17
Adjusted Level of Significance	0.0434	Adjusted Chi Square Value	17.8

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	594.5	95% Adjusted Gamma UCL (use when n<50)	606.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.938	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.142	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.732	Mean of logged Data	4.273
Maximum of Logged Data	8.245	SD of logged Data	1.86

Assuming Lognormal Distribution			
95% H-UCL	1193	90% Chebyshev (MVUE) UCL	811.9
95% Chebyshev (MVUE) UCL	1016	97.5% Chebyshev (MVUE) UCL	1299
99% Chebyshev (MVUE) UCL	1855		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	567.2	95% Jackknife UCL	572.4
95% Standard Bootstrap UCL	569.6	95% Bootstrap-t UCL	742
95% Hall's Bootstrap UCL	882.3	95% Percentile Bootstrap UCL	579.4
95% BCA Bootstrap UCL	645.9		
90% Chebyshev(Mean, Sd) UCL	733.7	95% Chebyshev(Mean, Sd) UCL	900.6
97.5% Chebyshev(Mean, Sd) UCL	1132	99% Chebyshev(Mean, Sd) UCL	1587
Suggested UCL to Use			
95% Chebyshev (Mean, Sd) UCL	900.6		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Result (manganese)			
General Statistics			
Total Number of Observations	33	Number of Distinct Observations	32
		Number of Missing Observations	0
Minimum	116	Mean	574
Maximum	2990	Median	363
SD	582.5	Std. Error of Mean	101.4
Coefficient of Variation	1.015	Skewness	2.682
Normal GOF Test			
Shapiro Wilk Test Statistic	0.692	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.272	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.152	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	

95% Student's-t UCL	745.7	95% Adjusted-CLT UCL (Chen-1995)	791.4
		95% Modified-t UCL (Johnson-1978)	753.6
Gamma GOF Test			
A-D Test Statistic	1.243	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.763	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.176	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.156	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.68	k star (bias corrected MLE)	1.547
Theta hat (MLE)	341.7	Theta star (bias corrected MLE)	371
nu hat (MLE)	110.9	nu star (bias corrected)	102.1
MLE Mean (bias corrected)	574	MLE Sd (bias corrected)	461.4
		Approximate Chi Square Value (0.05)	79.81
Adjusted Level of Significance	0.0419	Adjusted Chi Square Value	78.79
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	734.5	95% Adjusted Gamma UCL (use when n<50)	744
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.931	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.126	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.152	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	4.754	Mean of logged Data	6.026
Maximum of Logged Data	8.003	SD of logged Data	0.768
Assuming Lognormal Distribution			
95% H-UCL	748.3	90% Chebyshev (MVUE) UCL	792.9
95% Chebyshev (MVUE) UCL	902.8	97.5% Chebyshev (MVUE) UCL	1055
99% Chebyshev (MVUE) UCL	1355		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	740.8	95% Jackknife UCL	745.7
95% Standard Bootstrap UCL	735.5	95% Bootstrap-t UCL	850
95% Hall's Bootstrap UCL	908.7	95% Percentile Bootstrap UCL	756.1

95% BCA Bootstrap UCL	802.5		
90% Chebyshev(Mean, Sd) UCL	878.2	95% Chebyshev(Mean, Sd) UCL	1016
97.5% Chebyshev(Mean, Sd) UCL	1207	99% Chebyshev(Mean, Sd) UCL	1583

Suggested UCL to Use

95% H-UCL	748.3		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Result (naphthalene)

General Statistics

Total Number of Observations	45	Number of Distinct Observations	36
Number of Detects	6	Number of Non-Detects	39
Number of Distinct Detects	6	Number of Distinct Non-Detects	31
Minimum Detect	0.398	Minimum Non-Detect	0.34
Maximum Detect	100	Maximum Non-Detect	41
Variance Detects	1642	Percent Non-Detects	86.67%
Mean Detects	17.29	SD Detects	40.52
Median Detects	0.925	CV Detects	2.344
Skewness Detects	2.449	Kurtosis Detects	5.999
Mean of Logged Detects	0.448	SD of Logged Detects	2.085

