



From Michelle Norman efile

May 6, 2013

Project Reference #10724



Ms. Michele Norman
c/o Ms. Victoria Stovall
Wisconsin Dept. of Natural Resources
Remediation & Redevelopment Program
2300 N. Dr. Martin Luther King Jr. Drive
Milwaukee, WI 53212

Subject: Update for Subslab Vapor Testing & Request for Technical Review
Superior Health Linens – 5005 S. Packard Avenue, Cudahy, WI
BRRTS #02-41-532649 FID #241780880

Dear Ms. Norman:

The Sigma Group, Inc. (Sigma) has prepared this letter on behalf of Superior Health Linens to document recent environmental activities completed at the above referenced property (hereinafter the "Site"). The environmental field work was completed in accordance with Sigma's October 2012 submittal¹ (included as **Attachment 1** for reference). Specifically, this letter discusses the field activities and results associated with the following:

- In February 2013, Sigma performed four high purge volume (HPV) subslab vapor sampling tests and one standard sub-slab vapor sample collection at select locations beneath the existing site building to evaluate the presence/degree of chlorinated volatile organic compounds (CVOCs) in the soil vapor beneath the building floor slab.

FACILITY CONDITIONS

Figure 1 illustrates the building footprint and general use areas. The majority of the site building is used as a laundry/processing area for incoming and outgoing health linen materials and is an open warehouse/shop area with high ceilings, overhead doors, laundry washing, drying and pressing equipment and constant air circulation. The existing dryer systems are dual vented, meaning combustion air is brought in from the outside, and very little interior air is used. Considering the testing was completed during the winter the facility was closed (overhead doors are typically open during the summer) and the potential for vapor migration was at its greatest. The office area of the facility is located within a recently constructed addition that includes a thicker (6-inch) concrete slab and plastic vapor barrier.

SUB-SLAB VAPOR SAMPLING ACTIVITIES

On February 8, 2013, Sigma collected five sub-slab vapor samples (SSV-1 through SSV-5) to determine the concentrations of CVOCs in the subslab vapors beneath the building. At four of the five sample locations (SSV-1, SSV-2, SSV-4, and SSV-5), the HPV testing protocol was performed because a larger (more representative) volume of subslab vapor is sampled versus multiple discrete Summa canister testing points. By way of example, based on field measurements, the volume of vapor extracted during the HPV tests ranged between

¹ "Remedial Approach Documentation, Superior Health Linens, Cudahy, Wisconsin" by Sigma (dated October 19, 2012)

approximately 1,600 to 3,500 cubic feet over the course of the Summa canister samples. Following collection of sub-slab vapor samples at three of the four sample locations (SSV-2, SSV-4 and SSV-5), the radius of influence of the applied vacuum was evaluated through installation of communication test points (TP-1 through TP-6). Communication testing was not completed around sample location SSV-1 as SSV-1 was located in a high-traffic area of the site building and additional sampling at this location would have disrupted facility operations.

The vapor testing activities were performed in general accordance with recommendations provided in a WDNR vapor intrusion seminar presentation² and technical article³. The subslab vapor extraction points (SSV-1, SSV-2, SSV-4 and SSV-5) and communication test points (TP-1 through TP-6), as identified in Figure 1, were constructed in the following manner:

- Subslab vapor extraction points
 - Drill a 3-inch diameter hole through the 4 to 6-inch thick concrete floor slab;
 - Remove several additional inches of subslab material;
 - Place several inches of filter pack sand in bottom of void;
 - Place 2-inch Schedule 80 PVC suction point (open end with four $\frac{1}{4}$ -inch diameter holes in side of PVC wrapped with fine gauge stainless steel wire mesh to prevent suction of filter pack sand) at the bottom of the suction point and connect rest of PVC assembly to shop vacuum (which is vented to outdoors (photos of typical setup included in Attachment 2));
 - Place additional filter pack around suction point;
 - Place several inches of quick-setting cement in the annulus between the suction point PVC and the core hole through the floor slab and allow to cure to seal off atmospheric air leakage into subsurface;
 - Turn on shop vacuum and smoke-test floor seal and fittings (passed based on visual observations), pressure test fittings (passed based on stable vacuum gauge readings over a 5 minute period), and leak test floor seal with helium gas tracer (passed based on less than 10% leakage);
 - Connect organic vapor monitor to access port on suction point and monitor for 5 minutes (all readings consistently 0.0 to 0.1 ppm at all locations);
 - Measure air velocity in PVC assembly (1,200 feet per minute [ft/min] at SSV-1, 2,800 ft/min at SSV-2, 1,300 ft/min at SSV-4, and 1,200 ft/min at SSV-5) to determine the purged vapor volumes;
 - Connect Summa canister and initiate sample collection; and
 - Disconnect the Summa canister from the extraction point after approximately 1 hour (63 minutes for SSV-1, 63 minutes for SSV-2, 65 minutes for SSV-4 and 62 minutes for SSV-5).
- Communication test points:
 - Drill a $\frac{1}{4}$ -inch diameter hole through the concrete floor slab at each test location;
 - Insert a section of $\frac{1}{4}$ -inch diameter nylon tubing into each hole and seal the tubing with quick-setting cement;
 - Seal the open ends of each tube when not being used for field measurements; and

