SUPPLEMENTAL PHASE II PROPERTY ASSESSMENT

OF THE:
FORMER CHAMPION SPARK PLUG PROPERTY
900 UPTON AVENUE
TOLEDO, OHIO

PREPARED FOR:
CITY OF TOLEDO-DIVISION OF ENVIRONMENTAL SERVICES
348 SOUTH ERIE STREET
TOLEDO, OHIO 43604

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HULL

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EXECUTIVE SUMMARY

General

The City of Toledo (Client) authorized Hull & Associates, Inc. (Hull) to complete a Supplemental Phase II Environmental Site Assessment (Phase II) near the location of SB-13 at the Former Champion Spark Plug property. The Former Champion Spark Plug property is comprised of approximately 18 acres formerly developed with industrial manufacturing buildings occupied by the Champion Sparkplug Company (Champion). The Site was first developed by Champion in 1936. Site buildings were razed in the early 1990s, 2000s and 2014. Many of the buildings razed in 2014 currently remain as debris piles at the Site with one of the buildings still partially standing. The Site has not been used for manufacturing purposes since the early 1990s. For the purposes of this report, the address is referred to as 900 Upton Avenue, Toledo, Lucas County, Ohio (Property). The location of the Property is shown on Figure 1.

WSP Environmental Strategies, LLC (WSP) conducted a Phase II assessment between June 2001 and August 2006 under the Ohio Voluntary Action Program (Ohio VAP). Activities conducted by WSP included installation of soil borings and monitoring wells, collection of soil, groundwater, and soil vapor samples, and closure of two underground storage tanks (USTs). Various Chemicals of Concern (COCs) were analyzed across the twelve (12) identified areas documented in the WSP Phase I. Results indicated that remedial activities were needed to address COCs in two identified areas: the South Manufacturing Bureau of Underground Storage Tank Regulations (BUSTR) Area (Area 5) and the South Manufacturing Area (Area 10). Soils were excavated in 2004 to remove polynuclear aromatic hydrocarbons (PAHs), with approximately 55 cubic yards removed from Area 5 and 22 cubic yards from Area 10. A No Further Action (NFA) letter was submitted on April 15, 2008. Ohio EPA issued a Covenant Not to Sue (CNS) with a groundwater use restriction and land use restriction to commercial/industrial use on November 17, 2008.

Hull completed a Phase I ESA (Phase I) in accordance with the scope and limitations of ASTM Practice E 1527-13, in December 2015 that identified the presence of potential impacts to media of the Property (*i.e.,* soil, groundwater and soil gas) based on previous use of the Property and adjacent properties. Based on correspondence with the City of Toledo, Phase II assessment activities for the on-Property recognized environmental conditions (RECs), which are identified below, were the focus of Hull's assessment activities.

IA/REC #	Description	COCs
REC 1	CREC – 2008 CNS	No Additional Investigation
REC 2	Suspected on-Property USTs	BTEX/MTBE, TPH-GRO
REC 3	Release from Transformer(s)	Information Received from US EPA Indicating No Further Action Required
REC 4	Debris Piles – Data Gap	VOCs, PAHs, TPH-GRO, TPH-DRO, Metals
REC 5	No Current Owner Interview – Data Gap	Attempt to Interview Current Owner during the Phase II

Initial Phase II assessment activities were conducted by Hull from May to June 2015 and the report detailing the initial Phase II assessment activities was executed under Hull project number COT235. The supplemental Phase II assessment activities detailed in this report were completed in July 2016 under Hull project number COT273. The Property is currently undeveloped. Residential development is located adjacent west and north of the Site, while commercial/industrial use is present to the east and south. The objective of the Supplemental Phase II Property Assessment (Supplemental Phase II PA) are to further characterize the environmental conditions at the Property near sample location SB-13. It is Hull's understanding that the Property is intended for use as a laydown area (i.e., commercial/industrial use) and that no structures intended for human occupancy are planned for the Property. Based in this understanding, soil gas samples were not collected in the area of SB-13. In addition, the Property is located in an Urban Setting Designation (USD), which is a demonstration that groundwater underlying the Property is not extracted for potable use. Because the Property is located in a USD, no monitoring wells were installed in the area of SB-13. Additionally, there is no nearby surface water body receiving groundwater discharge from the Property.

Phase II Assessment Activities

Although this Phase II was not Ohio VAP compliant, data were collected in accordance with Ohio Administrative Code (OAC) 3745-300-07(D) to identify and evaluate potential COCs in the area of SB-13 and to evaluate Property-specific geology and hydrogeology.

Although this is not an Ohio VAP compliant Phase II assessment, consistent with OAC 3745-300-07, sampling locations installed were biased toward areas where a release of hazardous substances was identified in the initial Phase II PA. Sampling was performed in general accordance with the sampling procedures specified in OAC 3745-300-07. A laboratory certified in accordance with OAC 3745-300-04 analyzed all samples.

The results of the Phase II Assessment indicated the following soil-related conclusions:

> Several COCs were detected above the method detection limit; however, no COCs exceeded respective single chemical direct contact commercial/industrial or construction/excavation standards within the applicable point of compliance (POC) (i.e., 2-foot POC for commercial/industrial receptors and 10-foot POC for construction/excavation workers).

1.0 INTRODUCTION

1.1 General

The City of Toledo (Client) authorized Hull & Associates, Inc. (Hull) to complete a Supplemental Phase II Site Assessment (Phase II) in the area of SB-13 on the Former Champion Spark Plug property. The Former Champion Spark Plug property is comprised of approximately 18 acres and was formerly developed with industrial manufacturing buildings operated by Champion Spark Plug. For the purposes of this report, the address is referred to as 900 Upton Avenue, Toledo, Lucas County, Ohio (Property). The location of the Property is shown on Figure 1.

The Property is located on the south of Upton, east of Montrose Avenue, and the north side of Nebraska Avenue. The Property is accessible from Upton and Montrose. WSP Environmental Strategies, LLC (WSP) conducted a Phase II assessment between June 2001 and August 2006 under the Ohio Voluntary Action Program (Ohio VAP), which included installation of soil borings and monitoring wells. The Phase II assessment activities also included the collection of soil, groundwater, and soil vapor samples, and closure of two underground storage tanks (USTs). Various Chemicals of Concern (COCs) were analyzed across the twelve (12) identified areas from the Phase I. Results indicated that remedial activities were needed to address COCs in two identified areas: the South Manufacturing Bureau of Underground Storage Tank Regulations (BUSTR) Area (Area 5) and the South Manufacturing Area (Area 10). Soils were excavated in 2004 to remove polynuclear aromatic hydrocarbons (PAHs), with approximately 55 cubic yards removed from Area 5 and 22 cubic yards from Area 10. A No Further Action (NFA) letter was submitted on April 15, 2008 And Ohio EPA issued a Covenant Not to Sue (CNS) with a groundwater use restriction and land use restriction to commercial/industrial use on November 17, 2008.

Hull completed a Phase I ESA (Phase I) in accordance with the scope and limitations of ASTM Practice E 1527-13, in December 2014 that identified the presence of potential impacts to media of the Property (*i.e.,* soil, groundwater and soil gas) based on previous use of the Property and adjacent properties. Based on correspondence with the City of Toledo, initial Phase II assessment activities were conducted in June 2015 and focused on the on-Property recognized environmental conditions (RECs), which are identified below.

REC 1 – CREC – 2008 CNS

The WSP Phase II assessment was conducted between June 2001 and August 2006. Activities included installation of soil borings and monitoring wells, and the subsequent collection of soil, groundwater, and soil vapor samples. Phase II activities also included the closure of two on-Property underground storage tanks. Various COCs were analyzed across the twelve (12) identified areas from the Phase I. Results indicated that remedial activities were needed to address COCs in two identified areas: the South Manufacturing BUSTR

Area (Area 5) and the South Manufacturing Area (Area 10). Soils were excavated in 2004 to remove elevated concentrations of PAHs, with approximately 55 cubic yards removed from Area 5 and 22 cubic yards from Area 10. A NFA letter was submitted on April 15, 2008. Ohio EPA issued a CNS with a groundwater use restriction and land use restriction to commercial/industrial use on November 17, 2008. This CREC is also considered a REC.

REC 2 - Suspected on-Property USTs

What appeared to be fill ports for five or more USTs was observed on the north-central portion of the Site. Although leak detection for the USTs was listed on BUSTRs website, all structures at the Site as well as the utilities have been disconnected, rendering the leak detection inoperable. Based on previous LUSTs at the Site and the current condition of the UST system, the five remaining USTs are considered a REC.

Size	Contents	Installation Date	COCs
6,000-gallons	gasoline	10/1/1987	BTEX/MTBE
6,000-gallons		10/1/1987	
6,000-gallons		10/1/1987	
2,500		2/1/1992	
2,500		2/1/1992	

REC 3 – Release from Transformer(s)

Several releases of oil from electrical transformers were documented at the Site in 2012. While the City of Toledo and the U.S. EPA responded to the incidents, samplings results for the oil were not provided during the file review. Release from electrical transformers at the Site is considered a REC.

REC 4 – Debris Piles – Data Gap

Several buildings were razed at the Site in 2014. As a result of the demolition activities, several debris piles were created. In addition to the demolition debris piles, several dozen piles of apparent uncontrolled dumping were observed at the Site. These debris piles generally consist of tires (several hundred in total) yard debris and construction remodeling debris (drywall, paint, roofing materials, household refuse, etc.) These debris piles restrict observation of a significant portion of the Site. The limitation results in a significant data gap resulting in a REC.

REC 5 – No Current Owner Interview – Data Gap

The Client indicated that the Site is owned by Moorhouse Real Estate, LLC. Hull attempted to interview the current owner, but all attempts resulted in unopened returned mail. The absence of Owner feedback is a significant data gap that results in a REC.

The initial Phase II assessment activities were executed under Hull project number COT235 and were conducted by Hull in June of 2015.

During the June 2015 Initial Phase II PA activities, an elevated concentration of trichloroethylene (TCE) was detected in soil boring SB-13 at a depth of 10 to 12 feet below ground surface. The supplemental assessment activities completed in July of 2016 was intended to investigate the concentration of TCE at the location of SB-13, in the upper soil horizon, and in the area of SB-13 in surface and near surface soils. This report was conducted for the purpose of summarizing the findings consistent with ASTM E1903-11. Reporting for all Phase II assessment activities completed at the Property is summarized and provided herein.

This assessment was conducted by the following Hull personnel:

Project Managers:	**Hydrogeologists/Scientists**:
Mr. J Matthew Beil, CPG	Mr. Jake Ardner
Mr. Michael Coonfare, CP	

Resumes for the personnel involved in the completion of this assessment are located in Appendix A.

1.2 Property Description

The location of the Property is shown in Figure 1. The Property is comprised of six parcels and is currently vacant. According to records maintained by the Lucas County Auditor, Mark Fayson currently owns the Property. The Property was previously developed as residential, commercial, and industrial uses.

The Property is currently vacant. The general Property features are illustrated on Figure 2. A general description of the Property information obtained from the Lucas County Auditor's Office is included below.

Address	Parcel ID	Acreage	Zoning
1102 Upton Avenue	04-11355	0.315	RD6 (Duplex Residence)
914 Upton Avenue	04-11370	14.761	Mx (Mixed Zone Parcel)
1013 Montrose Avenue	11-22444	0.080	RD6 (Duplex Residence)
1013 Montrose Avenue	11-22447	0.080	RD6 (Duplex Residence)
907 Montrose Avenue	11-22450	1.141	Mx (Mixed Zone Parcel)
719 Montrose Avenue	11-23980	1.585	IL (Limited Industrial)

Property Acreage: 17.962 acres

The Property was occupied by Champion Spark Plug from 1910 until 2009. All structures at the Site have been razed, with the exception of one building. One wall of a building remains standing on the Site. Several subsurface rooms were observed during the Site reconnaissance. Some of these features appeared to be

former basements, while others appeared to be utility tunnels. Debris piles from previous demolition activities, as well as apparent uncontrolled dumping are observed at the Site. Uses at the site since 1910 included residential and office building structures, gasoline fueling station, nickel plating and pickling building, metal rod cutting facility/factory, and a mill building.

1.3 Previous Investigations

WSP Environmental Strategies, LLC (WSP) conducted a Phase II assessment between June 2001 and August 2006 under the Ohio Voluntary Action Program (Ohio VAP), which included installation of soil borings and monitoring wells. The Phase II assessment activities also included the collection of soil, groundwater, and soil vapor samples, and closure of two underground storage tanks (USTs). Various Chemicals of Concern (COCs) were analyzed across the twelve (12) identified areas from the Phase I. Results indicated that remedial activities were needed to address COCs in two identified areas: the South Manufacturing Bureau of Underground Storage Tank Regulations (BUSTR) Area (Area 5) and the South Manufacturing Area (Area 10). Soils were excavated in 2004 to remove polynuclear aromatic hydrocarbons (PAHs), with approximately 55 cubic yards removed from Area 5 and 22 cubic yards from Area 10. A No Further Action (NFA) letter was submitted on April 15, 2008 And Ohio EPA issued a Covenant Not to Sue (CNS) with a groundwater use restriction and land use restriction to commercial/industrial use on November 17, 2008.

Hull completed a Phase I ESA (Phase I) in accordance with the scope and limitations of ASTM Practice E 1527-13, in December 2014 that identified the presence of potential impacts to media of the Property (*i.e.,* soil, groundwater and soil gas) based on previous use of the Property and adjacent properties. Based on correspondence with the City of Toledo, Phase II assessment activities focused on the on-Property recognized environmental conditions (RECs) identified in Section 1.1 of this report.

The initial Phase II assessment activities were executed under Hull project number COT235 and were conducted by Hull in June of 2015.

During the June 2015 Initial Phase II PA activities, an elevated concentration of trichloroethylene (TCE) was detected in soil boring SB-13 at a depth of 10 to 12 feet below ground surface. The supplemental assessment activities completed in July of 2016 was intended to investigate the concentration of TCE at the location of SB-13, in the upper soil horizon, and in the area of SB-13 in surface and near surface soils. This report was conducted for the purpose of summarizing the findings consistent with ASTM E1903-11. Reporting for the Supplemental Phase II assessment activities completed at the Property is provided herein.

1.4 Applicability and Recognized Environmental Conditions

The RECs identified at the Property are described above in Section 1.1. This Supplemental Phase II focuses on an elevated detection of TCE in the 10 – 12 ft. depth interval of SB-13, which was installed in June of 2015. Additional investigation of this area focuses on the upper soil horizon of SB-13 and surface and near surface soils in the area of SB-13.

1.5 Purpose

This work was completed in accordance with ASTM Standard E1903-11, which covers the process for conducting Phase II ESAs with respect to the presence or the likely presence of substances including, but not limited to, those within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (e.g., hazardous substances), pollutants, contaminants, petroleum and petroleum products, etc. The supplemental assessment was conducted in sufficient detail to appropriately assess soil in the area of SB-13.

1.6 Limitations and Qualifications

Based on the current condition of the Site and the fact that the property received a CNS under the Ohio VAP, in addition to a review of Phase II Assessment data collected in June of 2015, Hull focused this supplemental assessment to the area of SB-13.

1.7 Current and Intended Land Use

The Property is currently vacant. The planned future land use at the Property is commercial/industrial with no developed structures intended for extended human occupancy.

2.0 PHASE II DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) were developed and implemented in a manner consistent with U.S. EPA's "Guidance on Systemic Planning Using the Data Quality Objectives Process" according to their limitations and intended uses.

2.1 Phase II Assessment Goals

Based upon the findings of the initial Phase II conducted in June 2015, the goals for this Phase II assessment are as follows:

1. Collect data to further evaluate the nature and extent of TCE identified in SB-13.

2.2 Data and Information to Support the Phase II Objectives

Historical data and information for the Property was reviewed to attempt to identify any gaps that needed to be addressed during Phase II assessment activities, in order to evaluate the area of the Property near SB-13. Any data gaps identified were investigated through the collection of soil samples. Chemical analytical methods for these samples were determined based on historical background information.

Although not an Ohio VAP compliant Phase II assessment, data obtained from the Phase II was evaluated in the context of the VAP generic numerical standards in accordance with the Property-specific pathway analyses and an emerging understanding of construction and redevelopment options. To the extent that the Phase II data exceed applicable standards, it was understood during all portions of the project that additional sampling may be required to more fully understand the potential effect of pathway completeness and exposures to receptor populations.

2.3 Decision Process and Project Approach

2.3.1 Inputs to the Decision Process

In consideration of future Property redevelopment efforts, a site conceptual model (SCM) was developed during the Phase II to identify complete exposure pathways, and current and reasonably anticipated future receptors. The SCM was developed to address exposures by both current and potential future receptor populations at the Property.

In development of the SCM and in the approach to developing the Phase II activities, the following questions were considered:

1. Do portions of the Property contain COCs that exceed applicable VAP standards, and do data gaps exist such that additional data are required to assess potentially complete exposure pathways and receptor populations?

2. For areas of the Property containing COCs exceeding applicable VAP standards, what are appropriate and cost-effective options for cleaning up the contamination or eliminating the pathways (*i.e.*, through engineering and/or institutional controls) such that Property redevelopment can be accomplished?

The investigative approach for this supplemental Phase II, was defined based on results from the initial Phase II in order to assess the area of SB-13 at the Property. These investigations included soil sampling conducted during the advancement of soil borings to:

1. identify the presence and concentrations of COCs in soil, and

2. characterize the hydrogeology.

During the Phase II activities, it was understood that the findings of the assessment activities could result in:

1. a decision to conduct additional investigations for the re-delineation of existing or new RECs and to further define the information required to meet applicable standards; and

2. a decision to adjust Property redevelopment plans, including implementation of remedial activities, as necessary, to meet applicable standards.

Following completion of each portion of the Phase II assessment, a pathway analysis was completed for the purpose of evaluating current and potential exposure pathways. The results of this evaluation are presented in Section 7.

2.3.2 Project Approach

A Work Plan was prepared by Hull and approved by the U.S. EPA for the completion of the Supplemental Phase II activities. A copy of the Work Plan is included in Appendix B.

3.0 SAMPLING AND SAMPLE ANALYSIS

Laboratory analysis of samples described in this report was conducted by Belmont/Pace Analytical Labs (Certified Lab # CL0032) in Englewood, Ohio. Laboratory procedures were conducted in accordance with the substantive requirements of the selected test methods.

Acceptable quality assurance and quality control procedures were employed in accordance with the approved QAPP for the City of Toledo. The field quality assurance and quality control procedures include the review of the laboratory's quality assurance program plan and standard operating procedures (SOPs) for consistency with field quality assurance and quality control procedures.

The use of specific methodologies in the form of SOPs to address quality control procedures employed when collecting field data ensures that data collection, field testing, field screening, and sampling techniques are consistent with achieving the purpose of the Phase II. The Work Plan is provided in Appendix B.

4.0 PHASE II ACTIVITIES

4.1 General

In general, this assessment was conducted to investigate the area of SB-13, where elevated concentrations of TCE were detected in the 10 – 12 ft. soil sample documented in the September 2015 Phase II Site Assessment. The Supplemental Phase II activities completed as part of this assessment are as follows:

2016 Supplemental Phase II Activities

July 19, 2016

- Installation and soil sampling of Hull soil borings HSB-13A through HSB-13H

Data was collected to identify and evaluate potential COCs and to evaluate Property-specific geology and hydrogeology. Sampling locations were biased toward areas where TCE was detected in the Initial Phase II Site Assessment. Sampling was performed to meet the data quality objectives defined within Section 2.0. A summary of all soil samples collected during the Supplemental Phase II assessment activities at the Property are presented in Table 1. The locations of the sampling locations (e.g., soil borings, temporary monitoring wells and soil vapor monitoring points) are shown on Figure 2.

4.2 Soil Borings

The geological and hydrogeological conditions, as well as the concentration and distribution of COCs in the surface and subsurface soils, were evaluated by installing continuously sampled, direct-push soil borings. The summary of the soil sampling is provided in Table 1. Locations of all soil borings are shown on Figure 2. Logs of the soil borings completed during this investigation are provided in Appendix C.

4.3 Soil Sampling and Analysis Methodology

Drilling and sampling operations for the above investigations were performed by Terra Probe using direct-push technology. Drilling and sampling activities were conducted under the supervision of a Hull hydrogeologist. Locations of the soil borings were selected based on the suspected location of potential on-sources of contamination on the Property. Representative soil samples from these soil borings were analyzed for the applicable COCs. Soil sample screening results are shown on the boring logs in Appendix C. A summary of the soil sample analytical results is provided in Table 1. The soil laboratory reports and chain-of-custody documentation is included in Appendix D.

All soil borings installed using the direct-push methods were continuously sampled utilizing either a two-inch outside diameter (O.D.) by 48-inch/60-inch long dual-tube sampler with single-use acetate sampler liners or 2 1/4-inch O.D. by 48-inch/60-inch long dual tube sampler with single use acetate liner. Soil samples

were collected from each distinct stratigraphic unit or a minimum of one sample per two-foot interval, whichever was greater. The field hydrogeologist wore clean nitrile gloves while handling each soil sample to maintain the integrity of the samples. Furthermore, the soil samplers were decontaminated in a non-phosphate soap solution and then rinsed with potable water between each sampling interval to minimize the potential of cross contamination and to ensure the integrity of the samples. All decontamination procedures were performed on-site under the observation of Hull's hydrogeologist.

A representative portion of each sample was immediately placed in clean, laboratory-supplied sample jars with *Teflon*-lined lids. The sample jars were properly labeled and immediately placed on ice in a cooler. Where soil was analyzed for VOCs, sample preservation Method 5035 was used and soil was placed into Terra Core™ kits or equivalent to preserve the sample. The remaining soil from the appropriate sample interval was placed in a clean *Ziploc*® type bag for field headspace screening using a MiniRae photoionization detector (PID) equipped with an 11.7 eV lamp. Before screening any samples, the PID was calibrated in accordance with the manufacturer's specifications using a 100 parts per million (ppm) isobutylene gas standard. The portion of each soil sample collected for headspace screening was allowed to warm to ambient temperature to promote volatilization of any VOCs. The PID probe was carefully inserted through the seal of each bag and the maximum meter response from each sample was recorded in the soil boring log.

Visual observations and PID screening results were used to select samples from each soil boring location for laboratory analysis. Analyses included VOCs in accordance with U.S. EPA Method 8260, targeting TCE and its breakdown chemicals.

Soil samples selected for analyses were analyzed by Belmont/Pace Labs (Certified Lab # CL0032).

4.4 Quality Assurance

In general, for all Hull 2016 Phase II Activities QA/QC samples (field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), field blanks, etc.) were collected to meet the scope of work, QAPP, or FSAP requirements, as applicable. In general, one duplicate, and equipment blank were collected for approximately every 20 soil sample collected. A trip blank was also included for every shipment containing samples submitted for VOC analysis. Laboratory analytical quality assurance data is provided in Appendix D.

5.0 REGIONAL AND PROPERTY-SPECIFIC GEOLOGY, HYDROGEOLOGY, AND PHYSICAL CONDITIONS

A review and evaluation of existing regional and Property-specific geological, hydrological and physical characteristics of the Property was completed. These findings, as applicable and necessary, are summarized below.

5.1 Regional Geology and Hydrogeology

5.1.1 Regional Geology

The Property is located in the City of Toledo, in the Maumee River Basin. According to the ODNR, Lucas County lies on a relatively flat glacial lake plain comprised of glacial sediments of Wisconsinan Age (ODNR, 2005). The glacial deposits range in thickness from zero feet where bedrock outcrops to 144 feet across Lucas County, with an average thickness of approximately 80 feet or more in the vicinity of the Property (ODNR, 1986).

5.1.2 Regional Hydrogeology

The surface drainage is generally to the northeast toward Lake Erie. The main rivers draining the region are the Ottawa River, Maumee River, and Swan Creek, a tributary of the Maumee River. There is no major groundwater divide in Lucas County.

Groundwater resources can be obtained from semi-confined sand and gravel aquifers within the glacial till and from limestone and dolomite of Silurian and Devonian age, which underlie the till. No public water supply wells have been located by the ODNR within a 1/2-mile distance of the Property, but ODNR records outside of this distance indicated that wells produce water from the carbonate bedrock. Bedrock at the Site is present at approximately 490 feet USGS.

Ground-surface elevation at the Site is approximately 615 feet (USGS). The topography is generally flat near the Property. Drainage from the Property appears to be toward the northwest toward the Ottawa River. Note that much of the natural topographic expression of the region has been disturbed by development.

5.1.3 Regional Availability of Surface water and Groundwater as Sources for Drinking Water

The Public Water System Inventory provided by the Ohio EPA was reviewed to obtain records of public water supplies within one-half mile of the Property boundary. According to Ohio EPA records, there are no public water wells located within a one-half mile radius of the Property. The City of Toledo provides water to the Property. The Property is located in a Toledo City USD approved by the Director of the Ohio EPA.

The area surrounding the Property is a very poor area for even minimal domestic water supplies within the region. Hull searched the ODNR Division of Water online database of located and unlocated well logs for private/public/monitoring wells within 0.5-mile of the Property. Seven water monitoring wells were identified within 0.5-mile of the Property. The presence of these monitoring wells is not anticipated to negatively impact the Property. Copies of the ODNR water well logs are included in Appendix F.

Potentiometric surface maps in the WGS Phase II ESA from May 2005 indicates that the shallow groundwater at the Site flows to the northwest on the northern two-thirds of the Site and to the southwest on the southern one-third of the Site. Static water levels ranged from approximately 1.5 feet below ground surface to just over 10 feet below ground surface.

5.2 Property-Specific Geology, Hydrogeology, and Other Characteristics

5.2.1 Property-Specific Geology

Review of soil boring logs completed at the Property by Hull indicates that the Property is primarily underlain by silts and clays. Fill material was observed in some of the soil borings at depths less than two feet.

5.2.2 Property Specific Hydrology and Hydrogeology

5.2.2.1 Recharge and Evaporation Rates

The average annual precipitation in Toledo, Ohio is approximately 34 inches per year. Evaporation and surface water runoff serve to reduce the groundwater recharge rate. In relatively recent history, transpiration has been minimal at the Property. Recharge rates for northwest Ohio have been documented between 2 to 10 inches per year (Hallfrisch, 2002, revised by Sprowls, 2010). The rate of recharge varies dependent on the nature of the surface cover. Future recharge will probably be reduced following development of the Property with stormwater runoff being carried to detention basins and then to off-Property locations via storm sewers.

5.2.2.2 Localized Groundwater Flow Conditions

Groundwater was encountered at depths ranging from approximately 6 to 10 feet below ground surface. Each of the four monitoring wells installed at the Property terminated in a grey or brown and grey clayey silt. Based on historical information as well as hydrogeological properties of clayey silts, these soil are likely acting as an aquitard, restriction vertical migration of groundwater at the Site.

6.0 IDENTIFICATION AND EVALUATION OF CHEMICALS OF CONCERN

6.1 Detected COCs in Soil

During 2015 Phase II activities, an elevated concentration of TCE was detected in the 10 – 12 ft. depth interval of SB-13. Supplemental sampling of near surface soil was conducted in close proximity to SB-13 and seven offset borings were installed to assess the surface and near surface soils in the area of SB-13. A summary table of the laboratory analytical report is provided in Table 1. TCE; tetrachloroethene (PCE); vinyl chloride (VC); trans-1,2-dichloroethene (DCE); cis-1,2-DCE; 1,1-DCE; and 1,1-dichloroethane (DCA) were detected in one or more samples submitted to the laboratory for analysis. Detected concentrations of these compounds were all below the single-chemical direct contact soil standard for commercial/industrial property use and for construction/excavation activity.

6.2 Data Quality Assurance

Data collection activities and data analysis were reviewed to verify that analytical data generated as part of this Phase II investigation comply with the data quality objectives identified in Section 2.0.

Based on a review of the available data, it appears that no evidence of contamination was identified in trip blanks, field blanks or equipment blanks. Additionally, all data reported meet the appropriate reporting limits for comparison against applicable standards.

A summary of the analytical data is presented in Table 1. Complete copies of the laboratory analytical data are provided in Appendix D.

7.0 DATA EVALUATION

Bulk soil data was evaluated assuming a commercial/industrial land use. Data evaluation was completed to provide a better understanding of the potential hazards and risks associated with a commercial/industrial use of the Property given the environmental conditions that have been identified on the basis of the surface and near surface soil sampling that has been completed during this investigation.

7.1 Purpose of the Data Evaluation

Sampling and analysis activities conducted during the Phase II investigation identified COCs in soil at the Property. The data was evaluated with respect to the depth the soil sample was collected, the planned or anticipated end use of the property, and the recorded use restrictions on the property.

7.2 Evaluation of Data

Supplemental soil analytical data was collected during the Phase II investigation. Soil analytical data identified the seven COCs listed in Section 6.1 as detected above the PQL. During the initial Phase II Site Assessment, trichloroethylene was detected at a concentration exceeding the respective direct contact generic numerical standard at SB-13; however, the detection was not located within the two-foot point of compliance for commercial/industrial end use or the ten-foot point of compliance for construction and excavation work.

The supplemental soil data was intended to further assess soil in the area of SB-13. An additional 14 soil samples were collected in the area of SB-13 from the 0 – 10 ft. soil horizon. While concentrations of TCE, PCE and their breakdown compounds were detected in one or more soil samples, none of the concentrations exceeded the Generic Direct-contact Soil Standard for a Single Chemical (GDCSS). The GDCSSs are listed in Tables II and III of Appendix A to Ohio Administrative Code 3745-300-08. These standards are also provided in Appendix A of the Work Plan for a Supplemental Phase II Property Assessment for the Former Champion Spark Plug Property, prepared by Hull in July 2016.

7.3 Identification of Receptor Populations and Exposure Pathways

The receptor populations are based on current use (i.e., undeveloped/vacant) and anticipated future use (*i.e.*, commercial/industrial use). The following receptor populations have been identified at the Property:

- Future on-Property Commercial/Industrial Worker; and
- On-Property Construction/Excavation Worker.

7.3.1 Future On-Property Commercial/Industrial Worker Receptor Population

Anticipated future use of the Property is assumed to be industrial use. The Ohio VAP generic numerical direct contact soil standards for the commercial and industrial land use categories were used as a point of comparison for soil analytical data collected on the property. At this time, the construction of buildings on the Property intended for human occupancy was not planned. Therefore, the volatilization to indoor air exposure pathway is considered incomplete. If this plan changes, supplemental soil gas sampling is recommended in the area of SB-13, and potentially in other areas of the Property.

7.3.2 Construction/Excavation Worker Receptor Population

If the Property were to be redeveloped in the future, construction activities including grading, excavating and filling, and construction of a parking lot or new structures may take place. Thus, activities by construction and excavation workers at the Property were also evaluated herein.

7.4 Summary of Data Evaluation

Soil analytical data collected from the upper ten-foot soil horizon was compared to single-chemical generic numerical standards of the Ohio VAP as a point of comparison. While concentrations of TCE, PCE and their breakdown compounds were detected in one or more soil samples, none of the concentrations exceeded the GDCSS.

8.0 FINDINGS

Data were collected to identify and evaluate potential COCs at the property in the area of SB-13.

Sampling locations installed were biased toward the area of SB-13 where a release of hazardous substances has or may have occurred. Sampling was performed in accordance with the approved Work Plan.

The results of the Phase II Assessment indicated the following:

Soil analytical data were compared to generic numerical standards of the Ohio VAP as a point of comparison. While concentrations of TCE, PCE and their breakdown compounds were detected in one or more soil samples, none of the concentrations exceeded the GDCSS.

9.0 REPORT LIMITATIONS

The conclusions and recommendations presented herein are based on the level of effort and investigative techniques defined under the Scope of Work. Hull has conducted this investigation in a manner consistent with sound engineering practices and with professional judgment. No other warranty or guarantee, expressed or implied, is made. This report does not attempt to evaluate past or present compliance with federal, state and local environmental or land use laws and regulations. Hull makes no guarantees regarding the completeness or accuracy of any information obtained in review of public or private files. Furthermore, this report is prepared for, and made available for the sole use of City of Toledo. The contents thereof may not be used or relied upon by any other person without the express written consent and authorization of City of Toledo.

10.0 REFERENCES

A variety of technical documents and publications were referred to during the course of this project. Some of the references consulted are presented below. Referenced documents and publications may or may not have been reviewed in their entirety. The guidelines and procedures presented in the documents and publications referenced have not been strictly adhered to unless stated otherwise.

Hallfrisch, Michael. Groundwater Pollution Potential of Lucas County, Ohio. 2002 (Revised 2010).

Hull & Associates, Inc., *Phase I Environmental Site Assessment,* Former Champion Sparkplug Property, Hull Document #: COT235.100.0135, December 2014.

