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June 5, 2000

Project #3125

Mr. Andrew F. Boettcher  
Remediation and Redevelopment Team  
Wisconsin Department of Natural Resources  
2300 N. Dr. ML King Drive  
P. O. Box 12436  
Milwaukee, Wisconsin 53121-0436

*Timing should be soon.*

**Re: Scope of Work for Investigation Activities to Further Define the Downgradient Impacts Associated with the Former Good Hope Landfill Site, Milwaukee, Wisconsin**

Dear Mr. Boettcher:

At the request of the Village of Whitefish Bay, Sigma Environmental Services, Inc. (Sigma) is submitting this scope of work for completing investigation activities south of the former Good Hope landfill site for your review.

#### **PROPOSED INVESTIGATION ACTIVITIES**

The proposed investigation activities have been designed to: 1) evaluate potential concerns regarding volatile organic compound (VOC) migration within unsaturated material underlying the residential subdivision located south of the Green Tree Road, and 2) further determine the degree and extent of groundwater impacts south of the Webster Middle School Property. The following sections describe the proposed activities.

**Subsurface Vapor Study.** A subsurface soil vapor study is proposed to determine the potential for the generation and migration of vapors from the dissolved phase in the groundwater to the vapor phase in the underlying unsaturated soils. Sigma is proposing to install twelve temporary vapor probes in the City of Milwaukee right-of-way within the residential area between Green Tree Road and Mill Road (Figure 1). The vapor probes will be installed using the GeoProbe™ soil boring method with one soil gas sample collected from each location from a depth interval of eight to twelve feet below ground surface. The soil vapor samples will be collected in a laboratory supplied SUMMA™ canister and submitted for laboratory analysis of volatile organic compounds using an analytical method appropriate for air quality monitoring (EPA Method TO14). The results of the study will be evaluated to identify potential concerns regarding subsurface vapor migration and will be presented in a letter report documenting the investigation activities.

\* Soils continuously logged for stratigraphy

\* also collect gw

"grab" samples

from at least some boring

\* soil gas probes perm. install.

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**Lateral and Vertical Groundwater Plume Delineation.** In order to further assess the lateral and vertical extent of groundwater impacts south of the Webster Middle School property Sigma is proposing to complete a phased investigation consisting of the installation of three shallow monitoring wells and four piezometers. The following bullet items summarize the proposed approach for the investigation activities.

- Install three shallow monitoring wells in the City of Milwaukee right-of-way, to the east, west and south of the residential property defined by 50<sup>th</sup> Street to the east, 56<sup>th</sup> Street to the west, and Mill Road to the south. The well screens will be positioned to intercept the shallow water table present in the saturated sand unit at an estimated depth of 10 to 15 feet below ground surface (ft-bgs). The approximate location of these wells are depicted on the attached figure (Figure 1).
- Collect groundwater samples from the three shallow monitoring wells and analyze for EPA Method 8260 VOCs. Evaluate the data to determine the presence of source areas south of the school property, and confirm that the degree and extent of shallow groundwater impacts have been defined.
- Install four double-cased piezometers to depths of approximately 55 to 65 ft-bgs to determine the groundwater quality in the deep saturated zone. The well screens will be positioned to intercept the deeper flow system immediately above the bedrock unit. The piezometers will be double cased to prevent cross contamination between the shallow and deep interval of the underlying saturated unconsolidated units. One piezometer will be positioned on the Webster Middle School property adjacent to existing shallow monitoring well MPS:P-6. The other three piezometers be nested with the three proposed shallow wells, pending review of the shallow groundwater quality results.
- Collect a round of groundwater samples and water level measurements from select existing wells/piezometers south of the landfill property (MPS:P-4,P-5 and P-6), and all the newly installed wells/piezometers and analyze using EPA Method 8260 VOCs. In addition, perform a location and elevation survey of all newly installed wells to the state plane coordinate system and mean sea level, respectively in accordance with the NR700 requirements.

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- o Compile and evaluate the data to generate groundwater flow and contaminant distribution maps.

Please do not hesitate to call us at 414-768-7144 if you have any questions.