² "High Purge Volume Sub-Slab Sampling, Former Paragon Electric Case Study " presentation by Annette Weissbach, WDNR (March 2011 FET seminar)

³ "High Purge Volume Sampling – A New Paradigm for Subslab Soil Gas Monitoring" by Todd McAlary, etc. al. (Ground Water Monitoring & Remediation, Vol. 30, No. 2, Spring 2010, pages 73 – 85)

- o Measure vacuum pressure at the communication test ports with a micromanometer during each test:
 - During SSV-2 test:
 - TP-1 = 0.020 inches water
 - TP-2 = 0.000 inches water
 - During SSV-4 test:
 - TP-3 = 0.000 inches water
 - TP-4 = 0.008 inches water
 - During SSV-5 test:
 - TP-5 = 0.027 inches water
 - TP-6 = 0.011 inches water

The measured vacuum readings at the communication test points indicate that the HPV tests had a radius of influence of at least 20 to 25 feet. Upon the completion of the HPV tests, the PVC suction point assembly and nylon tubing at the communication test points were removed and the concrete floor slab was patched with concrete. Each six-liter Summa canister sub-slab vapor sample was submitted under chain of custody to the environmental laboratory for analysis of select CVOCs by EPA Method TO-15.

In addition to the HPV samples, a standard sub-slab vapor sample was collected at the location selected for SSV-3 due to space constraints in the vicinity of the sample location. At SSV-3, a 2-inch diameter hole was drilled to a depth of approximately 2 inches into the concrete floor slab. A 3/8 inch diameter drill was used to complete the drill hole through the concrete floor slab. A small amount of filter pack sand was placed at the bottom of the drill hole (beneath the floor slab). An appropriate length of 1/4-inch diameter stainless steel tubing was placed in the drill hole with the tip, covered with fine stainless steel mesh, located in the filter pack sand. The steel tubing was set in the hole using hydrated anchoring cement. The anchoring cement was allowed to set until stiff.

New nylon tubing was connected to the steel sampling point using brass swage-lok fittings. The nylon tubing was connected to a teflon bag in a lung-box. A shroud was placed around the sub-slab sampling point and helium gas was introduced into the shroud. A vacuum pump was connected to the lung box and a vacuum created within the lung box so that vapors from beneath the slab would be drawn through the sub-slab sampling point into the teflon bag. An IonScience GasCheck 3000 Helium Detector was used to check the helium concentration within the teflon bag. At SSV-3, the measured helium levels within the teflon bag were identical to background concentrations, indicating that the surface seal around the sub-slab sampling point and the nylon tubing connected to the sub-slab sampling point were leak-free.

Following completion of the helium leak test, the sub-slab sampling point was purged using a photo-ionization detector (PID) until at least two volumes of the sampling point were removed. PID readings during purging did not detect concentrations greater than background levels. Following purging, a laboratory certified 6 liter SUMA vacuum canister was connected to the sampling point. The sub-slab sample was collected over a period of approximately 2 hours. Following sampling, the SUMA canister was re-packed for submittal to the analytical laboratory.

SUB-SLAB VAPOR SAMPLING RESULTS

Subslab vapor analytical data are summarized in Table 1; a copy of the laboratory analytical report is included as Attachment 3. The analytical laboratory was not able to run analysis on the sub-slab sample collected from sampling point SSV-4 due to the low volume of sample collected; although the canister was allowed to collect sample over the 1 hour calibrated

sampling period, an insufficient volume of air was pulled into the canister, possibly due to high moisture levels in the sampled air causing the small diameter tubing in the sampling train to become blocked with condensation.

Vapor risk screening levels are based on Vapor Action Levels modified with a 0.01 subslab vapor-to-ambient air attenuation factor as referenced in the WDNR's vapor intrusion guidance document⁴. All sample concentrations are reported below these risk screening levels.

Therefore, based on the collected data the vapor intrusion pathway is not considered a receptor risk and no additional investigation or remediation work is warranted. The sample locations were spaced to evaluate the majority of the building footprint area and included a sample in the vicinity of the highest reported CVOC concentrations within soil and groundwater samples collected from the site.

RECOMMENDATIONS

Although installation of a sub-slab venting/de-pressurization system was proposed in Sigma's November 2012 submittal, the sub-slab vapor sampling results collected since the November 2012 submittal have demonstrated that the concentrations of CVOCs identified within soil and groundwater beneath the site do not pose a level of risk via vapor intrusion to the site building that would warrant installation/operation of such a system. Sigma requests WDNR concurrence that installation of a sub-slab venting system will not be required as part of the remedial strategy/path to regulatory case closure for the release associated with CVOC contamination at the site.

If you concur with our recommendation, we would appreciate a written response. Please call us at (414) 643-4200 if you have any questions. Thank you for your assistance on this project.

Sincerely,

THE SIGMA GROUP, INC.



