

## Cieslak, Douglas J - DNR

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**From:** Matt Dahlem <mdahlem@fehr-graham.com>  
**Sent:** Thursday, October 05, 2017 4:54 PM  
**To:** Cieslak, Douglas J - DNR  
**Subject:** FW: contamination at 5725/5717 Sheridan Road, Kenosha WI  
**Attachments:** DATA TABLES - 16-1501.xlsx; figures.pdf

**Importance:** High

See below.

**MATT DAHLEM, P.G.** | Project Manager / Sr. Engineering Hydrogeologist  
Fehr Graham - Engineering & Environmental

**From:** Matt Dahlem  
**Sent:** Monday, September 25, 2017 5:14 PM  
**To:** 'Mangia Wine Bar' <kenoshamangia@gmail.com>  
**Subject:** RE: contamination at 5725/5717 Sheridan Road, Kenosha WI  
**Importance:** High

Hi Sue,

If you recall we installed some soil borings and groundwater monitoring wells on your property. I have the data back and need to inform you that we found soil and groundwater contamination on your property. The Wisconsin Department of Natural Resources (WDNR) will be contacting you and will require that you take further steps to address the contamination that is present.

There are a few kinds of contaminants in both the soil and groundwater. Contaminants include polycyclic aromatic hydrocarbons (PAHs), which are heavy petroleum compounds that can occur naturally, but are very commonly seen in coal and foundry-type fill in downtown industrial areas. PAHs result from the incomplete combustion of petroleum products.

We also found a couple volatile organic compounds (VOCs), namely tetrachloroethene (PCE) (a drycleaning solvent), and naphthalene (a petroleum compound found in gasoline).

Some metals were also present at levels slightly above their naturally occurring range of typical concentrations, including lead (a gasoline additive, among other sources), arsenic and selenium. Arsenic can be related to industrial processes, treated lumber, historic pesticide use, etc., and selenium occurs at higher levels in fly-ash, as well as in agricultural runoff. Please see the attached maps and tables for a summary of the data.

PAHs are very common, and we have attributed the source of the PAHs on your property to the historic shallow fill used for grading purposes way back when your property was developed with buildings. As part of our work, we looked into the historic use of your property. In the table below, you can see your property has been a historic gas station and a historic drycleaning facility. The naphthalene and lead contamination is most likely from the site being a former gas station and/or possibly from the contaminated fill, similar to that of the PAH contamination. The table below shows what we discovered by review of historic city directories. It doesn't cover every year, but gives you an idea of some of the historic uses of your property.

|      |      |
|------|------|
| Year | 5725 |
|------|------|

|           | Sheridan                         |
|-----------|----------------------------------|
| 1949/1950 | Lockwood Oil Co Gas Station      |
| 1954      | Rays Shell Gas Station           |
| 1962      | Ken Johnson Oil Inc. Gas Station |
| 1967      | One Hour Martinizing             |
| 1972      | One Hour Martinizing             |
| 1977      | One Hour Martinizing             |
| 1982      | One Hour Martinizing             |
| 1987      | Teddy's Carryout Food            |

The PCE contamination is from historic drycleaning operations on your property. During the 20-year period of historic dry-cleaning operations on your property, PCE (also called perc) was likely used as the drycleaning solvent, as 90% of drycleaners used perc. Release of PCE is very common around drycleaners that operated in the 1960's through the 1980's, as the drycleaning process involved a lot of handling of the liquid PCE in the wet clothes, lint, spent filters, and in the drums, tanks, or pails of PCE that were used to fill the drycleaning machine.

Typically the most contaminated areas at a drycleaner are right around the former drycleaning machine, which was somewhere in your building at 5725 Sheridan Ave, and near the rear door, where the liquid PCE was delivered, often by truck / hose, or by drum.

The good news is that the levels of PCE in the soil and groundwater that are known so far seem to indicate that the level of contamination isn't particularly high, so it may be that the only steps required by the DNR will be to define the magnitude and extent of the contamination, check to be sure that the contamination hasn't caused the indoor air of your building to have levels of PCE or other compounds in the air that could cause a health risk, and then keep it capped (as it currently is) so contamination doesn't get worse or spread.

When you get the letter from the WDNR, called the Responsible Party letter, it will state that you are responsible for the cleanup / management of this soil and groundwater contamination. The letter will give you the name of a project manager from the DNR, and you should call them to discuss what you need to do next.

While not great news, there is no need to freak out, we deal with this all the time. Typically, the next steps are to install more soil borings and get more water samples, to define where it is clean and where it is dirty. Once that is determined, we can assess if there is any need to dig out the contamination, or just keep it capped.

When you get the letter, please call the WDNR project manager, and then give me a call, and I can run through your options.

If you would like to discuss this more via phone or email, please do so Sue – Im here to answer any questions you may have.

Matt

**MATT DAHLEM, P.G.** | Project Manager / Sr. Engineering Hydrogeologist  
**Fehr Graham - Engineering & Environmental**

1237 Pilgrim Road  
Plymouth, Wisconsin 53073  
P: 920.892.2444  
F: 920.892.2620  
[www.fehr-graham.com](http://www.fehr-graham.com)

Table A.2.b  
 Soil Analytical Results Table - PAH  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID                                  |         | Groundwater Pathway RCL<br>(ug/kg) | Non-Industrial Direct Contact<br>RCL (ug/kg) | MW-106     |            | MW-107     |            |
|--|---------|------------------------------------|--|------------|------------|------------|------------|
| Sample Date                                |         |                                    |  | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 |
| Sample Depth                               |         |                                    |  | 1-3'       | 11-13'     | 1-3'       | 9-11'      |
| Description                                |         |                                    |  | SAND       | SAND       | SAND       | SAND       |
| DEPTH to Seasonal Low Water Table (ft BGS) |         |                                    |  | 13-15'     | 13-15'     | 13-15'     | 13-15'     |
| Saturated (S) or Unsaturated (U)           |         |                                    |  | U          | U          | U          | U          |
| PID Reading (i.u.)                         |         |                                    |  | 0.0        | 0.0        | 0.0        | 0.0        |
| Notes                                      |         |                                    |  |            |            |            |            |
| Acenaphthene                               | (µg/kg) | NS                                 | <b>3,440,000</b>                             | 15.9       | <4.4       | 22.8       | 9.0 J      |
| Acenaphthylene                             | (µg/kg) | NS                                 | NS   | 13.1       | <3.8       | 39.0       | 12.4 J     |
| Anthracene                                 | (µg/kg) | <i>197,727</i>                     | <b>17,200,000</b>                            | 52.4       | <6.5       | 197        | 27.5       |
| Benzo(a)anthracene                         | (µg/kg) | NS                                 | 147  | 112        | <3.6       | 256        | 64.7       |
| Benzo(a)pyrene                             | (µg/kg) | 470                                | 15   | 110        | <2.9       | 220        | 71.8       |
| Benzo(b)fluoranthene                       | (µg/kg) | 479                                | 148  | 182        | <3.2       | 571        | 98.4       |
| Benzo(g,h,i)perylene                       | (µg/kg) | NS                                 | NS   | 47.6       | <2.3       | 174        | 44.7       |
| Benzo(k)fluoranthene                       | (µg/kg) | NS                                 | 1,480  | 42.7       | <2.9       | 127        | 34.1       |
| Chrysene                                   | (µg/kg) | 145                                | 14,800                                       | 146        | <3.8       | 312        | 76.4       |
| Dibenz(a,h)anthracene                      | (µg/kg) | NS                                 | 15   | 16.7       | <2.5       | 70.2       | 10.8       |
| Fluoranthene                               | (µg/kg) | <i>88,878</i>                      | <b>2,290,000</b>                             | 218        | <5.9       | 470        | 139        |
| Fluorene                                   | (µg/kg) | <i>14,803</i>                      | <b>2,290,000</b>                             | 7.5 J      | <4.7       | 24.6       | 7.5 J      |
| Indeno(123-cd)pyrene                       | (µg/kg) | NS                                 | 148  | 44.5       | <2.5       | 152        | 36.3       |
| 1-methylnaphthalene                        | (µg/kg) | NS                                 | 15,600                                       | 272        | <4.6       | 61.7       | 50.2       |
| 2-methylnaphthalene                        | (µg/kg) | NS                                 | <b>229,000</b>                               | 385        | <5.7       | 80.8       | 61.6       |
| Naphthalene                                | (µg/kg) | 658                                | 5,150  | 150        | <9.6       | 49.5       | 33.8       |
| Phenanthrene                               | (µg/kg) | NS                                 | NS   | 328        | <13.3      | 355        | 146        |
| Pyrene                                     | (µg/kg) | <i>54,132</i>                      | <b>1,720,000</b>                             | 199        | <5.1       | 352        | 119        |
| No. of Individual Exceedances (DC)         |         |                                    |  | 3          | --         | 5          | --         |
| Cumulative Hazard Index (DC)               |         |                                    | ≤1.0   | 0.0028     | --         | 0.0011     | --         |
| Cumulative Cancer Risk (DC)                |         |                                    | 1.00E-05                                     | 1.1E-05    | --         | 2.6E-05    | --         |

**Exceedance Highlights:**

BOLD Red font indicates individual or cumulative DC RCL exceedance per DNR RCL calculator 1/16/16, and BTV exceedance for metals.

