



Infrastructure, buildings, environment, communications

FID# 241287200

ARCADIS G&M, Inc.  
126 North Jefferson Street  
Suite 400  
Milwaukee  
Wisconsin 53202  
Tel 414 276 7742  
Fax 414 276 7603

**Transmittal Letter**

To:  
Gina Keenan  
2300 N. Dr. Martin Luther King Jr., Drive  
Milwaukee, WI 53212-3196

Copies:  
Donald Gallo  
Jonathon Ward

ENVIRONMENT

From:  
Jim Bannantine

Date:  
2 June 2003

Subject:  
Former Norge Dry Cleaners  
6854 West Beloit Road  
West Allis, WI  
FID# 268085840, ERR  
Norman Getz - Owner

ARCADIS Project No.:  
WI001027.001

**We are sending you:**

Attached

Under Separate Cover Via \_\_\_\_\_ the Following Items:

- Shop Drawings
- Prints
- Other:

- Plans
- Samples

- Specifications
- Copy of Letter

- Change Order
- Reports

Copies	Date	Drawing No.	Rev.	Description	Action*
1				Permit application for WPDES	
1				Request for temporary exemption for injection of remedial materials to enhance in-situ groundwater remediation process	

**Action\***

- A Approved
- AN Approved As Noted
- AS As Requested
- Other:
- CR Correct and Resubmit
- F File
- FA For Approval
- Resubmit \_\_\_\_ Copies
- Return \_\_\_\_ Copies
- Review and Comment

**Mailing Method**

- U.S. Postal Service 1<sup>st</sup> Class
- Certified/Registered Mail
- Other:
- Courier/Hand Delivery
- United Postal Service (UPS)
- FedEx Priority Overnight
- FedEx Standard Overnight
- FedEx 2-Day Delivery
- FedEx Economy

**Comments:** Per my voice mails to you we are asking for your approval of the exemption to implement our remediation strategy for this facility. Please contact us at 414 275 7742 if you have any questions or require any additional information.



Infrastructure, buildings, environment, communications

Gina Keenan  
Wisconsin Department of Natural Resources  
2300 North Dr. Martin Luther King Drive  
P.O. Box 12436  
Milwaukee, Wisconsin 53212-0436

ARCADIS G&M, Inc.  
126 North Jefferson Street  
Suite 400  
Milwaukee  
Wisconsin 53202  
Tel 414 276 7742  
Fax 414 276 7603

Subject:

Request for Temporary Exemption for Injection of Remedial Material to Enhance In Situ Groundwater Remediation Process, Norman Getz Property, West Allis, Wisconsin.  
FID #268085840, ERR

ENVIRONMENT

Dear Ms. Keenan:

ARCADIS has been retained by Norman Getz to implement the planned remediation of contaminated soils and groundwater at the Norman Getz site in the city of West Allis, Wisconsin (Figure 1 is the Site location map and Figure 2 is the Site Layout map). A Remedial Action Plan, dated January 15, 2003 was previously submitted to and approved by the Wisconsin Department of Natural Resources (WDNR). Approval to proceed with an enhanced biodegradation pilot test was received from you in a letter dated February 26, 2003.

Date:

29 May 2003

Contact:

Jim Bannantine

Phone:

414 277 6230

Email:

[jbannantine@arcadis-us.com](mailto:jbannantine@arcadis-us.com)

One of the components of the remediation will include enhancing the anaerobic biodegradation of tetrachloroethene (PCE) in the groundwater at the site. A solution of water and food-grade molasses (a source of readily degradable organic carbon) will be injected into the aquifer to stimulate biological activity and enhance the reductive dechlorination of the PCE and its various degradation products. Because this process involves injecting remedial material into the waters of the state (i.e., groundwater), an application for a Wisconsin Pollutant Discharge Elimination System (WPDES) permit has been submitted to Mr. Corey Heckel of the WDNR. In addition to the WPDES permit, it is understood that the injection of remedial material also requires an exemption under Chapter NR 140.28(5) of the Wisconsin Administrative Code (WAC).