Stephen Meer, P.E.
Project Engineer



Kristin Kurzka, P.E.
Senior Engineer

Enclosures: Table 1 - Subslab Vapor Analytical Results
 Figure 1 - Subslab Vapor Extraction Points
 Attachment 1 - Remedial Approach Documentation
 Attachment 2 - September High Purge Volume Testing Photographs
 Attachment 3 - Subslab Vapor Analytical Data

cc: William Nicklas – Superior Health Linens

⁴ "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin" PUB-RR-800 by WDNR (dated December 2010)

Table 1
Subslab Vapor Analytical Results
Superior Health Linens - 5005 S. Packard Avenue, Cudahy, Wisconsin
Project Reference #10724

Sample Point:			SSV-1	SSV-2	SSV-3	SSV-5
VOCs (Detects Only)	Unit	Vapor Risk Screening Level ²	Raw Data	Raw Data	Raw Data	Raw Data
		Industrial Air	Collection Date			
			02/08/13	02/08/13	02/08/13	02/08/13
cis-1,2-Dichloroethene	µg/m ³	NS	<5.5	<1.4	<1.3	<1.6
trans-1,2-Dichloroethene	µg/m ³	26,000	<5.5	<1.4	<1.3	<1.6
1,1-Dichloroethene	µg/m ³	88,000	<5.5	<1.4	<1.3	<1.6
Tetrachloroethene	µg/m ³	18,000	<4.7	<1.2	<1.1	<1.3
1,1,1-Trichloroethane	µg/m ³	2,200,000	<7.5	<1.9	79.1	<2.1
Trichloroethene	µg/m ³	880	<3.7	<0.92	1.1	<1.1
Vinyl chloride	µg/m ³	28,000	<1.8	<0.44	<0.40	<0.50

Notes

1. µg/m³ = micrograms per cubic meter
2. Vapor Risk Screening Level based on Vapor Action Levels (VALs) described in WDNR publication PUB-RR-800 "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin" (dated December 2010), which in turn references EPA Region 3 Risk-Based Concentrations for industrial air (Regional Screening Level Master Table - November 2012 [http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm]), and WDNR November 2012 "Indoor Air Vapor Action Levels for Various VOCs Quick Look-Up Table". Vapor Risk Screening Level adjusted to 1-in-100,000 increase in lifetime cancer risk for carcinogens per WDNR publication PUB-RR-800; VAL is not adjusted for non-carcinogens (i.e., hazard index = 1). Furthermore, Vapor Risk Screening Level has been adjusted with an Attenuation Factor of 0.01 for the subslab to ambient air pathway as provided in WDNR publication PUB-RR-800 for a large commercial/industrial building.
4. Exceedances: [] = concentration exceeds Vapor Risk Screening Level

State of Wisconsin
Department of Natural Resources

- Route To:
 Solid Waste Haz. Waste
 Emergency Response Underground Tanks
 Wastewater Water Resources
 Other

SOIL BORING LOG INFORMATION
Form 4400-122

Facility/Project Name
Superior Health Linen
Boring Drilled By (firm name and name of crew chief)

On-Site Env.

DNR Project/Well No. *10167107* Common Well Name

Boring Location
Sect. Plane _____ N. _____ E. S.C.N. _____ Lat. _____

1/4 of 1/4 of Section T N. R. E/W Long. _____

County Milwaukee

License/Permit/Monitoring Number Boring Number

MW-2

Page 1 of 2

Date Drilling Started
10/16/71 07

M M D D Y Y

Date Drilling Completed
10/16/71 07

M M D D Y Y

Drilling Method
HSAF

Final Static Water Level
Feet MSL

Surface Elevation
Feet MSL

Borehole Diamc
in.

Local Grid Location (if applicable)

Sect. Plane _____ N. _____ E. S.C.N. _____ Lat. _____

1/4 of 1/4 of Section T N. R. E/W Long. _____

Foot N. _____ S. _____

Foot S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

Foot E. _____ W. _____

Foot N. _____ S. _____

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

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

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
<i>Superior Health Liners</i>		G14	
Boring Drilled By: Name of crew chief (first, last) and Firm		Date Drilling Started	Date Drilling Completed
First Name: <i>Joe</i>	Last Name: <i>Sikora</i>	<i>05/15/2008</i>	<i>05/15/2008</i>
Firm: <i>Sigma Env. Serv.</i>		Drilling Method	
WID Unique Well No.: <i>51000000000000000000000000000000</i>	DNR Well ID No.: <i>51000000000000000000000000000000</i>	Final Static Water Level	Surface Elevation
		Feet MSL	Borehole Diameter
Local Grid Origin (estimated) or Boring Location		Lat <input type="checkbox"/> N <input checked="" type="checkbox"/> S	Local Grid Location
State Plane <input type="checkbox"/> N, <input checked="" type="checkbox"/> S, <input type="checkbox"/> E, <input type="checkbox"/> W		Long <input type="checkbox"/> N <input checked="" type="checkbox"/> S	<input type="checkbox"/> E <input type="checkbox"/> W
1/4 of <input type="checkbox"/> 1/4 of Section <input type="checkbox"/> T, <input type="checkbox"/> N, <input type="checkbox"/> R	County <i>Milwaukee</i>	County Code	Civil Town/City or Village <i>Cudahy</i>

Sample Number	Soil Type	Depth in Feet (below ground surface)	Soil/Rock Description And Geologic Origin For Each Major Unit		Soil Properties								
			USCS	Grav/Log	Soil Test	Well Diagram	PID/FID	Compressive Strength	Moderate Content	Liquid Limit	Plastic Limit	Index	P-200
1		Brown/Black Silt w/ Some Sand											
1		+Center Damp											
2		Dark Brown Silt Moist											
3		Becomes Clayey @ 3' bgs											
4													
5		Brown Silty Clay Moist											
6													
7													
8													
9													
10													
11		Becomes Very Silty and Wet @ 11' bgs											
12													
13		End of Boring											
14													