Sincerely,

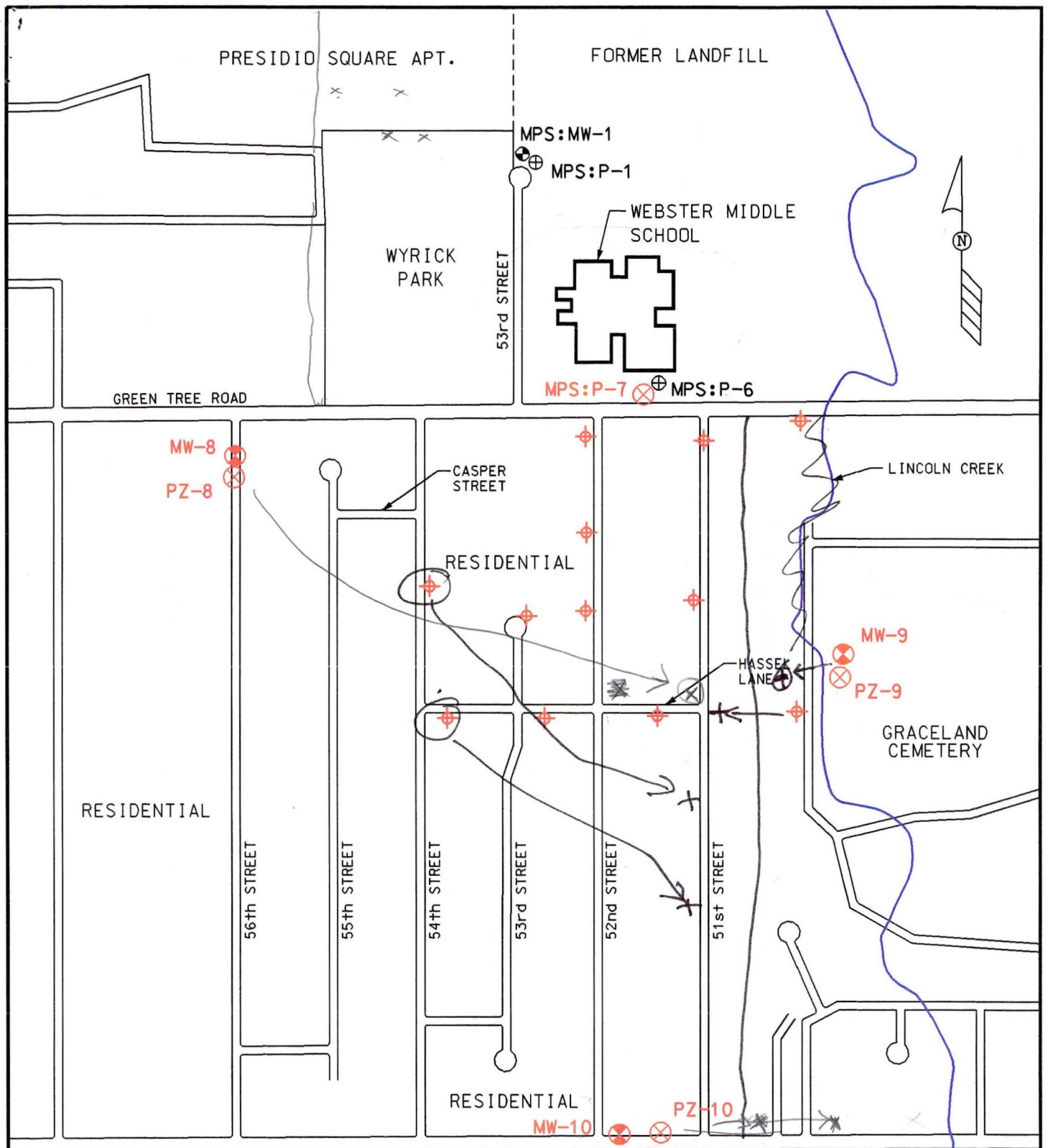
**SIGMA ENVIRONMENTAL SERVICES, INC.**

  
Randy E. Boness, P.G.  
Senior Project Manager

  
Mafizul Islam, P.E.  
Senior Project Engineer

/attachments

cc: Mr. Ed Henschel / Village of Whitefish Bay  
Mr. Dennis L. Fisher / Meissner Tierney et. al.  
Mr. Henry Nehls-Lowe / Department of Health and Family Services



- NOTES:
1. BOUNDARIES ARE APPROXIMATE
  2. MONITORING WELL / PIZOMETER LOCATIONS ARE APPROXIMATE
  3. THIS MAP WAS DEVELOPED FROM A MILWAUKEE COUNTY MAP AND THIENSVILLE QUADRANGLE TOPOGRAPHIC MAP.

| LEGEND |                            |
|--------|----------------------------|
|        | = MONITORING WELL          |
|        | = PIEZOMETER               |
|        | = PROPOSED MONITORING WELL |
|        | = PROPOSED PIEZOMETER      |
|        | = PROPOSED GEOPROBE BORING |

|  |             |               |
|--|-------------|---------------|
| <b>VILLAGE OF WHITEFISH BAY</b><br>MILWAUKEE, WI       |             |               |
| DATE: 3-21-00  | DR. BY: TMM | DR.# 3125-037 |
| <b>PROPOSED MONITORING WELL AND GEOPROBE LOCATIONS</b> |             |               |

|                  |
|------------------|
|                  |
| SCALE: 1" = 500' |
| <b>FIGURE 1</b>  |