\*B1\*: Cumulative exceedance (HI > 1), even though no individual DC RCL was exceeded.

*Italic Red font* indicates GW RCL Exceedance per DNR RCL calculator 1/16/16. Groundwater quality (> NR 140 ES) may be affected when GW RCLs are exceeded.

**Notes:**

- NS = No standard established
- NA = Not analyzed for parameter
- NR = Not Reported
- RCL = Residual Contaminant Level
- DC = Direct Contact

Table A.2.b  
Soil Analytical Results Table - PAH  
Heritage House  
5708 8th Ave., Kenosha, WI

| Sample ID                                  |         | Groundwater Pathway RCL<br>(ug/kg) | Non-Industrial Direct Contact<br>RCL (ug/kg) | MW-109     |            | MW-110     |            |            |
|--|---------|------------------------------------|--|------------|------------|------------|------------|------------|
| Sample Date                                |         |                                    |  | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 |
| Sample Depth                               |         |                                    |  | 1-3'       | 7-9'       | 1-3'       | 9-11'      | 15-17'     |
| Description                                |         |                                    |  | SAND       | CLAY       | SAND       | SAND       | SAND       |
| DEPTH to Seasonal Low Water Table (ft BGS) |         |                                    |  | 13-15'     | 13-15'     | 13-15'     | 13-15'     | 13-15'     |
| Saturated (S) or Unsaturated (U)           |         |                                    |  | U          | U          | U          | U          | S          |
| PID Reading (i.u.)                         |         |                                    |  | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Notes                                      |         |                                    |  |            |            |            |            |            |
| Acenaphthene                               | (µg/kg) | NS                                 | 3,440,000                                    | <4.5       | <4.4       | 9.7 J      | <49.5      | <5.4       |
| Acenaphthylene                             | (µg/kg) | NS                                 | NS   | <3.8       | <3.7       | 13.2       | <42.0      | <4.6       |
| Anthracene                                 | (µg/kg) | 197,727                            | 17,200,000                                   | 8.0 J      | <6.4       | 34.0       | <72.9      | <7.9       |
| Benzo(a)anthracene                         | (µg/kg) | NS                                 | 147  | 59.8       | <3.6       | 110        | 53.2 J     | <4.4       |
| Benzo(a)pyrene                             | (µg/kg) | 470                                | 15   | 114        | <2.8       | 118        | <32.0      | <3.5       |
| Benzo(b)fluoranthene                       | (µg/kg) | 479                                | 148  | 157        | <3.2       | 153        | <36.0      | <3.9       |
| Benzo(g,h,i)perylene                       | (µg/kg) | NS                                 | NS   | 90.1       | 3.2 J      | 70.0       | <25.9      | <2.8       |
| Benzo(k)fluoranthene                       | (µg/kg) | NS                                 | 1,480  | 54.5       | <2.8       | 62.9       | <32.0      | <3.5       |
| Chrysene                                   | (µg/kg) | 145                                | 14,800                                       | 65.5       | 5.3 J      | 116        | <43.0      | <4.7       |
| Dibenz(a,h)anthracene                      | (µg/kg) | NS                                 | 15   | 26.8       | <2.5       | 21.1       | <28.5      | <3.1       |
| Fluoranthene                               | (µg/kg) | 88,878                             | 2,290,000                                    | 76.7       | <5.9       | 221        | 93.0 J     | <7.2       |
| Fluorene                                   | (µg/kg) | 14,803                             | 2,290,000                                    | <4.8       | <4.7       | 9.6 J      | <52.8      | <5.7       |
| Indeno(123-cd)pyrene                       | (µg/kg) | NS                                 | 148  | 85.4       | <2.5       | 62.5       | <28.1      | <3.0       |
| 1-methylnaphthalene                        | (µg/kg) | NS                                 | 15,600                                       | <4.7       | 9.5 J      | 12.9 J     | 2,560      | 13.3 J     |
| 2-methylnaphthalene                        | (µg/kg) | NS                                 | 229,000                                      | <5.8       | 16.7 J     | 14.0 J     | 2,440      | 19.4 J     |
| Naphthalene                                | (µg/kg) | 658                                | 5,150  | <9.8       | <9.5       | 11.8 J     | 2,340      | 44.4       |
| Phenanthrene                               | (µg/kg) | NS                                 | NS   | 32.5 J     | 14.2 J     | 125        | <149       | <16.1      |
| Pyrene                                     | (µg/kg) | 54,132                             | 1,720,000                                    | 69.0       | <5.1       | 182        | 77.7 J     | <6.2       |
| No. of Individual Exceedances (DC)         |         |                                    |  | 3          | --         | 3          | --         | --         |
| Cumulative Hazard Index (DC)               |         |                                    | ≤1.0   | 0.0001     | --         | 0.0003     | --         | --         |
| Cumulative Cancer Risk (DC)                |         |                                    | 1.00E-05                                     | 1.2E-05    | --         | 1.2E-05    | --         | --         |

**Exceedance Highlights:**

BOLD Red font indicates individual or cumulative DC RCL exceedance per DNR RCL calculator 1/16/16, and BTV exceedance for metals.

\*B1\*: Cumulative exceedance (HI > 1), eventhough no individual DC RCL was exceeded.

*Italic Red font* indicates GW RCL Exceedance per DNR RCL calculator 1/16/16. Groundwater quality (> NR 140 ES) may be affected when GW RCLs are exceeded.

**Notes:**

NS = No standard established

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RCL = Residual Contaminant Level

DC = Direct Contact

Table A.2.b  
Soil Analytical Results Table - PAH  
Heritage House  
5708 8th Ave., Kenosha, WI

| Sample ID                                     |         | Groundwater Pathway RCL<br>(ug/kg) | Non-Industrial Direct Contact<br>RCL (ug/kg) | MW-111             |            |            |
|---|---------|------------------------------------|--|--------------------|------------|------------|
| Sample Date                                   |         |                                    |  | 05/24/2017         | 05/24/2017 | 05/24/2017 |
| Sample Depth                                  |         |                                    |  | 1-3'               | 9-11'      | 15-17'     |
| Description                                   |         |                                    |  | SAND               | SAND       | SAND       |
| DEPTH to Seasonal Low Water Table (ft<br>BGS) |         |                                    |  | 13-15'             | 13-15'     | 13-15'     |
| Saturated (S) or Unsaturated (U)              |         |                                    |  | U                  | U          | S          |
| PID Reading (i.u.)                            |         |                                    |  | 0.0                | 0.0        | 0.0        |
| Notes   |         |                                    |  | Well not installed |            |            |
|   |         |                                    |  |                    |            |            |
| Acenaphthene                                  | (µg/kg) |                                    |  | NS                 | 3,440,000  | 26.0       |
| Acenaphthylene                                | (µg/kg) | NS                                 | NS   | 27.4               | <3.7       | <4.1       |
| Anthracene                                    | (µg/kg) | 197,727                            | 17,200,000                                   | 179                | 8.8 J      | <7.0       |
| Benzo(a)anthracene                            | (µg/kg) | NS                                 | 147  | 268                | 34.7       | <3.9       |
| Benzo(a)pyrene                                | (µg/kg) | 470                                | 15   | 282                | 35.0       | <3.1       |
| Benzo(b)fluoranthene                          | (µg/kg) | 479                                | 148  | 390                | 47.3       | <3.5       |
| Benzo(g,h,i)perylene                          | (µg/kg) | NS                                 | NS   | 133                | 15.8       | <2.5       |
| Benzo(k)fluoranthene                          | (µg/kg) | NS                                 | 1,480  | 150                | 20.0       | <3.1       |
| Chrysene                                      | (µg/kg) | 145                                | 14,800                                       | 280                | 37.5       | <4.2       |
| Dibenz(a,h)anthracene                         | (µg/kg) | NS                                 | 15   | 37.8               | 4.5 J      | <2.8       |
| Fluoranthene                                  | (µg/kg) | 88,878                             | 2,290,000                                    | 747                | 73.0       | <6.4       |
| Fluorene                                      | (µg/kg) | 14,803                             | 2,290,000                                    | 39.9               | <4.7       | <5.1       |
| Indeno(123-cd)pyrene                          | (µg/kg) | NS                                 | 148  | 130                | 14.9       | <2.7       |
| 1-methylnaphthalene                           | (µg/kg) | NS                                 | 15,600                                       | 4.4 J              | <4.6       | <5.0       |
| 2-methylnaphthalene                           | (µg/kg) | NS                                 | 229,000                                      | <5.5               | <5.7       | <6.2       |
| Naphthalene                                   | (µg/kg) | 658                                | 5,150  | <9.2               | <9.5       | <10.4      |
| Phenanthrene                                  | (µg/kg) | NS                                 | NS   | 550                | 39.3 J     | <14.4      |
| Pyrene  | (µg/kg) | 54,132                             | 1,720,000                                    | 541                | 59.8       | <5.6       |
| No. of Individual Exceedances (DC)            |         |                                    |  | 4                  | --         | --         |
| Cumulative Hazard Index (DC)                  |         |                                    | ≤1.0   | 0.0007             | --         | --         |
| Cumulative Cancer Risk (DC)                   |         |                                    | 1.00E-05                                     | 2.7E-05            | --         | --         |

Exceedance Highlights:

BOLD Red font indicates individual or cumulative DC RCL exceedance per DNR RCL calculator 1/16/16, and BTV exceedance for metals.