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

Signature *Joe Sikora*

Firm *Sigma Env. Services*

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.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

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

Facility/Project Name		License/Permit/Monitoring Number	Boring Number
<i>Superior Health Liners</i>		G15	
Boring Drilled By: Name of crew chief (first, last) and Firm		Date Drilling Started	Date Drilling Completed
First Name: <i>Joe</i>	Last Name: <i>Sikora</i>	<i>05/15/2008</i>	<i>05/15/2008</i>
Firm: <i>Sigma Env. Serv.</i>		Drilling Method	
WID Unique Well No.: <i>51000000000000000000000000000000</i>	DNR Well ID No.: <i>51000000000000000000000000000000</i>	Final Static Water Level	Surface Elevation
		Feet MSL	Borehole Diameter
Local Grid Origin (estimated) or Boring Location		Lat <input type="checkbox"/> N <input checked="" type="checkbox"/> S	Local Grid Location
State Plane <input type="checkbox"/> N, <input checked="" type="checkbox"/> S, <input type="checkbox"/> E, <input type="checkbox"/> W		Long <input type="checkbox"/> N <input checked="" type="checkbox"/> S	<input type="checkbox"/> E <input type="checkbox"/> W
1/4 of <input type="checkbox"/> 1/4 of Section <input type="checkbox"/> T, <input type="checkbox"/> N, <input type="checkbox"/> R	County <i>Milwaukee</i>	County Code	Civil Town/City or Village <i>Cudahy</i>

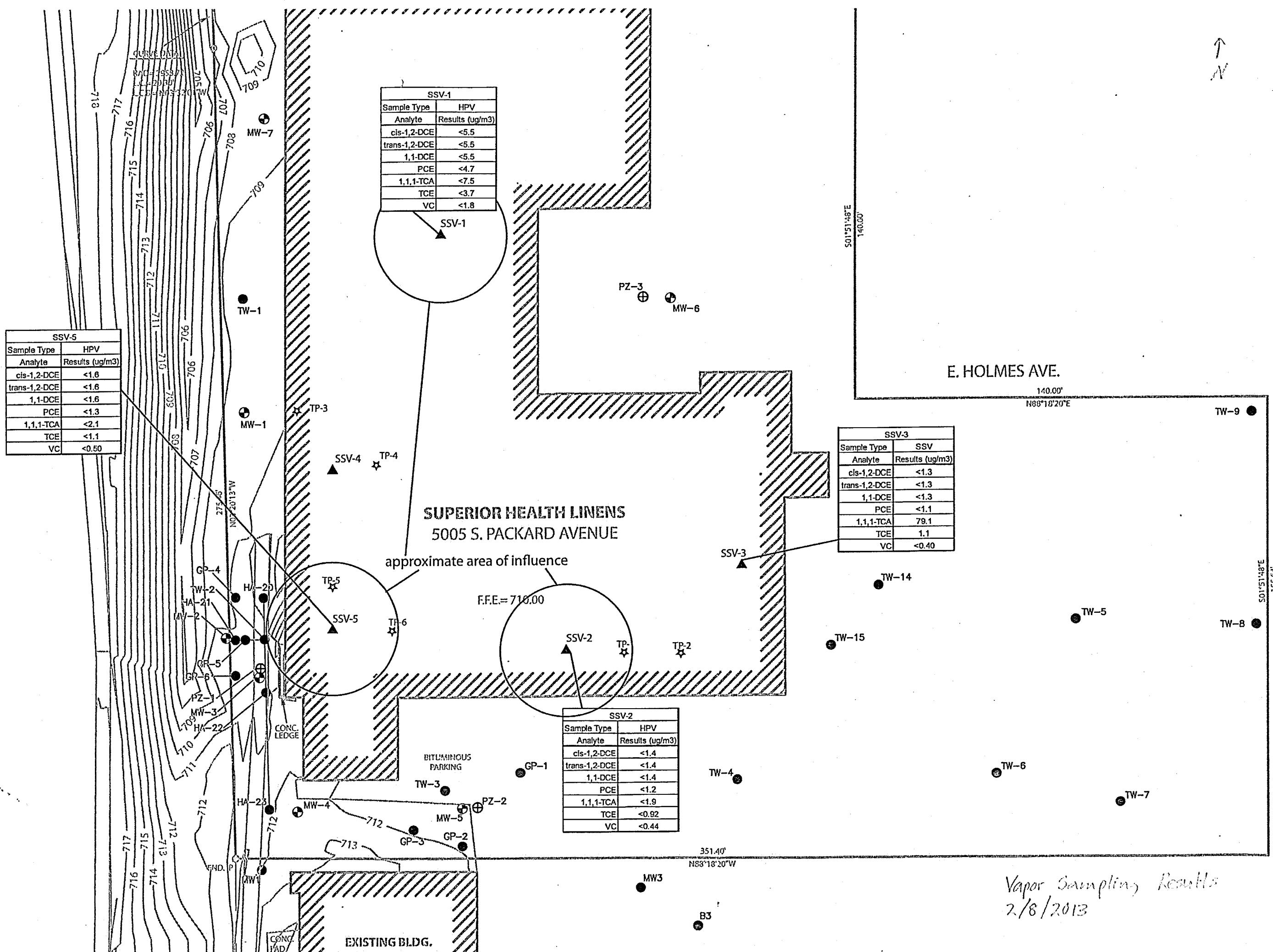
Sample Number	Soil Type	Depth in Feet (below ground surface)	Soil/Rock Description And Geologic Origin For Each Major Unit		Soil Properties								
			USCS	Grav/Log	Soil Test	Well Diagram	PID/FID	Compressive Strength	Moderate Content	Liquid Limit	Plastic Limit	Index	P-200
1		Dark Brown/Black Sandy Silt Damp											
2		Brown Silty Clay Moist											
3													
4		Becomes Very Silty and Moist-Wet @ 4' bgs											
5		Less Silt and Damp @ 5.5' bgs											
6		Bottom 1' Red + Grey 6'-8'											
7													
8		Very Silty + Moist-Damp 8'-9'											
9		Becomes Silty w/ some Gravel + moist @ 7' bgs											
10													
11													
12		End of Boring											
13													
14													