Hull & Associates, Inc., *Phase II Property Assessment Work Plan*, Hull Document #: COT235.100.0157, May 2015.

Hull & Associates, Inc., *Phase II Property Assessment*, Hull Document #: COT235.100.0161, September 2015.

Hull & Associates, Inc., *Phase II Property Assessment Work Plan*, Hull Document #: COT273.100.0012, July 2016.

Ohio Administrative Code 3745-300-01*, Definitions Rule* for the Voluntary Action Program, May 2016.

Ohio Administrative Code 3745-300-07*, Phase II Property Assessment Procedures Rule* for the Voluntary Action Program, May 2016.

Ohio Administrative Code 3745-300-08, *Generic Numerical Standards Rule* for the Voluntary Action Program, May 2016.

Ohio Administrative Code 3745-300-10, Ground Water Classification and Response Requirements for the Voluntary Action Program, May 2016.

Ohio Department of Natural Resources, Division of Water. *Well Log and Drilling Reports.*

Ohio Department of Natural Resources, Division of Geological Survey. Glacial Map of Ohio, 2005.

Ohio Department of Natural Resources, County Bedrock Topography Maps.

WSP Environmental Strategies, LLC, June 2001 thru August 2006, *Phase II Environmental Site Assessment,* Former Champion Sparkplug Property.

TABLES

SUPPLEMENTAL PHASE II PROPERTY ASSESSMENT
FORMER CHAMPION SPARK PLUG PROPERTY

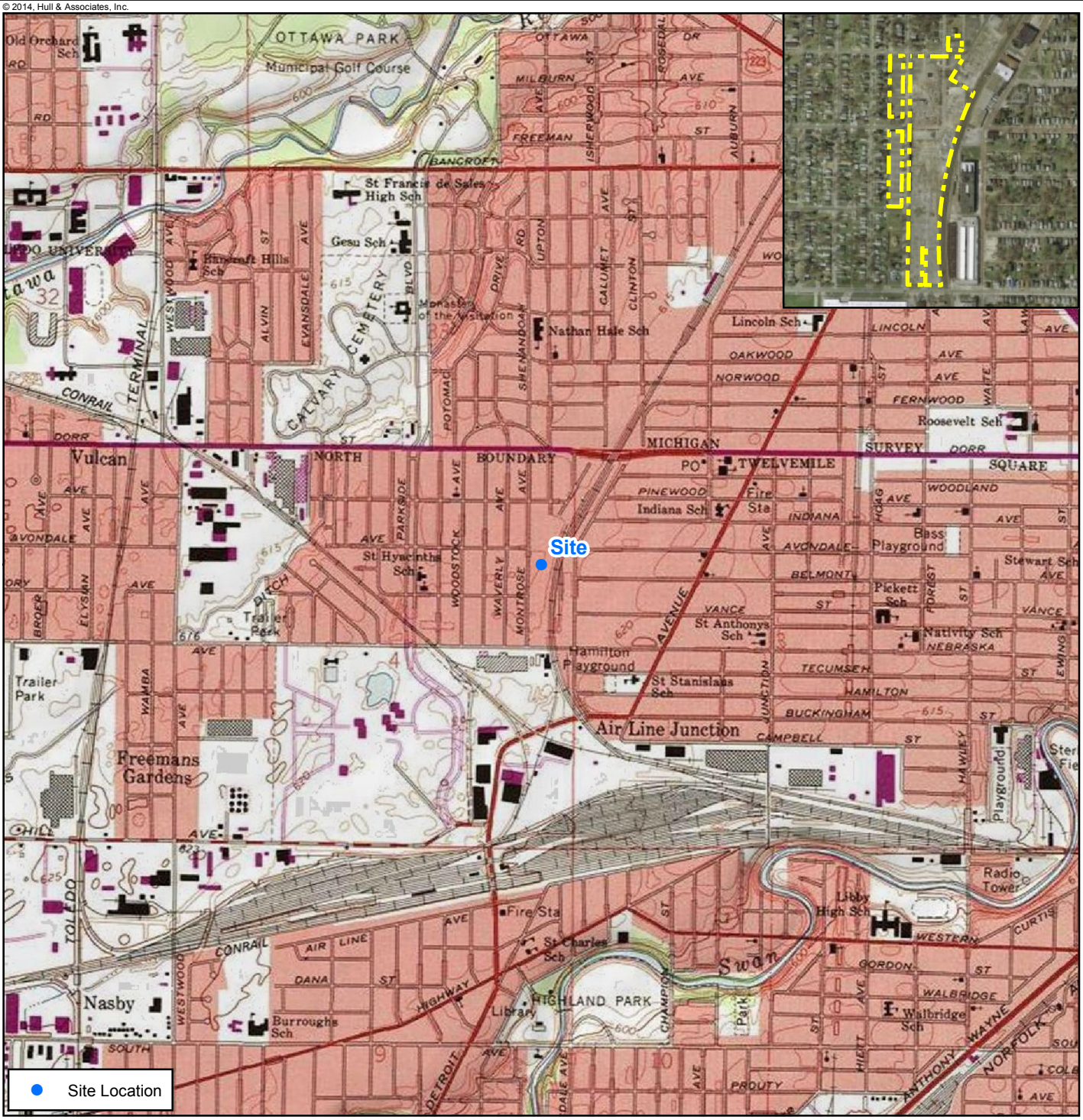
TABLE 1

SOIL ANALYTICAL SUMMARY TABLE (mg/kg)

Station Name	CAS Number	Generic Direct-Contact Soil Standard-Commercial/ Industrial	Generic Direct-Contact Soil Standard-Construction/ Excavation	HSB-13A	HSB-13A	HSB-13B	HSB-13B	HSB-13C	HSB-13C	HSB-13D	HSB-13D	HSB-13E	HSB-13F	HSB-13G	HSB-13G	HSB-13H	HSB-13H
Sample Depth				0.5 - 2 ft	4 - 6 ft	0.5 - 2 ft	8 - 10 ft	0.5 - 2 ft	6 - 8 ft	0.5 - 2 ft	4 - 6 ft	0.5 - 1.5 ft	0.5 - 1.2 ft	0.5 - 2 ft	8 - 10 ft	0.5 - 2 ft	8 - 10 ft
Sample Date				7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016	7/19/2016
FieldSampleID				COT273: HSB-13A: S005020	COT273: HSB-13A: S040060	COT273: HSB-13B: S005020	COT273: HSB-13B: S080100	COT273: HSB-13C: S005020	COT273: HSB-13C: S060080	COT273: HSB-13D: S005020	COT273: HSB-13D: S040060	COT273: HSB-13E: S005015	COT273: HSB-13F: S005012	COT273: HSB-13G: S005020	COT273: HSB-13G: S080100	COT273: HSB-13H: S005020	COT273: HSB-13H: S080100
EPA 8260																	
1,1-Dichloroethane	*75-34-3*	420	1,700	<0.0047	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	**0.13**	<0.0048	**0.023**
1,1-Dichloroethene	*75-35-4*	1,200	360	<0.0047	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	<0.0046	<0.0048	**0.013**
1,2-Dichloroethane	107-06-2	56	480	<0.0047	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	<0.0046	<0.0048	<0.0056
cis-1,2-Dichloroethene	156-59-2	*2,400*	*2,400*	<0.0047	<0.0044	<0.005	**0.28**	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	**0.1 J**	<0.0048	**3.5**
trans-1,2-Dichloroethene	156-60-5	1,700	1,700	<0.0047	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	**0.017**	<0.0048	**0.028**
1,1,1,2-Tetrachloroethane	630-20-6	240	680	<0.0047	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	<0.0046	<0.0048	<0.0056
1,1,2,2-Tetrachloroethane	*79-34-5*	*75*	670	<0.0047	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	<0.0046	<0.0048	<0.0056
Tetrachloroethene	127-18-4	170	170	0.0052	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	<0.0046	<0.0048	**0.0063**
Trichloroethene	*79-01-6*	51	17	**1.4**	**0.13**	**0.038**	**4.3**	**0.068**	<0.0064	**0.016**	**0.049**	**0.13**	**0.023**	**0.08**	**0.037**	**0.038**	**14.4**
Vinyl Chloride	*75-01-4*	50	280	<0.0047	<0.0044	<0.005	<0.0048	<0.0047	<0.0064	<0.0051	<0.0041	<0.0046	<0.0058	<0.005	**0.45**	<0.0048	**0.3**
SM 2540G																	
Percent Moisture				9.8	14.1	2	20.1	1.3	14.8	3.4	14.6	4.4	1.6	1.5	9.5	1.9	19.4

Notes:
Bold: Indicates the compound was detected in the sample
Analytical results are expressed in mg/kg, with the exception of percent moisture, which is expressed in %
Standards are located in the Appendix to OAC 3745-300-08, effective may 26, 2016
Italicized standards are located in the Chemical Information Database and Applicable Regulatory Standards (CIDARS) and are current as of May 26, 2015

FIGURES



Ohio

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0 500 1,000 2,000 Feet
1:24,000

Quad: Toledo

Source: The topographic map was acquired through the USGS Topographic Map web service.

The aerial photo in the inset was acquired through the ESRI Imagery web service. Aerial photography dated 2014.

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Supplemental Phase II
Former Champion Sparkplug

Site Location Map

914 Upton Avenue
Toledo, Lucas County, Ohio

Date:
August 2016

File Name:
COT273_03b_Fig01_ChampSLM.mxd

Edited: 8/18/2016 By: jslifer

Figure
1

Produced using ArcGIS 10.0 SP1

0 40 80 160 Feet
1:960

HSB-1 HSB-3 HSG-2 Fill Ports HSB-2/HTMW-2 HSG-1 HSB-4 Area 1 Area 3 HSB-8/HTMW-3 S #1 S #2 #3 #4 Incident # 488279-03 #10 Former Recovery Sump #5 #6 #7 #8 #9 HSB-9/HTMW-6 Former Manfield House Incident # 488279-00 Cardox AST Former Research and Engineering Building 1 inch = 20 feet

Pole Mounted Transformer Area 11 Former Hastings Warehouse HSB-5 HSB-6 Former Tech. Services Bldg. HSB-17/TMW-1 HSB-7 Incident # 488279-0? Incident # 488279-01 #1 #2 Fill Ports REC-2 Area 1 Area 3 Incident # 488279-03 S #1 S #2 #3 #4 #10 Former Recovery Sump Former Manfield House Former Research and Engineering Building #5 #6 #7 #8 #9 Cardox AST Incident # 488279-00 REC-3 Transformers REC-4 HSB-11 Area 9 Former 6 Story Office Building HSB-10/HTMW-4 Former Production and Engineering Building Area 4 #14 Incident # 488279-05 HSB-12/HTMW-5 #15 HSB-18 Incident # 488279-02 #11 #12 #13 Area 2

Area 2 Area 9 Former Above Ground Vapor Degreaser Incident # 488279-0? #16 HSB-13 Area 7 Former 1-Story Production Bldg. HSB-14 Boiler House HSB-15 10,000 Gal Fuel Oil Tank with Concrete Dike Area 10 Former Manufacturing Building HSB-16 Above Ground Heating Oil Tank HSB-13F HSB-13G HSB-13B HSB-13A HSB-13H HSB-13E HSB-13C HSB-13 HSB-13D Area 7 1 inch = 20 feet

Substation High Voltage Transformers Oil Recovery Sump at Monrose Street Pump Room Incident # 488279-04 #17 Former Blaw Knox Bldg. Oil Recovery Sump Area 5 #18 3 Manholes #22 2 Manhole #19 #20 #21 Incident # 488279-06 Buried Drum Containing Metal Hydroxide Filter Cake RCRA Waste Storage Area Area 8 Incident # 488279-07 #23 Area 6

Oil Recovery Sump at MonroseSt Pump Room Area 10 #17 Incident # 488279-04 Substation High Voltage Transformers Area 5 Incident # 488279-06 #18 #19 3 Manholes #22 2 Manhole #20 #21 1 inch = 20 feet

Area 12 Former REX Research, Inc. (?) (Insecticides) Office Building and outline

- Property Boundary
- Zone of Contamination from Oil Overflow (WSP Environmental Strategies Locations)
- AST (WSP Environmental Strategies Locations)
- UST (WSP Environmental Strategies Locations)
- Identified Areas (WSP Environmental Strategies Locations)
- Incidents (BUSTR Incident ID)
- Electrical Duct
- Storm Line
- Product Fill Line
- Underground Piping Runs
- Underground Tunnel
- Manhole
- Sump

Recognized Environmental Conditions
- REC-2
- REC-3
- REC-4

Sample Locations
- Soil Boring
- Soil Boring/Temporary Well
- Soil Gas Location
- Supplemental Soil Borings

Recognized Environmental Condition (REC)
REC-1: Ground water Restriction and Lane Use Restricted to Commercial/Industrial Use
REC-2: Five Out-of-Service USTS
REC-3: Oil Release from Electrical Transformers
REC-4: Debris Piles Prohibiting Observation Resulting in a Data Gap

Notes:
-The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2012.
-Information was obtained from WSP Strategies 2001-2006 Reports.

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August 2016

Supplemental Phase II
Former Champion Sparkplug

Site Map

914 Upton Avenue
Toledo, Lucas County, Ohio

Figure 2

Produced using ArcGIS 10.0 SP1

File Name: COT273_03b_Fig02_SitePlan.mxd

Edited: 8/18/2016 By: jslifer

APPENDIX A

Project Personnel Resumes

JACOB ARDNER | Hydrogeologist II

EDUCATION:

- Bachelor of Science, Geology, the University of Toledo, 2009

TRAINING:

- SafeLandUSA/PEC Basic Orientation Course (2013)
- OSHA 10-Hour Construction Outreach Training: September 2013
- OSHA 1910.120, 40-Hour OSHA Hazardous Waste Site Course and Annual 8-Hour OSHA Refresher Training Course
- RCRA Hazardous Waste Management Training: July 2015
- DOT Hazardous Materials Transportation Course: December 2015
- CPR, First Aid and AED Course: January 2016

Jacob Ardner is a Hydrogeologist II at Hull. Jacob has significant experience in brownfield redevelopment, Phase I/Phase II Investigations, RCRA Corrective Action, Bureau of Underground Storage Tank Regulations Investigations and federal Toxic Substances Control Act (TSCA) Evaluations. He is also involved in coordinating groundwater and soil sampling activities, drilling activities, and sub-slab vapor probe installation, and has also contributed to writing Phase I and Phase II site assessment reports that are compliant with both the Ohio Voluntary Action Program (VAP) and ASTM standards.

Jacob's expertise includes:

Phase I and Phase II Environmental Assessment

- Conducts Ohio VAP Phase I and II Environmental Site Assessments; field activities include collecting soil and groundwater samples, well installation, well development, surveying, slug testing, yield testing and preparing site-specific health and safety plans.
- Responsible for performing Phase I ESA site reconnaissance, interviews, and data collection from various public and private sources. Activities also include correspondence with clients and reviewing reports.
- Prepares potentiometric surface maps.
- Prepares Phase I and II reports and Remediation Action Work Plans.
- Conducts flow groundwater sampling and prepares quarterly groundwater reports.
- Conducts injection oversight utilizing REGENESIS 3DMe and BDI Plus for contaminated groundwater remediation.
- Processes sediment cores taken from local study sites to examine soil characteristics.
- Serves as supervisor for demolition oversight.
- Serves as staff hydrogeologist for TCSA Closure activities.

Geotechnical Investigations

- Conducts geotechnical drilling to obtain engineering properties of site soils and bedrock.

BUSTR Program

- Responsible for implementation of Tier I and II field investigation which include installation of soil borings, monitoring wells and soil vapor probes, collection of soil, sediment, surface water, groundwater and soil vapor samples, surveying, slug testing, LNAPL recovery and decommissioning activities.
- Assists in preparation of compliance documentation including permitting, Tier 1 and 2 Investigations, and monthly LNAPL recovery reports.

Emergency Spill Response

- Responsible for emergency excavation oversight, stream profiling, stockpile profiling, surface water sampling, and air quality monitoring.

Selected project experience:

- Phase II Investigation and Remediation Project | Lead Field Supervisor | Port Clinton, Ohio
- Phase II Investigation – Superfund Site | Peterborough, New Hampshire
- BUSTR Tier I and Tier II Investigation | Columbus, Ohio
- Proposed Residual Waste Disposal Facility | Hydrogeologic Investigation| Mansfield, Ohio
- Demolition and Remediation Project / TSCA Assessment | Lead Field Supervisor | Marietta, Ohio
- Extensive Hydrogeologic Investigation | Ottawa, Illinois
- Quarterly Groundwater Evaluation / Explosive Gas Monitoring | Gahanna, Ohio

J MATTHEW BEIL, CPG | Project Hydrogeologist

EDUCATION:
- Bachelor of Science, Geology, The University of Toledo, 2002

TRAINING:
- OSHA 1910.120, 40-Hour Health and Safety Training Course and Annual 8- Hour OSHA Refresher
- HeartSaver First Aid and CPR/AED
- Smith Systems Defensive Driving

CERTIFICATIONS:
- Certified Professional Geologist (AIPG)

Matt is a Project Manager in Hull's Toledo Ohio office. He has extensive experience in the environmental field, including groundwater sampling, soil sampling, explosive gas monitoring, installation of gas probes, vents, monitoring wells and piezometers. He also has been involved in construction observation and cost estimating for large industrial facilities. He completes comprehensive site history investigations, site walkovers, regulatory agency file reviews, and Phase I/II site assessments. Additionally, Matt has served as a field representative on construction projects that typically included demolition, excavation and placement of backfill, contract compliance assurance, and documentation for permanent records.

Matt's expertise includes:

Remedial Activities
- Conducts free product recovery, UST removal oversight, and associated closure sampling including field screening of excavated soils for presence of hydrocarbons with a PID.
- Performs contractor observation and documentation for site preparation and remedial activities such as chemical oxidation injection for remediation of groundwater.
- Performs cost estimating.
- Has assisted and performed asbestos surveys on a variety of facilities.

Environmental Assessment
- Serves as lead investigator and author for multiple Phase I and Phase II reports pursuant to ASTM and Ohio Voluntary Action Program (VAP) standards at residential, commercial, industrial, military, and agricultural sites in multiple states.
- Serves as staff hydrogeologist for Phase II ESAs. Responsible for soil boring and monitoring well installation; air, soil, water, and leachate field sampling and monitoring activities; explosive gas monitoring; data analysis and evaluation; and report preparation. Also develops project scopes and cost estimates.
- Decommissions monitoring and production wells to obtain compliance.
- Provides general GIS mapping support for many projects including Phase I and Phase II ESAs.

Geotechnical Investigations
- Conducts geotechnical drilling and sampling to obtain subsurface geologic information and to determine relevant engineering properties of site soils.

Selected project experience:
- Major Rehabilitation and Widening of Interstate IR 75 | Red Flag Study Geotechnical Investigation | Lucas and Wood Counties, Ohio
- Multi-million Dollar Remediation Project | Contractor Observation and Documentation | Confidential Site, Northwest Ohio

MICHAEL COONFARE, REM, CP | Senior Project Manager

EDUCATION:
Bachelor of Science, Environmental Studies, Ohio Northern University, 1996

TRAINING/SEMINARS:
- RMD's LPA-1 Lead Paint Inspection System
- PSI Phase I Inspection Course
- OSHA 1910.120 40-Hour Hazardous Materials Safety Course
- OSHA 1910.120 8-Hour Refresher
- Certified Training, DOT General Awareness
- ODOT Categorical Exclusion Training

CERTIFICATIONS:
- Ohio EPA VAP Certified Professional #298
- National Registry of Environmental Health Professionals Registered Environmental Manager
- Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist (Inactive)
- State of Indiana Building Inspector (Inactive)
- State of Michigan Management Planner (Inactive)
- Ohio Department of Health Lead Risk Assessor (Inactive)

Michael is a Senior Project Manager with over 17 years of experience and currently manages Hull's Toledo office. His expertise includes the preparation and management of Phase I and Phase II Environmental Site Assessments, remedial action plans, demolition oversight, cost estimating, and UST closure and transportation projects. Michael specializes in the management of large brownfield redevelopment projects.

Mike's expertise includes:

Brownfield Redevelopment
- Conducts initial site assessment and eligibility determination.
- Performs multimedia sampling.
- Prepares remediation plans, cost estimates, and No Further Action Letters (NFAs).

RCRA Closure / Corrective Action
- Prepares RCRA Corrective Action Plans for facilities under findings and orders from the Ohio EPA.
- Prepares and Reviews Cessation of Regulated Operations Documentation.

Building Decommissioning Oversight
- Performs oversight of building decommissioning activities including the removal of mercury containing switches and units; the draining, rinsing and removal of transformers with PCB-containing and PCB-contaminated oils; removal of asbestos-containing material; and removal of building residuals (mercury-containing lights, Freon canisters, oils, caustics and acids, etc.).
- Provides specification preparation, coordination of pre-bid site walks, review of bid responses, oversight of decommissioning activity, and review of invoices.

UST Removal and Closure
- Performs UST Closure Documentation.
- Conducts Tier 1 and Tier 2 Assessment and Reporting.
- Performs IRA implementation and reporting.
- Performs RAP implementation and reporting.

Selected Project Experience

- Naval Weapons Industrial Reserve Plant VAP MOA Assessment and Remediation | Toledo, Ohio
- Marina District Project VAP Assessment and Remediation | Toledo, Ohio
- Ohio Turnpike Commission UST Closure and Soil Remediation | Swanton, Ohio
- Cuyahoga Valley Industrial Center Job Ready Site Remediation and Redevelopment | Cleveland, Ohio
- Ecological Management and Recycling Facility Ohio VAP Assessment, Remediation and Redevelopment | Napoleon, Ohio

APPENDIX B

Work Plan

WORK PLAN
FOR A
SUPPLEMENTAL PHASE II PROPERTY ASSESSMENT

FOR THE:
FORMER CHAMPION SPARK PLUG PROPERTY
900 UPTON AVENUE
TOLEDO, OHIO

PREPARED FOR:
CITY OF TOLEDO-DIVISION OF ENVIRONMENTAL SERVICES
348 SOUTH ERIE STREET
TOLEDO, OHIO 43604

PREPARED BY:
HULL & ASSOCIATES, INC.
3401 GLENDALE AVENUE
SUITE 300
TOLEDO, OHIO 43614

JULY 2016

HULL

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Appendix A OAC 3745-300-08 Generic Numerical Standards

1.0 INTRODUCTION

1.1 General

This Work Plan has been prepared for the City of Toledo (Client) by Hull & Associates, Inc. (Hull) for supplemental field sampling at the Former Champion Spark Plug property to satisfy the Data Quality Objectives (DQOs) requirements under OAC 3745-300-07(C)(6). All work performed under this Work Plan is subject to the conditions listed in the 2016 QAPP for the City of Toledo's Hazardous Substances and Petroleum Contaminated Sites 2015 Community-wide Coalition Assessment Grant. The US EPA approved the QAPP on Friday June 17, 2016. The property subject to this work plan is located at 900 Upton Avenue, Toledo, Lucas County, Ohio (Property) and is comprised of approximately 18 acres that is currently undeveloped. The location of the Property is shown on Figure 1.

1.2 Background

WSP Environmental Strategies, LLC (WSP) conducted a Phase II assessment between June 2001 and August 2006 under the Ohio Voluntary Action Program (Ohio VAP). Activities included installation of monitoring wells, collection of soil, groundwater, and soil vapor samples, and closure of two underground storage tanks (USTs). Various Chemicals of Concern (COCs) were analyzed across the twelve (12) identified areas from the Phase I. Results indicated that remedial activities were needed to address COCs in two identified areas: the South Manufacturing Bureau of Underground Storage Tank Regulations (BUSTR) Area (Area 5) and the South Manufacturing Area (Area 10). Soils were excavated in 2004 to remove polynuclear aromatic hydrocarbons (PAHs), with approximately 55 cubic yards removed from Area 5 and 22 cubic yards from Area 10. A No Further Action (NFA) letter was submitted on April 15, 2008. Ohio EPA issued a Covenant Not to Sue (CNS) with a groundwater use restriction and land use restriction to commercial/industrial use on November 17, 2008.

At the Request of the City of Toledo – Division of Environmental Services, Hull conducted a Phase I ESA at the Site in December 2015. The Phase I ESA identified the following Recognized Environmental Conditions (RECs):

IA/REC #	Description	COCs
REC 1	CREC – 2008 CNS	No Additional Investigation
REC 2	Suspected on-Property USTs	BTEX/MTBE, TPH-GRO
REC 3	Release from Transformer(s)	Information Received from US EPA Indicating No Further Action Required
REC 4	Debris Piles – Data Gap	VOCs, PAHs, TPH-GRO, TPH-DRO, Metals
REC 5	No Current Owner Interview – Data Gap	Attempt to Interview Current Owner during the Phase II

Following issuance of the Phase I to the City, Hull prepared a scope of work to assess soil, groundwater and soil gas at the Property. The Phase II assessment activities were conducted by Hull from May to June 2015. This report was executed under Hull project number COT235. The Property is currently undeveloped. Residential development is located adjacent west and north of the Site, while commercial/industrial use is present to the east and south. The objectives of the Phase II Property Assessment (Phase II PA) was to further characterize the environmental conditions at the Property and, due to the use of the property (demolition of structures) following the issuance of the CNS, to collect the necessary data to pursuant to ASTM E1903-11.

Phase II Assessment Activities

Although the Phase II was not Ohio VAP compliant, data were collected in accordance with Ohio Administrative Code (OAC) 3745-300-07(D) to identify and evaluate potential COCs in the RECs and to evaluate Property-specific geology and hydrogeology. Sampling locations installed were biased toward areas where a release of hazardous substances has or may have occurred. Sampling was performed in general accordance with the sampling procedures specified in OAC 3745-300-07. A laboratory certified in accordance with OAC 3745-300-04 analyzed all samples.

The results of the Phase II Assessment indicated the following soil-related conclusions:

> Several COCs were detected above the method detection limit; however, no COCs exceeded respective single chemical direct contact commercial/industrial or construction/excavation standards within the applicable point of compliance (POC) (i.e., 2-foot POC for commercial/industrial receptors and 10-foot POC for construction/excavation workers). Trichloroethene was detected at 123 mg/kg in soil boring HSB-13 from ten to twelve feet below grade.

The results of the Phase II assessment indicated the following groundwater-related conclusions:

1. Groundwater samples were collected from all six temporary monitoring wells (TMW-1 thru TMW-6) on the Property on June 11, 2015. Based upon sampling review of the laboratory analytical results, groundwater collected from four of the temporary monitoring wells exceed the VAP generic Unrestricted Potable Use Standards (UPUS) for one or more of the following COCs: arsenic, benzene, and m,p-xylenes. The Property is located within an Urban Setting Designation (USD) and also has a groundwater use restriction and land use restriction under the November 17, 2008 CNS.

1.3 Property-specific Geology/Hydrogeology

The Property is located in the City of Toledo, in the north central portion of Lucas County, Ohio, and lies on the Lake Plain deposits of Central Lowland Physiographic Province. The county is situated on a lake plain formed largely as the result of post-glacial events following the Wisconsinan glacial epoch. The lake plain region is typified by relatively flat topography sloping regionally southeastward toward the Maumee River and northeastward toward Lake Erie, with minor undulations scattered throughout the county.

The surface drainage is generally to the northeast toward Lake Erie. The main rivers draining the region are the Ottawa River, Maumee River, and Swan Creek, a tributary of the Maumee River. There is no major groundwater divide in Lucas County.

Groundwater resources can be obtained from semi-confined sand and gravel aquifers within the glacial till and from limestone and dolomite of Silurian and Devonian age, which underlie the till. No public water supply wells have been located by the ODNR within a 1/2-mile distance of the Property, but ODNR records outside of this distance indicated that wells produce water from the carbonate bedrock. Bedrock at the Site is present at approximately 490 feet USGS.

Ground-surface elevation at the Site is approximately 615 feet (USGS). The topography is generally flat near the Property. Drainage from the Property appears to be toward the northwest toward the Ottawa River. Note that much of the natural topographic expression of the region has been disturbed by development.

Potentiometric surface maps in the WGS Phase II ESA from May 2005 indicates that the shallow groundwater at the Site flows to the northwest on the northern two-thirds of the Site and to the southwest on the southern one-third of the Site. Static water levels ranged from approximately 1.5 feet below ground surface to just over 10 feet below ground surface.

2.0 DATA QUALITY OBJECTIVES

2.1 Problem Statement

The Property is currently undeveloped. Residential development is located adjacent west and north of the Site, while commercial/industrial use is present to the east and south. The objective of the Supplemental Phase II Property Assessment (Phase II PA) is to further investigate the horizontal and vertical extent of TCE in the upper ten-foot soil horizon on the Property.

Data obtained from the Phase II PA will be evaluated in the context of VAP risk-based cleanup goals given assumptions of Property-specific pathway analyses. To the extent Phase II PA data exceed risk-based standards, additional delineation sampling may be required to more fully define the nature and extent of contamination.

2.1.1 Project Team

The proposed project team is presented below. The team members have been selected based on individual project experience related to the specific tasks required. A brief description of each individual's project responsibilities is provided below:

J Matthew Beil, Hull Project Manager (PM)

Mr. Beil will be the Hull Project Manager and oversee the implementation of the assessment activities and coordinate all work schedules/agendas with the Client. His responsibilities will also consist of the following:

1. administrate and supervise all phases of the project;
2. determine that project objectives are met within financial and time constraints;
3. work with the Quality Assurance Officer (QAO) and field personnel to plan and conduct project operations, progress meetings, etc.; and
4. review reports and other work products prior to their issuance.

A designated Sample Team Leader and Health and Safety Officer for drilling and sampling activities will report to Mr. Beil, and will serve as Hull's on-site contact during drilling and sampling activities.

Michael T. Coonfare, Hull Senior Project Manager (SPM) – Certified Professional (CP)

Mr. Coonfare will be the Senior Project Manager and will review and oversee the completion of the Phase II Property Assessment.

Laboratory Director

The Laboratory Director will be primarily responsible for the overall operation of the laboratory including all samples analyzed and data reported. The Laboratory Director will also be responsible for initiating corrective action measures when analytical data do not meet the requirements of this plan or the laboratory's Quality Assurance Plan (QAP). The Client will maintain direct contact with the Laboratory.

Laboratory Project Manager

The Laboratory Project Manager will be the primary communications link between the laboratory and the Client. The Laboratory Project Manager will be responsible for relating any special needs of the field operations personnel to the laboratory. The Laboratory Project Manager will also provide the final review of all data packages before reporting results.

Laboratory QAO

The Laboratory QAO will be primarily responsible for implementing and monitoring compliance with the laboratory's QAP. The Laboratory QAO's duties will also include: conducting audits, reviewing all QC data, and reporting problems to the Laboratory Director for corrective action.

Site Safety Officer

A Site Safety Officer will be designated for the implementation of all fieldwork. The Site Safety Officer will ensure compliance with the health and safety plan (HASP) for the project. The purpose of the HASP is to define the health and safety considerations for on-site activities by Hull employees and subcontractors. The HASP is required by **OSHA 29 CFR 1910.120**. The basic requirements for the HASP of the project are delineated in the standard health and safety policies and procedures. All personnel on-site will be informed about the pertinent sections of the HASP. The Site Safety Officer assumes responsibility for providing leadership in safety and health matters for site operations by:

1. performing daily site-safety audits;
2. communicating safety and health information to those working at the site;
3. communicating and coordinating safety practices with contractors;
4. conducting daily "tail-gate" safety discussions;
5. ensuring that emergency plans specific to the site have been established, discussed with personnel on-site, and are understood;
6. ensuring that communications equipment is readily available on-site;

7. checking that Hull employees, visitors and contractors read the HASP before entering or beginning work on the site;

8. ensuring that all minimum training and education requirements are met for on-site personnel;

9. advising or seeking advice from the Project Manager and safety and health consultant on issues that may require attention and/or correction; and

10. ensuring that electrical work is performed safely, i.e., de-energize all circuits, if feasible, when doing electrical work. If de-energizing is not feasible, adherence to NFPA 70E requirements is required.

2.1.2 Conceptual Site Model

A Conceptual Site Model (CSM) forms an understanding of the chemical source areas, chemical release mechanisms, environmental transport media, potential human intake routes, and potential human receptors for the Property. The purpose of the CSM is to provide a framework for problem definition, identification of exposure pathways that may result in human health risks, indication of data gaps, and aid in identification of appropriate assessment and remediation measures. Chemical release mechanisms, environmental transport media, and potential human intake routes are identified for each potentially exposed receptor.