\*B1\*: Cumulative exceedance (HI > 1), eventhough no individual DC RCL was exceeded.

*Italic Red font indicates GW RCL Exceedance per DNR RCL calculator 1/16/16. Groundwater quality (> NR 140 ES) may be affected when GW RCLs are exceeded.*

Notes:

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- NA = Not analyzed for parameter
- NR = Not Reported
- RCL = Residual Contaminant Level
- DC = Direct Contact

Table A.2.c  
Soil Analytical Results Table - Metals  
Heritage House  
5708 8th Ave., Kenosha, WI

| Sample ID                          | Date    | Depth  | Description | DEPTH to Seasonal Low Water Table (ft BGS) | Saturated (S) or Unsaturated (U) | PID Reading | Notes | Groundwater Pathway RCL (mg/kg) | Non-Industrial Direct Contact RCL (mg/kg) | Background Threshold Value (mg/kg) | USGS Background* (mg/kg) | MW-106     |            | MW-107     |            |
|------------------------------------|---------|--------|-------------|--|----------------------------------|-------------|-------|---------------------------------|---|------------------------------------|--------------------------|------------|------------|------------|------------|
|                                    |         |        |             |  |                                  |             |       |                                 |   |                                    |                          | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 |
|                                    |         | 1-3'   | SAND        |  |                                  |             |       |                                 |   |                                    |                          | 113        | 15.3       | 1,170      | 119        |
|                                    |         | 11-13' | SAND        |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
|                                    |         | 1-3'   | SAND        |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
|                                    |         | 9-11'  | SAND        |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
|                                    |         | 13-15' |             |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
|                                    |         | 13-15' |             |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
|                                    |         | U      |             |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
|                                    |         | 0.0    |             |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
|                                    |         |        |             |  |                                  |             |       |                                 |   |                                    |                          |            |            |            |            |
| Lead                               | (mg/kg) | 27     | 400         | 52   | - 10-300                         |             |       |                                 |   |                                    |                          |            |            |            |            |
| No. of Individual Exceedances (DC) |         |        |             |  |                                  |             |       |                                 |   |                                    |                          | --         | --         | 1          | --         |
| Cumulative Hazard Index (DC)       |         |        |             |  |                                  |             |       |                                 |   |                                    |                          | --         | --         | 0.         | --         |
| Cumulative Cancer Risk (DC)        |         |        |             |  |                                  |             |       |                                 |   |                                    |                          | 1.00E-05   | --         | 0.0E+00    | --         |

**Exceedance Highlights:**

**BOLD Red font** indicates individual or cumulative DC RCL exceedance per DHR RCL calculator 1/16/16, and BTV exceedance for metals.

\*B1\*: Cumulative exceedance (HI > 1), even though no individual DC RCL was exceeded.

**Italic Red font** indicates GW RCL Exceedance per DHR RCL calculator 1/16/16. Groundwater quality (> NR 140 ES) may be affected when GW RCLs are exceeded.

**Notes:**

NS = No standard established

-- = Not analyzed for parameter

NR = Not Reported

RCL = Residual Contaminant Level

DC = Direct Contact

++ NS/0.293 mg/kg is TOTAL CrIII & CrIV / Hexavalent Cr.

\* = Concentration is above Standards but below BTVs and is considered naturally occurring

\*J\* qualifier indicates the result is in between the Limit of Detection and the Limit of Quantification

The surficial soil background threshold values (BTVs) are included in a separate column in the spreadsheet for use in comparing the metal concentrations in site soils. The BTVs are the non-outlier maximum metal concentrations from 664 surficial (to 0.5 ft depth) soil background samples collected statewide in 2004 and 2007. Background threshold values are non-outlier trace element maximum levels in Wisconsin surface soils from the United States Geological Survey (USGS) Report at: <http://pubs.usgs.gov/sir/2011/5202>.

-USGS background concentrations for the eastern United States from USGS Professional Paper 1270

Table A.2.c  
 Soil Analytical Results Table - Metals  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID                          | Date    | Depth  | Description | DEPTH to Seasonal Low Water Table (ft BGS) | Saturated (S) or Unsaturated (U) | PID Reading | Notes  | Groundwater Pathway RCL (mg/kg) | Non-Industrial Direct Contact RCL (mg/kg) | Background Threshold Value (mg/kg) | USGS Background* (mg/kg) | MW-109     |            | MW-110     |            |            | MW-111     |            |     |    |
|------------------------------------|---------|--------|-------------|--|----------------------------------|-------------|--------|---------------------------------|---|------------------------------------|--------------------------|------------|------------|------------|------------|------------|------------|------------|-----|----|
|                                    |         |        |             |  |                                  |             |        |                                 |   |                                    |                          | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 | 05/24/2017 |     |    |
|                                    |         | 1-3'   | 7-9'        | 1-3'                                       | 9-11'                            | 15-17'      | 1-3'   | 9-11'                           | 15-17'                                    |                                    |                          |            |            |            |            |            |            |            |     |    |
|                                    |         | SAND   | CLAY        | SAND                                       | SAND                             | SAND        | SAND   |                                 |   |                                    |                          |            |            |            |            |            |            |            |     |    |
|                                    |         | 13-15' | 13-15'      | 13-15'                                     | 13-15'                           | 13-15'      | 13-15' |                                 |   |                                    |                          |            |            |            |            |            |            |            |     |    |
|                                    |         | U      | U           | U  | U                                | S           | U      |                                 |   |                                    |                          |            |            |            |            |            |            |            |     |    |
|                                    |         | 0.0    | 0.0         | 0.0  | 0.0                              | 0.0         | 0.0    |                                 |   |                                    |                          |            |            |            |            |            |            |            |     |    |
| Lead                               | (mg/kg) | 27     | 400         | 52   | < 10-300                         |             |        |                                 |   |                                    |                          | 102        | 10.5       | 153        | 203        | 62.9       | 16.7       | 9.7        | 9.4 |    |
| No. of Individual Exceedances (DC) |         |        |             |  |                                  |             |        |                                 |   |                                    |                          | --         | --         | --         | --         | --         | --         | --         | --  | -- |
| Cumulative Hazard Index (DC)       |         |        |             |  |                                  |             |        |                                 |   |                                    |                          | --         | --         | --         | --         | --         | --         | --         | --  | -- |
| Cumulative Cancer Risk (DC)        |         |        |             |  |                                  |             |        |                                 |   |                                    |                          | --         | --         | --         | --         | --         | --         | --         | --  | -- |

**Exceedance Highlights:**

BOLD Red font indicates individual or cumulative DC RCL exceedance per DNR RCL calculator 1/16/16, and BTY exceedance for metals.

\*B1\*: Cumulative exceedance (HI > 1), even though no individual DC RCL was exceeded.

*Italic Red font indicates GW RCL Exceedance per DNR RCL calculator 1/16/16. Groundwater quality (> NR 140 ES) may be affected when GW RCLs are exceeded.*

**Notes:**

NS = No standard established

-- = Not analyzed for parameter

NR = Not Reported

RCL = Residual Contaminant Level

DC = Direct Contact

++ NS/0.293 mg/kg is TOTAL CrIII & CrIV / Hexavalent Cr.

\* = Concentration is above Standards but below BTVs and is considered naturally occurring

\*J\* qualifier indicates the result is in between the Limit of Detection and the Limit of Quantification

The surficial soil background threshold values (BTVs) are included in a separate column in the spreadsheet for use in comparing the metal concentrations in site soils. The BTVs are the non-outlier maximum metal concentrations from 664 surficial (to 0.5 ft depth) soil background samples collected statewide in 2006 and 2007. Background threshold values are non-outlier trace element maximum levels in Wisconsin surface soils from the United States Geological Survey (USGS) Report at: <http://pubs.usgs.gov/sir/2011/5202>.