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

Signature *Joe Sikora*

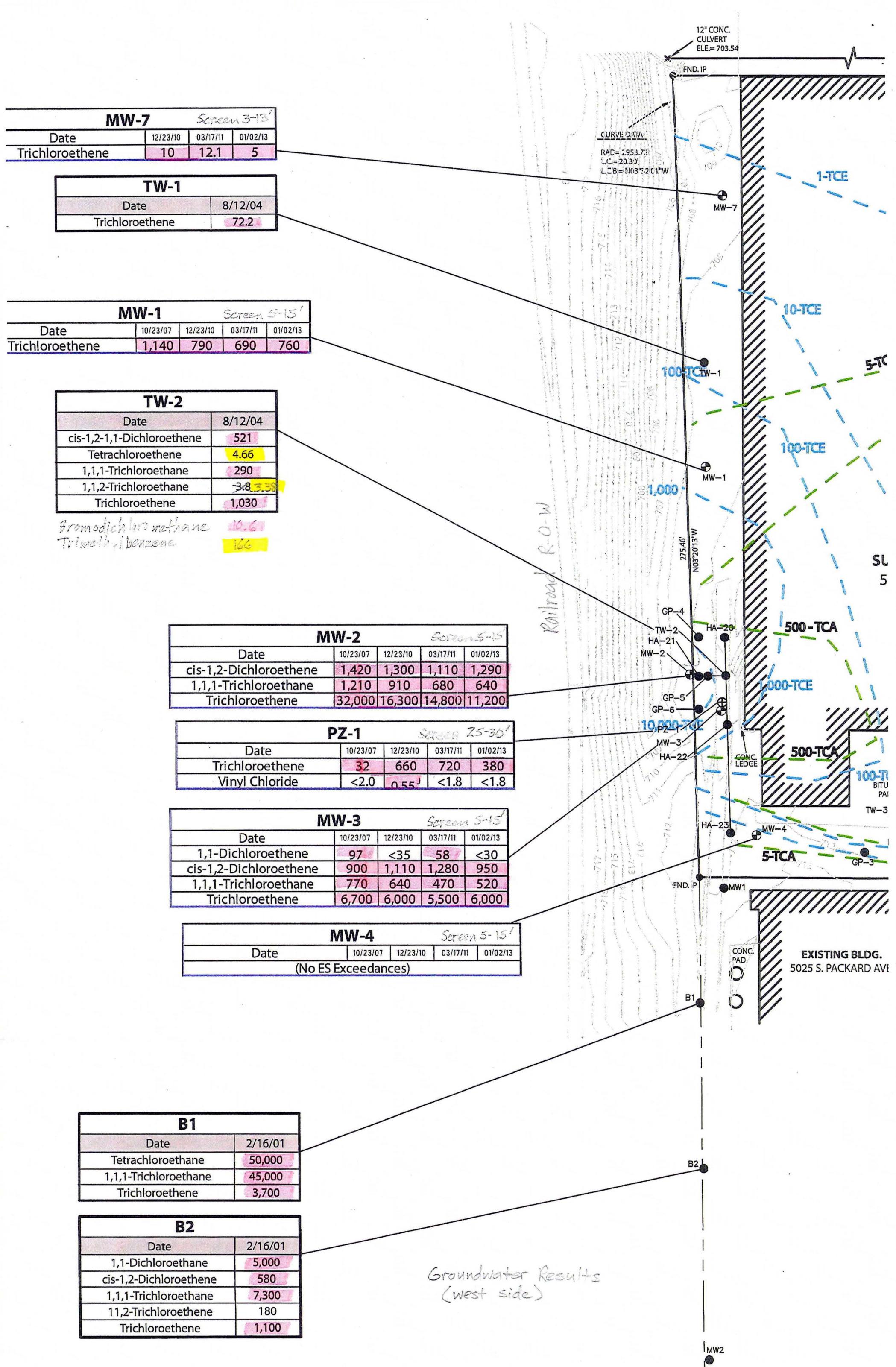
Firm *Sigma Env. Services*