COCs were determined from the potential on- and off-Property sources as identified during the Phase I and were refined as a result of initial Phase II sampling completed in 2015. The COC that is the focus of this supplemental investigation is TCE. This COC may be governed by the following Property-specific transport mechanisms in association with applicable points of exposure:

1. volatilization of COCs in soil to ambient air (outdoor and/or indoor);

2. dust emissions of COCs in soil to ambient air;

3. direct contact with soil and/or groundwater;

4. leaching of COCs in soil to groundwater;

5. volatilization of COCs in groundwater to ambient air (indoor and/or outdoor);

6. surface water run-off; and

7. free-phase migration.

The preliminary CSM (Figure 3) provides a baseline assessment of the Property and will be modified as additional data are obtained.

2.2 Decision Identification

Phase II PA data will be compared to applicable VAP risk-based cleanup goals. Data gaps will be identified and, to the extent appropriate, supplemental investigations may be necessary to address those data gaps.

The following decisions will be made from the Phase II PA:

1. Do portions of the Property contain COCs that exceed VAP risk-based cleanup goals; and
2. Do data gaps exist such that additional data are required to define nature and extent?

2.3 Inputs to the Decision

The investigative approach described in this FSAP was defined based on the findings of previous investigations, including the Phase I Environmental Site Assessment (ESA) and Phase II Property Assessment prepared by Hull in 2015. In general, points of investigation have been designated within the proximity of HSB-13 to further investigate the detected concentration of TCE in HSB-13 from ten to twelve feet below grade. The investigation will employ soil sampling conducted during advancement of soil borings to:

1. identify the presence and concentrations of TCE in soil;
2. assist in defining (to the extent feasible) the vertical and lateral extent of TCE in soil; and,
3. identify and/or eliminate potential migration and exposure pathways.

Phase II PA findings may result in:

1. a decision to conduct additional investigations for the purpose of delineating the horizontal and vertical extent of COCs; and
2. a decision to implement Property remedial activities, as necessary.

2.4 Study Boundaries

The spatial boundary of the environmental investigation will be limited to an approximate 50-foot radius of HSB-13. Proposed sampling locations are illustrated on Figure 2.

Soils will be investigated to various depths depending on depth to saturation, potential sources, and/or potential receptors. If the intended end use of the Property is modified prior to the execution of this work plan that in turn modifies the point of compliance, the depth of soil investigation may be adjusted accordingly.

2.5 Decision Rule

A decision rule usually compares an output parameter to an action level, which is then used to determine a course of action for the Property. Soil analytical results characterizing the upper two-foot soil horizon will

be initially compared to the Ohio VAP Generic Numerical Standards for the anticipated commercial-industrial land use of the Property and soil analytical results characterizing the upper ten-foot soil horizon will be initially compared to construction/excavation activity standards.

Based on analytical results obtained from soil samples, the decision will be made whether to further investigate the Property. Should analytical concentrations of COCs exceed VAP cleanup goals, additional investigative activities may be needed to delineate the extent of contamination. Additionally, property-specific risk based criteria may be developed to determine if remedial activities are required.

2.6 Decision Error Limits

The proposed sampling locations have been biased towards characterization of HSB-13 and the detected COC TCE. A decision was made to bias the sample locations to where the potential for maximum concentration of TCE may exist, which initially may be an overestimation.

2.7 Design Optimization

Optimization of the sampling and analysis was based on existing non-intrusive data such as record searches, previous intrusive sampling data from previous assessments, and a Property reconnaissance, evaluated as part of the Phase I and review of data collected during intrusive work in 2015. As mentioned previously, sampling and analysis will be directed towards HSB-13. Furthermore, field screening and visual observations may result in a subset of the samples being collected at depths that contain the highest concentrations of COCs.

2.8 Quality Assurance Objectives for Measurement

The overall QA objective for each project is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide legally defensible results. Specific procedures for field sampling, chain-of-custody, and documentation are provided in later sections of this document. Laboratory procedures will be conducted in accordance with the substantive requirements of the selected test methods and the laboratory's Quality Assurance Plan.

2.9 Special Considerations

Quality assurance and control guidelines and specific methodologies in the form of Standard Operating Procedures (SOPs) that apply to this Work Plan are contained in the approved 2016 QAPP for the City of Toledo's Hazardous Substances and Petroleum Contaminated Sites 2015 Community-wide Coalition Assessment Grant.

3.0 SOIL ASSESSMENT

3.1 Objectives

Soil sampling will be completed to identify Property hydrogeology and to characterize COCs in the area of HSB-13.

3.2 Soil Boring and Subsurface Investigation

The soil investigation will consist of installing eight soil borings and collecting up to 16 discrete soil grab samples on the Property to assess the soils to the appropriate point of compliance (*i.e.* commercial/industrial worker and construction and excavation worker receptor populations). All soil borings will terminate at a depth of approximately 12 feet bgs.

Two soil samples will be collected for chemical analysis from each soil boring based on field screening (i.e., headspace screening using a photoionization detector (PID)) with an 11.7 eV lamp or direct observation (i.e., identification of coloration of soils suspected to be due to past activities). Visual soil descriptions (textural) will be documented on each boring log. Sample collection will be vertically distributed to address point of compliance considerations for commercial/industrial end use as well as potential exposure to the construction and excavation worker. A tabulation of sample intervals and chemical analytical parameters for the proposed soil samples at the Property is summarized on Table 1. The chemical analytical methods are described in section 3.2.5.

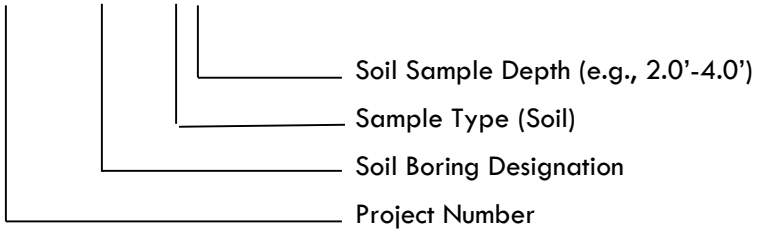
3.2.1 Sample Locations and Frequency

Proposed soil boring locations are shown on Figure 2. One soil sample will be collected from each soil boring for chemical analysis. Sample intervals will be biased towards the known point of compliance and depths where soils show the greatest evidence of impact by past activities at the Property. Hull reserves the right to modify the sampling intervals based on field observations of criteria discussed in Section 2.4.

3.2.2 Sample Designation

Soil samples will be identified according to the following sample identification number (SIN):

COT273:HSB-13A:S020040 (Example)



The soil sample identification will identify the station number (e.g., soil boring number SBA-1) and the depth interval of the sample.

3.2.3 Sampling Equipment and Procedures

Soil borings will be advanced using direct-push technology utilizing a *Geoprobe* sampling system. Soil samples will be collected continuously with a four-foot by two-inch diameter macrosampler equipped with an acetate sleeve consistent with ASTM D 6282-98. Standard Operating Procedures for direct push sampling is provided in the approved 2016 QAPP for the City of Toledo's Hazardous Substances and Petroleum Contaminated Sites 2015 Community-wide Coalition Assessment Grant.

3.2.4 Headspace Screening of Soil Samples

Soil samples will be field screened using a photo-ionization detector (PID) using an 11.7 eV lamp, as described in SOP No. F4008. The PID will be calibrated daily in the field consistent with the manufacturer's specifications.

3.2.5 Sample Handling-Chemical Analyses

At a minimum, soil samples will be collected to identify concentrations of COCs in potential source areas and affected material. Two soil samples from each boring will be selected for chemical analysis to evaluate the concentration of COCs in soil. Visual observations and additional field screening techniques (i.e., PID screening) will be used to identify samples to submit for laboratory analysis. Sample selection may deviate from the above with the approval of Hull's Project Managers or Assessment Coordinator.

The soil analysis regime is presented in Table 1.

3.2.5.1 Sample Preservation

Samples collected for chemical or physical analysis will be stored in a manner to prevent the samples from freezing in cold weather. Samples collected in weather conditions above freezing for chemical analysis will be stored at approximately 4° Celsius by placing them on ice in a laboratory-supplied cooler immediately after the samples are collected. In addition, the samples will be packed for shipping in a manner to avoid disturbing the sample.

All soil samples being submitted to the laboratory for VOC analysis will be sampled and preserved in the field in accordance with U.S. EPA Method 5035 using commercially-prepared sampling kits.

3.2.5.2 Special Handling Considerations

Volatile Organics

Those samples that are to be analyzed for VOCs will not be transferred from one container to another. Transferring samples between containers may cause a loss of VOCs onto the walls of the sampling containers. Headspace will not be present in the sample container, thus minimizing the volatilization of organics from the sample. The laboratory will supply the appropriate glass containers with *Teflon*-lined lids.

Blanks

Both trip blanks and equipment blanks will be collected to verify that sample handling and equipment have not affected the integrity of the field samples.

Trip blanks will be prepared by the laboratory and will consist of filling bottles associated with VOCs analysis with laboratory supplied reagent water. The trip blank will be subject to the same handling and transportation procedures as the samples. Trip blanks will be required at the rate of one per shipping container that contains VOC samples. Trip blanks will accompany sample containers during sample collection and transportation. Trip blanks will be analyzed for VOCs only or as directed by the Quality Assurance Officer.

To evaluate whether the sampling device has been effectively cleaned, equipment blanks will be prepared by filling the sampling device with laboratory supplied reagent water, transferring the sample to bottles, and submitting the sample to the laboratory for analysis. The water will be collected in properly preserved containers specified by the laboratory. The sample will be analyzed for identical methods as the soil sample.

The number of equipment blanks analyzed for a class of compounds will be equal to at least 5% of the total samples to be analyzed for those methods. It will be the sample team leader's responsibility to collect the appropriate number of equipment blanks for the day's sampling efforts.

3.2.6 Chain-of-Custody

The chain-of-custody will allow for the tracing of possession and handling of individual samples from the time of field collection through laboratory analysis. The chain-of-custody program will include: sample labels, sample seals, field logbook, and chain-of-custody form/sample analysis request sheet and laboratory logbook. All chain-of-custody procedures will be performed in accordance with SOP No. F3014.

3.2.6.1 Sample Labels

All sample labels will contain the following information:

1. sample I.D. number
2. sample collector's ID number
3. date and time of collection
4. place of collection
5. parameter(s) requested for analysis

3.2.6.2 Sample Seal

A seal will be placed on the sample container or on the shipping container to ensure that samples have not been disturbed during transportation.

3.2.6.3 Field Logbook

An up-to-date field logbook will be kept by each sampling team to document daily activities (if more than one group of individuals is sampling). The logbook will include a general list of tasks performed, additional data, or observations not listed on field data sheets, and document communication with on-site personnel or visitors as it applies to the project.

3.2.6.4 Chain-of-Custody Record Sheet

The chain-of-custody record will be maintained to trace sample possession and time of collection. The chain-of-custody will accompany each sample and record the:

1. sample number
2. signature of collectors
3. date and time of collection
4. sample type
5. sample location identification
6. number of containers
7. analytical parameters requested
8. signature of relinquished and dates of possession by each party
9. preservatives

3.2.6.5 Laboratory Logbook

The laboratory will maintain a record of the processing steps that are applied to each sample (i.e., sample preparation techniques, instrumental methods, experimental conditions, QC results). The time, date, and name of the person performing each processing will also be recorded.

3.2.7 Soil Classification and Field Descriptions

Samples will be classified in the field consistent with SOP No. F1006. In addition, pertinent observations noted during installation of the soil borings will be documented on the soil boring logs.

3.2.8 Decontamination of Equipment

Soil sampling equipment such as drilling tools will be decontaminated prior to arrival on-site consistent with SOP No. F1000. Decontamination will consist of washing each sampler with non-phosphate detergent and rinsing with distilled water between each sampling interval and decontaminating rods with a high-pressure steam cleaner. Rinseates will be placed in Department of Transportation (DOT) approved fifty-five gallon steel drums.

3.2.9 Decommissioning of Soil Borings

To the extent that no well is installed in the borehole, soil borings will be decommissioned consistent with SOP No. F2022. The surface will be finished to grade with asphalt or soil commensurate with the original surface conditions.

3.2.10 Disposal of Cuttings and Unused Soil Samples

Minimal cuttings should be generated during the installation of soil borings; however, excess soil generated will be properly stored and secured. Cuttings will be staged in a common area as agreed upon by the Property owner. The drummed cuttings will be sampled for proper disposal (returned to Property or taken to appropriate disposal facility).

4.0 SOIL GAS ASSESSMENT

4.1 Objectives

Based on the proposed end use for the Property (outdoor storage), additional soil gas sampling is not proposed at this time.

5.0 GROUNDWATER ASSESSMENT

5.1 Objectives

Additional groundwater assessment is no being considered at this time.

6.0 REFERENCES

A variety of technical manuals, administrative documents, and publications were referred to in preparing this document. Some of the references consulted are presented below. Referenced documents and publications may or may not have been reviewed in their entirety. The guidelines and procedures presented in the documents and publications referenced have been strictly adhered to unless stated otherwise.

Brockman, C. Scott, Ohio Department of Natural Resources, Division of Geological Survey, Physiographic Regions of Ohio (map), 1998.

Hull & Associates, Inc. December 2014, Phase I Environmental Site Assessment Former Champion Spark Plug Site

Hull & Associates, Inc. September 2015, Phase II Property Assessment Former Champion Spark Plug Site

Ohio Environmental Protection Agency. Sample Collection and Evaluation of Vapor Intrusion to Indoor Air. May 2010.

Ohio Environmental Protection Agency. Voluntary Action Program Regulations, OAC-3745-300-07 and OAC-3745-300-08.

TABLES

SUPPLEMENTAL PHASE II WORK PLAN FOR THE FORMER CHAMPION SPARK PLUG PROPERTY
900 UPTON AVENUE TOLEDO, LUCAS COUNTY, OHIO

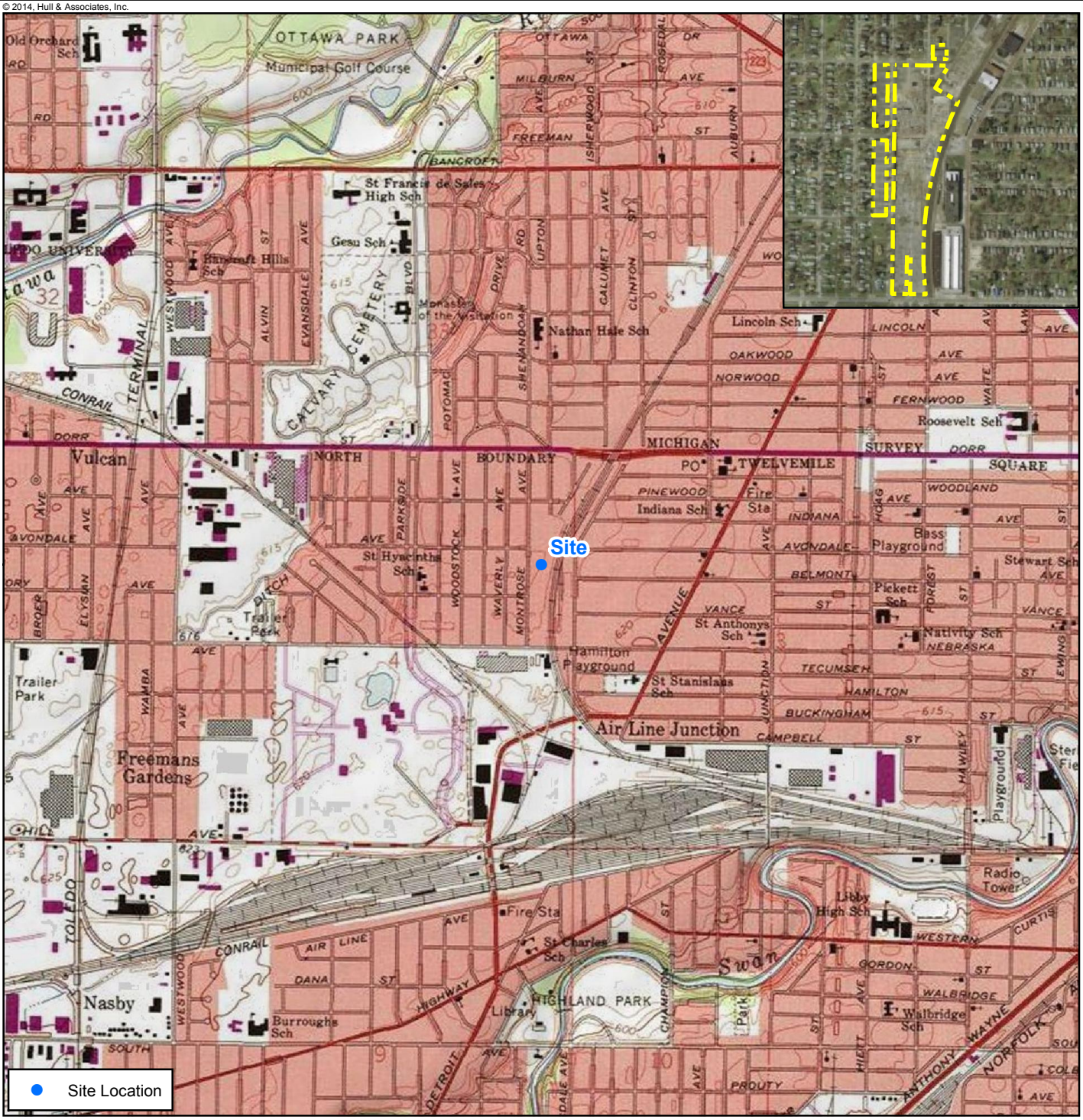
TABLE 1

SOIL SAMPLING PLAN

Boring ID	Depth* (feet BGS)	Soil Sample Interval (feet)	Contaminants of Concern
			VOCs (TCE and Breakdown Chemicals)
HSB-13A	8	0 - 2 ft. / 4 - 6 ft.	**2**
HSB-13B	12	0 - 2 ft. / TBD	**2**
HSB-13C	12	0 - 2 ft. / TBD	**2**
HSB-13D	12	0 - 2 ft. / TBD	**2**
HSB-13E	12	0 - 2 ft. / TBD	**2**
HSB-13F	12	0 - 2 ft. / TBD	**2**
HSB-13G	12	0 - 2 ft. / TBD	**2**
HSB-13H	12	0 - 2 ft. / TBD	**2**

Notes:
* Depth may vary depending on actual field conditions
One field blank and one trip blank will be collected for analysis
HSB-13A represent boring location HSB-13. B-H are offsets.

FIGURES



0 500 1,000 2,000 Feet

1:24,000

Quad: Toledo

Source: The topographic map was acquired through the USGS Topographic Map web service.

The aerial photo in the inset was acquired through the ESRI Imagery web service. Aerial photography dated 2014.

HULL

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Supplemental Phase II Work Plan
Former Champion Sparkplug

Site Location Map

914 Upton Avenue
Toledo, Lucas County, Ohio

Date:

July 2016

File Name:
COT273_03_Fig01_ChampSpkSLM.mxd

Edited: 7/7/2016 By: jslifer

Figure
1

Produced using ArcGIS 10.0 SP1

0 40 80 160 Feet
1:960

	HTMW-2	2014 VAP Generic Unrestricted Potable Use Standard
	6/11/2015	
	COT235:HTMW-2: G061115	
Arsenic	**32**	10

	HTMW-6	2014 VAP Generic Unrestricted Potable Use Standard
	6/11/2015	
	COT235:HTMW-6: G061215	
Arsenic	**27**	10
Benzene	**6.87**	5.0

	HTMW-4	2014 VAP Generic Unrestricted Potable Use Standard
	6/12/2015	
	COT235:HTMW-4: G061215	
Arsenic	**27**	10
m,p-Xylenes	**13.3**	5

	HSB-9	2014 VAP Commerical/ Industrial Generic Direct Contact	2014 VAP Construction /Excavation Generic Direct Contact
	6/8/2015		
	6' - 8'		
Acrolein	**3.23**	1.6	5.5

	HTMW-5	2014 VAP Generic Unrestricted Potable Use Standard
	6/12/2015	
	COT235:HTMW-5: G061215	
m,p-Xylenes	**11.9**	5

	HSB-13	2014 VAP Commerical/ Industrial Generic Direct Contact	2014 VAP Construction /Excavation Generic Direct Contact
	6/9/2015		
	10' - 12'		
Trichloroethene	**123**	51	17

Recognized Environmental Condition (REC)
REC-1: Ground water Restriction and Lane Use Restricted to Commercial/Industrial Use
REC-2: Five Out-of-Service USTS
REC-3: Oil Release from Electrical Transformers
REC-4: Debris Piles Prohibiting Observation Resulting in a Data Gap

- Property Boundary
- Proposed Soil Boring
- Soil Boring
- Soil Boring/Temporary Well
- Soil Gas Location
- Zone of Contamination from Oil Overflow (WSP Environmental Strategies Locations)
- AST (WSP Environmental Strategies Locations)
- UST (WSP Environmental Strategies Locations)
- Identified Areas (WSP Environmental Strategies Locations)
- Incidents (BUSTR Incident ID)
- Electrical Duct
- Storm Line
- Product Fill Line
- Underground Piping Runs
- Underground Tunnel
- Manhole
- Sump

Recognized Environmental Conditions
- REC-2
- REC-3
- REC-4

Notes:
-The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2012.
-Information was obtained from WSP Strategies 2001-2006 Reports.

Produced using ArcGIS 10.0 SP1

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July 2015

Supplemental Phase II Property Assessment
Former Champion Sparkplug

Site Map with Proposed Supplemental Phase II Soil Boring Locations

914 Upton Avenue
Toledo, Lucas County, Ohio

Figure 2

File Name: COT235_21_Fig02_ChampSpkSamp.mxd

Edited: 7/7/2016 By: mopel

FIGURE 3

HULL & ASSOCIATES, INC.
TOLEDO, OHIO

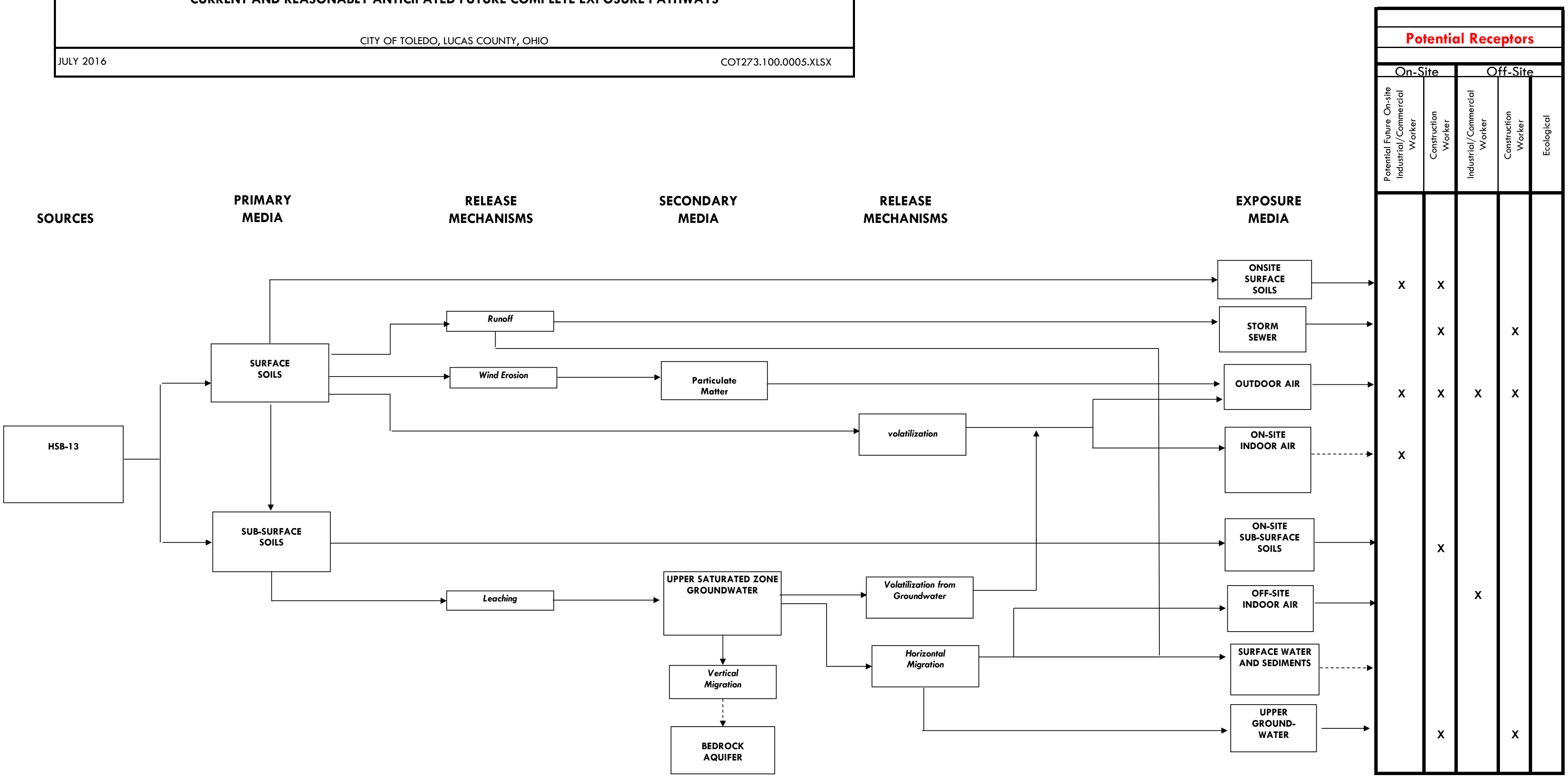
WORK PLAN FOR A PHASE II PROPERTY ASSESSMENT
FORMER CHAMPION SPARK PLUG PROPERTY

PRELIMINARY EXPOSURE PATHWAY - CONCEPTUAL SITE MODEL

CURRENT AND REASONABLY ANTICIPATED FUTURE COMPLETE EXPOSURE PATHWAYS

CITY OF TOLEDO, LUCAS COUNTY, OHIO

JULY 2016 COT273.100.0005.XLSX



X = Complete pathway with potentially significant exposure

-------▸ = Incomplete Pathway

APPENDIX A

OAC 3745-300-08 Generic Numerical Standards

3745-300-08 **Generic numerical standards.**

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules, and federal statutory provisions referenced in this rule, see paragraph (B) of rule 3745-300-01 of the Administrative Code titled "Incorporation by reference."]

(A) Generic numerical standards.

(1) Applicability.

(a) Generic numerical standards listed in this rule for hazardous substances and petroleum may be used to demonstrate compliance with applicable standards provided the exposure scenario for the property comports with land use and activity patterns used to derive the generic numerical standard. Generic numerical standards are provided for complete exposure pathways to petroleum releases (paragraph (B) of this rule), direct contact with hazardous substances in soil to human receptors (paragraph (C) of this rule), unrestricted potable use for hazardous substances in ground water (paragraph (D) of this rule), and complete exposure pathways to human and ecological receptors from surface water and sediment (paragraphs (F), (G) and (H) of this rule).

(b) If complete exposure pathways exist on a property that are not considered in the development of a generic numerical standard listed in this rule or if a generic numerical standard is not listed for chemicals of concern on a property, applicable standards must be derived in accordance with rule 3745-300-09 of the Administrative Code. Demonstration of compliance with applicable standards at a property may be made using a combination of generic numerical standards in accordance with this rule and standards developed through a property-specific risk assessment in accordance with rule 3745-300-09 of the Administrative Code.

(c) If radioactive materials are identified at a property, the property may be subject to the Atomic Energy Act and regulations adopted thereunder and Chapters 3701. and 3747. of the Revised Code and rules adopted thereunder. If radionuclides or radioactive materials are present at a property, the cleanup of the radionuclides or radioactive material shall be conducted in compliance with requirements of the Ohio department of health. Remedy approval by the Ohio department of health shall be considered sufficient to meet applicable standards for radionuclides or radioactive materials for the voluntary action and may be considered a generic numerical standard.

(d) If polychlorinated biphenyls are identified at a property, the property may be subject to cleanup levels or other provisions of the Toxic Substances Control Act and regulations adopted thereunder. Polychlorinated biphenyls shall be addressed within the voluntary action as a hazardous substance and meet either generic numerical standards in accordance with this rule or property-specific standards in accordance with rule 3745-300-09 of the Administrative Code.

(2) Assumptions.

(a) Summation of risk and hazard across complete exposure pathways.

If more than one complete exposure pathway exists to each receptor population, the incremental cancer risk and hazard indices determined for each exposure pathway must be summed to calculate a cumulative cancer risk and hazard index to each receptor population. All final cumulative human health carcinogenic risk and non-carcinogenic hazard levels are based on one significant figure.

(b) If the generic numerical standards of this rule are applied to one or more exposure units or identified areas of the property and applicable standards, as determined in accordance with rule 3745-300-09 of the Administrative Code, are applied to one or more other areas of the property, then the volunteer must ensure that the risk and hazard levels for each receptor on the property do not exceed:

(i) One excess cancer in a population of 100,000 (1×10^{-5}); and

(ii) A hazard index of 1.

All final cumulative human health carcinogenic risk and non-carcinogenic hazard levels are based on one significant figure.

(c) Points of compliance. The volunteer must comply with the applicable standards at all points of compliance at the property, for each environmental media and complete exposure pathway, in accordance with paragraph (I) of rule 3745-300-07 of the Administrative Code.

(3) A property-specific risk assessment must be conducted in accordance with the procedures established in rule 3745-300-09 of the Administrative Code to determine applicable standards instead of or in addition to using the generic numerical standards from this rule, if any of the following apply to the property:

(a) The complete exposure pathways as identified in accordance with paragraph (F)(1) of rule 3745-300-07 of the Administrative Code, include exposure pathways that are not considered in the development of standards listed in this rule. Such exposure pathways include, but are not limited to, volatilization of contaminants to indoor air or non-potable use of ground water;

(b) The exposure factors for the receptors identified in paragraph (E)(6) of rule 3745-300-07 of the Administrative Code are not considered in the development of standards listed in this rule;

(c) The chemicals of concern on the property consist of hazardous substances or petroleum that do not have generic numerical standards included in this rule. If only some of the chemicals of concern identified have a generic numerical standard listed in this rule, a

volunteer may use the applicable generic numerical standards for the chemicals of concern having listed standards and conduct a property-specific risk assessment in accordance with rule 3745-300-09 of the Administrative Code. When using a combination of generic numerical standards and applicable standards determined by a property-specific risk assessment conducted in accordance with rule 3745-300-09 of the Administrative Code, the volunteer must adjust the concentrations of the applicable standards to meet the human health risk and hazard levels described in paragraph (A)(2)(b) of this rule;

(d) Concentrations of chemicals of concern in surface water or sediment exceed applicable standards determined in accordance with this rule;

(e) Complete exposure pathways to important ecological resources other than sediment or surface water exist; or

(f) It is determined that chemicals of concern on or emanating from the property are persistent, bioaccumulative, and toxic in animal tissue and the development of the generic standards, other than Ohio-specific sediment reference values contained in attachment H of Ohio EPA's "Guidance for Conducting Ecological Risk Assessments," do not consider bioaccumulative effects.

(B) Generic numerical standards for petroleum.

(1) Applicability.

(a) The generic numerical standards referenced in paragraph (B)(3) of this rule apply to all petroleum releases regardless of the source or how the petroleum was released. After eligibility requirements in accordance with rule 3745-300-02 of the Administrative Code have been met, applicable standards for all petroleum releases on the property must be achieved in accordance with this chapter.

(b) The generic numerical standards referenced in paragraph (B)(3) of this rule apply to the exposure pathways for which rules adopted under division (B) of section 3737.882 of the Revised Code have numerical clean-up standards. If an exposure pathway is not addressed by a generic numerical standard under division (B) of section 3737.882 of the Revised Code, then the exposure pathway must be evaluated in accordance with rule 3745-300-09 of the Administrative Code.

(2) Assumptions.

(a) The points of compliance for generic petroleum standards are those identified in paragraph (I)(1) for rule 3745-300-07 of the Administrative Code. For example, exposure pathways that are encompassed within the generic direct-contact soil standard shall use the points of compliance indicated in paragraph (I)(1)(a)(i) of rule 3745-300-07

of the Administrative Code. The volunteer must comply with the applicable standards at all points of compliance at the property, for each environmental medium and complete exposure pathway, in accordance with paragraph (I) of rule 3745-300-07 of the Administrative Code.

(b) Cumulative adjustment for multiple chemicals and summation of risk across complete exposure pathways that are required for chemicals of concern on the property in order to comply with paragraphs (A)(2)(a) and (E) of this rule may not necessarily apply for generic petroleum standards referenced in paragraph (B)(3) of this rule. Cumulative adjustment for multiple chemicals and summation of risk across complete exposure pathways to meet generic petroleum standards are required only when required by rules adopted under division (B) of section 3737.882 of the Revised Code.