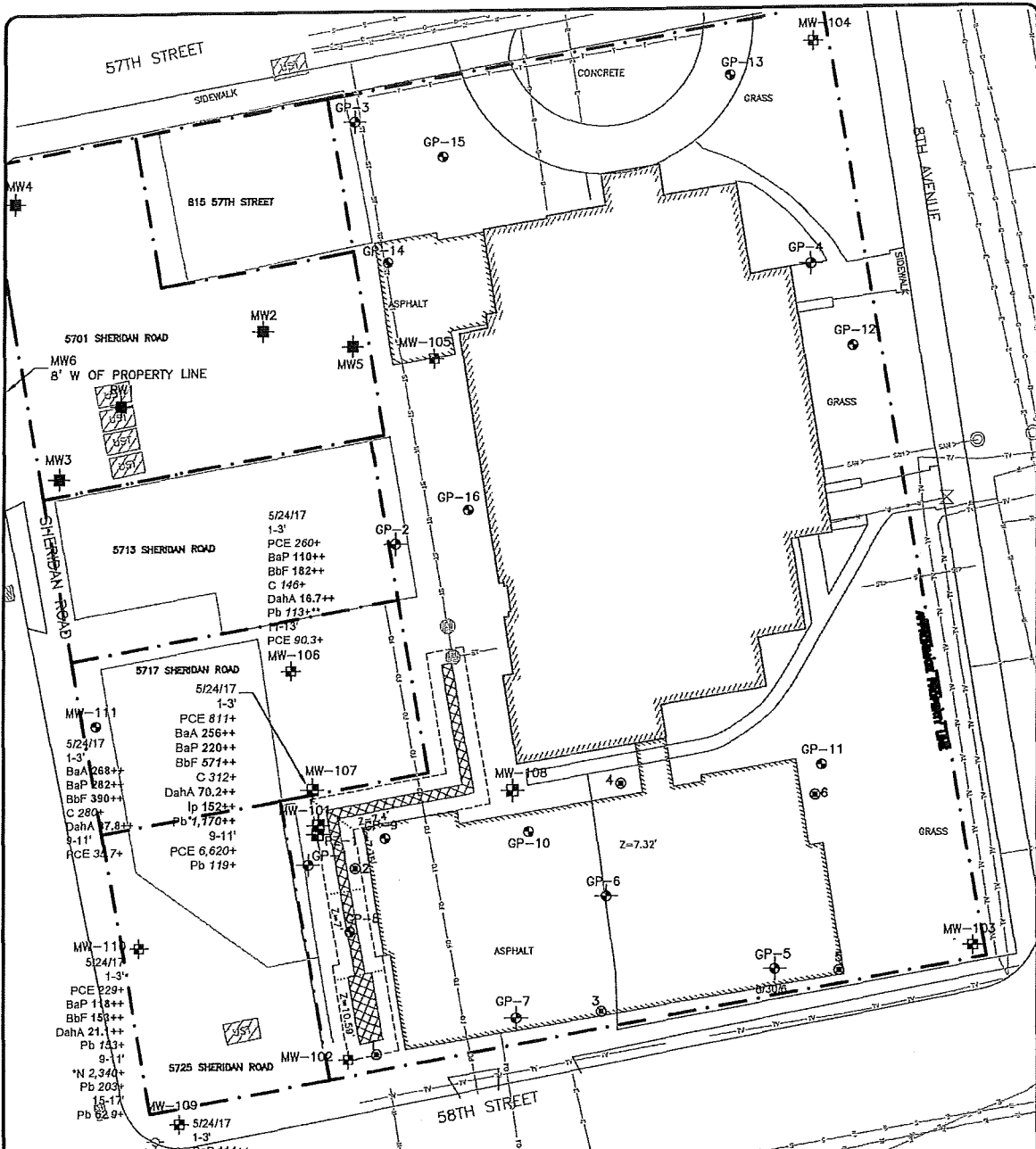
-USGS background concentrations for the eastern United States from USGS Professional Paper 1270





