

# Limited Phase II Environmental Site Assessment

Former Wigle Recreation Center Site  
901 Selden Street  
Detroit, Michigan 48201

City of Detroit

May 8, 2019

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901 Selden Street  
Detroit, Michigan 48201

May 8, 2019

## Report Prepared For:

City of Detroit – Detroit Building Authority  
1301 Third Avenue  
Detroit, MI 48226

## Report Prepared By:

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**KES Project No. 17-04879.20**

Report Prepared & Reviewed by:



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Jeffrey Guzick, EP  
Project Manager

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## Executive Summary

KES Environmental Services (KES) was retained by The City of Detroit to conduct a Limited Phase II Environmental Site Assessment (ESA) at a portion of the Former Wigle Recreation Center Site located at 901 Selden Street, Detroit, Wayne County Michigan (Property). At the request of the City of Detroit, the Phase II ESA was limited to the proposed Fourth Avenue right-of-way portion of the Property (running north-south along the eastern-central portion of the Property). Recognized environmental conditions (RECs) were previously identified at the Property, as listed in the Phase I ESA previously completed by KES (January 15, 2018). A Phase II ESA (soil borings SB-1 through SB-9) was completed by ASTI Environmental (Brighton, MI), dated April 27, 2018. KES was not provided with the results of the Phase II ESA conducted by ASTI Environmental.

This Limited Phase II Report was prepared for the benefit of the City of Detroit, and KES acknowledges that said party may rely upon the contents and conclusions presented in this report. The subsurface investigation activities were performed per written authorization of Ms. Jill Bryant (Real Estate Management – Detroit Building Authority), representative of the City of Detroit, on April 18, 2019.

The Limited Phase II included a subsurface investigation, which consisted of the advancement of eight (8) soil borings at the Property (SB-10 through SB-17) and the collection of eight soil samples to identify potential RECs associated with historical operations at the proposed Fourth Avenue right-of-way portion of the Property. Please note that KES encountered refusal (obstructions) at several drilling locations within the proposed Fourth Avenue right-of-way. The obstructions were encountered at depths ranging from approximately 2.0-3.3 feet below ground surface (BGS).

During the subsurface investigation eight soil samples were collected by KES from the soil strata with physical characteristics suggesting the greatest potential of impact and submitted to Fibertec Environmental Services of Holt, Michigan, for analysis. Laboratory analysis included volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PNAs), and/or the Michigan 10 Metals.

Soil analytical results were then compared to the applicable Generic Residential Cleanup Criteria (GRCC) under Part 201 of Michigan's *Natural Resources and Environmental Protection Act, 1994 PA 451, as Amended* (Part 201). The applicable GRCC for soil at the Property are the soil volatilization to indoor air inhalation (SVIAI), the groundwater surface water interface protection (GSIP), and the soil direct contact (DC) criterion.

The results of the April 2019 subsurface investigation indicated that the following soil detections exceeded applicable GRCC:

### SB-10 (7.5-8 feet BGS):

The metal arsenic was detected at 14,000 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic



SB-11 (7.5-8 feet BGS):

The metal arsenic was detected at 8,700 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-14 (7.5-8 feet BGS):

The metal arsenic was detected at 10,000 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-15 (7.5-8 feet BGS):

The metal arsenic was detected at 8,300 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-16 (7.5-8 feet BGS):

The metal arsenic was detected at 8,100 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

The metal mercury was detected at 140 ug/kg, which exceeds the GSIP criteria (50 ug/kg) for mercury

Because the Michigan State Wide Default concentration (5,800 ug/Kg) value for arsenic does not consider different soil types (such as sand, topsoil, or clay), using data provided in the *Michigan Background Soil Survey-2005* (published by MDEQ) is a more precise means to show that metal concentrations of a certain soil type are naturally occurring and do not exceed a specific cleanup criterion value.

Using the clay soil classification and statistical data specifically developed for Huron-Erie Glacial Lobe soils, a calculation using the mean for arsenic (3,420 ug/Kg for sand and 9,000 ug/kg for clay) and adding three times the standard deviation (2,437 ug/Kg and 2,047 ug/Kg for sand and clay, respectively) a site specific criteria value of 10,731 ug/Kg for sand and 15,141 ug/Kg for clay has been calculated for the soils at the Property. Soil encountered at the depths the soil samples were collected from (7.5-8.0 feet BGS) primarily consisted of clay with some sand, which will fall between these two calculated site specific values.

The mean value for arsenic was obtained from *Michigan Background Soil Survey-2005* and is a large data set involving soil analytical results from the collection of 926 samples statewide. These concentrations ranged from a low value of 470 ug/kg to a maximum concentration of 27,700 ug/kg. The arsenic detections at SB-10, SB-11, SB-14, SB-15, and SB-16 were 14,000 ug/kg, 8,700 ug/kg, 10,000 ug/kg, 8,300 ug/kg, and 8,100 ug/kg, respectively. These concentrations are below the calculated site specific value for naturally occurring (background) arsenic in clay and sandy soils at these locations.

However, based on the results of soil analysis (mercury detected at soil boring SB-16 at 140 ug/kg, which exceeds the GSIP criteria for mercury) the Property is a "facility", as defined in Section 20101(1)(o) of Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

## **1.0 INTRODUCTION**

Kem-Tec Environmental Services, Inc. (KES) was retained by The City of Detroit to conduct a Limited Phase II Environmental Site Assessment (ESA) at a portion of the Former Wigle Recreation Center Site located at 901 Selden Street, Detroit, Wayne County Michigan (Property). At the request of the City of Detroit, the Phase II ESA was limited to the proposed Fourth Avenue right-of-way portion of the Property (running north-south along the eastern-central portion of the Property). This Phase II Report was prepared for the benefit of The City of Detroit, and KES acknowledges that said party may rely upon the contents and conclusions presented in this report. The subsurface investigation activities were performed per authorization of Ms. Jill Bryant (Real Estate Management – Detroit Building Authority), representative of the City of Detroit, on April 18, 2019.

Recognized environmental conditions (RECs) were previously identified at the Property, as listed in the Phase I ESA previously completed by KES (January 15, 2018). A Phase II ESA (soil borings SB-1 through SB-9) was completed by ASTI Environmental (Brighton, MI), dated April 27, 2018. KES was not provided with the results from the Phase II ESA conducted by ASTI Environmental.

### **1.1 Purpose**

The Limited Phase II ESA conducted for The City of Detroit included a subsurface investigation which consisted of the advancement of eight (8) soil borings at the Property (SB-10 through SB-17) and the collection of eight soil samples to identify RECs associated with historical operations at the Property at the proposed Fourth Avenue right-of-way portion of the Property. The Limited Phase II ESA was conducted in regard to a water main line replacement.

## **2.0 FIELD ACTIVITIES**

### **2.1 Subsurface Investigation**

On April 25, 2019, KES supervised the installation of eight soil borings at the Property. Fibertec Environmental Services (Fibertec) of Holt, Michigan, advanced the Geoprobe soil borings under the direction of KES. The Geoprobe soil borings were advanced with a Geoprobe® hydraulic-push truck-mounted drill rig. All eight of the soil borings were advanced at the proposed Fourth Avenue right-of-way portion of the Property (running north-south along the eastern-central portion of the Property). The soil borings were advanced at the following locations:

- Soil borings SB-10 and SB-11 were advanced at the northeastern portion of the Property; SB-10 was advanced in the central portion of the right-of-way and SB-11 was advanced along the eastern side of the right-of-way due to several obstructions encountered at this area within the right-of-way.
- Soil borings SB-12, SB-13, and SB-14 were advanced at the eastern-central portion of the Property; SB-12 was advanced along the eastern side of the right-of-way, SB-13 and SB-14 were advanced along the western side of the right-of-way due to several obstructions encountered at these areas.
- Soil borings SB-15, SB-16, and SB-17 were advanced at the southeastern portion of the Property; SB-15 was advanced in along the western side of the right-of-way, SB-16 was advanced at the central portion of the right-of-way, and SB-17 were advanced along the eastern portion of the right-of-way due to several obstructions at this area.

Following soil sample collection, all borings were backfilled with soil cuttings from the borings mixed with bentonite chips to match the existing grade.

Figure 2 illustrates the locations of the soil borings (and areas where obstructions were encountered) relative to the site features and relative to ASTI Environmental's previous soil borings (SB-1 through SB-9) from their April 2018 Phase II ESA. Digital photos of the subsurface investigation are provided as Appendix B.

## **2.2 Sample Collection Procedures**

Soil encountered during field activities was identified by KES's geologist, examined for visual and/or olfactory evidence of impact, screened using a MiniRAE photoionization detector (PID) and recorded in a field logbook. Prior to sampling, the PID was calibrated to manufacturer specifications using 100 part per million (ppm) isobutylene calibration gas. Soil samples were collected in 5-foot stainless steel sample tubes with disposable liners. All downhole equipment was decontaminated using an Alconox® wash and clean water rinse between borings to minimize the risk of cross contamination of samples.

All soil samples were collected into laboratory certified clean glass 4-ounce jars and/or 40-ml glass vials preserved in the field with methanol. All samples were cooled to 4°C and submitted to Fibertec Environmental Services under standard chain-of-custody procedures. Soil samples collected were submitted for analysis of VOCs by US EPA Method SW846 8260, PNAs by US EPA Method SW846 8270, and/or the Michigan 10 Metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc) by US EPA Method SW846 6020A/7471A. All soil samples submitted for VOC analysis were preserved in the field with methanol per US EPA Method 5035.

The soil profiles encountered across the Property were fairly consistent and consisted of topsoil, with sandy and clayey fill from the ground surface to approximately 1.0-3.0 feet below ground surface (BGS). The fill was underlain by silty-clay and some sand. Groundwater was not encountered in any of the soil borings. Elevated PID readings (higher than 0.1 ppm) were not detected in any of the soil borings. Soil boring logs are provided in Appendix D.

## **2.3 Results of Field Observations**

Soil analytical results were then compared to the applicable Generic Residential Cleanup Criteria (GRCC) under Part 201 of Michigan's *Natural Resources and Environmental Protection Act, 1994 PA 451, as Amended* (Part 201). The applicable GRCC for soil at the Property are the soil volatilization to indoor air inhalation (SVIAI), the groundwater surface water interface protection (GSIP), and the soil direct contact (DC) criterion. The following detections exceeded applicable cleanup criteria:

SB-10 (7.5-8 feet BGS):

The metal arsenic was detected at 14,000 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-11 (7.5-8 feet BGS):

The metal arsenic was detected at 8,700 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-14 (7.5-8 feet BGS):

The metal arsenic was detected at 10,000 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-15 (7.5-8 feet BGS):

The metal arsenic was detected at 8,300 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-16 (7.5-8 feet BGS):

The metal arsenic was detected at 8,100 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic.

The metal mercury was detected at 140 ug/kg, which exceeds the GSIP criteria (50 ug/kg) for mercury

Because the Michigan State Wide Default concentration (5,800 ug/Kg) value for arsenic does not consider different soil types (such as sand, topsoil, or clay), using data provided in the *Michigan Background Soil Survey-2005* (published by MDEQs Hazardous Waste Technical Support Unit of the Waste and Hazardous Materials Division) is a more precise means to show that metal concentrations of a certain soil type are naturally occurring and do not exceed a specific cleanup criterion value.

Using the clay soil classification and statistical data specifically developed for Huron-Erie Glacial Lobe soils, a calculation using the mean for arsenic (3,420 ug/Kg for sand and 9,000 ug/kg for clay) and adding three times the standard deviation (2,437 ug/Kg and 2,047 ug/Kg for sand and clay, respectively) a site specific criteria value of 10,731 ug/Kg for sand and 15,141 ug/Kg for clay has been calculated for the soils at the Property. Soil encountered at the depths the soil samples were

collected from (7.5-8.0 feet bgs) primarily consisted of clay with some sand, which will fall between these two calculated site specific values.

The mean value for arsenic was obtained from *Michigan Background Soil Survey-2005* and is a large data set involving soil analytical results from the collection of 926 samples statewide. These concentrations ranged from a low value of 470 ug/kg to a maximum concentration of 27,700 ug/kg. The arsenic detections at SB-10, SB-11, SB-14, SB-15, and SB-16 were 14,000 ug/kg, 8,700 ug/kg, 10,000 ug/kg, 8,300 ug/kg, and 8,100 ug/kg, respectively. These concentrations are below the calculated site specific value for naturally occurring (background) arsenic in clay and sandy soils at these locations. The Michigan Background Soil Survey is included as Appendix F.

None of the VOC, PNA, or remaining Michigan 10 Metal parameters were identified in soil samples above applicable DEQ Part 201 GRCC. A summary of soil analytical results are included in Table 1.

Based on these results of soil analysis, (mercury detected at SB-16 at 140 ug/kg, which exceeds the GSIP criteria for mercury), the Property is a “facility”, as defined in Section 20101(1)(o) of Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

The laboratory analytical report and chain-of-custody form are included in Appendix C. Figure 2 illustrates the locations of the soil borings relative to the site features, as well as relative to ASTI Environmental’s previous soil borings (SB-1 through SB-9) from their April 2018 Phase II ESA.

### 3.0 CONCLUSIONS AND RECOMMENDATIONS

KES was retained by The City of Detroit to conduct a Limited Phase II ESA at a portion of the Former Wigle Recreation Center Site located at 901 Selden Street, Detroit, Wayne County Michigan (Property). At the request of the City of Detroit, the Phase II ESA was limited to the proposed Fourth Avenue right-of-way portion of the Property (running north-south along the eastern-central portion of the Property) in regard to a water main replacement. RECs were previously identified at the Property, as listed in the Phase I ESA previously completed by KES (January 15, 2018). A Phase II ESA (soil borings SB-1 through SB-9) was completed by ASTI Environmental (Brighton, MI), dated April 27, 2018. KES was not provided with the results from the Phase II ESA conducted by ASTI Environmental.

The Limited Phase II ESA conducted by KES included a subsurface investigation which consisted of the advancement of eight (8) soil borings at the Property (SB-10 through SB-17) and the collection of eight soil samples to identify potential RECs associated with historical operations at the Property across the proposed Fourth Avenue right-of-way portion of the Property. Soil borings were located at the following locations:

- Soil borings SB-10 and SB-11 were advanced at the northeastern portion of the Property; SB-10 was advanced in the central portion of the right-of-way and SB-11 was advanced along the eastern side of the right-of-way due to several obstructions encountered at this area within the right-of-way.
- Soil borings SB-12, SB-13, and SB-14 were advanced at the eastern-central portion of the Property; SB-12 was advanced along the eastern side of the right-of-way, SB-13 and SB-14 were advanced along the western side of the right-of-way due to several obstructions encountered at these areas.
- Soil borings SB-15, SB-16, and SB-17 were advanced at the southeastern portion of the Property; SB-15 was advanced in along the western side of the right-of-way, SB-16 was advanced at the central portion of the right-of-way, and SB-17 were advanced along the eastern portion of the right-of-way due to several obstructions at this area.

Soil analytical results were compared to the applicable GRCC under Part 201 of Michigan's *Natural Resources and Environmental Protection Act, 1994 PA 451, as Amended* (Part 201). Soil analytical results indicated that the following detections exceeded applicable cleanup criteria:

SB-10 (7.5-8 feet BGS):

The metal arsenic was detected at 14,000 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-11 (7.5-8 feet BGS):

The metal arsenic was detected at 8,700 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-14 (7.5-8 feet BGS):

The metal arsenic was detected at 10,000 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-15 (7.5-8 feet BGS):

The metal arsenic was detected at 8,300 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic

SB-16 (7.5-8 feet BGS):

The metal arsenic was detected at 8,100 ug/kg, which exceeds the DC criteria (7,600 ug/kg) and the GSIP criteria (4,600) for arsenic.

The metal mercury was detected at 140 ug/kg, which exceeds the GSIP criteria (50 ug/kg) for mercury

None of the remaining VOC, PNA, or Michigan 10 Metals parameters were identified at levels above applicable DEQ Part 201 GRCC.

Using the clay soil classification and statistical data in the *Michigan Background Soil Survey-2005*, specifically developed for Huron-Erie Glacial Lobe soils, a calculation using the mean for arsenic (3,420 ug/Kg for sand and 9,000 ug/kg for clay) and adding three times the standard deviation (2,437 ug/Kg and 2,047 ug/Kg for sand and clay, respectively) a site specific criteria value of 10,731 ug/Kg for sand and



15,141 ug/Kg for clay has been calculated for the soils at the Property. Soil encountered at the depths the soil samples were collected from (7.5-8.0 feet bgs) primarily consisted of clay with some sand, which will fall between these two calculated site specific values.

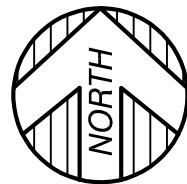
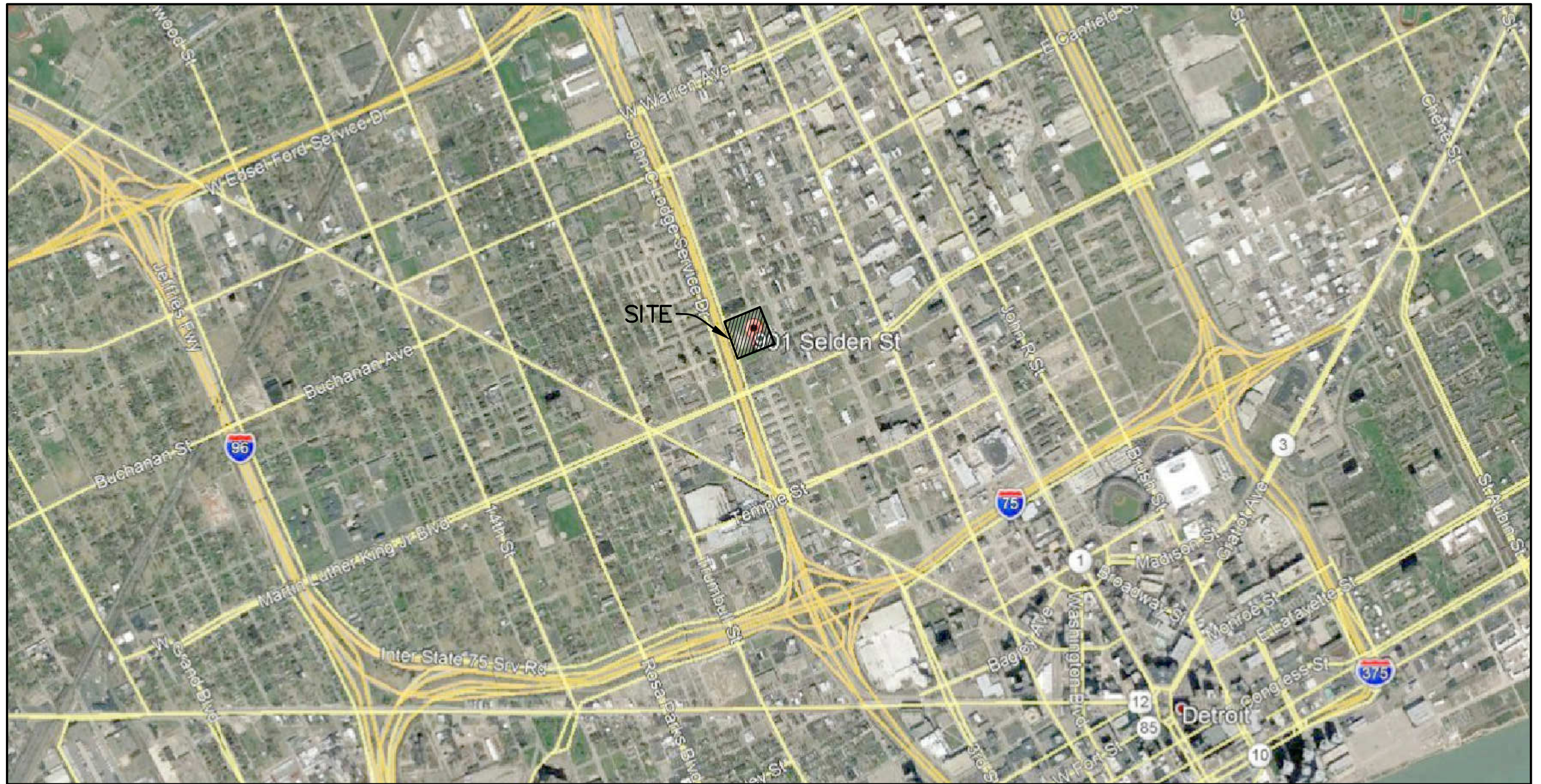
The arsenic detections at SB-10, SB-11, SB-14, SB-15, and SB-16 were 14,000 ug/kg, 8,700 ug/kg, 10,000 ug/kg, 8,300 ug/kg, and 8,100 ug/kg, respectively. These concentrations are below the calculated site specific value for naturally occurring (background) arsenic in clay and sandy soils at these locations.

The metal mercury was detected at 140 ug/kg, which exceeds the GSIP criteria (50 ug/kg) for mercury

Based on the soil analytical results, none of the VOC, PNA, or remaining Michigan 10 Metal parameters were identified in soil samples above applicable DEQ Part 201 GRCC.

Based on these results of soil analysis (the mercury detection at soil boring SB-16), the Property is a "facility", as defined in Section 20101(1)(o) of Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.





**SITE LOCATION MAP**  
**901 SELDEN STREET**  
**DETROIT, MICHIGAN 48201**



**KEM-TEC ENVIRONMENTAL SERVICES INC.**

22556 GRATIOT AVE. EASTPOINTE, MI 48021

PROFESSIONAL ENVIRONMENTAL SCIENTISTS

(586)772-2222 \* FAX (586)772-4048

CLIENT:

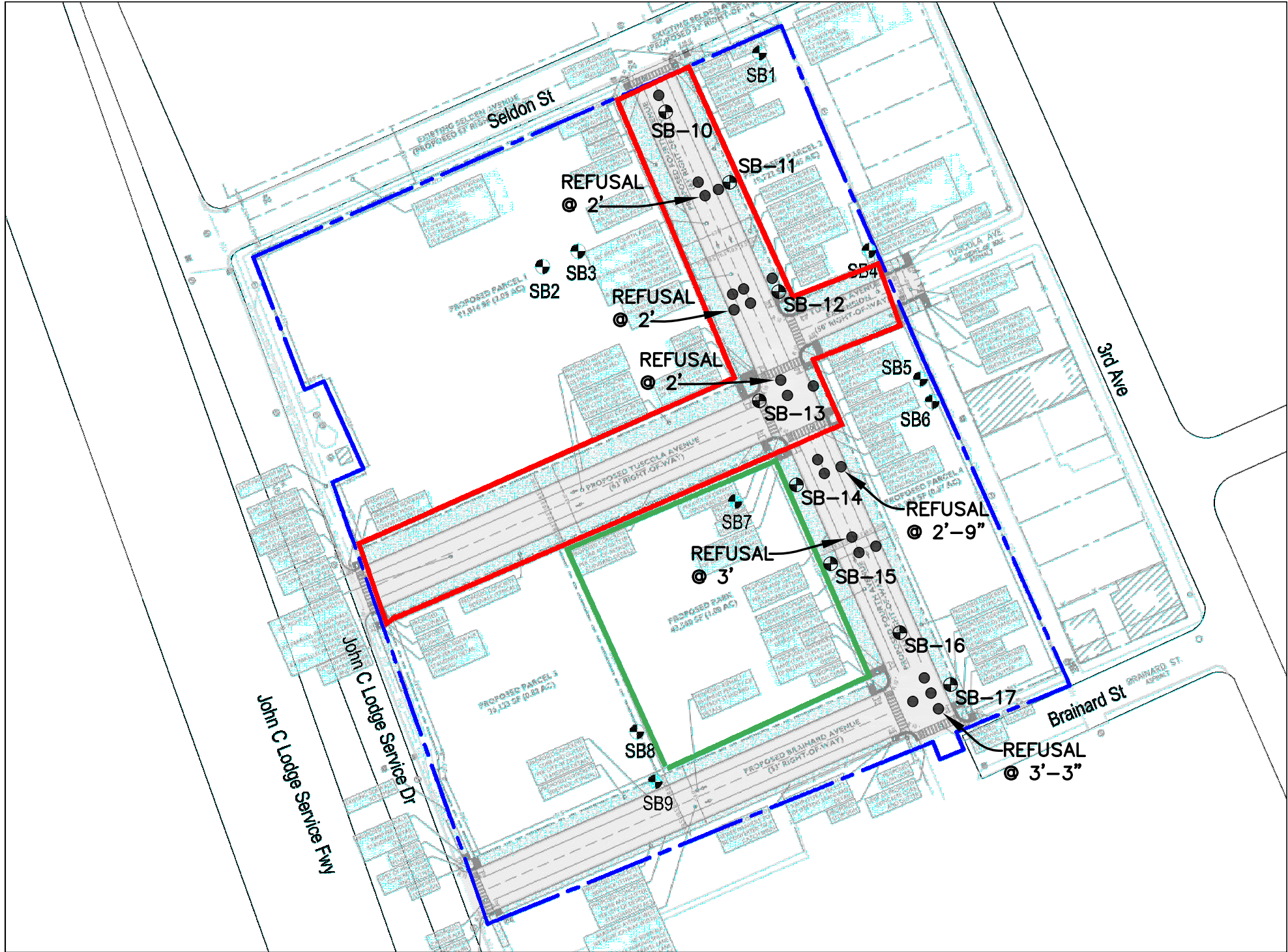
**THE CITY OF DETROIT**

DATE: MAY 01, 2019

JOB NO.: 17-04879.20

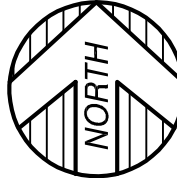
**FIGURE - 1**





NOTE: SITE MAP AND SOIL BORINGS SB-1 THROUGH SB-9 LOCATIONS PROVIDED IN FIGURE 2-SOIL BORING LOCATION MAP, APRIL 27, 2018, ASTI ENVIRONMENTAL.

SCALE: 1"=80'



- ⊕ - SOIL BORING LOCATION
- - SOIL BORING REFUSAL (OBSTRUCTION) LOCATIONS

**SOIL BORING LOCATION MAP**  
 901 SELDEN STREET  
 DETROIT, MICHIGAN 48201



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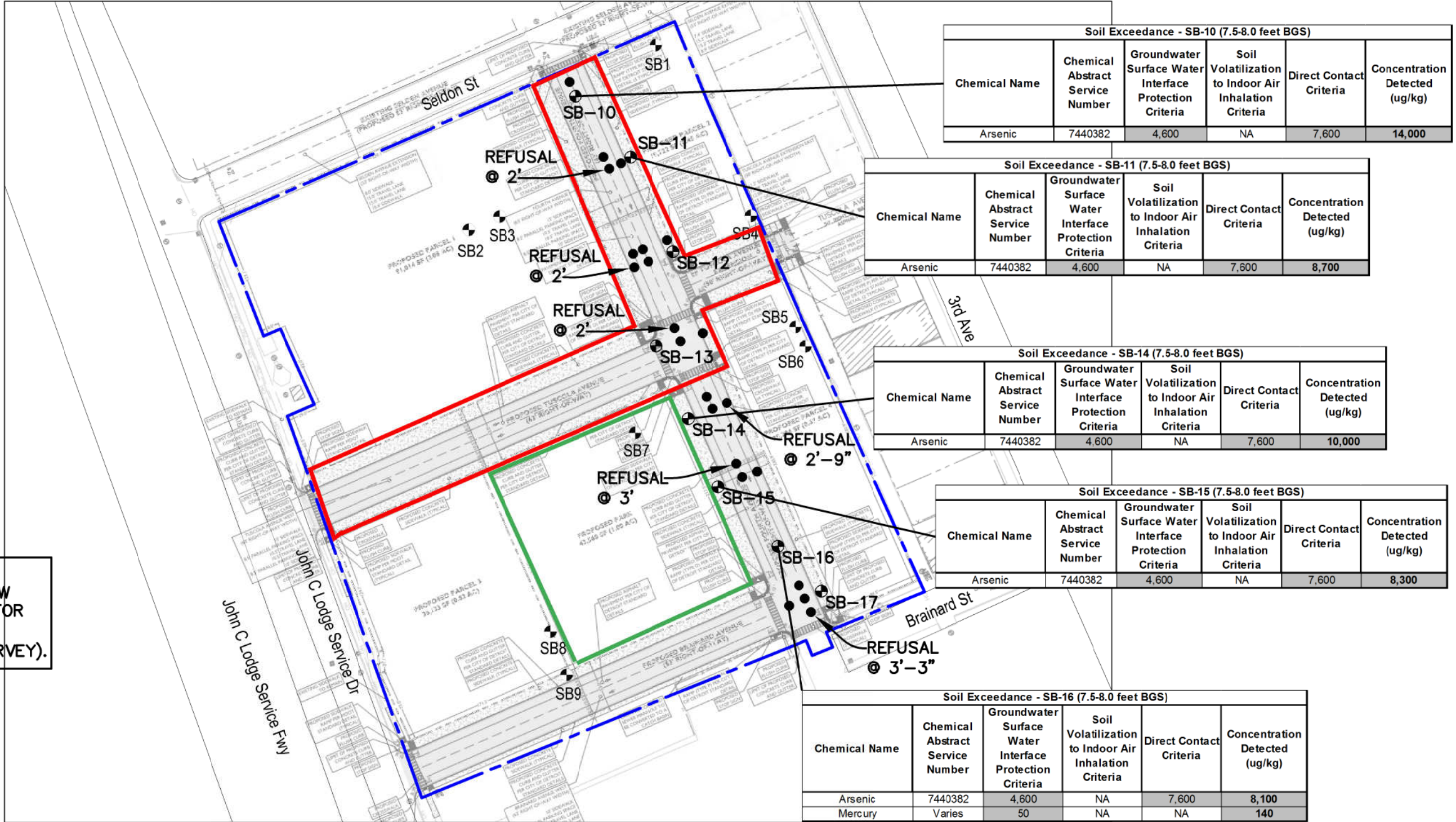
CLIENT: **THE CITY OF DETROIT**

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**FIGURE - 2**



**NOTE: ALL ARSENIC DETECTIONS ARE BELOW CALCULATED VALUES FOR ARSENIC (MICHIGAN BACKGROUND SOIL SURVEY).**



SCALE: 1"=80'