(c) When ground water exceeds unrestricted potable use standards, ground water response requirements in accordance with rule 3745-300-10 of the Administrative Code must be met. Properties with free product exceed applicable standards for unrestricted potable use of ground water.

(d) Commercial and industrial land use categories (as described in paragraph (C)(2)(c) of this rule) require implementation of institutional controls in accordance with paragraph (C)(3) of rule 3745-300-11 of the Administrative Code.

(3) Generic numerical clean-up standards for petroleum.

The generic numerical standards for petroleum at residential, commercial, or industrial properties are the standards established in rules adopted under division (B) of section 3737.882 of the Revised Code, as provided in division (B)(1) of section 3746.04 of the Revised Code. The state fire marshal's bureau of underground storage tank regulations administers the rules adopted under division (B) of section 3737.882 of the Revised Code. Property-specific standards for petroleum may be developed using rule 3745-300-09 of the Administrative Code.

(C) Generic direct-contact soil standards for hazardous substances.

(1) Applicability.

(a) When applying generic direct-contact standards to soils on a property, a volunteer must select the generic land use or activity category which is consistent with the exposure factors for the generic land use or activity category contained in paragraph (C)(2)(c) of this rule. The exposure factor distributions used in the development of generic numerical standards are contained in Ohio EPA's "Support Document For the Development of Generic Numerical Standards and Risk Assessment Procedures." Generic direct-contact soil standards for commercial and industrial land uses are equal unless paragraph (B)(1)(b) of rule 3745-300-09 of the Administrative Code applies.

(b) A property-specific risk assessment must be conducted in accordance with the procedures established in rule 3745-300-09 of the Administrative Code, to determine applicable standards instead of or in addition to using the generic direct-contact soil standards, if any conditions of paragraph (A)(3) of this rule apply.

(c) Generic numerical standards for petroleum releases are identified in paragraph (B)(3) of this rule. The standards listed in paragraph (C)(3) of this rule apply to releases of hazardous substances.

(2) Assumptions.

(a) Single chemical.

The generic direct-contact soil standards presented in paragraph (C) of this rule assume a single chemical of concern is present within an identified area or exposure unit.

(i) The single chemical generic direct-contact soil standards set forth in this rule are based on the following risk and hazard levels.

(*a*) For hazardous substances having carcinogenic effects, the chemical-specific carcinogenic risk must not exceed one excess cancer in a population of 100,000 (i.e., 1×10^{-5}); and

(*b*) For hazardous substances having non-carcinogenic effects, the chemical-specific risk must not exceed a hazard index of 1.

(ii) The concentration of a chemical of concern, as determined in accordance with paragraph (F)(5) of rule 3745-300-07 of the Administrative Code, must not exceed the single chemical generic direct-contact soil standard for that chemical.

(b) Cumulative adjustment for multiple chemicals.

When more than one chemical of concern is present within an identified area or exposure unit and an applicable generic direct-contact soil standard for each of the chemicals of concern is contained in paragraphs (C)(3)(b), (C)(3)(c) or (C)(3)(d) of this rule, the standard for each chemical of concern must be adjusted for the presence of multiple chemicals in order to meet the risk and hazard levels described in paragraph (C)(2)(a) of this rule. A cumulative adjustment for multiple chemicals must also be made when using a combination of generic direct-contact soil standards and applicable standards determined by a property-specific risk assessment in accordance with rule 3745-300-09 of the Administrative Code. The incremental risk and hazard from direct contact to soils must be added to the incremental risk and hazard from other complete exposure pathways to the same receptor population, in accordance with (A)(2)(a) of this rule. All

final cumulative human health carcinogenic risk and non-carcinogenic hazard levels are based on one significant figure.

(c) Land use and activity categories.

The generic direct-contact soil standards established in this rule are based upon the intended use of the property after the completion of a voluntary action. Standards applied to commercial and industrial land use categories require implementation of institutional controls in accordance with paragraph (C)(3) of rule 3745-300-11 of the Administrative Code. Land use and activity categories must be determined as follows:

(i) Residential land use category.

Residential land use is land use with a high frequency of potential exposure of adults and children to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. Residential land use is considered protective for, and may be applied to, any and all categories of land use, without further restriction. Examples of residential land uses include, but are not limited to residences; day care facilities; schools, colleges and other educational institutions; nursing homes, elder care and other long-term health care facilities; and correctional facilities.

(ii) Commercial land use category.

Commercial land use is land use with potential exposure of adult workers during a business day and potential exposures of adults and children who are customers, patrons or visitors to commercial facilities during the business day. Commercial land use has potential exposure of adults to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. Examples of commercial land uses include, but are not limited to warehouses; retail gasoline stations; retail establishments; professional offices; hospitals and clinics; religious institutions; hotels; motels; and parking facilities.

(iii) Industrial land use category.

Industrial land use is land use with potential exposure of adult workers during a business day and potential exposures of adults and children who are visitors to industrial facilities during the business day. Industrial land use has potential exposure of adults to dermal contact with soil, inhalation of vapors and particles from soil and ingestion of soil. Examples of industrial land uses include, but are not limited to: lumberyards; power plants; manufacturing facilities such as metal-working shops, plating shops, blast furnaces, coke plants, oil refineries, brick factories, chemical plants and plastics plants; assembly plants; non-public airport areas; limited access highways; railroad switching yards; and marine port facilities.

(iv) Construction or excavation activities.

Construction or excavation activities include invasive activities that result in potential exposure of adult workers during the business day for a portion of one year. Exposures during construction or excavation activities are of greater intensity and shorter duration than those for the commercial and industrial land use categories. Construction or excavation activities have potential exposures of adults to dermal contact with soil, inhalation of vapors and particles from soil, and ingestion of soil. Examples of construction or excavation activities include but are not limited to maintenance or installation of utilities; installation of building footers or foundations; grading; trenching; or laying utility lines or cables; and repair of engineering controls where there is significant exposure to soils.

(3) Generic numerical direct-contact soil standards.

(a) The generic direct-contact soil standards for carcinogenic and non-carcinogenic chemicals of concern are derived considering only the following exposures; ingestion of soil, dermal contact with soil, inhalation of volatile compounds in outdoor air and the inhalation and ingestion of particulate emissions. Any and all applicable exposures not considered within the generic direct-contact soil standards shall be addressed in accordance with rule 3745-300-09 of the Administrative Code.

The soil saturation concentrations are calculated using the U.S. EPA recommended soil saturation equation specified in paragraph (C)(3)(e) of this rule. This equation is not recommended for compounds that are at solid phase at ambient soil temperatures; therefore, no generic soil saturation values were calculated for those chemicals whose melting point is greater than seventeen degrees Celsius. Further, soil saturation values were determined only for those chemicals whose physicochemical parameters used to derive the soil saturation concentrations could be verified. The volunteer may use the equation specified in paragraph (C)(3)(e) of this rule, along with property-specific information, to calculate a property-specific soil saturation concentration in lieu of the generic soil saturation concentrations listed in tables I through III in paragraphs (C)(3)(b) through (C)(3)(d) of this rule.

(b) Table I: generic direct-contact soil standards for carcinogenic and non-carcinogenic chemicals of concern - residential land use category (values are in mg/kg).

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
Volatile Organic Chemicals					
67-64-1	Acetone	64,000	NA	100,000	64,000
71-43-2	Benzene	94	64	920	64

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
75-15-0	Carbon Disulfide	1,400	NA	1,400	1,400
56-23-5	Carbon Tetrachloride	5.5	6.6	1,400	5.5
108-90-7	Chlorobenzene	410	NA	740	410
75-00-3	Chloroethane	10,000	3,700	2,200	2,200
67-66-3	Chloroform	300	6.6	3,400	6.6
124-48-1	Dibromochloromethane	1,500	130	1,600	130
75-71-8	Dichlorodifluoromethane	380	NA	1,400	380
75-34-3	Dichloroethane, 1,1-	2,000	NA	2,300	2,000
107-06-2	Dichloroethane, 1,2-	1,400	8.7	2,900	8.7
75-35-4	Dichloroethene, 1,1-	410	NA	1,700	410
156-59-2	Dichloroethene, *cis*-1,2-	760	NA	2,200	760
156-60-5	Dichloroethene, *trans*-1,2-	180	NA	1,800	180
78-87-5	Dichloropropane, 1,2 -	23	19	1,100	19
542-75-6	Dichloropropene, 1,3 -	92	35	810	35
123-91-1	Dioxane, 1,4-	7,400	260	270,000	260
60-29-7	Ethyl Ether	15,000	NA	33,000	15,000
100-41-4	Ethylbenzene	3,600	NA	230	230
50-00-0	Formaldehyde	1,900	560	130,000	560
64-18-6	Formic acid	1,200	NA	170,000	1,200
110-54-3	Hexane, *n*-	530	NA	190	190
78-83-1	Isobutyl Alcohol	23,000	NA	40,000	23,000
67-56-1	Methanol	33,000	NA	110,000	33,000
78-93-3	Methyl Ethyl Ketone (MEK)	37,000	NA	100,000	37,000
108-10-1	Methyl Isobutyl Ketone (MIBK)	5,800	NA	16,000	5,800
1634-04-4	Methyl *tert*-Butyl Ether (MTBE)	21,000	850	6,700	850
75-09-2	Methylene Chloride	2,200	250	2,300	250
100-42-5	Styrene	9,500	NA	1,700	1,700
630-20-6	Tetrachloroethane , 1,1,1,2-	2,300	37	750	37
79-34-5	Tetrachloroethane, 1,1,2,2-	4,500	11	1,700	11
127-18-4	Tetrachloroethene	510	17	380	17
108-88-3	Toluene	5,100	NA	520	520
71-55-6	Trichloroethane, 1,1,1-	6,100	NA	1,300	1,300
79-00-5	Trichloroethane, 1,1,2-	300	25	2,600	25
79-01-6	Trichloroethene	2,300	65	950	65
75-69-4	Trichlorofluoromethane	1,200	NA	1,600	1,200
96-18-4	Trichloropropane, 1,2,3-	450	1.5	1,100	1.5
75-01-4	Vinyl Chloride	98	4.6	1,100	4.6
1330-20-7	Xylenes, Total	1,000	NA	370	370
Semi-Volatile Organic Chemicals					
83-32-9	Acenaphthene	3,500	NA	NA	3,500
98-86-2	Acetophenone	6,300	NA	NA	6,300

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
107-13-1	Acrylonitrile	35	6.6	22,000	6.6
62-53-3	Aniline	220	1,500	62,000	220
120-12-7	Anthracene	18,000	NA	NA	18,000
92-87-5	Benzidine	190	0.04	NA	0.04
56-55-3	Benzo(a)anthracene	NA	11	NA	11
50-32-8	Benzo(a)pyrene	NA	1.1	NA	1.1
205-99-2	Benzo(b)fluoranthene	NA	11	NA	11
207-08-9	Benzo(k)fluoranthene	NA	110	NA	110
117-81-7	Bis (2-ethylhexyl) Phthalate (BEHP & DEHP)	1,300	620	190	190
85-68-7	Butyl Benzyl Phthalate	13,000	620	58	58
86-74-8	Carbazole	NA	430	NA	430
57-74-9	Chlordane	34	28	NA	28
218-01-9	Chrysene	NA	1,100	NA	1,100
53-70-3	Dibenz(a,h)anthracene	NA	1.1	NA	1.1
95-50-1	Dichlorobenzene, 1,2- (o)	2,300	NA	370	370
106-46-7	Dichlorobenzene, 1,4- (p)	3,500	60	NA	60
91-94-1	Dichlorobenzidine, 3,3-	NA	19	NA	19
72-54-8	Dichlorodiphenyldichloroethane (DDD)	140	42	NA	42
72-55-9	Dichlorodiphenyldichloroethene (DDE)	NA	29	NA	29
50-29-3	Dichlorodiphenyltrichloroethane (DDT)	36	30	NA	30
94-75-7	Dichlorophenoxyacetic acid, 2,4-	630	NA	NA	630
84-66-2	Diethyl Phthalate	50,000	NA	590	590
105-67-9	Dimethylphenol, 2,4-	1,300	NA	NA	1,300
84-74-2	Di-*n*-butyl Phthalate	6,300	NA	110	110
99-65-0	Dinitrobenzene, 1,3- (m)	6.3	NA	NA	6.3
528-29-0	Dinitrobenzene, 1,2-	6.3	NA	NA	6.3
121-14-2	Dinitrotoluene, 2,4-	120	13	NA	13
606-20-2	Dinitrotoluene, 2,6-	63	13	NA	13
72-20-8	Endrin	19	NA	NA	19
107-21-1	Ethylene Glycol	110,000	NA	110,000	110,000
206-44-0	Fluoranthene	2,400	NA	NA	2,400
86-73-7	Fluorene	2,400	NA	NA	2,400
76-44-8	Heptachlor	31	1.8	NA	1.8
1024-57-3	Heptachlor Epoxide	0.81	0.95	NA	0.81
87-68-3	Hexachloro-1,3-Butadiene	13	83	1,000	13
118-74-1	Hexachlorobenzene	50	5.2	NA	5.2
67-72-1	Hexachloroethane	63	550	NA	63
193-39-5	Indeno(1,2,3-c,d)pyrene	NA	11	NA	11
78-59-1	Isophorone	12,000	9,100	4,600	4,600
98-82-8	Isopropylbenzene (Cumene)	2,700	NA	260	260

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
58-89-9	Lindane	21	8.7	NA	8.7
108-39-4	m-cresol	3,100	NA	61,000	3,100
72-43-5	Methoxychlor	310	NA	NA	310
90-12-0	Methylnaphthalene, 1-	4,100	NA	360	360
91-20-3	Naphthalene	180	69	NA	69
98-95-3	Nitrobenzene	27	NA	1,500	27
86-30-6	Nitrosodiphenylamine, *n*-	1,300	1,700	NA	1,300
95-48-7	o-cresol	3,100	NA	NA	3,100
117-84-0	Octyl Phthalate, di-*n*-	2,500	NA	12	12
106-44-5	p-cresol	310	NA	NA	310
87-86-5	Pentachlorophenol	1,400	55	NA	55
108-95-2	Phenol	15,000	NA	NA	15,000
1336-36-3	Polychlorinated Biphenyls	1.2	4.0	NA	1.2
129-00-0	Pyrene	1,800	NA	NA	1,800
110-86-1	Pyridine	63	NA	400,000	63
93-72-1	Silvex	500	NA	NA	500
8001-35-2	Toxaphene	NA	7.8	NA	7.8
95-95-4	Trichlorophenol, 2,4,5-	6,300	NA	NA	6,300
88-06-2	Trichlorophenol, 2,4,6-	NA	770	NA	770
95-63-6	Trimethylbenzene, 1,2,4-	85	NA	250	85
108-67-8	Trimethylbenzene, 1,3,5-	69	NA	200	69
99-35-4	Trinitrobenzene, 1,3,5- (s)	1,900	NA	NA	1,900
108-05-4	Vinyl Acetate	1,400	NA	2,700	1,400
	Inorganic Chemicals				
7440-36-0	Antimony	30	NA	NA	30
7440-38-2	Arsenic, Inorganic	21	6.7	NA	6.7
7440-39-3	Barium and Compounds	15,000	NA	NA	15,000
7440-41-7	Beryllium and Compounds	150	16,000	NA	150
7440-43-9	Cadmium	72	22,000	NA	72
16065-83-1	Chromium (III)	110,000	NA	NA	110,000
18540-29-9	Chromium (VI)	230	3,300	NA	230
7440-48-4	Cobalt	1,400	14,000	NA	1,400
57-12-5	Cyanide, Free	1,500	NA	NA	1,500
7782-41-4	Fluorine (soluble fluoride)	4,500	NA	NA	4,500
7439-97-6	Mercury	7.6	NA	NA	7.6
7440-02-0	Nickel (Soluble Salts)	1,500	NA	NA	1,500
7782-49-2	Selenium and Compounds	380	NA	NA	380
7440-22-4	Silver	380	NA	NA	380
7440-28-0	Thallium	6.1	NA	NA	6.1
7440-62-2	Vanadium	680	NA	NA	680
7440-66-6	Zinc and Compounds	23,000	NA	NA	23,000

(c) Table II: generic direct-contact soil standards for carcinogenic and non-carcinogenic chemicals of concern - Commercial and Industrial Land Use Categories (values are in mg/kg).

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
Volatile Organic Chemicals					
67-64-1	Acetone	850,000	NA	100,000	100,000
71-43-2	Benzene	170	140	920	140
75-15-0	Carbon Disulfide	2,200	NA	1,400	1,400
56-23-5	Carbon Tetrachloride	8.2	15	1,400	8.2
108-90-7	Chlorobenzene	710	NA	740	710
75-00-3	Chloroethane	18,000	68,000	2,200	2,200
67-66-3	Chloroform	600	14	3,400	14
124-48-1	Dibromochloromethane	59,000	2,300	1,600	1,600
75-71-8	Dichlorodifluoromethane	520	NA	1,400	520
75-34-3	Dichloroethane, 1,1-	3,000	NA	2,300	2,300
107-06-2	Dichloroethane, 1,2-	17,000	19	2,900	19
75-35-4	Dichloroethene, 1,1-	610	NA	1,700	610
156-59-2	Dichloroethene, *cis*-1,2-	29,000	NA	2,200	2,200
156-60-5	Dichloroethene, *trans*-1,2-	260	NA	1,800	260
78-87-5	Dichloropropane, 1,2 -	31	41	1,100	31
542-75-6	Dichloropropene, 1,3 -	130	84	810	84
123-91-1	Dioxane, 1,4-	160,000	600	270,000	600
60-29-7	Ethyl Ether	590,000	NA	33,000	33,000
100-41-4	Ethylbenzene	8,500	NA	230	230
50-00-0	Formaldehyde	2,900	1,200	130,000	1,200
64-18-6	Formic acid	1,700	NA	170,000	1,700
110-54-3	Hexane, *n*-	800	NA	190	190
78-83-1	Isobutyl Alcohol	880,000	NA	40,000	40,000
67-56-1	Methanol	240,000	NA	110,000	110,000
78-93-3	Methyl Ethyl Ketone (MEK)	220,000	NA	100,000	100,000
108-10-1	Methyl Isobutyl Ketone (MIBK)	97,000	NA	16,000	16,000
1634-04-4	Methyl *tert*-Butyl Ether (MTBE)	28,000	1,900	6,700	1,900
75-09-2	Methylene Chloride	4,900	570	2,300	570
100-42-5	Styrene	29,000	NA	1,700	1,700
630-20-6	Tetrachloroethane , 1,1,1,2-	88,000	81	750	81
79-34-5	Tetrachloroethane, 1,1,2,2-	180,000	24	1,700	24
127-18-4	Tetrachloroethene	1,700	53	380	53
108-88-3	Toluene	33,000	NA	520	520
71-55-6	Trichloroethane, 1,1,1-	11,000	NA	1,300	1,300
79-00-5	Trichloroethane, 1,1,2-	12,000	55	2,600	55
79-01-6	Trichloroethene	3,200	150	950	150
75-69-4	Trichlorofluoromethane	1,600	NA	1,600	1,600
96-18-4	Trichloropropane, 1,2,3-	18,000	28	1,100	28

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
75-01-4	Vinyl Chloride	210	12	1,100	12
1330-20-7	Xylenes, Total	1,500	NA	370	370
Semi-Volatile Organic Chemicals					
83-32-9	Acenaphthene	56,000	NA	NA	56,000
98-86-2	Acetophenone	110,000	NA	NA	110,000
107-13-1	Acrylonitrile	48	16	22,000	16
62-53-3	Aniline	540	7,400	62,000	540
120-12-7	Anthracene	280,000	NA	NA	280,000
92-87-5	Benzidine	3,400	0..30	NA	0..30
56-55-3	Benzo(a)anthracene	NA	76	NA	76
50-32-8	Benzo(a)pyrene	NA	7.7	NA	7.7
205-99-2	Benzo(b)fluoranthene	NA	77	NA	77
207-08-9	Benzo(k)fluoranthene	NA	770	NA	770
117-81-7	Bis (2-ethylhexyl) Phthalate (BEHP & DEHP)	22,000	4,800	190	190
85-68-7	Butyl Benzyl Phthalate	220,000	4,800	58	58
86-74-8	Carbazole	NA	3,400	NA	3,400
57-74-9	Chlordane	670	270	NA	270
218-01-9	Chrysene	NA	7,600	NA	7,600
53-70-3	Dibenz(a,h)anthracene	NA	7.7	NA	7.7
95-50-1	Dichlorobenzene, 1,2- (o)	4,600	NA	370	370
106-46-7	Dichlorobenzene, 1,4- (p)	17,000	130	NA	130
91-94-1	Dichlorobenzidine, 3,3-	NA	110	NA	110
72-54-8	Dichlorodiphenyldichloroethane (DDD)	4,100	470	NA	470
72-55-9	Dichlorodiphenyldichloroethene (DDE)	NA	310	NA	310
50-29-3	Dichlorodiphenyltrichloroethane (DDT)	1,000	350	NA	350
94-75-7	Dichlorophenoxyacetic acid, 2,4-	11,000	NA	NA	11,000
84-66-2	Diethyl Phthalate	900,000	NA	590	590
105-67-9	Dimethylphenol, 2,4-	22,000	NA	NA	22,000
84-74-2	Di-*n*-butyl Phthalate	110,000	NA	110	110
99-65-0	Dinitrobenzene, 1,3- (m)	110	NA	NA	110
528-29-0	Dinitrobenzene, 1,2-	110	NA	NA	110
121-14-2	Dinitrotoluene, 2,4-	2,200	98	NA	98
606-20-2	Dinitrotoluene, 2,6-	1,100	100	NA	100
72-20-8	Endrin	340	NA	NA	340
107-21-1	Ethylene Glycol	760,000	NA	110,000	110,000
206-44-0	Fluoranthene	37,000	NA	NA	37,000
86-73-7	Fluorene	37,000	NA	NA	37,000
76-44-8	Heptachlor	560	8.9	NA	8.9
1024-57-3	Heptachlor Epoxide	15	7.0	NA	7.0
87-68-3	Hexachloro-1,3-Butadiene	220	240	1,000	220
118-74-1	Hexachlorobenzene	900	28	NA	28

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
67-72-1	Hexachloroethane	1,100	1,700	NA	1,100
193-39-5	Indeno(1,2,3-c,d)pyrene	NA	77	NA	77
78-59-1	Isophorone	140,000	71,000	4,600	4,600
98-82-8	Isopropylbenzene (Cumene)	5,700	NA	260	260
58-89-9	Lindane	550	70	NA	70
108-39-4	m-cresol	56,000	NA	61,000	56,000
72-43-5	Methoxychlor	5,600	NA	NA	5,600
90-12-0	Methylnaphthalene, 1-	66,000	NA	360	360
91-20-3	Naphthalene	280	150	NA	150
98-95-3	Nitrobenzene	170	NA	1,500	170
86-30-6	Nitrosodiphenylamine, *n*-	22,000	10,000	NA	10,000
95-48-7	o-cresol	56,000	NA	NA	56,000
117-84-0	Octyl Phthalate, di-*n*-	45,000	NA	12	12
106-44-5	p-cresol	5,600	NA	NA	5,600
87-86-5	Pentachlorophenol	17,000	280	NA	280
108-95-2	Phenol	66,000	NA	NA	66,000
1336-36-3	Polychlorinated Biphenyls	18	26	NA	18
129-00-0	Pyrene	28,000	NA	NA	28,000
110-86-1	Pyridine	1,100	NA	400,000	1,100
93-72-1	Silvex	9,000	NA	NA	9,000
8001-35-2	Toxaphene	NA	59	NA	59
95-95-4	Trichlorophenol, 2,4,5-	110,000	NA	NA	110,000
88-06-2	Trichlorophenol, 2,4,6-	NA	4,400	NA	4,400
95-63-6	Trimethylbenzene, 1,2,4-	120	NA	250	120
108-67-8	Trimethylbenzene, 1,3,5-	95	NA	200	95
99-35-4	Trinitrobenzene, 1,3,5- (s)	34,000	NA	NA	34,000
108-05-4	Vinyl Acetate	2,000	NA	2,700	2,000
Inorganic Chemicals					
7440-36-0	Antimony	1,200	NA	NA	1,200
7440-38-2	Arsenic, Inorganic	610	82	NA	82
7440-39-3	Barium and Compounds	370,000	NA	NA	370,000
7440-41-7	Beryllium and Compounds	5,100	39,000	NA	5,100
7440-43-9	Cadmium	2,300	52,000	NA	2,300
16065-83-1	Chromium (III)	1,000,000	NA	NA	1,000,000
18540-29-9	Chromium (VI)	8,400	7,900	NA	7,900
7440-48-4	Cobalt	23,000	34,000	NA	23,000
57-12-5	Cyanide, Free	59,000	NA	NA	59,000
7782-41-4	Fluorine (soluble fluoride)	180,000	NA	NA	180,000
7439-97-6	Mercury	290	NA	NA	290
7440-02-0	Nickel (Soluble Salts)	44,000	NA	NA	44,000
7782-49-2	Selenium and Compounds	15,000	NA	NA	15,000
7440-22-4	Silver	15,000	NA	NA	15,000
7440-28-0	Thallium	230	NA	NA	230
7440-62-2	Vanadium	26,000	NA	NA	26,000
7440-66-6	Zinc and Compounds	880,000	NA	NA	880,000

(d) Table III: generic direct-contact soil standards for carcinogenic and non-carcinogenic chemicals of concern - construction and excavation activities category: (values are in mg/kg).

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
Volatile Organic Chemicals					
67-64-1	Acetone	320,000	NA	100,000	100,000
71-43-2	Benzene	150	540	920	150
75-15-0	Carbon Disulfide	190	NA	1,400	190
56-23-5	Carbon Tetrachloride	24	56	1,400	24
108-90-7	Chlorobenzene	2,100	NA	740	740
75-00-3	Chloroethane	5,500	470,000	2,200	2,200
67-66-3	Chloroform	430	55	3,400	55
124-48-1	Dibromochloromethane	390,000	16,000	1,600	1,600
75-71-8	Dichlorodifluoromethane	1,500	NA	1,400	1,400
75-34-3	Dichloroethane, 1,1-	2,500	NA	2,300	2,300
107-06-2	Dichloroethane, 1,2-	6,600	75	2,900	75
75-35-4	Dichloroethene, 1,1-	180	NA	1,700	180
156-59-2	Dichloroethene, *cis*-1,2-	190,000	NA	2,200	2,200
156-60-5	Dichloroethene, *trans*-1,2-	78	NA	1,800	78
78-87-5	Dichloropropane, 1,2 -	30	160	1,100	30
542-75-6	Dichloropropene, 1,3 -	38	330	810	38
123-91-1	Dioxane, 1,4-	87,000	2,300	270,000	2,300
60-29-7	Ethyl Ether	1,000,000	NA	33,000	33,000
100-41-4	Ethylbenzene	2,600	NA	230	230
50-00-0	Formaldehyde	3,500	4,700	130,000	3,500
64-18-6	Formic acid	1,500	NA	170,000	1,500
110-54-3	Hexane, *n*-	710	NA	190	190
78-83-1	Isobutyl Alcohol	1,000,000	NA	40,000	40,000
67-56-1	Methanol	1,000,000	NA	110,000	110,000
78-93-3	Methyl Ethyl Ketone (MEK)	15,000	NA	100,000	15,000
108-10-1	Methyl Isobutyl Ketone (MIBK)	12,000	NA	16,000	12,000
1634-04-4	Methyl *tert*-Butyl Ether (MTBE)	8,300	7,500	6,700	6,700
75-09-2	Methylene Chloride	1,500	2,200	2,300	1,500
100-42-5	Styrene	27,000	NA	1,700	1,700
630-20-6	Tetrachloroethane , 1,1,1,2-	58,000	310	750	310
79-34-5	Tetrachloroethane, 1,1,2,2-	970,000	94	1,700	94
127-18-4	Tetrachloroethene	540	220	380	220
108-88-3	Toluene	2,000	NA	520	520
71-55-6	Trichloroethane, 1,1,1-	33,000	NA	1,300	1,300
79-00-5	Trichloroethane, 1,1,2-	78,000	210	2,600	210

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
79-01-6	Trichloroethene	960	560	950	560
75-69-4	Trichlorofluoromethane	4,800	NA	1,600	1,600
96-18-4	Trichloropropane, 1,2,3-	120,000	190	1,100	190
75-01-4	Vinyl Chloride	63	48	1,100	48
1330-20-7	Xylenes, Total	440	NA	370	370
Semi-Volatile Organic Chemicals					
83-32-9	Acenaphthene	440,000	NA	NA	440,000
98-86-2	Acetophenone	850,000	NA	NA	850,000
107-13-1	Acrylonitrile	14	69	22,000	14
62-53-3	Aniline	1,300	44,000	62,000	1,300
120-12-7	Anthracene	1,000,000	NA	NA	1,000,000
92-87-5	Benzidine	2,600	2.5	NA	2.5
56-55-3	Benzo(a)anthracene	NA	680	NA	680
50-32-8	Benzo(a)pyrene	NA	69	NA	69
205-99-2	Benzo(b)fluoranthene	NA	690	NA	690
207-08-9	Benzo(k)fluoranthene	NA	6,900	NA	6,900
117-81-7	Bis (2-ethylhexyl) Phthalate (BEHP & DEHP)	170,000	42,000	190	190
85-68-7	Butyl Benzyl Phthalate	1,000,000	43,000	58	58
86-74-8	Carbazole	NA	30,000	NA	30,000
57-74-9	Chlordane	77	1,900	NA	77
218-01-9	Chrysene	NA	69,000	NA	69,000
53-70-3	Dibenz(a,h)anthracene	NA	69	NA	69
95-50-1	Dichlorobenzene, 1,2- (o)	12,000	NA	370	370
106-46-7	Dichlorobenzene, 1,4- (p)	15,000	510	NA	510
91-94-1	Dichlorobenzidine, 3,3-	NA	730	NA	730
72-54-8	Dichlorodiphenyldichloroethane (DDD)	2,800	3,500	NA	2,800
72-55-9	Dichlorodiphenyldichloroethene (DDE)	NA	2,200	NA	2,200
50-29-3	Dichlorodiphenyltrichloroethane (DDT)	700	2,700	NA	700
94-75-7	Dichlorophenoxyacetic acid, 2,4-	8,500	NA	NA	8,500
84-66-2	Diethyl Phthalate	1,000,000	NA	590	590
105-67-9	Dimethylphenol, 2,4-	170,000	NA	NA	170,000
84-74-2	Di-*n*-butyl Phthalate	850,000	NA	110	110
99-65-0	Dinitrobenzene, 1,3- (m)	850	NA	NA	850
528-29-0	Dinitrobenzene, 1,2-	850	NA	NA	850
121-14-2	Dinitrotoluene, 2,4-	1,700	870	NA	870
606-20-2	Dinitrotoluene, 2,6-	8,600	880	NA	880
72-20-8	Endrin	1,700	NA	NA	1,700
107-21-1	Ethylene Glycol	1,000,000	NA	110,000	110,000
206-44-0	Fluoranthene	290,000	NA	NA	290,000
86-73-7	Fluorene	290,000	NA	NA	290,000
76-44-8	Heptachlor	85	52	NA	52

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
1024-57-3	Heptachlor Epoxide	11	58	NA	11
87-68-3	Hexachloro-1,3-Butadiene	170	1,100	1,000	170
118-74-1	Hexachlorobenzene	85	170	NA	85
67-72-1	Hexachloroethane	8,500	8,000	NA	8,000
193-39-5	Indeno(1,2,3-c,d)pyrene	NA	690	NA	690
78-59-1	Isophorone	1,000,000	630,000	4,600	4,600
98-82-8	Isopropylbenzene (Cumene)	17,000	NA	260	260
58-89-9	Lindane	3,900	420	NA	420
108-39-4	m-cresol	430,000	NA	61,000	61,000
72-43-5	Methoxychlor	4,300	NA	NA	4,300
90-12-0	Methylnaphthalene, 1-	51,000	NA	360	360
91-20-3	Naphthalene	84	580	NA	84
98-95-3	Nitrobenzene	610	NA	1,500	610
86-30-6	Nitrosodiphenylamine, *n*-	17,000	71,000	NA	17,000
95-48-7	o-cresol	430,000	NA	NA	430,000
117-84-0	Octyl Phthalate, di-*n*-	340,000	NA	12	12
106-44-5	p-cresol	4,300	NA	NA	4,300
87-86-5	Pentachlorophenol	460	2,600	NA	460
108-95-2	Phenol	510,000	NA	NA	510,000
1336-36-3	Polychlorinated Biphenyls	42	230	NA	42
129-00-0	Pyrene	220,000	NA	NA	220,000
110-86-1	Pyridine	8,500	NA	400,000	8,500
93-72-1	Silvex	6,800	NA	NA	6,800
8001-35-2	Toxaphene	NA	500	NA	500
95-95-4	Trichlorophenol, 2,4,5-	850,000	NA	NA	850,000
88-06-2	Trichlorophenol, 2,4,6-	NA	29,000	NA	29,000
95-63-6	Trimethylbenzene, 1,2,4-	35	NA	250	35
108-67-8	Trimethylbenzene, 1,3,5-	280	NA	200	200
99-35-4	Trinitrobenzene, 1,3,5- (s)	430	NA	NA	430
108-05-4	Vinyl Acetate	100	NA	2,700	100
Inorganic Chemicals					
7440-36-0	Antimony	390	NA	NA	390
7440-38-2	Arsenic, Inorganic	420	640	NA	420
7440-39-3	Barium and Compounds	120,000	NA	NA	120,000
7440-41-7	Beryllium and Compounds	3,100	63,000	NA	3,100
7440-43-9	Cadmium	1,600	83,000	NA	1,600
16065-83-1	Chromium (III)	1,000,000	NA	NA	1,000,000
18540-29-9	Chromium (VI)	15,000	13,000	NA	13,000
7440-48-4	Cobalt	4,000	54,000	NA	4,000
57-12-5	Cyanide, Free	39,000	NA	NA	39,000
7782-41-4	Fluorine (soluble fluoride)	120,000	NA	NA	120,000
7439-97-6	Mercury	190	NA	NA	190
7440-02-0	Nickel (Soluble Salts)	21,000	NA	NA	21,000
7782-49-2	Selenium and Compounds	9,700	NA	NA	9,700

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Soil Saturation	Generic Direct Contact Soil Standard for a Single Chemical (mg/kg)
7440-22-4	Silver	9,700	NA	NA	9,700
7440-28-0	Thallium	1,600	NA	NA	1,600
7440-62-2	Vanadium	17,000	NA	NA	17,000
7440-66-6	Zinc and Compounds	580,000	NA	NA	580,000

(e) Calculating property-specific soil saturation concentrations.