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.503	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.489	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.607	KM Standard Error of Mean	2.398
KM SD	14.68	95% KM (BCA) UCL	7.047
95% KM (t) UCL	6.636	95% KM (Percentile Bootstrap) UCL	7.038
95% KM (z) UCL	6.551	95% KM Bootstrap t UCL	219.6
90% KM Chebyshev UCL	9.8	95% KM Chebyshev UCL	13.06

97.5% KM Chebyshev UCL	17.58	99% KM Chebyshev UCL	26.47
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.329	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.771	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.485	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.358	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.289	k star (bias corrected MLE)	0.256
Theta hat (MLE)	59.86	Theta star (bias corrected MLE)	67.66
nu hat (MLE)	3.466	nu star (bias corrected)	3.067
Mean (detects)	17.29		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	2.314
Maximum	100	Median	0.01
SD	14.9	CV	6.437
k hat (MLE)	0.16	k star (bias corrected MLE)	0.164
Theta hat (MLE)	14.49	Theta star (bias corrected MLE)	14.13
nu hat (MLE)	14.37	nu star (bias corrected)	14.74
Adjusted Level of Significance (β)	0.0447		
Approximate Chi Square Value (14.74, α)	7.084	Adjusted Chi Square Value (14.74, β)	6.907
95% Gamma Approximate UCL (use when n>=50)	4.816	95% Gamma Adjusted UCL (use when n<50)	4.939
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	2.607	SD (KM)	14.68
Variance (KM)	215.6	SE of Mean (KM)	2.398
k hat (KM)	0.0315	k star (KM)	0.0442
nu hat (KM)	2.837	nu star (KM)	3.981
theta hat (KM)	82.71	theta star (KM)	58.94
80% gamma percentile (KM)	0.222	90% gamma percentile (KM)	3.342
95% gamma percentile (KM)	13.18	99% gamma percentile (KM)	59.43
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.98, α)	0.714	Adjusted Chi Square Value (3.98, β)	0.672
95% Gamma Approximate KM-UCL (use when n>=50)	14.53	95% Gamma Adjusted KM-UCL (use when n<50)	15.45
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.684	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.402	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	2.307	Mean in Log Scale	-6.069
SD in Original Scale	14.9	SD in Log Scale	2.878
95% t UCL (assumes normality of ROS data)	6.038	95% Percentile Bootstrap UCL	6.744
95% BCA Bootstrap UCL	11.13	95% Bootstrap t UCL	186.5
95% H-UCL (Log ROS)	1.278		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.863	KM Geo Mean	0.422
KM SD (logged)	0.87	95% Critical H Value (KM-Log)	2.232
KM Standard Error of Mean (logged)	0.143	95% H-UCL (KM -Log)	0.826
KM SD (logged)	0.87	95% Critical H Value (KM-Log)	2.232
KM Standard Error of Mean (logged)	0.143		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.426	Mean in Log Scale	-0.956
SD in Original Scale	15.13	SD in Log Scale	1.453
95% t UCL (Assumes normality)	7.215	95% H-Stat UCL	2.097
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			
Suggested UCL to Use			
97.5% KM (Chebyshev) UCL	17.58		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Result (nickel)			
General Statistics			
Total Number of Observations	33	Number of Distinct Observations	32

Number of Detects	31	Number of Non-Detects	2
Number of Distinct Detects	30	Number of Distinct Non-Detects	2
Minimum Detect	6.5	Minimum Non-Detect	1.4
Maximum Detect	3350	Maximum Non-Detect	1.7
Variance Detects	565858	Percent Non-Detects	6.061%
Mean Detects	347.4	SD Detects	752.2
Median Detects	26.1	CV Detects	2.165
Skewness Detects	2.81	Kurtosis Detects	8.306
Mean of Logged Detects	3.98	SD of Logged Detects	1.851

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.527	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.929	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.365	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.156	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	326.4	KM Standard Error of Mean	127.8
KM SD	722	95% KM (BCA) UCL	551.7
95% KM (t) UCL	542.8	95% KM (Percentile Bootstrap) UCL	551.5
95% KM (z) UCL	536.6	95% KM Bootstrap t UCL	736.3
90% KM Chebyshev UCL	709.7	95% KM Chebyshev UCL	883.3
97.5% KM Chebyshev UCL	1124	99% KM Chebyshev UCL	1598