- ⊕ - SOIL BORING LOCATION
- - SOIL BORING REFUSAL (OBSTRUCTION) LOCATIONS
- GRCC - GENERIC RESIDENTIAL CLEANUP CRITERIA

**SOIL EXCEEDANCES ABOVE APPLICABLE GRCC LEVELS**  
 901 SELDEN STREET  
 DETROIT, MICHIGAN 48201



**KEM-TEC ENVIRONMENTAL SERVICES INC.**  
 22556 GRATIOT AVE. EASTPOINTE, MI 48021  
 PROFESSIONAL ENVIRONMENTAL SCIENTISTS  
 (586)772-2222 \* FAX (586)772-4048

CLIENT: **THE CITY OF DETROIT**

DATE: MAY 08, 2019  
 JOB NO.: 17-04879.20

**FIGURE - 3**



901 Selden Street,  
Detroit, MI  
Soil Sample Analytical Results

Analytical Parameters	Part 201 Generic Residential Criteria						Soil Samples				Soil Samples			
	Chemical Abstract Service Number	Analytical Method	State Default Background Levels	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Direct Contact Criteria	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16	SB-17
Sample Depth (in feet)							(7.5'-8.0')	(7.5'-8.0')	(7.5'-8.0')	(7.5'-8.0')	(7.5'-8.0')	(7.5'-8.0')	(7.5'-8.0')	(7.5'-8.0')
Sample Date							4-25-2019	4-25-2019	4-25-2019	4-25-2019	4-25-2019	4-25-2019	4-25-2019	4-25-2019
<b>PNAs</b>														
Acenaphthene	83329	SW 846 8270C	NA	8,700	1.9E+8	4.1E+7	<330	<330	<330	<330	<330	<330	<330	<330
Acenaphthylene	208968	SW 846 8270C	NA	ID	1.6E+8	1.6E+6	<330	<330	<330	<330	<330	<330	<330	<330
Anthracene	120127	SW 846 8270C	NA	ID	1.0E+9 (D)	2.3E+8	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(a)anthracene (Q)	56553	SW 846 8270C	NA	NLL	NLV	20,000	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(a)pyrene (Q)	50328	SW 846 8270C	NA	NLL	NLV	2,000	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(b)fluoranthene (Q)	205992	SW 846 8270C	NA	NLL	ID	20,000	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(g,h,i)perylene (Q)	191242	SW 846 8270C	NA	NLL	NLV	2.5E+6	<330	<330	<330	<330	<330	<330	<330	<330
Benzo(k)fluoranthene (Q)	207089	SW 846 8270C	NA	NLL	NLV	2.0E+5	<330	<330	<330	<330	<330	<330	<330	<330
Chrysene (Q)	218019	SW 846 8270C	NA	NLL	ID	2,000,000	<330	<330	<330	<330	<330	<330	<330	<330
Dibenzo(a,h)anthraene	53703	SW 846 8270C	NA	NLL	NLV	2,000	<330	<330	<330	<330	<330	<330	<330	<330
Fluoranthene	206440	SW 846 8270C	NA	5,500	1.0E+9 (D)	46,000,000	<330	<330	<330	<330	<330	<330	<330	<330
Fluorene	53703	SW 846 8270C	NA	5,300	5.8E+8	27,000,000	<330	<330	<330	<330	<330	<330	<330	<330
Indeno(1,2,3-cd)pyrene (Q)	193395	SW 846 8270C	NA	NLL	NLV	20,000	<330	<330	<330	<330	<330	<330	<330	<330
2-Methylnaphthalene	91576	SW 846 8260B	NA	4,200	2.7E+6	8.1E+6	<330	<330	<330	<330	<330	<330	<330	<330
Phenanthrene	85018	SW 846 8270C	NA	2,100	2.8E+6	1,600,000	<330	<330	<330	<330	<330	<330	<330	<330
Pyrene	129000	SW 846 8270C	NA	ID	1.0E+9 (D)	29,000,000	<330	<330	<330	<330	<330	<330	<330	<330
<b>Metals</b>														
Arsenic	7440382	SW846 6020	5,800	4,600	NLV	7,600	14,000	8,700	7,200	6,900	10,000	8,300	8,100	7,200
Barium	7440393	SW846 6021	75,000	(G)	NLV	37,000,000	50,000	59,000	62,000	53,000	51,000	61,000	53,000	78,000
Cadmium (B)	7440439	SW846 6022	1,200	(G,X)	NLV	550,000	66	150	150	92	140	160	160	170
Chromium (B,H)	16065831	SW846 6023	18,000	(G,X)	NLV	790,000,000	21,000	18,000	21,000	14,000	15,000	18,000	19,000	20,000
Copper (B)	7440508	SW846 6024	32,000	(G)	NLV	2.0E+7	19,000	16,000	20,000	13,000	15,000	17,000	17,000	17,000
Lead (B)	7439921	SW846 6027	21,000	(G,X)	NLV	400,000	8,900	11,000	8,800	6,200	8,000	8,700	13,000	8,900
Mercury	Varies	SW846 6032	NA	50 (M); 1.2	48,000	160,000	<50	<50	<50	<50	<50	<50	140	<50
Selenium (B)	7782492	SW846 6034	410	400	NLV	2,600,000	<200	<200	<200	<200	<200	<200	<200	<200
Silver (B)	7440224	SW846 6035	1,000	100 (M); 27	NLV	2,500,000	<100	<100	<100	<100	<100	<100	<100	<100
Zinc	7440666	SW846 6036	47,000	(G)	NLV	170,000,000	52,000	45,000	51,000	42,000	43,000	50,000	51,000	49,000

**Notes:**

All Samples were analyzed by Fibertec Environmental Services using various methods.  
Concentrations have been compared with P.A. 451, Part 201 Generic Residential Criteria RRD Operational Memorandum #1, (December 30, 2013).

- XX** Shaded values indicate concentrations which exceed one or more Part 201 Criteria and statewide default background levels if appropriate.
- (A)** Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.
- (B)** Background, as defined in R.299.5701(b), may be substituted if higher than the calculated cleanup criterion.
- (C)** Value presented is a screening level based on the chemical-specific generic soil saturation concentration ( $C_{sat}$ ) since the calculated risk-based criterion is greater than  $C_{sat}$ .
- (D)** Calculated criterion exceeds 100%, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb)
- (G)** (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water.
- (H)** Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria.
- (I)** Hazardous substance may exhibit the characteristic of ignitability.
- (Q)** Criteria for carcinogenic polycyclic aromatic hydrocarbons (PNAs) were developed using "relative potential potencies" to benzo (a) pyrene.
- (T)** Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, to determine the applicability of TSCA cleanup standards.
- (X)** Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA
- NLL** cleanup standards.
- NLV** Hazardous substance is not likely to volatilize.
- ND** Not detected at or above the Method Detection Limit (MDL). Raised detection limits may have been required for samples that required dilution.
- ID** Inadequate data to develop criterion.
- Parameter was not analyzed in this sample.

Phase I Environmental Site Assessment  
Former Wigle Recreation Center Site  
901 Selden Street  
Detroit, Michigan 48201

PDH Development Group, LLC

January 15, 2018

Phase I Environmental Site Assessment  
Former Wigle Recreation Center Site  
901 Selden Street  
Detroit, Michigan 48201

January 15, 2018

**Report Prepared For:**

PDH Development Group, LLC  
535 Griswold Street, Suite 1800  
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**Report Prepared By:**

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**KES Project No. 17-04879.20**

Report Prepared and Reviewed by:



Jeffrey J Guzick, EP  
Site Assessor and Project Manager



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## Executive Summary

KES Environmental Services (KES) was retained by PDH Development Group, LLC to conduct a Phase I Environmental Site Assessment (ESA) of an irregular-shaped vacant parcel located at 901 Selden Street, Detroit, Wayne County Michigan (Property). The Phase I ESA was conducted in accordance with American Society for Testing and Materials (ASTM) Practice E 1527-13. The information and opinions rendered in this report are exclusively for use by PDH Development Group, LLC, and KES will not distribute or publish this report without the consent of said parties except as required by law or court order. This Phase I ESA is to be used by PDH Development Group, LLC to qualify for one of three Landowner Liability Protections: Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner on CERCLA Liability and for a property transaction.

The ESA included (1) a site inspection on December 14, 2017, (2) interviews with knowledgeable site contacts, (3) review of pertinent City of Detroit records, (4) acquisition and review of federal and state database search, (5) review of historical aerial photographs and Sanborn Maps, and (6) review of historical address directories.

The Subject Property is an irregular-shaped vacant parcel formerly containing the Wigle Recreation Center at the western-central portion of the Property. Up until recently (~April 2017), "The Wig" skatepark occupied the central portion of the Property. The former Wigle Recreation Center building footprint and basketball courts are still visible at the western-central portion of the Property. The entire northern, eastern, and southern portions of the Subject Property are grass-covered areas which are part of the Wigle Memorial Playground. The Property is approximately 7.03 acres in size.

Historically, the Property was densely occupied by several residential duplexes and some associated sheds by no later than 1889. Additionally, Tuscola Street cut through the central portion of the Property, running east-northeast – south-southwest; Fourth Street cut through the eastern portion of the Property, running north-northwest – south-southeast; and Brainard Street made up the entire southern Property boundary at this time. According to Sanborn Maps, two "Auto Repair" shops were identified at different portions of the Subject Property. These auto repair shops were located at 939½ Selden Street at the northern-central portion of the Property, and at 3656½ Fourth Street at the eastern-central portion of the Property. This site (3656½ Fourth Street) was also identified as Metal Products Factory on the 1953 Sanborn Map. Between 1953 and 1957, all structures that had occupied the central and western portions of the Property had been wrecked and removed. By 1961, all remaining structures occupying the eastern portion of the Property had also been removed. In 1960-61, a brick recreation/community center (Wigle Center – 3650 John C Lodge Freeway) was built on the western-central portion of the Subject Property, with a concrete-paved parking area east of the building established shortly after. The remainder of the Property was grass-covered play area. Between 1997 and 1999, the concrete-paved area east of the building contained two basketball courts and one tennis court. Between 2012 and 2015, the brick recreation/community center building was wrecked and removed. Between

approximately 2014 and early 2017, the court area was occupied by “The Wig” D.I.Y. skatepark. The Subject Property is now vacant, with the building footprint of the former Wigle Recreation Center and court area still visible at the western-central portion of the Property.

The Subject Property was not listed in the federal or state databases of the EDR Radius Map Report. However, it should be noted that two “Auto Repair” shops are identified at different portions of the Subject Property in Historical Sanborn Maps. The auto repair shops included the following:

- On the 1921 Sanborn Map, an “Auto Repair Shop” is identified at the northern-central portion of the Property at 939½ Selden Street.
- An “Auto Repair Shop” is identified on the 1921 Sanborn Map at the eastern-central portion of the Property at 3656½ Fourth Street. This facility is also identified on the 1950 Sanborn Map. By the 1953 Sanborn Map, the structure at 3656½ Fourth Street is identified as “Metal Products Factory.” According to historical address directories, Ashton Wreckers/Carson Auto Sales was in operation at 3656 Fourth Street in at least 1949.

In addition, three adjoining properties were listed in the federal or state databases of the EDR Radius Map Report. These adjoining properties included the following:

- The site located at 824 Selden Street is listed as a Historical Auto Station site under the name Selden Avenue Garage. This site was located adjacent to the north of the northeast corner of the Property, across Selden Street. This site is listed as a Historical Auto Station site for the years 1921 (Otto J Palmer), 1926 and 1931 (Selden Avenue Garage, and 1940 (Selden Automotive Service). Additionally, according to Sanborn Maps, this site was occupied by an auto repair shop, which included a 1,000-gallon gasoline UST along the north side of Selden Street, from at least 1919 until at least 2002. Since the site is located adjacent to the Property and the status of the UST is unknown, this site represents environmental risk to the Subject Property.
- The site located at 816 Tuscola Street is listed as a Historical Cleaner site under the name Parisian Tailoring Company. This site was located adjacent to the east of the eastern-central portion of the Property. This site is listed as a Historical Cleaner site for the years 1940 (Parisian Tailoring Co.) and 1956 (Louis Miahlas). On historical Sanborn Maps, this site is only shown as a storefront; specific occupant is not identified.
- The site located at 3904 Fourth Street is listed as a RCRA-NonGen/NLR site under the name the City of Detroit site. This site is located adjacent to the north of the northeastern portion of the Property, across Selden Street. This site was designated a RCRA-NonGen/NLR site that produces ignitable waste on August 18, 2006. Records provided by the City of Detroit Fire Department included a City of

Detroit Buildings & Safety Engineering Department document (dated December 22, 1937) for installation of one 1,000-gallon gasoline storage tank. The site is identified as McGarrys Service Station. In addition, a City of Detroit Buildings & Safety Engineering Division of Inflammable Liquids Department inspection report (January 7, 1938) for Selden Service Station was also provided. The records also included a site sketch which shows two 1,000-gallon gasoline tanks. The tanks are shown to be located side-by-side, approximately 20 feet north of Selden Avenue and 20 feet west of Fourth Avenue. Comments in the inspection report indicated that the USTs were buried three feet below ground surface.

In the professional opinion of KES, all appropriate inquiry has been made into the previous ownership and uses of the Subject Property consistent with good commercial and customary practices in an effort to minimize liability.

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 of 901 Selden Street, Detroit, Wayne County Michigan, collectively referred to as the "Property". Any exceptions to, or deletions from this practice are described in Section 1.4 of this report. This assessment has revealed evidence of recognized environmental conditions (RECs) in connection with the Property and adjoining properties. KES recommends conducting an additional investigation at this time.

## **1.0 INTRODUCTION**

KES Environmental Services (KES) was retained by PDH Development Group, LLC to conduct a Phase I Environmental Site Assessment (ESA) of an irregular-shaped vacant parcel located at 901 Selden Street, Detroit, Wayne County Michigan (Property). The Subject Property is approximately 7.03 acres in size. The ESA was conducted in accordance with the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (E 1527-13).

### **1.1 Purpose**

The assessment was conducted to identify recognized environmental conditions (RECs) associated with the historical uses of the Property, current site operations and the condition of surrounding properties. This Phase I ESA is to be used by PDH Development Group, LLC to qualify for one of three Landowner Liability Protections: Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner on CERCLA Liability and for a property transaction.

According to ASTM Practice E 1527-13, the term "recognized environmental condition" means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Conditions determined to be de minimis are not recognized environmental conditions. A "historical recognized environmental condition" is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the Property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria, without subjecting the Property to any required controls such as activity and use limitations, institutional controls, or engineering controls.

The term "conditional recognized environmental condition" means a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (e.g., as evidenced by the issuance of a "No Further Action" letter or equivalent, or meeting risk-based criteria established by regulatory authority).

## **1.2 Detailed Scope of Services**

Information required to complete the ESA was obtained from personal interviews and review of practically reviewable and reasonably ascertainable records. Informational sources include the following:

- Interviews with personnel from (a) Detroit Assessing and Building Departments, (b) Detroit Fire Department, and (c) Wayne County Health Department;
- Available records provided during the timeline of this investigation by Detroit and Wayne County;
- The Michigan Department of Natural Quality (DEQ) Perfected Environmental Lien List;
- EDR Aerial Photograph Decade Package Report, December 4, 2017;
- The EDR Radius Map Report with GeoCheck, December 4, 2017;
- EDR Certified Sanborn Map Report, December 4, 2017; and
- Historical Bresser's Address Directories

Mr. Jeffrey Guzick, Environmental Professional (EP), inspected the Property on December 14, 2017 and prepared the Phase I ESA Report. A copy of Mr. Guzick's resume is provided as Appendix M.

## **1.3 Significant Assumptions**

Information obtained during this assessment, to the extent it was relied on to form our opinion, was assumed to be complete and accurate. KES cannot be held responsible for the quality or content of information obtained from interviews and standard sources.

## **1.4 Limitations and Exceptions**

The information and opinions included in this report were given in response to a limited scope of work, being a Phase I ESA per ASTM Practice E 1527-13, and should be considered and implemented only in light of that particular scope of work. In particular, E1527-13 recognizes inherent limitations for Phase I ESAs, including, but not limited to:

- Phase I requirements only require review of standard historical sources at five-year intervals. Therefore, past uses of the property at less than five-year intervals may not be discovered.



- KES used reasonable efforts to identify evidence of aboveground and underground storage tanks and ancillary equipment on the property during the assessment. “Reasonable efforts” were limited to observation of accessible areas, review of referenced public records and interviews. These reasonable efforts may not identify subsurface equipment or evidence hidden from view by things including, but not limited to, overgrown vegetation, paving, construction activities, stored materials and landscaping.
- KES is not a professional title insurance or land surveyor firm and makes no guarantee, express or implied, that any land title records acquired or reviewed in this report, or any physical descriptions or depictions of the property in this report, represent a comprehensive definition or precise delineation of property ownership or boundaries.
- In accordance with the ASTM Standard Practice E1527-13, this report is presumed to be valid for a six-month period. If the report is older than six months, the following information must be updated in order for the report to be valid: (1) regulatory review, (2) site visit, (3) interviews, (4) specialized knowledge and (5) environmental liens search. Reports older than one year may not meet the ASTM Standard Practice E1527-13 and therefore, the entire report must be updated to reflect current conditions and property-specific information.

### **1.5 Special Terms and Conditions**

The Phase I ESA was performed in conformance with the scope and limitations of ASTM Practice E 1527-13. No special terms and conditions outside ASTM Practice E 1527-13 have been addressed.

### **1.6 User Reliance**

The ESA was performed for the benefit of PDH Development Group, LLC, and KES acknowledges that said party may rely on the contents and conclusions presented in this report. KES acknowledges the fact that the scope of work was sufficient in KES's opinion to uncover, to the extent of KES's services, potential environmental liabilities at the Property.

The Phase I ESA effort was performed per authorization of Mr. Mario Procida, representative of PDH Development Group, LLC, on December 4, 2017. The

information and opinions rendered in this report are exclusively for use by PDH Development Group, LLC, and KES will not distribute or publish this report without the consent of said parties except as required by law or court order.

## **2.0 SITE DESCRIPTION**

### **2.1 Location and Legal Description**

The Property is located at 901 Selden Street on the south side of Selden Street, between Third Street to the east and John C Lodge Drive to the west, in Detroit, Wayne County Michigan. A site location map is provided as Appendix A. The Property includes the following Parcel Identification Number: 04000759. The legal description for the Property is as follows:

S SELDEN S 25.85 FT 14 13 THRU 9 BLK 4 16 THRU 9 BLK 1 SUB OF CRANE FARM L60 P58 DEEDS, W C R 4/108 1 THRU 11 BLK 3 5 THRU 1 BLK 2 BONSWOR & SCOTTS SUB L3 P69 1/2 PLATS, W C R 4/117 N 52 FT OF W 107.5 FT OF 2 SUB OF CRANE FARM L1 P117 PLATS, W C R 4/103 3 THRU 12 17 THRU 26 EXC EXPWAY AS OP SUB OF FORSYTH FARM L1 P219 PLATS, W C R 4/33 VAC TUSCOLA & FOURTH STS & VAC ALLEYS ADJ & E 25 FT OF N 30 FT VAC FOURTH LYG S & ADJ 4/--- 7.026 AC

Copies of the assessment records, with the legal description of the Property are included in Appendix B.

### **2.2 Site and Vicinity General Characteristics**

The Subject Property is an irregular-shaped vacant parcel formerly containing the Wigle Recreation Center at the western-central portion of the Property. Up until recently (approximately April 2017), “The Wig” skatepark occupied the central portion of the Property. The former Wigle Recreation Center building footprint and basketball courts are still visible at the western-central portion of the Property. The entire northern, eastern, and southern portions of the Subject Property are grass-covered areas which are part of the Wigle Memorial Playground. Public sidewalks mark the northern and western Property boundaries; a concrete-paved alleyway marks the eastern Property boundary. The Property is approximately 7.03 acres in size.

The Property and adjacent properties to the east and south are zoned SD2 – Special Development District, Mixed Use; adjacent properties to the west, across the Lodge Expressway, are zoned PD – Planned Development District; and adjacent properties to the north are zoned a mix of SD1 – Special Development District, Small-Scale, Mixed Use and R-2 – Two-Family Residential District.

### **2.3 Current Use of the Property**

The Property at 901 Selden Street is currently vacant, having most recently been occupied by the Wigle Recreation Center at the western-central portion of the Property and (briefly) “The Wig” skate park at the central portion of the Property.

### **2.4 Descriptions and Structures, Roads, Other Improvements on the Site**

The table below provides a summary of improvements on the Property.

<b>PROPERTY IMPROVEMENTS</b>	
Size of Property (approximate)	7.03 acres in size
General Topography of Property	The Property is relatively flat
Adjoining and/or Access/Egress Roads	There is automobile access to the Subject Property by way of two concrete/gravel-covered driveways from the John C Lodge Service Drive to the west, as well as one gravel-and-dirt-covered access point from Tuscola Street to the east.
Paved or Concrete Areas	A concrete and gravel-covered former parking area occupies much of the western-central portion of the Property; a paved area formerly containing tennis and basketball courts occupies much of the central portion of the Property.
Unimproved Areas	The majority of the northern, eastern, and southern portions of the Subject Property are grass-covered areas.
Landscaped Areas	The majority of the northern, eastern, and southern portions of the Subject Property are grass-covered areas. There is limited landscaping in the form of trees along the western Property boundary.
Surface Water	None
Potable Water Source	City of Detroit
Sanitary Sewer Utility	City of Detroit
Storm Sewer Utility	City of Detroit
Electric Utility	DTE Electric
Natural Gas Utility	DTE Gas
Current Occupancy Status	Currently unoccupied
Unoccupied Buildings/Spaces/Structures	None
Number of Occupied Buildings	None
General Building Description	Not Applicable
Number of Floors	Not Applicable
Total Square Feet of Space (approximate)	Not Applicable
Construction Completion Date (year)	Not Applicable
Interior Finishes Description	Not Applicable
Exterior Finishes Description	Not Applicable
Floor Drains	Not Applicable

PROPERTY IMPROVEMENTS	
Cooling System Type	Not Applicable
Heating System Type	Not Applicable
Emergency Power	Not Applicable

## **2.5 Current Uses of Adjoining Properties**

KES observed adjoining properties during the site inspection to evaluate the potential risk these properties may pose to the Property. Observations were made from the Property and public access areas, as appropriate. Each is described as follows:

North – Selden Street; with Thomas Edison Intermediate School (950 Selden Street), a vacant residential property (3904 Fourth Street); with Fourth Street and a mix of two-family residential (3912 Fourth Street), vacant residential parcels, and vacant commercial properties (3939 Third Street and 3951 Third Street) located beyond

South – A school (Detroit Delta Preparatory Academy – 3550 John C Lodge), Brainard Street, a vacant commercial property (3544 Third Street); with a mix of commercial properties (Detroit City Rescue Mission – 3541-3551 Third Street/3544 Fourth Street and Bill’s Recreation – 3525 Third Street) and vacant parcels; with six lanes of Martin Luther King Jr. Boulevard (three west-bound and three east-bound lanes with a grass-covered median) located beyond

East – Vacant commercial parcels (3701-3745 Third Street), Tuscola Street, Third Ave Hardware (3645-3657 Third Street), vacant commercial parcels (3619-3642 Third Street), Detroit City Rescue Mission (3607 Third Street), a residential property owned by Detroit City Rescue Mission (816 Brainard Street); with Third Street; and a mix of additional commercial properties (Jumbo’s Bar – 3736 Third Street and vacant – 3700 Third Street) and residential properties located beyond

West – North-bound John C Lodge Service Drive, with six lanes of the John C Lodge Freeway (three north-bound and three south-bound lanes, at an elevation approximately 20 feet below ground surface), with multi-tenant residential properties (Detroit Housing Commission – 1201 Selden Street/1200 Marvin Gaye Drive) and Woodbridge Senior Village (3610 Miracles Boulevard) located beyond

No chemical storage, stained areas, stressed vegetation, or signs of material spillage were observed along the property lines between the Property and adjoining properties. No USTs, pits, ponds or lagoons were observed on the adjoining properties. An Adjacent Properties Map is included as Figure 3 in Appendix C.

### **3.0 USER/CLIENT PROVIDED INFORMATION**

KES submitted a User Questionnaire to Mr. Mario Procida, representative of PDH Development Group, LLC. Mr. Procida requested that KES assist in filling out the questionnaire based on the site inspection conducted on December 14, 2017. A copy of the User Questionnaire is included in Appendix E.

#### **3.1 Title Records**

KES was not provided with title records for the Property. According to the City of Detroit General Property Information sheet, the Property is owned by City of Detroit – P&DD.

#### **3.2 Environmental Liens or Activity and Use Limitations**

KES has not been provided with any information regarding environmental liens or activity and use limitations on the Property. The DEQ maintains a listing of environmental liens on properties in the State. No environmental liens were listed for the Property (Appendix I).

#### **3.3 Specialized Knowledge**

KES has not been provided with any other specialized knowledge of the Property.

#### **3.4 Commonly Known or Reasonably Ascertainable Information**

KES has not been provided with any other commonly known or reasonably ascertainable information regarding the Property.

#### **3.5 Valuation Reduction for Environmental Issues**

KES was not provided with an appraisal report for the Property.

#### **3.6 Owner, Property Manager and Occupant Information**

According to the City of Detroit General Property Information sheet, the Property is owned by City of Detroit – P&DD.

#### **3.7 Reason for Performing Phase I ESA**

This Phase I ESA is being conducted to satisfy due diligence requirements.

## **4.0 RECORDS REVIEW**

### **4.1 Standard Environmental Record Sources**

KES ordered a government records search for the Property from Environmental Data Resources, Inc. (EDR) in Shelton, Connecticut. A copy of the EDR Radius Map Report with GeoCheck®, dated December 4, 2017, is included in Appendix H. A description of the databases, search distances and results are presented in the report.

#### **4.1.1 Federal Databases**

The Property does not appear in any of the federal or state databases searched by EDR. However, it should be noted that two “Auto Repair” shops are identified at different portions of the Subject Property in Historical Sanborn Maps. On the 1921 Sanborn Map, an “Auto Repair Shop” is identified at the northern-central portion of the Property at 939½ Selden Street. Additionally, another “Auto Repair Shop” is identified on the 1921 Sanborn Map at the eastern-central portion of the Property at 3656½ Fourth Street. This facility is also identified on the 1950 Sanborn Map. By the 1953 Sanborn Map, the structure at 3656½ Fourth Street is identified as “Metal Products Factory.” The presence of these historical auto repair sites and the metal factory represents environmental risk to the Subject Property.

#### National Priorities List

No National Priorities List (NPL) sites were identified within a 1-mile radius of the Property.

No delisted NPL sites were identified within a 1-mile radius of the Property.

#### Superfund Enterprise Management System (SEMS)

No Superfund Enterprise Management System (SEMS) sites were identified within a 1/2-mile radius of the Property.

#### Superfund Enterprise Management System Archive (SEMS – ARCHIVE)

No Superfund Enterprise Management System Archive (SEMS – ARCHIVE) sites were identified within a 1/2-mile radius of the Property.

### Resource Conservation and Recovery Information System

No RCRA CORRACTS (corrective action) sites were identified within a 1-mile radius of the Property. RCRA CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

No RCRA-TSDF (treatment, storage and disposal) facilities were identified within a 1/2-mile radius of Property.

No RCRA-LQG large-quantity generator sites were identified within a 1/2-mile radius of the Property. RCRA-LQG sites are generally sites that generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

One RCRA-SQG (small-quantity generator) site was identified within a 1/2-mile radius of the Property. RCRA-SQG sites are generally sites that generate between 100 kg and 1,000 kg of hazardous waste per month. The RCRA-SQG site closest to the Property is the Campus Collision Inc. site at 665 Selden Street, which is located approximately 405 feet northeast (side gradient) of the Property. This site was designated a RCRA-SQG site that produced ignitable waste on January 11, 2011. Historically, this site was listed as a SQG site that produced ignitable waste on November 17, 1986, and as a verified non-generator site that produced ignitable waste on December 31, 2001. No violations were found at the site. The Campus Collision Inc. site is located at a distance too far to be considered an environmental risk to the Property. Therefore, this RCRA-SQG site represents minimal environmental risk to the Property.

No RCRA-CESQG (conditionally exempt small generator) sites were identified within a 1/4-mile radius of the Property. RCRA-CESQG sites are generally sites that generate less than 100 kg of hazardous waste per month.

Five RCRA-NonGen/NLR sites were identified within a 1/4-mile radius of the Property. This database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste. The following is a list of the three RCRA-NonGen/NLR sites located within a 1/8-mile radius of the Property:



EDR ID#	Name	Address	Distance/Direction	Status
A4	City of Detroit	3904 Fourth Street	<1/8 Mile North	RCRA-NonGen/NLR
7	Detroit Schools	3550 John C Lodge Freeway	<1/8 Mile South-Southeast	RCRA-NonGen/NLR
18	MI Dept/Transportation	M-10 under Selden Street	<1/8 Mile West-Northwest	RCRA-NonGen/NLR

The RCRA-NonGen/NLR sites closest to the Property are the City of Detroit site (3904 Fourth Street) and the Detroit Schools site (3550 John C Lodge Freeway). The City of Detroit site at 3904 Fourth Street is located adjacent to the north (up gradient) of the northeastern portion of the Property, across Selden Street. This site was designated a RCRA-NonGen/NLR site that produces ignitable waste on August 18, 2006. This site has no historical generator statuses and no notice of any RCRA violations; the City of Detroit site is not listed in any additional environmental databases. However, records provided by the City of Detroit Fire Department included a City of Detroit Buildings & Safety Engineering Department document (dated December 22, 1937) for installation of one 1,000-gallon gasoline storage tank. The site is identified as McGarrys Service Station. In addition, a City of Detroit Buildings & Safety Engineering Division of Inflammable Liquids Department inspection report (January 7, 1938) for Selden Service Station was also provided. A site sketch is included which shows two 1,000-gallon gasoline tanks. The tanks are shown to be located side-by-side, approximately 20 feet north of Selden Avenue and 20 feet west of Fourth Avenue. Comments in the inspection report indicated that the USTs were buried three feet below ground surface (BGS). Because this site is located adjacent to the Subject Property and records indicate the historical presence of an automotive service station with one 1,000-gallon gasoline UST, this site (3904 Fourth Street) represents environmental risk to the Property.

The Detroit Schools site at 3550 John C Lodge Freeway is located adjacent to the south-southeast (down gradient) of the Property. This site (EPA ID: MIK975151754) was designated a RCRA-NonGen/NLR site that produces ignitable waste on August 12, 2010. Historically, this site was designated a SQG site that produced ignitable waste on August 8, 2005. This site has no notice of any RCRA violations and is not listed in any additional environmental databases. The site does not presently generate hazardous waste, has no notice of past or current RCRA violations, and is not listed in any additional environmental databases. Although this site is located adjacent to the Subject Property, this site is located approximately 50 feet south of the Property beyond an area

which was an abandoned street (Brainard Street). The former Brainard Street road sub-grade, potential utility corridors, and building foundations can act to inhibit the possible hazardous substance migration onto the Property. Therefore, this sites and the remaining RCRA-NonGen/NLR sites represent minimal environmental risk to the Property.