(i) In lieu of using the generic soil saturation concentrations listed in table I through table III in paragraphs (C)(3)(b) through (C)(3)(d) of this rule, the volunteer may use the following equation to calculate a property-specific soil saturation concentration:

$$C_{sat} = \frac{S}{\rho_b} (K_d \rho_b + \theta_w + H'\theta_a)$$

Where :

C_{sat} *is the soil saturation concentration (mg/kg)*

S *is the water solubility (mg/L water)*

ρ_b *is dry soil bulk density (kg/L)*

K_d *is the soil - water partition coefficient (L/kg) (default is* $K_d = K_{oc} \times f_{oc}$*)*

K_{oc} *is the soil organic carbon/water partition coefficient (L/kg)*

f_{oc} *is the fraction organic carbon of soil (g/g)*

θ_w *is the water - filled soil porosity* (L_{water} / L_{soil})

H' is the dimensionless Henry's Law constant

θ_a *is the air - filled soil porosity* (L_{pore} / L_{soil}).

(ii) All chemical-specific values for the above equation must be obtained from one of the following sources:

(a) U.S. EPA's "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites;"

(b) Ohio EPA's "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures;"

(*c*) Hazardous substances data bank;

(d) The physical properties database;

(e) CHEMFATE chemical search;

(f) Risk assessment information system; or

(g) If chemical-specific values for the equation specified in this paragraph are not available in the sources listed in this paragraph, contact an Ohio EPA division of emergency and remedial response representative.

(i) Physical values must be obtained from one of the following sources:

(*a*) Physical values must be obtained from one of the following sources:

(*i*) U.S. EPA's "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites;" or

(ii) Property-specific data that meet the criteria contained in paragraph (D)(3)(b)(iv) of rule 3745-300-09 of the Administrative Code.

(f) Table IV: generic direct-contact standards for lead (values are in mg/kg).

	Residential Land Use	Commercial/Industrial Land Use	Construction and Excavation Activities
Lead	400	1800	750

The lead standards contained in the table IV take into account other factors and assumptions in addition to the carcinogenic or non-carcinogenic risk of lead. Therefore, using the cumulative risk considerations contained in paragraph (C)(2)(b) of this rule is not appropriate and need not be performed.

(D) Generic unrestricted potable use standards for hazardous substances in ground water.

(1) Applicability.

(a) The generic unrestricted potable use standards contained in paragraph (D)(3) of this rule apply as determined in accordance with rule 3745-300-10 of the Administrative Code.

(b) A property-specific risk assessment must be conducted in accordance with the procedures established in rule 3745-300-09 of the Administrative Code to determine applicable standards in place of or in addition to using the generic unrestricted potable use standards if any of paragraph (A)(3)(a) through (A)(3)(c) of this rule apply to the property, and those exposures are required to be evaluated under rule 3745-300-10 of the Administrative Code;

(c) The standards listed in paragraph (D)(3) of this rule apply to releases of hazardous substances. Generic numerical standards for petroleum releases are identified in paragraph (B)(3) of this rule.

(2) Assumptions.

The generic unrestricted potable use standards contained in table V in paragraph (D)(3)(b) of this rule or table VI in paragraph (D)(3)(c) of this rule were determined using the assumption that the ground water on, underlying and emanating from the property will be used as a source of water for drinking, cooking, showering and bathing.

(a) The generic unrestricted potable use standards listed in table V in paragraph (D)(3)(b) of this rule are maximum contaminant levels or other regulatory established criteria which take into account factors and assumptions in addition to carcinogenic risk and non-carcinogenic hazards of the chemical. Therefore, the volunteer does not need to include the values for the chemicals of concern in table V in paragraph (D)(3)(b) of this rule in the cumulative adjustment for multiple chemicals required by paragraph (D)(2)(c) of this rule.

(b) The risk-derived generic unrestricted potable use standards presented in table VI in paragraph (D)(3)(c) of this rule assume a single chemical of concern is present in the ground water on, underlying, or emanating from the property.

(i) The generic unrestricted potable use standards presented in table VI in paragraph (D)(3)(c) of this rule are based on the following risk and hazard levels:

(*a*) For hazardous substances having carcinogenic effects, the chemical-specific carcinogenic risk must not exceed one excess cancer in a population of 100,000 (i.e. 1×10^{-5}); and

(*b*) For hazardous substances having non-carcinogenic effects, the chemical-specific hazard must not exceed a hazard index of 1.

(ii) The concentration of chemicals of concern, as determined in accordance with paragraph (F)(5) of rule 3745-300-07 of the Administrative Code, must not exceed the single chemical generic unrestricted potable use standard. Applicable ground water response requirements are included in rule 3745-300-10 of the Administrative Code.

(c) Multiple chemicals.

When more than one chemical of concern is present at a property and applicable generic unrestricted potable use standards for the chemicals of concern are contained in table VI in paragraph (D)(3)(c) of this rule, the values for each chemical of concern contained in

table VI must be adjusted for the presence of multiple chemicals in order to meet the human health risk and hazard levels described in paragraph (D)(2)(b)(i) of this rule. Those chemicals of concern present on the property that have applicable generic unrestricted potable use standards available in table V in paragraph (D)(3)(b) of this rule are not included within the multiple chemical adjustment. The cumulative adjustment must be made in accordance with paragraph (E)(2) of this rule. All final cumulative human health carcinogenic risk and non-carcinogenic hazard levels are based on one significant figure. A cumulative adjustment for multiple chemicals must also be made when using a combination of values listed in table VI and applicable standards determined by a property-specific risk assessment conducted in accordance with rule 3745-300-09 of the Administrative Code.

(3) The generic unrestricted potable use standards for ground water.

(a) The generic unrestricted potable use standards for petroleum at commercial, industrial, and residential properties are the standards established in rules adopted under division (B) of section 3737.882 of the Revised Code, as provided by division (B)(1) of section 3746.04 of the Revised Code.

(b) Table V: generic unrestricted potable use standards based on maximum contaminant levels or other regulatory established criteria (values are in µg/l, or micrograms per liter).

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Generic Unrestricted Potable Use Standard for a Single Chemical (µg/L)
Volatile Organic Chemicals		
71-43-2	Benzene	5
56-23-5	Carbon Tetrachloride	5
108-90-7	Chlorobenzene	100
107-06-2	Dichloroethane, 1,2-	5
75-35-4	Dichloroethene, 1,1-	7
156-59-2	Dichloroethene, *cis*-1,2-	70
156-60-5	Dichloroethene, *trans*-1,2-	100
78-87-5	Dichloropropane, 1,2 -	5
100-41-4	Ethylbenzene	700
1634-04-4	Methyl *tert*-Butyl Ether (MTBE)	40
75-09-2	Methylene Chloride	5
100-42-5	Styrene	100
127-18-4	Tetrachloroethene	5
108-88-3	Toluene	1,000
71-55-6	Trichloroethane, 1,1,1-	200
79-00-5	Trichloroethane, 1,1,2-	5
79-01-6	Trichloroethene	5
75-01-4	Vinyl Chloride	2
1330-20-7	Xylenes, Total	10,000

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Generic Unrestricted Potable Use Standard for a Single Chemical (μg/L)
Inorganic Chemicals		
7440-36-0	Antimony	6
7440-38-2	Arsenic, Inorganic	10
12001-28-4	Asbestos	7*
7440-39-3	Barium and Compounds	2,000
7440-41-7	Beryllium and Compounds	4
7440-43-9	Cadmium	5
7440-47-3	Chromium, Total	100
57-12-5	Cyanide, Free	200
7782-41-4	Fluorine (soluble fluoride)	4,000
7439-92-1	Lead	15
7439-97-6	Mercury	2
7782-49-2	Selenium and Compounds	50
7440-28-0	Thallium	2
Semi-Volatile Organic Chemicals and Pesticides		
15972-60-8	Alachlor	2
1912-24-9	Atrazine	3
50-32-8	Benzo(a)pyrene	0.2
117-81-7	Bis (2-ethylhexyl) Phthalate (BEHP & DEHP)	6
1563-66-2	Carbofuran	40
57-74-9	Chlordane	2
75-99-0	Dalapon	200
95-50-1	Dichlorobenzene, 1,2- (o)	600
106-46-7	Dichlorobenzene, 1,4- (p)	75
94-75-7	Dichlorophenoxyacetic acid, 2,4-	70
103-23-1	Di(2-ethylhexyl)adipate	400
96-12-8	Dibromochloropropane (DBCP)	0.2
88-85-7	Dinoseb	7
1746-01-6	Dioxin (2,3,7,8-TCDD)	0.00003
85-00-7	Diquat	20
145-73-3	Endothall	100
72-20-8	Endrin	2
106-93-4	Ethylene Dibromide (EDB)	0.05
107-18-36	Glyphosate	700
76-44-8	Heptachlor	0.4
1024-57-3	Heptachlor Epoxide	0.2
118-74-1	Hexachlorobenzene	1
77-47-4	Hexachlorocyclopentadiene	50
58-89-9	Lindane	0.2
72-43-5	Methoxychlor	40
23135-22-0	Oxamyl (Vydate)	200
87-86-5	Pentachlorophenol	1
1918-02-1	Picloram	500
1336-36-3	Polychlorinated Biphenyls	0.5
93-72-1	Silvex (2,4,5 TP)	50

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Generic Unrestricted Potable Use Standard for a Single Chemical (μg/L)
122-34-9	Simazine	4
8001-35-2	Toxaphene	3
120-82-1	Trichlorobenzene, 1,2,4-	70
Trihalomethanes (THMs)		
Not Available	Trihalomethanes, Total	80

* Units for this standard are in million fibers per liter, for all fibers longer than ten micrometers in length.

(c) Table VI: risk-derived generic unrestricted potable use standards (values are in μg/l, or micrograms per liter).

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Generic Unrestricted Potable Use Standard for a Single Chemical (μg/L)
Volatile Organic Chemicals				
67-64-1	Acetone	14,000	NA	14,000
75-15-0	Carbon Disulfide	1,400	NA	1,400
75-00-3	Chloroethane	6,200	550	550
67-66-3	Chloroform	150	40	40
124-48-1	Dibromochloromethane	320	19	19
75-71-8	Dichlorodifluoromethane	2,100	NA	2,100
75-34-3	Dichloroethane, 1,1-	2,600	250	250
542-75-6	Dichloropropene, 1,3 -	270	16	16
123-91-1	Dioxane, 1,4-	1,600	140	140
60-29-7	Ethyl Ether	3,200	NA	3,200
50-00-0	Formaldehyde	3,200	NA	3,200
64-18-6	Formic acid	32,000	NA	32,000
110-54-3	Hexane, n-	910	NA	910
78-83-1	Isobutyl Alcohol	4,700	NA	4,700
67-56-1	Methanol	7,900	NA	7,900
78-93-3	Methyl Ethyl Ketone (MEK)	8,900	NA	8,900
108-10-1	Methyl Isobutyl Ketone (MIBK)	1,200	NA	1,200
630-20-6	Tetrachloroethane , 1,1,1,2-	470	56	56
79-34-5	Tetrachloroethane, 1,1,2,2-	930	7.0	7.0
75-69-4	Trichlorofluoromethane	3,800	NA	3,800
Semi-Volatile Organic Chemicals				
83-32-9	Acenaphthene	950	NA	950
98-86-2	Acetophenone	1,600	NA	1,600
62-53-3	Aniline	110	280	110
120-12-7	Anthracene	4,700	NA	4,700
56-55-3	Benzo(a)anthracene	NA	0.63	0.63
205-99-2	Benzo(b)fluoranthene	NA	0.46	0.46
207-08-9	Benzo(k)fluoranthene	NA	22	22

Chemical Abstract Service Number (CAS #)	Chemical of Concern	Standard for Single Chemical Noncarcinogen	Standard for Single Chemical Carcinogen	Generic Unrestricted Potable Use Standard for a Single Chemical (μg/L)
85-68-7	Butyl Benzyl Phthalate	3,200	110	110
86-74-8	Carbazole	NA	79	79
218-01-9	Chrysene	NA	63	63
72-54-8	Dichlorodiphenyldichloroethane (DDD)	22	3.5	3.5
72-55-9	Dichlorodiphenyldichloroethene (DDE)	NA	2.6	2.6
50-29-3	Dichlorodiphenyltrichloroethane (DDT)	4.8	2.0	2.0
84-66-2	Diethyl Phthalate	13,000	NA	13,000
105-67-9	Dimethylphenol, 2,4-	310	NA	310
84-74-2	Di-*n*-butyl Phthalate	1,500	NA	1,500
107-21-1	Ethylene Glycol	32,000	NA	32,000
206-44-0	Fluoranthene	420	NA	420
86-73-7	Fluorene	630	NA	630
67-72-1	Hexachloroethane	15	100	15
193-39-5	Indeno(1,2,3-c,d)pyrene	NA	0.34	0.34
78-59-1	Isophorone	3,200	1700	1,700
98-82-8	Isopropylbenzene (Cumene)	1,400	NA	1,400
108-39-4	m-cresol	790	NA	790
90-12-0	Methylnaphthalene, 1-	1,100	NA	1,100
91-20-3	Naphthalene	67	100	67
86-30-6	Nitrosodiphenylamine, *n*-	310	300	300
95-48-7	o-cresol	790	NA	790
117-84-0	Octyl Phthalate, di-*n*-	630	NA	630
106-44-5	p-cresol	79	NA	79
108-95-2	Phenol	4,700	NA	4,700
129-00-0	Pyrene	470	NA	470
110-86-1	Pyridine	16	NA	16
95-95-4	Trichlorophenol, 2,4,5-	1,600	NA	1,600
88-06-2	Trichlorophenol, 2,4,6-	NA	120	120
95-63-6	Trimethylbenzene, 1,2,4-	140	NA	140
108-67-8	Trimethylbenzene, 1,3,5-	140	NA	140
99-35-4	Trinitrobenzene, 1,3,5- (s)	470	NA	470
108-05-4	Vinyl Acetate	4,300	NA	4,300
Inorganic Chemicals				
7440-48-4	Cobalt	320	NA	320
7440-02-0	Nickel (Soluble Salts)	320	NA	320
7440-22-4	Silver	79	NA	79
7440-62-2	Vanadium	130	NA	130
7440-66-6	Zinc and Compounds	4,700	NA	4,700

(E) Procedures for cumulative adjustment for multiple chemicals

(1) Concentration of chemicals of concern in soils.

(a) Several procedures may be used to adjust for the presence of multiple carcinogenic chemicals of concern in an identified area or exposure unit to comply with paragraph (C)(2)(b) of this rule. One method is to divide the exposure point concentration ($chem_a$) for each chemical of concern by the "Carcinogenic Single Chemical Direct-Contact Soil Standard" ($GDCSC_a$) in table I in paragraph (C)(3)(b) of this rule, table II in paragraph (C)(3)(b) of this rule, or table III in paragraph (C)(3)(d) of this rule. The resultant ratios are summed as an expression of estimated risk (see the equation below). When the summed ratios result in a value less than one, carcinogenic risk levels have been met on the property. When the summed ratios result in a value greater than one the carcinogenic risk levels are not met and remedial action is required.

$$\left(\frac{[\,chem_a\,]}{GDCSC_a} + \frac{[\,chem_b\,]}{GDCSC_b} + ...\right) = \begin{array}{c}\textit{cumulative cancer risk ratio for}\\ \textit{direct contact soils on the property}\end{array}$$

(b) Several procedures may be used to adjust for the presence of multiple non-carcinogenic chemicals of concern in an identified area or exposure unit to comply with paragraph (C)(2)(b) of this rule. One method is to divide the exposure point concentration ($chem_a$) for each chemical of concern by the "Non-carcinogenic Single Chemical Direct-Contact Soil Standard" ($GDCSN_a$) in table I in paragraph (C)(3)(b) of this rule, table II in paragraph (C)(3)(c) of this rule, or table III in paragraph (C)(3)(d) of this rule. The resultant ratios are summed as an expression of estimated hazard index (see the equation below). When the summed ratios result in a value less than one, non-carcinogenic risk levels have been met on the property. When the summed ratios result in a value greater than one the non-carcinogenic risk levels are not met and remedial action is required.

$$\left(\frac{[\,chem_a\,]}{GDCSN_a} + \frac{[\,chem_b\,]}{GDCSN_b} + ...\right) = \begin{array}{c}\textit{cumulative noncancer risk ratio for}\\ \textit{direct contact soils on the property}\end{array}$$

Non-cancer risk ratios for non-carcinogenic chemicals of concern which do not exhibit the same toxic endpoint may be excluded from the calculation of the cumulative non-cancer risk ratio described above if a written justification for such exclusion is submitted. The consideration of all major toxic endpoints and mechanisms of action must include, at a minimum, those identified with the critical effect upon which the reference dose or reference concentration for each non-carcinogenic chemical of concern is based. The source for each reference dose and reference concentration for each non-carcinogenic chemical for which generic direct-contact soil standards have been derived, are cited in Ohio EPA's "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." It may be necessary to calculate more than one

cumulative non-cancer risk ratio for a property resulting from the segregation of non-carcinogenic chemicals of concern on the basis of toxic endpoints or mechanisms of action.

(c) For situations where a chemical of concern poses both carcinogenic and non-carcinogenic risks and a value for the chemical of concern is listed in both the "Standard for Single Chemical Carcinogens" column and the "Standard for Single Chemical Non-carcinogens" column contained in paragraph (C)(3) of this rule or an applicable single chemical carcinogen and non-carcinogen standard has been determined in accordance with rule 3745-300-09 of the Administrative Code, the chemical of concern must be included in the multiple carcinogenic chemical adjustment calculation under paragraph (E)(1)(a) of this rule and the adjustment calculation for multiple non-carcinogenic chemicals under paragraph (E)(1)(b) of this rule. The applicable standard for the chemical of concern will be the lowest of the values determined by using the equations in this paragraph or, if appropriate, the soil saturation concentration.

(2) Concentration of chemicals of concern in ground water.

(a) Several procedures may be used to adjust for the presence of multiple carcinogenic chemicals of concern in groundwater to comply with paragraph (D)(2)(c) of this rule. One method is to divide the exposure point concentration ($chem_a$) for each chemical of concern by the "Carcinogenic Single Chemical Unrestricted Potable Use Standard" ($GUPCS_a$) in table VI in paragraph (D)(3)(c) of this rule. The resultant ratios are summed as an expression of estimated risk (see the equation below). When the summed ratios result in a value less than one, carcinogenic risk levels have been met on the property. When the summed ratios result in a value greater than one the carcinogenic risk levels are not met and remedial action is required.

$$\left(\frac{[chem_a]}{GUPCS_a} + \frac{[chem_b]}{GUPCS_b} + ...\right) = \begin{array}{c} cumulative\ cancer\ risk\ ratio\ for \\ generic\ unrestricted\ potable\ use \\ ground\ water\ on\ the\ property \end{array}$$

(b) Several procedures may be used to adjust for the presence of multiple non-carcinogenic chemicals of concern in groundwater to comply with paragraph (D)(2)(c) of this rule. One method is to divide the exposure point concentration ($chem_a$) for each chemical of concern by the "Non-carcinogenic Single Chemical Unrestricted Potable Use Standard" ($GUPNS_a$) in table VI in paragraph (D)(3)(c) of this rule. The resultant ratios are summed as an expression of estimated hazard index (see the equation below). When the summed ratios result in a value less than one, non-carcinogenic hazard levels have been

met on the property. When the summed ratios result in a value greater than one the non-carcinogenic hazard levels are not met and remedial action is required.

$$\left(\frac{[chem_a]}{GUPNS_a} + \frac{[chem_b]}{GUPNS_b} + ...\right) = \begin{array}{c}\textit{cumulative noncancer risk ratio for}\\ \textit{generic potable use ground water}\\ \textit{on the Property}\end{array}$$

Non-cancer risk ratios for non-carcinogenic chemicals of concern which do not exhibit the same toxic endpoint may be excluded from the calculation of the cumulative non-cancer risk ratio described above if a written justification for such exclusion is submitted. The consideration of all major toxic endpoints and mechanisms of action must include, at a minimum, those identified with the critical effect upon which the reference dose or reference concentration for each non-carcinogenic chemical of concern is based. The source for each reference dose and reference concentration for each non-carcinogenic chemical for which generic unrestricted potable use standards have been derived, are cited in Ohio EPA's "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." It may be necessary to calculate more than one cumulative non-cancer risk ratio for a property resulting from the segregation of non-carcinogenic chemicals of concern on the basis of toxic endpoints or mechanisms of action.

(c) For situations where a chemical of concern poses both carcinogenic and non-carcinogenic risk and a value for the chemical of concern is listed in both the "Standard for Single Chemical Carcinogens" column and the "Standard for Single Chemical Non-carcinogens" column contained in table VI in paragraph (D)(3)(c) of this rule or an applicable single chemical carcinogen and non-carcinogen standard has been determined in accordance with rule 3745-300-09 of the Administrative Code, the chemical of concern must be evaluated in the adjustment calculation for multiple carcinogenic chemicals under paragraph (E)(2)(a) of this rule and the multiple non-carcinogenic chemical adjustment calculation under paragraph (E)(2)(b)of this rule. The applicable standard for the chemical of concern is the lowest value determined by using the equations in this paragraph.

(F) Generic numerical standards for surface water.

(1) Applicability.

(a) The generic numerical standards for surface water in paragraph (F)(2) of this rule apply to a property as determined in accordance with paragraph (F) of rule 3745-300-07 of the Administrative Code.

(b) For all releases of petroleum on underlying or emanating to surface water of the state, the generic petroleum standards are contained within paragraph (B) of this rule.

(2) Generic surface water standards.

(a) For all releases or source areas of hazardous substances on, underlying or emanating from the property to surface waters of the state, surface water chemical concentrations must be compared to the chemical criteria pursuant to Chapter 3745-1 of the Administrative Code. The outside mixing zone average criteria for human health and aquatic life and wildlife should be compared against ambient samples averaged over a thirty-day period. Single ambient samples are not to exceed the outside the mixing zone maximum. If all chemical constituents are below their corresponding chemical criteria, then the surface water may be eliminated as an exposure medium. If chemical constituents exceed their corresponding chemical criteria, then the surface water shall be further assessed in accordance with rule 3745-300-09 of the Administrative Code.

For the purposes of this rule, the generic numerical standards for surface water apply regardless of whether the release or source area of hazardous substances is a point source or nonpoint source.

(b) All regulated point source discharges of pollutants to surface waters of the state and any other regulated discharges that occur from or on the property must comply with all permit and other applicable requirements of the Federal Water Pollution Control Act and Chapter 6111. of the Revised Code, and the regulations adopted thereunder.

The permit and other applicable requirements of point source discharges include but are not limited to: (a) the national pollutant discharge elimination system permit issued pursuant to Chapter 3745-33 of the Administrative Code (also referred to as Ohio NPDES permits), and (b) the water quality certification issued pursuant to Chapter 3745-32 of the Administrative Code. A volunteer may obtain a consolidated standards permit for activities conducted in connection with a voluntary action which require permits from the director.

(c) Storm water associated with industrial activity that is discharged to surface waters of the state or is discharged through a separate municipal storm sewer system must comply with the applicable requirements contained in 40 C.F.R. 122.26.

(G) Generic numerical standards for human exposure to sediments.

(1) Applicability.

(a) For purposes of this rule and rule 3745-300-07 of the Administrative Code, human health exposure pathways to sediment on or emanating from the property are considered complete when the surface water which contains the sediments:

(i) Produces or can produce a consistent supply of edible-sized fish and the chemicals of concern in the sediment are persistent, bioaccumulative and toxic; or

(ii) Is reasonably anticipated to support recreational activities such as wading, swimming, or boating.

(b) For all releases of petroleum on, underlying or emanating to surface waters of the state which contains sediments, the generic petroleum standards are contained in paragraph (B) of this rule.

(c) If the concentrations of chemicals of concern in sediment exceed the generic numerical standards for human exposure to sediment, the volunteer must conduct a human health property-specific risk assessment following the methodology outlined in paragraph (D) of rule 3745-300-09 of the Administrative Code or conduct a remedy in accordance with the 3745-300-11 of the Administrative Code.

(2) Generic numerical standards for human exposure to sediment.

(a) Generic direct-contact standards for sediments are the generic direct-contact soil standards for residential land use specified in paragraph (C)(3)(b) of this rule. Cumulative adjustment for multiple chemicals must be evaluated in accordance with paragraph (C)(2)(b) of this rule.

(b) If chemicals of concern in sediment are persistent, bioaccumulative and toxic and the surface water containing the sediments produces or can produce a consistent supply of edible-sized fish, the volunteer must conduct a human health property-specific risk assessment in accordance with rule 3745-300-09 of the Administrative Code to evaluate fish consumption.

(H) Generic numerical standards for exposure of important ecological resources to sediments.

(1) Applicability.

(a) The volunteer may smaples sediments directly and apply the applicable standards in accordance with (H)(2)(a) and (H)(2)(b) of this rule; or

(b) Demonstrate compliance with applicable standards in accordance with paragraph (F)(5) of rule 3745-300-09 of the Administrative Code.

(2) Generic numerical standards for exposure of important ecological resources to sediments.

(a) The volunteer may compare the concentration of chemicals of concern in sediments on the property to the Ohio-specific sediment reference values contained in attachment H of Ohio EPA's "Guidance for Conducting Ecological Risk Assessments"; or

(b) For each chemical of concern for which the volunteer does not compare the sediment concentrations to the Ohio-specific sediment reference values, the ecotoxicologically-based benchmarks from the following hierarchy must be used:

(i) Consensus-based threshold effects concentration values contained in MacDonald, Ingersoll and Berger's "Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems"; or

(ii) U.S. EPA, region 5 ecological screening levels.

(3) If concentrations of chemicals of concern do not exceed Ohio-specific sediment reference values or appropriate ecotoxicologically-based benchmarks and the provisions in paragraph (A)(3)(f) of this rule do not apply, then the applicable standards have been met.

(4) The volunteer shall evaluate the sediments on the property in accordance with paragraph (F) of rule 3745-300-09 of the Administrative Code or conduct a remedy in accordance with rule 3745-300-11 of the Administrative Code if any of the following apply:

(a) The sediments on the property exceed applicable standards in accordance with this rule; or

(b) The sediment samples were not compared to the sediment values in accordance with paragraph (H)(2) of this rule.

(I) Developing soil standards for leaching of chemicals of concern from soil to ground water.

(1) Applicability.

(a) Soil standards for leaching may be developed when one or more ground water zones are determined to meet unrestricted potable use standards and the potential for leaching of chemicals of concern from soil to ground water is determined to be a complete exposure pathway.

(b) Soil standards for leaching may be developed when one or more ground water zones are determined to exceed unrestricted potable use standards and the potential for leaching of chemicals of concern from soil to ground water is a complete exposure pathway that must be evaluated in accordance with:

(i) Applicable ground water response requirements contained in paragraph (E) of rule 3745-300-10 of the Administrative Code; or

(ii) A pathway completeness determination in paragraph (F)(1) of rule 3745-300-07 of the Administrative Code.

(2) Soil standards for leaching.

(a) Soil standards for leaching when the underlying ground water zone meets unrestricted potable use standards.

Soil standards for leaching are the soil concentrations determined to be protective of the applicable ground water zone and will not cause unrestricted potable use standards to be exceeded in the ground water zone as demonstrated in accordance with paragraph (F)(3)(a) of rule 3745-300-07 of the Administrative Code.

(b) Soil standards for leaching when the underlying ground water zone exceeds unrestricted potable use standards.

(i) Soil standards for leaching are the soil concentrations determined to be protective of the applicable ground water response requirements for the ground water zone as determined by rule 3745-300-10 of the Administrative Code.

(ii) Soil standards for leaching are the soil concentrations determined to be protective of any other applicable standard in ground water that must be met in accordance with a pathway completeness determination and the demonstration of compliance with applicable standards.

