

MEMORANDUM

To: Mr. Mat Reimer
From: Stephen Meer, P.E.
Cc:
Project Number: 16763
Date: March 14, 2017
RE: Summary of Phase II Environmental Site Assessment Results, 1313 & 1329-1331 W. National Ave., Milwaukee, Wisconsin

Dear Mat:

The Sigma Group, Inc. (Sigma) was retained by the Redevelopment Authority of the City of Milwaukee (RACM) to complete Phase II environmental site assessment (Phase II ESA) activities at the properties located at 1313 & 1329-1331 W. National Avenue, Milwaukee, Wisconsin (hereinafter the "site"). The purpose of the subsurface investigation was to characterize and evaluate subsurface conditions relative to historic site use, which included automobile repair and sales and the possible presence of a fuel oil/waste oil underground storage tank (UST).

To evaluate the site for the potential presence of subsurface impacts resulting from historic site activities, Sigma on behalf of RACM completed the following:

- 1) Soil sampling via ten (10) Geoprobe soil boring advancement to evaluate site soil characteristics and quality,
- 2) Installation of three (3) temporary groundwater monitoring wells, and
- 3) Groundwater sampling from temporary wells to screen groundwater quality

The location of completed soil borings and installed monitoring wells are illustrated on **Figure 1**. Results of the investigation activities completed to date are summarized below.

Geology

Based on information obtained during Sigma's subsurface investigation, the site is covered with 6 inches to 1 foot of asphalt and/or concrete pavement. Reworked silty clay and sand with varying amounts of silt and gravel generally underlay the pavement to depths between 2 to 6 feet below ground surface (bgs). The apparently reworked soil fill is underlain by apparently native silty clay with interbedded layers of sand to the maximum depth investigated (15 feet bgs). The soil boring logs are included as **Attachment A**.

Hydrogeology

During subsurface investigation activities, apparently saturated conditions were observed between 4 and 7 feet bgs. During the groundwater sampling event, depths to groundwater within the temporary wells at the site ranged from 12 to 14 feet bgs. Due to the short interval of time between well installation and groundwater sampling and the geology of the site, the measured groundwater depths may not accurately represent shallow groundwater elevation at the site.

Sufficient groundwater had not entered temporary monitoring well GP-2 to allow collection of a groundwater sample. A shallow groundwater flow direction could not be determined based on the information collected during the Phase II activities.

Soil Quality Results

A total of 20 soil samples collected at the site were submitted for laboratory analysis of the following parameters: VOCs, PAHs, RCRA Metals, and/or PBCs. Soil samples were also screened in the field with a photoionization detector (PID) for the presence of volatile organic compounds. Review of field screening results indicates that PID readings taken from soil samples collected at the site range from 0 to 878 parts per million (ppm). The highest PID readings were observed within soil borings GP-6 and GP-7 at the depth intervals 7.5 to 10 feet bgs (878 ppm) and 10 to 12.5 feet bgs (801 ppm), respectively.

VOC Results: Review of the laboratory analytical results indicates that concentrations of select petroleum VOC constituents (PVOCs) were reported at concentrations greater than WDNR Residual Contaminant Levels (RCLs) within four soil samples collected from the site. Benzene, ethylbenzene, naphthalene, toluene, trimethylbenzenes, and/or xylenes were reported at concentrations greater than Groundwater Pathway and/or Non-Industrial Direct Contact RCLs within soil samples collected from soil boring GP-6 (7.5 to 10 feet bgs), and GP-7 (10 to 12.5 feet bgs).

Tetrachloroethene (PCE) was also reported at concentrations greater than the Groundwater Pathway RCL within soil samples collected at soil boring GP-2 (2.5 to 4 feet bgs) and GP-10 (5 to 7.5 feet bgs).