Emergency Response Notification System Data

No Emergency Response Notification System (ERNS) sites were identified in the database.

Federal Institutional Control/Engineering Control Registry

No federal institutional control/engineering control registries sites were identified within a 1/2-mile radius of the Property.

Federal Brownfield Sites

Three Federal Brownfield (US BROWNFIELDS) sites were identified within a 1/2-mile radius of the Property. Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. The following is a list of Federal Brownfield sites within a 1/2-mile radius of the Property:

EDR ID#	Name	Address	Distance/Direction	Status
O58	Weber Block 7	Second and West Willis	1/4-1/2 Mile North-Northeast	US BROWNFIELDS
Y103	Corktown Development	331 & 3401 Trumbull Avenue	1/4-1/2 Mile Southwest	US BROWNFIELDS
124	4625 Second Avenue, LLC	4625 Second Avenue	1/4-1/2 Mile North	US BROWNFIELDS

The US BROWNFIELDS site closest to the Property is the Weber Block 7 site at “Second and West Willis,” which is located approximately 1,644 feet north-northeast (side gradient) of the Property. This site is a 1.7-acre site that received an assessment grant for a Phase I ESA on June 30, 2001; the recipient of the grant is listed as Wayne County Brownfield Redevelopment Authority. No additional pertinent information is provided in the EDR Report regarding this site’s inclusion in the US BROWNFIELDS database. The Weber Block 7 site and the remaining US BROWNFIELDS sites are located at distances too far to be considered an environmental risk to the Property.

Therefore, these US BROWNFIELDSD sites represent minimal environmental risk to the Property.

#### **4.1.2 State Databases**

Tribal records are not applicable to this investigation.

##### State Hazardous Waste Sites

No State Hazardous Waste Sites (SHWS) were identified within a 1-mile radius of the Property.

##### Delisted State Hazardous Waste Sites

No Delisted State Hazardous Waste Site (SHWS) was identified within a 1-mile radius of the Property.

##### Landfill/Solid Waste Disposal

No state or tribal landfill or Solid Waste Landfill (SWF) sites were identified within a 1/2-mile radius of the Property.

##### Historical Landfill/Solid Waste Disposal Sites

No Michigan Historical Landfill/Solid Waste Disposal Sites (MI HIST LF) were identified within a 1/2-mile radius of the Property.

##### State Brownfield Sites

One State Brownfield (MI BROWNFIELDSD) site was identified within a 1/4-mile radius of the Property. MI BROWNFIELDSD sites are all state funded Part 201 and 213 sites, as well as LUST sites that have been redeveloped by private entities using the BEA process. The MI BROWNFIELDSD site closest to the Property is the Geri's Auto Service site at 3574 Second Avenue, which is located approximately 1,169 feet east (cross gradient) of the Property. This site (Facility ID: 00015274) has an Ernie ID Number of 82001810. No additional information is provided in the EDR Report regarding this site's inclusion in the MI BROWNFIELDSD database. The Geri's Auto Service site is located at a distance too far to be considered an environmental risk to the Property. Therefore, this MI BROWNFIELDSD site represents minimal environmental risk to the Property.

##### Leaking Underground Storage Tank List

Twenty-three Michigan Leaking Underground Storage Tank (LUST) sites were identified within a 1/2-mile radius of the Property. The following is a list of the two LUST sites located within a 1/4-mile radius of the Property:

EDR ID#	Name	Address	Distance/Direction	Status
G27	Woodbridge Estates	3521 John C Lodge Freeway	1/8-1/4 Mile South-Southwest	Site Closed
J39	Geri's Auto Service	3574 Second Avenue	1/8-1/4 Mile East	Site Closed

The LUST sites closest to the Property are the Woodbridge Estates site (3521 John C Lodge Freeway) and the Geri's Auto Service site (3574 Second Avenue). The Woodbridge Estates site at 3521 John C Lodge Freeway is located approximately 874 feet south-southwest (side gradient) of the Property. On February 6, 2004, a confirmed release of gasoline (Leak Number: C-0073-04) was reported at this site; this release was listed as "closed" on September 8, 2004.

The Geri's Auto Service site at 3574 Second Avenue is located approximately 1,169 feet east (cross gradient) of the Property. On May 21, 2001, a confirmed release of gasoline (Leak Number: C-0318-01) was reported at this site; this release was listed as "closed" on January 31, 2002. The Woodbridge Estates site, Geri's Auto Service site, and the remaining LUST sites are located at distances too far to be considered an environmental risk to the Property. Therefore, these LUST sites represent minimal environmental risk to the Property.

#### Registered Underground Storage Tank List

Two Registered Underground Storage Tank (UST) sites were identified within a 1/4-mile radius of the Property.

EDR ID#	Name	Address	Distance/Direction	Status
G27	Woodbridge Estates	3521 John C Lodge	1/8-1/4 Mile South-Southwest	Site Closed
J39	Geri's Auto Service	3574 Second Avenue	1/8-1/4 Mile East	Site Closed

The UST sites closest to the Property are the Woodbridge Estates site (3521 John C Lodge Freeway) and the Geri's Auto Service site (3574 Second Avenue). The Woodbridge Estates site at 3521 John C Lodge Freeway is located approximately 874 feet south-southwest (side gradient) of the Property. According to the EDR Report, one 4,000-gallon gasoline UST was removed from this site on February 6, 2004. This site (Facility ID: 00041497) is a "Closed" facility.

The Geri's Auto Service site at 3574 Second Avenue is located approximately 1,169 feet east (cross gradient) of the Property. According to the EDR Report, six USTs (three 6,000-gallon gasoline USTs, two 1,000-gallon gasoline USTs, and one 500-gallon gasoline UST) were removed from this site on May 21 & 22, 2001. This site (Facility ID: 00015274) is a "Closed" facility. The Woodbridge Estates site, Geri's Auto Service site, and the remaining LUST sites are located at distances too far to be considered an environmental risk to the Property. Therefore, these LUST sites represent minimal environmental risk to the Property.

Aboveground Storage Tank List

One Aboveground Storage Tank (AST) site was identified within a 1/2-mile radius of the Property. The AST site closest to the Property is the Airgas USA LLC site at 666 Selden Street, which is located approximately 835 feet northeast (side gradient) of the Property. According to the EDR Report, this site (Facility ID: 92082530) formerly contained one 1,000-gallon AST; the substance stored is listed as "other." This tank (Tank ID: ATK-053328-15) was originally installed on July 26, 1994. On June 14, 2011, the tank was "Emptied and Cleaned." No additional information is provided for this site regarding its inclusion in the AST database. The Airgas USA LLC site is located at a distance too far to be considered an environmental risk to the Property. Therefore, this AST site represents minimal environmental risk to the Property.

Inventory of Facilities Sites

Fifty-eight Inventory of Facilities sites (INVENTORY) were identified within a 1/2-mile radius of the Property. These are facilities under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA), Part 213, Leaking Underground Storage Tanks of the NREPA; BEA Facilities pursuant to part 201 or Part 213 of the NREPA. The following is a list of the eleven INVENTORY sites located within a 1/4-mile radius of the Property.

EDR ID#	Name	Address	Distance/Direction	Status
E22	Third Avenue Garage	3946-3960 Third Street	1/8-1/4 Mile North-Northeast	BEA Site
F28	644 Selden Street	644 Selden Street	1/8-1/4 Mile Northeast	BEA Site
H29	Caffrey Enterprises	3484 Third Street	1/8-1/4 Mile Southeast	BEA Site
H30	Caffrey Enterprises	3484 Third Street	1/8-1/4 Mile Southeast	Part 201 Site

EDR ID#	Name	Address	Distance/Direction	Status
F31	Building	634 Selden Street	1/8-1/4 Mile Northeast	BEA Site
H33	Caffrey Enterprises	687 & 697 Myrtle Street	1/8-1/4 Mile Southeast	BEA Site
34	3423 Third Street	3423 Third Street	1/8-1/4 Mile Southeast	BEA Site
I35	Selden Gardens, LLC	3921-3929 Second Avenue	1/8-1/4 Mile Northeast	BEA/Part 201 Site
I36	Selden Gardens, LLC	3921-3929 Second Avenue	1/8-1/4 Mile Northeast	BEA Site
37	Not Reported	632-660 Brainard Street	1/8-1/4 Mile East-Northeast	Part 201 Site
K43	The Green Garage, LLC	636-640 & 646 West Alexandrine Street	1/8-1/4 Mile North-Northeast	BEA Site

The INVENTORY site closest to the Property is the Third Avenue Garage site at 3946-3960 Third Street, which is located approximately 746 feet north-northeast (side gradient) of the Property. This site is listed in the INVENTORY database as a BEA site (BEA Number: 200101337LV). No additional information is provided for this site regarding its inclusion in the INVENTORY database. The Third Avenue Garage site and the remaining Inventory of Facilities sites are all located at distances too far to be considered an environmental risk to the Property. Therefore, these sites represent minimal environmental risk to the Property.

#### MI Part 201 Sites

Two MI Part 201 sites were identified within a 1-mile radius of the Property. A Part 201 Listed site is a location that has been evaluated and scored by the DEQ using the Part 201 scoring model. The Part 201 site closest to the Property is the Geri's Auto Service site at 3574 Second Avenue, which is located approximately 1,169 feet east (cross gradient) of the Property. On June 24, 2004, this site received a SAM Score (Selected Analytical Methods for Environmental Remediation and Recovery) of 17; Source is identified as "Gasoline Service Station"; pollutants were "Not Reported." No additional information is provided for this site regarding its inclusion in the Part 201 database. The Geri's Auto Service site and the remaining Part 201 site are located at distances too far to be considered an environmental risk to the Property. Therefore, these MI Part 201 sites represent minimal environmental risk to the Property.

#### Delisted Part 201 Sites

No Delisted Part 201 sites were identified within a 1-mile radius of the Property.

### State Record of Decision (ROD)

No state ROD sites were identified within a 1-mile radius of the Property.

### CONSENT Sites

No state CONSENT sites were identified within 1-mile of the Property.

### State Institutional Control/Engineering Control Registry (AUL)

Three state institutional control/engineering control registries sites were identified within a 1/2-mile radius of the Property. The following is a list of the AUL sites located within a 1/2-mile radius of the Property:

EDR ID#	Name	Address	Distance/ Direction	Status
80	Amoco Oil Co.	3531 Grand River Avenue	1/4-1/2 Mile Southwest	Recorded – Commercial III Land Use Restriction, Site Specific Restrictions, Groundwater Consumption Restrictions, Special Building Restrictions, Excavation and Soil Movement Restrictions, Exposure Barrier in Place
97	Former Continental Baking Co.	2930 Brooklyn Avenue	1/4-1/2 Mile South	Recorded – Commercial IV Land Use Restriction
AA110	Amoco Oil Co.	2800 Grand River Avenue	1/4-1/2 Mile South	Pending

The AUL site closest to the Property is the Amoco Oil Co. site at 3531 Grand River Avenue, which is located approximately 2,044 feet southwest (side gradient) of the Property. This site has a Restrictive Covenant that was recorded on May 22, 2003, with the following restrictions in place: Commercial III Land Use Restriction, Site Specific Restrictions, Groundwater Consumption Restrictions, Special Building Restrictions, Excavation and Soil Movement Restrictions, and Exposure Barrier in Place. The Amoco Oil Co. site and the remaining AUL sites are located at distances too far to be considered an environmental risk to the Property. Therefore, these AUL sites represent minimal environmental risk to the Property.

### EDR High Risk Historical Records

EDR classifies three databases as "High Risk Historical Records", or HRHR. These databases include the Manufactured Gas Plant database, the Historical Auto Station database, and the Historical Cleaner database.

No Manufactured Gas Plant (MGP) sites were identified within a 1/4-mile radius of the Property in the HRHR portion of the EDR Report. The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers.

In addition to one located on the Subject Property, ten Historical Auto Station sites were identified within a 1/8-mile radius of the Property. EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. The following is a list of the Historical Auto Station sites within a 1/8-mile radius of the Property:

EDR ID#	Name	Address	Distance/Direction	Status
A5	Selden Avenue Garage	824 Selden Street	<1/8 Mile North	Historical Auto Station 1921-1940
3	Erwin Remelius	991 Selden Street	<1/8 Mile West-Northwest	Historical Auto Station 1931
B6	Standard Oil Co.	1011 Fourth Street	<1/8 Mile Southeast	Historical Auto Station 1931-1935
B9	Paul Sciberras	1280 Fourth Street	<1/8 Mile Southeast	Historical Auto Station 1931
B10	Lee Bros.	730 Fourth Street	<1/8 Mile Southeast	Historical Auto Station 1926
B11	Charles B Wilson	2322 Fourth Street	<1/8 Mile Southeast	Historical Auto Station 1921
B12	All Car Garage	1020 Fourth Street	<1/8 Mile Southeast	Historical Auto Station 1931
D14	M MacDaniel	3909 Third Street	<1/8 Mile North-Northeast	Historical Auto Station 1921
D15	Frank E Marshall	711 Selden Street	<1/8 Mile North-Northeast	Historical Auto Station 1935-1965
20	Economy Auto Service	1220 Frank Avenue	<1/8 Mile Northwest	Historical Auto Station 1935
E21	John J Beighton	3940 Third Street	<1/8 Mile North-Northeast	Historical Auto Station 1931-1940

The Historical Auto Station sites closest to the Property are the Selden Avenue Garage site (824 Selden Street), Erwin Remelius site (991 Selden Street), and the Standard Oil Co. site (1011 Fourth Street). The Selden Avenue Garage site at 824 Selden Street is located adjacent to the north (up gradient) of the northeast corner of the Property, across Selden Street. This site is listed as a Historical Auto Station site for the years 1921 (Otto J Palmer), 1926 and 1931 (Selden Avenue Garage, and 1940 (Selden Automotive Service). Additionally, according to Sanborn Maps, this site was occupied



by an auto repair shop, which included a 1,000-gallon gasoline UST along the north side of Selden Street, from at least 1919 until at least 2002. Since the Selden Avenue Garage site is located adjacent to the Property and the status of the UST is unknown, this site represents environmental risk to the Subject Property.

The Erwin Remelius site at 991 Selden Street was located adjacent to the west-northwest (cross gradient) of the Property. This site is listed as a Historical Auto Station site for the year 1931. This site does not appear on the Sanborn Maps and the site is not listed in any other environmental database. The location of this site is the current location of the John C Lodge Freeway. As mentioned previously, the elevation of the John C Lodge Freeway is approximately 20 feet below ground surface level (lower than the elevation of the Subject Property). When the John C Lodge Freeway was constructed, the area of the Erwin Remelius site would have been excavated and it is likely that any impacts from the former Historical Auto Station at that site would have been removed at that time. Therefore, this site represents minimal environmental risk to the Subject Property.

The Standard Oil Co. site at 1011 Fourth Street is located approximately 455 feet southeast (side gradient) of the Property. According to the EDR Report, this site is listed as a Historical Auto Station site for the years 1931 and 1935 under the name Standard Oil Co. This site is not identifiable on any of the Sanborn Maps and does not appear in any other environmental database. The Standard Oil Co. site, and the remaining Historical Auto Station sites are located at distances too far to be considered an environmental risk to the Property. Therefore, these Historical Auto Station sites represent minimal environmental risk to the Property.

Seven Historical Cleaner sites were identified within a 1/8-mile radius of the Property. These are potential dry cleaners, cleaners, laundry, and cleaning/laundry sites that were available to the EDR researchers in selected business directories. The following is a list of the Historical Cleaner sites within a 1/8-mile radius of the Property:

EDR ID#	Name	Address	Distance/Direction	Status
1	Parisian Tailoring Co.	816 Tuscola Street	<1/8 Mile Northeast	Historical Cleaner 1940-1956
2	Joseph Weinstein	3643 Third Street	<1/8 Mile East	Historical Cleaner 1926-1940

EDR ID#	Name	Address	Distance/Direction	Status
B8	Elmer Lancaster	1448 Fourth Street	<1/8 Mile Southeast	Historical Cleaner 1926
C13	Third Street Laundromat	3557 Third Street	<1/8 Mile East- Southeast	Historical Cleaner 1965
D16	On Wing	3912 Third Street	<1/8 Mile North- Northeast	Historical Cleaner 1926-1956
C17	Leveck Lace Curtain	3547 Third Street	<1/8 Mile East- Southeast	Historical Cleaner 1931
19	Theo Nyman	693 Selden Street	<1/8 Mile Northeast	Historical Cleaner 1926

The Historical Cleaner sites closest to the Property are the Parisian Tailoring Co. site (816 Tuscola Street) and the Joseph Weinstein site (3643 Third Street). The Parisian Tailoring Co. site at 816 Tuscola Street was located adjacent to the east (cross gradient) of the eastern-central portion of the Property. According to the EDR Report, this site is listed as a Historical Cleaner site for the years 1940 (Parisian Tailoring Co.) and 1956 (Louis Miahlas). On Sanborn Maps, this site is only shown as a storefront; specific occupant is not identified. Since this site is located adjacent to the Subject Property and listed as a Historical Cleaner site, this site represents environmental risk to the Subject Property.

The Joseph Weinstein site at 3643 Third Street was located approximately 376 feet east (down gradient) of the Property. According to the EDR Report, this site is listed as a Historical Cleaner site under the name Joseph Weinstein for the years 1926 through 1940. On historical Sanborn Maps, this site is only shown as a storefront; specific occupant is not identified. The Joseph Weinstein site and the remaining Historical Cleaner sites are located at distances too far to be considered an environmental risk to the Property. Therefore, these Historical Cleaner sites represent minimal environmental risk to the Property.

#### Baseline Environmental Assessments (BEA)

Twenty-four BEA sites were identified within a 1/2-mile radius of the Property. The following is a list of the six BEA sites located within a 1/4-mile radius of the Property:

EDR ID#	Name	Address	Distance/Direction	Category/Status
E23	Third Avenue Garage	3946-3960 Third Street	1/8-1/4 Mile North- Northeast	No Hazardous Substances
H32	Caffrey Enterprises	687 and 697 Myrtle Street	1/8-1/4 Mile Southeast	Not Reported

EDR ID#	Name	Address	Distance/Direction	Category/Status
I35	Selden Gardens, LLC	3921-3929 Second Avenue	1/8-1/4 Mile Northeast	Not Reported
41	University Lofts LLC	627-637 West Alexandrine Street	1/8-1/4 Mile North-Northeast	No Hazardous Substances
K42	The Green Garage, LLC	636-640 & 646 West Alexandrine Street	1/8-1/4 Mile North-Northeast	Not Reported
44	Detroit Medical Center	Second and Myrtle	1/8-1/4 Mile East	No Hazardous Substances

The BEA site closest to the Property is the Third Avenue Garage site at 3946-3960 Third Street, which is located approximately 746 feet north-northeast (side gradient) of the Property. A BEA (BEA Number: 200101337LV) was received for this site by the MDEQ on January 16, 2001. The category of the BEA was “Category N” (No Hazardous Substances). No additional pertinent information is provided in the EDR Report regarding this site’s inclusion in the BEA database. The Third Avenue Garage site and the remaining BEA sites are located at distances too far to be considered an environmental risk to the Property. Therefore, these sites represent minimal environmental risk to the Property.

#### Voluntary Cleanup Sites

No voluntary cleanup sites were identified within a 1/2-mile radius of the Property.

#### Orphan Sites

Five orphan sites were identified in the EDR report. These are sites that cannot be located on a map by EDR’s mapping software.

### **4.2 Additional Environmental Record Sources**

#### Michigan Oil & Gas Wells

Records indicate that no United States Geological Survey (FED USGS) wells, state database wells (MI WELLS), or oil and gas wells (OIL/GAS) are located within a 1-mile radius of the Property.

One Federal Public Water Supply System Information (FRDS PWS) well is located within a 1-mile radius of the Property. The closest FRDS PWS well to the Property is located between 1/2 and 1-mile west (cross gradient) of the Property. According to the EDR Report, this well (PWS ID: MI6320951) is a groundwater well for the John F Ivory Moving Company. No violations were reported for the well. This FRDS PWS well is

located at a distance too far to be considered an environmental risk to the Property. Therefore, this well represents minimal environmental risk to the Property.

#### State, County and Municipal Records

KES requested information from the Wayne County Health Department and City of Detroit offices regarding the Property and adjoining properties. The City of Detroit Assessment Department provided records for the Subject Property. The following is a summary of the Assessment Department records:

#### 901 Selden Street (Subject Property)

- Records included a general information sheet for the Property, which identified the Property as owned by City of Detroit – P&DD. According to the Property information record, the assessed value, taxable value, and state equalized value of the Property for the 2017 tax year is listed as \$0. Additional information provided in the Property Information record includes Total Acreage (7.03 acres); Land Improvements (\$35,134); and Zoning Code (SD2 – Special Development District).

Copies of the assessment records are included in Appendix B.

KES requested information from the Wayne County Health Department for the Subject Property and adjacent properties. A response was received by KES on December 21, 2017, from Mr. Patrick Cullen, FOIA Officer for the Wayne County Health Department. Mr. Cullen indicated that “after a diligent search for the requested records, we have determined and certify the records do not exist.” No additional information was provided. Copies of the information request letter submitted by KES and the response provided by the Wayne County Health Department records are included in Appendix G.

KES personnel requested information from the City of Detroit Fire Department in regard to the Subject Property and adjacent properties. No records were provided for the Subject Property. However, records were provided for four adjacent properties. The following is a summary of the records:

#### 3550 John C Lodge (located adjacent to the south of the Subject Property)

- A City of Detroit Fire Department inspection report dated November 2, 1995, which identified the site as occupied by Dewey Center. No violations were noted.

- A Certificate of Steam Boiler Inspection dated August 25, 2000, which identified the site as occupied by Detroit Public Schools – Dewey Center. According to the inspection, the building was built in 1998; the boiler was approved.
- An Inspection Report dated September 28, 2004, which identified the site as occupied by Detroit Public Schools – Dewey. No violations were noted.

824 Selden Street (located adjacent to the north of the Subject Property across Selden Street)

- A City of Detroit Boiler Inspection report dated May 6, 1918, which identified the site as occupied by Selden Avenue Garage. According the report, one 1,000-gallon UST was listed at the site, at the southern site boundary along Selden Street. No aboveground storage tanks were listed at the site.
- A City of Detroit Department of Safety Engineering inspection report dated February 25, 1921, which identified the site as occupied by Peerless Garage. According to the report, the site was used for ‘welding, cutting, etc’.
- A City of Detroit Fire Department violation notice dated December 6, 1951. The violation notice indicated to ‘remove out of use gasoline tank from ground. Tanks are still in ground alongside dwelling’. Reportedly, the tank was permanently abandoned.
- A Detroit Fire Department inspection report dated August 21, 1970. The site was listed as occupied by Whitey’s Glass service, a 1,120-square foot repair garage.
- A Detroit Fire Marshall Division document dated October 27, 1978. The site was listed as formerly occupied by a repair garage. The document indicated to ‘verify if garage is still vacant’.

3904 Fourth Street (located adjacent to the north of the Subject Property across Selden Street)

- A City of Detroit Buildings & Safety Engineering Department document dated December 22, 1937 for installation of one 1,000-gallon gasoline storage tank. The site is identified as McGarrys Service Station.

- A City of Detroit Buildings & Safety Engineering Division of Inflammable Liquids Department inspection report dated January 7, 1938 for Selden Service Station. A site sketch is included which shows two 1,000-gallon gasoline tanks. The tanks are shown to be located side-by-side, approximately 20 feet north of Selden Avenue and 20 feet west of Fourth Avenue. Comments in the inspection report indicated that the USTs were buried three feet below ground surface (BGS); connected by galvanized piping; and 'OK at 5 pounds air pressure'; Installation was listed as approved subject to final inspection of pumps and equipment.

3645 Third Street (located adjacent to the east of the Subject Property)

- A Detroit Fire Department Fire Marshall Division Inspection Report dated November 13, 1985, which identified the site as Third Avenue Hardware Company. The site was building was listed as one-story, with gas forced air furnace. Inflammable liquids at the site included Class I – 30 gallons, Class II, and Class III – 'used for sale only'.
- A Detroit Fire Department Fire Marshall Division Inspection Report dated April 8, 1992 (Third Avenue Hardware Company). Inflammable liquids at the site included 12 gallons Class I, 8 gallons Class II, and 77 gallons Class III.
- A Detroit Fire Department Fire Marshall Division Inspection Report dated November 20, 1995 (Third Avenue Hardware Company). Inspection report comments indicated 'Fire Inspection/Industrial Floor Area Under 3,001 SQ FT; Retail Package Dealer Under 501 GALS'.

Copies of the records provided by the City of Detroit Fire Department are included in Appendix G.

KES personnel reviewed historic Building Department card records from the City of Detroit Building Department in regard to the Subject Property and pertinent adjacent properties. The following is a summary of the historic Building Department card records associated with the Subject Property:

3650 John C Lodge (formerly western-central portion of Subject Property)

- A Building Department card (#34730) dated February 8, 1960, noting the approval by City Planning Commission for a brick recreation building.

- Building Department cards dated between June 5, 1970 and July 19, 1984 regarding repairs and alterations to the Wigle Recreation Center.

3656 Fourth Street (formerly located at eastern-central portion of Subject Property)

- A Building Department card (#5575) dated April 9, 1919, for the construction of a cement block garage.
- A Building Department card (#85924) to build a one-story addition (5-foot by 46-foot) to existing repair garage; the entire building is then to be used as a machine shop.

3600 Fourth Street (formerly southeast corner of Subject Property)

- A Building Department card (#40926) dated October 19, 1936, noting the completion of a brick factory.
- A Building Department card (#3193) noting the demolition and removal of block & brick factory building.

925-975 Selden Street (formerly northwestern portion of Subject Property)

- Building Department cards dated between June 9, 1945 and February 15, 1954 noting the demolition and removal of several residential structures formerly occupying the northwestern portion of the Property.

Copies of the City of Detroit Building Department card records are provided in Appendix F.

Prior Environmental Investigations

KES requested information from the DEQ in regard to the Subject Property and adjacent properties. KES contacted the DEQ Department of Licensing and Regulatory Affairs (LARA) Department as well as the DEQ Remediation and Redevelopment Division (RRD), Resource Management Group Division (RMG), Water Resources Division (WRD), and the Office of Waste Management and Radiological Protection Division (OWMRP). Records were not available for the Subject Property. However, records were not available for the Subject Property or any adjacent properties. Copies of the information request response letters provided by the DEQ are included in Appendix J.

In the opinion of KES, available records provided by the Wayne County Health Department; City of Detroit Offices (Assessment Department); the DEQ; and a review of historical directories, aerial maps, and the EDR Radius Map Report, were sufficient to evaluate environmental conditions at the Property and adjoining properties.

### **4.3 Physical Setting Sources**

A Physical Setting Sources Map, which includes an overlay of the United States Geological Survey (USGS) topographic map (7.5-minute series) for the Detroit West, Michigan quadrangle, which includes the Property, is provided in the EDR report in Appendix H. The Property lies at an elevation of approximately 615 feet above mean sea level (MSL). Topography of the area of the Property generally declines to the south. Regional ground water flow direction usually coincides with regional topography and surface water features. The available hydrogeologic information indicates that the presumed local ground water flow direction could potentially be toward the south in the general direction of the Detroit River.

KES reviewed the U.S. Fish and Wildlife serviced on-line wetland mapper; no wetlands were identified on the Subject Property, any adjacent properties, or in the broader Property vicinity.

The State of Michigan Department of Natural Resources' 1987 *Geology of Michigan* map indicates that the bedrock in the vicinity of the Subject Property consists of Antrim Shale. The EDR Report identifies the geologic information in the general area of the Subject Property as the Middle Devonian Series of the Devonian System and Paleozoic Era. Depth to bedrock was not included on the map or in the EDR Report; nor did KES discover a source indicating the depth of bedrock in the vicinity of the Subject Property.

According to the EDR report (pages A-5 and A-6), the soil component name in the Property vicinity is the Urbanland complex. The soils at the Property are mapped and described as the Urbanland complex. Based on the Wayne County Soil Survey Map from 1974, the Urbanland complex consists of nearly level to gently sloping, somewhat poorly drained soil that formed on lake plains in stratified lacustrine deposits of clay loam and silty clay loam that contain thin lenses of silt, fine sand, and clay. Urbanland soil is typically underlain by fine to coarse grained sand, and silt clay loam. These soils developed on lake plains in stratified lacustrine deposits.



#### **4.4 Historical Use Information on the Property**

KES's historical research included the review of documentation from 1889 through 2017 for the Subject Property and adjacent properties. To evaluate the historical use of the Property, KES contacted (1) City of Detroit personnel, (2) the Property owner, (3) researched Wayne County Health Department records, (4) reviewed historical aerial photographs and Sanborn Maps, and (5) reviewed historical address directories.

##### **4.4.1 Prior Occupancy**

Historically, the Property was densely occupied by several residential duplexes and some associated sheds by approximately 1889. Tuscola Street cut through the central portion of the Property, running east-northeast to south-southwest. Fourth Street cut through the eastern portion of the Property, running north-northwest to south-southeast. In addition, Brainard Street made up the entire southern Property boundary at this time. According to Sanborn Maps, two "Auto Repair" shops were identified at different portions of the Subject Property. On the 1921 Sanborn Map, an "Auto Repair Shop" is identified at the northern-central portion of the Property at 939½ Selden Street. Another "Auto Repair Shop" is identified at the eastern-central portion of the Property at 3656½ Fourth Street. The auto repair shop is also identified on the 1950 Sanborn Map. By the 1953 Sanborn Map, the structure at 3656½ Fourth Street is identified as "Metal Products Factory." Between 1953 and 1957, all structures previously located at the central and western portions of the Property were demolished and removed. By 1961, all remaining structures at the eastern portion of the Property were also demolished. In 1960-61, a brick recreation/community center (Wigle Center – 3650 John C Lodge Freeway) was constructed on the western-central portion of the Subject Property, with a concrete-paved parking area to the east of the building. The remainder of the Property was a grass-covered play area. Between 1997 and 1999, the concrete-paved area east of the building contained two basketball courts and one tennis court. Between 2012 and 2015, the brick recreation/community center building was demolished and removed. Between approximately 2014 and early 2017, the court area was occupied by "The Wig" D.I.Y. skatepark. The Subject Property is now vacant, with the building footprint of the former Wigle Recreation Center and court area still visible at the western-central portion of the Property.