Effective:	03/01/2009
R.C. 119.032 review dates:	03/01/2014

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Certification

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Date

Promulgated Under:	119.03
Statutory Authority:	3746.04
Rule Amplifies:	3746

APPENDIX C

Soil Boring

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started	: 7-19-2016
Date Completed	: 7-19-2016
Logged By	: J. Ardner
Reviewed By	: M. Beil
Drilling Contractor	: Terra Probe
Drilling Method	: Direct Push
Sampling Method	: 4' Dual Tube/Continuous
Total Depth	: 10'

LOG OF BORING HSB-13A

PID model	: MiniRae 3000 (11.7 eV lamp)
PID Calibration	: 100 ppm Isobutylene

Soil Samples
- Sample Interval
- Lab Sample

Water Levels
- Static Water Level
- During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/2	DP-1 0.0-2.0	0.6				Concrete
1							Loose, light brown, medium to coarse SAND; slightly moist.
2							Stiff, dark brown/black, silty CLAY; trace brick fragments; slightly moist.
3							
4	4/3	DP-2 4.0-7.0	0.2				Medium stiff, light brown, silty CLAY; little grey mottling; slightly plastic; slightly moist.
5							
6							
7							
8	2/2	DP-3 8.0-10.0	0.0				
9							
10							End of Boring at 10'
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started	: 7-19-2016
Date Completed	: 7-19-2016
Logged By	: J. Ardner
Reviewed By	: M. Beil
Drilling Contractor	: Terra Probe
Drilling Method	: Direct Push
Sampling Method	: 4' Dual Tube/Continuous
Total Depth	: 12'

LOG OF BORING HSB-13B

PID model	: MiniRae 3000 (11.7 eV lamp)
PID Calibration	: 100 ppm Isobutylene

Soil Samples
- Sample Interval
- Lab Sample

Water Levels
- Static Water Level
- During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/2.5	DP-1 0.0-2.0	0.1				Concrete
1							Sand and brick FILL; slightly moist.
2		2.0-2.5	0.4				
3							
4	4/4	DP-2 4.0-6.0	0.8				Same as above; some clay.
5							Stiff, light brown, clayey SILT; some light grey mottling; slightly moist.
6		6.0-8.0	0.2				
7							
8	4/4	DP-3 8.0-10.0	1.3				Same as above; medium stiff.
9							
10		10.0-12.0	1.1				
11							
12							End of Boring at 12'
13							
14							
15							
16							
17							
18							
19							
20							

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started	: 7-19-2016
Date Completed	: 7-19-2016
Logged By	: J. Ardner
Reviewed By	: M. Beil
Drilling Contractor	: Terra Probe
Drilling Method	: Direct Push
Sampling Method	: 4' Dual Tube/Continuous
Total Depth	: 12'

LOG OF BORING HSB-13C

PID model	: MiniRae 3000 (11.7 eV lamp)
PID Calibration	: 100 ppm Isobutylene

Soil Samples
- Sample Interval
- Lab Sample

Water Levels
- Static Water Level
- During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/2.3	DP-1 0.0-2.3	0.2				Concrete
1							Loose, light brown fine to coarse gravel SAND; slightly moist.
2							
3							
4	4/3	DP-2 4.0-6.0	0.0				Same as above; very moist.
5							
6		6.0-8.0	1.2				Same as above; wet.
7							
8	4/4	DP-3 8.0-10.0	0.0				Same as above; becoming clay; some dark grey discoloration; very moist to wet. Same as above; grey; wet.
9							
10		10.0-12.0	0.8				Medium stiff, light brown SILT; trace clay; moist.
11							
12							End of Boring at 12'
13							
14							
15							
16							
17							
18							
19							
20							

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started	: 7-19-2016
Date Completed	: 7-19-2016
Logged By	: J. Ardner
Reviewed By	: M. Beil
Drilling Contractor	: Terra Probe
Drilling Method	: Direct Push
Sampling Method	: 4' Dual Tube/Continuous
Total Depth	: 12'

LOG OF BORING HSB-13D

PID model	: MiniRae 3000 (11.7 eV lamp)
PID Calibration	: 100 ppm Isobutylene

Soil Samples
- Sample Interval
- Lab Sample

Water Levels
- Static Water Level
- During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/2	DP-1 0.0-2.0	0.5				Concrete
1							Loose, light brown fine to coarse gravel SAND; slightly moist.
2							
3							
4	4/2.8	DP-2 4.0-6.0	0.0				Same as above; asphalt chunks.
5							Medium stiff, light brown silty CLAY; some grey mottling slightly plastic; slightly moist.
6		6.0-6.8					
7							
8	4/4	DP-3 8.0-10.0	0.0				Same as above.
9							
10		10.0-12.0	0.0				
11							
12							End of Boring at 12'
13							
14							
15							
16							
17							
18							
19							
20							

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started : 7-19-2016
Date Completed : 7-19-2016
Logged By : J. Ardner
Reviewed By : M. Beil
Drilling Contractor : Terra Probe
Drilling Method : Direct Push
Sampling Method : 4' Dual Tube/Continuous
Total Depth : 1.5'

LOG OF BORING HSB-13E

PID model : MiniRae 3000 (11.7 eV lamp)
PID Calibration : 100 ppm Isobutylene

Soil Samples
Sample Interval
Lab Sample

Water Levels
Static Water Level
During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/1.5	DP-1 0.0-1.5	0.2				Concrete
1							Medium to coarse-grained, light brown, SAND; dry.
2							Boring refused at 1.5'
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started	: 7-19-2016
Date Completed	: 7-19-2016
Logged By	: J. Ardner
Reviewed By	: M. Beil
Drilling Contractor	: Terra Probe
Drilling Method	: Direct Push
Sampling Method	: 4' Dual Tube/Continuous
Total Depth	: 1.2'

LOG OF BORING HSB-13F

PID model	: MiniRae 3000 (11.7 eV lamp)
PID Calibration	: 100 ppm Isobutylene

Soil Samples
- Sample Interval
- Lab Sample

Water Levels
- Static Water Level
- During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/1.2	DP-1 0.0-1.2					Concrete
1							Loose, light brown, medium to coarse SAND; dry.
2							Boring refused at 1.2'
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started	: 7-19-2016
Date Completed	: 7-19-2016
Logged By	: J. Ardner
Reviewed By	: M. Beil
Drilling Contractor	: Terra Probe
Drilling Method	: Direct Push
Sampling Method	: 4' Dual Tube/Continuous
Total Depth	: 12'

LOG OF BORING HSB-13G

PID model	: MiniRae 3000 (11.7 eV lamp)
PID Calibration	: 100 ppm Isobutylene

Soil Samples: Sample Interval; Lab Sample

Water Levels: Static Water Level; During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/2	DP-1 0.0-2.0	1.1				Concrete
1							Loose, light brown fine to coarse gravel SAND; slightly moist.
2							
3							
4	4/3	DP-2 4.0-6.0	0.4				Same as above.
5							Soft, light brown silty CLAY; slightly plastic; slightly moist.
6		6.0-7.0	0.2				Loose, light brown, fine to coarse-grained SAND; moist.
7							
8	4/4	DP-3 8.0-10.0	5.9				Same as above; black; light sheen; very moist.
9							Fine black SAND; wet.
10		10.0-12.0	32.8				Soft, light brown, silty CLAY; plastic; slightly moist.
11							
12							End of Boring at 12'
13							
14							
15							
16							
17							
18							
19							
20							

08-18-2016 F:\Clients\Active\COT\COT273\Boring Logs\HSB-13G.bor

Hull & associates, inc.

Champion Spark Plug
COT273

Date Started	: 7-19-2016
Date Completed	: 7-19-2016
Logged By	: J. Ardner
Reviewed By	: M. Beil
Drilling Contractor	: Terra Probe
Drilling Method	: Direct Push
Sampling Method	: 4' Dual Tube/Continuous
Total Depth	: 11.5'

LOG OF BORING HSB-13H

PID model	: MiniRae 3000 (11.7 eV lamp)
PID Calibration	: 100 ppm Isobutylene

Soil Samples
- Sample Interval
- Lab Sample

Water Levels
- Static Water Level
- During drilling

Depth in Feet	Driven/recovery (ft) Sample Interval(ft)	Sample Number/ Sample Interval (ft)	PID	Sample	GRAPHIC	Water Level	DESCRIPTION
0	4/2.5	DP-1 0.0-2.0	0.3				Concrete
1							Loose, light brown fine to coarse SAND; slightly moist.
2		2.0-2.5	0.2				
3							
4	4/3	DP-2 4.0-6.0	0.3				Same as above.
5							Soft to medium stiff, light brown silty CLAY; some grey mottling; slightly plastic; slightly moist.
6		6.0-7.0	0.1				
7							
8	4/3.5	DP-3 8.0-10.0	10.2				Same as above.
9							Same as above; very moist.
10		10.0-11.5	8.6				
11							Clayey SILT.
12							End of Boring at 11.5'
13							
14							
15							
16							
17							
18							
19							
20							

APPENDIX D

Laboratory Analytical Data/Chain of Custody Documentation

Pace Analytical Services, Inc.
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(614)486-5421

Pace Analytical Services, Inc.
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

July 27, 2016

Mr. Matt Beil
Hull & Associates, Inc. (Toledo)
3401 Glendale Ave.
Suite 300
Toledo, OH 43614

RE: Project: COT273
Pace Project No.: 50150033

Dear Mr. Beil:
Enclosed are the analytical results for sample(s) received by the laboratory on July 20, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Tina Sayer

Tina Sayer
tina.sayer@pacelabs.com
Project Manager

Enclosures

cc: Hull Data/EDD Admin

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CERTIFICATIONS

Project: COT273
Pace Project No.: 50150033

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268
Illinois Certification #: 200074
Indiana Certification #: C-49-06
Kansas/NELAP Certification #:E-10177
Kentucky UST Certification #: 0042
Kentucky WW Certification #:98019
Ohio VAP Certification #: CL-0065
Oklahoma Certification #: 2014-148
Texas Certification #: T104704355-15-9
West Virginia Certification #: 330
Wisconsin Certification #: 999788130
USDA Soil Permit #: P330-10-00128

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SAMPLE SUMMARY

Project: COT273
Pace Project No.: 50150033

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50150033001	**COT273:HSB-13A:S005020**	Solid	07/19/16 09:50	07/20/16 08:50
50150033002	**COT273:HSB-13A:S040060**	Solid	07/19/16 10:05	07/20/16 08:50
50150033003	**COT273:HSB-13B:S005020**	Solid	07/19/16 11:50	07/20/16 08:50
50150033004	**COT273:HSB-13B:S080100**	Solid	07/19/16 12:00	07/20/16 08:50
50150033005	**COT273:HSB-13C:S005020**	Solid	07/19/16 10:15	07/20/16 08:50
50150033006	**COT273:HSB-13C:S060080**	Solid	07/19/16 10:25	07/20/16 08:50
50150033007	**COT273:HSB-13D:S005020**	Solid	07/19/16 12:40	07/20/16 08:50
50150033008	**COT273:HSB-13D:S040060**	Solid	07/19/16 12:50	07/20/16 08:50
50150033009	**COT273:HSB-13E:S005015**	Solid	07/19/16 09:45	07/20/16 08:50
50150033010	**COT273:HSB-13F:S005012**	Solid	07/19/16 09:08	07/20/16 08:50
50150033011	**COT273:HSB-13G:S005020**	Solid	07/19/16 11:05	07/20/16 08:50
50150033012	**COT273:HSB-13G:S080100**	Solid	07/19/16 11:25	07/20/16 08:50
50150033013	**COT273:HSB-13H:S005020**	Solid	07/19/16 10:35	07/20/16 08:50
50150033014	**COT273:HSB-13H:S080100**	Solid	07/19/16 10:45	07/20/16 08:50
50150033015	**COT273:EB-1:W071916**	Water	07/19/16 13:05	07/20/16 08:50
50150033016	**COT273:Trip Blank:W071916**	Water	07/19/16 08:00	07/20/16 08:50

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: COT273
Pace Project No.: 50150033

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50150033001	**COT273:HSB-13A:S005020**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033002	**COT273:HSB-13A:S040060**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033003	**COT273:HSB-13B:S005020**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033004	**COT273:HSB-13B:S080100**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033005	**COT273:HSB-13C:S005020**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033006	**COT273:HSB-13C:S060080**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033007	**COT273:HSB-13D:S005020**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033008	**COT273:HSB-13D:S040060**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033009	**COT273:HSB-13E:S005015**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033010	**COT273:HSB-13F:S005012**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033011	**COT273:HSB-13G:S005020**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033012	**COT273:HSB-13G:S080100**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033013	**COT273:HSB-13H:S005020**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033014	**COT273:HSB-13H:S080100**	EPA 8260	JLZ	13	PASI-I
		SM 2540G	MDG	1	PASI-I
50150033015	**COT273:EB-1:W071916**	EPA 8260	JLZ	13	PASI-I
50150033016	**COT273:Trip Blank:W071916**	EPA 8260	JLZ	13	PASI-I

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: COT273
Pace Project No.: 50150033

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50150033001	**COT273:HSB-13A:S005020**					
EPA 8260	Tetrachloroethene	0.0052	mg/kg	0.0047	07/25/16 18:53	
EPA 8260	Trichloroethene	1.4	mg/kg	0.13	07/26/16 20:50	
SM 2540G	Percent Moisture	9.8	%	0.10	07/26/16 12:44	
50150033002	**COT273:HSB-13A:S040060**					
EPA 8260	Trichloroethene	0.13	mg/kg	0.0044	07/25/16 13:00	
SM 2540G	Percent Moisture	14.1	%	0.10	07/26/16 12:44	
50150033003	**COT273:HSB-13B:S005020**					
EPA 8260	Trichloroethene	0.038	mg/kg	0.0050	07/25/16 13:32	
SM 2540G	Percent Moisture	2.0	%	0.10	07/26/16 12:44	
50150033004	**COT273:HSB-13B:S080100**					
EPA 8260	cis-1,2-Dichloroethene	0.28	mg/kg	0.0048	07/25/16 14:04	
EPA 8260	Trichloroethene	4.3	mg/kg	0.46	07/26/16 21:22	
SM 2540G	Percent Moisture	20.1	%	0.10	07/26/16 12:45	
50150033005	**COT273:HSB-13C:S005020**					
EPA 8260	Trichloroethene	0.068	mg/kg	0.0047	07/25/16 14:36	
SM 2540G	Percent Moisture	1.3	%	0.10	07/26/16 12:45	
50150033006	**COT273:HSB-13C:S060080**					
SM 2540G	Percent Moisture	14.8	%	0.10	07/26/16 12:45	
50150033007	**COT273:HSB-13D:S005020**					
EPA 8260	Trichloroethene	0.016	mg/kg	0.0051	07/25/16 15:40	
SM 2540G	Percent Moisture	3.4	%	0.10	07/26/16 12:45	
50150033008	**COT273:HSB-13D:S040060**					
EPA 8260	Trichloroethene	0.049	mg/kg	0.0041	07/25/16 16:12	
SM 2540G	Percent Moisture	14.6	%	0.10	07/26/16 12:45	
50150033009	**COT273:HSB-13E:S005015**					
EPA 8260	Trichloroethene	0.13	mg/kg	0.0046	07/25/16 16:44	
SM 2540G	Percent Moisture	4.4	%	0.10	07/26/16 12:45	
50150033010	**COT273:HSB-13F:S005012**					
EPA 8260	Trichloroethene	0.023	mg/kg	0.0058	07/25/16 17:16	
SM 2540G	Percent Moisture	1.6	%	0.10	07/26/16 12:45	
50150033011	**COT273:HSB-13G:S005020**					
EPA 8260	Trichloroethene	0.080	mg/kg	0.0050	07/25/16 17:49	
SM 2540G	Percent Moisture	1.5	%	0.10	07/26/16 12:45	
50150033012	**COT273:HSB-13G:S080100**					
EPA 8260	1,1-Dichloroethane	0.13	mg/kg	0.0046	07/25/16 18:21	
EPA 8260	cis-1,2-Dichloroethene	0.10J	mg/kg	0.12	07/27/16 13:03	C0,J
EPA 8260	trans-1,2-Dichloroethene	0.017	mg/kg	0.0046	07/25/16 18:21	
EPA 8260	Trichloroethene	0.037	mg/kg	0.0046	07/25/16 18:21	
EPA 8260	Vinyl chloride	0.45	mg/kg	0.12	07/27/16 13:03	
SM 2540G	Percent Moisture	9.5	%	0.10	07/26/16 12:45	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: COT273
Pace Project No.: 50150033

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50150033013	**COT273:HSB-13H:S005020**					
EPA 8260	Trichloroethene	0.038	mg/kg	0.0048	07/25/16 20:29	
SM 2540G	Percent Moisture	1.9	%	0.10	07/26/16 12:45	
50150033014	**COT273:HSB-13H:S080100**					
EPA 8260	1,1-Dichloroethane	0.023	mg/kg	0.0056	07/26/16 14:25	
EPA 8260	1,1-Dichloroethene	0.013	mg/kg	0.0056	07/26/16 14:25	
EPA 8260	cis-1,2-Dichloroethene	3.5	mg/kg	0.27	07/27/16 12:39	
EPA 8260	trans-1,2-Dichloroethene	0.028	mg/kg	0.0056	07/26/16 14:25	
EPA 8260	Tetrachloroethene	0.0063	mg/kg	0.0056	07/26/16 14:25	
EPA 8260	Trichloroethene	14.4	mg/kg	0.27	07/27/16 12:39	
EPA 8260	Vinyl chloride	0.30	mg/kg	0.0056	07/26/16 14:25	
SM 2540G	Percent Moisture	19.4	%	0.10	07/26/16 12:46	

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: COT273
Pace Project No.: 50150033

Method: **EPA 8260**
Description: 8260 MSV
Client: Hull & Associates (Toledo)
Date: July 27, 2016

General Information:
2 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: COT273
Pace Project No.: 50150033

Method: **EPA 8260**
Description: 8260 MSV 5035A VOA
Client: Hull & Associates (Toledo)
Date: July 27, 2016

General Information:
14 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 343551

S1: Surrogate recovery outside laboratory control limits (confirmed by re-analysis).
- COT273:HSB-13E:S005015 (Lab ID: 50150033009)
  - Dibromofluoromethane (S)
- COT273:HSB-13G:S080100 (Lab ID: 50150033012)
  - 4-Bromofluorobenzene (S)
  - Toluene-d8 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 343551

1d: The internal standard response was below the laboratory acceptance limits and confirmed by reanalysis. The results reported are from the most QC compliant analysis and may be biased high. JLZ 07/26/16
- COT273:HSB-13B:S080100 (Lab ID: 50150033004)
  - Dibromofluoromethane (S)

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PROJECT NARRATIVE

Project: COT273
Pace Project No.: 50150033

Method: **EPA 8260**
Description: 8260 MSV 5035A VOA
Client: Hull & Associates (Toledo)
Date: July 27, 2016

Analyte Comments:

QC Batch: 343551

1d: The internal standard response was below the laboratory acceptance limits and confirmed by reanalysis. The results reported are from the most QC compliant analysis and may be biased high. JLZ 07/26/16

- COT273:HSB-13G:S080100 (Lab ID: 50150033012)
  - Dibromofluoromethane (S)

C0: Result confirmed by second analysis.

- COT273:HSB-13G:S080100 (Lab ID: 50150033012)
  - cis-1,2-Dichloroethene

QC Batch: 343773

2d: The internal standard response was below the laboratory acceptance limits and not confirmed by reanalysis due to high sample matrix. The results reported are from the most QC compliant analysis and may be biased high. JLZ 07/27/16

- COT273:HSB-13H:S080100 (Lab ID: 50150033014)
  - Dibromofluoromethane (S)

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13A:S005020 **Lab ID: 50150033001** Collected: 07/19/16 09:50 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0047	1		07/25/16 18:53	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0047	1		07/25/16 18:53	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0047	1		07/25/16 18:53	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0047	1		07/25/16 18:53	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0047	1		07/25/16 18:53	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0047	1		07/25/16 18:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0047	1		07/25/16 18:53	79-34-5	
Tetrachloroethene	**0.0052**	mg/kg	0.0047	1		07/25/16 18:53	127-18-4	
Trichloroethene	**1.4**	mg/kg	0.13	25		07/26/16 20:50	79-01-6	
Vinyl chloride	ND	mg/kg	0.0047	1		07/25/16 18:53	75-01-4	
Surrogates								
Dibromofluoromethane (S)	100	%.	70-128	1		07/25/16 18:53	1868-53-7	
Toluene-d8 (S)	112	%.	72-139	1		07/25/16 18:53	2037-26-5	
4-Bromofluorobenzene (S)	83	%.	65-127	1		07/25/16 18:53	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**9.8**	%	0.10	1		07/26/16 12:44		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13A:S040060 **Lab ID: 50150033002** Collected: 07/19/16 10:05 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0044	1		07/25/16 13:00	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0044	1		07/25/16 13:00	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0044	1		07/25/16 13:00	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0044	1		07/25/16 13:00	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0044	1		07/25/16 13:00	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0044	1		07/25/16 13:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0044	1		07/25/16 13:00	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0044	1		07/25/16 13:00	127-18-4	
Trichloroethene	**0.13**	mg/kg	0.0044	1		07/25/16 13:00	79-01-6	
Vinyl chloride	ND	mg/kg	0.0044	1		07/25/16 13:00	75-01-4	
Surrogates								
Dibromofluoromethane (S)	98	%.	70-128	1		07/25/16 13:00	1868-53-7	
Toluene-d8 (S)	112	%.	72-139	1		07/25/16 13:00	2037-26-5	
4-Bromofluorobenzene (S)	88	%.	65-127	1		07/25/16 13:00	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**14.1**	%	0.10	1		07/26/16 12:44		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13B:S005020 **Lab ID: 50150033003** Collected: 07/19/16 11:50 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0050	1		07/25/16 13:32	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0050	1		07/25/16 13:32	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0050	1		07/25/16 13:32	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	1		07/25/16 13:32	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	1		07/25/16 13:32	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	1		07/25/16 13:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	1		07/25/16 13:32	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0050	1		07/25/16 13:32	127-18-4	
Trichloroethene	**0.038**	mg/kg	0.0050	1		07/25/16 13:32	79-01-6	
Vinyl chloride	ND	mg/kg	0.0050	1		07/25/16 13:32	75-01-4	
Surrogates								
Dibromofluoromethane (S)	96	%.	70-128	1		07/25/16 13:32	1868-53-7	
Toluene-d8 (S)	103	%.	72-139	1		07/25/16 13:32	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	65-127	1		07/25/16 13:32	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**2.0**	%	0.10	1		07/26/16 12:44		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13B:S080100 **Lab ID: 50150033004** Collected: 07/19/16 12:00 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0048	1		07/25/16 14:04	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0048	1		07/25/16 14:04	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0048	1		07/25/16 14:04	75-35-4	
cis-1,2-Dichloroethene	**0.28**	mg/kg	0.0048	1		07/25/16 14:04	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0048	1		07/25/16 14:04	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0048	1		07/25/16 14:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0048	1		07/25/16 14:04	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0048	1		07/25/16 14:04	127-18-4	
Trichloroethene	**4.3**	mg/kg	0.46	100		07/26/16 21:22	79-01-6	
Vinyl chloride	ND	mg/kg	0.0048	1		07/25/16 14:04	75-01-4	
Surrogates								
Dibromofluoromethane (S)	107	%.	70-128	1		07/25/16 14:04	1868-53-7	1d
Toluene-d8 (S)	123	%.	72-139	1		07/25/16 14:04	2037-26-5	
4-Bromofluorobenzene (S)	74	%.	65-127	1		07/25/16 14:04	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**20.1**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13C:S005020 **Lab ID: 50150033005** Collected: 07/19/16 10:15 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0047	1		07/25/16 14:36	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0047	1		07/25/16 14:36	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0047	1		07/25/16 14:36	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0047	1		07/25/16 14:36	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0047	1		07/25/16 14:36	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0047	1		07/25/16 14:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0047	1		07/25/16 14:36	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0047	1		07/25/16 14:36	127-18-4	
Trichloroethene	**0.068**	mg/kg	0.0047	1		07/25/16 14:36	79-01-6	
Vinyl chloride	ND	mg/kg	0.0047	1		07/25/16 14:36	75-01-4	
Surrogates								
Dibromofluoromethane (S)	94	%.	70-128	1		07/25/16 14:36	1868-53-7	
Toluene-d8 (S)	103	%.	72-139	1		07/25/16 14:36	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	65-127	1		07/25/16 14:36	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**1.3**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13C:S060080 **Lab ID: 50150033006** Collected: 07/19/16 10:25 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0064	1		07/25/16 15:08	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0064	1		07/25/16 15:08	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0064	1		07/25/16 15:08	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0064	1		07/25/16 15:08	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0064	1		07/25/16 15:08	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0064	1		07/25/16 15:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0064	1		07/25/16 15:08	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0064	1		07/25/16 15:08	127-18-4	
Trichloroethene	ND	mg/kg	0.0064	1		07/25/16 15:08	79-01-6	
Vinyl chloride	ND	mg/kg	0.0064	1		07/25/16 15:08	75-01-4	
Surrogates								
Dibromofluoromethane (S)	97	%.	70-128	1		07/25/16 15:08	1868-53-7	
Toluene-d8 (S)	101	%.	72-139	1		07/25/16 15:08	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	65-127	1		07/25/16 15:08	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**14.8**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13D:S005020 **Lab ID: 50150033007** Collected: 07/19/16 12:40 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0051	1		07/25/16 15:40	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0051	1		07/25/16 15:40	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0051	1		07/25/16 15:40	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0051	1		07/25/16 15:40	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0051	1		07/25/16 15:40	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0051	1		07/25/16 15:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0051	1		07/25/16 15:40	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0051	1		07/25/16 15:40	127-18-4	
Trichloroethene	**0.016**	mg/kg	0.0051	1		07/25/16 15:40	79-01-6	
Vinyl chloride	ND	mg/kg	0.0051	1		07/25/16 15:40	75-01-4	
Surrogates								
Dibromofluoromethane (S)	95	%.	70-128	1		07/25/16 15:40	1868-53-7	
Toluene-d8 (S)	104	%.	72-139	1		07/25/16 15:40	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	65-127	1		07/25/16 15:40	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**3.4**	%	0.10	1		07/26/16 12:45		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13D:S040060 **Lab ID: 50150033008** Collected: 07/19/16 12:50 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0041	1		07/25/16 16:12	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0041	1		07/25/16 16:12	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0041	1		07/25/16 16:12	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0041	1		07/25/16 16:12	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0041	1		07/25/16 16:12	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0041	1		07/25/16 16:12	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0041	1		07/25/16 16:12	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0041	1		07/25/16 16:12	127-18-4	
Trichloroethene	**0.049**	mg/kg	0.0041	1		07/25/16 16:12	79-01-6	
Vinyl chloride	ND	mg/kg	0.0041	1		07/25/16 16:12	75-01-4	
Surrogates								
Dibromofluoromethane (S)	96	%.	70-128	1		07/25/16 16:12	1868-53-7	
Toluene-d8 (S)	104	%.	72-139	1		07/25/16 16:12	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	65-127	1		07/25/16 16:12	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**14.6**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13E:S005015 **Lab ID: 50150033009** Collected: 07/19/16 09:45 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0046	1		07/25/16 16:44	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0046	1		07/25/16 16:44	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0046	1		07/25/16 16:44	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0046	1		07/25/16 16:44	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0046	1		07/25/16 16:44	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0046	1		07/25/16 16:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0046	1		07/25/16 16:44	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0046	1		07/25/16 16:44	127-18-4	
Trichloroethene	**0.13**	mg/kg	0.0046	1		07/25/16 16:44	79-01-6	
Vinyl chloride	ND	mg/kg	0.0046	1		07/25/16 16:44	75-01-4	
Surrogates								
Dibromofluoromethane (S)	56	%.	70-128	1		07/25/16 16:44	1868-53-7	S1
Toluene-d8 (S)	103	%.	72-139	1		07/25/16 16:44	2037-26-5	
4-Bromofluorobenzene (S)	92	%.	65-127	1		07/25/16 16:44	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**4.4**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13F:S005012 **Lab ID: 50150033010** Collected: 07/19/16 09:08 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0058	1		07/25/16 17:16	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0058	1		07/25/16 17:16	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0058	1		07/25/16 17:16	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0058	1		07/25/16 17:16	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0058	1		07/25/16 17:16	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0058	1		07/25/16 17:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0058	1		07/25/16 17:16	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0058	1		07/25/16 17:16	127-18-4	
Trichloroethene	**0.023**	mg/kg	0.0058	1		07/25/16 17:16	79-01-6	
Vinyl chloride	ND	mg/kg	0.0058	1		07/25/16 17:16	75-01-4	
Surrogates								
Dibromofluoromethane (S)	84	%.	70-128	1		07/25/16 17:16	1868-53-7	
Toluene-d8 (S)	103	%.	72-139	1		07/25/16 17:16	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	65-127	1		07/25/16 17:16	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**1.6**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13G:S005020 **Lab ID: 50150033011** Collected: 07/19/16 11:05 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0050	1		07/25/16 17:49	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0050	1		07/25/16 17:49	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0050	1		07/25/16 17:49	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0050	1		07/25/16 17:49	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	1		07/25/16 17:49	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0050	1		07/25/16 17:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0050	1		07/25/16 17:49	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0050	1		07/25/16 17:49	127-18-4	
Trichloroethene	**0.080**	mg/kg	0.0050	1		07/25/16 17:49	79-01-6	
Vinyl chloride	ND	mg/kg	0.0050	1		07/25/16 17:49	75-01-4	
Surrogates								
Dibromofluoromethane (S)	92	%.	70-128	1		07/25/16 17:49	1868-53-7	
Toluene-d8 (S)	105	%.	72-139	1		07/25/16 17:49	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	65-127	1		07/25/16 17:49	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**1.5**	%	0.10	1		07/26/16 12:45		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13G:S080100 **Lab ID: 50150033012** Collected: 07/19/16 11:25 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	**0.13**	mg/kg	0.0046	1		07/25/16 18:21	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0046	1		07/25/16 18:21	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0046	1		07/25/16 18:21	75-35-4	
cis-1,2-Dichloroethene	**0.10J**	mg/kg	0.12	25		07/27/16 13:03	156-59-2	C0,J
trans-1,2-Dichloroethene	**0.017**	mg/kg	0.0046	1		07/25/16 18:21	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0046	1		07/25/16 18:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0046	1		07/25/16 18:21	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0046	1		07/25/16 18:21	127-18-4	
Trichloroethene	**0.037**	mg/kg	0.0046	1		07/25/16 18:21	79-01-6	
Vinyl chloride	**0.45**	mg/kg	0.12	25		07/27/16 13:03	75-01-4	
Surrogates								
Dibromofluoromethane (S)	120	%.	70-128	1		07/25/16 18:21	1868-53-7	1d
Toluene-d8 (S)	147	%.	72-139	1		07/25/16 18:21	2037-26-5	S1
4-Bromofluorobenzene (S)	61	%.	65-127	1		07/25/16 18:21	460-00-4	S1
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**9.5**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13H:S005020 **Lab ID: 50150033013** Collected: 07/19/16 10:35 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	mg/kg	0.0048	1		07/25/16 20:29	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0048	1		07/25/16 20:29	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.0048	1		07/25/16 20:29	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.0048	1		07/25/16 20:29	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0048	1		07/25/16 20:29	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0048	1		07/25/16 20:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0048	1		07/25/16 20:29	79-34-5	
Tetrachloroethene	ND	mg/kg	0.0048	1		07/25/16 20:29	127-18-4	
Trichloroethene	**0.038**	mg/kg	0.0048	1		07/25/16 20:29	79-01-6	
Vinyl chloride	ND	mg/kg	0.0048	1		07/25/16 20:29	75-01-4	
Surrogates								
Dibromofluoromethane (S)	93	%.	70-128	1		07/25/16 20:29	1868-53-7	
Toluene-d8 (S)	101	%.	72-139	1		07/25/16 20:29	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	65-127	1		07/25/16 20:29	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**1.9**	%	0.10	1		07/26/16 12:45		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:HSB-13H:S080100 **Lab ID: 50150033014** Collected: 07/19/16 10:45 Received: 07/20/16 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
1,1-Dichloroethane	**0.023**	mg/kg	0.0056	1		07/26/16 14:25	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0056	1		07/26/16 14:25	107-06-2	
1,1-Dichloroethene	**0.013**	mg/kg	0.0056	1		07/26/16 14:25	75-35-4	
cis-1,2-Dichloroethene	**3.5**	mg/kg	0.27	50		07/27/16 12:39	156-59-2	
trans-1,2-Dichloroethene	**0.028**	mg/kg	0.0056	1		07/26/16 14:25	156-60-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0056	1		07/26/16 14:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0056	1		07/26/16 14:25	79-34-5	
Tetrachloroethene	**0.0063**	mg/kg	0.0056	1		07/26/16 14:25	127-18-4	
Trichloroethene	**14.4**	mg/kg	0.27	50		07/27/16 12:39	79-01-6	
Vinyl chloride	**0.30**	mg/kg	0.0056	1		07/26/16 14:25	75-01-4	
Surrogates								
Dibromofluoromethane (S)	108	%.	70-128	1		07/26/16 14:25	1868-53-7	2d
Toluene-d8 (S)	130	%.	72-139	1		07/26/16 14:25	2037-26-5	
4-Bromofluorobenzene (S)	72	%.	65-127	1		07/26/16 14:25	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**19.4**	%	0.10	1		07/26/16 12:46		

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:EB-1:W071916 **Lab ID: 50150033015** Collected: 07/19/16 13:05 Received: 07/20/16 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	5.0	1		07/25/16 15:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		07/25/16 15:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		07/25/16 15:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		07/25/16 15:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		07/25/16 15:24	156-60-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		07/25/16 15:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		07/25/16 15:24	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		07/25/16 15:24	127-18-4	
Trichloroethene	ND	ug/L	5.0	1		07/25/16 15:24	79-01-6	
Vinyl chloride	ND	ug/L	2.0	1		07/25/16 15:24	75-01-4	
Surrogates								
Dibromofluoromethane (S)	97	%.	84-118	1		07/25/16 15:24	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	79-116	1		07/25/16 15:24	460-00-4	
Toluene-d8 (S)	100	%.	86-110	1		07/25/16 15:24	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: COT273
Pace Project No.: 50150033

Sample: COT273:Trip Blank:W071916 **Lab ID: 50150033016** Collected: 07/19/16 08:00 Received: 07/20/16 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	5.0	1		07/25/16 15:56	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		07/25/16 15:56	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		07/25/16 15:56	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		07/25/16 15:56	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		07/25/16 15:56	156-60-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		07/25/16 15:56	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		07/25/16 15:56	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		07/25/16 15:56	127-18-4	
Trichloroethene	ND	ug/L	5.0	1		07/25/16 15:56	79-01-6	
Vinyl chloride	ND	ug/L	2.0	1		07/25/16 15:56	75-01-4	
Surrogates								
Dibromofluoromethane (S)	98	%.	84-118	1		07/25/16 15:56	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	79-116	1		07/25/16 15:56	460-00-4	
Toluene-d8 (S)	101	%.	86-110	1		07/25/16 15:56	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: COT273
Pace Project No.: 50150033

QC Batch: 343552 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 50150033015, 50150033016