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.438	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.841	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.313	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.17	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.358	k star (bias corrected MLE)	0.345
Theta hat (MLE)	970.1	Theta star (bias corrected MLE)	1007
nu hat (MLE)	22.2	nu star (bias corrected)	21.39
Mean (detects)	347.4		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	326.3
Maximum	3350	Median	26
SD	733.2	CV	2.247
k hat (MLE)	0.297	k star (bias corrected MLE)	0.29
Theta hat (MLE)	1100	Theta star (bias corrected MLE)	1126
nu hat (MLE)	19.58	nu star (bias corrected)	19.13
Adjusted Level of Significance (β)	0.0419		
Approximate Chi Square Value (19.13, α)	10.22	Adjusted Chi Square Value (19.13, β)	9.88
95% Gamma Approximate UCL (use when n>=50)	611.3	95% Gamma Adjusted UCL (use when n<50)	632.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	326.4	SD (KM)	722
Variance (KM)	521232	SE of Mean (KM)	127.8
k hat (KM)	0.204	k star (KM)	0.206
nu hat (KM)	13.49	nu star (KM)	13.6
theta hat (KM)	1597	theta star (KM)	1584
80% gamma percentile (KM)	436.8	90% gamma percentile (KM)	987.3
95% gamma percentile (KM)	1669	99% gamma percentile (KM)	3536

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.60, α)	6.298	Adjusted Chi Square Value (13.60, β)	6.043
95% Gamma Approximate KM-UCL (use when n>=50)	704.9	95% Gamma Adjusted KM-UCL (use when n<50)	734.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.846	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.929	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.224	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.156	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	326.4	Mean in Log Scale	3.725
SD in Original Scale	733.2	SD in Log Scale	2.061
95% t UCL (assumes normality of ROS data)	542.6	95% Percentile Bootstrap UCL	542.5
95% BCA Bootstrap UCL	590.5	95% Bootstrap t UCL	715.5
95% H-UCL (Log ROS)	1458		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.759	KM Geo Mean	42.91
KM SD (logged)	1.967	95% Critical H Value (KM-Log)	3.8
KM Standard Error of Mean (logged)	0.348	95% H-UCL (KM -Log)	1114
KM SD (logged)	1.967	95% Critical H Value (KM-Log)	3.8
KM Standard Error of Mean (logged)	0.348		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	326.4	Mean in Log Scale	3.723
SD in Original Scale	733.2	SD in Log Scale	2.066
95% t UCL (Assumes normality)	542.6	95% H-Stat UCL	1480

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	883.3		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (trichloroethene)

General Statistics

Total Number of Observations	91	Number of Distinct Observations	67
Number of Detects	50	Number of Non-Detects	41
Number of Distinct Detects	44	Number of Distinct Non-Detects	26
Minimum Detect	4.0000E-4	Minimum Non-Detect	0.0044
Maximum Detect	17.6	Maximum Non-Detect	0.31
Variance Detects	6.518	Percent Non-Detects	45.05%
Mean Detects	0.642	SD Detects	2.553
Median Detects	0.0135	CV Detects	3.975
Skewness Detects	6.293	Kurtosis Detects	41.83
Mean of Logged Detects	-3.762	SD of Logged Detects	2.807

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.275	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.401	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.125	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.354	KM Standard Error of Mean	0.201
KM SD	1.9	95% KM (BCA) UCL	0.756
95% KM (t) UCL	0.689	95% KM (Percentile Bootstrap) UCL	0.721
95% KM (z) UCL	0.685	95% KM Bootstrap t UCL	1.918