KES reviewed available historical address directories at Bresser's on December 15, 2017, regarding historical occupants of the Subject Property and adjoining properties. The following table is a summary of the historical research:

Year	Addresses					
	901-967 Selden Street/3650 John C Lodge (Property)	3600-3742 Fourth Street (Property)	816-960 Tuscola Street (Property)	824-950 Selden Street (adjacent to the north)	3601-3749 Third Street (adjacent to the east)	3550 John C Lodge (adjacent to the south)
2014	Not Listed	Not Listed	Not Listed	Detroit Midtown Academy/ Experience Academy (950)	DRM Annex (3607)/ Third Ave Hardware (3645)	3550 John C Lodge LLC
2009	Not Listed	Not Listed	Not Listed	Marilyn Lundy Academy (950)	Third Ave Hardware (3645)	Detroit Public Schools
2004	Detroit City Rec Dept.	Not Listed	Not Listed	Detroit Edison Public School (920)	Third Ave Hardware (3645)	Detroit Public Schools
1999	Detroit City Rec Dept.	Not Listed	Not Listed	Jefferson School (950)	Third Ave Hardware (3645)	Detroit Public Schools
1994	Wigle Recreation Center	Not Listed	Not Listed	Jefferson School (950)	Third Ave Hardware (3645)	Couzens Elementary -Middle
1989	Wigle Recreation Center	Not Listed	Not Listed	Jefferson School (950)	Third Ave Hardware (3645)	Couzens Elementary -Middle
1984	Wigle Recreation Center	Not Listed	Not Listed	Jefferson School (950)	Residential (3625)/ Third Ave Hardware (3645)/ Residential (3721, 3733, and 3741 Third)	Detroit School Project Find/ DPS Couzens 1/ Couzens Pre-School/ Elementary
1979	Wigle Recreation Center/ Wigle Ice Rink (3650)	Not Listed	Not Listed	Jefferson School (950)	Residential (3625)/ R&R Confectionary (3639)/ Third Ave Hardware (3645)/ Residential (3741)/ Jacobs Motown Cny.	Detroit SchoolDPS Couzens 1/ Couzens Pre-School
1974	Wigle Park/ Wigle Center (3650)	Not Listed	Not Listed	Jefferson School (950)	Residential (3625)/ Gell Jewelers (3643)/ Third Ave Hardware (3645)/ Shooters Bar (3657)/ Residential (3733 & 3741)/ Jacobs Motown Cny.	Couzens School/Pre-school

Year	901-967 Selden Street/3650 John C Lodge (Property)	3600-3742 Fourth Street (Property)	816-960 Tuscola Street (Property)	824-950 Selden Street (adjacent to the north)	3601-3749 Third Street (adjacent to the east)	3550 John C Lodge (adjacent to the south)
1969	Wigle Center (3650)	Not Listed	Not Listed	Whiteys Glass Service (824)/ Jefferson Junior High School (950)	Olin's Drug Store (3603)/ Residential (3609)/ Jims Bar (3619)/ Surplus Outlet (3639)/ Gell Jewelers (3643)/ Third Ave Hardware (3645)/ Shooters Bar (3657)/ Residential (3731, 3733, & 3741)/ White Tower Restaurant	Couzens School
1964	Wigle Center (3650)	Not Listed	Not Listed	Whiteys Glass Service (824)/ Jefferson Junior High School (950)	Olin's Drug Store (3603)/ Midtown Medical Center (3605)/ Jims Bar (3619)/ Residential (3625)/ Jones Lunch (3633)/ Third Ave Hardware (3645)/ Harrys Bar (3657)/ Doll House (3701)/ Hub Hotel (3705)/ Three E Restaurant (3723)/ Royall Recreation (3727)/ Residential (3733 & 3741)/ Marian House (3737)/ White Tower Restaurant	Couzens School
1959	Not Listed	Not Listed	Not Listed	Whiteys Glass Service (824)/ Jefferson Junior High School (950)	Olin Drug Store (3603)/ Doctors (3605)/ Union Surplus (3609)/ Jims Bar (3619)/ Jims Party Store (3639)/ Third Ave Hardware (3645)/ Angelo's Bar (3657)/ Ella's Bargain Shop (3663)/ Hub Furniture Co. (3701)/ Hub Hotel (3705)/ Edolite Prod. Co. (3717)/ Residential (3731 & 3741)/ Chamber Chili (3737)/ White Tower	Couzens
1954	Not Listed	Electric Watson/ Harry D Osgood & Co. (3600)/ W Hallen Mtl. Prod. (3656). Residential (3605, 3615, 3618, 3631, 3638, 3662, 3700, 3721, 3735, 3741, 3742 Fourth)	Residential (816, 931, 934, 936, & 942 Tuscola)	Jefferson (950)	Olin Drug Store (3603)/ Doctors (3605)/ Residential (3615)/ Jims Bar (3619)/ Beat Em All Rest. (3633)/ Residential (3639 & 3643)/ Third Ave Hardware (3645)/ Angelo's Bar (3657)/ Residential (3659)/ Third Avenue Hotel (3705)/ Shamrock Bar (3707)/ Bernstein Dept. Store (3717)/ Ark Surplus Outlet (3733)/ Residential (3741)	Not Listed

Year	901-967 Selden Street/3650 John C Lodge (Property)	3600-3742 Fourth Street (Property)	816-960 Tuscola Street (Property)	824-950 Selden Street (adjacent to the north)	3601-3749 Third Street (adjacent to the east)	3550 John C Lodge (adjacent to the south)
1949	Residential (927, 933, 941, 957, 961, and 963 Selden)	Watson - electrician/ Harry D Osgood & Co. (3600)/ <b>Ashton Wreckers/ Carson Auto Sales (3656)</b> /Res. (3605, 3611, 3618, 3627, 3628, 3631, 3637, 3638, 3645, 3703, 3721, 3726, 3727, 3730, 3735, 3741, 3742 Fourth)	Residential (819, 917, 924, 926, 931, 934, 941, 942, 947, 950, 955, 959, & 960 Tuscola)	Jefferson Intermediate (950)	Olin Drug Store (3603)/ Doctors (3605)/ Residential (3615)/ Jims Bar (3619)/ Residential (3625 & 3643)/ Third Ave Hardware (3645)/ Angelo's Bar (3657)/ Residential (3659 & 3701)/ Third Avenue Hardware Co. (3701)/ Third Avenue Hotel (3705)/ Shamrock Bar (3707)/ New Belmont Rest. (3723)/ Det. Billiards (3727)/ Coney Island Rest. (3737)/ Residential (3741)/ White Tower Restaurant (3745)	Not Listed

#### 4.4.2 Aerial Photographs

KES reviewed available aerial photographs of the Property provided by EDR for the years 1937, 1949, 1952, 1956, 1961, 1967, 1972, 1981, 1987, 1997, 1999, 2005, 2009, 2010, and 2012. Below is a summary of the provided aerial photographs. Copies of the aerial photographs are provided in Appendix K.

Date of Aerial Photograph	Comments
1937	The Subject Property is densely covered with several residential structures; identification of specific occupants is unavailable. Adjacent properties in all directions and the vast majority of the broader Property vicinity are also occupied by residential structures, with exception of the Jefferson School adjacent to the northwest of the Subject Property, across Selden Street.
1949	Similar to previous aerial photograph – Subject Property appears to be occupied by several single-family and multi-tenant residential structures.
1952	The southwestern portion of the Subject Property is now almost completely vacant, with the exception of one rectangular-shaped apartment building at the far southwestern corner. Development of the John C Lodge Freeway is apparent adjacent to the west of the Property. The areas north, east, and south of the Property appear little-changed from the previous aerial photograph.
1956	The Subject Property west of Fourth Street is now completely vacant, while all structures east of Fourth Street remain. Tuscola Street is visible at the eastern-central portion of the Property, but now ends at Fourth Street. A new large school building (Couzens Public School – 3550 John C Lodge) now stands adjacent to the south of the western portion of the Property. The John C Lodge Freeway is now complete west of the Property, and several new public housing structures are visible beyond to the west.

Date of Aerial Photograph	Comments
1961	An irregular-shaped community building (Wigle Center – 3650 John C Lodge) is visible at the western-central portion of the Property. The remainder of the Subject Property is vacant grass-covered land, including the area east of Fourth Street; Fourth Street no longer cuts through the eastern portion of the Subject Property. The broader Property vicinity appears little-changed.
1967	A paved court or play area is visible east of the community building, at the central-western portion of the Property. Adjacent properties in all directions and the broader Property vicinity all appear little-changed from the previous aerial photograph.
1972	Similar to previous aerial photograph.
1981	Similar to previous aerial photographs – an increase in vacancies is noticeable east and south of the Subject Property.
1987	Similar to previous aerial photographs – vacancies continue north, east, and south of the Subject Property.
1997	Similar to previous aerial photographs.
1999	Similar to previous aerial photographs.
2005	Similar to previous aerial photographs – new residential development is apparent east of the Subject Property.
2009	Similar to previous aerial photographs.
2010	Similar to previous aerial photographs.
2012	Similar to previous aerial photographs.

#### 4.4.3 Sanborn Maps

KES reviewed available Sanborn Maps of the Property provided by EDR for the years 1889, 1987, 1919, 1921, 1950, 1953, 1957, 1961, 1977, 1988, 1991, 1996, and 2002. Below is a summary of the provided Sanborn Map. A copy of the Sanborn Map Report is provided in Appendix L.

Date of Sanborn Map	Comments
1889	The southern portion of the Subject Property and sites located further south are unmapped. The Property is densely occupied by several residential duplexes and some associated sheds. Tuscola Street cuts through the central portion of the Property, running east-northeast to south-southwest. Fourth Street cuts through the eastern portion of the Property, running north-northwest to south-southeast. Brainard Street makes up the entire southern Property boundary. Additional residential duplexes and Crawford Street appear adjacent to the west (in the current location of the John C Lodge Freeway). A mix of properties are located adjacent to the north of the Property, and include several residential and a commercial property (Kelso's Coal Yard – northwest corner of Selden Street and Fourth Street). The Jefferson School is located adjacent to the northwest, at the current location of the John C Lodge Freeway.
1897	The entire Subject Property is shown on the Sanborn Map and includes approximately fifty-three (53) residential duplex structures and associated sheds spread throughout the Subject Property. Occupants of one shed was identified as "Decoy Duck Factory" at 959 Tuscola Street), a wood & coal yard shed was present at the southwest corner of the Property (~968 Brainard Street), and a blacksmith shop was located at the southeast portion (~914 Brainard Street) of the Property. In addition, an unidentified storefront at the southeastern corner (3600 Fourth Street). Adjacent properties to the north, across Selden Street, are now all residential duplexes; the former coal yard no longer is shown on the map. A mix of residential duplexes and commercial storefronts stand adjacent to the east, fronting the west side of Third Street; a mix of residential duplexes and commercial storefronts present adjacent to the south and west. The broader Property vicinity is primarily occupied by residential duplexes; Crawford Street is now identified as Greenwood Avenue.

Date of Sanborn Map	Comments
1919	Similar to previous Sanborn Map – the Subject Property is occupied by several residential structures, with additional residential structures beyond in all directions, with the exception of the Jefferson School to the north-northeast across Selden Street (824 Selden Street, then addressed 206 Selden Street). An auto repair shop with a 1,000-gallon UST is visible at this location.
1921	The Subject Property is still occupied by several residential structures. However, three of the structures are now identified as follows: 939-½ Selden Street at the northern-central portion of the Property is identified as “Auto Repair Shop”; 3656-½ Fourth Street at the eastern-central portion of the Property is identified as “Auto Repair Shop”; and 3651 Fourth Street at the eastern-central portion of the Property is identified as “Printing.” Adjacent properties in all directions appear little-changed from the previous Sanborn Map.
1950	The Subject Property has seen the removal of some of the former residential structures, as well as the remodeling of former duplexes into larger multi-tenant residential apartments. There are now approximately forty-seven (47) residential structures across the Subject Property. The structures at 939-½ Selden Street and 3651 Fourth Street formerly identified as an auto shop and a printer, respectively, have reverted back to residential duplexes. The auto repair shop previously identified at 3656-½ Fourth Street is still identified as an auto repair shop. Additionally, at 3600 Fourth Street (the southeastern corner of the Property) is a large commercial structure identified as “Contractor’s Office & Warehouse.” Several residential structures and Greenwood Avenue (adjacent to the west of the Property) have been removed. The area adjacent to the west of the Property is now identified as the “John C Lodge Highway.” A new large gasoline filling station with three identified USTs is visible east-northeast of the Property at 3778 Third Street.
1953	A number of residential structures that had occupied the southern portion of the Property, south of Tuscola Street, have been removed. The structure at 3656-½ Fourth Street formerly identified as an auto repair shop is now identified as a “Metal Products Factory.” Adjacent properties and the broader Property vicinity appear little-changed from the previous Sanborn Map.
1957	The entire central and western portions of the Property, west of Fourth Street, are now completely vacant; residential structures on the eastern portion of the Property, east of Fourth Street, remain but are identified as vacant and set for removal. Adjacent sites and the broader Property vicinity are little-changed from the previous Sanborn Map, with the exception of a large public school (James Couzens Public School – 3550 John C Lodge), located adjacent to the south of the western portion of the Property. Additionally, new commercial structures are visible adjacent to the east of the Property, fronting the west side of Third Street.
1961	The Subject Property no longer contains any of the former residential structures that had occupied the Property. A new “Community Building” (Wigle Center – 3650 John C Lodge) is now at the western-central portion of the Property. The remainder of the Subject Property is now identified as “Play Grounds.” Fourth Street continues to cut through the eastern portion of the Subject Property; Tuscola Street continues to occupy the eastern-central portion of the Property, but now stops at Fourth Street. Adjacent sites and the broader Property vicinity are little-changed from the previous Sanborn Map.
1977	Similar to 1961 Sanborn Map – one notable exception is that the large gasoline filling station east-northeast of the Property (3778 Third Street) has been demolished and removed, leaving the site vacant.
1988	Similar to previous Sanborn Maps – some of the former structures adjacent to the east along Third Street have been demolished and removed, leaving vacant sites.
1991	Similar to previous Sanborn Maps – additional former structures adjacent to the east along Third Street have been demolished and removed, leaving more vacant sites.
1996	Similar to previous Sanborn Maps.
2002	Similar to previous Sanborn Maps.

#### 4.4.4 Title Search

KES was not provided with title search documents for the Property.

#### 4.5 Historical Use Information on Adjoining Properties

According to aerial photographs and information found from historical research, adjacent properties in all directions were primarily occupied by residential duplexes by

no later than 1889, with the exception of the Jefferson Public School (938 Selden Street) which stood adjacent to the northwest of the Property, across Selden Street. Between 1889 and 1897, a number of commercial storefronts were built adjacent to the east of the Property, fronting the west side of Third Street. By no later than 1919, an auto repair facility (824 Selden Street) containing one 1,000-gallon UST was built north of the eastern portion of the Subject Property, across Selden Street. Between 1921 and 1937, the Jefferson Public School adjacent to the northwest of the Property was significantly expanded. By the late 1940s, a large gasoline filling station was built east-northeast (not adjacent) of the Property. In approximately 1950, residential structures and roads west of the Property were removed in order to construct the John C Lodge Freeway. By no later than 1956, the John C Lodge Freeway was completed adjacent to the west of the Property, with several new public housing structures beyond. Additionally, a new school building (Couzens Public School – 3550 John C Lodge) was built adjacent to the south of the western portion of the Property by no later than 1956. By the early 1970s, vacant properties began occupying sites adjacent to the east and south of the Subject Property, continuing throughout the 1980s and eventually included some of the adjacent properties to the north. Adjacent properties in all directions generally appeared in their current configuration by the mid-1990s.

The northern adjacent properties across Selden Street were primarily residential structures by no later than 1889, with the exception of the Jefferson Public School (938 Selden Street) which stood adjacent to the northwest of the Property, across Selden Street. By no later than 1919, an auto repair facility (824 Selden Street) containing one 1,000-gallon UST stood north of the eastern portion of the Subject Property, across Selden Street. Between 1921 and 1937, the Jefferson Public School adjacent to the northwest of the Property was significantly expanded. During the 1980s, some of the residential structures that had stood adjacent to the north of the Property, across Selden Street, had been demolished and removed.

The southern adjacent properties across Brainard Street were primarily residential structures and a few commercial storefronts by no later than 1897. By no later than 1950, several of the former residential structures south of the Property were demolished and removed. Between 1953 and 1956, the remaining residential structures south of the western portion of the Property were also removed and the Couzens Public School (3550 John C Lodge) was built adjacent to the south of the Property, across Brainard Street. Between 1961 and 1967, the portion of Brainard Street adjacent to the south of

the western portion of the Property had been removed and replaced with grass-covered vacant land.

The eastern adjacent properties were a mix of single-family residential and commercial storefront properties fronting the west side of Third Street by no later than 1897. By the late 1940s, a large gasoline filling station was built east-northeast (not adjacent) of the Property. By no later than 1950, some of the former structures adjacent to the east of the Property were demolished and removed, leaving vacant areas in their place. Vacancies east of the Property continued throughout the 1970s. Adjacent properties to the east conformed to their current configuration by the mid-1990s.

The western adjacent properties were primarily residential structures by no later than 1889. In approximately 1950, residential structures and roads west of the Property were removed in order to construct the John C Lodge Freeway. By no later than 1956, the John C Lodge Freeway was completed adjacent to the west of the Property, with several new public housing structures beyond.



## **5.0 SITE RECONNAISSANCE**

### **5.1 Methodology and Limiting Conditions**

KES inspected the Property on December 15, 2017. Findings reported in this section are based on site observations, review of available documentation, and interviews with persons knowledgeable in the areas of inquiry. No limiting conditions were observed during the site inspection. However, snow covered the ground surface at the majority of the Property at the time of the site inspection.

### **5.2 General Site Settings**

The Subject Property is an irregular-shaped vacant parcel formerly containing the Wigle Recreation Center. The Property is located on the south side of Selden Street, east of the John C Lodge Service Drive in the southeast 1/4 of Section 31 (T1S, R12E) in Detroit, Wayne County Michigan. The building footprint of the former Wigle Recreation Center and basketball courts are still visible at the western-central portion of the Property. The entire northern, eastern, and southern portions of the Subject Property are grass-covered areas which are part of the Wigle Memorial Playground. Public sidewalks mark the northern and western Property boundaries; a concrete-paved alleyway marks the eastern Property boundary. The Property is approximately 7.03 acres in size.

### **5.3 Exterior Observations**

#### **5.3.1 Hazardous Substances and Petroleum Products in Connection with Identified Uses**

No hazardous substances or petroleum products were observed on the exterior areas of the Property.

#### **5.3.2 Hazardous Substance Containers and Unidentified Substance Containers**

No hazardous substance containers or unidentified substance containers were observed on the exterior areas of the Property.

#### **5.3.3 Storage Tanks**

##### *Underground Storage Tanks*

KES did not observe evidence of potential USTs on the Property during the site inspection.

#### *Above Ground Storage Tanks*

KES did not observe evidence of potential ASTs on the Property during the site inspection.

#### **5.3.4 Indications of PCBs**

KES inspected the Property for the presence of equipment that has the potential to contain PCBs, such as electrical transformers, capacitors, and older style fluorescent light ballasts. Two pole-mounted transformers were observed along the eastern Property boundary and one pole-mounted transformer was observed along the western Property boundary. No evidence of spills or leakage was observed near the transformers.

#### **5.3.5 Indications of Solid Waste Disposal**

No indications of solid waste disposal were observed on the Property during the site reconnaissance, with the exception of a minor amount of debris along the eastern Property boundary.

### **5.4 Interior Observations**

#### **5.4.1 Hazardous Substances and Petroleum Products in Connection with Identified Uses**

KES did not observe potentially hazardous substance and petroleum product containers during the site reconnaissance.

#### **5.4.2 Hazardous Substance Containers and Unidentified Substance Containers**

KES did not observe potentially hazardous substance containers or unidentified substance containers during the site reconnaissance.

#### **5.4.3 Storage Tanks**

##### *Underground Storage Tanks*

KES did not observe evidence of potential USTs on the Property during the site inspection.

##### *Above Ground Storage Tanks*

KES did not observe evidence of potential USTs on the Property during the site inspection.

#### **5.4.4 Indications of PCBs**

KES inspected the Property for the presence of equipment that has the potential to contain PCBs, such as electrical transformers, capacitors, and older style fluorescent light ballasts. The Property is vacant, therefore no indications of PCBs were observed.

#### **5.4.5 Indications of Solid Waste Disposal**

No evidence of solid waste disposal was observed on the Property.

## **6.0 INTERVIEWS**

### **6.1 Interview with Owner or Site Manager**

KES did not interview a site owner or manager. KES submitted a User Questionnaire to Mr. Mario Procida, representative of PDH Development Group, LLC. Mr. Procida requested that KES assist in filling out the questionnaire based on the site inspection conducted on December 14, 2017.

### **6.2 Interview with Occupants**

KES did not interview any other occupants of the Property.

### **6.3 Interviews with Local Government Officials**

Conversations with local government officials were limited to requesting assessment, building, and fire department records.

## 7.0 FINDINGS

The Subject Property is an irregular-shaped vacant parcel formerly containing the Wigle Recreation Center at the western-central portion of the Property. Up until recently, “The Wig” skatepark occupied the central portion of the Property. The former Wigle Recreation Center building footprint and basketball courts are still visible at the western-central portion of the Property. The entire northern, eastern, and southern portions of the Subject Property are grass-covered areas which are part of the Wigle Memorial Playground. Public sidewalks mark the northern and western Property boundaries; a concrete-paved alleyway marks the eastern Property boundary. The Property is approximately 7.03 acres in size.

Historically, the Property was densely occupied by several residential duplexes and some associated sheds by no later than 1889. Additionally, Tuscola Street cut through the central portion of the Property, running east-northeast – south-southwest; Fourth Street cut through the eastern portion of the Property, running north-northwest – south-southeast; and Brainard Street made up the entire southern Property boundary at this time. According to Sanborn Maps, two “Auto Repair” shops were identified at different portions of the Subject Property. On the 1921 Sanborn Map, an “Auto Repair Shop” is identified at the northern-central portion of the Property at 939½ Selden Street; additionally, another “Auto Repair Shop” is identified on the 1921 Sanborn Map at the eastern-central portion of the Property at 3656½ Fourth Street. This facility is also identified on the 1950 Sanborn Map. By the 1953 Sanborn Map, the structure at 3656½ Fourth Street is identified as “Metal Products Factory.” Between 1953 and 1957, all structures that had occupied the central and western portions of the Property had been wrecked and removed; by 1961, all remaining structures occupying the eastern portion of the Property had also been removed. In 1960-61, a brick recreation/community center (Wigle Center – 3650 John C Lodge Freeway) was built on the western-central portion of the Subject Property, with a concrete-paved parking area east of the building established shortly after; the rest of the Property was grass-covered play area. Between 1997 and 1999, the concrete-paved area east of the building contained two basketball courts and one tennis court. Between 2012 and 2015, the brick recreation/community center building was wrecked and removed; between approximately 2014 and early 2017, the court area was occupied by “The Wig” D.I.Y. skatepark. The Subject Property is now vacant, with the building footprint of the former Wigle Recreation Center and court area still visible at the western-central portion of the Property.

The Subject Property was not listed in the federal or state databases of the EDR Radius Map Report. However, it should be noted that two “Auto Repair” shops are identified at different portions of the Subject Property in Historical Sanborn Maps. The auto repair shops included the following:

- On the 1921 Sanborn Map, an “Auto Repair Shop” is identified at the northern-central portion of the Property at 939½ Selden Street.
- An “Auto Repair Shop” is identified on the 1921 Sanborn Map at the eastern-central portion of the Property at 3656½ Fourth Street. This facility is also identified on the 1950 Sanborn Map. By the 1953 Sanborn Map, the structure at 3656½ Fourth Street is identified as “Metal Products Factory.” According to historical address directories, Ashton Wreckers/Carson Auto Sales was in operation at 3656 Fourth Street in at least 1949.

In addition, three adjoining properties were listed in the federal or state databases of the EDR Radius Map Report. These adjoining properties included the following:

- The site located at 824 Selden Street is listed as a Historical Auto Station site under the name Selden Avenue Garage. This site was located adjacent to the north of the northeast corner of the Property, across Selden Street. This site is listed as a Historical Auto Station site for the years 1921 (Otto J Palmer), 1926 and 1931 (Selden Avenue Garage, and 1940 (Selden Automotive Service). Additionally, according to Sanborn Maps, this site was occupied by an auto repair shop, which included a 1,000-gallon gasoline UST along the north side of Selden Street, from at least 1919 until at least 2002. Since the Selden Avenue Garage site is located adjacent to the Property and the status of the UST is unknown, this site represents environmental risk to the Subject Property.
- The site located at 816 Tuscola Street is listed as a Historical Cleaner site under the name Parisian Tailoring Company. This site was located adjacent to the east of the eastern-central portion of the Property. This site is listed as a Historical Cleaner site for the years 1940 (Parisian Tailoring Co.) and 1956 (Louis Miahlas). On historical Sanborn Maps, this site is only shown as a storefront; specific occupant is not identified.

- The site located at 3904 Fourth Street is listed as a RCRA-NonGen/NLR site under the name the City of Detroit site. This site is located adjacent to the north of the northeastern portion of the Property, across Selden Street. This site was designated a RCRA-NonGen/NLR site that produces ignitable waste on August 18, 2006. Records provided by the City of Detroit Fire Department included a City of Detroit Buildings & Safety Engineering Department document (dated December 22, 1937) for installation of one 1,000-gallon gasoline storage tank. The site is identified as McGarrys Service Station. In addition, a City of Detroit Buildings & Safety Engineering Division of Inflammable Liquids Department inspection report (January 7, 1938) for Selden Service Station was also provided. A site sketch is included which shows two 1,000-gallon gasoline tanks. The tanks are shown to be located side-by-side, approximately 20 feet north of Selden Avenue and 20 feet west of Fourth Avenue. Comments in the inspection report indicated that the USTs were buried three feet BGS.

Based on the EDR Radius Map Report and records provided by the Detroit Fire Department, Wayne County Health Department, and the DEQ, historical and/or current operations at the Subject Property and the adjacent properties represent environmental risk to the Subject Property. KES recommends additional investigation at this time.

## **8.0 OPINION**

In the professional opinion of KES, an appropriate level of inquiry has been made into the previous ownership and uses of the Property consistent with good commercial and customary practice in an effort to minimize liability. This assessment has revealed recognized environmental conditions (RECs) in connection with the historical operations at the Subject Property and properties located adjacent to the Subject Property. KES recommends additional investigation to address the RECs at this time.



## **9.0 CONCLUSIONS**

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 of 901 Selden Street, Detroit, Wayne County Michigan, collectively referred to as the "Property". Any exceptions to, or deletions from this practice are described in Section 1.4 of this report. This assessment has revealed evidence of recognized environmental conditions (RECs) in connection with the Property and adjoining properties. KES recommends conducting an additional investigation at this time.

## **10.0 DEVIATIONS**

No deletions, deviations or additions to ASTM Practice E 1527-13 have occurred during this assessment.

## **11.0 ADDITIONAL SERVICES**

### *Asbestos-Containing Materials (ACM)*

An ACM inspection was not requested during this Phase I ESA.

### *Lead-Based Paint (LBP)*

A LBP inspection was not requested in the scope of this Phase I ESA.

### *Wetlands*

A wetland delineation was not requested in the scope of this Phase I ESA.

## 12.0 REFERENCES

The following references were used in preparing this Phase I ESA:

- Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E 1527-13
- The EDR Radius Map Report with GeoCheck, December 4, 2017
- EDR Aerial Photograph Decade Package Report, December 4, 2017
- EDR Certified Sanborn Map Report, December 4, 2017
- Detroit Municipal Records
- DEQ Perfected Environmental Liens List

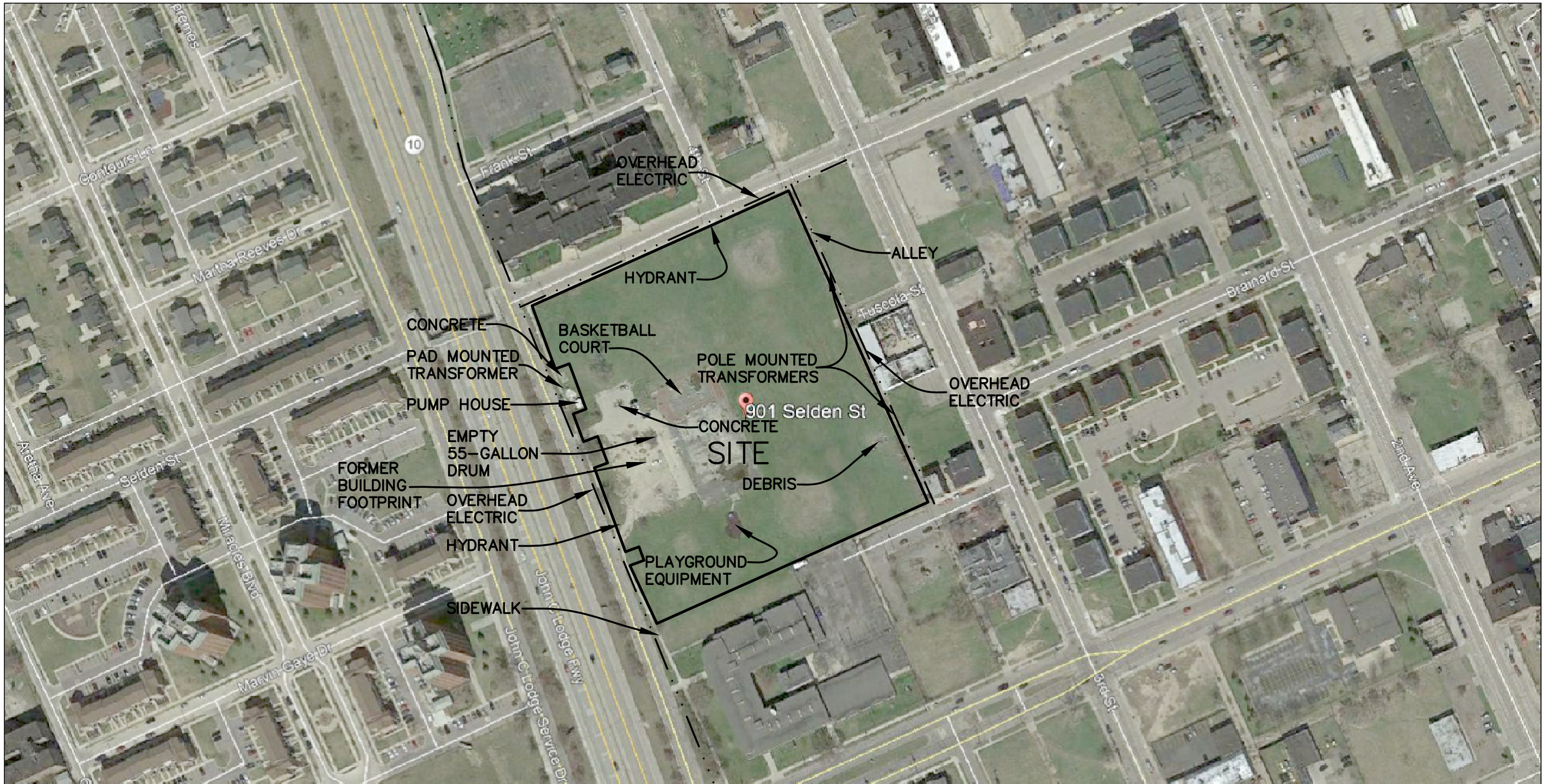
### 13.0 SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S)

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 312.10 of 40 CFR 312.