METHOD BLANK: 1591232 Matrix: Water
Associated Lab Samples: 50150033015, 50150033016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	07/25/16 12:12	
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	07/25/16 12:12	
1,1-Dichloroethane	ug/L	ND	5.0	07/25/16 12:12	
1,1-Dichloroethene	ug/L	ND	5.0	07/25/16 12:12	
1,2-Dichloroethane	ug/L	ND	5.0	07/25/16 12:12	
cis-1,2-Dichloroethene	ug/L	ND	5.0	07/25/16 12:12	
Tetrachloroethene	ug/L	ND	5.0	07/25/16 12:12	
trans-1,2-Dichloroethene	ug/L	ND	5.0	07/25/16 12:12	
Trichloroethene	ug/L	ND	5.0	07/25/16 12:12	
Vinyl chloride	ug/L	ND	2.0	07/25/16 12:12	
4-Bromofluorobenzene (S)	%.	96	79-116	07/25/16 12:12	
Dibromofluoromethane (S)	%.	93	84-118	07/25/16 12:12	
Toluene-d8 (S)	%.	100	86-110	07/25/16 12:12	

LABORATORY CONTROL SAMPLE: 1591233

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	59.9	120	74-130	
1,1,2,2-Tetrachloroethane	ug/L	50	56.4	113	72-124	
1,1-Dichloroethane	ug/L	50	52.3	105	70-120	
1,1-Dichloroethene	ug/L	50	55.8	112	69-127	
1,2-Dichloroethane	ug/L	50	45.8	92	70-123	
cis-1,2-Dichloroethene	ug/L	50	53.8	108	74-120	
Tetrachloroethene	ug/L	50	57.9	116	69-119	
trans-1,2-Dichloroethene	ug/L	50	57.7	115	72-122	
Trichloroethene	ug/L	50	53.7	107	75-123	
Vinyl chloride	ug/L	50	53.7	107	61-147	
4-Bromofluorobenzene (S)	%.			101	79-116	
Dibromofluoromethane (S)	%.			94	84-118	
Toluene-d8 (S)	%.			103	86-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1591234 1591235

Parameter	Units	50150253007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	48.9	54.7	98	109	44-142	11	20	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	50.1	54.2	100	108	49-138	8	20	
1,1-Dichloroethane	ug/L	ND	50	50	49.3	52.3	99	105	48-137	6	20	

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QUALITY CONTROL DATA

Project: COT273
Pace Project No.: 50150033

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1591234 1591235

Parameter	Units	50150253007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1-Dichloroethene	ug/L	ND	50	50	50.5	55.5	101	111	51-144	9	20	
1,2-Dichloroethane	ug/L	ND	50	50	42.5	47.3	85	95	44-144	11	20	
cis-1,2-Dichloroethene	ug/L	ND	50	50	48.9	54.2	98	108	43-144	10	20	
Tetrachloroethene	ug/L	ND	50	50	44.0	50.7	88	101	38-139	14	20	
trans-1,2-Dichloroethene	ug/L	ND	50	50	50.1	55.5	100	111	50-139	10	20	
Trichloroethene	ug/L	ND	50	50	45.1	50.8	90	102	44-146	12	20	
Vinyl chloride	ug/L	ND	50	50	46.1	49.4	92	99	43-166	7	20	
4-Bromofluorobenzene (S)	%.						99	104	79-116			
Dibromofluoromethane (S)	%.						95	95	84-118			
Toluene-d8 (S)	%.						100	101	86-110			

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QUALITY CONTROL DATA

Project: COT273
Pace Project No.: 50150033

QC Batch: 343551 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 50150033001, 50150033002, 50150033003, 50150033004, 50150033005, 50150033006, 50150033007, 50150033008, 50150033009, 50150033010, 50150033011, 50150033012, 50150033013

METHOD BLANK: 1591230 Matrix: Solid
Associated Lab Samples: 50150033001, 50150033002, 50150033003, 50150033004, 50150033005, 50150033006, 50150033007, 50150033008, 50150033009, 50150033010, 50150033011, 50150033012, 50150033013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	0.0050	07/25/16 11:56	
1,1,2,2-Tetrachloroethane	mg/kg	ND	0.0050	07/25/16 11:56	
1,1-Dichloroethane	mg/kg	ND	0.0050	07/25/16 11:56	
1,1-Dichloroethene	mg/kg	ND	0.0050	07/25/16 11:56	
1,2-Dichloroethane	mg/kg	ND	0.0050	07/25/16 11:56	
cis-1,2-Dichloroethene	mg/kg	ND	0.0050	07/25/16 11:56	
Tetrachloroethene	mg/kg	ND	0.0050	07/25/16 11:56	
trans-1,2-Dichloroethene	mg/kg	ND	0.0050	07/25/16 11:56	
Trichloroethene	mg/kg	ND	0.0050	07/25/16 11:56	
Vinyl chloride	mg/kg	ND	0.0050	07/25/16 11:56	
4-Bromofluorobenzene (S)	%.	100	65-127	07/25/16 11:56	
Dibromofluoromethane (S)	%.	96	70-128	07/25/16 11:56	
Toluene-d8 (S)	%.	101	72-139	07/25/16 11:56	

LABORATORY CONTROL SAMPLE: 1591231

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	.05	0.053	107	71-125	
1,1,2,2-Tetrachloroethane	mg/kg	.05	0.051	102	67-129	
1,1-Dichloroethane	mg/kg	.05	0.049	97	69-115	
1,1-Dichloroethene	mg/kg	.05	0.048	97	64-133	
1,2-Dichloroethane	mg/kg	.05	0.045	89	71-121	
cis-1,2-Dichloroethene	mg/kg	.05	0.052	104	74-115	
Tetrachloroethene	mg/kg	.05	0.050	100	66-118	
trans-1,2-Dichloroethene	mg/kg	.05	0.050	101	71-120	
Trichloroethene	mg/kg	.05	0.050	99	73-120	
Vinyl chloride	mg/kg	.05	0.048	97	54-155	
4-Bromofluorobenzene (S)	%.			100	65-127	
Dibromofluoromethane (S)	%.			96	70-128	
Toluene-d8 (S)	%.			101	72-139	

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QUALITY CONTROL DATA

Project: COT273
Pace Project No.: 50150033

QC Batch: 343773
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 50150033014

METHOD BLANK: 1591979
Matrix: Solid
Associated Lab Samples: 50150033014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	0.0050	07/26/16 13:52	
1,1,2,2-Tetrachloroethane	mg/kg	ND	0.0050	07/26/16 13:52	
1,1-Dichloroethane	mg/kg	ND	0.0050	07/26/16 13:52	
1,1-Dichloroethene	mg/kg	ND	0.0050	07/26/16 13:52	
1,2-Dichloroethane	mg/kg	ND	0.0050	07/26/16 13:52	
cis-1,2-Dichloroethene	mg/kg	ND	0.0050	07/26/16 13:52	
Tetrachloroethene	mg/kg	ND	0.0050	07/26/16 13:52	
trans-1,2-Dichloroethene	mg/kg	ND	0.0050	07/26/16 13:52	
Trichloroethene	mg/kg	ND	0.0050	07/26/16 13:52	
Vinyl chloride	mg/kg	ND	0.0050	07/26/16 13:52	
4-Bromofluorobenzene (S)	%.	97	65-127	07/26/16 13:52	
Dibromofluoromethane (S)	%.	94	70-128	07/26/16 13:52	
Toluene-d8 (S)	%.	103	72-139	07/26/16 13:52	

LABORATORY CONTROL SAMPLE: 1591980

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	.05	0.056	112	71-125	
1,1,2,2-Tetrachloroethane	mg/kg	.05	0.056	113	67-129	
1,1-Dichloroethane	mg/kg	.05	0.049	99	69-115	
1,1-Dichloroethene	mg/kg	.05	0.050	100	64-133	
1,2-Dichloroethane	mg/kg	.05	0.044	89	71-121	
cis-1,2-Dichloroethene	mg/kg	.05	0.052	103	74-115	
Tetrachloroethene	mg/kg	.05	0.050	100	66-118	
trans-1,2-Dichloroethene	mg/kg	.05	0.051	101	71-120	
Trichloroethene	mg/kg	.05	0.049	99	73-120	
Vinyl chloride	mg/kg	.05	0.049	99	54-155	
4-Bromofluorobenzene (S)	%.			101	65-127	
Dibromofluoromethane (S)	%.			93	70-128	
Toluene-d8 (S)	%.			103	72-139	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
Not NELAP Accredited
4860 Blazer Parkway
Dublin, OH 43017
(614)486-5421

Pace Analytical Services, Inc.
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: COT273
Pace Project No.: 50150033

QC Batch: 343716 Analysis Method: SM 2540G
QC Batch Method: SM 2540G Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 50150033001, 50150033002, 50150033003, 50150033004, 50150033005, 50150033006, 50150033007, 50150033008, 50150033009, 50150033010, 50150033011, 50150033012, 50150033013, 50150033014

SAMPLE DUPLICATE: 1591687

Parameter	Units	50150253001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.1	9.5	6	5	R1

SAMPLE DUPLICATE: 1591688

Parameter	Units	50150253005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.9	15.9	0	5	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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(614)486-5421

Pace Analytical Services, Inc.
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALIFIERS

Project: COT273
Pace Project No.: 50150033

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-I	Pace Analytical Services - Indianapolis

ANALYTE QUALIFIERS

1d	The internal standard response was below the laboratory acceptance limits and confirmed by reanalysis. The results reported are from the most QC compliant analysis and may be biased high. JLZ 07/26/16
2d	The internal standard response was below the laboratory acceptance limits and not confirmed by reanalysis due to high sample matrix. The results reported are from the most QC compliant analysis and may be biased high. JLZ 07/27/16
C0	Result confirmed by second analysis.
J	Analyte detected below reporting limit, therefore result is an estimate.
R1	RPD value was outside control limits.
S1	Surrogate recovery outside laboratory control limits (confirmed by re-analysis).

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(317)228-3100

METHOD CROSS REFERENCE TABLE

Project: COT273
Pace Project No.: 50150033

Parameter	Matrix	Analytical Method	Preparation Method
8260 MSV	Water	SW-846 8260C	SW-846 5030B
8260 MSV 5035A VOA	Solid	SW-846 8260C	SW-846 5035A

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Pace Analytical Services, Inc.
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Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: COT273
Pace Project No.: 50150033

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50150033015	**COT273:EB-1:W071916**	EPA 8260	343552		
50150033016	**COT273:Trip Blank:W071916**	EPA 8260	343552		
50150033001	**COT273:HSB-13A:S005020**	EPA 8260	343551		
50150033002	**COT273:HSB-13A:S040060**	EPA 8260	343551		
50150033003	**COT273:HSB-13B:S005020**	EPA 8260	343551		
50150033004	**COT273:HSB-13B:S080100**	EPA 8260	343551		
50150033005	**COT273:HSB-13C:S005020**	EPA 8260	343551		
50150033006	**COT273:HSB-13C:S060080**	EPA 8260	343551		
50150033007	**COT273:HSB-13D:S005020**	EPA 8260	343551		
50150033008	**COT273:HSB-13D:S040060**	EPA 8260	343551		
50150033009	**COT273:HSB-13E:S005015**	EPA 8260	343551		
50150033010	**COT273:HSB-13F:S005012**	EPA 8260	343551		
50150033011	**COT273:HSB-13G:S005020**	EPA 8260	343551		
50150033012	**COT273:HSB-13G:S080100**	EPA 8260	343551		
50150033013	**COT273:HSB-13H:S005020**	EPA 8260	343551		
50150033014	**COT273:HSB-13H:S080100**	EPA 8260	343773		
50150033001	**COT273:HSB-13A:S005020**	SM 2540G	343716		
50150033002	**COT273:HSB-13A:S040060**	SM 2540G	343716		
50150033003	**COT273:HSB-13B:S005020**	SM 2540G	343716		
50150033004	**COT273:HSB-13B:S080100**	SM 2540G	343716		
50150033005	**COT273:HSB-13C:S005020**	SM 2540G	343716		
50150033006	**COT273:HSB-13C:S060080**	SM 2540G	343716		
50150033007	**COT273:HSB-13D:S005020**	SM 2540G	343716		
50150033008	**COT273:HSB-13D:S040060**	SM 2540G	343716		
50150033009	**COT273:HSB-13E:S005015**	SM 2540G	343716		
50150033010	**COT273:HSB-13F:S005012**	SM 2540G	343716		
50150033011	**COT273:HSB-13G:S005020**	SM 2540G	343716		
50150033012	**COT273:HSB-13G:S080100**	SM 2540G	343716		
50150033013	**COT273:HSB-13H:S005020**	SM 2540G	343716		
50150033014	**COT273:HSB-13H:S080100**	SM 2540G	343716		

HULL

CHAIN OF CUSTODY RECORD

NO. 0088

Dublin, OH	Indianapolis, IN	Mason, OH	Bedford, OH	Toledo, OH	St. Clairsville, OH	Pittsburgh, PA
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	146 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-9945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 448-0315

REPORT TO: Matt Bell

Client: City of Toledo
Site: Former Champion Spark plug Property, Toledo, OH
Project #: COT273 Phase: Champion
Samplers: Jacob Ardner
Purchase Order # COT273-Champion-Pace-Jans

SAMPLE MATRIX	PRESERVATIVES	METALS
AA-AMBIENT AIR C-ASBESTOS D-SEDIMENT G-GROUNDWATER IA-INDOOR AIR L-LEACHATE P-PRODUCT S-SOIL SG-SOIL GAS SS-SUBSLAB VAPOR W-WATER X-CONCRETE	A-Cool only, <4 deg. C B-HNO_3 pH<2 C-H_2SO_4 pH<2 D-NaOH pH>12 E-ZnAcetate + NaOH, pH>9 F-$Na_2S_2O_3$ (0.008%) G-HCL pH <2 H-EDTA I-5ml 1:1 HCL J-none K-Stored in dark L-NH4Cl M-Methanol S-Sodium	N - Not filtered F45u- filtered with 0.45 micron F5u- filtered with 5 micron

ANALYSES

PRESERVATIVES: 5035 Kits w/ H_2O / MeOH

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	Trichloroethylene / tetrachloroethene	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2 Dichloroethene	trans-1,2 Dichloroethene	1,1,1,2 Tetrachloroethane	1,1,2,2-Tetrachloroethane	Vinyl Chloride	COMMENTS
COT273 : HSB-13A : S005020	4	discrete	7-19-16/950		X	X	X	X	X	X	X	X	X	-001
: HSB-13A : S040060			/1005		X	X	X	X	X	X	X	X	X	002
: HSB-13B : S005020			/1150		X	X	X	X	X	X	X	X	X	003
: HSB-13B : S080100			/1200		X	X	X	X	X	X	X	X	X	004
: HSB-13C : S005020			/1015		X	X	X	X	X	X	X	X	X	005
: HSB-13C : S060080			/1025		X	X	X	X	X	X	X	X	X	006
: HSB-13D : S005020			/1240		X	X	X	X	X	X	X	X	X	007
: HSB-13D : S040060			/1250		X	X	X	X	X	X	X	X	X	008
: HSB-13E : S005015			/945		X	X	X	X	X	X	X	X	X	009
: HSB-13F : S005012			/908		X	X	X	X	X	X	X	X	X	010
: HSB-13G : S005020			/1105		X	X	X	X	X	X	X	X	X	011
: HSB-13G : S080100			/1125		X	X	X	X	X	X	X	X	X	012

50150033 K20

RELINQUISHED BY:	DATE: 7-19-16	RECEIVED BY: Fed Ex	DATE:
	TIME: 1600		TIME:
RELINQUISHED BY: Fed Ex	DATE:	RECEIVED BY:	DATE: 7-20-16
	TIME:		TIME: 850
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:

COOLER TEMPERATURE AS RECEIVED: 1.0 °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT); YELLOW -LAB USE; PINK -RETAINED BY HULL

Deliver To: PACE
Method of Delivery: Fedex
Airbill Number:
Regulatory Program: Ohio VAP &
Required Limits: US EPA Approved QAPP

NOTES:

TURN AROUND TIME: STD DAYS

HULL

CHAIN OF CUSTODY RECORD

NO. 0089

Dublin, OH	Indianapolis, IN	Mason, OH	Bedford, OH	Toledo, OH	St. Clairsville, OH	Pittsburgh, PA
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	148 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-9945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9877		P: (419) 385-2018	P: (800) 241-7173	P: (412) 446-0315

REPORT TO: Matt Bell

Client: City of Toledo

Site: Former Champion Spark Plug Toledo

Project #: COT273 Phase:

Samplers: J. Ardner

Purchase Order #: COT273-Champion-Pace-JM

SAMPLE MATRIX	PRESERVATIVES		METALS
AA-AMBIENT AIR	A-Cool only, <4 deg. C	H-EDTA	N - Not filtered
C-ASBESTOS	B-HNO_3 pH<2	I-5ml 1:1 HCL	F45u- filtered with 0.45 micron
D-SEDIMENT	C-H_2SO_4 pH<2	J-none	F5u- filtered with 5 micron
G-GROUNDWATER	D-NaOH pH>12	K-Stored in dark	
IA-INDOOR AIR	E-ZnAcetate + NaOH, pH>9	L-NH_4Cl	
L-LEACHATE	F-$Na_2S_2O_3$ (0.008%)	M-Methanol	
P-PRODUCT	G-HCL pH <2	S-Sodium	
S-SOIL			
SG-SOIL GAS			
SS-SUBSLAB			
VAPOR			
W-WATER			
X-CONCRETE			

ANALYSES

PRESERVATIVES: 5035 Kits | H_2O / MeOH

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	Trichloroethylene	Tetrachloroethene	1,1-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2 Dichloroethene	Trans-1,2 Dichloroethene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Vinyl Chloride	COMMENTS
COT273 : HSB-13H : S005020	4	discrete	7-19-16 / 1035		X	X	X	X	X	X	X	X	X	X	013
COT273 : HSB-13H : S080100	4	discrete	7-19-16 / 1045		X	X	X	X	X	X	X	X	X	X	014
COT273 : EB-1 : W071916	3		7-19-16 / 1305		X	X	X	X	X	X	X	X	X	X	015
COT273 : TRIP : BLANK	3		/		X	X	X	X	X	X	X	X	X	X	016
: :			/												
: :			/												
: :			/												
: :			/												
: :			/												
: :			/												
: :			/												
: :			/												

50150033

RELINQUISHED BY:	DATE: 7-19-16	RECEIVED BY: Fed Ex	DATE:
	TIME: 1610		TIME:
RELINQUISHED BY: Fed Ex	DATE:	RECEIVED BY:	DATE: 7-20-16
	TIME:		TIME: 850
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:

COOLER TEMPERATURE AS RECEIVED: 1.0 °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT); YELLOW -LAB USE; PINK -RETAINED BY HULL

Deliver To: Pace

Method of Delivery: Fedex

Airbill Number:

Regulatory Program: Ohio VAPA

Required Limits: US EPA Approved QAPP

NOTES:

TURN AROUND TIME: STD DAYS

Sample Condition Upon Receipt

Pace Analytical

Client Name: Hull & Assoc

Project # 50150033

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 6907 5115 7349

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Date/Time 5035A kits placed in freezer: 7-20-16 / 12:06

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☑ Other Ziploc

Thermometer 1 2 3 4 5 6 A B C D E F **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature (Initial/Corrected) 1.0 / 1.0 **Ice Visible in Sample Containers:** ☐ yes ☑ no

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: A.S 7-20-16

Are samples from West Virginia? Document any containers out of temp.	☐Yes	☑No		1.
Chain of Custody Present:	☑Yes	☐No	☐N/A	2.
Chain of Custody Filled Out:	☑Yes	☐No	☐N/A	3.
Chain of Custody Relinquished:	☑Yes	☐No	☐N/A	4.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.
Containers Intact:	☑Yes	☐No	☐N/A	8.
Sample Labels match COC: -Includes date/time/ID/Analysis	☑Yes	☐No	☐N/A	9.
All containers needing acid/base pres. have been checked? **exceptions: VOA, coliform, TOC, O&G** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.	☐Yes	☐No	☑N/A	10 (Circle) HNO3 H2SO4 NaOH NaOH/ZnAc
Residual Chlorine Check (SVOC 625 Pest/PCB 608)				11. Present Absent
Residual Chlorine Check (Total/Amenable/Free Cyanide)				12. Present Absent
Headspace in VOA Vials (>6mm):	☐Yes	☑No	☐N/A	13
Headspace Wisconsin Sulfide	☐Yes	☐No		14
Trip Blank Present:	☑Yes	☐No	☐N/A	15
Trip Blank Custody Seals Present	☑Yes	☐No	☐N/A	
Project Manager Review				
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	15.
Sufficient Volume:	☑Yes	☐No	☐N/A	16.
Correct Containers Used:	☑Yes	☐No	☐N/A	17.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution:

Project Manager Review: T Sayles **Date:** 7/20/16

Form F-IN-Q-290-rev.09, 13Oct2015

Sample Container Count

CLIENT: Hull & Assoc

COC PAGE 1 of 2
COC ID# 0088

Project # 50150033

KH

Sample Line Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	BP3C	BP1U	SP5T	AG2U	pH <2	pH >9	pH>12
1						4															
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Container Codes

DG9H	40mL HCL amber voa vial	AG0U	100mL unpreserved amber glass	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber glass	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved **amber** vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	SP5T	120mL Coliform Na Thiosulfate
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber glass	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved **clear** vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear glass	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFX	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag

Sample Container Count

CLIENT: Hull & Assoc

COC PAGE 2 of 2
COC ID# 0089

KH

Project # 50150033

Sample Line Item	DG9H	AG1U	WGFU	AG0U	R	4 / 6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	BP3C	BP1U	SP5T	AG2U	pH <2	pH >9	pH>12
1						4															
2						4															
3	3																				
4	3															Trip Blank					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Container Codes

DG9H	40mL HCL amber voa vial	AG0U	100mL unpreserved amber glass	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber glass	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved **amber** vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	SP5T	120mL Coliform Na Thiosulfate
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber glass	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved **clear** vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear glass	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFX	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag

APPENDIX E

Field Data Sheets

HULL

CHAIN OF CUSTODY RECORD

NO. 0088

Dublin, OH ☐	Indianapolis, IN ☐	Mason, OH ☐	Bedford, OH ☐	Toledo, OH ☒	St. Clairsville, OH ☐	Pittsburgh, PA ☐
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	146 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-9945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 446-0315

REPORT TO: Matt Beal

Client: City of Toledo

Site: Former Champion Spark Plug Property, Toledo OH

Project #: C0273 Phase: Chamber

Samplers: Jack Nolan

Purchase Order #: C0273-Champion-Pace-JMS

SAMPLE MATRIX	PRESERVATIVES		METALS
AA-AMBIENT AIR	A-Cool only, <4 deg. C	H-EDTA	N - Not filtered
C-ASBESTOS	B-HNO_3 pH<2	I-5ml 1:1 HCL	F45u- filtered with 0.45 micron
D-SEDIMENT	C-H_2SO_4 pH<2	J-none	F5u- filtered with 5 micron
G-GROUNDWATER	D-NaOH pH>12	K-Stored in dark	
IA-INDOOR AIR	E-ZnAcetate + NaOH, pH>9	L-NH_4Cl	
L-LEACHATE	F-$Na_2S_2O_3$ (0.008%)	M-Methanol	
P-PRODUCT	G-HCL pH <2	S-Sodium	
S-SOIL			
SG-SOIL GAS			
SS-SUBSLAB VAPOR			
W-WATER			
X-CONCRETE			

ANALYSES / PRESERVATIVES

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	Dichlorodifluoromethane	1,1-DCA	1,1-Dichloroethene	1,2-Dichloroethene	cis-1,2 Dichloroethene	trans-1,2 Dichloroethene	1,1,1,2 Tetrachloroethane	1,1,2,2-Tetrachloroethane	Vinyl chloride	COMMENTS
C0273 : HSB-13A : S005020	4	discrete	7-19-16/950		X	X	X	X	X	X	X	X		
: HSB-13A : S040060			/1005		X	X	X	X	X	X	X	X		
: HSB-13B : S005020			/1150		X	X	X	X	X	X	X	X		
: HSB-13B : S080100			/1200		X	X	X	X	X	X	X	X		
: HSB-13C : S005020			/1015		X	X	X	X	X	X	X	X		
: HSB-13C : S060080			/1025		X	X	X	X	X	X	X	X		
: HSB-13D : S005020			/1240		X	X	X	X	X	X	X	X		
: HSB-13D : S040060			/1250		X	X	X	X	X	X	X	X		
: HSB-13E : S005015			/945		X	X	X	X	X	X	X	X		
: HSB-13F : S005012			/908		X	X	X	X	X	X	X	X		
: HSB-13G : S005020			/1105		X	X	X	X	X	X	X	X		
: HSB-13G : S080100			/1125		X	X	X	X	X	X	X	X		

RELINQUISHED BY:	DATE: 7-19-16	RECEIVED BY:	DATE:
	TIME: 1105		TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:

Deliver To: PACE

Method of Delivery: FedEx

Airbill Number:

Regulatory Program: Ohio VAP

Required Limits: USEPA Approved RRVP

COOLER TEMPERATURE AS RECEIVED °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT); YELLOW -LAB USE; PINK -RETAINED BY HULL

NOTES:

TURN AROUND TIME: STD DAYS

HULL

CHAIN OF CUSTODY RECORD

NO. 0088

Dublin, OH ☐	Indianapolis, IN ☐	Mason, OH ☐	Bedford, OH ☐	Toledo, OH ☒	St. Clairsville, OH ☐	Pittsburgh, PA ☐
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	146 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-9945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 446-0315

REPORT TO: Matt Bell

Client: City of Toledo

Site: Former Champion Spark Plug Property, Toledo OH

Project #: CO273 Phase: Champion

Samplers: Josh Nolan

Purchase Order # CO273-champion-Pace-JMB

SAMPLE MATRIX
AA-AMBIENT AIR
C-ASBESTOS
D-SEDIMENT
G-GROUNDWATER
IA-INDOOR AIR
L-LEACHATE
P-PRODUCT
S-SOIL
SG-SOIL GAS
SS-SUBSLAB VAPOR
W-WATER
X-CONCRETE

PRESERVATIVES
A-Cool only, <4 deg. C
B-HNO_3 pH<2
C-H_2SO_4 pH<2
D-NaOH pH>12
E-ZnAcetate + NaOH, pH>9
F-$Na_2S_2O_3$ (0.008%)
G-HCL pH <2
H-EDTA
I-5ml 1:1 HCL
J-none
K-Stored in dark
L-NH_4Cl
M-Methanol
S-Sodium

METALS
N - Not filtered
F45u- filtered with 0.45 micron
F5u- filtered with 5 micron

ANALYSES

PRESERVATIVES

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	Trichloroethylene / 1,1-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2 Dichloroethene / trans-1,2 Dichloroethene	1,1,1,2 Tetrachloroethane	1,1,2,2-Tetrachloroethane	Vinyl chloride	COMMENTS
CO273 : HSB-13A : S005020	4	discrete	7-19-16/950		X	X	X	X	X	X	X	X	
: HSB-13A : S040060			/1005		X	X	X	X	X	X	X	X	
: HSB-13B : S005020			/1150		X	X	X	X	X	X	X	X	
: HSB-13B : S080100			/1200		X	X	X	X	X	X	X	X	
: HSB-13C : S005020			/1015		X	X	X	X	X	X	X	X	
: HSB-13C : S060080			/1025		X	X	X	X	X	X	X	X	
: HSB-13D : S005020			/1240		X	X	X	X	X	X	X	X	
: HSB-13D : S040060			/1250		X	X	X	X	X	X	X	X	
: HSB-13E : S005015			/945		X	X	X	X	X	X	X	X	
: HSB-13F : S005012			/908		X	X	X	X	X	X	X	X	
: HSB-13G : S005020			/1105		X	X	X	X	X	X	X	X	
: HSB-13G : S080100			/1125		X	X	X	X	X	X	X	X	

RELINQUISHED BY:	DATE: 7-19-16	RECEIVED BY:	DATE:
	TIME: 1645		TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:

Deliver To: PACE
Method of Delivery: FedEx
Airbill Number:
Regulatory Program: Ohio VAP
Required Limits: USEPA Approved RRVP

COOLER TEMPERATURE AS RECEIVED °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT)
YELLOW -LAB USE
PINK -RETAINED BY HULL

NOTES:

TURN AROUND TIME: STD DAYS

NO. 0089

HULL

CHAIN OF CUSTODY RECORD

Dublin, OH ☐ — 6397 Emerald Pkwy, Suite 200, Dublin, OH 43016, P: (614) 793-8777

Indianapolis, IN ☐ — 8445 Keystone Crossing, Suite 135, Indianapolis, IN 46240, P: (800) 241-7173

Mason, OH ☐ — 4770 Duke Dr., Suite 300, Mason, OH 45040, P: (513) 459-9677

Bedford, OH ☐ — 4 Hemisphere Way, Bedford, OH 44146, P: (440) 232-9945

Toledo, OH ☒ — 3401 Glendale Ave., Suite 300, Toledo, OH 43614, P: (419) 385-2018

St. Clairsville, OH ☐ — 146 W. Main St., 2nd Floor, St. Clairsville, OH 43950, P: (800) 241-7173

Pittsburgh, PA ☐ — Campbells Run Business Center, 300 Business Center Dr., Suite 320, Pittsburgh, PA 15205, P: (412) 446-0315

REPORT TO: Matt Bell

Client: City of Toledo

Site: Front Cheapside - Spark plug Toledo

Project #: COT273 Phase:

Samplers: J. Aldred

Purchase Order # COT273 - Champion Rec - JM

SAMPLE MATRIX
AA-AMBIENT AIR
C-ASBESTOS
D-SEDIMENT
G-GROUNDWATER
IA-INDOOR AIR
L-LEACHATE
P-PRODUCT
S-SOIL
SG-SOIL GAS
SS-SUBSLAB
VAPOR
W-WATER
X-CONCRETE

PRESERVATIVES
A-Cool only, <4 deg. C
B-HNO_3 pH<2
C-H_2SO_4 pH<2
D-NaOH pH>12
E-ZnAcetate + NaOH, pH>9
F-$Na_2S_2O_3$ (0.008%)
G-HCL pH <2
H-EDTA
I-5ml 1:1 HCL
J-none
K-Stored in dark
L-NH_4Cl
M-Methanol
S-Sodium

METALS
N - Not filtered
F45u- filtered with 0.45 micron
F5u- filtered with 5 micron

ANALYSES — PRESERVATIVES — 5035 kit H_2O/MeOH

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	Trichloroethylene (TCE)	1,1-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2 Dichloroethene	trans-1,2 Dichloroethene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Vinyl Chloride	COMMENTS
COT273 : HSB-13H : S005020	4	discrete	7-19-16/1035		X	X	X	X	X	X	X	X		
COT273 : HSB-13H : S080100	4	discrete	7-19-16/1045		X	X	X	X	X	X	X	X		
COT273 : EB-1 : W071916	3		7-19-16/1305		X	X	X	X	X	X	X	X		
COT273 : TRIP : BLANK	3		/		X	X	X	X	X	X	X	X		
: :			/											
: :			/											
: :			/											
: :			/											
: :			/											
: :			/											
: :			/											
: :			/											

RELINQUISHED BY:	DATE: 7-19-16	RECEIVED BY:	DATE:	Deliver To: Pace
	TIME: 1610		TIME:	
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:	Method of Delivery: Fedex
	TIME:		TIME:	Airbill Number:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:	Regulatory Program: Ohio VAPA
	TIME:		TIME:	Required Limits: NO FRA Upland GAPP

COOLER TEMPERATURE AS RECEIVED °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT); YELLOW -LAB USE; PINK -RETAINED BY HULL

NOTES:

TURN AROUND TIME: STD DAYS

SUPPLEMENTAL PHASE II WORK PLAN FOR THE FORMER CHAMPION SPARK PLUG PROPERTY
900 UPTON AVENUE TOLEDO, LUCAS COUNTY, OHIO

TABLE 1

SOIL SAMPLING PLAN

Boring ID	Depth (feet BGS)	Soil Sample Interval (feet)	Contaminants of Concern
			VOCs (TCE and Breakdown Chemicals)
HSB-13A	8	0 - 2 ft. / 4 - 6 ft.	2
HSB-13B	12	0 - 2 ft. / TBD	2
HSB-13C	12	0 - 2 ft. / TBD	2
HSB-13D	12	0 - 2 ft. / TBD	2
HSB-13E	12	0 - 2 ft. / TBD	2
HSB-13F	12	0 - 2 ft. / TBD	2
HSB-13G	12	0 - 2 ft. / TBD	2
HSB-13H	12	0 - 2 ft. / TBD	2

Notes:
* Depth may vary depending on actual field conditions
One field blank and one trip blank will be collected for analysis
HSB-13A represent boring location HSB-13. B-H are offsets.