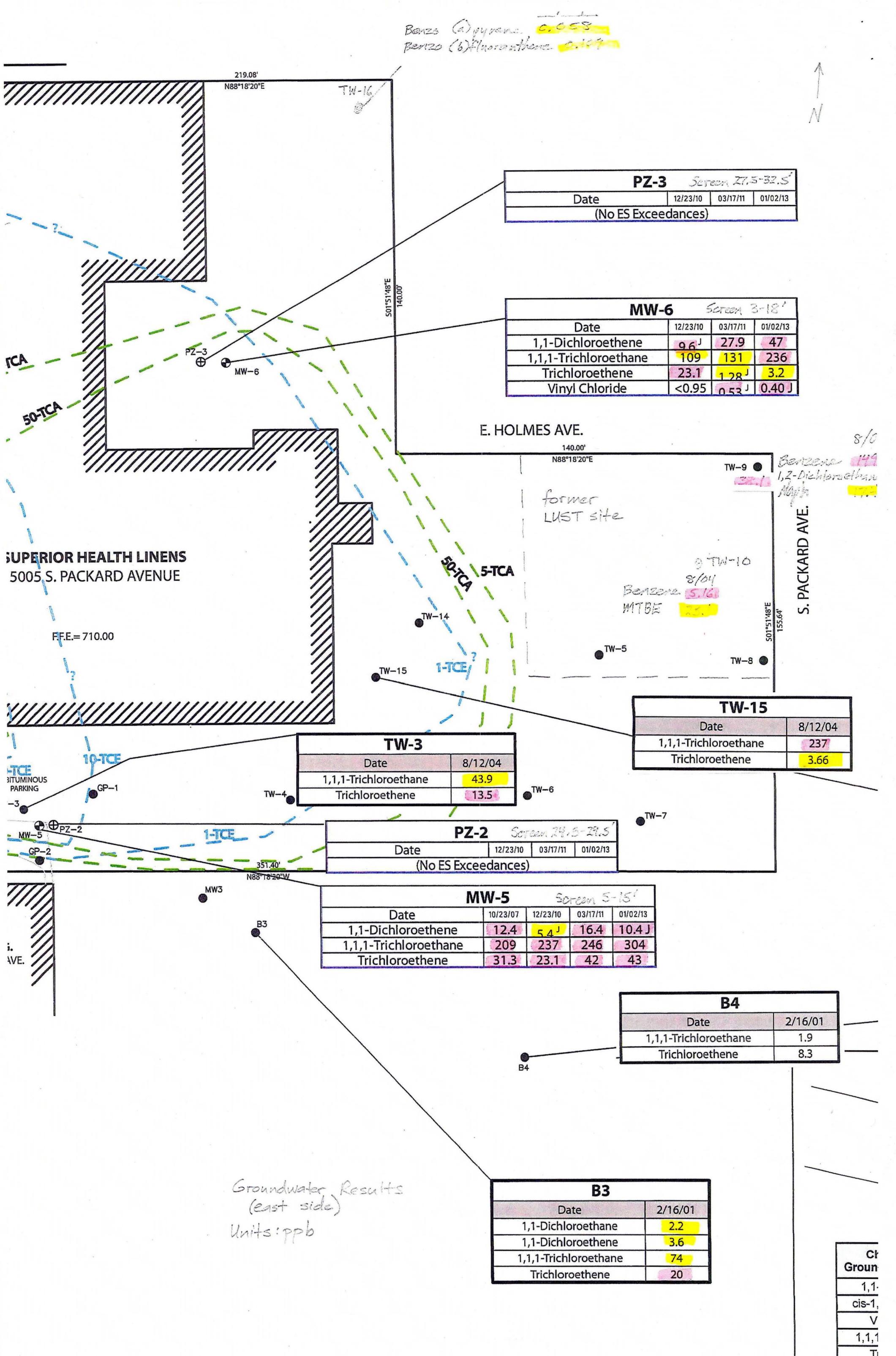
This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally 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.