PAHs Results: Review of the laboratory analytical results indicate that one or more PAH constituents were reported at concentrations greater than WDNR RCLs within nine soil samples collected from the site. One or more PAH constituents were reported at concentrations greater than Groundwater Pathway and/or Direct Contact RCLs within soil samples collected from soil borings GP-1 (5 to 7.5 feet bgs), GP-3 (2.5 to 5 feet bgs and 5 to 7.5 feet bgs), GP-5 (2.5 to 4 feet bgs and 5 to 7.5 feet bgs), GP-6 (7.5 to 10 feet bgs), GP-7 (10 to 12.5 feet bgs), GP-9 (2.5 to 4 feet bgs) and GP-10 (2.5 to 4 feet bgs).

Metal Results: Review of the laboratory analytical results indicate that arsenic was detected at concentrations greater than the groundwater pathway and non-industrial direct contact RCL within all soil samples collected from the site. However, all reported arsenic concentrations are within typical background levels established for southeastern Wisconsin.

PCB Results: A soil sample was collected from soil borings GP-6 (2.5 to 4 feet and 7.5 to 10 feet bgs) and GP-7 (2.5 to 4 feet bgs and 10 to 12.5 feet bgs). Review of the laboratory analytical results indicate that no PCBs were detected within the soil samples submitted for laboratory analysis.

Soil analytical results for the site are summarized in **Table 1**.

Groundwater Quality Results

Groundwater samples from two temporary monitoring wells (GP-6 and GP-7) were collected and submitted for laboratory analysis of VOCs. It is important to note that

although the groundwater quality data has been reviewed and compared to regulatory standards, the groundwater samples were collected from temporary wells; the results are not reproducible; therefore, the groundwater analytical results cannot be confirmed.

VOCs Discussion: Review of the laboratory analytical results indicate that select PVOC constituents were reported at concentrations greater than WDNR ch. NR 140 Preventative Action Limits (PALs) and/or Enforcement Standards (ESs) within the groundwater samples collected from temporary wells GP-6 and GP-7. Benzene, ethylbenzene, naphthalene, toluene, trimethylbenzenes, and/ or xylenes were reported at concentrations greater than their PALs and/or ESs within the groundwater sample collected from temporary wells GP-6 and GP-7. In addition, detections of several other PVOC constituents were reported at concentrations less than WDNR standards.

Groundwater analytical results for the site are summarized in **Table 2**.

Results Discussion

Based on soil and groundwater analytical results a release associated with historic storage/use of petroleum products (likely gasoline, based on the relative concentrations of petroleum compounds reported within soil and groundwater samples collected from the site) has occurred at the site. The highest concentrations of petroleum related impacts were reported within soil samples collected from soil borings GP-6 (7.5 to 10 feet bgs) and GP-7 (10 to 12.5 feet bgs). Identified groundwater impacts, based on samples collected to date, are consistent with identified soil impacts.

The petroleum impacts were identified within the footprint of the site building within an area formerly used for automobile service and repair. There are hydraulic lift hoists with apparent in-ground components as well as floor drains within the building where the petroleum impacts were identified. This portion of the site building abuts another area of the site building (to the south of the completed borings) that contains a basement level. In addition, the layout of the site building limited soil boring equipment access in the area to the west and immediately to the north of the area of identified petroleum impacts. However, the petroleum impacts were not observed within soil borings GP-1, GP-2 and GP-10, located to the northeast, east and south of the area of identified impacts.

PCE was reported at concentrations flagged by the analytical laboratory as between the laboratory limit of detection and laboratory limit of quantitation and also greater than applicable WDNR RCLs within soil samples collected from soil borings, GP-2 and GP-10. These soil borings are located in the central portion of the site both north and south of the portion of the site building that includes a basement level. The source of the identified PCE impacts is unknown; however, PCE is a common constituent in metal parts cleaners/degreasers and the use of these types of products at auto repair facilities is not uncommon.

Soil analytical results also identified PAH impacts located across a portion of the site. The PAH impacts are typical of urban sites in southeast Wisconsin and are likely not associated with a specific release but may be associated with de minimis releases, reworked soil fill or the weathering of asphalt pavement present at the site.