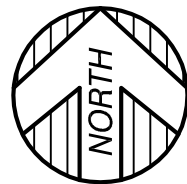
I have the specific qualifications based on education, training and experience to assess a property of the nature, history and setting of the subject property. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Jeffrey Guzick EP  
Site Assessor and Project Manager



SCALE: 1"=200'



**SITE FEATURES MAP**  
 901 SELDEN STREET  
 DETROIT, MICHIGAN 48201



**KEM-TEC ENVIRONMENTAL SERVICES INC.**

22556 GRATIOT AVE. EASTPOINTE, MI 48021  
 PROFESSIONAL ENVIRONMENTAL SCIENTISTS  
 (586)772-2222 \* FAX (586)772-4048

CLIENT:

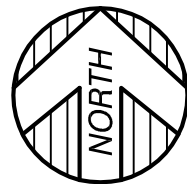
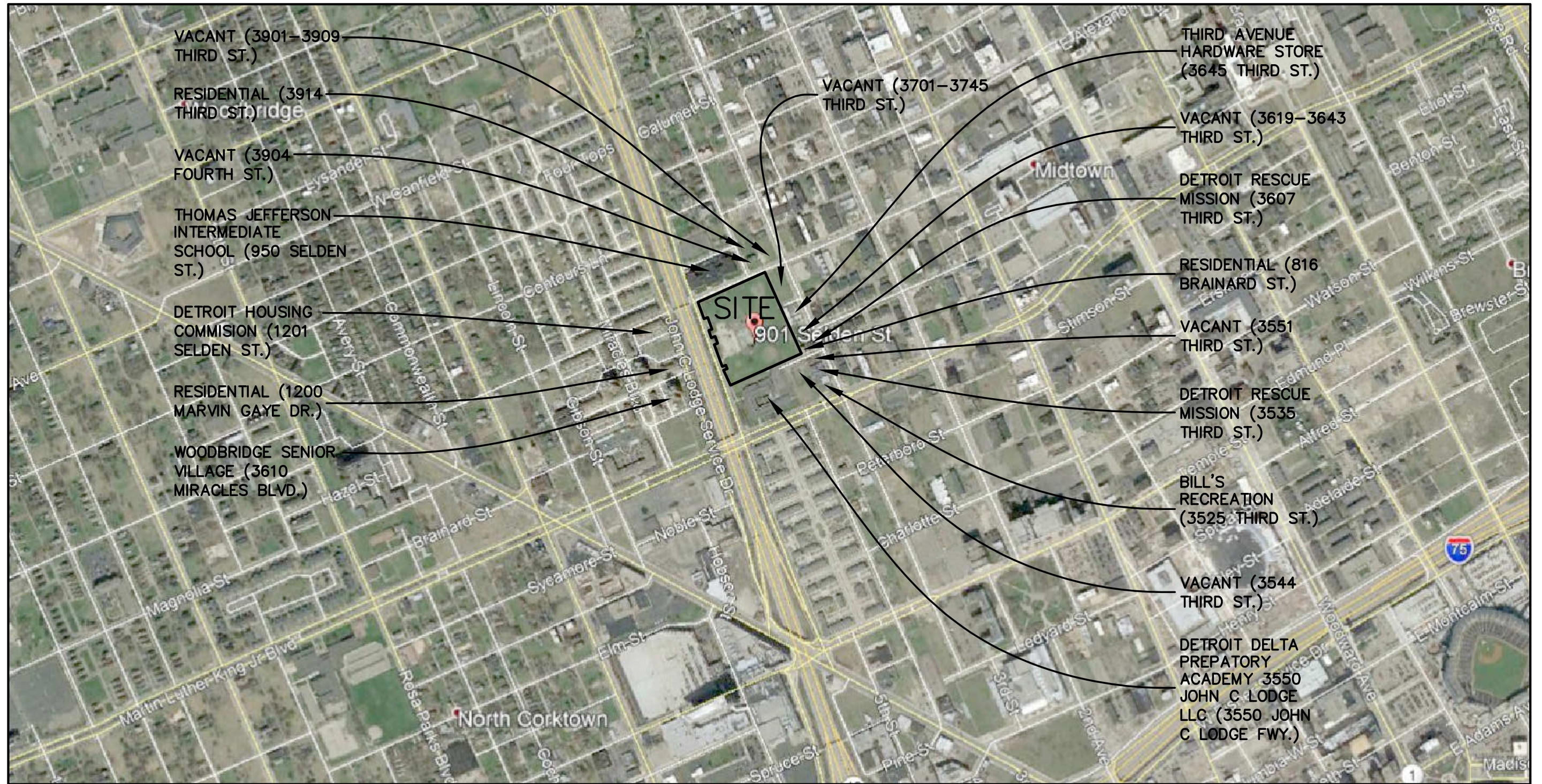
**PDM DEVELOPMENT GROUP, LLC**

DATE: DECEMBER 19, 2017

JOB NO.: 17-04879.20

**FIGURE - 2**





**ADJACENT PROPERTIES MAP**  
 901 SELDEN STREET  
 DETROIT, MICHIGAN 48201



**KEM-TEC ENVIRONMENTAL SERVICES INC.**

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CLIENT: **PDM DEVELOPMENT GROUP, LLC**

DATE: DECEMBER 19, 2017

JOB NO.: 17-04879.20

**FIGURE - 3**



**PHOTO LOG**  
901 Selden Street, Detroit, MI



Photo 1. View of soil boring SB-10 along northern Property boundary, facing south



Photo 2. View of soil boring SB-13 at the central-eastern portion of the Property boundary, facing south



**PHOTO LOG**  
901 Selden Street, Detroit, MI



Photo 3. View of soil boring SB-15 at the southeastern portion of the Property, facing east



Photo 4. View of soil boring SB-17 near the southern Property boundary, facing south



Wednesday, May 01, 2019

Fibertec Project Number: 90149  
Project Identification: Midtown West /  
Submittal Date: 04/25/2019

Mr. Jeffrey Guzick  
Kem-Tec Environmental Services, Inc.  
22556 Gratiot Ave  
Eastpointe, MI 48021

Dear Mr. Guzick,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

A handwritten signature in black ink, appearing to read "Sharon Rakow".

*By Sharon Rakow at 5:12 PM, May 01, 2019*

For Daryl P. Strandbergh  
Laboratory Director

Enclosures

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-001**

Order: 90149  
 Page: 2 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-10 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>09:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C** Aliquot ID: **90149-001** Matrix: **Soil/Solid**  
 Method: **ASTM D2216-10** Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>16</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS** Aliquot ID: **90149-001** Matrix: **Soil/Solid**  
 Method: **EPA 0200.2/EPA 6020A** Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>14000</b>		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
2. Barium	<b>50000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
3. Cadmium	<b>66</b>		µg/kg	50	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
4. Chromium	<b>21000</b>		µg/kg	500	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
5. Copper	<b>19000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
6. Lead	<b>8900</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
9. Zinc	<b>52000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH

**Mercury by CVAAS** Aliquot ID: **90149-001** Matrix: **Soil/Solid**  
 Method: **EPA 7471B** Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	U		µg/kg	50	9.0	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-001A** Matrix: **Soil/Solid**  
 Method: **EPA 5035A/EPA 8260B** Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 2. Acrylonitrile	U		µg/kg	130	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
3. Benzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
7. Bromoform	U		µg/kg	130	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-001**

Order: 90149  
 Page: 3 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-10 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>09:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-001A** Matrix: **Soil/Solid**  
 Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
14. Carbon Tetrachloride	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
26. Dichlorodifluoromethane	U		µg/kg	340	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
28. 1,2-Dichloroethane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
32. 1,2-Dichloropropane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
33. cis-1,3-Dichloropropene	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
35. Ethylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
42. MTBE	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
45. Styrene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-001**

Order: 90149  
 Page: 4 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-10 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>09:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-001A** Matrix: **Soil/Solid**  
 Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
49. Toluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
50. 1,2,4-Trichlorobenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
52. 1,1,2-Trichloroethane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
57. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
59. Vinyl Chloride	U		µg/kg	40	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
61. o-Xylene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

Aliquot ID: **90149-001** Matrix: **Soil/Solid**  
 Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-001**

Order: 90149  
 Page: 5 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-10 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>09:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Polynuclear Aromatic Hydrocarbons (PNAs)** Aliquot ID: **90149-001** Matrix: **Soil/Solid**  
 Method: **EPA 3546/EPA 8270E** Description: **SB-10 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-002**

Order: 90149  
 Page: 6 of 34  
 Date: 05/01/19

Client Identification: **Kem-Tec Environmental Services, Inc.**      Sample Description: **SB-11 (7.5'-8.0')**      Chain of Custody: **161201**  
 Client Project Name: **Midtown West**      Sample No:      Collect Date: **04/25/19**  
 Client Project No: **NA**      Sample Matrix: **Soil/Solid**      Collect Time: **10:30**

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions:      Q: Qualifier (see definitions at end of report)      NA: Not Applicable      ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C**      Aliquot ID: **90149-002**      Matrix: **Soil/Solid**  
**Method: ASTM D2216-10**      Description: **SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>13</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS**      Aliquot ID: **90149-002**      Matrix: **Soil/Solid**  
**Method: EPA 0200.2/EPA 6020A**      Description: **SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>8700</b>		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
2. Barium	<b>59000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
3. Cadmium	<b>150</b>		µg/kg	50	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
4. Chromium	<b>18000</b>		µg/kg	500	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
5. Copper	<b>16000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
6. Lead	<b>11000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
9. Zinc	<b>45000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH

**Mercury by CVAAS**      Aliquot ID: **90149-002**      Matrix: **Soil/Solid**  
**Method: EPA 7471B**      Description: **SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	U		µg/kg	50	9.8	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**      Aliquot ID: **90149-002A**      Matrix: **Soil/Solid**  
**Method: EPA 5035A/EPA 8260B**      Description: **SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 2. Acrylonitrile	U		µg/kg	120	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
3. Benzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
7. Bromoform	U		µg/kg	120	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-002**

Order: 90149  
 Page: 7 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-11 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>10:30</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-002A** Matrix: **Soil/Solid**  
 Description: **SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	62	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
14. Carbon Tetrachloride	U		µg/kg	62	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
26. Dichlorodifluoromethane	U		µg/kg	310	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
28. 1,2-Dichloroethane	U		µg/kg	62	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
32. 1,2-Dichloropropane	U		µg/kg	62	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
33. cis-1,3-Dichloropropene	U		µg/kg	62	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
35. Ethylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
42. MTBE	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
45. Styrene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-002**

Order: 90149  
Page: 8 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-11 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>10:30</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

**Aliquot ID: 90149-002A**      **Matrix: Soil/Solid**  
**Description: SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	62	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
49. Toluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
50. 1,2,4-Trichlorobenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
52. 1,1,2-Trichloroethane	U		µg/kg	62	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
57. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
59. Vinyl Chloride	U		µg/kg	40	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
61. o-Xylene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

**Aliquot ID: 90149-002**      **Matrix: Soil/Solid**  
**Description: SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-002**

Order: 90149  
 Page: 9 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-11 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>10:30</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Polynuclear Aromatic Hydrocarbons (PNAs)** Aliquot ID: **90149-002** Matrix: **Soil/Solid**  
 Method: **EPA 3546/EPA 8270E** Description: **SB-11 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-003**

Order: 90149  
 Page: 10 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-12 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:00</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C** Aliquot ID: **90149-003** Matrix: **Soil/Solid**  
 Method: **ASTM D2216-10** Description: **SB-12 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>20</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS** Aliquot ID: **90149-003** Matrix: **Soil/Solid**  
 Method: **EPA 0200.2/EPA 6020A** Description: **SB-12 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>7200</b>		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
2. Barium	<b>62000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
3. Cadmium	<b>150</b>		µg/kg	50	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
4. Chromium	<b>21000</b>		µg/kg	500	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
5. Copper	<b>20000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
6. Lead	<b>8800</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
9. Zinc	<b>51000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH

**Mercury by CVAAS** Aliquot ID: **90149-003** Matrix: **Soil/Solid**  
 Method: **EPA 7471B** Description: **SB-12 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	U		µg/kg	50	9.2	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-003A** Matrix: **Soil/Solid**  
 Method: **EPA 5035A/EPA 8260B** Description: **SB-12 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 2. Acrylonitrile	U		µg/kg	150	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
3. Benzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
7. Bromoform	U		µg/kg	150	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-003**

Order: 90149  
 Page: 11 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-12 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:00</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-003A** Matrix: **Soil/Solid**  
 Description: **SB-12 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	77	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
14. Carbon Tetrachloride	U		µg/kg	77	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
26. Dichlorodifluoromethane	U		µg/kg	380	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
28. 1,2-Dichloroethane	U		µg/kg	77	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
32. 1,2-Dichloropropane	U		µg/kg	77	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
33. cis-1,3-Dichloropropene	U		µg/kg	77	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
35. Ethylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
42. MTBE	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
45. Styrene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-003**

Order: 90149  
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Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-12 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:00</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

**Aliquot ID: 90149-003A**      **Matrix: Soil/Solid**  
**Description: SB-12 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	77	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
49. Toluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
50. 1,2,4-Trichlorobenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
52. 1,1,2-Trichloroethane	U		µg/kg	77	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
57. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
59. Vinyl Chloride	U		µg/kg	40	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
61. o-Xylene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

**Aliquot ID: 90149-003**      **Matrix: Soil/Solid**  
**Description: SB-12 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-003**

Order: 90149  
 Page: 13 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-12 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:00</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

<b>Polynuclear Aromatic Hydrocarbons (PNAs)</b>	<b>Aliquot ID: 90149-003</b>	<b>Matrix: Soil/Solid</b>
<b>Method: EPA 3546/EPA 8270E</b>	<b>Description: SB-12 (7.5'-8.0')</b>	

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-004**

Order: 90149  
Page: 14 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-13 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:15</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C** Aliquot ID: **90149-004** Matrix: **Soil/Solid**  
**Method: ASTM D2216-10** Description: **SB-13 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>13</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS** Aliquot ID: **90149-004** Matrix: **Soil/Solid**  
**Method: EPA 0200.2/EPA 6020A** Description: **SB-13 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>6900</b>		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
2. Barium	<b>53000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
3. Cadmium	<b>92</b>		µg/kg	50	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
4. Chromium	<b>14000</b>		µg/kg	500	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
5. Copper	<b>13000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
6. Lead	<b>6200</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
9. Zinc	<b>42000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH

**Mercury by CVAAS** Aliquot ID: **90149-004** Matrix: **Soil/Solid**  
**Method: EPA 7471B** Description: **SB-13 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	U		µg/kg	50	8.6	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-004A** Matrix: **Soil/Solid**  
**Method: EPA 5035A/EPA 8260B** Description: **SB-13 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 2. Acrylonitrile	U		µg/kg	130	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
3. Benzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
7. Bromoform	U		µg/kg	130	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-004**

Order: 90149  
Page: 15 of 34  
Date: 05/01/19

Client Identification:	<b>Kem-Tec Environmental Services, Inc.</b>	Sample Description:	<b>SB-13 (7.5'-8.0')</b>	Chain of Custody:	<b>161201</b>
Client Project Name:	<b>Midtown West</b>	Sample No.:		Collect Date:	<b>04/25/19</b>
Client Project No.:	<b>NA</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>11:15</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-004A** Matrix: **Soil/Solid**  
Description: **SB-13 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
14. Carbon Tetrachloride	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
26. Dichlorodifluoromethane	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
28. 1,2-Dichloroethane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
32. 1,2-Dichloropropane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
33. cis-1,3-Dichloropropene	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
34. trans-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
35. Ethylbenzene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
42. MTBE	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
45. Styrene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-004**

Order: 90149  
Page: 16 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-13 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:15</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

**Aliquot ID: 90149-004A**      **Matrix: Soil/Solid**  
**Description: SB-13 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
49. Toluene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
50. 1,2,4-Trichlorobenzene	U		µg/kg	250	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
52. 1,1,2-Trichloroethane	U		µg/kg	67	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
57. 1,2,4-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
59. Vinyl Chloride	U		µg/kg	40	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
61. o-Xylene	U		µg/kg	50	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VP19D26A	04/26/19	VP19D26A	MAK

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

**Aliquot ID: 90149-004**      **Matrix: Soil/Solid**  
**Description: SB-13 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-004**

Order: 90149  
Page: 17 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-13 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:15</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

<b>Polynuclear Aromatic Hydrocarbons (PNAs)</b>	<b>Aliquot ID: 90149-004</b>	<b>Matrix: Soil/Solid</b>
<b>Method: EPA 3546/EPA 8270E</b>	<b>Description: SB-13 (7.5'-8.0')</b>	

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-005**

Order: 90149  
 Page: 18 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-14 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:35</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C** Aliquot ID: **90149-005** Matrix: **Soil/Solid**  
**Method: ASTM D2216-10** Description: **SB-14 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>12</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS** Aliquot ID: **90149-005** Matrix: **Soil/Solid**  
**Method: EPA 0200.2/EPA 6020A** Description: **SB-14 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>10000</b>		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
2. Barium	<b>51000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
3. Cadmium	<b>140</b>		µg/kg	50	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
4. Chromium	<b>15000</b>		µg/kg	500	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
5. Copper	<b>15000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
6. Lead	<b>8000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
9. Zinc	<b>43000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH

**Mercury by CVAAS** Aliquot ID: **90149-005** Matrix: **Soil/Solid**  
**Method: EPA 7471B** Description: **SB-14 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	U		µg/kg	50	9.8	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-005A** Matrix: **Soil/Solid**  
**Method: EPA 5035A/EPA 8260B** Description: **SB-14 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 2. Acrylonitrile	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
3. Benzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
7. Bromoform	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-005**

Order: 90149  
 Page: 19 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-14 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:35</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-005A** Matrix: **Soil/Solid**  
 Method: **EPA 5035A/EPA 8260B** Description: **SB-14 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
14. Carbon Tetrachloride	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
34. trans-1,3-Dichloropropene	U		µg/kg	66	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
35. Ethylbenzene	U		µg/kg	66	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
42. MTBE	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
45. Styrene	U		µg/kg	66	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-005**

Order: 90149  
Page: 20 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-14 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:35</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

**Aliquot ID: 90149-005A**      **Matrix: Soil/Solid**  
**Description: SB-14 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
49. Toluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
50. 1,2,4-Trichlorobenzene	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
52. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	130	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
57. 1,2,4-Trimethylbenzene	U		µg/kg	130	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
59. Vinyl Chloride	U		µg/kg	46	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
61. o-Xylene	U		µg/kg	66	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

**Aliquot ID: 90149-005**      **Matrix: Soil/Solid**  
**Description: SB-14 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-005**

Order: 90149  
 Page: 21 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-14 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:35</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

<b>Polynuclear Aromatic Hydrocarbons (PNAs)</b>	<b>Aliquot ID: 90149-005</b>	<b>Matrix: Soil/Solid</b>
<b>Method: EPA 3546/EPA 8270E</b>	<b>Description: SB-14 (7.5'-8.0')</b>	

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-006**

Order: 90149  
Page: 22 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-15 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:50</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C** Aliquot ID: **90149-006** Matrix: **Soil/Solid**  
**Method: ASTM D2216-10** Description: **SB-15 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>15</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS** Aliquot ID: **90149-006** Matrix: **Soil/Solid**  
**Method: EPA 0200.2/EPA 6020A** Description: **SB-15 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>8300</b>		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
2. Barium	<b>61000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
3. Cadmium	<b>160</b>		µg/kg	50	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
4. Chromium	<b>18000</b>		µg/kg	500	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
5. Copper	<b>17000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
6. Lead	<b>8700</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
9. Zinc	<b>50000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH

**Mercury by CVAAS** Aliquot ID: **90149-006** Matrix: **Soil/Solid**  
**Method: EPA 7471B** Description: **SB-15 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	U		µg/kg	50	9.3	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-006A** Matrix: **Soil/Solid**  
**Method: EPA 5035A/EPA 8260B** Description: **SB-15 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 2. Acrylonitrile	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
3. Benzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
7. Bromoform	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-006**

Order: 90149  
 Page: 23 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-15 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:50</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-006A** Matrix: **Soil/Solid**  
 Description: **SB-15 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
14. Carbon Tetrachloride	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
34. trans-1,3-Dichloropropene	U		µg/kg	67	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
35. Ethylbenzene	U		µg/kg	67	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
42. MTBE	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
45. Styrene	U		µg/kg	67	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-006**

Order: 90149  
Page: 24 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-15 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:50</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

**Aliquot ID: 90149-006A**      **Matrix: Soil/Solid**  
**Description: SB-15 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
49. Toluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
50. 1,2,4-Trichlorobenzene	U		µg/kg	260	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
52. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	130	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
57. 1,2,4-Trimethylbenzene	U		µg/kg	130	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
59. Vinyl Chloride	U		µg/kg	47	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
61. o-Xylene	U		µg/kg	67	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

**Aliquot ID: 90149-006**      **Matrix: Soil/Solid**  
**Description: SB-15 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-006**

Order: 90149  
Page: 25 of 34  
Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-15 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>11:50</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

<b>Polynuclear Aromatic Hydrocarbons (PNAs)</b>	<b>Aliquot ID: 90149-006</b>	<b>Matrix: Soil/Solid</b>
<b>Method: EPA 3546/EPA 8270E</b>	<b>Description: SB-15 (7.5'-8.0')</b>	

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-007**

Order: 90149  
 Page: 26 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-16 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>12:10</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C** Aliquot ID: **90149-007** Matrix: **Soil/Solid**  
 Method: **ASTM D2216-10** Description: **SB-16 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>16</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS** Aliquot ID: **90149-007** Matrix: **Soil/Solid**  
 Method: **EPA 0200.2/EPA 6020A** Description: **SB-16 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>8100</b>		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
2. Barium	<b>53000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
3. Cadmium	<b>160</b>		µg/kg	50	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
4. Chromium	<b>19000</b>		µg/kg	500	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
5. Copper	<b>17000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
6. Lead	<b>13000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH
9. Zinc	<b>51000</b>		µg/kg	1000	20	04/30/19	PT19D30C	05/01/19	T419E01B	JLH

**Mercury by CVAAS** Aliquot ID: **90149-007** Matrix: **Soil/Solid**  
 Method: **EPA 7471B** Description: **SB-16 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	<b>140</b>		µg/kg	50	9.7	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-007A** Matrix: **Soil/Solid**  
 Method: **EPA 5035A/EPA 8260B** Description: **SB-16 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 2. Acrylonitrile	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
3. Benzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
7. Bromoform	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-007**

Order: 90149  
 Page: 27 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-16 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>12:10</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-007A** Matrix: **Soil/Solid**  
 Description: **SB-16 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
14. Carbon Tetrachloride	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
34. trans-1,3-Dichloropropene	U		µg/kg	70	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
35. Ethylbenzene	U		µg/kg	70	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
42. MTBE	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
45. Styrene	U		µg/kg	70	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-007**

Order: 90149  
 Page: 28 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-16 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>12:10</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-007A** Matrix: **Soil/Solid**  
 Description: **SB-16 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
49. Toluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
50. 1,2,4-Trichlorobenzene	U		µg/kg	270	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
52. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	140	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
57. 1,2,4-Trimethylbenzene	U		µg/kg	140	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
59. Vinyl Chloride	U		µg/kg	49	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
61. o-Xylene	U		µg/kg	70	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

Aliquot ID: **90149-007** Matrix: **Soil/Solid**  
 Description: **SB-16 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-007**

Order: 90149  
 Page: 29 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-16 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>12:10</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

<b>Polynuclear Aromatic Hydrocarbons (PNAs)</b>	<b>Aliquot ID: 90149-007</b>	<b>Matrix: Soil/Solid</b>
<b>Method: EPA 3546/EPA 8270E</b>	<b>Description: SB-16 (7.5'-8.0')</b>	

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	05/01/19	SG19D30A	GJP

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-008**

Order: 90149  
 Page: 30 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-17 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>12:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Water (Moisture) Content Dried at 105 ± 5°C** Aliquot ID: **90149-008** Matrix: **Soil/Solid**  
 Method: **ASTM D2216-10** Description: **SB-17 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
‡ 1. Percent Moisture (Water Content)	<b>14</b>		%	1	1.0	04/29/19	MC190429	04/30/19	MC190429	DW

**Michigan 10 Elements by ICP/MS** Aliquot ID: **90149-008** Matrix: **Soil/Solid**  
 Method: **EPA 0200.2/EPA 6020A** Description: **SB-17 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Arsenic	<b>7200</b>		µg/kg	100	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
2. Barium	<b>78000</b>		µg/kg	1000	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
3. Cadmium	<b>170</b>		µg/kg	50	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
4. Chromium	<b>20000</b>		µg/kg	500	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
5. Copper	<b>17000</b>		µg/kg	1000	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
6. Lead	<b>8900</b>		µg/kg	1000	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
7. Selenium	U		µg/kg	200	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
8. Silver	U		µg/kg	100	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH
9. Zinc	<b>49000</b>		µg/kg	1000	20	05/01/19	PT19E01A	05/01/19	T419E01B	JLH

**Mercury by CVAAS** Aliquot ID: **90149-008** Matrix: **Soil/Solid**  
 Method: **EPA 7471B** Description: **SB-17 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Mercury	U		µg/kg	50	9.5	04/30/19	PM19D30B	05/01/19	M719E01A	SEM

**Volatile Organic Compounds (VOCs) by GC/MS, 5035** Aliquot ID: **90149-008A** Matrix: **Soil/Solid**  
 Method: **EPA 5035A/EPA 8260B** Description: **SB-17 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		Init.
						P. Date	P. Batch	A. Date	A. Batch	
1. Acetone	U		µg/kg	1000	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 2. Acrylonitrile	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
3. Benzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
4. Bromobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
5. Bromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
6. Bromodichloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
7. Bromoform	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
8. Bromomethane	U		µg/kg	200	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
9. 2-Butanone	U		µg/kg	750	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-008**

Order: 90149  
 Page: 31 of 34  
 Date: 05/01/19

Client Identification:	<b>Kem-Tec Environmental Services, Inc.</b>	Sample Description:	<b>SB-17 (7.5'-8.0')</b>	Chain of Custody:	<b>161201</b>
Client Project Name:	<b>Midtown West</b>	Sample No.:		Collect Date:	<b>04/25/19</b>
Client Project No.:	<b>NA</b>	Sample Matrix:	<b>Soil/Solid</b>	Collect Time:	<b>12:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-008A** Matrix: **Soil/Solid**  
 Description: **SB-17 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
10. n-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
11. sec-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
12. tert-Butylbenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
13. Carbon Disulfide	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
14. Carbon Tetrachloride	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
15. Chlorobenzene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
16. Chloroethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
17. Chloroform	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
18. Chloromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
19. 2-Chlorotoluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 20. 1,2-Dibromo-3-chloropropane (SIM)	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
21. Dibromochloromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
22. Dibromomethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
23. 1,2-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
24. 1,3-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
25. 1,4-Dichlorobenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
26. Dichlorodifluoromethane	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
27. 1,1-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
28. 1,2-Dichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
29. 1,1-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
30. cis-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
31. trans-1,2-Dichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
32. 1,2-Dichloropropane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
33. cis-1,3-Dichloropropene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
34. trans-1,3-Dichloropropene	U		µg/kg	64	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
35. Ethylbenzene	U		µg/kg	64	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
36. Ethylene Dibromide	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
37. 2-Hexanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
38. Isopropylbenzene	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
39. 4-Methyl-2-pentanone	U		µg/kg	2500	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
40. Methylene Chloride	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 41. 2-Methylnaphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
42. MTBE	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
43. Naphthalene	U		µg/kg	330	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
44. n-Propylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
45. Styrene	U		µg/kg	64	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
46. 1,1,1,2-Tetrachloroethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

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**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-008**

Order: 90149  
 Page: 32 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-17 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>12:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**Volatile Organic Compounds (VOCs) by GC/MS, 5035**  
**Method: EPA 5035A/EPA 8260B**

Aliquot ID: **90149-008A** Matrix: **Soil/Solid**  
 Description: **SB-17 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
47. 1,1,2,2-Tetrachloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
48. Tetrachloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
49. Toluene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
50. 1,2,4-Trichlorobenzene	U		µg/kg	250	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
51. 1,1,1-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
52. 1,1,2-Trichloroethane	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
53. Trichloroethene	U		µg/kg	50	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
54. Trichlorofluoromethane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
55. 1,2,3-Trichloropropane	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 56. 1,2,3-Trimethylbenzene	U		µg/kg	130	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
57. 1,2,4-Trimethylbenzene	U		µg/kg	130	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
58. 1,3,5-Trimethylbenzene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
59. Vinyl Chloride	U		µg/kg	45	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
60. m&p-Xylene	U		µg/kg	100	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
61. o-Xylene	U		µg/kg	64	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS
‡ 62. Xylenes	U		µg/kg	150	1.0	04/26/19	VJ19D26C	04/27/19	VJ19D26C	KSS

**Polynuclear Aromatic Hydrocarbons (PNAs)**  
**Method: EPA 3546/EPA 8270E**

Aliquot ID: **90149-008** Matrix: **Soil/Solid**  
 Description: **SB-17 (7.5'-8.0')**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Acenaphthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
2. Acenaphthylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
3. Anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
4. Benzo(a)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
5. Benzo(a)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
6. Benzo(b)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
7. Benzo(ghi)perylene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
8. Benzo(k)fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
9. Chrysene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
10. Dibenzo(a,h)anthracene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
11. Fluoranthene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
12. Fluorene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
13. Indeno(1,2,3-cd)pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
14. 2-Methylnaphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
15. Naphthalene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

1914 Holloway Drive  
 11766 E. Grand River  
 8660 S. Mackinaw Trail

Holt, MI 48842  
 Brighton, MI 48116  
 Cadillac, MI 49601

T: (517) 699-0345  
 T: (810) 220-3300  
 T: (231) 775-8368

F: (517) 699-0388  
 F: (810) 220-3311  
 F: (231) 775-8584



**Analytical Laboratory Report**  
**Laboratory Project Number: 90149**  
**Laboratory Sample Number: 90149-008**

Order: 90149  
 Page: 33 of 34  
 Date: 05/01/19

Client Identification: <b>Kem-Tec Environmental Services, Inc.</b>	Sample Description: <b>SB-17 (7.5'-8.0')</b>	Chain of Custody: <b>161201</b>
Client Project Name: <b>Midtown West</b>	Sample No:	Collect Date: <b>04/25/19</b>
Client Project No: <b>NA</b>	Sample Matrix: <b>Soil/Solid</b>	Collect Time: <b>12:40</b>

Sample Comments: **Soil results have been calculated and reported on a dry weight basis unless otherwise noted.**

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

<b>Polynuclear Aromatic Hydrocarbons (PNAs)</b>	<b>Aliquot ID: 90149-008</b>	<b>Matrix: Soil/Solid</b>
<b>Method: EPA 3546/EPA 8270E</b>	<b>Description: SB-17 (7.5'-8.0')</b>	

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
16. Phenanthrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT
17. Pyrene (SIM)	U		µg/kg	330	1.0	04/29/19	PS19D29B	04/29/19	S619D29A	TKT

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---

**Definitions/ Qualifiers:**

- A:** Spike recovery or precision unusable due to dilution.
- B:** The analyte was detected in the associated method blank.
- E:** The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
- J:** The concentration is an estimated value.
- M:** Modified Method
- U:** The analyte was not detected at or above the reporting limit.
- X:** Matrix Interference has resulted in a raised reporting limit or distorted result.
- W:** Results reported on a wet-weight basis.
- \*:** Value reported is outside QC limits

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**Exception Summary:**

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**Analysis Locations:**

All analyses performed in Holt.