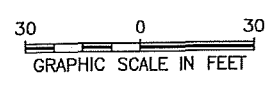




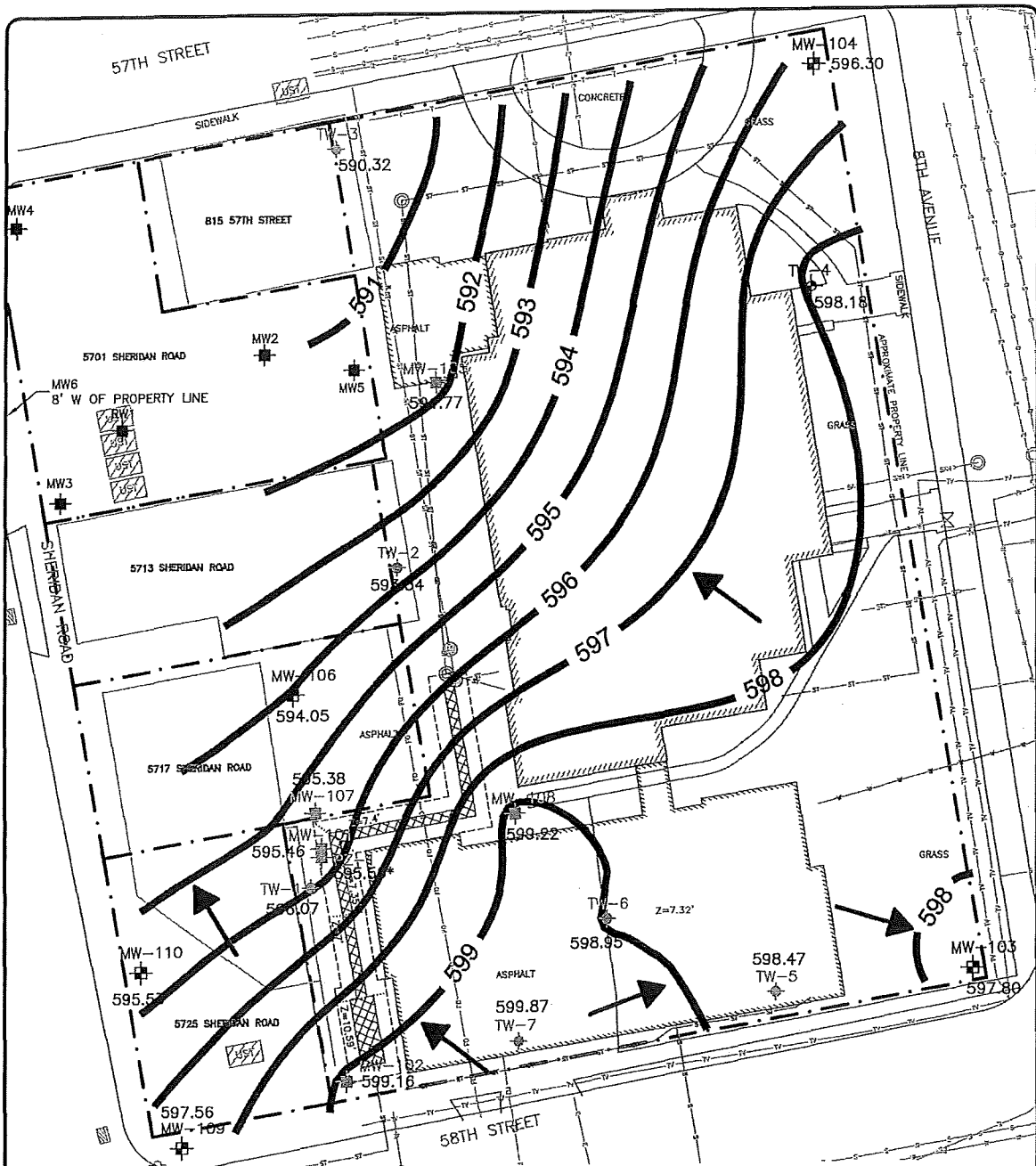


**LEGEND**

- |   |   |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
|---|---|--|----------|-------------|------|--------------|-----|---------------------------|-----|----------------------------|-----|------------------------|-----|------------------------------|---|------------------|------|--------------------------------|----|--------------------------------|----|---|----|-----------------|----|--------------|----|------------------|-----------------|---------------------------------|---------------|--|---|--|-----|----------------------------|-----|-----------------------------------|
| <ul style="list-style-type: none"> <li> FORMER UNDERGROUND FUEL TANK</li> <li> STORM SEWER</li> <li> SANITARY SEWER</li> <li> TELEPHONE LINE</li> <li> FIBER OPTIC CABLE</li> <li> WATER UTILITY</li> <li> GAS LINE</li> <li> CATCH BASIN</li> <li> MANHOLE</li> <li> VALVE</li> <li> UTILITY POLE</li> </ul> | <ul style="list-style-type: none"> <li> SOIL BORING &amp; TEMP WELL</li> <li> SOIL BORING</li> <li> SOIL BORING (CGC, INC. JAN 27&amp;28, 2015) **NO CHEMISTRY PROVIDED</li> <li> MONITORING WELL OR PIEZOMETER</li> <li> ABANDONED MONITORING WELL (BRRTS: 03-30-001791)</li> <li> PROPOSED BUILDING OUTLINE</li> <li> PROPOSED EXCAVATION LIMIT</li> <li> PROPOSED EXCAVATION DEPTH</li> <li> PROPOSED DETENTION SYSTEM</li> <li> PROPOSED STORM SEWER</li> <li> PROPOSED MANHOLE</li> <li> PROPOSED SANITARY SEWER</li> <li> PROPOSED WATER UTILITY</li> </ul> | <table border="0"> <tr> <td>10/13/16</td> <td>SAMPLE DATE</td> </tr> <tr> <td>1-3'</td> <td>SAMPLE DEPTH</td> </tr> <tr> <td>PCE</td> <td>TETRACHLOROETHENE (ug/kg)</td> </tr> <tr> <td>BaA</td> <td>BENZO(a)ANTHRACENE (ug/kg)</td> </tr> <tr> <td>BaP</td> <td>BENZO(a)PYRENE (ug/kg)</td> </tr> <tr> <td>BbF</td> <td>BENZO(b)FLUORANTHENE (ug/kg)</td> </tr> <tr> <td>C</td> <td>CHRYSENE (ug/kg)</td> </tr> <tr> <td>DahA</td> <td>DIBENZO(a,h)ANTHRACENE (ug/kg)</td> </tr> <tr> <td>Ip</td> <td>INDENO(1,2,3-CD)PYRENE (ug/kg)</td> </tr> <tr> <td>*N</td> <td>NAPHTHALENE (ug/kg), EPA METHOD 8270 (PAHS)</td> </tr> <tr> <td>As</td> <td>ARSENIC (mg/kg)</td> </tr> <tr> <td>Pb</td> <td>LEAD (mg/kg)</td> </tr> <tr> <td>Se</td> <td>SELENIUM (mg/kg)</td> </tr> <tr> <td><i>ITALICS+</i></td> <td>EXCEEDS GROUNDWATER PATHWAY RCL</td> </tr> <tr> <td><b>BOLD++</b></td> <td>EXCEEDS NON-INDUSTRIAL DIRECT CONTACT (0-4') RCL</td> </tr> <tr> <td>*</td> <td>EXCEEDS STANDARD, BUT BELOW BACKGROUND THRESHOLD VALUE, CONSIDERED NATURALLY OCCURRING</td> </tr> <tr> <td>VOC</td> <td>VOLATILE ORGANIC COMPOUNDS</td> </tr> <tr> <td>PAH</td> <td>POLYNUCLEAR AROMATIC HYDROCARBONS</td> </tr> </table> <p>NOTE: GP-7, GP-10, &amp; PZ-1 HAD DETECTIONS BELOW STANDARDS OR NO DETECTION OF COMPOUNDS, SO CHEMISTRY IS NOT LISTED</p> | 10/13/16 | SAMPLE DATE | 1-3' | SAMPLE DEPTH | PCE | TETRACHLOROETHENE (ug/kg) | BaA | BENZO(a)ANTHRACENE (ug/kg) | BaP | BENZO(a)PYRENE (ug/kg) | BbF | BENZO(b)FLUORANTHENE (ug/kg) | C | CHRYSENE (ug/kg) | DahA | DIBENZO(a,h)ANTHRACENE (ug/kg) | Ip | INDENO(1,2,3-CD)PYRENE (ug/kg) | *N | NAPHTHALENE (ug/kg), EPA METHOD 8270 (PAHS) | As | ARSENIC (mg/kg) | Pb | LEAD (mg/kg) | Se | SELENIUM (mg/kg) | <i>ITALICS+</i> | EXCEEDS GROUNDWATER PATHWAY RCL | <b>BOLD++</b> | EXCEEDS NON-INDUSTRIAL DIRECT CONTACT (0-4') RCL | * | EXCEEDS STANDARD, BUT BELOW BACKGROUND THRESHOLD VALUE, CONSIDERED NATURALLY OCCURRING | VOC | VOLATILE ORGANIC COMPOUNDS | PAH | POLYNUCLEAR AROMATIC HYDROCARBONS |
| 10/13/16  | SAMPLE DATE   |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| 1-3'  | SAMPLE DEPTH  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| PCE   | TETRACHLOROETHENE (ug/kg)   |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| BaA   | BENZO(a)ANTHRACENE (ug/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| BaP   | BENZO(a)PYRENE (ug/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| BbF   | BENZO(b)FLUORANTHENE (ug/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| C   | CHRYSENE (ug/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| DahA  | DIBENZO(a,h)ANTHRACENE (ug/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| Ip  | INDENO(1,2,3-CD)PYRENE (ug/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| *N  | NAPHTHALENE (ug/kg), EPA METHOD 8270 (PAHS)   |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| As  | ARSENIC (mg/kg)   |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| Pb  | LEAD (mg/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| Se  | SELENIUM (mg/kg)  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| <i>ITALICS+</i>   | EXCEEDS GROUNDWATER PATHWAY RCL   |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| <b>BOLD++</b>   | EXCEEDS NON-INDUSTRIAL DIRECT CONTACT (0-4') RCL  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| *   | EXCEEDS STANDARD, BUT BELOW BACKGROUND THRESHOLD VALUE, CONSIDERED NATURALLY OCCURRING  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| VOC   | VOLATILE ORGANIC COMPOUNDS  |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |
| PAH   | POLYNUCLEAR AROMATIC HYDROCARBONS   |  |          |             |      |              |     |                           |     |                            |     |                        |     |                              |   |                  |      |                                |    |                                |    |   |    |                 |    |              |    |                  |                 |                                 |               |  |   |  |     |                            |     |                                   |

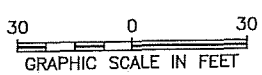


|  |  |                                      |
|--|--|--------------------------------------|
| <b>FEHR GRAHAM</b><br>ENGINEERING & ENVIRONMENTAL<br>5706 8TH AVENUE<br>KENOSHA, WI 53140<br>DRWN:MKH DATE:07/10/16 APPD:XXX | SLMKRS<br>100%<br>VCS025H                                    | TITLE:<br><b>SITE SOIL CHEMISTRY</b> |
|  | BRRTS: 02-30-57767<br>JOB NO.: 16-1501<br>PLOT DATE: 9/12/17 | FIGURE:<br><b>1</b>                  |