90% KM Chebyshev UCL	0.958	95% KM Chebyshev UCL	1.231
97.5% KM Chebyshev UCL	1.611	99% KM Chebyshev UCL	2.356
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	3.376	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.903	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.217	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.138	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.219	k star (bias corrected MLE)	0.219
Theta hat (MLE)	2.938	Theta star (bias corrected MLE)	2.935
nu hat (MLE)	21.86	nu star (bias corrected)	21.88
Mean (detects)	0.642		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	4.0000E-4	Mean	0.357
Maximum	17.6	Median	0.01
SD	1.91	CV	5.345
k hat (MLE)	0.231	k star (bias corrected MLE)	0.231
Theta hat (MLE)	1.547	Theta star (bias corrected MLE)	1.549
nu hat (MLE)	42.05	nu star (bias corrected)	42
Adjusted Level of Significance (β)	0.0474		
Approximate Chi Square Value (42.00, α)	28.14	Adjusted Chi Square Value (42.00, β)	27.96
95% Gamma Approximate UCL (use when n>=50)	0.533	95% Gamma Adjusted UCL (use when n<50)	0.537
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.354	SD (KM)	1.9
Variance (KM)	3.611	SE of Mean (KM)	0.201
k hat (KM)	0.0348	k star (KM)	0.0409
nu hat (KM)	6.326	nu star (KM)	7.451
theta hat (KM)	10.19	theta star (KM)	8.654
80% gamma percentile (KM)	0.0216	90% gamma percentile (KM)	0.4
95% gamma percentile (KM)	1.722	99% gamma percentile (KM)	8.305
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (7.45, α)	2.421	Adjusted Chi Square Value (7.45, β)	2.375
95% Gamma Approximate KM-UCL (use when n>=50)	1.09	95% Gamma Adjusted KM-UCL (use when n<50)	1.111

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.118	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.125	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Approximate Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.354	Mean in Log Scale	-4.874
SD in Original Scale	1.911	SD in Log Scale	2.482
95% t UCL (assumes normality of ROS data)	0.687	95% Percentile Bootstrap UCL	0.723
95% BCA Bootstrap UCL	0.963	95% Bootstrap t UCL	2.011
95% H-UCL (Log ROS)	0.477		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-4.987	KM Geo Mean	0.00683
KM SD (logged)	2.527	95% Critical H Value (KM-Log)	4.08
KM Standard Error of Mean (logged)	0.282	95% H-UCL (KM -Log)	0.493
KM SD (logged)	2.527	95% Critical H Value (KM-Log)	4.08
KM Standard Error of Mean (logged)	0.282		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.36	Mean in Log Scale	-4.494
SD in Original Scale	1.91	SD in Log Scale	2.348
95% t UCL (Assumes normality)	0.692	95% H-Stat UCL	0.455
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	1.231		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			

Attachment B-1
CALCULATION OF RECEPTOR-SPECIFIC SOIL VOLATILIZATION FACTORS FOR THE RME SCENARIO
RACER Trust, Moraine, Ohio

Model Equations [1]

Construction Worker

$$VF_{sc} = \frac{Q/C_{sa} \times \frac{1}{F_D} \times (3.14 \times D_A \times T)^{1/2} \times 10^{-4} (m^2/cm^2)}{2 \times \rho_b \times D_A}$$

where:

$$D_A = \frac{\left[\left(\theta_a^{10/3} D^{air} H + \theta_w^{10/3} D^{wat}\right) / \theta_T^2\right]}{\rho_b K_d + \theta_w + \theta_a H}$$

$$Q/C_{sa} = A\ x\ exp\left[\frac{(lnA_c - B)^2}{C}\right]$$

Office Worker & Industrial Worker

$$VF = \frac{Q/C_{vol} \times (3.14 \times D_A \times T)^{1/2} \times 10^4 (m^2/cm^2)}{2 \times \rho_b \times D_A}$$

where:

$$D_A = \frac{\left[\left(\theta_a^{10/3} D^{air} H + \theta_w^{10/3} D^{wat}\right) / \theta_T^2\right]}{\rho_b K_d + \theta_w + \theta_a H}$$