Recommendations

It is Sigma's opinion that the degree and extent of identified petroleum impacts to soil and groundwater at the site have not been sufficiently defined to meet the requirements of ch. NR 716, Wisc. Admin. Code. Therefore, it is Sigma's opinion that additional investigation activities to evaluate the possible degree and extent of soil and groundwater impacts would be required by WDNR in accordance with chs. NR 700 – 746, Wisc. Admin. Code.

In accordance with chs. NR 700 – 746, to obtain site closure the source, degree, and extent of impacts must be defined, and based on the degree of impact, corrective action may be necessary. Review of the existing site data indicates that the degree and extent of petroleum impacts to soil and groundwater, as well as PCE impacts to soil have not been defined. To evaluate the degree and extent of soil and groundwater impacts, the completion of six (6) additional soil borings with five (5) installed as ch. NR 141 compliant groundwater monitoring wells is recommended. The approximate proposed locations of the additional soil borings and monitoring wells are presented in **Figure 2**.

Please note that access for soil boring equipment within the existing site building is limited. Completion of additional site investigation activities may also be limited by the presence of the basement level within the site building which, at the time of Sigma's Phase II activities, was partially flooded.

A detailed scope of work and cost estimate to complete the supplemental activities discussed above can be prepared upon request.

TABLES

Table 1
Soil Analytical Table
1313 & 1329-31 W. National Avenue, Milwaukee, WI
Sigma Project No.16763