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Accreditation Number(s):

**T104704518-19-8 (TX)**

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1914 Holloway Drive  
11766 E. Grand River  
8660 S. Mackinaw Trail

Holt, MI 48842  
Brighton, MI 48116  
Cadillac, MI 49601

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T: (810) 220-3300  
T: (231) 775-8368

F: (517) 699-0388  
F: (810) 220-3311  
F: (231) 775-8584



Analytical Laboratory  
 1914 Holloway Drive  
 Holt, MI 48842  
 Phone: 517 699 0345  
 Fax: 517 699 0388  
 email: lab@fibertec.us

Industrial Hygiene Services, Inc.  
 1914 Holloway Drive  
 Holt, MI 48842  
 Phone: 517 699 0345  
 Fax: 517 699 0382  
 email: asbestos@fibertec.com

Geoprobe  
 11766 E. Grand River Rd.  
 Brighton, MI 48116  
 Phone: 810 220 3300  
 Fax: 810 220 3311

Client Name: **Kem-Tec Environmental Services**  
 Contact Person: **Jeffrey Greick**  
 Project Name/ Number: **Midtown West**  
 Email distribution list: **jgreick@kemtechsurvey.com**

MATRIX (SEE RIGHT CORNER FOR CODE)		PARAMETERS				Matrix Code				Deliverables			
S	A	O	P	Wipe	Soil	Ground Water	Surface Water	Waste Water	Other: Specify	Level 2	Level 3	Level 4	EDD

Quote#	Purchase Order#	Date	Time	Sample #	Client Sample Descriptor	# OF CONTAINERS	NOG	PLAS	HI TO METALS	Remarks:
		4/25/19	0940	SB-10	(7.5'-8.0')	5	X	X	X	
		4/25/19	1030	SB-11	(7.5'-8.0')	5	X	X	X	
		4/25/19	1100	SB-12	(7.5'-8.0')	5	X	X	X	
		4/25/19	1115	SB-13	(7.5'-8.0')	5	X	X	X	
		4/25/19	1135	SB-14	(7.5'-8.0')	5	X	X	X	
		4/25/19	1150	SB-15	(7.5'-8.0')	5	X	X	X	
		4/25/19	1210	SB-16	(7.5'-8.0')	5	X	X	X	
		4/25/19	1240	SB-17	(7.5'-8.0')	5	X	X	X	

Comments:

Received By: *[Signature]* Date/Time: 4/25/19 1:57

Received By: *[Signature]* Date/Time: 4/25/19 4:03

Received By: *[Signature]* Date/Time: 4/25/19 4:03

LAB USE ONLY

Fibertec project number: 90149

Temperature upon receipt at Lab: 5.1°C

RCV'D ON ICE

Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY

1 bus. day 2 bus. days 3 bus. days 4 bus. days

Other (specify time/date requirement):

Please see back for terms and conditions

# KEM-TEC and Associates

Environmental Services Group  
 22556 Gratiot Ave.  
 Eastpointe, Michigan 48021

## Lithologic Log

State	Michigan
County	Wayne
Town/Range	1S/12E
Section	31

<b>Site Address:</b>	
901 Selden Street	
Detroit, Michigan	

Boring #	SB-10
Well #	
Project #	17-04879.20
Date:	4.25.2019

Drilled by	Kem-Tec
Tech/Geol	Jeffrey Guzick
Method	Geoprobe
Grout	Cuttings
Developed	NA

<b>CASING DATA</b>		
Diameter	na	
Length	na	
Type	na	

<b>WELL LOCATION</b>	

Well Yield	NA
Miss Dig #	NA
Weather	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
Mfgr	na
Slot	na
Mtrl	na

<b>DISPOSAL METHOD</b>	

<b>WATER LEVELS</b>	
From G L	na
From TOC	na

<b>ELEVATIONS</b>			
Ground	na	Length	na
Of TOC	na	From	na
		To	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black, sandy, grass cover		100%	
0.25	1.00	FILL: sand, brown, some clay, some fine gravel, dry, no odor			0.0
1.00	8.00	CLAY: brown, silty, some sand, medium stiff, dry, no odor	7.5'-8.0'		0.0
EOB		Becoming gray and stiff at 4.0; brown-gray from 5.0'-8.0'			0.0
		Obstruction encountered at apx. 2', moved south for second boring attempt and encountered no obstruction			
<b>TD=</b>	8'				

# KEM-TEC and Associates

Environmental Services Group  
 22556 Gratiot Ave.  
 Eastpointe, Michigan 48021

## Lithologic Log

State	Michigan
County	Wayne
Town/Range	1S/12E
Section	31

<b>Site Address:</b>	
901 Selden Street	
Detroit, Michigan	

Boring #	SB-11
Well #	
Project #	17-04879.20
Date:	4.25.2019

Drilled by	Kem-Tec
Tech/Geol	Jeffrey Guzick
Method	Geoprobe
Grout	Cuttings
Developed	NA

<b>CASING DATA</b>		
Diameter	na	
Length	na	
Type	na	

<b>WELL LOCATION</b>	

Well Yield	NA
Miss Dig #	NA
Weather	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
Mfgr	na
Slot	na
Mtrl	na

<b>DISPOSAL METHOD</b>	

<b>WATER LEVELS</b>	
From G L	na
From TOC	na

<b>ELEVATIONS</b>			
Ground	na	From	na
Of TOC	na	To	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black, sandy, grass cover		100%	
0.25	1.00	FILL: sand and gravel, brown, some brick, dry, no odor			0.0
1.00	8.00	CLAY: brown-gray, silty, medium stiff, dry-moist, no odor	7.5'-8.0'		0.0
EOB		Becoming moist from 6.0'-7.0'			
		Obstruction encountered at apx. 2', moved south and east for additional boring attempts			
TD=	8'				

# KEM-TEC and Associates

Environmental Services Group

22556 Gratiot Ave.

Eastpointe, Michigan 48021

## Lithologic Log

<b>State</b>	Michigan
<b>County</b>	Wayne
<b>Town/Range</b>	1S/12E
<b>Section</b>	31

<b>Site Address:</b>	
901 Selden Street	
Detroit, Michigan	

<b>Boring #</b>	SB-12
<b>Well #</b>	
<b>Project #</b>	17-04879.20
<b>Date:</b>	4.25.2019

<b>Drilled by</b>	Kem-Tec
<b>Tech/Geol</b>	Jeffrey Guzick
<b>Method</b>	Geoprobe
<b>Grout</b>	Cuttings
<b>Developed</b>	NA

<b>CASING DATA</b>	
<b>Diameter</b>	na
<b>Length</b>	na
<b>Type</b>	na

### WELL LOCATION

<b>Well Yield</b>	NA
<b>Miss Dig #</b>	NA
<b>Weather</b>	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
<b>Mfgr</b>	na
<b>Slot</b>	na
<b>Mtrl</b>	na
<b>Length</b>	na
<b>From</b>	na
<b>To</b>	na

### DISPOSAL METHOD

<b>WATER LEVELS</b>	
<b>From G L</b>	na
<b>From TOC</b>	na

<b>ELEVATIONS</b>			
<b>Ground</b>	na	<b>From</b>	na
<b>Of TOC</b>	na	<b>To</b>	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black-brown, sandy, grass cover		100%	
0.25	4.00	FILL: clay, brown, some sand, some fine gravel, dry, no odor			0.0
4.00	8.00	CLAY: brown, silty, medium stiff, some gravel from 5.5'-5.75',	7.5'-8.0'		0.0
EOB		dry, no odor			
		Obstruction encountered at apx. 2', moved west, north, and east for additional boring attempts			
<b>TD=</b>	8'				



# KEM-TEC and Associates

Environmental Services Group

22556 Gratiot Ave.

Eastpointe, Michigan 48021

## Lithologic Log

State	Michigan
County	Wayne
Town/Range	1S/12E
Section	31

<b>Site Address:</b>	
901 Selden Street	
Detroit, Michigan	

Boring #	SB-13
Well #	
Project #	17-04879.20
Date:	4.25.2019

Drilled by	Kem-Tec
Tech/Geol	Jeffrey Guzick
Method	Geoprobe
Grout	Cuttings
Developed	NA

<b>CASING DATA</b>	
Diameter	na
Length	na
Type	na

<b>WELL LOCATION</b>	

Well Yield	NA
Miss Dig #	NA
Weather	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
Mfgr	na
Slot	na
Mtrl	na
Length	na
From	na
To	na

<b>DISPOSAL METHOD</b>	

<b>WATER LEVELS</b>	
From G L	na
From TOC	na

<b>ELEVATIONS</b>			
Ground	na	From	na
Of TOC	na	To	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black-brown, sandy, grass cover		100%	
0.25	4.00	FILL: clay with sand, brown, some brick at 3.25', some cinders, no odor, dry			0.0
4.00	8.00	CLAY: brown, silty, medium stiff, some sand, trace fine gravel, dry, no odor	7.5'-8.0'		0.0
EOB					
		Obstruction encountered at apx. 2', moved west, north, and east for additional boring attempts			
TD=	8'				



# KEM-TEC and Associates

Environmental Services Group

22556 Gratiot Ave.

Eastpointe, Michigan 48021

## Lithologic Log

<b>State</b>	Michigan
<b>County</b>	Wayne
<b>Town/Range</b>	1S/12E
<b>Section</b>	31

<b>Site Address:</b>
901 Selden Street
Detroit, Michigan

<b>Boring #</b>	SB-14
<b>Well #</b>	
<b>Project #</b>	17-04879.20
<b>Date:</b>	4.25.2019

<b>Drilled by</b>	Kem-Tec
<b>Tech/Geol</b>	Jeffrey Guzick
<b>Method</b>	Geoprobe
<b>Grout</b>	Cuttings
<b>Developed</b>	NA

<b>CASING DATA</b>	
<b>Diameter</b>	na
<b>Length</b>	na
<b>Type</b>	na

<b>WELL LOCATION</b>	

<b>Well Yield</b>	NA
<b>Miss Dig #</b>	NA
<b>Weather</b>	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
<b>Mfgr</b>	na
<b>Slot</b>	na
<b>Mtrl</b>	na
<b>Length</b>	na
<b>From</b>	na
<b>To</b>	na

<b>DISPOSAL METHOD</b>	

<b>WATER LEVELS</b>	
<b>From G L</b>	na
<b>From TOC</b>	na

<b>ELEVATIONS</b>			
<b>Ground</b>	na	<b>From</b>	na
<b>Of TOC</b>	na	<b>To</b>	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black-brown, sandy, grass cover		100%	
0.25	1.00	FILL: clay with sand, brown, trace brick, no odor, dry			0.0
1.00	2.75	CLAY: brown-black, silty, medium stiff, some sand and fine gravel, dry, no odor	7.5'-8.0'		0.1
2.75	8.00	Becoming brown at 3', stiff at 6'			0.0
EOB					
		Obstruction encountered at apx. 2'9", moved north, east, and west for additional boring attempts			
<b>TD=</b>	8'				

# KEM-TEC and Associates

Environmental Services Group

22556 Gratiot Ave.

Eastpointe, Michigan 48021

## Lithologic Log

State	Michigan
County	Wayne
Town/Range	1S/12E
Section	31

<b>Site Address:</b>	
901 Selden Street	
Detroit, Michigan	

Boring #	SB-15
Well #	
Project #	17-04879.20
Date:	4.25.2019

Drilled by	Kem-Tec
Tech/Geol	Jeffrey Guzick
Method	Geoprobe
Grout	Cuttings
Developed	NA

<b>CASING DATA</b>	
Diameter	na
Length	na
Type	na

<b>WELL LOCATION</b>	

Well Yield	NA
Miss Dig #	NA
Weather	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
Mfgr	na
Slot	na
Mtrl	na
Length	na
From	na
To	na

<b>DISPOSAL METHOD</b>	

<b>WATER LEVELS</b>	
From G L	na
From TOC	na

<b>ELEVATIONS</b>			
Ground	na	From	na
Of TOC	na	To	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black-brown, sandy, grass cover		100%	
0.25	4.00	FILL: clay, some sand, brown, brick at 2.25', medium stiff, no odor, dry			0.0
4.00	8.00	CLAY: brown-gray, silty, stiff, some sand and fine gravel, dry, no odor	7.5'-8.0'		0
EOB					0.0
		Obstruction encountered at apx. 3', moved north, south, east, and west for additional boring attempts			
TD=	8'				

# KEM-TEC and Associates

Environmental Services Group

22556 Gratiot Ave.

Eastpointe, Michigan 48021

## Lithologic Log

State	Michigan
County	Wayne
Town/Range	1S/12E
Section	31

<b>Site Address:</b>	
901 Selden Street	
Detroit, Michigan	

Boring #	SB-16
Well #	
Project #	17-04879.20
Date:	4.25.2019

Drilled by	Kem-Tec
Tech/Geol	Jeffrey Guzick
Method	Geoprobe
Grout	Cuttings
Developed	NA

<b>CASING DATA</b>	
Diameter	na
Length	na
Type	na

<b>WELL LOCATION</b>	

Well Yield	NA
Miss Dig #	NA
Weather	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
Mfgr	na
Slot	na
Mtrl	na
Length	na
From	na
To	na

<b>DISPOSAL METHOD</b>	

<b>WATER LEVELS</b>	
From G L	na
From TOC	na

<b>ELEVATIONS</b>			
Ground	na	From	na
Of TOC	na	To	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black-brown, sandy, grass cover		100%	
0.25	4.00	FILL: clay, some sand, brown, gravel from 3.75'-4', medium stiff, no odor, moist			0.0
4.00	7.75	SAND: brown, medium to fine grained, moist-wet, no odor	7.5'-8.0'		0.1
7.75	8.00	CLAY: brown, silty, stiff, dry, no odor			0.0
EOB					
		No obstructions encountered			
TD=	8'				

# KEM-TEC and Associates

Environmental Services Group

22556 Gratiot Ave.

Eastpointe, Michigan 48021

## Lithologic Log

State	Michigan
County	Wayne
Town/Range	1S/12E
Section	31

<b>Site Address:</b>	
901 Selden Street	
Detroit, Michigan	

Boring #	SB-17
Well #	
Project #	17-04879.20
Date:	4.25.2019

Drilled by	Kem-Tec
Tech/Geol	Jeffrey Guzick
Method	Geoprobe
Grout	Cuttings
Developed	NA

<b>CASING DATA</b>	
Diameter	na
Length	na
Type	na

<b>WELL LOCATION</b>	

Well Yield	NA
Miss Dig #	NA
Weather	Overcast, 50 Degree F

<b>SCREEN DATA</b>	
Mfgr	na
Slot	na
Mtrl	na
Length	na
From	na
To	na

<b>DISPOSAL METHOD</b>	

<b>WATER LEVELS</b>	
From G L	na
From TOC	na

<b>ELEVATIONS</b>			
Ground	na	From	na
Of TOC	na	To	na

Depth (ft below grade)		Drilling Data	Sample Depth	% Rec'd	PID VOC's (PPM)
From	To				
Grade	0.25	Topsoil: black-brown, sandy, grass cover		100%	
0.25	4.00	FILL: clay, some sand, brown, gravel from 3.75'-4.0', medium stiff, no odor, moist			0.0
4.00	7.75	SAND: brown, medium to fine grained, moist-wet, no odor	7.5'-8.0'		0.1
7.75	8.00	CLAY: brown, silty, stiff, dry, no odor			0.0
EOB					
		Obstruction encountered at apx. 3'3", moved north, south, and west for additional boring attempts			
TD=	8'				

---

**JEFFREY GUZICK**  
**Environmental Professional**  
**PROJECT MANAGER**

---

**Certificates:**

40-Hour OSHA HazWoper & Hazardous Site Supervisor Training (1996)  
Certified Asbestos Inspector, Michigan (Certification No. A46552)  
8-Hour OSHA Refresher (2017)  
Troxler Nuclear Gauge Transportation and Operation Certification (2013)

**Education and Training:**

B.S. Environmental Studies, Western Michigan University, 12/1996  
B.S. Field Hydrogeology, Western Michigan University, 12/1996  
ASTM Risk Based Corrective Action, MDEQ, Lansing, Michigan  
ITRC Vapor Intrusion Pathway Training, 7/2011  
HUD Detroit Field Office Environmental Training, June 2015

**Qualifications:**

Mr. Guzick is currently working as a project manager at Kem-Tec Environmental Services and is responsible for conducting Phase I and Phase II environmental site investigations (ESAs). He has conducted large-scale Remedial Investigation/Feasibility Studies (RI/FS) at MDEQ Level of Effort (LOE) site (\$1.5M budget), including a complex geology subsurface investigation; provided oversight and O&M of Air Sparge/Soil Vapor Extraction remediation systems; and has been the prime report author of Remedial Investigation/Feasibility Study (RI/FS), Construction Summary Reports, Ground Water Monitoring Reports, and Bidding and Contractor Document Specification reports. He has overseen several UST removals and site restoration projects at MDOT sites throughout Michigan. He has operated GSSI Ground Penetrating Radar, processed data (RADAN software) and prepared GPR reports at the Detroit Marathon refinery and several MDEQ sites. Mr. Guzick's field experience includes monitoring well and soil boring installation, rotary and sonic drilling technology, aquifer (slug) testing, contractor oversight, surveying, and data validation. Experienced in soils laboratory including conducting unconfined strength, sieve analysis, Hydrometer testing, Permeability, Loss on Ignition, and Shelby Tube testing. Specialized in conducting historical research for the Phase I & II ESA process and other environmental investigations such as soil vapor intrusion, soil, and ground water investigations.

**Current Projects:**

Subsurface/Soil Vapor Intrusion Investigation	Detroit, MI
Phase I and II Environmental Site Assessment	Detroit, MI
Phase I and II Environmental Site Assessment	Canton, MI
Hazardous Materials Survey	Farmington, MI
Asbestos Survey	Detroit, MI
Mold Inspection and Assessment	Troy, MI
Phase I & II ESA, BEA, Due Care Obligations and Asbestos	Entertainment District Detroit, MI
Various MSHDA Tax Credit Environmental Reporting Requirements	Various Michigan locations

**EXPERIENCE**

**Kem-Tec Professional Engineers, Surveyors  
& Environmental Services**  
Eastpointe, MI  
Project Scientist/Geologist

**Mannik & Smith Group**  
Canton, MI  
Geologist III  
1/2008-10/2012

**ASTI Environmental**  
Brighton, MI  
Staff Scientist/Environmental Professional  
11/2005 - 12/2007

**URS Corporation**  
Novi, MI  
Staff Geologist  
10/2003 - 11/2005

**ARCADIS**  
Southfield, MI  
Geologist  
10/1999 - 10/2003

**McDowell & Associates**  
Ferndale, MI  
Soil Scientist  
9/1997 - 9/1999



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# MICHIGAN BACKGROUND SOIL SURVEY 2005



Hazardous Waste Technical Support Unit  
Hazardous Waste Section  
Waste and Hazardous Materials Division



## Michigan Background Soil Survey 2005

### Introduction

In 1991, the Michigan Department of Natural Resources (MDNR) released a compilation of soil sampling data that represented what is assumed to be the naturally occurring background concentration of metals in Michigan soils. The data was presented in the “Michigan Background Soil Survey” (MBSS) dated April 1991. Since that time, additional soil sampling data from locations that represent background conditions has been collected, and the MBSS has been updated by the Michigan Department of Environmental Quality (MDEQ).

### History

During the mid-1980s, closure plans were submitted to the state pursuant to cleanups and corrective action work at regulated hazardous waste treatment, storage, and disposal facilities. In order to assure that soil removal performed to get a clean closure was accomplished, standards were established that mandated the removal of contaminants until concentrations were nondetectable or within the naturally occurring background range. Therefore, facilities undergoing closure or corrective action for metals were required to submit analyses of soil from their specific location to determine the criteria to be met, which is statistically equivalent to the local, unimpacted background conditions. In order to evaluate the validity of these site-specific background values, a Michigan soil background database was compiled. That background soils database included information gathered by regulated facilities, as well as samples collected and analyzed by the state.

Background soil data from the regulated facilities has been obtained using standard sampling and analytical techniques at the time of collection, which were approved by the state, usually as part of a closure plan or remediation efforts. Common analytical methods from EPA/SW-846 were used (EPA method 200.7, SW-846 method series 6000/7000, etc.). Samples collected by the state were analyzed by an approved contract laboratory, or through the State of Michigan Environmental Laboratory. Some data was included from United States Geological Survey (USGS) and the Army Corp of Engineers. All results represent a total (available) metals analysis.

### Data Reduction

The background soil data for each metal has been reviewed in two basic ways. The first is looking at the data by general soil type. Based usually on a visual observation, and occasionally a soil classification system, soil samples were divided into the following general soil types: topsoil, clay, sand & silt, or sand. The other breakdown was by geographic location, using glacial geology distinctions. In Michigan there were several different glacial ice sheets (lobes) that covered distinct areas. The glacial lobes have varying points of origin and traverse differing types of bedrock, and thus the resulting glacial sediments could have varying chemical characteristics based on source rock influences. Summary statistics are presented for general soil types and broad geographic areas based on the location of major glacial lobes.

Since the data comes from investigations at different sites, each with various parameters of concern, the suite of metals analyzed was not the same in each case. Depending on how

common the metal was a pollutant of concern, and the number of samples taken for site-specific background determinations, each metal will have a different total number of individual samples and number of sites.

### Statistics

A basic statistical analysis was performed for each metal represented in the database. First, the percentage of nondetect values was determined, followed by analysis of the underlying distribution of the data. Finally, summary statistics such as the mean, median, standard deviation, quantiles and the range of concentrations for a metal were calculated with normal, lognormal, or nonparametric methods as appropriate.

In terms of detection limits, metals with 0 – 15 % nondetect results had a value equal to one half (1/2) of the respective detection limit substituted for calculation of summary statistics (Al, As, Ba, Ca, Cr, Cu, Fe, Mg, Mn, K, Na, Sr, Ti, V, Zn). Metals that have 15 - 50% nondetect values had summary statistics calculated using Cohen’s adjustment (Li, Ni, Pb). For metals with over 50% nondetects, a nonparametric method was used (Ag, Be, Cd, Co, Hg, Mo, Sb, Se, Tl).

The data distribution was analyzed using graphical techniques (histogram, probability plot, box plot) and the Shapiro-Francia or Shapiro-Wilk Goodness-of-Fit test. For simplicity’s sake, only normal or lognormal distributions were checked and the best fit to the respective metals’ data was chosen. Subsequently, summary statistics were calculated as appropriate for a normal, lognormal, or nonparametric distribution. Tables are attached that list the summary statistics for each metal.

### Summary

It is important to understand that the data and statistical summaries in the MBSS are to be used only for comparative purposes. The MBSS is meant to provide a resource for information regarding the concentration of naturally occurring metals that can be expected in various soil types and geographic areas of Michigan. Site-specific data is recommended to get the best representation of a local background concentration. This data is not to be used for setting site-specific cleanup criteria.

### Contact Information

If there are any questions, or a desire to obtain data, please contact those listed below:

David Slayton	517-373-8012	slaytond@michigan.gov
De Montgomery	517-373-7973	montgomd@michigan.gov

### Attachments

Table 1..... General Information – all data combined  
Tables 2, 3, 4.....Topsoil, Sand and Clay - typical range of concentrations  
Figure 1.....All Sample Locations and glacial lobe boundaries  
Figures 2, 3, 4.....Topsoil, Sand and Clay - sample locations



## General Information

METAL	Number of samples	Percent Non-detect	Assumed Distribution of Data	{a} Mean (mg/kg)	{b} Standard Deviation	Median (mg/kg)	{c} Typical Range of data (mg/kg)
Aluminum (Al)	295	0 %	Lognormal	3215	2.291	3420	2603 - 16,324
Antimony (Sb)	35	94 %	Nonparametric	--	--	< 5	< 0.04 – 2.5
Arsenic (As)	926	3 %	Lognormal	3.6	2.829	3.8	0.47 - 27.7
Barium (Ba)	463	1 %	Lognormal	31	2.707	38	4 - 220
Beryllium (Be)	128	77 %	Nonparametric	--	--	< 0.5	< 0.2 - 1.8
Cadmium (Cd)	535	72 %	Nonparametric	--	--	< 2	< 0.05 - 2.5
Chromium (Cr)	595	9 %	Lognormal	8.8	2.559	10	1.4 - 55
Cobalt (Co)	265	60 %	Nonparametric	--	--	< 5	< 3 - 12
Copper (Cu)	580	8 %	Lognormal	7.4	2.565	10	1 - 58
Iron (Fe)	266	0 %	Lognormal	5403	2.565	5645	852 - 34,233
Lead (Pb)	682	21 %	Censored-Log	7.1	2.562	7.73	1 - 45
Lithium (Li)	259	30 %	Censored-Log	3.8	3.373	3.5	0.35 - 41
Magnesium (Mg)	86	0 %	Lognormal	1360	4.837	824	62 - 29,875
Manganese (Mn)	326	0 %	Lognormal	139	3.235	190	14 - 1391
Mercury (Hg)	431	83 %	Nonparametric	--	--	< 0.1	< 0.025 - 0.6
Molybdenum (Mo)	100	100 %	--	--	--	< 5	< 5
Nickel (Ni)	492	23 %	Censored-Nor	12.3	13	11	2.4 - 39
Selenium (Se)	430	82 %	Nonparametric	--	--	< 0.5	< 0.05 - 1.2
Silver (Ag)	202	84 %	Nonparametric	--	--	< 0.5	< 0.2 - 2
Sodium (Na)	82	10 %	Normal	101.5	46.5	98	8.5 - 194.5
Strontium (Sr)	39	0 %	Nonparametric	--	--	100	30 - 150
Thallium (Tl)	90	86 %	Nonparametric	--	--	< 1	< 0.08 - 3.8
Titanium (Ti)	68	0 %	Normal	124	46.4	112	31 - 217
Vanadium (V)	122	1 %	Lognormal	12.5	2.729	10.9	2 - 89
Zinc (Zn)	582	3 %	Normal	33	21.1	32	2.5 - 75

{a} For lognormal distributions, this represents the geometric mean. For normal distributions this represents the arithmetic mean. The mean was not estimated for data with non-parametric distributions (greater than 50% non-detect).

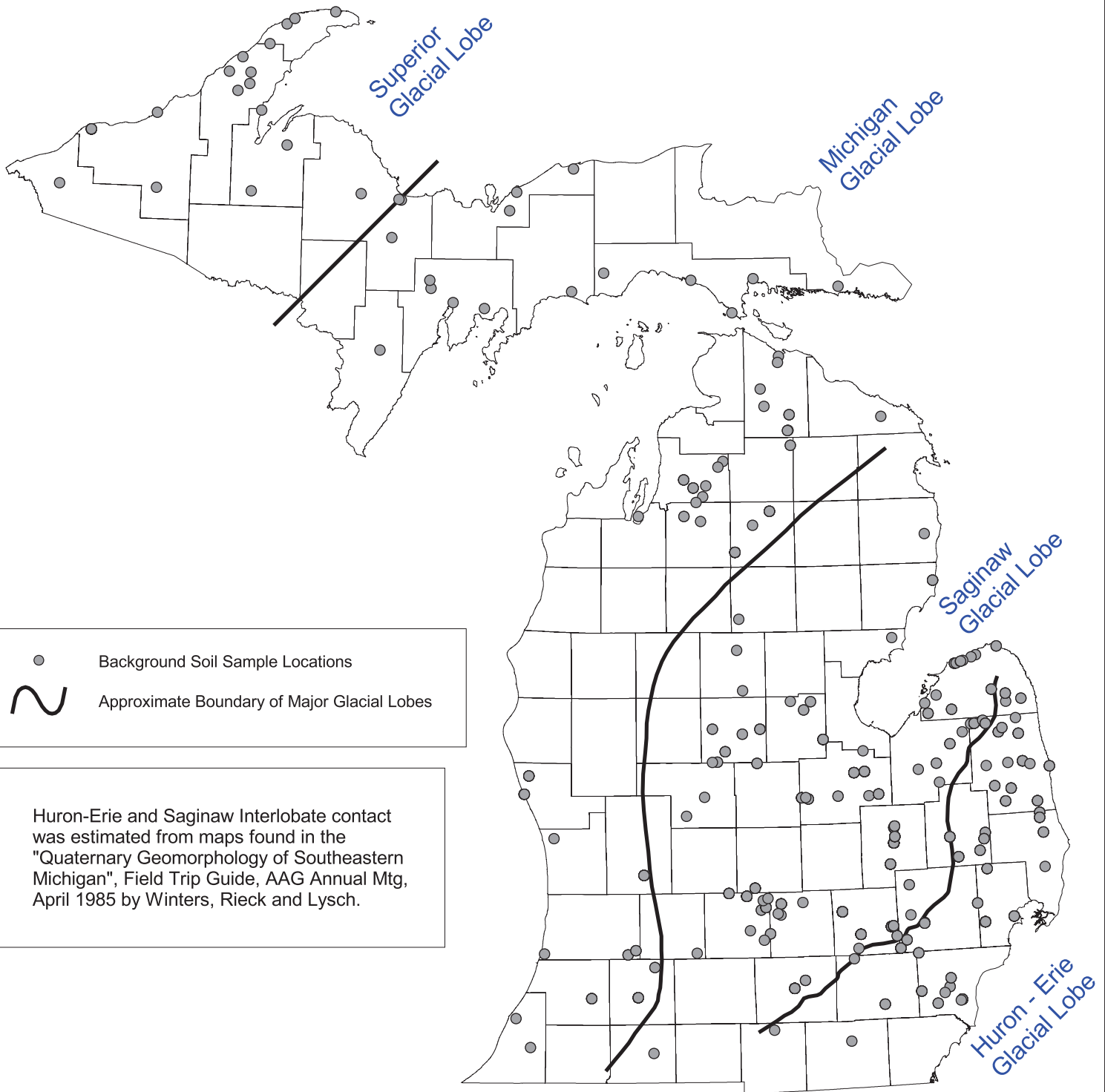
{b} For lognormal distributions, this represents the geometric standard deviation. The standard deviation is not estimated for data with non-parametric distributions.