$$Q/C_{vol} = A\ x\ exp\left[\frac{(lnA_{site} - B)^2}{C}\right]$$

Parameter Code	Parameter Definition	Value	Units	Rationale/Reference
Receptor-Specific Parameters				
Construction Worker				
T	Total time over which construction occurs	3.2E+07	s	Professional judgment [2]
Q/C_{sa}	Inverse of the ratio of the 1-h geometric mean air concentration to the volatilization flux at the center of a square site	14.31	g/m^2-s per kg/m^3	Calc using Equation E-15 in USEPA (2002)
A	Constant A	2.4538	unitless	USEPA (2002) [3]
B	Constant B	17.566	unitless	USEPA (2002) [3]
C	Constant C	189.0426	unitless	USEPA (2002) [3]
A_c	Areal extent of site soil contamination	0.50	acres	[8]
F_D	Dispersion correction factor	0.186	unitless	USEPA (2002) [4]
On-Site Routine Worker				
T	Exposure interval	7.9E+08	s	Professional judgment [2]
Q/Cvol	Inverse of the ratio of the 1-h geometric mean air concentration to the volatilization flux at the center of a square site	68.18	g/m^2-s per kg/m^3	Calculated
A	Constant A	11.911	unitless	USEPA (2002) [5]
B	Constant B	18.4385	unitless	USEPA (2002) [5]
C	Constant C	209.7845	unitless	USEPA (2002) [5]
A_c	Areal extent of site surface soil contamination	0.50	acres	[8]
On-Site Maintenance Worker				
T	Exposure interval	7.9E+08	s	Professional judgment [2]
Q/Cvol	Inverse of the ratio of the 1-h geometric mean air concentration to the volatilization flux at the center of a square site	68.18	g/m^2-s per kg/m^3	Calculated
A	Constant A	11.911	unitless	USEPA (2002) [5]
B	Constant B	18.4385	unitless	USEPA (2002) [5]
C	Constant C	209.7845	unitless	USEPA (2002) [5]
A_c	Areal extent of site surface soil contamination	0.50	acres	[8]
Environmental Parameters				
ρ_b	Dry soil bulk density	1.5	g/cm^3	USEPA (1996; 2002) [6]
θ_T	Total Porosity	0.43	cm^3/cm^3	Calculated (1 - ρ_b/ρ_s)
θ_w	Water-filled soil porosity	0.15	cm^3/cm^3	USEPA (1996; 2002) [6]
θ_a	Air-filled soil porosity	0.284	cm^3/cm^3	Calculated (θ_T - θ_w)
ρ_s	Soil particle density	2.65	g/cm^3	USEPA (1996; 2002) [6]
f_{oc}	Fraction organic carbon	0.006	g/g	USEPA (1996; 2002) [6]

Attachment B-1
CALCULATION OF RECEPTOR-SPECIFIC SOIL VOLATILIZATION FACTORS FOR THE RME SCENARIO
RACER Trust, Moraine, Ohio

	Chemical-Specific Parameters [9]						Receptor-Specific Volatilization Factors		
	Soil-Organic Carbon Partition Coefficient K_{OC} (cm^3/g)	Soil-Water Partition Coefficient K_d (cm^3/g)	Henry's Law Constant H (unitless)	Diffusivity in Air D^{air} (cm^2/s)	Diffusivity in Water D^{wat} (cm^2/s)	Apparent Diffusivity D_A (cm^2/s)	Construction Worker VFsc (m^3/kg)	On-Site Routine Worker VFs (m^3/kg)	On-Site Maintenance Worker VFs (m^3/kg)
Aroclor-1242 (PCB-1242)	7.8E+04	4.7E+02	1.4E-02	2.4E-02	6.1E-06	3.8E-08	1.3E+05	5.8E+05	5.8E+05
Aroclor-1248 (PCB-1248)	7.7E+04	4.6E+02	1.8E-02	2.4E-02	6.2E-06	5.0E-08	1.1E+05	5.0E+05	5.0E+05
Aroclor-1254 (PCB-1254)	1.3E+05	7.8E+02	1.2E-02	2.4E-02	6.1E-06	1.9E-08	1.9E+05	8.3E+05	8.3E+05
Aroclor-1260 (PCB-1260)	3.5E+05	2.1E+03	1.4E-02	2.2E-02	5.6E-06	7.7E-09	2.9E+05	1.3E+06	1.3E+06
Antimony	NA	4.5E+01	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	2.9E+01	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	1.8E+05	1.1E+03	4.9E-04	2.6E-02	6.7E-06	6.8E-10	9.8E+05	4.3E+06	4.3E+06
Benzo(a)pyrene	5.9E+05	3.5E+03	1.9E-05	4.8E-02	5.6E-06	2.3E-11	5.3E+06	2.3E+07	2.3E+07
Benzo(b)fluoranthene	6.0E+05	3.6E+03	2.7E-05	4.8E-02	5.6E-06	2.9E-11	4.8E+06	2.1E+07	2.1E+07
Benzo(k)fluoranthene	5.9E+05	3.5E+03	2.4E-05	4.8E-02	5.6E-06	2.7E-11	4.9E+06	2.2E+07	2.2E+07
Biphenyl (1,1-Biphenyl)	5.1E+03	3.1E+01	1.3E-02	4.7E-02	7.6E-06	1.0E-06	2.5E+04	1.1E+05	1.1E+05
Cadmium	NA	7.5E+01	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	4.5E+01	NA	NA	NA	NA	NA	NA	NA
Copper	NA	3.5E+01	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	1.9E+06	1.1E+04	5.8E-06	4.5E-02	5.2E-06	4.1E-12	1.3E+07	5.6E+07	5.6E+07
Dibenzofuran	9.2E+03	5.5E+01	8.7E-03	6.5E-02	7.4E-06	5.5E-07	3.4E+04	1.5E+05	1.5E+05
Indeno(1,2,3-cd)pyrene	2.0E+06	1.2E+04	1.4E-05	4.5E-02	5.2E-06	5.7E-12	1.1E+07	4.7E+07	4.7E+07
Lead	NA	9.0E+02	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	6.5E+01	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	6.5E+01	NA	NA	NA	NA	NA	NA	NA
Naphthalene	1.5E+03	9.3E+00	1.8E-02	6.0E-02	8.4E-06	6.2E-06	1.0E+04	4.5E+04	4.5E+04
Thallium	NA	7.1E+01	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	6.1E+01	3.6E-01	4.0E-01	6.9E-02	1.0E-05	2.7E-03	4.9E+02	2.2E+03	2.2E+03