Soil Sample Location:	GP-1		GP-2		GP-3		GP-4		GP-5		GP-6		GP-7		GP-8		GP-9		GP-10		Groundwater	Non-Industrial	Industrial			
Sample Depth (feet bgs):	2.5-4	5-7.5	2.5-4	5-7.5	2.5-4	5-7.5	2.5-4	5-7.5	2.5-4	5-7.5	2.5-4	7.5-10	2.5-4	10-12.5	2.5-4	5-7.5	2.5-4	5-7.5	2.5-4	5-7.5	Pathway	Direct Contact	Direct Contact			
Sample Collection Date:	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	2/23/17	RCL ⁴	RCL ⁵	RCL ⁶			
Organic Vapor Monitor	ppm	0	0	0	0	0	0	0	0	0	0	878	2	801	0	0	0	0	0	0	NS	NS	NS			
VOCs																										
Benzene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	7.3	<0.03	16.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.0051	1.49	7.41	
tert-Butylbenzene	mg/kg	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.26	<0.026	<0.52	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	NS	183	183	
sec-Butylbenzene	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	1.1	<0.033	0.91	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	NS	145	145	
n-Butylbenzene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	4.5	<0.04	3.8	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	NS	108	108	
Carbon tetrachloride	mg/kg	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.16	<0.016	<0.32	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.0039	0.854	4.25	
1,4-Dichlorobenzene	mg/kg	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.37	<0.037	<0.74	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	0.144	3.48	17.5	
1,3-Dichlorobenzene	mg/kg	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.37	<0.037	<0.74	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	<0.037	1.1528	297	297	
1,2-Dichlorobenzene	mg/kg	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.28	<0.28	<0.28	0.78	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	1.168	376	376	
1,1-Dichloroethene	mg/kg	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022	<0.22	<0.22	<0.22	<0.44	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.005	342	1,190	
cis-1,2-Dichloroethene	mg/kg	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.32	<0.032	<0.64	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	0.0412	156	2,040	
trans-1,2-Dichloroethene	mg/kg	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.28	<0.28	<0.28	<0.56	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	0.0588	1,560	1,860	
Ethylbenzene	mg/kg	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	24.2	<0.035	28.3	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1.57	7.47	37	
Isopropylbenzene	mg/kg	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	2.41	<0.034	2.25	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	<0.034	NS	NS	NS	
p-Isopropyltoluene	mg/kg	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	0.54	<0.029	<0.58	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	NS	162	162	
Methyl-tert-butyl-ether	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.027	59.4	293	
Naphthalene	mg/kg	<0.094	0.14	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	5.6	<0.094	7.5	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	0.6582	5.15	26	
n-Propylbenzene	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	9.9	<0.033	10.3	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	NS	264	264	
Tetrachloroethene (PCE)	mg/kg	<0.032	<0.032	0.074	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.32	<0.032	<0.64	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	0.0045	30.7	153	
Toluene	mg/kg	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	12.7	<0.032	116	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	0.0042	1,1072	818	
1,1,1-Trichloroethane	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.3	<0.03	<0.6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1402	640	640	
1,1,2-Trichloroethane	mg/kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.33	<0.033	<0.66	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	0.0032	1.48	7.34	
Trichloroethene (TCE)	mg/kg	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.41	<0.041	<0.82	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	0.0036	1.26	8.81	
1,2,4-Trimethylbenzene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	58	<0.025	57	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	1.3821	89.8	219
1,3,5-Trimethylbenzene	mg/kg	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	18.4	<0.032	16.3	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	0.0001	182	182	
Vinyl Chloride	mg/kg	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.19	<0.091	<0.38	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	0.0001	0.067	2.03	
Xylenes (total)	mg/kg	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	93.6	<0.116	128	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	<0.116	3.94	258	258	
PAHs																										
Acenaphthene	mg/kg	<0.0151	0.168	<0.0151	<0.0151	0.0311	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	<0.0151	NS	3,440	33,000	
Acenaphthylene	mg/kg	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	NS	NS	NS	
Anthracene	mg/kg	<0.0109	0.43	0.0139	<0.0109	0.114	0.113	<0.0109	<0.0109	0.0164	0.0181	<0.0109	0.054	<0.0109	<0.0109	<0.0109	0.011	<0.0109	0.0212	<0.0109	<0.0109	<0.0109	197.7273	17,200	100,000	
Benzo(a)anthracene	mg/kg	0.0209	0.46	0.0169	<0.0116	0.14	<0.0116	<0.0116	0.045	0.04	<0.0116	0.0192	<0.0116	0.0118	<0.0116	<0.0116	0.0262	<0.0116	0.054	<0.0116	<0.0116	<0.0116	NS	0.147	2.1	
Benzo(a)pyrene	mg/kg	<0.0113	0.33	0.0114	<0.0113	0.075	0.086	<0.0113	<0.0113	0.0264	0.0223	<0.0113	<0.0113	<0.0113	<0.0113	<0.0113	0.0164	<0.0113	0.036	<0.0113	<0.0113	<0.0113	0.47	0.015	0.211	
Benzo(b)fluoranthene	mg/kg	0.0156	0.50	0.0189	0.0116	0.233	0.147	<0.0069	<0.0069	0.047	0.04	<0.0069	0.0107	<0.0069	<0.0069	<0.0069	<0.0069	<0.0069	0.0263	<0.0069	0.056	<0.0069	0.4793	0.148	2.11	
Benzo(ghi)perylene	mg/kg	<0.0084	0.206	<0.0084	<0.0084	0.072	0.059	<0.0084	<0.0084	0.0174	0.0147	<0.0084	<0.0084	<0.0084	<0.0084	<0.0084	0.0133	<0.0084	0.0232	<0.0084	<0.0084	<0.0084	NS	NS	NS	
Benzo(k)fluoranthene	mg/kg	<0.0147	0.134	<0.0147	<0.0147	0.042	0.042	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	NS	1.48	21.1	
Chrysene	mg/kg	<0.0121	0.34	0.0122	<0.0121	0.151	0.104	<0.0121	<0.0121	0.032	0.0275	<0.0121	0.0292	<0.0121	<0.0121	<0.012										

Table 2
Groundwater Analytical Table
1313 & 1329-1331 W. National Avenue, Milwaukee, Wisconsin
Sigma Project No. 16763