Vapor Sampling Results 2/8/2013

Monitoring Well Identification:				MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		PZ-1		PZ-2		PZ-3						
Parameter	Unit	NR 140		ES	PAL	10/23/07	12/23/10	03/17/11	10/23/07	12/23/10	03/17/11	10/23/07	12/23/10	03/17/11	10/23/07	12/23/10	03/17/11	12/23/10	03/17/11	10/23/07	12/23/10	03/17/11	12/23/10	03/17/11	12/23/10	03/17/11		
Benzene	µg/L	5.0	0.5	<23.5	<0.38	<5	<235	<190	<100	<47	<19	<25	<0.47	<0.38	<0.5	<2.35	<1.9	<2.5	<1.9	<0.5	<4.7	<0.38	<5	<0.38	<0.5	<0.5		
Bromobenzene	µg/L	NS	NS	<18	<10	<7.4	<180	<500	<148	<36	<50	<37	<0.36	<10	<0.74	<1.8	<5	<3.7	<5	<0.74	<10	<3.6	<10	<7.4	<10	<0.74	<0.74	
Bromodichloromethane	µg/L	0.6	0.06	<25	<6.4	<6.8	<250	<320	<136	<50	<32	<34	<0.5	<6.4	<0.68	<2.5	<3.2	<3.4	<2.15	<3.2	<0.68	<5.0	<6.4	<6.8	<6.4	<6.4	<0.68	
Bromoform	µg/L	4.4	0.44	<19	<3.9	<4.3	<190	<195	<86	<38	<19.5	<21.5	<0.38	<3.9	<0.43	<1.9	<1.95	<1.95	<0.43	<3.9	<0.43	<3.8	<3.9	<4.3	<3.9	<0.43	<3.9	
tert-Butylbenzene	µg/L	NS	NS	<17	<5.5	<7.1	<170	<275	<142	<34	<27.5	<35.5	<0.34	<5.5	<0.71	<1.7	<2.75	<3.55	<2.75	<0.71	<5.5	<0.71	<3.4	<5.5	<7.1	<5.5	<0.71	
sec-Butylbenzene	µg/L	NS	NS	<18	<5.9	<10	<180	<295	<200	<36	<29.5	<50	<0.36	<5.9	<1	<1.8	<2.95	<5	<2.95	<1	<5.9	<1	<3.6	<5.9	<10	<5.9	<1	<5.9
n-Butylbenzene	µg/L	NS	NS	<26	<9.4	<9	<260	<470	<180	<52	<47	<45	<0.52	<9.4	<0.9	<2.6	<4.7	<4.5	<4.7	<0.9	<5.2	<9.4	<9	<9.4	<0.9	<9.4	<0.9	
Carbon Tetrachloride	µg/L	5.0	0.5	<23	<2.5	<4.7	<230	<125	<94	<46	<12.5	<23.5	<0.46	<2.5	<0.47	<2.3	<1.25	<2.35	<1.25	<0.47	<2.5	<0.47	<4.6	<2.5	<4.7	<2.5	<0.47	
Chlorobenzene	µg/L	100	10	<15.5	<9.1	<5.1	<155	<455	<102	<31	<45.5	<25.5	<0.31	<9.1	<0.51	<1.55	<4.55	<4.55	<0.51	<9.1	<0.51	<3.1	<9.1	<5.1	<9.1	<0.51	<9.1	
Chloroethane	µg/L	400	80	<23.5	<6.7	<14	<235	<335	<280	<47	<33.5	<70	<0.47	<6.7	<1.4	<2.35	<3.35	<7	<3.35	<1.4	<6.7	<1.4	<4.7	<6.7	<14	<6.7	<1.4	
Chloroform	µg/L	6.0	0.6	<24	<3.2	<4.9	<240	<160	<98	<48	<16	<24.5	<0.48	<3.2	<0.49	<2.4	<1.6	<2.45	<1.8	<0.49	<3.2	<0.49	<4.8	<3.2	<4.9	<3.2	<0.49	<4.9
Chloromethane	µg/L	3.0	0.3	<50	<12	<19	<500	<600	<380	<100	<60	<95	<1.0	<12	<1.9	<5.0	<6	<9.5	<6	<1.9	<12	<10	<12	<19	<12	<1.9	<12	
2-Chlorotoluene	µg/L	NS	NS	<24.5	<5.1	<7	<245	<255	<140	<49	<25.5	<35	<0.49	<5.1	<0.7	<2.45	<2.55	<3.5	<2.55	<0.7	<5.1	<0.7	<4.9	<5.1	<0.7	<5.1	<0.7	
4-Chlorotoluene	µg/L	NS	NS	<19	<7.4	<4.4	<190	<370	<88	<37	<22	<0.38	<7.4	<0.44	<1.9	<3.7	<2.2	<3.7	<0.44	<7.4	<0.44	<3.8	<7.4	<4.4	<7.4	<0.44		
1,2-Dibromo-3-Chloropropane	µg/L	0.2	0.02	<70 ²	<19	<28	<700 ²	<950	<560	<140 ²	<95	<140	<1.4 ²	<19	<2.8	<7.0 ²	<9.5	<14	<9.5	<2.8	<19	<2.8	<19	<2.8	<19	<2.8		
Dibromochloromethane	µg/L	60	6.0	<16	<11	<5.5	<160	<550	<110	<32	<55	<27.5	<0.32	<11	<0.55	<1.6	<5.5	<2.75	<5.5	<0.55	<11	<0.55	<3.2	<11	<5.5	<11	<0.55	
1,4-Dichlorobenzene	µg/L	75	15	<16.5	<9.5	<9.8	<165	<475	<196	<33	<47.5	<49	<0.33	<9.5	<0.98	<1.65	<4.75	<4.9	<4.75	<0.98	<9.5	<0.98	<3.3	<9.5	<9.8	<9.5	<0.98	
1,3-Dichlorobenzene	µg/L	1,250	125	<15	<7.9	<8.7	<150	<395	<174	<30	<39.5	<43.5	<0.3	<7.9	<0.87	<1.5	<3.95	<4.35	<3.95	<0.87	<7.9	<0.87	<3.0	<7.9	<8.7	<7.9	<0.87	
1,2-Dichlorobenzene	µg/L	600	60	<17.5	<8.4	<7.6	<175	<420	<152	<35	<42	<38	<0.35	<8.4	<0.76	<1.75	<4.2	<3.8	<4.2	<0.76	<8.4	<0.76	<3.5	<8.4	<7.6	<8.4	<0.76	
Dichlorodifluoromethane	µg/L	1,000	200	<23	<7	<18	<230	<350	<360	<46	<35	<90	<0.46	<7	<1.8	<2.3	<3.5	<9	<3.5	<1.8	<7	<1.8	<7	<1.8	<7	<1.8		
1,2-Dichloroethane	µg/L	5.0	0.5	<22.5	<3.8	<5	<225	<190	<100	<45	<19	<25	<0.45	<3.8	<0.5	<2.25	<1.9	<2.5	<1.9	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8			
1,1-Dichloroethane	µg/L	850	85	<28	<6.9	<9.8	<280	<345	<196	74 ^J	60 ^J	82 J	<0.56	<6.9	<0.98	<2.8	<3.45	<4.9	48 ^J	18.5	<6.9	<0.98	<5.6	4.9	<9.8	<6.9	1.59 J	<6.9
1,1-Dichloroethene	µg/L	7.0	0.7	<32	<7	<6	<320	<350	<120	97 ^J	58 ^J	<0.64	<7	<0.6	12.4	5.4 ^J	16.4	9.6 ^J	27.9	<7	<0.6	6.4	1.8 ^{J</}					