Abbreviations:
cm^2/s = square centimeters per second.
cm^3/cm^3 = cubic centimeters per cubic centimeter.
cm^3/g = cubic centimeter per gram.
g/cm^3 = grams per cubic centimeter.
g/g = grams per gram
g/m^2-s per kg/m^3 = grams per square meter-second per kilogram per cubic meter.
m^3/kg = cubic meter per kilogram.
NA = not available or not applicable
NV = not volatile

Notes:
Volatilization factors calculated only for volatile constituents of potential concern (COPCs) in soil.
[1] Volatilization model equations were obtained from USEPA (2002).
VF_{sc} - Equation 5-14 VF - Equation 4-8
Q/C_{sa} - Equation 5-15 Q/C_{vol} - Equation D-3
[2] The duration of construction is expected to be 1 year. The exposure duration for workers is 25 years.
[3] Default values presented in Equation 5-15 in USEPA 2002.
[4] Calculated using Equation E-16 in USEPA 2002.
[5] Values reflect default values for outdoor workers (volatiles) for use in Equation D-1 in USEPA 2002.
[6] Environmental Parameters were obtained from USEPA (1996, 2002).
[7] For organics, soil-water partitioning coefficient is calculated as $K_d = K_{oc} \times f_{oc}$.
[8] Default area.
[9] Chemical-specific parameter values obtained from USEPA (2019).

References:
USEPA. 1996. Soil Screening Guidance: User's Guide. OSWER Publication 9355.4-23. July.
USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. December.
USEPA. 2019. Regional Screening Levels: User's Guide. Available at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm. Last updated November 2019.

Attachment B-2
CALCULATION OF RECEPTOR-SPECIFIC SOIL VOLATILIZATION FACTORS FOR THE CTE SCENARIO
RACER Trust, Moraine, Ohio

Model Equations [1]

Construction Worker

$$VF_{sc} = \frac{Q/C_{sa} \times \frac{1}{F_D} \times (3.14 \times D_A \times T)^{1/2} \times 10^{-4} (m^2/cm^2)}{2 \times \rho_b \times D_A}$$

where:

$$D_A = \frac{\left[\left(\theta_a^{10/3} D^{air} H + \theta_w^{10/3} D^{wat}\right) / \theta_T^2\right]}{\rho_b K_d + \theta_w + \theta_a H}$$

$$Q/C_{sa} = A\ x\ exp\left[\frac{(lnA_c - B)^2}{C}\right]$$

Routine Worker & Maintenance Worker

$$VF = \frac{Q/C_{vol} \times (3.14 \times D_A \times T)^{1/2} \times 10^4 (m^2/cm^2)}{2 \times \rho_b \times D_A}$$