Well Location:		GP-6	GP-7	NR 140	NR 140
Date:		3/2/17	3/2/17	ES	PAL
<i>PVOCs & Detected VOCs</i>					
Benzene	µg/L	2650	308	5	0.5
tert-Butylbenzene	µg/L	<19.5	<19.5	NS	NS
sec-Butylbenzene	µg/L	17.5 J	16 J	NS	NS
n-Butylbenzene	µg/L	<17	62	NS	NS
Carbon Tetrachloride	µg/L	<10.5	<10.5	5	0.5
1,2-Dichloroethane	µg/L	<22.5	<22.5	5	0.5
1,1-Dichloroethane	µg/L	<21	<21	850	85
1,1-Dichloroethene	µg/L	<23	<23	7	0.7
cis-1,2-Dichloroethene	µg/L	<20.5	<20.5	70	7
trans-1,2-Dichloroethene	µg/L	<17.5	<17.5	100	20
Ethylbenzene	µg/L	3110	166	700	140
Isopropylbenzene	µg/L	112	18.5 J	NS	NS
p-Isopropyltoluene	µg/L	<14	<14	NS	NS
Methyl-tert-butyl-ether	µg/L	<41	<41	60	12
Naphthalene	µg/L	400	<108.5	100	10
n-Propylbenzene	µg/L	360	80	NS	NS
Tetrachloroethene (PCE)	µg/L	<24.5	<24	5	0.5
Toluene	µg/L	24700	400	800	160
Trichloroethene (TCE)	µg/L	<22.5	<22.5	5	0.5
1,2,4-Trimethylbenzene	µg/L	2340	420	NS	NS
1,3,5-Trimethylbenzene	µg/L	630	125 J	NS	NS
Total Trimethylbenzene	µg/L	2970	545	480	96
Vinyl Chloride	µg/L	<9.5	<9.5	0.2	0.02
Xylenes, Total	µg/L	13300	725	2,000	400

Notes:

1. NR 140 ES = Wisconsin Administrative Code, Chapter NR 140 Enforcement Standard
2. NR 140 PAL = Wisconsin Administrative Code, Chapter NR 140 Preventive Action Limit
3. NS = no standard
4. µg/L = micrograms per liter (equivalent to parts per billion, ppb)
5. NA = Not Analyzed
6. Laboratory flags: "J" = Analyte detected between Limit of Detection and Limit of Quantitation.
7. Trip blank results: 3/2/17: All VOCs reported below laboratory detection limits.
- 8 Exceedances: **BOLD** = Concentration exceeds NR 140 ES
ITALICS = Concentration exceeds NR 140 PAL
9. Special notes: * = monitoring well screen submerged below water table
** = not a statistically valid PAL exceedance per NR 140.14(3)(c)

FIGURES

Orthography from:
2005 SEWRPC Map Data



THE **SIGMA** GROUP
Single Source. Sound Solutions.

www.thesigmagroup.com
1300 West Canal Street
Milwaukee, WI 53233
414-643-4200

Site Name: 1313 & 1329-1331 W. National Avenue

Address: 1313 & 1329-1331 W. National Avenue
Milwaukee, WI

Project: #16763



0 ————— 60 ft.

FIGURE 1
SOIL BORING/TEMPORARY
MONITORING WELL
LOCATION MAP

Orthography from:
2005 SEWRPC Map Data



-  APPROXIMATE SUBJECT PROPERTY BOUNDARY
-  GEOPROBE SOIL BORING
-  GEOPROBE SOIL BORING/TEMPORARY MONITORING WELL
-  Additional Proposed Boring

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Project: #16763



0  60 ft.

FIGURE 2
Proposed Additional
Boring Map

ATTACHMENT A

Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National		License/Permit/Monitoring Number		Boring Number GP-1	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration			Date Drilling Started 2/23/2017	Date Drilling Completed 2/23/2017	Drilling Method Geoprobe
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation Feet MSL	Borehole Diameter 2.0 inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/> State Plane N, E S/C/N			Lat _____"	Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E		Long _____"			
Facility ID	County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 40	P U S H	1	ASPHALT and base coarse				0							
			2	silty CLAY, grayish brown to yellowish brown, medium stiff, trace sand, red mottling, damp to wet				0						Sampled 2.5-4' for VOCs, PAHs, and metals	
			3				0								
			4		Water at approximately 4'			0							
2 GP	60 60	P U S H	5				0					Sampled 5-7.5' for VOCs, PAHs, and metals			
			6				0								
3 GP	60 60	P U S H	7				0								
			8		CL-MI		0								
			9				0								
			10				0								
			11				0								
15				End of boring at 15'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature  Firm **The Sigma Group, Inc.** Tel: 414-643-4200
1300 West Canal Street Milwaukee, WI 53233 Fax: 414-643-4210

Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National		License/Permit/Monitoring Number		Boring Number GP-2	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration		Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
Drilling Method Geoprobe		WI Unique Well No. GP-2		DNR Well ID No.	
Common Well Name GP-2		Final Static Water Level Feet MSL		Surface Elevation Feet MSL	
Borehole Diameter 2.0 inches		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		Local Grid Location	
State Plane NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E		Lat _____"		<input type="checkbox"/> N <input type="checkbox"/> E	
Long _____"		Feet <input type="checkbox"/> S		Feet <input type="checkbox"/> W	
Facility ID		County Milwaukee		County Code 41	
				Civil Town/City/ or Village Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 35	PUSH	0	ASPHALT and base coarse				0							
			1	SAND, medium brown, medium coarse, trace gravel, moist	SP										
2 GP	60 46	PUSH	2	silty CLAY, medium brown to gray, medium stiff, moist to wet, trace sand	CL-MI			0							Sampled 2.5-4' for VOCs, PAHs, and metals
			3												
3 GP	44	PUSH	4	Water at approximately 5'				0						Sampled 5-7.5' for VOCs, PAHs, and metals	
			5												
			6					0							
			7					0							
			8					0							
			9					0							
			10					0							
			11					0							
			12					0							
			13	SAND, medium brown, medium coarse, wet	SP			0							
			14												
			15	End of boring at 15', Temporary well set 0-15', screen 5-15'											

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Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National		License/Permit/Monitoring Number		Boring Number GP-3	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration		Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
Drilling Method Geoprobe		Final Static Water Level Feet MSL		Surface Elevation Feet MSL	
WI Unique Well No.	DNR Well ID No.	Common Well Name	Borehole Diameter 2.0 inches		
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>			Local Grid Location		
State Plane N, E S/C/N			Lat <input type="checkbox"/> N <input type="checkbox"/> E		
NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E			Long <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 32	P U S H	1	ASPHALT and base coarse				0							
			2	SAND, medium brown, fine to medium coarse, moist to wet, red mottling	SP			0					Sampled 2.5-4' for VOCs, PAHs, and metals		
2 GP	60 30	P U S H	5	Water at approximately 5'				0							
			6	silty SAND to sandy SILT, medium to grayish brown, fine, wet	ML			0				Sampled 5-7.5' for VOCs, PAHs, and metals			
			10	End of boring at 10'											

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Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National		License/Permit/Monitoring Number		Boring Number GP-4	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration		Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
Drilling Method Geoprobe		Final Static Water Level Feet MSL		Surface Elevation Feet MSL	
WI Unique Well No.	DNR Well ID No.	Common Well Name	Borehole Diameter 2.0 inches		
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>			Local Grid Location		
State Plane NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E			Lat _____ " <input type="checkbox"/> N <input type="checkbox"/> E Long _____ " <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 48	P U S H	1	CONCRETE				0							
			2	silty CLAY, medium brown, medium soft, wood debris, trace gravel, damp, likely fill	CL-MI										
			3	Yellow brick debris											
			4	silty CLAY, medium brown to grayish brown, medium soft, moist to wet, red orange mottles				0							Sampled 2.5-4' for VOCs, PAHs, and metals
2 GP	60 50	P U S H	5	Water at approximately 5'				0							Sampled 5-7.5' for VOCs, PAHs, and metals
			6		CL-MI										
			7												
			8					0							
			9												
			10	End of boring at 10'											