{c} Typical range given is the central 95% of the data, or two standard deviations, calculated using the appropriate normal or lognormal formulas. The non-parametric range is based on the 2.5 and 97.5 quantiles of the data set.

**TABLE 1**

# ALL SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005



## TOPSOIL

	Dist.	Glacial Lobe Area												Statewide							
		HURON - ERIE			SAGINAW			MICHIGAN			SUPERIOR			TOPSOIL - Combined Statewide Data							
		n	x	SD	n	x	SD	n	x	SD	n	x	SD	n	min	max	x	SD	1 SD	2 SD	
Al	L	10	4572	1.467	37	2740	2.172	34	1112	1.724	16	3055	2.448	97	340	9950	2144	2.34	5017	11347	
Sb	non	0	--	--	0	--	--	0	--	--	0	--	--	0	--	--	--	--	--	--	
As	L	47	5.67	1.652	93	2.39	2.394	39	1.09	2.10	18	1.36	1.69	197	< 0.5	34	2.4	2.552	6.1	15	
Ba	L	15	37.7	2.614	42	26.2	1.748	39	14.2	2.225	16	37.3	2.125	112	2.2	10.	23.4	2.284	53.4	118	
Be	non	2	< 0.2	--	12	< 0.3	--	0	--	--	0	--	--	14	< 0.2	0.4	< 0.3	--	0.3	0.37	
Cd	non	15	< 2	--	42	< 2	--	38	< 2	--	18	< 2	--	113	0.12	2	< 2	--	< 2	< 2	
Cr	L	15	12.9	1.718	45	7.2	2.164	39	2.8	1.938	18	7.274	2.273	117	1	36	5.7	2.426	13.8	32	
Co	non	10	< 5	--	29	< 5	--	32	< 5	--	16	> 5	--	87	< 5	14	< 5	--	< 5	7	
Cu	L	15	10.1	2.410	42	4.7	2.462	39	2.7	2.259	18	28.1	2.522	114	< 1	82.5	5.7	3.267	18.6	58	
Fe	L	10	9547	1.503	42	4953	2.563	38	2432	1.91	18	4722	2.297	108	320	22300	4065	2.431	9882	23185	
Pb	L	38	11.7	1.931	60	7.8	2.147	39	7.4	1.854	18	11.4	2.587	155	2.3	66.2	8.8	2.149	18.9	39	
Li	L	10	4.5	1.559	34	2.9	2.292	32	< 2	--	18	2.8	1.990	94	2	12	2.2	2.363	5.2	12	
Mg	L	2	1576	1.245	8	2281	2.332	0	--	--	0	--	--	10	490	8900	2119	2.152	4560	9517	
Mn	L	10	475	2.158	42	124	3.065	38	117	3.113	18	136	2.718	108	3	1500	140	3.116	436	1299	
Hg	non	15	< 0.1	--	42	< 0.1	--	38	< 0.1	--	18	< 0.1	--	113	< 0.05	0.5	< 0.1	--	< 0.1	0.24	
Mo	--	2	< 5	--	12	< 5	--	0	--	--	0	--	--	14	< 1	< 5	--	--	< 5	< 5	
Ni	L	11	8.8	1.501	42	5.6	1.740	38	< 5	--	18	7.4	3.157	109	5	47	4.4	2.424	10.7	25	
Se	non	22	< 1	--	42	< 0.5	--	38	< 0.5	--	18	< 0.5	--	120	< 0.05	8	< 0.5	--	< 0.5	1.3	
Ag	non	6	< 0.25	--	5	< 0.25	--	0	--	--	0	--	--	11	< 0.2	1.7	< 0.25	--	< 0.25	1.3	
Na	N	2	125	--	5	92	24.6	0	--	--	0	--	--	7	65	130	101	25.9	127	153	
Sr	non	0	--	--	7	106	--	0	--	--	0	--	--	7	73	157	106	--	148	156	
Tl	non	2	< 1	--	5	< 1	--	0	--	--	0	--	--	7	< 1	< 1	< 1	--	< 1	< 1	
Ti	N	2	94.5	9.2	12	133	43.9	0	--	--	0	--	--	14	73	210	127.4	42.8	170	213	
V	L	2	20.9	1.145	12	14.1	1.483	0	--	--	0	--	--	14	8	28	14.9	1.48	22	32	
Zn	N	23	43.2	17.9	45	28.1	16.6	39	13	7.2	18	42.9	28.5	125	< 5	99	28.3	20.7	49	70	

Dist. = Distribution of data (L ~ Lognormal, non ~ nonparametric, N ~ Normal).

n = number of samples.

x = arithmetic or geometric mean, nonparametric median (mg/kg).

SD = arithmetic or geometric standard deviation, not applicable for nonparametric.

min = minimum value in data set (mg/kg).

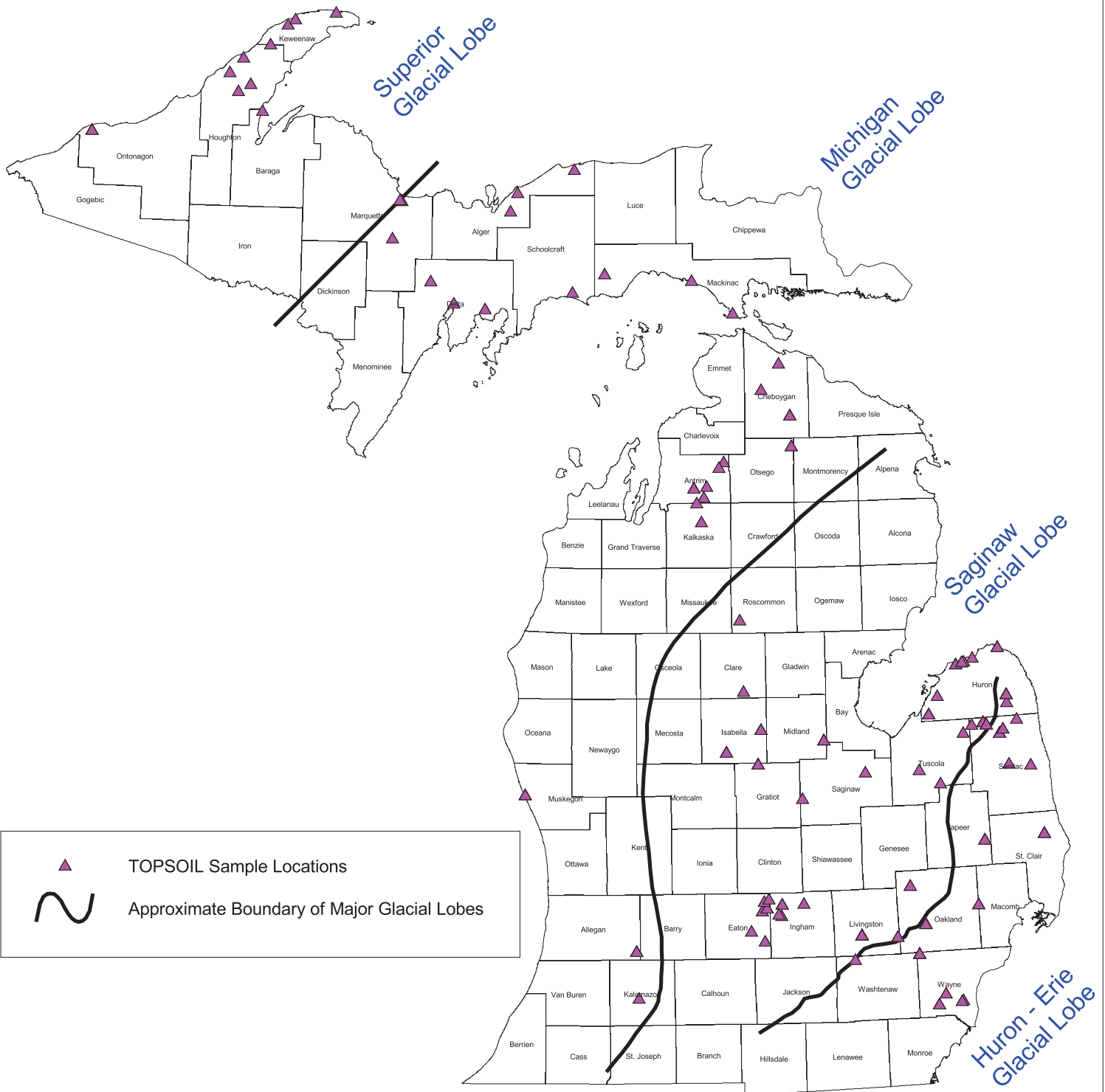
max = maximum value in data set (mg/kg)

Data Range	Lognormal	Normal	Nonparametric
1 SD	(x)(SD)	x + (1)SD	84 <sup>th</sup> quantile
2 SD	(x)(SD) <sup>1.96</sup>	x + (2)SD	97.5 quantile

### TABLE 2

# TOPSOIL SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005



## SAND

	Dist.	Glacial Lobe Area											Statewide							
		HURON - ERIE			SAGINAW			MICHIGAN			SUPERIOR		SAND - Combined Statewide Data							
		n	x	SD	n	x	SD	n	x	SD	n	x	SD	n	min	max	x	SD	1 SD	2 SD
Al	L	2	1699	1.171	54	2339	1.952	34	2624	1.816	3	1230	1.102	93	260	16400	2373	1.891	4487	8272
Sb	non	1	6.45	--	3	< 1	--	3	< 1	--	0	--	--	7	< 1	6.45	< 1	--	2.7	5.9
As	L	34	3.42	2.437	118	2.6	3.244	53	1.25	2.645	3	< 1	--	208	< 0.4	40	2.2	3.139	6.9	20.7
Ba	L	22	75.2	2.914	71	12.4	2.014	51	16.6	2.052	3	5.6	1.073	147	2.6	200	17.7	2.693	47.7	123
Be	non	3	< 0.2	--	51	< 0.2	--	6	< 1	--	0	--	--	60	< 0.2	0.645	< 0.2	--	< 1	0.37
Cd	non	22	< 2	--	67	< 2	--	39	0.11	--	3	< 2	--	131	< 0.01	2.1	< 2	--	< 2	1.8
Cr	L	22	4.0	2.29	90	5.2	1.986	67	3.9	2.209	3	8.6	1.372	182	1	50	4.6	2.125	9.8	20.2
Co	non	2	< 5	--	61	< 5	--	16	< 5	--	3	< 5	--	82	< 3	8.7	< 5	--	< 5	7
Cu	L	22	6.3	2.204	90	3.2	2.484	67	3.5	2.596	3	4.1	1.197	182	0.4	28	3.6	2.523	9.1	22.1
Fe	L	2	4247	1.051	55	3612	2.192	17	3418	1.88	3	3023	1.108	77	99.5	20400	3559	2.063	7342	14715
Pb	L	25	4.7	2.358	95	2.9	2.963	52	3.9	3.230	3	< 5	--	175	1.0	30	3.5	2.906	10.2	28.3
Li	L	2	< 2	--	62	2.3	2.223	11	2.2	3.333	3	< 2	--	78	< 2	20	2.14	2.402	5.1	11.9
Mg	L	2	840	1.017	44	871	4.09	13	671	1.759	0	--	--	59	35	28000	821	3.471	2850	9411
Mn	L	2	41	1.071	62	50.3	3.809	24	107	3.649	3	36.7	1.178	91	1	1500	60.5	3.773	228	817
Hg	non	17	< 0.04	--	66	< 0.05	--	22	0.03	--	3	< 0.1	--	108	< 0.018	0.62	< 0.05	--	< 0.1	0.08
Mo	--	2	< 5	--	51	< 5	--	6	< 5	--	0	--	--	59	< 5	< 5	< 5	--	< 5	< 5
Ni	L	8	9.3	1.875	78	4.8	2.185	40	4.0	2.175	3	< 5	--	129	1.2	34	4.6	2.243	10.3	22.4
Se	non	18	< 0.4	--	62	< 0.5	--	20	< 0.5	--	3	< 0.5	--	103	< 0.05	1.5	< 0.5	--	< 0.5	0.56
Ag	non	8	< 1	--	48	< 0.5	--	13	0.017	--	0	--	--	69	< 0.01	0.71	< 0.25	--	< 0.5	0.66
Na	N	2	140	14.1	44	81	42.5	12	123	22.5	0	--	--	58	25	210	92	42.9	135	178
Sr	non	0	--	--	7	50	--	6	70	--	0	--	--	13	30	150	70	--	104	150
Tl	non	3	< 0.5	--	46	< 1	--	9	< 0.086	--	0	--	--	58	< 0.5	6.13	< 1	--	< 1	5
Ti	N	2	186	10.6	44	121	43.2	0	--	--	0	--	--	46	13	227	124	44.4	168	213
V	L	2	9	1	51	8.9	2.693	19	9.4	2.226	0	--	--	72	0.05	98	9	2.519	22.7	55
Zn	N	22	27	19.4	80	17	15.5	64	18.2	16.6	3	6.3	0.29	169	1.3	95	19	16.9	36	53

Dist. = Distribution of data (L ~ Lognormal, non ~ nonparametric, N ~ Normal).

n = number of samples.

x = arithmetic or geometric mean, nonparametric median (mg/kg).

SD = arithmetic or geometric standard deviation, not applicable for nonparametric.

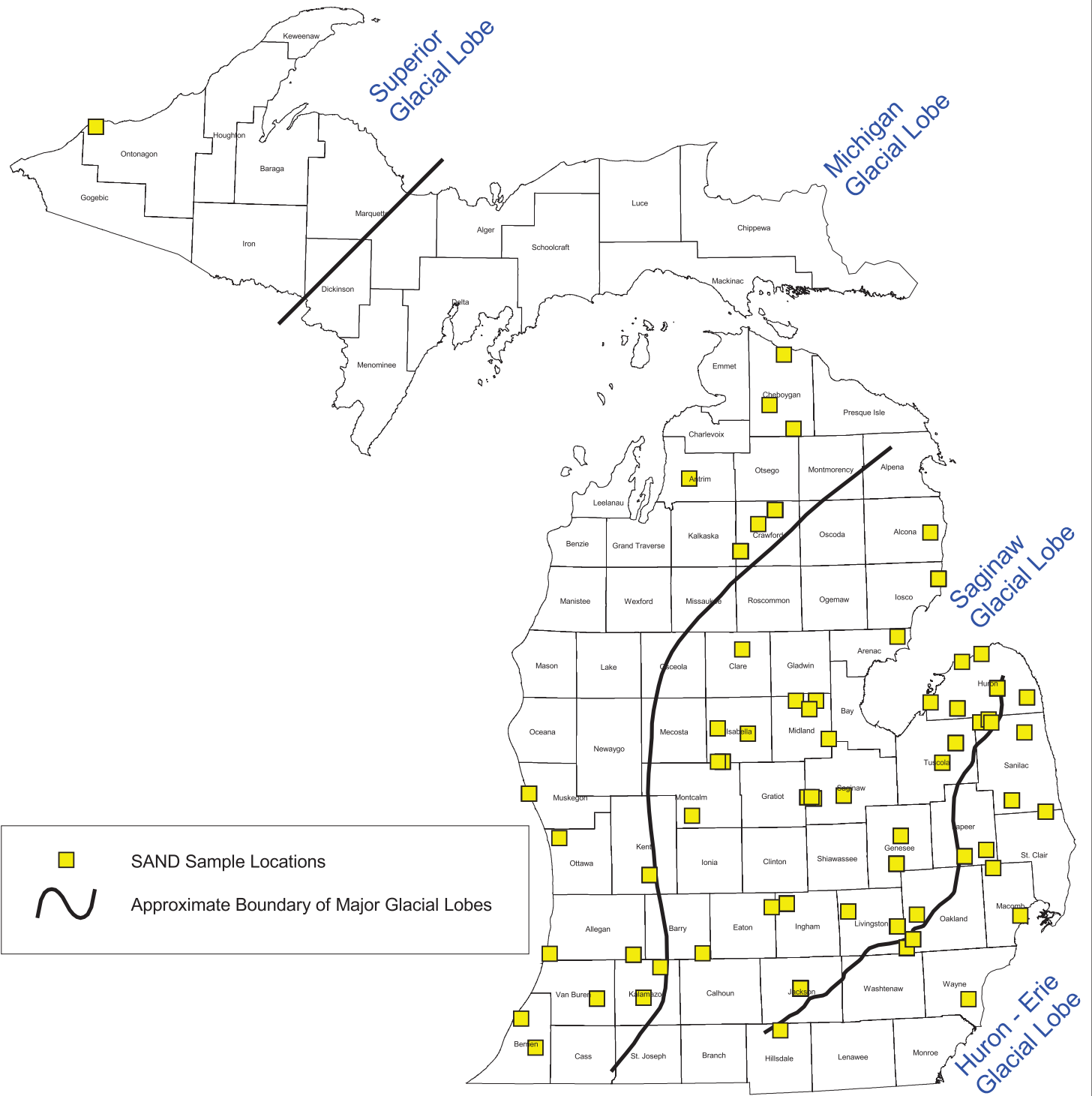
min = minimum value in data set (mg/kg).

max = maximum value in data set (mg/kg).

Data Range	Lognormal	Normal	Nonparametric
1 SD	(x)(SD)	x + (1)SD	84 <sup>th</sup> quantile
2 SD	(x)(SD) <sup>1.96</sup>	x + (2)SD	97.5 quantile

# SAND SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005



## CLAY

	Dist.	Glacial Lobe Area												Statewide						
		HURON - ERIE			SAGINAW			MICHIGAN			SUPERIOR			CLAY - Combined Statewide Data						
		n	x	SD	n	x	SD	n	x	SD	n	x	SD	n	min	max	x	SD	1 SD	2 SD
Al	L	23	8182	1.248	51	6862	1.428	6	8691	1.548	3	9490	1.131	83	1720	15570	7416	1.40	10382	14341
Sb	non	8	6	--	0	--	--	12	<0.04	--	0	--	--	20	<0.04	7.2	<0.4	--	6.2	6.9
As	L	126	9	2.047	224	4.7	1.978	17	2	1.888	3	2	1.077	370	0.2	88	5.6	2.201	12.3	26.3
Ba	L	104	74.2	1.959	48	44.9	1.577	6	49.5	1.592	3	94.7	1.032	161	6.8	291	63.2	1.906	120	224
Be	non	11	0.65	--	9	<0.2	--	12	<0.5	--	0	--	--	32	<0.2	1.82	0.275	--	0.7	1.6
Cd	non	128	< 2	--	108	< 2	--	16	<0.4	--	3	< 2	--	255	<0.12	4.7	< 2	--	1.5	2.9
Cr	L	107	22	1.708	111	14.3	1.626	17	10.1	1.521	3	27	1.038	238	< 5	70	17.1	1.753	30	51.4
Co	non	29	9.1	--	22	9	--	6	4	--	3	6.5	--	60	1.9	13	8.9	--	11	12.5
Cu	L	103	16.3	1.738	103	14.1	1.485	17	12.6	1.474	3	20.6	1.078	226	0.56	52	15	1.613	24	38.3
Fe	L	26	20110	1.107	24	15090	1.398	6	10120	1.603	3	10970	1.119	59	5000	26000	16180	1.419	22959	32127
Pb	L	126	9	1.859	125	9.7	2.770	17	12.1	2.017	3	< 5	--	271	1	32	10.1	2.076	21	42.3
Li	L	29	20.1	1.437	22	14.4	1.698	4	9.1	1.542	3	11	1.095	58	3.5	77	16.3	1.630	26.6	42.5
Mg	N	0	--	--	8	36690	13040	2	12450	16340	0	--	--	10	895	49000	31844	16324	48168	64492
Mn	L	29	343	1.508	52	277	1.463	6	182	1.554	3	256	1.097	90	84	730	288	1.515	436	650
Hg	non	97	<0.1	--	54	<0.1	--	5	<0.1	--	3	<0.1	--	159	<0.02	0.9	<0.1	--	0.19	0.63
Mo	--	3	< 3	--	9	<5	--	0	--	--	0	--	--	12	<3	<5	<5	--	<5	<5
Ni	N	100	25.8	9.6	105	19.9	8.4	6	15.4	8.8	3	20	1.73	214	2.5	53	22.6	9.5	32.1	41.6
Se	non	94	0.33	--	43	<0.5	--	16	<0.4	--	3	<0.5	--	156	<0.05	2.4	<0.5	--	< 1	0.72
Ag	non	61	0.6	--	28	<0.5	--	12	<0.4	--	0	--	--	101	<0.2	3.3	< 1	--	1	3.1
Na	N	0	--	--	8	170	38.5	2	164	22.6	0	--	--	10	110	220	169	34.9	204	239
Sr	non	3	150	--	1	100	--	0	--	--	0	--	--	4	70	150	125	--	150	150
Tl	non	8	0.6	--	8	< 1	--	1	<0.5	--	0	--	--	17	<0.5	0.72	< 1	--	0.64	0.69
Ti	N	0	--	--	8	123	67.3	0	--	--	0	--	--	8	42	210	123	67.3	190	258
V	L	4	104	1.886	9	20.6	1.756	2	16.8	1.95	0	--	--	14	6	150	28.3	2.437	69	162
Zn	N	126	52.6	15.25	97	35.9	14.91	6	23.8	11	3	30.7	3.22	232	8.4	140	44.6	17.4	62	79

Dist. = Distribution of data (L~ Lognormal, non ~ nonparametric, N ~ Normal).

n = number of samples.

x = arithmetic or geometric mean, nonparametric median (mg/kg).

SD = arithmetic or geometric standard deviation, not applicable for nonparametric.

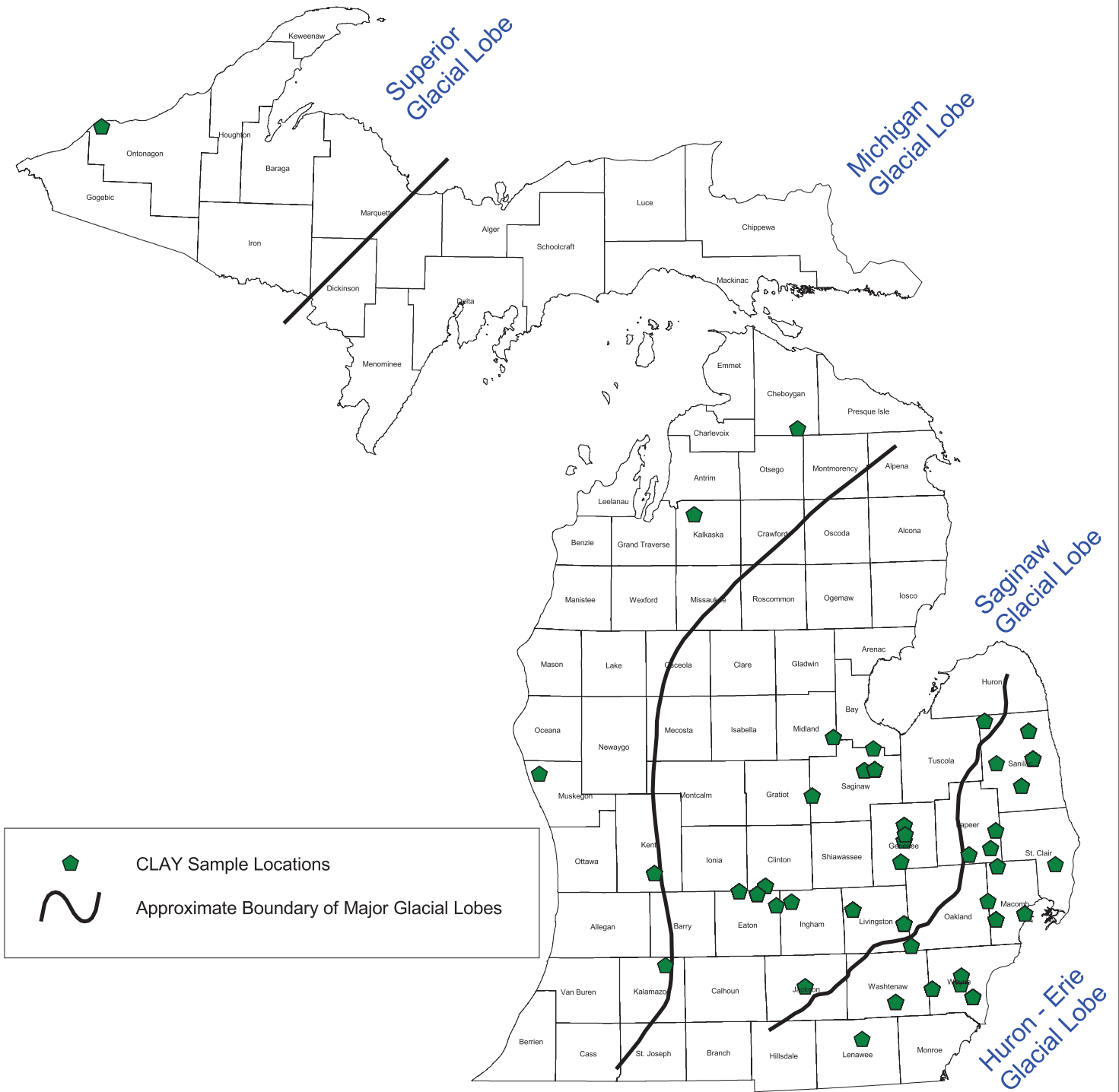
min = minimum value in data set (mg/kg).

max = maximum value in data set (mg/kg).

Data Range	Lognormal	Normal	Nonparametric
1 SD	(x)(SD)	x + (1)SD	84 <sup>th</sup> quantile
2 SD	(x)(SD) <sup>1.96</sup>	x + (2)SD	97.5 quantile

# CLAY SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005





# MICHIGAN BACKGROUND SOIL SURVEY 2005



Hazardous Waste Technical Support Unit  
Hazardous Waste Section  
Waste and Hazardous Materials Division



## Michigan Background Soil Survey 2005

### Introduction

In 1991, the Michigan Department of Natural Resources (MDNR) released a compilation of soil sampling data that represented what is assumed to be the naturally occurring background concentration of metals in Michigan soils. The data was presented in the "Michigan Background Soil Survey" (MBSS) dated April 1991. Since that time, additional soil sampling data from locations that represent background conditions has been collected, and the MBSS has been updated by the Michigan Department of Environmental Quality (MDEQ).

### History

During the mid-1980s, closure plans were submitted to the state pursuant to cleanups and corrective action work at regulated hazardous waste treatment, storage, and disposal facilities. In order to assure that soil removal performed to get a clean closure was accomplished, standards were established that mandated the removal of contaminants until concentrations were nondetectable or within the naturally occurring background range. Therefore, facilities undergoing closure or corrective action for metals were required to submit analyses of soil from their specific location to determine the criteria to be met, which is statistically equivalent to the local, unimpacted background conditions. In order to evaluate the validity of these site-specific background values, a Michigan soil background database was compiled. That background soils database included information gathered by regulated facilities, as well as samples collected and analyzed by the state.

Background soil data from the regulated facilities has been obtained using standard sampling and analytical techniques at the time of collection, which were approved by the state, usually as part of a closure plan or remediation efforts. Common analytical methods from EPA/SW-846 were used (EPA method 200.7, SW-846 method series 6000/7000, etc.). Samples collected by the state were analyzed by an approved contract laboratory, or through the State of Michigan Environmental Laboratory. Some data was included from United States Geological Survey (USGS) and the Army Corp of Engineers. All results represent a total (available) metals analysis.

### Data Reduction

The background soil data for each metal has been reviewed in two basic ways. The first is looking at the data by general soil type. Based usually on a visual observation, and occasionally a soil classification system, soil samples were divided into the following general soil types: topsoil, clay, sand & silt, or sand. The other breakdown was by geographic location, using glacial geology distinctions. In Michigan there were several different glacial ice sheets (lobes) that covered distinct areas. The glacial lobes have varying points of origin and traverse differing types of bedrock, and thus the resulting glacial sediments could have varying chemical characteristics based on source rock influences. Summary statistics are presented for general soil types and broad geographic areas based on the location of major glacial lobes.

Since the data comes from investigations at different sites, each with various parameters of concern, the suite of metals analyzed was not the same in each case. Depending on how

common the metal was a pollutant of concern, and the number of samples taken for site-specific background determinations, each metal will have a different total number of individual samples and number of sites.

### Statistics

A basic statistical analysis was performed for each metal represented in the database. First, the percentage of nondetect values was determined, followed by analysis of the underlying distribution of the data. Finally, summary statistics such as the mean, median, standard deviation, quantiles and the range of concentrations for a metal were calculated with normal, lognormal, or nonparametric methods as appropriate.