where:

$$D_A = \frac{\left[\left(\theta_a^{10/3} D^{air} H + \theta_w^{10/3} D^{wat}\right) / \theta_T^2\right]}{\rho_b K_d + \theta_w + \theta_a H}$$

$$Q/C_{vol} = A\ x\ exp\left[\frac{(lnA_{site} - B)^2}{C}\right]$$

Parameter Code	Parameter Definition	Value	Units	Rationale/Reference
Receptor-Specific Parameters				
Construction Worker				
T	Total time over which construction occurs	3.2E+07	s	Professional judgment [2]
Q/C_{sa}	Inverse of the ratio of the 1-h geometric mean air concentration to the volatilization flux at the center of a square site	14.31	g/m^2-s per kg/m^3	Calc using Equation E-15 in USEPA (2002)
A	Constant A	2.4538	unitless	USEPA (2002) [3]
B	Constant B	17.566	unitless	USEPA (2002) [3]
C	Constant C	189.0426	unitless	USEPA (2002) [3]
A_c	Areal extent of site soil contamination	0.50	acres	[8]
F_D	Dispersion correction factor	0.186	unitless	USEPA (2002) [4]
On-Site Routine Worker				
T	Exposure interval	7.9E+08	s	Professional judgment [2]
Q/Cvol	Inverse of the ratio of the 1-h geometric mean air concentration to the volatilization flux at the center of a square site	68.18	g/m^2-s per kg/m^3	Calculated
A	Constant A	11.911	unitless	USEPA (2002) [5]
B	Constant B	18.4385	unitless	USEPA (2002) [5]
C	Constant C	209.7845	unitless	USEPA (2002) [5]
A_c	Areal extent of site surface soil contamination	0.50	acres	[8]
On-Site Maintenance Worker				
T	Exposure interval	7.9E+08	s	Professional judgment [2]
Q/Cvol	Inverse of the ratio of the 1-h geometric mean air concentration to the volatilization flux at the center of a square site	68.18	g/m^2-s per kg/m^3	Calculated
A	Constant A	11.911	unitless	USEPA (2002) [5]
B	Constant B	18.4385	unitless	USEPA (2002) [5]
C	Constant C	209.7845	unitless	USEPA (2002) [5]
A_c	Areal extent of site surface soil contamination	0.50	acres	[8]
Environmental Parameters				
ρ_b	Dry soil bulk density	1.5	g/cm^3	USEPA (1996; 2002) [6]
θ_T	Total Porosity	0.43	cm^3/cm^3	Calculated (1 - ρ_b/ρ_s)
θ_w	Water-filled soil porosity	0.15	cm^3/cm^3	USEPA (1996; 2002) [6]
θ_a	Air-filled soil porosity	0.284	cm^3/cm^3	Calculated (θ_T - θ_w)
ρ_s	Soil particle density	2.65	g/cm^3	USEPA (1996; 2002) [6]
f_{oc}	Fraction organic carbon	0.006	g/g	USEPA (1996; 2002) [6]

Attachment B-2
CALCULATION OF RECEPTOR-SPECIFIC SOIL VOLATILIZATION FACTORS FOR THE CTE SCENARIO
RACER Trust, Moraine, Ohio