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Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National			License/Permit/Monitoring Number		Boring Number GP-5	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration			Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Final Static Water Level Feet MSL	Surface Elevation Feet MSL
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane N, E S/C/N		Lat _____ "		<input type="checkbox"/> N <input type="checkbox"/> E
NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E		Long _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W		Feet <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 50	P U S H	1	CONCRETE				0							
			2	silty CLAY, medium brown, damp, medium stiff, trace sand and gravel, potential fill	CL-MI			0					Sampled 2.5-4' for VOCs, PAHs, and metals		
2 GP	60 60	P U S H	4	clayey SILT to silty CLAY, grayish brown to gray, moist to wet, medium stiff, trace sand, trace red orange and black mottles, slight odor at bottom Water at approximately 6'	CL-MI			0							Sampled 5-7.5' for VOCs, PAHs, and metals
			5												
			6												
			7												
			8												
			9												
			10												
			End of boring at 10'												

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm The Sigma Group, Inc. 1300 West Canal Street Milwaukee, WI 53233	Tel: 414-643-4200 Fax: 414-643-4210
---	---	--

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National		License/Permit/Monitoring Number		Boring Number GP-6	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration		Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
Drilling Method Geoprobe		WI Unique Well No.		DNR Well ID No.	
Common Well Name GP-6		Final Static Water Level Feet MSL		Surface Elevation Feet MSL	
Borehole Diameter 2.0 inches		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		Local Grid Location	
State Plane NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E		Lat <input type="checkbox"/> N <input type="checkbox"/> E		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
County Milwaukee		County Code 41		Civil Town/City/ or Village Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 60	P U S H	0-1	CONCRETE				0							
			1-2	silty CLAY, medium brown, damp, medium stiff, trace sand and gravel, potential fill	CL-ML										
			2-5	clayey SILT to silty CLAY, grayish brown, damp to wet, medium stiff, trace sand, trace red orange mottles				0							Sampled 2.5-4' for VOCs, PAHs, and metals
2 GP	60 60	P U S H	5-6		CL-ML			102							
			7	Water at approximately 7'											
			7-8					878							Sampled 7.5-10' for VOCs, PAHs, and metals
			8-9	silty CLAY, wet, medium soft, brown to gray, odor at 9-10'											
3 GP	60 50	P U S H	10-11		CL-ML			255							
			11-15					8							
			15	End of boring at 15', Temporary well set 0-15', screen 5-15'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature  Firm **The Sigma Group, Inc.** 1300 West Canal Street Milwaukee, WI 53233 Tel: 414-643-4200 Fax: 414-643-4210

Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National		License/Permit/Monitoring Number		Boring Number GP-7	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration		Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
Drilling Method Geoprobe		Final Static Water Level Feet MSL		Surface Elevation Feet MSL	
WI Unique Well No.	DNR Well ID No.	Common Well Name GP-7	Borehole Diameter 2.0 inches		
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>			Local Grid Location		
State Plane NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E			Lat _____ " <input type="checkbox"/> N <input type="checkbox"/> E Long _____ " <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID	County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 54	PUSH	1	CONCRETE				1							
			2	silty CLAY, medium to dark brown, medium stiff, damp, red orange mottles, trace sand and gravel	CL-MI										
			3	silty CLAY, light brown to gray, medium soft, moist to wet, red orange mottles, trace sand, petro odor present, black coloring at 14', sheen on water				2							Sampled 2.5-4' for VOCs, PAHs, and metals
			4												
2 GP	60 31	PUSH	5					100							
			6	Water at approximately 6'											
			7												
			8					470							
			9		CL-MI										
			10												
3 GP	60 45	PUSH	11					801							Sampled 10-12.5' for VOCs, PAHs, and metals
			12												
			13												
			14												
			15	End of boring at 15', Temporary well set 0-15', screen 5-15'				490							

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature  Firm **The Sigma Group, Inc.** Tel: 414-643-4200
1300 West Canal Street Milwaukee, WI 53233 Fax: 414-643-4210

Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National		License/Permit/Monitoring Number		Boring Number GP-8	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration			Date Drilling Started 2/23/2017	Date Drilling Completed 2/23/2017	Drilling Method Geoprobe
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level Feet MSL	Surface Elevation Feet MSL	Borehole Diameter 2.0 inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>			Local Grid Location		
State Plane NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E			Lat _____ "	Feet <input type="checkbox"/> N <input type="checkbox"/> E	
			Long _____ "	Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID	County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 GP	60 48	P U S H	1	ASPHALT and base coarse				0						
			2	SAND, medium dark brown, moist, medium coarse	SP									
2 GP	60 48	P U S H	3	silty CLAY, grayish brown to gray, moist to wet, medium soft to medium stiff, red orange mottles, trace sand				0						Sampled 2.5-4' for VOCs, PAHs, and metals
			4											
			5					Water at approximately 5'						
3 GP	60 60	P U S H	6					0						
			7											
			8					0						
			9											
			10					0						
			11	SAND, medium dark brown, wet, medium coarse	SP									
			12	silty CLAY, grayish brown to gray, wet, medium stiff				0						
			13											
			14											
			15	End of boring at 15'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

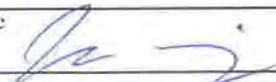
Signature 	Firm The Sigma Group, Inc. 1300 West Canal Street Milwaukee, WI 53233	Tel: 414-643-4200 Fax: 414-643-4210
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Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National			License/Permit/Monitoring Number		Boring Number GP-9	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration			Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Final Static Water Level Feet MSL	Surface Elevation Feet MSL
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane N, E S/C/N		Lat <input type="checkbox"/> N <input type="checkbox"/> E		Local Grid Location
NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E		Long <input type="checkbox"/> S <input type="checkbox"/> W		Feet <input type="checkbox"/> S <input type="checkbox"/> W		Feet <input type="checkbox"/> E <input type="checkbox"/> W
Facility ID		County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 41	P U S H	1	CONCRETE				0							
			2	silty CLAY, dark brown to grayish brown, medium stiff, damp, trace sand, trace red orange mottles, potential fill	CL-MI			0							Sampled 2.5-4' for VOCs, PAHs, and metals
2 GP	60 45	P U S H	5	SAND, medium brown, wet, medium fine	SP			0							Sampled 5-7.5' for VOCs, PAHs, and metals
			6	Water at approximately 5'											
			7	silty CLAY, tan to reddish brown, medium stiff, wet, red orange mottles, trace sand	CL-MI			0							
			10	End of boring at 10'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

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Route To: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name 13th and National			License/Permit/Monitoring Number		Boring Number GP-10	
Boring Drilled By: Name of crew chief (first, last) and Firm Bob Horizon Construction and Exploration			Date Drilling Started 2/23/2017		Date Drilling Completed 2/23/2017	
WI Unique Well No.		DNR Well ID No.	Common Well Name		Final Static Water Level Feet MSL	Surface Elevation Feet MSL
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		State Plane N, E S/C/N		Lat <input type="checkbox"/> N <input type="checkbox"/> E		Local Grid Location
NE 1/4 of SE 1/4 of Section 31, T 7 N, R 22 E		Long <input type="checkbox"/> S <input type="checkbox"/> W		Feet <input type="checkbox"/> S <input type="checkbox"/> W		Feet <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County Milwaukee	County Code 41	Civil Town/City/ or Village Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
1 GP	60 43	P U S H	1	ASPHALT and base coarse				0							
			2	silty CLAY, dark brown to medium brown, moist, medium soft, trace sand	CL-ML			0						Sampled 2.5-4' for VOCs, PAHs, and metals	
			3					0							
			4	silty CLAY, medium reddish brown to gray, wet, medium stiff, trace sand, red orange mottles Water at approximately 6'	CL-ML			0					Sampled 5-7.5' for VOCs, PAHs, and metals		
			5					0							
			6					0							
2 GP	60 45	P U S H	7												
			8												
			9												
			10	End of boring at 10'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

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