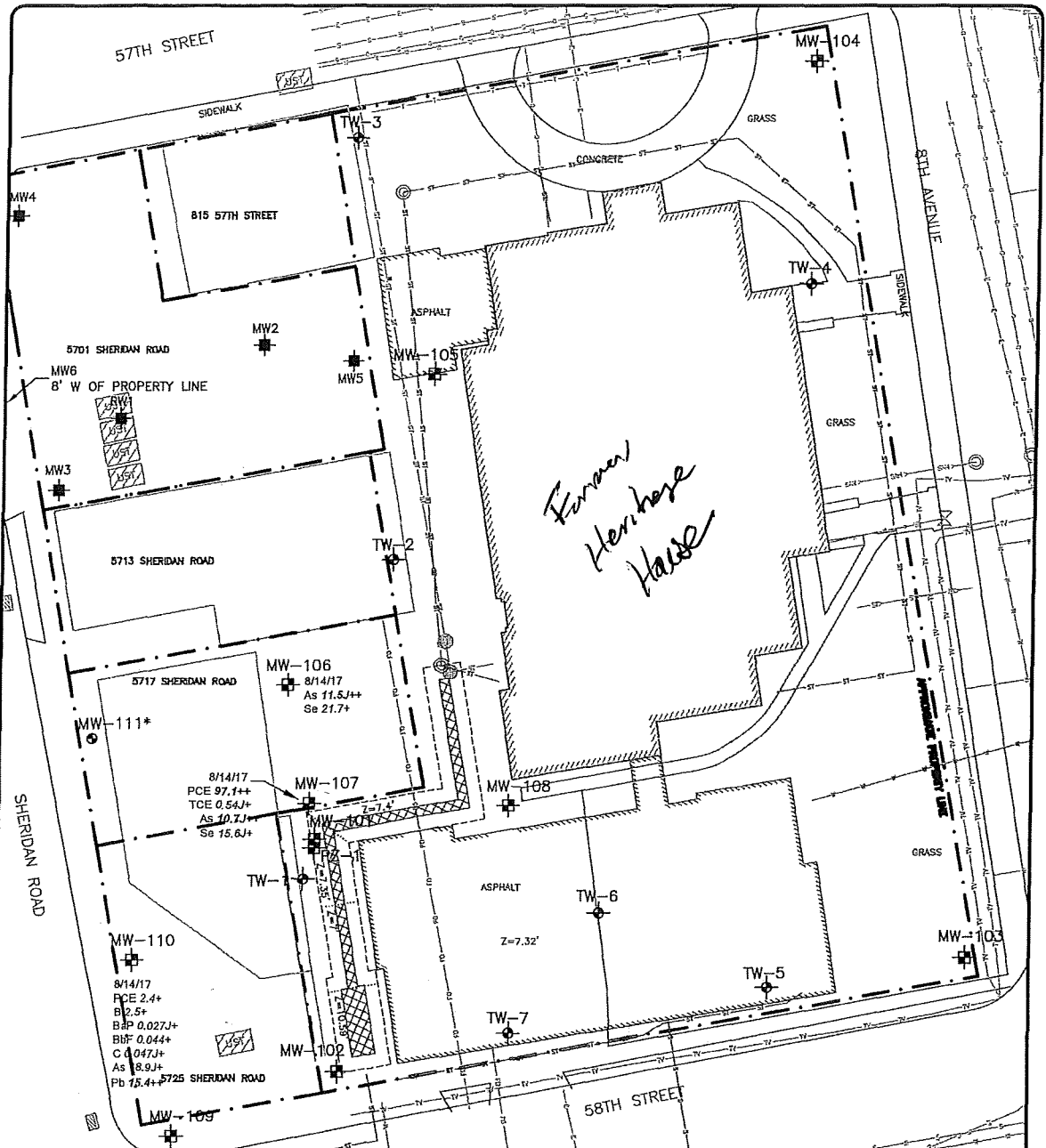


**LEGEND**

- |                              |   |                                       |
|------------------------------|---|---------------------------------------|
| FORMER UNDERGROUND FUEL TANK | SOIL BORING & TEMP WELL                         | 599.68 GROUNDWATER ELEVATION (ft/msl) |
| STORM SEWER                  | MONITORING WELL/PIEZOMETER                      | 592.65* NOT USED IN CONTOUR           |
| SANITARY SEWER               | ABANDONED MONITORING WELL (BRRIS: 03-30-001791) | GROUNDWATER FLOW DIRECTION            |
| TELEPHONE LINE               | ABANDONED MONITORING/TEMP WELL                  |                                       |
| FIBER OPTIC CABLE            | PROPOSED BUILDING OUTLINE                       |                                       |
| WATER UTILITY                | PROPOSED EXCAVATION LIMIT                       |                                       |
| GAS LINE                     | PROPOSED EXCAVATION DEPTH                       |                                       |
| CATCH BASIN                  | PROPOSED DETENTION SYSTEM                       |                                       |
| MANHOLE                      |   |                                       |
| VALVE                        |   |                                       |
| UTILITY POLE                 |   |                                       |



|  |   |
|--|---|
| <b>FEHR GRAHAM</b><br>ENGINEERING & ENVIRONMENTAL<br>ILLINOIS IOWA WISCONSIN | TITLE:  |
|  | <b>GROUNDWATER ELEVATION</b><br><b>AUGUST 14, 2017</b>        |
| FORMER HERITAGE HOUSE<br>5706 8TH AVENUE<br>KENOSHA, WI 53140                | BRRIS: 02-30-577677<br>JOB NO.: 16-1501<br>PLOT DATE: 9/25/17 |
| DRWN: MKH DATE: 07/10/16 APPD: XXX   | FIGURE:<br><b>2</b>   |

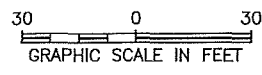


*Former Herzhose House*

| LEGEND |  |
|--------|--|
|        | FORMER UNDERGROUND FUEL TANK                         |
|        | STORM SEWER  |
|        | SANITARY SEWER                                       |
|        | TELEPHONE LINE                                       |
|        | FIBER OPTIC CABLE                                    |
|        | WATER UTILITY  |
|        | GAS LINE   |
|        | CATCH BASIN  |
|        | MANHOLE  |
|        | VALVE  |
|        | UTILITY POLE   |
|        | PROPOSED STORM SEWER                                 |
|        | PROPOSED MANHOLE                                     |
|        | PROPOSED SANITARY SEWER                              |
|        | PROPOSED WATER UTILITY                               |
|        | SOIL BORING & TEMP WELL                              |
|        | MONITORING WELL/PIEZOMETER                           |
|        | ABANDONED MONITORING WELL (BRRIS: 03-30-001791)      |
|        | SOIL BORING  |
|        | PROPOSED BUILDING OUTLINE                            |
|        | PROPOSED EXCAVATION LIMIT                            |
|        | Z=7.32' PROPOSED EXCAVATION DEPTH                    |
|        | PROPOSED DETENTION SYSTEM                            |
|        | PCE TETRACHLOROETHENE (ug/L)                         |
|        | TCE TRICHLOROETHENE (ug/L)                           |
|        | B BENZENE (ug/L)                                     |
|        | BaP BENZO(a)PYRENE (ug/L)                            |
|        | BbF BENZO(b)FLUORANTHENE (ug/L)                      |
|        | C CHRYSENE (ug/L)                                    |
|        | As ARSENIC (ug/L)                                    |
|        | Pb LEAD (ug/L)                                       |
|        | Se SELENIUM (ug/L)                                   |
|        | ITALICS+ EXCEEDS PREVENTIVE ACTION LIMIT             |
|        | BOLD++ EXCEEDS ENFORCEMENT STANDARD                  |
|        | J BETWEEN LIMIT OF DETECTION & LIMIT OF QUANTITATION |

MW-111\* - NO GROUNDWATER DATA; INFERRED TO CONTAIN ELEVATED LEVELS OF PCE, BASED ON THE DETECTED 3.57 ug/kg PCE IN SATURATED SOIL FROM 9 TO 11 FEET BELOW GRADE

NOTE: ONLY DETECTIONS ABOVE STANDARDS LISTED. SEVERAL WELLS WERE SAMPLED FOR COMPOUNDS BUT HAD DETECTIONS BELOW STANDARDS OR NO DETECT. REFER TO CHEMISTRY TABLES FOR DETAILS



|   |  |
|---|--|
| <b>FEHR GRAHAM</b><br>ENGINEERING & ENVIRONMENTAL<br>KENOSHA, WISCONSIN | TITLE: <b>GROUNDWATER CHEMISTRY</b>    |
|   | JOB NO.: 16-1501<br>PLOT DATE: 8/12/17 |
| HERITAGE HOUSE<br>5708 8TH AVENUE<br>KENOSHA, WI 53140                  | FIGURE: <b>3</b>                       |
| DRWN: MKH DATE: 07/10/16 APPD: XXX                                      | © 2014 FEHR GRAHAM                     |

Table A.1.b  
 Groundwater Analytical Table - PAH  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID              |        | NR 140.10<br>Preventive<br>Action Limit | NR 140.10<br>Enforcement<br>Standard | MW-106         |          |
|------------------------|--------|---|--------------------------------------|----------------|----------|
| Date                   |        |   |                                      | 5/31/17        | 8/14/17  |
| Groundwater Elevation  |        |   |                                      | 594.20         | 594.05   |
|                        |        |   |                                      |                |          |
| Acenaphthene           | (µg/L) | NS                                      | NS                                   | <0.0057        | <0.0056  |
| Acenaphthylene         | (µg/L) | NS                                      | NS                                   | <0.0047        | <0.0046  |
| Anthracene             | (µg/L) | 600                                     | 3,000                                | <0.0099        | <0.0096  |
| Benzo(a)anthracene     | (µg/L) | NS                                      | NS                                   | 0.023 J        | <0.0069  |
| Benzo(a)pyrene         | (µg/L) | 0.02                                    | 0.2                                  | <b>0.024 J</b> | <0.0097  |
| Benzo(b)fluoranthene   | (µg/L) | 0.02                                    | 0.2                                  | <b>0.029</b>   | 0.0066 J |
| Benzo(g,h,i)perylene   | (µg/L) | NS                                      | NS                                   | 0.018 J        | 0.0088 J |
| Benzo(k)fluoranthene   | (µg/L) | NS                                      | NS                                   | 0.017 J        | 0.0073 J |
| Chrysene               | (µg/L) | 0.02                                    | 0.2                                  | <b>0.032 J</b> | <0.012   |
| Dibenzo(a,h)anthracene | (µg/L) | NS                                      | NS                                   | <0.0095        | <0.0092  |
| Fluoranthene           | (µg/L) | 80                                      | 400                                  | 0.057          | <0.0098  |
| Fluorene               | (µg/L) | 80                                      | 400                                  | <0.0075        | <0.0073  |
| Indeno(123-cd)pyrene   | (µg/L) | NS                                      | NS                                   | <0.017         | <0.016   |
| 1-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | 0.0073 J       | 0.010 J  |
| 2-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | <0.0046        | 0.0065 J |
| Naphthalene            | (µg/L) | 10                                      | 100                                  | 0.018 J        | <0.017   |
| Phenanthrene           | (µg/L) | NS                                      | NS                                   | 0.040 J        | 0.019 J  |
| Pyrene                 | (µg/L) | 50                                      | 250                                  | 0.060          | 0.013 J  |