	Chemical-Specific Parameters [9]						Receptor-Specific Volatilization Factors		
	Soil-Organic Carbon Partition Coefficient K_{OC} (cm^3/g)	Soil-Water Partition Coefficient K_d (cm^3/g)	Henry's Law Constant H (unitless)	Diffusivity in Air D^{air} (cm^2/s)	Diffusivity in Water D^{wat} (cm^2/s)	Apparent Diffusivity D_A (cm^2/s)	Construction Worker VFsc (m^3/kg)	On-Site Routine Worker VFs (m^3/kg)	On-Site Maintenance Worker VFs (m^3/kg)
Aroclor-1242 (PCB-1242)	7.8E+04	4.7E+02	1.4E-02	2.4E-02	6.1E-06	3.8E-08	1.3E+05	5.8E+05	5.8E+05
Aroclor-1248 (PCB-1248)	7.7E+04	4.6E+02	1.8E-02	2.4E-02	6.2E-06	5.0E-08	1.1E+05	5.0E+05	5.0E+05
Aroclor-1254 (PCB-1254)	1.3E+05	7.8E+02	1.2E-02	2.4E-02	6.1E-06	1.9E-08	1.9E+05	8.3E+05	8.3E+05
Aroclor-1260 (PCB-1260)	3.5E+05	2.1E+03	1.4E-02	2.2E-02	5.6E-06	7.7E-09	2.9E+05	1.3E+06	1.3E+06
Antimony	NA	4.5E+01	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	2.9E+01	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	1.8E+05	1.1E+03	4.9E-04	2.6E-02	6.7E-06	6.8E-10	9.8E+05	4.3E+06	4.3E+06
Benzo(a)pyrene	5.9E+05	3.5E+03	1.9E-05	4.8E-02	5.6E-06	2.3E-11	5.3E+06	2.3E+07	2.3E+07
Benzo(b)fluoranthene	6.0E+05	3.6E+03	2.7E-05	4.8E-02	5.6E-06	2.9E-11	4.8E+06	2.1E+07	2.1E+07
Benzo(k)fluoranthene	5.9E+05	3.5E+03	2.4E-05	4.8E-02	5.6E-06	2.7E-11	4.9E+06	2.2E+07	2.2E+07
Biphenyl (1,1-Biphenyl)	5.1E+03	3.1E+01	1.3E-02	4.7E-02	7.6E-06	1.0E-06	2.5E+04	1.1E+05	1.1E+05
Cadmium	NA	7.5E+01	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	4.5E+01	NA	NA	NA	NA	NA	NA	NA
Copper	NA	3.5E+01	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	1.9E+06	1.1E+04	5.8E-06	4.5E-02	5.2E-06	4.1E-12	1.3E+07	5.6E+07	5.6E+07
Dibenzofuran	9.2E+03	5.5E+01	8.7E-03	6.5E-02	7.4E-06	5.5E-07	3.4E+04	1.5E+05	1.5E+05
Indeno(1,2,3-cd)pyrene	2.0E+06	1.2E+04	1.4E-05	4.5E-02	5.2E-06	5.7E-12	1.1E+07	4.7E+07	4.7E+07
Lead	NA	9.0E+02	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	6.5E+01	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	6.5E+01	NA	NA	NA	NA	NA	NA	NA
Naphthalene	1.5E+03	9.3E+00	1.8E-02	6.0E-02	8.4E-06	6.2E-06	1.0E+04	4.5E+04	4.5E+04
Thallium	NA	7.1E+01	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	6.1E+01	3.6E-01	4.0E-01	6.9E-02	1.0E-05	2.7E-03	4.9E+02	2.2E+03	2.2E+03

Abbreviations:
cm^2/s = square centimeters per second.
cm^3/cm^3 = cubic centimeters per cubic centimeter.
cm^3/g = cubic centimeter per gram.
g/cm^3 = grams per cubic centimeter.
g/g = grams per gram
g/m^2-s per kg/m^3 = grams per square meter-second per kilogram per cubic meter.
m^3/kg = cubic meter per kilogram.
NA = not available or not applicable
NV = not volatile

Notes:
Volatilization factors calculated only for volatile constituents of potential concern (COPCs) in soil.
[1] Volatilization model equations were obtained from USEPA (2002).
VF_{sc} - Equation 5-14 VF - Equation 4-8
Q/C_{sa} - Equation 5-15 Q/C_{vol} - Equation D-3
[2] The duration of construction is expected to be 1 year. The exposure duration for workers is 25 years.
[3] Default values presented in Equation 5-15 in USEPA 2002.
[4] Calculated using Equation E-16 in USEPA 2002.
[5] Values reflect default values for outdoor workers (volatiles) for use in Equation D-1 in USEPA 2002.
[6] Environmental Parameters were obtained from USEPA (1996, 2002).
[7] For organics, soil-water partitioning coefficient is calculated as $K_d = K_{oc} \times f_{oc}$.
[8] Default area.
[9] Chemical-specific parameter values obtained from USEPA (2019).

References:
USEPA. 1996. Soil Screening Guidance: User's Guide. OSWER Publication 9355.4-23. July.
USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. December.
USEPA. 2019. Regional Screening Levels: User's Guide. Available at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm. Last updated November 2019.

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