Soil Results
(west side)

HA-20 (2004)

Depth (ft.)	
cis-1,2-Dichloroethene	249
Tetrachloroethene	268
1,1,1-Trichloroethane	335
Trichloroethene	5,810

TW-1 (2004)

Depth (ft.)	
4-Chlorotoluene	83.1
1,2-Dichlorobenzene	48.1
1,3-Dichlorobenzene	65.3
1,2,3-Trichlorobenzene	100
1,2,4-Trichlorobenzene	96.2
1,1,1-Trichloroethane	456
Trichloroethene	254

GP-4 (2008)

Depth (ft.)	0-2	4-6
cis-1,2-Dichloroethene	<24	38 J
Tetrachloroethene	20.9 J	210
1,1,1-Trichloroethane	<27	410
Trichloroethene	4,200	26,600

TW-2 (2004)

Depth (ft.)	1-2
Tetrachloroethene	163
1,1,1-Trichloroethane	10,800
Trichloroethene	2,440

HA-21 (2004)

Depth (ft.)	3.5-4
Tetrachloroethene	176
1,1,1-Trichloroethane	81
Trichloroethene	6,940

MW-2 (2007)

Depth (ft.)	5-7.5
1,1-Dichloroethane	<25
1,1-Dichloroethene	<25
cis-1,2-Dichloroethene	254
Tetrachloroethene	132
1,1,1-Trichloroethane	730
Trichloroethene	28,000

GP-5 (2008)

Depth (ft.)	0-2	4-6
cis-1,2-Dichloroethene	<24	720
Tetrachloroethene	31.2 J	460
1,1,1-Trichloroethane	<27	1,380
Trichloroethene	1,290	30,300

GP-6 (2008)

Depth (ft.)	0-2	4-6
cis-1,2-Dichloroethene	<24	25.2 J
Tetrachloroethene	42 J	242
1,1,1-Trichloroethane	<27	330
Trichloroethene	1,080	22,200

MW-3 (2007)

Depth (ft.)	0-2
1,1-Dichloroethane	<25
1,1-Dichloroethene	<25
cis-1,2-Dichloroethene	53 J
1,1,1-Trichloroethane	288
Trichloroethene	1,180

HA-22 (2004)

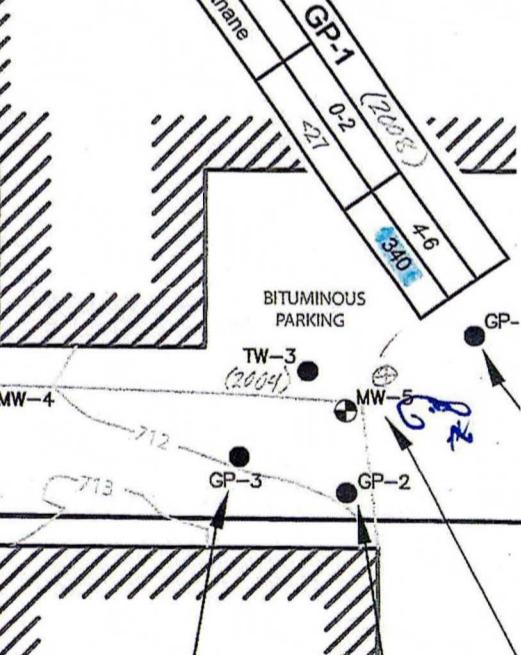
Depth (ft.)	3.5-4
cis-1,2-Dichloroethene	34.1
Tetrachloroethene	210
1,1,1-Trichloroethane	156
Trichloroethene	2,880

HA-23 (2004)

Depth (ft.)	2.5-3
1,1,1-Trichloroethane	491
Trichloroethene	179

MW-4 (2007)

Depth (ft.)	0-2	5-7.5
Tetrachloroethene	52 J	<25
1,1,1-Trichloroethane	210	67 J
Trichloroethene	107	54



Depth (ft.)	0-2	4-6
Toluene	51 J	<23
1,1,1-Trichloroethane	61 J	<27
Trichloroethene	135	27.4 J
1,2,4-Trimethylbenzene	41 J	<20
Xylenes (Total)	101 J	<33

Depth (ft.)	4-8
1,1-Dichloroethane	510
1,1-Dichloroethene	420
Tetrachloroethene	220
1,1,1-Trichloroethane	7,200
Trichloroethene	3,400