**Notes:**

NS = No standard established

-- = Not analyzed for parameter

**ITALICS** indicates exceedance of NR 140.10 Preventive Action Limit

**BOLD** indicates exceedance of NR 140.10 Enforcement Standard

J = Between limit of detection & limit of quantification

Table A.1.b  
 Groundwater Analytical Table - PAH  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID              |        | NR 140.10<br>Preventive<br>Action Limit | NR 140.10<br>Enforcement<br>Standard | MW-107       |         | MW-109         |          |
|------------------------|--------|---|--------------------------------------|--------------|---------|----------------|----------|
| Date                   |        |   |                                      | 5/31/17      | 8/14/17 | 5/31/17        | 8/14/17  |
| Groundwater Elevation  |        |   |                                      | 595.69       | 595.38  | 598.12         | 597.56   |
|                        |        |   |                                      |              |         |                |          |
| Acenaphthene           | (µg/L) | NS                                      | NS                                   | <0.0058      | <0.0071 | 0.0073 J       | <0.0056  |
| Acenaphthylene         | (µg/L) | NS                                      | NS                                   | <0.0047      | <0.0058 | <0.0047        | <0.0046  |
| Anthracene             | (µg/L) | 600                                     | 3,000                                | <0.010       | <0.012  | 0.055          | <0.0096  |
| Benzo(a)anthracene     | (µg/L) | NS                                      | NS                                   | <0.0072      | <0.0088 | 0.0075 J       | <0.0069  |
| Benzo(a)pyrene         | (µg/L) | 0.02                                    | 0.2                                  | <0.010       | <0.012  | 0.011 J        | <0.0097  |
| Benzo(b)fluoranthene   | (µg/L) | 0.02                                    | 0.2                                  | 0.0087 J     | <0.0067 | 0.0084 J       | 0.0059 J |
| Benzo(g,h,i)perylene   | (µg/L) | NS                                      | NS                                   | 0.010 J      | <0.0079 | 0.015 J        | <0.0062  |
| Benzo(k)fluoranthene   | (µg/L) | NS                                      | NS                                   | 0.011 J      | <0.0088 | 0.014 J        | <0.0069  |
| Chrysene               | (µg/L) | 0.02                                    | 0.2                                  | <b>0.068</b> | <0.015  | <b>0.025 J</b> | <0.012   |
| Dibenzo(a,h)anthracene | (µg/L) | NS                                      | NS                                   | <0.0095      | <0.012  | <0.0095        | <0.0092  |
| Fluoranthene           | (µg/L) | 80                                      | 400                                  | 0.019 J      | <0.012  | 0.032 J        | <0.0098  |
| Fluorene               | (µg/L) | 80                                      | 400                                  | <0.0076      | <0.0093 | <0.0075        | <0.0073  |
| Indeno(123-cd)pyrene   | (µg/L) | NS                                      | NS                                   | <0.017       | <0.021  | <0.017         | <0.016   |
| 1-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | <0.0056      | <0.0069 | 0.046          | <0.0054  |
| 2-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | <0.0047      | <0.0057 | 0.034          | 0.0068 J |
| Naphthalene            | (µg/L) | 10                                      | 100                                  | <0.017       | <0.021  | 0.041 J        | <0.017   |
| Phenanthrene           | (µg/L) | NS                                      | NS                                   | <0.013       | 0.019 J | 0.046 J        | 0.015 J  |
| Pyrene                 | (µg/L) | 50                                      | 250                                  | 0.021 J      | <0.0089 | 0.038          | 0.012 J  |

**Notes:**

NS = No standard established

-- = Not analyzed for parameter

**ITALICS** indicates exceedance of NR 140.10 Preventive Action Limit

**BOLD** indicates exceedance of NR 140.10 Enforcement Standard

J = Between limit of detection & limit of quantification



Table A.1.b  
 Groundwater Analytical Table - PAH  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID              |        | NR 140.10<br>Preventive<br>Action Limit | NR 140.10<br>Enforcement<br>Standard | MW-110      |                |
|------------------------|--------|---|--------------------------------------|-------------|----------------|
| Date                   |        |   |                                      | 5/31/17     | 8/14/17        |
| Groundwater Elevation  |        |   |                                      | 596.30      | 595.53         |
|                        |        |   |                                      |             |                |
| Acenaphthene           | (µg/L) | NS                                      | NS                                   | 0.32        | 0.079          |
| Acenaphthylene         | (µg/L) | NS                                      | NS                                   | 0.047       | 0.010 J        |
| Anthracene             | (µg/L) | 600                                     | 3,000                                | 0.11        | 0.0098 J       |
| Benzo(a)anthracene     | (µg/L) | NS                                      | NS                                   | 0.13        | 0.023 J        |
| Benzo(a)pyrene         | (µg/L) | 0.02                                    | 0.2                                  | <b>0.12</b> | <b>0.027 J</b> |
| Benzo(b)fluoranthene   | (µg/L) | 0.02                                    | 0.2                                  | <b>0.14</b> | <b>0.044</b>   |
| Benzo(g,h,i)perylene   | (µg/L) | NS                                      | NS                                   | 0.065       | 0.021 J        |
| Benzo(k)fluoranthene   | (µg/L) | NS                                      | NS                                   | 0.073       | 0.022 J        |
| Chrysene               | (µg/L) | 0.02                                    | 0.2                                  | <b>0.14</b> | <b>0.047 J</b> |
| Dibenzo(a,h)anthracene | (µg/L) | NS                                      | NS                                   | 0.015 J     | <0.0090        |
| Fluoranthene           | (µg/L) | 80                                      | 400                                  | 0.31        | 0.065          |
| Fluorene               | (µg/L) | 80                                      | 400                                  | 0.17        | 0.033 J        |
| Indeno(123-cd)pyrene   | (µg/L) | NS                                      | NS                                   | 0.053 J     | <0.016         |
| 1-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | 6.4         | 0.34           |
| 2-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | 3.3         | 0.048          |
| Naphthalene            | (µg/L) | 10                                      | 100                                  | 9.0         | 0.32           |
| Phenanthrene           | (µg/L) | NS                                      | NS                                   | 0.28        | 0.033 J        |
| Pyrene                 | (µg/L) | 50                                      | 250                                  | 0.29        | 0.095          |

**Notes:**

NS = No standard established

-- = Not analyzed for parameter

**ITALICS** indicates exceedance of NR 140.10 Preventive Action Limit

**BOLD** indicates exceedance of NR 140.10 Enforcement Standard

J = Between limit of detection & limit of quantification

Table A.1.b  
 Groundwater Analytical Table - PAH  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID              |        | NR 140.10<br>Preventive<br>Action Limit | NR 140.10<br>Enforcement<br>Standard | MW-106         |          |
|------------------------|--------|---|--------------------------------------|----------------|----------|
| Date                   |        |   |                                      | 5/31/17        | 8/14/17  |
| Groundwater Elevation  |        |   |                                      | 594.20         | 594.05   |
|                        |        |   |                                      |                |          |
| Acenaphthene           | (µg/L) | NS                                      | NS                                   | <0.0057        | <0.0056  |
| Acenaphthylene         | (µg/L) | NS                                      | NS                                   | <0.0047        | <0.0046  |
| Anthracene             | (µg/L) | 600                                     | 3,000                                | <0.0099        | <0.0096  |
| Benzo(a)anthracene     | (µg/L) | NS                                      | NS                                   | 0.023 J        | <0.0069  |
| Benzo(a)pyrene         | (µg/L) | 0.02                                    | 0.2                                  | <b>0.024 J</b> | <0.0097  |
| Benzo(b)fluoranthene   | (µg/L) | 0.02                                    | 0.2                                  | <b>0.029</b>   | 0.0066 J |
| Benzo(g,h,i)perylene   | (µg/L) | NS                                      | NS                                   | 0.018 J        | 0.0088 J |
| Benzo(k)fluoranthene   | (µg/L) | NS                                      | NS                                   | 0.017 J        | 0.0073 J |
| Chrysene               | (µg/L) | 0.02                                    | 0.2                                  | <b>0.032 J</b> | <0.012   |
| Dibenzo(a,h)anthracene | (µg/L) | NS                                      | NS                                   | <0.0095        | <0.0092  |
| Fluoranthene           | (µg/L) | 80                                      | 400                                  | 0.057          | <0.0098  |
| Fluorene               | (µg/L) | 80                                      | 400                                  | <0.0075        | <0.0073  |
| Indeno(123-cd)pyrene   | (µg/L) | NS                                      | NS                                   | <0.017         | <0.016   |
| 1-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | 0.0073 J       | 0.010 J  |
| 2-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | <0.0046        | 0.0065 J |
| Naphthalene            | (µg/L) | 10                                      | 100                                  | 0.018 J        | <0.017   |
| Phenanthrene           | (µg/L) | NS                                      | NS                                   | 0.040 J        | 0.019 J  |
| Pyrene                 | (µg/L) | 50                                      | 250                                  | 0.060          | 0.013 J  |

**Notes:**

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-- = Not analyzed for parameter