In terms of detection limits, metals with 0 – 15 % nondetect results had a value equal to one half (1/2) of the respective detection limit substituted for calculation of summary statistics (Al, As, Ba, Ca, Cr, Cu, Fe, Mg, Mn, K, Na, Sr, Ti, V, Zn). Metals that have 15 - 50% nondetect values had summary statistics calculated using Cohen’s adjustment (Li, Ni, Pb). For metals with over 50% nondetects, a nonparametric method was used (Ag, Be, Cd, Co, Hg, Mo, Sb, Se, Tl).

The data distribution was analyzed using graphical techniques (histogram, probability plot, box plot) and the Shapiro-Francia or Shapiro-Wilk Goodness-of-Fit test. For simplicity’s sake, only normal or lognormal distributions were checked and the best fit to the respective metals’ data was chosen. Subsequently, summary statistics were calculated as appropriate for a normal, lognormal, or nonparametric distribution. Tables are attached that list the summary statistics for each metal.

### Summary

It is important to understand that the data and statistical summaries in the MBSS are to be used only for comparative purposes. The MBSS is meant to provide a resource for information regarding the concentration of naturally occurring metals that can be expected in various soil types and geographic areas of Michigan. Site-specific data is recommended to get the best representation of a local background concentration. This data is not to be used for setting site-specific cleanup criteria.

### Contact Information

If there are any questions, or a desire to obtain data, please contact those listed below:

David Slayton	517-373-8012	slaytond@michigan.gov
De Montgomery	517-373-7973	montgomd@michigan.gov

### Attachments

Table 1..... General Information – all data combined  
Tables 2, 3, 4.....Topsoil, Sand and Clay - typical range of concentrations  
Figure 1.....All Sample Locations and glacial lobe boundaries  
Figures 2, 3, 4.....Topsoil, Sand and Clay - sample locations

## General Information

METAL	Number of samples	Percent Non-detect	Assumed Distribution of Data	{a} Mean (mg/kg)	{b} Standard Deviation	Median (mg/kg)	{c} Typical Range of data (mg/kg)
Aluminum (Al)	295	0 %	Lognormal	3215	2.291	3420	2603 - 16,324
Antimony (Sb)	35	94 %	Nonparametric	--	--	< 5	< 0.04 – 2.5
Arsenic (As)	926	3 %	Lognormal	3.6	2.829	3.8	0.47 - 27.7
Barium (Ba)	463	1 %	Lognormal	31	2.707	38	4 - 220
Beryllium (Be)	128	77 %	Nonparametric	--	--	< 0.5	< 0.2 - 1.8
Cadmium (Cd)	535	72 %	Nonparametric	--	--	< 2	< 0.05 - 2.5
Chromium (Cr)	595	9 %	Lognormal	8.8	2.559	10	1.4 - 55
Cobalt (Co)	265	60 %	Nonparametric	--	--	< 5	< 3 - 12
Copper (Cu)	580	8 %	Lognormal	7.4	2.565	10	1 - 58
Iron (Fe)	266	0 %	Lognormal	5403	2.565	5645	852 - 34,233
Lead (Pb)	682	21 %	Censored-Log	7.1	2.562	7.73	1 - 45
Lithium (Li)	259	30 %	Censored-Log	3.8	3.373	3.5	0.35 - 41
Magnesium (Mg)	86	0 %	Lognormal	1360	4.837	824	62 - 29,875
Manganese (Mn)	326	0 %	Lognormal	139	3.235	190	14 - 1391
Mercury (Hg)	431	83 %	Nonparametric	--	--	< 0.1	< 0.025 - 0.6
Molybdenum (Mo)	100	100 %	--	--	--	< 5	< 5
Nickel (Ni)	492	23 %	Censored-Nor	12.3	13	11	2.4 - 39
Selenium (Se)	430	82 %	Nonparametric	--	--	< 0.5	< 0.05 - 1.2
Silver (Ag)	202	84 %	Nonparametric	--	--	< 0.5	< 0.2 - 2
Sodium (Na)	82	10 %	Normal	101.5	46.5	98	8.5 - 194.5
Strontium (Sr)	39	0 %	Nonparametric	--	--	100	30 - 150
Thallium (Tl)	90	86 %	Nonparametric	--	--	< 1	< 0.08 - 3.8
Titanium (Ti)	68	0 %	Normal	124	46.4	112	31 - 217
Vanadium (V)	122	1 %	Lognormal	12.5	2.729	10.9	2 - 89
Zinc (Zn)	582	3 %	Normal	33	21.1	32	2.5 - 75

{a} For lognormal distributions, this represents the geometric mean. For normal distributions this represents the arithmetic mean. The mean was not estimated for data with non-parametric distributions (greater than 50% non-detect).

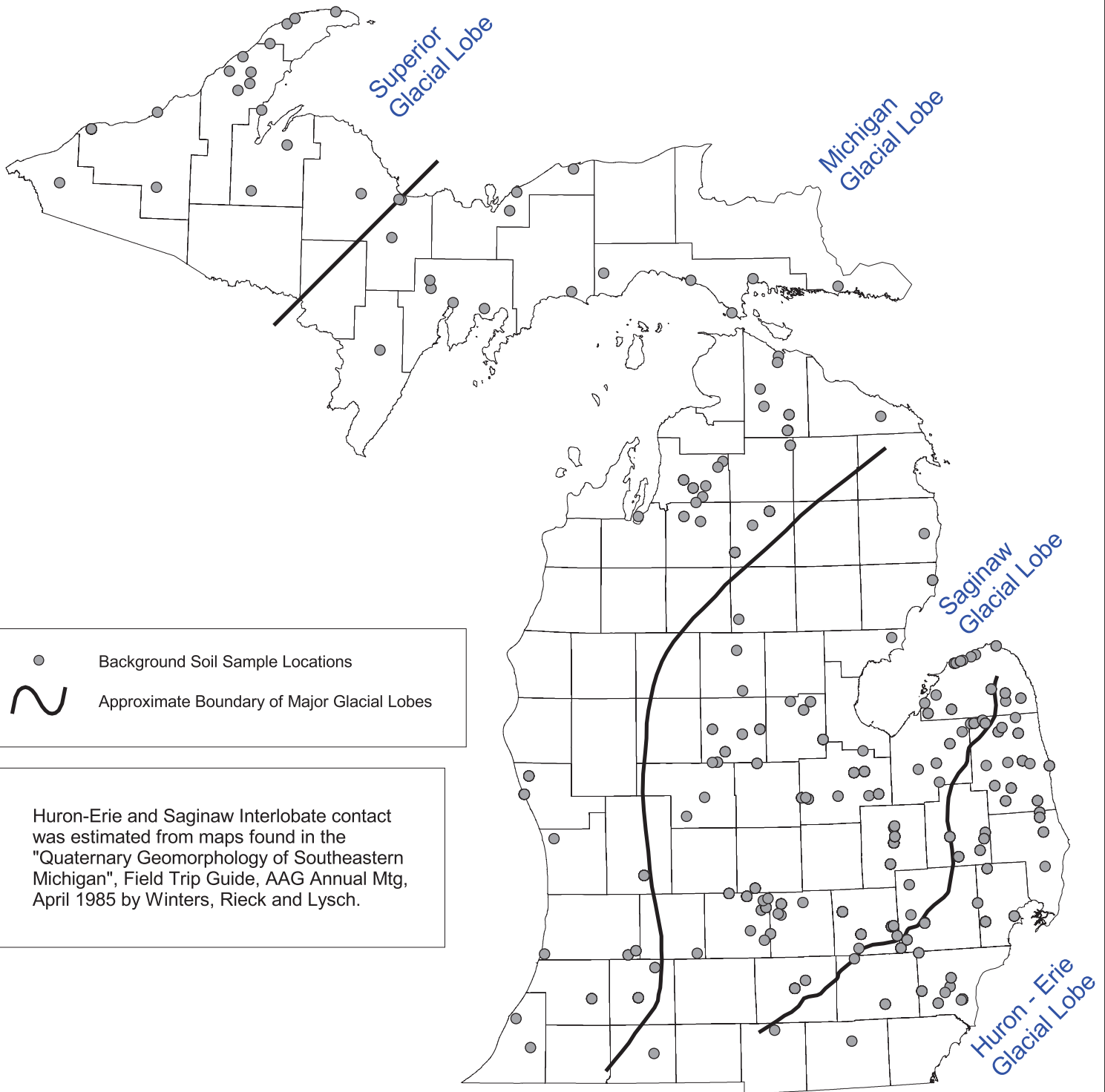
{b} For lognormal distributions, this represents the geometric standard deviation. The standard deviation is not estimated for data with non-parametric distributions.

{c} Typical range given is the central 95% of the data, or two standard deviations, calculated using the appropriate normal or lognormal formulas. The non-parametric range is based on the 2.5 and 97.5 quantiles of the data set.

**TABLE 1**

# ALL SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005



- Background Soil Sample Locations
- ~ Approximate Boundary of Major Glacial Lobes

Huron-Erie and Saginaw Interlobate contact was estimated from maps found in the "Quaternary Geomorphology of Southeastern Michigan", Field Trip Guide, AAG Annual Mtg, April 1985 by Winters, Rieck and Lysch.

## TOPSOIL

	Dist.	Glacial Lobe Area												Statewide							
		HURON - ERIE			SAGINAW			MICHIGAN			SUPERIOR			TOPSOIL - Combined Statewide Data							
		n	x	SD	n	x	SD	n	x	SD	n	x	SD	n	min	max	x	SD	1 SD	2 SD	
Al	L	10	4572	1.467	37	2740	2.172	34	1112	1.724	16	3055	2.448	97	340	9950	2144	2.34	5017	11347	
Sb	non	0	--	--	0	--	--	0	--	--	0	--	--	0	--	--	--	--	--	--	
As	L	47	5.67	1.652	93	2.39	2.394	39	1.09	2.10	18	1.36	1.69	197	< 0.5	34	2.4	2.552	6.1	15	
Ba	L	15	37.7	2.614	42	26.2	1.748	39	14.2	2.225	16	37.3	2.125	112	2.2	10.	23.4	2.284	53.4	118	
Be	non	2	< 0.2	--	12	< 0.3	--	0	--	--	0	--	--	14	< 0.2	0.4	< 0.3	--	0.3	0.37	
Cd	non	15	< 2	--	42	< 2	--	38	< 2	--	18	< 2	--	113	0.12	2	< 2	--	< 2	< 2	
Cr	L	15	12.9	1.718	45	7.2	2.164	39	2.8	1.938	18	7.274	2.273	117	1	36	5.7	2.426	13.8	32	
Co	non	10	< 5	--	29	< 5	--	32	< 5	--	16	> 5	--	87	< 5	14	< 5	--	< 5	7	
Cu	L	15	10.1	2.410	42	4.7	2.462	39	2.7	2.259	18	28.1	2.522	114	< 1	82.5	5.7	3.267	18.6	58	
Fe	L	10	9547	1.503	42	4953	2.563	38	2432	1.91	18	4722	2.297	108	320	22300	4065	2.431	9882	23185	
Pb	L	38	11.7	1.931	60	7.8	2.147	39	7.4	1.854	18	11.4	2.587	155	2.3	66.2	8.8	2.149	18.9	39	
Li	L	10	4.5	1.559	34	2.9	2.292	32	< 2	--	18	2.8	1.990	94	2	12	2.2	2.363	5.2	12	
Mg	L	2	1576	1.245	8	2281	2.332	0	--	--	0	--	--	10	490	8900	2119	2.152	4560	9517	
Mn	L	10	475	2.158	42	124	3.065	38	117	3.113	18	136	2.718	108	3	1500	140	3.116	436	1299	
Hg	non	15	< 0.1	--	42	< 0.1	--	38	< 0.1	--	18	< 0.1	--	113	< 0.05	0.5	< 0.1	--	< 0.1	0.24	
Mo	--	2	< 5	--	12	< 5	--	0	--	--	0	--	--	14	< 1	< 5	--	--	< 5	< 5	
Ni	L	11	8.8	1.501	42	5.6	1.740	38	< 5	--	18	7.4	3.157	109	5	47	4.4	2.424	10.7	25	
Se	non	22	< 1	--	42	< 0.5	--	38	< 0.5	--	18	< 0.5	--	120	< 0.05	8	< 0.5	--	< 0.5	1.3	
Ag	non	6	< 0.25	--	5	< 0.25	--	0	--	--	0	--	--	11	< 0.2	1.7	< 0.25	--	< 0.25	1.3	
Na	N	2	125	--	5	92	24.6	0	--	--	0	--	--	7	65	130	101	25.9	127	153	
Sr	non	0	--	--	7	106	--	0	--	--	0	--	--	7	73	157	106	--	148	156	
Tl	non	2	< 1	--	5	< 1	--	0	--	--	0	--	--	7	< 1	< 1	< 1	--	< 1	< 1	
Ti	N	2	94.5	9.2	12	133	43.9	0	--	--	0	--	--	14	73	210	127.4	42.8	170	213	
V	L	2	20.9	1.145	12	14.1	1.483	0	--	--	0	--	--	14	8	28	14.9	1.48	22	32	
Zn	N	23	43.2	17.9	45	28.1	16.6	39	13	7.2	18	42.9	28.5	125	< 5	99	28.3	20.7	49	70	

Dist. = Distribution of data (L ~ Lognormal, non ~ nonparametric, N ~ Normal).

n = number of samples.

x = arithmetic or geometric mean, nonparametric median (mg/kg).

SD = arithmetic or geometric standard deviation, not applicable for nonparametric.

min = minimum value in data set (mg/kg).

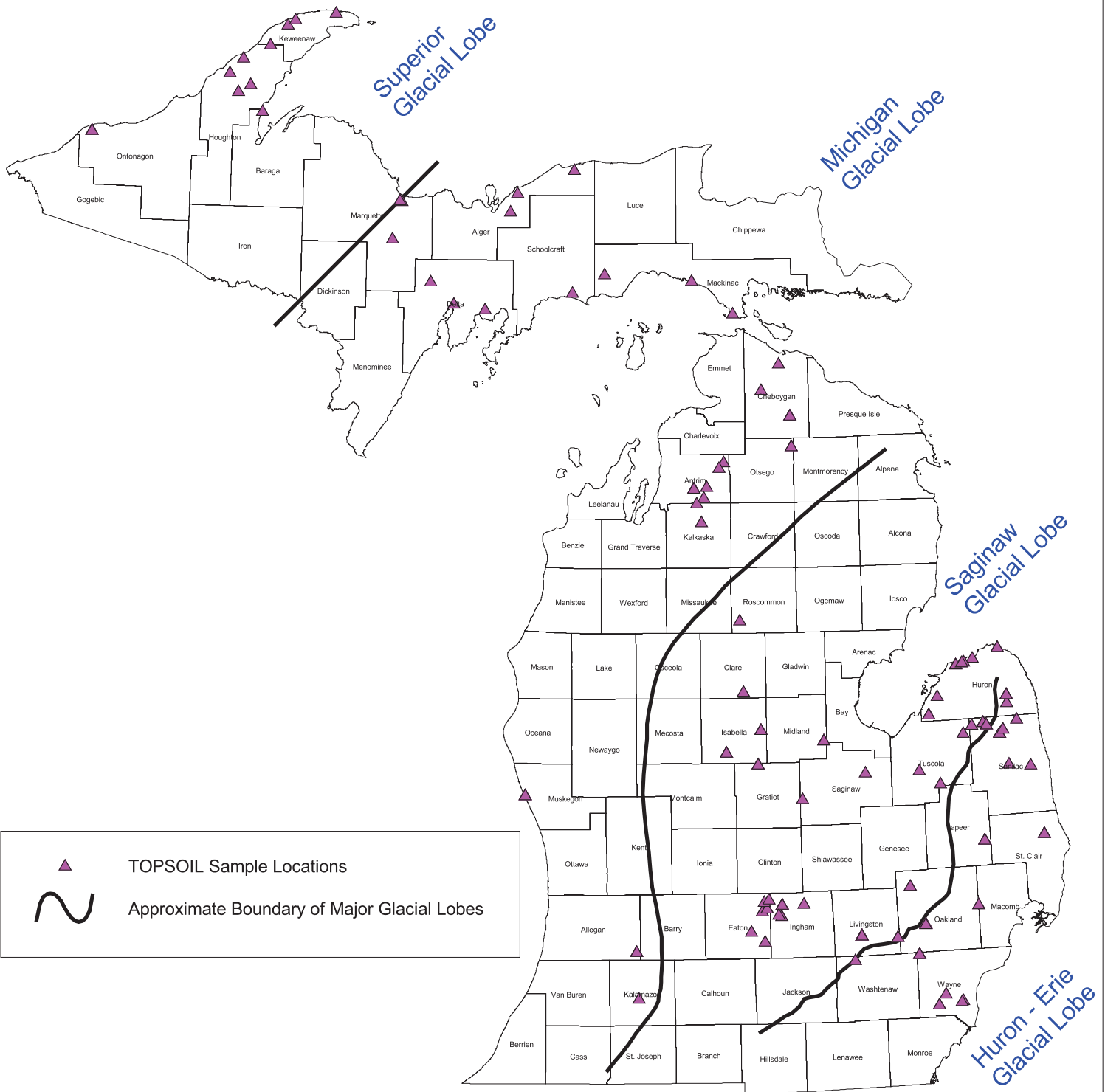
max = maximum value in data set (mg/kg)

Data Range	Lognormal	Normal	Nonparametric
1 SD	(x)(SD)	x + (1)SD	84 <sup>th</sup> quantile
2 SD	(x)(SD) <sup>1.96</sup>	x + (2)SD	97.5 quantile

### TABLE 2

# TOPSOIL SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005



## SAND

	Dist.	Glacial Lobe Area											Statewide							
		HURON - ERIE			SAGINAW			MICHIGAN			SUPERIOR			SAND - Combined Statewide Data						
		n	x	SD	n	x	SD	n	x	SD	n	x	SD	n	min	max	x	SD	1 SD	2 SD
Al	L	2	1699	1.171	54	2339	1.952	34	2624	1.816	3	1230	1.102	93	260	16400	2373	1.891	4487	8272
Sb	non	1	6.45	--	3	< 1	--	3	< 1	--	0	--	--	7	< 1	6.45	< 1	--	2.7	5.9
As	L	34	3.42	2.437	118	2.6	3.244	53	1.25	2.645	3	< 1	--	208	< 0.4	40	2.2	3.139	6.9	20.7
Ba	L	22	75.2	2.914	71	12.4	2.014	51	16.6	2.052	3	5.6	1.073	147	2.6	200	17.7	2.693	47.7	123
Be	non	3	< 0.2	--	51	< 0.2	--	6	< 1	--	0	--	--	60	< 0.2	0.645	< 0.2	--	< 1	0.37
Cd	non	22	< 2	--	67	< 2	--	39	0.11	--	3	< 2	--	131	< 0.01	2.1	< 2	--	< 2	1.8
Cr	L	22	4.0	2.29	90	5.2	1.986	67	3.9	2.209	3	8.6	1.372	182	1	50	4.6	2.125	9.8	20.2
Co	non	2	< 5	--	61	< 5	--	16	< 5	--	3	< 5	--	82	< 3	8.7	< 5	--	< 5	7
Cu	L	22	6.3	2.204	90	3.2	2.484	67	3.5	2.596	3	4.1	1.197	182	0.4	28	3.6	2.523	9.1	22.1
Fe	L	2	4247	1.051	55	3612	2.192	17	3418	1.88	3	3023	1.108	77	99.5	20400	3559	2.063	7342	14715
Pb	L	25	4.7	2.358	95	2.9	2.963	52	3.9	3.230	3	< 5	--	175	1.0	30	3.5	2.906	10.2	28.3
Li	L	2	< 2	--	62	2.3	2.223	11	2.2	3.333	3	< 2	--	78	< 2	20	2.14	2.402	5.1	11.9
Mg	L	2	840	1.017	44	871	4.09	13	671	1.759	0	--	--	59	35	28000	821	3.471	2850	9411
Mn	L	2	41	1.071	62	50.3	3.809	24	107	3.649	3	36.7	1.178	91	1	1500	60.5	3.773	228	817
Hg	non	17	< 0.04	--	66	< 0.05	--	22	0.03	--	3	< 0.1	--	108	< 0.018	0.62	< 0.05	--	< 0.1	0.08
Mo	--	2	< 5	--	51	< 5	--	6	< 5	--	0	--	--	59	< 5	< 5	< 5	--	< 5	< 5
Ni	L	8	9.3	1.875	78	4.8	2.185	40	4.0	2.175	3	< 5	--	129	1.2	34	4.6	2.243	10.3	22.4
Se	non	18	< 0.4	--	62	< 0.5	--	20	< 0.5	--	3	< 0.5	--	103	< 0.05	1.5	< 0.5	--	< 0.5	0.56
Ag	non	8	< 1	--	48	< 0.5	--	13	0.017	--	0	--	--	69	< 0.01	0.71	< 0.25	--	< 0.5	0.66
Na	N	2	140	14.1	44	81	42.5	12	123	22.5	0	--	--	58	25	210	92	42.9	135	178
Sr	non	0	--	--	7	50	--	6	70	--	0	--	--	13	30	150	70	--	104	150
Tl	non	3	< 0.5	--	46	< 1	--	9	< 0.086	--	0	--	--	58	< 0.5	6.13	< 1	--	< 1	5
Ti	N	2	186	10.6	44	121	43.2	0	--	--	0	--	--	46	13	227	124	44.4	168	213
V	L	2	9	1	51	8.9	2.693	19	9.4	2.226	0	--	--	72	0.05	98	9	2.519	22.7	55
Zn	N	22	27	19.4	80	17	15.5	64	18.2	16.6	3	6.3	0.29	169	1.3	95	19	16.9	36	53

Dist. = Distribution of data (L ~ Lognormal, non ~ nonparametric, N ~ Normal).

n = number of samples.

x = arithmetic or geometric mean, nonparametric median (mg/kg).

SD = arithmetic or geometric standard deviation, not applicable for nonparametric.

min = minimum value in data set (mg/kg).

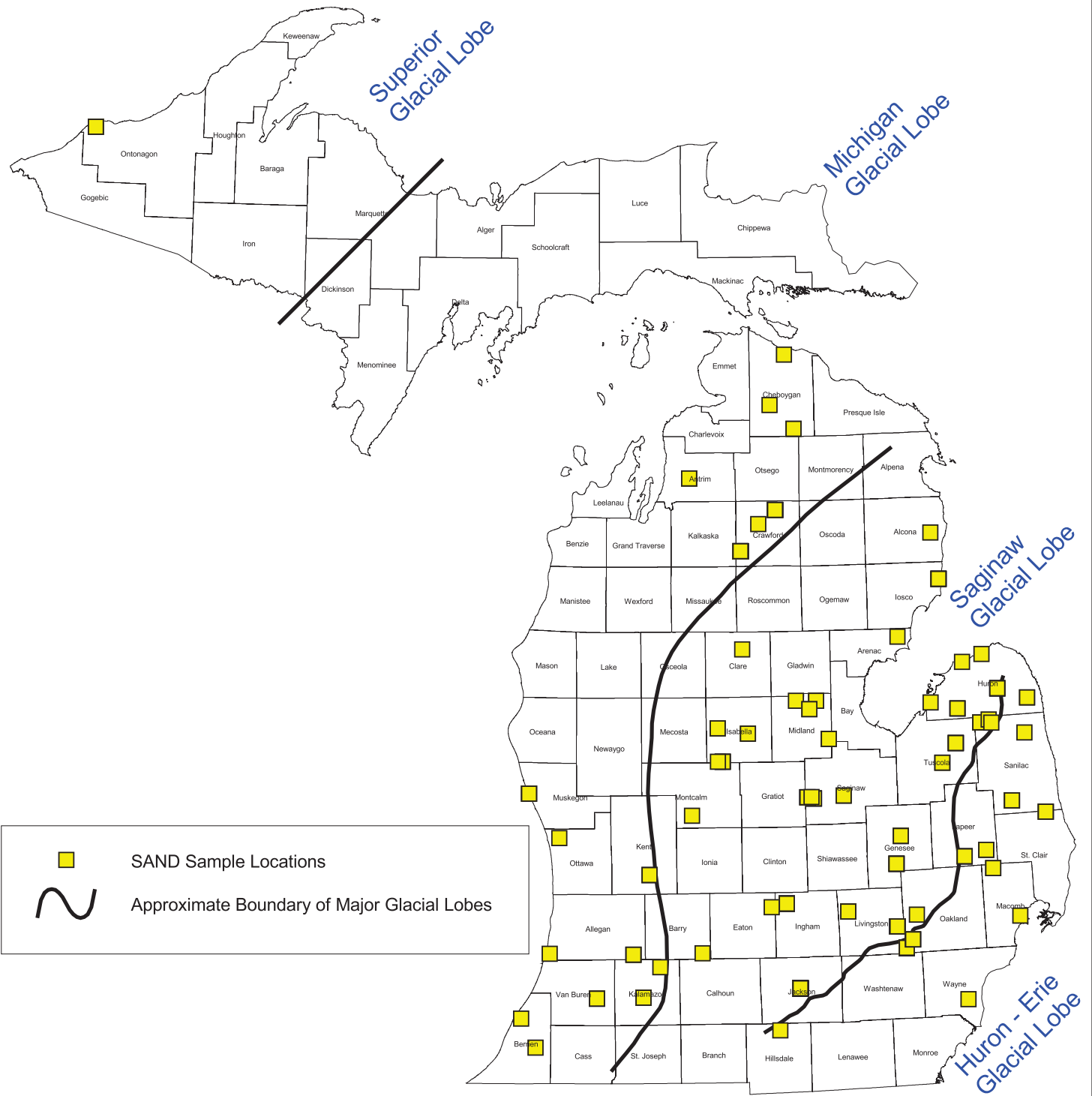
max = maximum value in data set (mg/kg).

Data Range	Lognormal	Normal	Nonparametric
1 SD	(x)(SD)	x + (1)SD	84 <sup>th</sup> quantile
2 SD	(x)(SD) <sup>1.96</sup>	x + (2)SD	97.5 quantile



# SAND SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005



## CLAY

	Dist.	Glacial Lobe Area											Statewide							
		HURON - ERIE			SAGINAW			MICHIGAN			SUPERIOR			CLAY - Combined Statewide Data						
		n	x	SD	n	x	SD	n	x	SD	n	x	SD	n	min	max	x	SD	1 SD	2 SD
Al	L	23	8182	1.248	51	6862	1.428	6	8691	1.548	3	9490	1.131	83	1720	15570	7416	1.40	10382	14341
Sb	non	8	6	--	0	--	--	12	<0.04	--	0	--	--	20	<0.04	7.2	<0.4	--	6.2	6.9
As	L	126	9	2.047	224	4.7	1.978	17	2	1.888	3	2	1.077	370	0.2	88	5.6	2.201	12.3	26.3
Ba	L	104	74.2	1.959	48	44.9	1.577	6	49.5	1.592	3	94.7	1.032	161	6.8	291	63.2	1.906	120	224
Be	non	11	0.65	--	9	<0.2	--	12	<0.5	--	0	--	--	32	<0.2	1.82	0.275	--	0.7	1.6
Cd	non	128	< 2	--	108	< 2	--	16	<0.4	--	3	< 2	--	255	<0.12	4.7	< 2	--	1.5	2.9
Cr	L	107	22	1.708	111	14.3	1.626	17	10.1	1.521	3	27	1.038	238	< 5	70	17.1	1.753	30	51.4
Co	non	29	9.1	--	22	9	--	6	4	--	3	6.5	--	60	1.9	13	8.9	--	11	12.5
Cu	L	103	16.3	1.738	103	14.1	1.485	17	12.6	1.474	3	20.6	1.078	226	0.56	52	15	1.613	24	38.3
Fe	L	26	20110	1.107	24	15090	1.398	6	10120	1.603	3	10970	1.119	59	5000	26000	16180	1.419	22959	32127
Pb	L	126	9	1.859	125	9.7	2.770	17	12.1	2.017	3	< 5	--	271	1	32	10.1	2.076	21	42.3
Li	L	29	20.1	1.437	22	14.4	1.698	4	9.1	1.542	3	11	1.095	58	3.5	77	16.3	1.630	26.6	42.5
Mg	N	0	--	--	8	36690	13040	2	12450	16340	0	--	--	10	895	49000	31844	16324	48168	64492
Mn	L	29	343	1.508	52	277	1.463	6	182	1.554	3	256	1.097	90	84	730	288	1.515	436	650
Hg	non	97	<0.1	--	54	<0.1	--	5	<0.1	--	3	<0.1	--	159	<0.02	0.9	<0.1	--	0.19	0.63
Mo	--	3	< 3	--	9	<5	--	0	--	--	0	--	--	12	<3	<5	<5	--	<5	<5
Ni	N	100	25.8	9.6	105	19.9	8.4	6	15.4	8.8	3	20	1.73	214	2.5	53	22.6	9.5	32.1	41.6
Se	non	94	0.33	--	43	<0.5	--	16	<0.4	--	3	<0.5	--	156	<0.05	2.4	<0.5	--	< 1	0.72
Ag	non	61	0.6	--	28	<0.5	--	12	<0.4	--	0	--	--	101	<0.2	3.3	< 1	--	1	3.1
Na	N	0	--	--	8	170	38.5	2	164	22.6	0	--	--	10	110	220	169	34.9	204	239
Sr	non	3	150	--	1	100	--	0	--	--	0	--	--	4	70	150	125	--	150	150
Tl	non	8	0.6	--	8	< 1	--	1	<0.5	--	0	--	--	17	<0.5	0.72	< 1	--	0.64	0.69
Ti	N	0	--	--	8	123	67.3	0	--	--	0	--	--	8	42	210	123	67.3	190	258
V	L	4	104	1.886	9	20.6	1.756	2	16.8	1.95	0	--	--	14	6	150	28.3	2.437	69	162
Zn	N	126	52.6	15.25	97	35.9	14.91	6	23.8	11	3	30.7	3.22	232	8.4	140	44.6	17.4	62	79

Dist. = Distribution of data (L~ Lognormal, non ~ nonparametric, N ~ Normal).

n = number of samples.

x = arithmetic or geometric mean, nonparametric median (mg/kg).

SD = arithmetic or geometric standard deviation, not applicable for nonparametric.

min = minimum value in data set (mg/kg).

max = maximum value in data set (mg/kg).

Data Range	Lognormal	Normal	Nonparametric
1 SD	(x)(SD)	x + (1)SD	84 <sup>th</sup> quantile
2 SD	(x)(SD) <sup>1.96</sup>	x + (2)SD	97.5 quantile

# CLAY SAMPLE LOCATIONS

## Michigan Background Soil Survey 2005