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:	PROJ No:	CLIENT: COT0273	LOCATION:
	PROJECT:	Champion SP Site	
	DRILLING METHOD:	Direct- Push	SB/MW No: HSB-13A
	SAMPLING METHOD:	4 foot duel tube sampler, continuous sampling	
	PID MODEL,CALIB.,BACKGR:	miniRAE3000 11.7eV lamp	SHEET
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm isobutylene	1 OF
CONTRACTOR: Terra Probe	WATER LEVEL FROM:		DRILLING START/FINISH
LOGGED BY: Jacob Ardner	TIME:		TIME: 950 / TIME: 1005
CHECKED BY: Matt Bell	DATE: 7/19/2016		DATE: 7-19-16 / DATE:
DATUM:	DEPTH:		AIR MONITORING

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):	TIME	PID	LEL
	4/2								0.0 to 0.5 - Concrete			
	950	0.5-2		0.6	1	X			0.5 to 7.0 - loose light brown med. to coarse SAND, slightly moist			
					2							
									1.0 to 2.0 - Stiff dark brown / black Silty CLAY, trace brick fragments slightly moist			
					3							
					4							
	4.0/3			0.2								
	1005	4-6			5	X						
					6				4.0 to 7.0 - Medium Stiff light brown Silty CLAY, slightly plastic, little gray mottling, slightly moist			
		6-7		0.0	7							
					8							
					9				EOB @ 10'			
					10							
					11							
					12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:	PROJ No:	CLIENT: COT0273	LOCATION: 10' north of HSB-13A	
	PROJECT:	Champion SP Site		
	DRILLING METHOD:	Direct- Push		SB/MW No: HSB-13B
	SAMPLING METHOD:	4 foot duel tube sampler, continuous sampling		
	PID MODEL,CALIB.,BACKGR:	miniRAE3000 11.7eV lamp		SHEET 1 OF
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm Isobutylene		
CONTRACTOR: Terra Probe	WATER LEVEL FROM:		DRILLING START/FINISH	
LOGGED BY: Jacob Ardner DATE: 7/19/2016	TIME:		TIME:	TIME:
CHECKED BY: Matt Bell DATE:	DATE: 7/19/2016		DATE: 7.19.16	DATE:
DATUM: ELEVATION:	DEPTH:		AIR MONITORING	

NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.): Refusal at 1.5' offset 2' East

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	
	4/2.5			0.1					0.0 to 0.5 Concrete
	1150	0.5-2			1				0.5 to 2.5 - Sand & Brick Fill (Fuel.) slightly moist.
					2				
		2-2.5		0.4	3				4.0 to 5.0 - SAA. Some clay
									5.0 to 8.0 - Stiff light brown Clayey SILT, some light grey mottling, slightly moist.
	4/4				4				
		4-6		0.8	5				
					6				
		6-8		0.2	7				
	4/4			1.3	8				8.0 to 12.0 - SAA, medium Stiff.
	1200	8-10			9				
					10				
				1.1					
		10-12			11				
					12				
					13				
					14				
					15				
					16				
					17				
					18				
					19				
					20				

TIME	PID	LEL

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:	PROJ No.	CLIENT: COT0273	LOCATION: 1st east step out 10-east of 13A
	PROJECT:	Champion SP Site	
	DRILLING METHOD:	Direct- Push	SB/MW No: HSB-13C
	SAMPLING METHOD:	4 foot duel tube sampler, continuous sampling	
	PID MODEL,CALIB.,BACKGR:	miniRAE3000 11.7eV lamp	SHEET 1 OF
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm isobutylene	
CONTRACTOR: Terra Probe	WATER LEVEL FROM:		DRILLING START/FINISH
LOGGED BY: Jacob Ardner	TIME:		TIME: 1008
CHECKED BY: Matt Bell	DATE:	7/19/2016	DATE: 7-19-16
DATUM:	DEPTH:	6-3' collapsed @ 7'	AIR MONITORING

NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):
~6" debris on slab

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	TIME	FID	LEL
	4/2.3			0.2							
	1015	0-2			1						
					2						
					3						
	4/3				4						
		4-6		0.0	5						
					6						
		6-8		1.2	7						
					8						
					9						
					10						
					11						
	4/4				12						
		8-10		0.0	13						
					14						
		10-12		0.8	15						
					16						
					17						
					18						
					19						
					20						

0.0 to 0.5 - Concrete
0.5 to 2.3 - loose light brown Fine to Coarse Grained SAND, slightly moist
4.0 to 7.9 - SAA, very moist to wet at 6.5' (Petro odor)
7.9 to 8.0 - SAA, wet, becoming clay, some dark gray discoloration, very moist to
8.0 to 10.0 - SAA, gray, Wet
10.0 to 12.0 - med. stiff light brown SILT, trace clay, moist

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:	PROJ No:	CLIENT: COT0273	LOCATION:	
	PROJECT:	Champion SP Site		
	DRILLING METHOD:	Direct- Push		SB/MW No: HSB-13D
	SAMPLING METHOD:	4 foot duel tube sampler, continuous sampling		
	PID MODEL,CALIB.,BACKGR:	miniRAE3000 11.7eV lamp		SHEET 1 OF
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm isobutylene		
CONTRACTOR: Terra Probe	WATER LEVEL FROM:			DRILLING START/FINISH
LOGGED BY: Jacob Ardner DATE: 7/19/2016	TIME:		TIME: 1230	TIME:
CHECKED BY: Matt Bell DATE:	DATE:	7/19/2016	DATE: 7-19-16	DATE: AIR MONITORING
DATUM: ELEVATION:	DEPTH:			

NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):
Refusal >1.0' concrete
Shifted location southeast ~4'

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL		TIME	FID	LEL
	4/2			0.5					0.0 to 0.5 - Concrete.			
	1240	0.5-2			1				0.5 to 2.5 - loose light brown fine to Coarse-grained SAND, slightly moist			
					2							
					3							
					4							
	4/2.8								4.0 to 4.4 - Asphalt chunks.			
	1250	4.0-6.0		4.0	5				4.4 to 6.0 - Med. stiff light brown silty CLAY (some gray mottling, slightly plastic, slightly moist			
					6							
		6-6.8			7							
									8.0 to 12.0 - SAA.			
	4/4			0.0	8							
		8-10			9							
					10							
		10-12		0.0	11							
					12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

HULL & ASSOCIATES, INC.

SOIL BORING / MONITORING WELL FIELD LOG

LOCATION OF BORING:	PROJ No:	CLIENT: COT0273	LOCATION:	
	PROJECT:	Champion SP Site		
	DRILLING METHOD:	Direct- Push	SB/MW No:	13E
	SAMPLING METHOD:	4 foot duel tube sampler, continuous sampling		
	PID MODEL,CALIB.,BACKGR:	miniRAE3000 11.7eV lamp	SHEET	
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm isobutylene	1 OF	
CONTRACTOR: Terra Probe	WATER LEVEL FROM:		DRILLING START/FINISH	
LOGGED BY: Jacob Ardner DATE: 7/19/2016	TIME:		TIME: 945	TIME:
CHECKED BY: Matt Bell DATE:	DATE:	7/19/2016	DATE: 7-19-16	DATE: AIR MONITORING
DATUM: ELEVATION:	DEPTH:			

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):	TIME	PID	LEL
	945	0.5-1.5		0.2	1				0.0 to 0.5 - Concrete 0.5 to 1.5 - SAND, light brown, med. to coarse-grained, dry 1.5 + - Refusal.			
					2							
					3							
					4							
					5							
					6							
					7							
					8							
					9							
					10							
					11							
					12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

HULL & ASSOCIATES, INC.

SOIL BORING / MONITORING WELL FIELD LOG

LOCATION OF BORING:	PROJ No:	CLIENT: COT0273	LOCATION:	
	PROJECT:	Champion SP Site		
	DRILLING METHOD:	Direct- Push		SB/MW No: HSB-1F
	SAMPLING METHOD:	4 foot duel tube sampler, continuous sampling		
	PID MODEL,CALIB.,BACKGR:	miniRAE3000 11.7eV lamp		SHEET 1 OF
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm isobutylene		
CONTRACTOR: Terra Probe	WATER LEVEL FROM:		DRILLING START/FINISH	
LOGGED BY: Jacob Ardner DATE: 7/19/2016	TIME:		TIME: 905	TIME:
CHECKED BY: Matt Bell DATE:	DATE:	7/19/2016	DATE: 7-19-16	DATE:
DATUM: ELEVATION:	DEPTH:			AIR MONITORING

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):	TIME	PID	LEL
	408				1				0.0 to 0.5 - Concrete 0.5 to 1.2 - loose light brown medium to coarse SAND. dry. -1.2 - Concrete Refusal			
					2							
					3							
					4							
					5							
					6							
					7							
					8							
					9							
					10							
					11							
					12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:	PROJ No:	CLIENT: COT0273	LOCATION:	
	PROJECT:	Champion SP Site		
	DRILLING METHOD:	Direct- Push		SB/MW No: HSB-13C
	SAMPLING METHOD:	4 foot dual tube sampler, continuous sampling		
	PID MODEL,CALIB.,BACKGR:	miniRAE3000 11.7eV lamp		SHEET
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm Isobutylene		1 OF
CONTRACTOR: Terra Probe	WATER LEVEL FROM:		DRILLING START/FINISH	
LOGGED BY: Jacob Ardner DATE: 7/19/2016	TIME:		TIME: 1100	TIME:
CHECKED BY: Matt Bell DATE:	DATE:	7/19/2016	DATE:	DATE:
DATUM: ELEVATION:	DEPTH:	6.5 - Collapsed @10.'	7 -	19 AIR MONITORING

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):	TIME	FID	LEL
					0				0.0 to 0.5 - concrete			
	1105	0.5-2.0		1.1	1				0.5 to 2.5. loose light brown fine to coarse			
					2				grained SAND, slightly moist			
					3							
					4							
	4/3								4.0 to 4.7 - SAA.			
		4-4		0.4	5				4.7 to 5.5. Soft light brown silty			
					6				CLAY, slightly plastic, moist			
				0.2					5.5 to 7.0 - loose light brown fine to coarse-			
		6-7			7				grained SAND, moist.			
					8							
8-9									8.0 to 9.0 - SAA, black, light sheen			
	1025	8-10		5.9	9				very moist, (wet at 9.0')			
					10				9.0 to 10.0 - fine black SAND, wet			
				32.8								
		10-12			11				10.0 to 12.0 - Soft light brown			
									silty CLAY, Plastic, sl. moist			
					12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:	PROJ No:	CLIENT: COT0273	LOCATION: 20' east fm HSB-13
	PROJECT: Champion SP Site		
	DRILLING METHOD: Direct- Push		SB/MW No: HSB-13/14
	SAMPLING METHOD: 4 foot duel tube sampler, continuous sampling		
	PID MODEL,CALIB.,BACKGR: miniRAE3000 11.7eV lamp		SHEET 1 OF
WEATHER:	PID MODEL:	PID CALIBRATION: 100 ppm isobutylene	
CONTRACTOR: Terra Probe	WATER LEVEL FROM:		DRILLING START/FINISH
LOGGED BY: Jacob Ardner DATE: 7/19/2016	TIME:		TIME: 1030 TIME: 1100
CHECKED BY: Matt Bell DATE:	DATE: 7/19/2016		DATE: 7-19-16 DATE: AIR MONITORING
DATUM: ELEVATION:	DEPTH:		

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.): ~1' debris on Concrete	TIME	FID	LEL
	4/2.5											
	1035	0.5-2		0.3	1				0.0 to 0.5 - Concrete 0.5 to 2.5 - loose light brown fine to coarse SAND, slightly moist			
					2							
		2-2.5		0.2	3							
					4							
	4/3											
		4-4		0.3	5				4.0 to 4.5 - SAA. 4.5 to 7.0 - Soft to medium stiff light brown Silty CLAY, some gray mottling, slightly plastic, moist			
					6							
		6-7		0.1	7							
					8				8.0 to 11.5 - SAA, very moist at 9.5 becoming clayey SILT at 11.0 feet			
	4/3.5											
	1045	8-10		10.2	9							
					10							
				8.6	11							
		10-11.5			12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION		SOIL BORING COMPLETION
SURFACE PROTECTOR:	CONCRETE SEAL:	MATERIAL:
RISER:	GROUT:	SURFACE MATERIAL:
SCREEN:	BENTONITE SEAL:	
	SAND PACK:	

SAMPLES SENT TO LABORATORY:

APPENDIX F

Ohio Department of Natural Resources Well Logs

GeoPlus Water Well Report

Satellite view

Target Property:

Champion Sparkplug
900-914 UPTON AVE
TOLEDO, Lucas County, Ohio 43607

Prepared For:

Historical Information Gatherers

Order #: 41213
Job #: 90695
Project #: 148131
Date: 09/25/2014

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Target Property Summary

Champion Sparkplug
900-914 UPTON AVE
TOLEDO, Lucas County, Ohio 43607

USGS Quadrangle: ***Toledo, OH***
Target Property Geometry: ***Area***

Target Property Longitude(s)/Latitude(s):
(-83.586335, 41.651305), (-83.587088, 41.651771), (-83.587644, 41.651771), (-83.587644, 41.651341), (-83.588164, 41.651323), (-83.588164, 41.651036), (-83.589939, 41.651036), (-83.589957, 41.647449), (-83.589222, 41.647449), (-83.589222, 41.645709), (-83.588182, 41.645709), (-83.588254, 41.646893), (-83.588002, 41.648381), (-83.587303, 41.649996), (-83.586353, 41.651269), (-83.586335, 41.651305)

County/Parish Covered:
Lucas (OH)

Zipcode(s) Covered:
Toledo OH: 43607

State(s) Covered:
OH

****Target property is located in Radon Zone 2.***
Zone 2 areas have a predicted average indoor radon screening level between 2 and 4 pCi/L (picocuries per liter).

Database Findings Summary

FEDERAL LISTING

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNITED STATES GEOLOGICAL SURVEY NATIONAL WATER INFORMATION SYSTEM	NWIS	0	0	0.5000

SUB-TOTAL		0	0	

Database Findings Summary

STATE (OH) LISTING

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
WATER WELLS	DNRWW	38	0	0.5000
PUBLIC WATER SUPPLY WELLS AND INTAKES	PWS	0	0	0.5000
SUB-TOTAL		38	0	
TOTAL		38	0	

Locatable Database Findings

FEDERAL LISTING

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
NWIS	0.5000		0	0	0	NS	NS	0
SUB-TOTAL			0	0	0	0	0	0

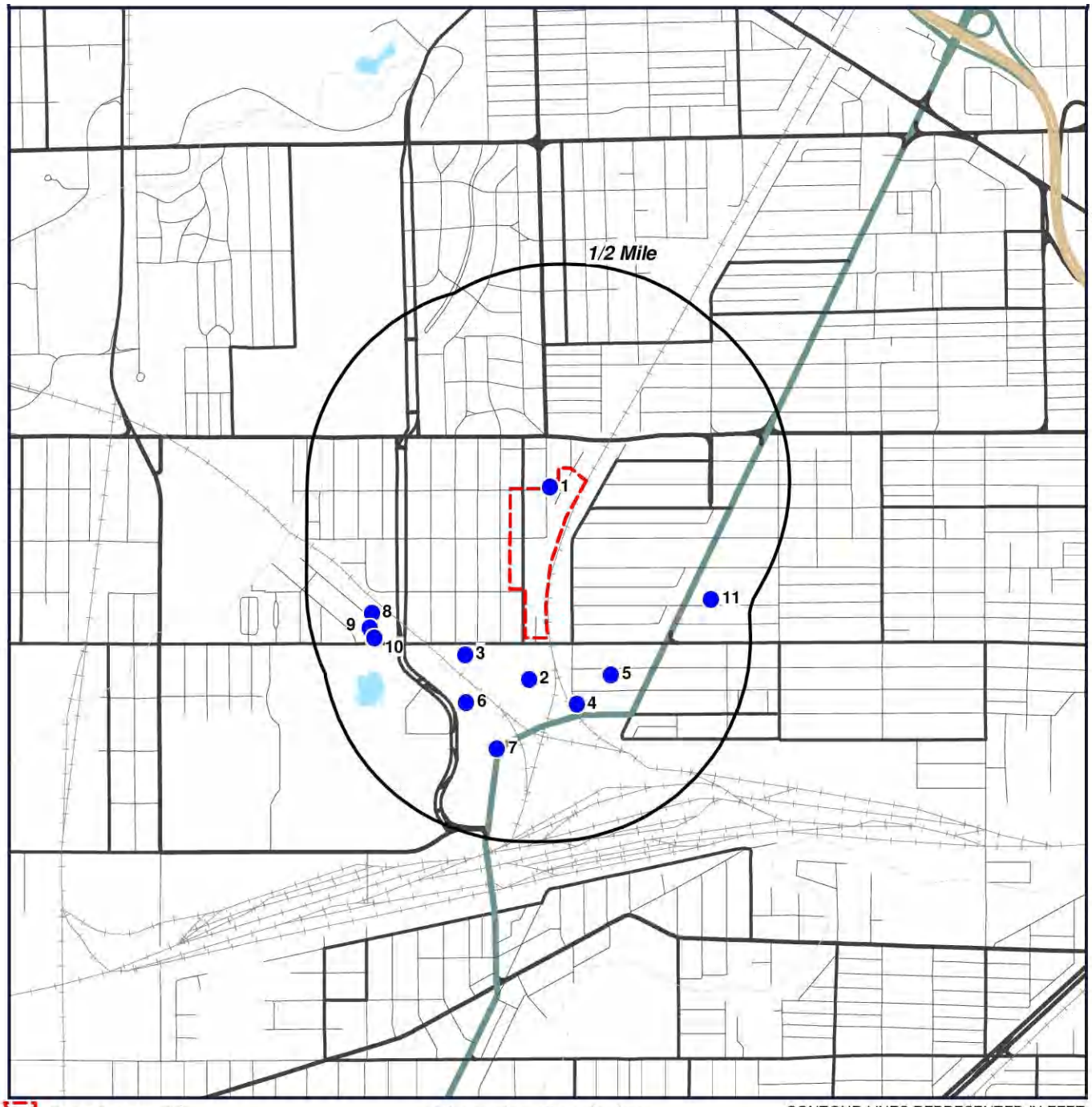
Locatable Database Findings

STATE (OH) LISTING

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
DNRWW	0.5000	22	1	6	9	NS	NS	38
PWS	0.5000		0	0	0	NS	NS	0
SUB-TOTAL		22	1	6	9	0	0	38
TOTAL		22	1	6	9	0	0	38

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Waterwell Map



Target Property (TP)

DNRWW

Champion Sparkplug
900-914 UPTON AVE
TOLEDO, Ohio
43607

CONTOUR LINES REPRESENTED IN FEET

N
W E
S

0' 1000' 2000' 3000'

SCALE: 1" = 2000'

[Click here to access Satelite view]

Report Summary of Locatable Sites

Map ID#	Database Name	Site ID#	Distance From Site	Site Name	Address	City, Zip Code	PAGE #
1	DNRWW	795829	0.001 W		900 UPTON AVE		9
1	DNRWW	795830	0.001 W		900 UPTON AVE		10
1	DNRWW	795854	0.001 W		900 UPTON AVE		11
1	DNRWW	795855	0.001 W		900 UPTON AVE		12
1	DNRWW	795856	0.001 W		900 UPTON AVE		13
1	DNRWW	795857	0.001 W		900 UPTON AVE		14
1	DNRWW	755305	0.001 W		900 UPTON AVE		15
1	DNRWW	753014	0.001 W		900 UPTON AVE		16
1	DNRWW	753012	0.001 W		900 UPTON AVE		17
1	DNRWW	740800	0.001 W		900 UPTON AVE		18
1	DNRWW	740780	0.001 W		900 UPTON AVE		19
1	DNRWW	740779	0.001 W		900 UPTON AVE		20
1	DNRWW	740781	0.001 W		900 UPTON AVE		21
1	DNRWW	740782	0.001 W		900 UPTON AVE		22
1	DNRWW	740783	0.001 W		900 UPTON AVE		23
1	DNRWW	740784	0.001 W		900 UPTON AVE		24
1	DNRWW	740791	0.001 W		900 UPTON AVE		25
1	DNRWW	740799	0.001 W		900 UPTON AVE		26
1	DNRWW	753013	0.001 W		900 UPTON AVE		27
1	DNRWW	755303	0.001 W		900 UPTON AVE		28
1	DNRWW	755304	0.001 W		900 UPTON AVE		29
1	DNRWW	795828	0.001 W		900 UPTON AVE		30
2	DNRWW	2023566	0.1 S		1925 NEBRASKA AVE	TOLEDO, 43607	31
3	DNRWW	2023570	0.16 SW		1925 NEBRASKA AVE	TOLEDO	32
4	DNRWW	31700	0.18 S		BROWN RD	TOLEDO	33
4	DNRWW	216314	0.18 S		BROWN RD	TOLEDO	34
4	DNRWW	277089	0.18 S		BROWN RD	TOLEDO	35
5	DNRWW	2023567	0.19 S		1925 NEBRASKA AVE	TOLEDO	36
6	DNRWW	2023569	0.22 SW		1925 NEBRASKA AVE	TOLEDO	37
7	DNRWW	734132	0.29 S		99 FEARING BLVD		38
7	DNRWW	734133	0.29 S		99 FEARING BLVD		39
7	DNRWW	734131	0.29 S		99 FEARING BLVD		40
8	DNRWW	2039782	0.35 SW		2225 NEBRASKA AVE	TOLEDO	41
8	DNRWW	2039780	0.35 SW		2225 NEBRASKA	TOLEDO	42
9	DNRWW	2039781	0.36 SW		2225 NEBRASKA AVE	TOLEDO	43
10	DNRWW	2039779	0.35 SW		2225 NEBRASKA AVE	TOLEDO	44
10	DNRWW	2039777	0.36 SW		2225 NEBRASKA AVE	TOLEDO	45

11	DNRWW	2014664	0.41 SE	1602 W BANCROFT	TOLEDO, 43606	46

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **795829**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/21/94**
WELL DEPTH (ft.): **13**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **795830**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/21/94**
WELL DEPTH (ft.): **15**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **795854**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/16/95**
WELL DEPTH (ft.): **17**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **795855**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/16/95**
WELL DEPTH (ft.): **15**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **795856**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/16/95**
WELL DEPTH (ft.): **15**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **795857**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/16/95**
WELL DEPTH (ft.): **15**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **755305**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **09/11/92**
WELL DEPTH (ft.): **15**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **753014**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **02/21/94**
WELL DEPTH (ft.): **8**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND & CLAY**
OWNER NAME: **CHAMPION SPARK PLUM**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **753012**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **10/22/93**
WELL DEPTH (ft.): **16**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740800**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **09/04/92**
WELL DEPTH (ft.): **15**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740780**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **12/09/91**
WELL DEPTH (ft.): **16**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740779**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **12/09/91**
WELL DEPTH (ft.): **16**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740781**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **12/09/91**
WELL DEPTH (ft.): **16**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740782**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **12/09/91**
WELL DEPTH (ft.): **21**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **GRAVEL**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740783**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **12/09/91**
WELL DEPTH (ft.): **21**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740784**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **12/09/91**
WELL DEPTH (ft.): **16**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740791**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **05/06/92**
WELL DEPTH (ft.): **11**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **740799**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/04/92**
WELL DEPTH (ft.): **12**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND & GRAVEL**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **753013**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **12/17/93**
WELL DEPTH (ft.): **9**
WELL USE: **NOT REPORTED**
AQUIFER DESCRIPTION: **LIMESTONE**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **755303**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **09/11/92**
WELL DEPTH (ft.): **17**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **755304**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **09/11/92**
WELL DEPTH (ft.): **15**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 1 **Distance from Property: 0.00 mi. W**

WELL LOG NUMBER: **795828**
LOCATION ADDRESS: **900 UPTON AVE**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/21/94**
WELL DEPTH (ft.): **6**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **CHAMPION SPARK PLUG**
LONGITUDE: **-83.58804**
LATITUDE: **41.65112**

Back to Report Summary

Water Wells (DNRWW)

MAP ID# 2 **Distance from Property: 0.10 mi. S**

WELL LOG NUMBER: **2023566**
LOCATION ADDRESS: **1925 NEBRASKA AVE**
TOLEDO, OH 43607
DATE OF COMPLETION: **08/13/09**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **CLAY**
OWNER NAME: **TECUMSEH PRODUCTS**
LONGITUDE: **-83.58905**
LATITUDE: **41.64428**

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Water Wells (DNRWW)

MAP ID# 3 **Distance from Property: 0.16 mi. SW**

WELL LOG NUMBER: **2023570**
LOCATION ADDRESS: **1925 NEBRASKA AVE**
TOLEDO, OH
DATE OF COMPLETION: **08/13/09**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **CLAY**
OWNER NAME: **TECUMSEH PRODUCTS**
LONGITUDE: **-83.59208**
LATITUDE: **41.64517**

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Water Wells (DNRWW)

MAP ID# 4 **Distance from Property: 0.18 mi. S**

WELL LOG NUMBER: **31700**
LOCATION ADDRESS: **BROWN RD**
TOLEDO, OH
DATE OF COMPLETION: **19610123**
WELL DEPTH (ft.): **0**
WELL USE: **DOMESTIC**
AQUIFER DESCRIPTION: **ROCK**
OWNER NAME: **RAY & SON CRANDELL**
LONGITUDE: **-83.58677**
LATITUDE: **41.64339**

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Water Wells (DNRWW)

MAP ID# 4 **Distance from Property: 0.18 mi. S**

WELL LOG NUMBER: **216314**
LOCATION ADDRESS: **BROWN RD**
TOLEDO, OH
DATE OF COMPLETION: **19620109**
WELL DEPTH (ft.): **0**
WELL USE: **DOMESTIC**
AQUIFER DESCRIPTION: **ROCK**
OWNER NAME: **DON LUENGEN**
LONGITUDE: **-83.58677**
LATITUDE: **41.64339**

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Water Wells (DNRWW)

MAP ID# 4 **Distance from Property: 0.18 mi. S**

WELL LOG NUMBER: **277089**
LOCATION ADDRESS: **BROWN RD**
TOLEDO, OH
DATE OF COMPLETION: **19640123**
WELL DEPTH (ft.): **0**
WELL USE: **DOMESTIC**
AQUIFER DESCRIPTION: **LIMESTONE**
OWNER NAME: **L M ROTHENBUHLER**
LONGITUDE: **-83.58677**
LATITUDE: **41.64339**

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Water Wells (DNRWW)

MAP ID# 5 **Distance from Property: 0.19 mi. S**

WELL LOG NUMBER: **2023567**
LOCATION ADDRESS: **1925 NEBRASKA AVE**
TOLEDO, OH
DATE OF COMPLETION: **08/13/09**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **CLAY**
OWNER NAME: **TECUMSEH PRODUCTS**
LONGITUDE: **-83.58515**
LATITUDE: **41.64445**

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Water Wells (DNRWW)

MAP ID# 6 **Distance from Property: 0.22 mi. SW**

WELL LOG NUMBER: **2023569**
LOCATION ADDRESS: **1925 NEBRASKA AVE**
TOLEDO, OH
DATE OF COMPLETION: **08/13/09**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **CLAY**
OWNER NAME: **TECUMSEH PRODUCTS**
LONGITUDE: **-83.59202**
LATITUDE: **41.64347**

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Water Wells (DNRWW)

MAP ID# 7 **Distance from Property: 0.29 mi. S**

WELL LOG NUMBER: **734132**
LOCATION ADDRESS: **99 FEARING BLVD**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/28/91**
WELL DEPTH (ft.): **8**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **TOLEDO STAMPING**
LONGITUDE: **-83.59055**
LATITUDE: **41.64180**

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MAP ID# 7 **Distance from Property: 0.29 mi. S**

WELL LOG NUMBER: **734133**
LOCATION ADDRESS: **99 FEARING BLVD**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/28/91**
WELL DEPTH (ft.): **8**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **TOLEDO STAMPING**
LONGITUDE: **-83.59055**
LATITUDE: **41.64180**

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Water Wells (DNRWW)

MAP ID# 7 **Distance from Property: 0.29 mi. S**

WELL LOG NUMBER: **734131**
LOCATION ADDRESS: **99 FEARING BLVD**
NO CITY/ZIP REPORTED, OH
DATE OF COMPLETION: **08/28/91**
WELL DEPTH (ft.): **9**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **TOLEDO STAMPING**
LONGITUDE: **-83.59055**
LATITUDE: **41.64180**

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Water Wells (DNRWW)

MAP ID# 8 **Distance from Property: 0.35 mi. SW**

WELL LOG NUMBER: **2039782**
LOCATION ADDRESS: **2225 NEBRASKA AVE**
TOLEDO, OH
DATE OF COMPLETION: **09/07/12**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **UNIVERSITY OF TOLEDO**
LONGITUDE: **-83.59638**
LATITUDE: **41.64626**

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Water Wells (DNRWW)

MAP ID# 8 **Distance from Property: 0.35 mi. SW**

WELL LOG NUMBER: **2039780**
LOCATION ADDRESS: **2225 NEBRASKA**
TOLEDO, OH
DATE OF COMPLETION: **09/06/12**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **UNIVERSITY OF TOLEDO**
LONGITUDE: **-83.59652**
LATITUDE: **41.64663**

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Water Wells (DNRWW)

MAP ID# 9 **Distance from Property: 0.36 mi. SW**

WELL LOG NUMBER: **2039781**
LOCATION ADDRESS: **2225 NEBRASKA AVE**
TOLEDO, OH
DATE OF COMPLETION: **09/07/12**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **UNIVERSITY OF TOLEDO**
LONGITUDE: **-83.59662**
LATITUDE: **41.64612**

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Water Wells (DNRWW)

MAP ID# 10 **Distance from Property: 0.35 mi. SW**

WELL LOG NUMBER: **2039779**
LOCATION ADDRESS: **2225 NEBRASKA AVE**
TOLEDO, OH
DATE OF COMPLETION: **09/06/12**
WELL DEPTH (ft.): **10**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **UNIVERSITY OF TOLEDO**
LONGITUDE: **-83.59617**
LATITUDE: **41.64583**

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Water Wells (DNRWW)

MAP ID# 10 **Distance from Property: 0.36 mi. SW**

WELL LOG NUMBER: **2039777**
LOCATION ADDRESS: **2225 NEBRASKA AVE**
TOLEDO, OH
DATE OF COMPLETION: **09/06/12**
WELL DEPTH (ft.): **10**
WELL USE: **VAPOR EXTRACTION**
AQUIFER DESCRIPTION: **SAND**
OWNER NAME: **UNIVERSITY OF TOLEDO**
LONGITUDE: **-83.59640**
LATITUDE: **41.64576**

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Water Wells (DNRWW)

MAP ID# 11 **Distance from Property: 0.41 mi. SE**

WELL LOG NUMBER: **2014664**
LOCATION ADDRESS: **1602 W BANCROFT**
TOLEDO, OH 43606
DATE OF COMPLETION: **01/04/08**
WELL DEPTH (ft.): **14**
WELL USE: **MONITOR**
AQUIFER DESCRIPTION: **SILT**
OWNER NAME: **ALL SEASON'S HEATING AND COOLING**
LONGITUDE: **-83.58038**
LATITUDE: **41.64713**

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NWIS United States Geological Survey National Water Information System

VERSION DATE: 07/02/14

This USGS National Water Information System database only includes groundwater wells. The USGS defines this well type as: A hole or shaft constructed in the earth intended to be used to locate, sample, or develop groundwater, oil, gas, or some other subsurface material. The diameter of a well is typically much smaller than the depth. Wells are also used to artificially recharge groundwater or to pressurize oil and gas production zones. Additional information about specific kinds of wells should be recorded under the secondary site types or the Use of Site field. Underground waste-disposal wells should be classified as waste-injection wells.

Environmental Records Definitions - STATE (OH)

DNRWW Water Wells

VERSION DATE: 01/21/14

The Ohio Department of Natural Resources (ODNR) Division of Soil and Water Resources maintains this water well database containing well log form information, such as the formations encountered during drilling, how the well was constructed and the efficiency of the well. Drillers have been required to fill out a Well Log and Drilling Report form and submit it to the ODNR Division of Water since 1947. Disclaimer: A significant number of wells in this database have very limited location information and therefore may not be locatable. Also, the agency provided spatial coordinates are not always accurate.

PWS Public Water Supply Wells and Intakes

VERSION DATE: 04/28/14

This database of public water supply wells and intakes is provided by the Ohio Environmental Protection Agency, Division of Drinking and Ground Waters. The data is utilized to locate drinking water source wells for analysis of ground water quality/quantity and source protection. In addition, many environmental regulations require the determination of the proximity to a public drinking water system source wells or intakes as part of a permitting process or risk assessment. Users of this data should be aware that inconsistencies and inaccuracies may exist if the data is compared to data from other time periods due to changes in methods of data collection and mapping.