**ITALICS** indicates exceedance of NR 140.10 Preventive Action Limit

**BOLD** indicates exceedance of NR 140.10 Enforcement Standard

J = Between limit of detection & limit of quantification

Table A.1.b  
 Groundwater Analytical Table - PAH  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID              |        | NR 140.10<br>Preventive<br>Action Limit | NR 140.10<br>Enforcement<br>Standard | MW-107   |         | MW-109   |          |
|------------------------|--------|---|--------------------------------------|----------|---------|----------|----------|
| Date                   |        |   |                                      | 5/31/17  | 8/14/17 | 5/31/17  | 8/14/17  |
| Groundwater Elevation  |        |   |                                      | 595.69   | 595.38  | 598.12   | 597.56   |
|                        |        |   |                                      |          |         |          |          |
| Acenaphthene           | (µg/L) | NS                                      | NS                                   | <0.0058  | <0.0071 | 0.0073 J | <0.0056  |
| Acenaphthylene         | (µg/L) | NS                                      | NS                                   | <0.0047  | <0.0058 | <0.0047  | <0.0046  |
| Anthracene             | (µg/L) | 600                                     | 3,000                                | <0.010   | <0.012  | 0.055    | <0.0096  |
| Benzo(a)anthracene     | (µg/L) | NS                                      | NS                                   | <0.0072  | <0.0088 | 0.0075 J | <0.0069  |
| Benzo(a)pyrene         | (µg/L) | 0.02                                    | 0.2                                  | <0.010   | <0.012  | 0.011 J  | <0.0097  |
| Benzo(b)fluoranthene   | (µg/L) | 0.02                                    | 0.2                                  | 0.0087 J | <0.0067 | 0.0084 J | 0.0059 J |
| Benzo(g,h,i)perylene   | (µg/L) | NS                                      | NS                                   | 0.010 J  | <0.0079 | 0.015 J  | <0.0062  |
| Benzo(k)fluoranthene   | (µg/L) | NS                                      | NS                                   | 0.011 J  | <0.0088 | 0.014 J  | <0.0069  |
| Chrysene               | (µg/L) | 0.02                                    | 0.2                                  | 0.068    | <0.015  | 0.025 J  | <0.012   |
| Dibenzo(a,h)anthracene | (µg/L) | NS                                      | NS                                   | <0.0095  | <0.012  | <0.0095  | <0.0092  |
| Fluoranthene           | (µg/L) | 80                                      | 400                                  | 0.019 J  | <0.012  | 0.032 J  | <0.0098  |
| Fluorene               | (µg/L) | 80                                      | 400                                  | <0.0076  | <0.0093 | <0.0075  | <0.0073  |
| Indeno(123-cd)pyrene   | (µg/L) | NS                                      | NS                                   | <0.017   | <0.021  | <0.017   | <0.016   |
| 1-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | <0.0056  | <0.0069 | 0.046    | <0.0054  |
| 2-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | <0.0047  | <0.0057 | 0.034    | 0.0068 J |
| Naphthalene            | (µg/L) | 10                                      | 100                                  | <0.017   | <0.021  | 0.041 J  | <0.017   |
| Phenanthrene           | (µg/L) | NS                                      | NS                                   | <0.013   | 0.019 J | 0.046 J  | 0.015 J  |
| Pyrene                 | (µg/L) | 50                                      | 250                                  | 0.021 J  | <0.0089 | 0.038    | 0.012 J  |

**Notes:**

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-- = Not analyzed for parameter

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Table A.1.b  
 Groundwater Analytical Table - PAH  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID              |        | NR 140.10<br>Preventive<br>Action Limit | NR 140.10<br>Enforcement<br>Standard | MW-110      |                |
|------------------------|--------|---|--------------------------------------|-------------|----------------|
| Date                   |        |   |                                      | 5/31/17     | 8/14/17        |
| Groundwater Elevation  |        |   |                                      | 596.30      | 595.53         |
|                        |        |   |                                      |             |                |
| Acenaphthene           | (µg/L) | NS                                      | NS                                   | 0.32        | 0.079          |
| Acenaphthylene         | (µg/L) | NS                                      | NS                                   | 0.047       | 0.010 J        |
| Anthracene             | (µg/L) | 600                                     | 3,000                                | 0.11        | 0.0098 J       |
| Benzo(a)anthracene     | (µg/L) | NS                                      | NS                                   | 0.13        | 0.023 J        |
| Benzo(a)pyrene         | (µg/L) | 0.02                                    | 0.2                                  | <b>0.12</b> | <b>0.027 J</b> |
| Benzo(b)fluoranthene   | (µg/L) | 0.02                                    | 0.2                                  | <b>0.14</b> | <b>0.044</b>   |
| Benzo(g,h,i)perylene   | (µg/L) | NS                                      | NS                                   | 0.065       | 0.021 J        |
| Benzo(k)fluoranthene   | (µg/L) | NS                                      | NS                                   | 0.073       | 0.022 J        |
| Chrysene               | (µg/L) | 0.02                                    | 0.2                                  | <b>0.14</b> | <b>0.047 J</b> |
| Dibenzo(a,h)anthracene | (µg/L) | NS                                      | NS                                   | 0.015 J     | <0.0090        |
| Fluoranthene           | (µg/L) | 80                                      | 400                                  | 0.31        | 0.065          |
| Fluorene               | (µg/L) | 80                                      | 400                                  | 0.17        | 0.033 J        |
| Indeno(123-cd)pyrene   | (µg/L) | NS                                      | NS                                   | 0.053 J     | <0.016         |
| 1-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | 6.4         | 0.34           |
| 2-methylnaphthalene    | (µg/L) | NS                                      | NS                                   | 3.3         | 0.048          |
| Naphthalene            | (µg/L) | 10                                      | 100                                  | 9.0         | 0.32           |
| Phenanthrene           | (µg/L) | NS                                      | NS                                   | 0.28        | 0.033 J        |
| Pyrene                 | (µg/L) | 50                                      | 250                                  | 0.29        | 0.095          |

**Notes:**

NS = No standard established

-- = Not analyzed for parameter

**ITALICS** indicates exceedance of NR 140.10 Preventive Action Limit

**BOLD** indicates exceedance of NR 140.10 Enforcement Standard

J = Between limit of detection & limit of quantification

Table A.1.c  
 Groundwater Analytical Table - Metals  
 Heritage House  
 5708 8th Ave., Kenosha, WI

| Sample ID             |         | NR 140.10<br>Preventive<br>Action Limit | NR 140.10<br>Enforcement<br>Standard | MW-106       |               | MW-107  |               | MW-109       |              | MW-110        |              |
|-----------------------|---------|---|--------------------------------------|--------------|---------------|---------|---------------|--------------|--------------|---------------|--------------|
| Date                  | 5/31/17 |   |                                      | 8/14/17      | 5/31/17       | 8/15/17 | 5/31/17       | 8/14/17      | 5/31/17      | 8/15/17       |              |
| Groundwater Elevation | 594.20  |   |                                      | 594.05       | 595.69        | 595.38  | 598.12        | 597.56       | 596.30       | 595.53        |              |
| Arsenic               | (ug/L)  | 1                                       | 10                                   | 5.8 <i>J</i> | 11.3 <i>J</i> | <5.4    | 10.7 <i>J</i> | 9.9 <i>J</i> | 8.0 <i>J</i> | <5.4          | 8.9 <i>J</i> |
| Barium                | (ug/L)  | 400                                     | 2,000                                | 109          | 114           | 28.9    | 33.6          | 281          | 312          | 115           | 161          |
| Cadmium               | (ug/L)  | 0.5                                     | 5                                    | <1.3         | <1.3          | <1.3    | <1.3          | <1.3         | <1.3         | <1.3          | <1.3         |
| Chromium, total       | (ug/L)  | 10                                      | 100                                  | <2.5         | <2.5          | <2.5    | <2.5          | <2.5         | <2.5         | <2.5          | <2.5         |
| Lead                  | (ug/L)  | 1.5                                     | 15                                   | <4.3         | <4.3          | <4.3    | <4.3          | <4.3         | <4.3         | 12.0 <i>J</i> | 15.4         |
| Mercury               | (ug/L)  | 0.2                                     | 2                                    | <0.13        | <0.13         | <0.13   | <0.13         | <0.13        | <0.13        | <0.13         | <0.13        |
| Selenium              | (ug/L)  | 10                                      | 50                                   | <5.6         | 21.7          | 22.8    | 15.6 <i>J</i> | <5.6         | <5.6         | <5.6          | <5.6         |
| Silver                | (ug/L)  | 10                                      | 50                                   | <3.2         | <3.2          | <3.2    | <3.2          | <3.2         | <3.2         | <3.2          | <3.2         |

**Notes:**

NS = No standard established

-- = Not analyzed for parameter

*ITALICS* indicates exceedance of NR 140.10 Preventive Action Limit

**BOLD** indicates exceedance of NR 140.10 Enforcement Standard

\* Standards according to NR 140.12

J = Between limit of detection & limit of quantification