Our ref:

WI001027.0001

On behalf of Norman Getz, ARCADIS has prepared this request for a temporary exemption under Chapter NR 140.28(5) of the WAC. This letter includes a description of the groundwater remediation process and the information necessary to address the exemption prerequisites and criteria listed in Sections NR 140.28(5)(c) and (d). This exemption is being requested for both the pilot test and the full-scale remedial system.

## Description of Groundwater Remediation Process

As introduced above, the groundwater remedy for the site requires the addition of a readily degradable source of carbon to the zone of impacted groundwater. The addition of readily degradable organic carbon will stimulate biological activity and promote the reductive dechlorination of PCE and its various degradation products. A dilute solution of food-grade molasses will be used as the source of readily degradable carbon.

A 25:1 solution of water and food-grade molasses (i.e., 25 gallons of water for every 1 gallon of food-grade molasses) will be injected into the impacted aquifer. Three injection wells are proposed for the pilot study, and 11 wells are currently proposed for the full-scale remedy. The actual number of injection wells may be changed after the pilot study has been completed.

To create a treatment zone within the source and to reduce the excavation costs, we propose to construct an infiltration gallery within the treatment zone during contaminated soil remediation activities to distribute the carbon solution. The infiltration gallery will consist of a network of 2-inch diameter Schedule 40 polyvinyl chloride well screen, oriented horizontally within the excavation. The gallery will be connected to two vertical sumps installed within the excavation. These sumps will be used to introduce the carbon amendment solution to the gallery. Figure 3 illustrates the well layout for the pilot test. After the pilot test is completed and the data is reviewed a layout for the full-scale remediation plan will be designed.

Approximately 120 to 600 gallons of the dilute molasses solution per event will be injected into the groundwater treatment zone during the pilot test. In full-scale application, approximately 440 to 1,100 gallons will be injected monthly for each of the first 12 months of operation. Based on the lateral area of treatment, the vertical extent of impact, and soil porosity, an estimated 500,000 gallons of impacted groundwater will be targeted during the injection activities. A portable water source will be used to dilute the carbon solution.

To verify system performance and evaluate whether a sufficient quantity of carbon (i.e., the dilute molasses solution) is being injected, a groundwater monitoring program will be implemented. Figure 4 presents the details of the monitoring program. Figure 2 illustrates the monitoring well network. In summary, field parameters such as pH, total dissolved solids (TDS), oxidation-reduction potential (ORP), and dissolved oxygen will be measured in five wells on the Norman Getz property (MW-2, MW-3, MW-7, MW-9, and MW-10) on a monthly basis for the first 3 months, and in all of the site monitoring wells on a quarterly basis. Samples will be collected from all of the wells in the monitoring network on a quarterly basis and analyzed for volatile organic compounds (VOCs), organic gases, and total

organic carbon (TOC). All sampling will be conducted using low-flow sampling techniques. Based on the first year monitoring results, modifications to the sampling program (i.e., sampling frequency, number of wells sampled) may be recommended. Changes could be made depending on the pilot scale results.

## Exemption Request

Chapter NR 140.28(5) identifies prerequisites and criteria for granting a temporary exemption where infiltration or injection is utilized for a remedial action. The following sections provide additional information as requested in Paragraphs NR140.28(5)(c) and (d).

### NR140.28(5)(c) - Exemption Prerequisites

This section addresses the exemption prerequisites listed in Paragraphs 1 through 6 of NR140.28(5)(c):

1. Reasonable Period of Time: This prerequisite requires that the remedial action achieve the response objectives of NR140.24(2) (compliance with Preventive Action Limits) or NR140.26(2) (compliance with Enforcement Standards) within a reasonable period of time. The active groundwater treatment should achieve a significant reduction in dissolved constituent concentrations. The time frame for active groundwater remediation is anticipated to be approximately 2 to 4 years. The molasses injection system will operate for approximately 1 to 3 years, followed by 12 to 24 months of post-remediation groundwater monitoring. In comparison to other groundwater treatment methods, this time frame appears reasonable.
2. Minimization of Injected Remedial Material: As indicated above, dissolved organic carbon concentrations and ORPs will be periodically measured at the monitoring wells during the pilot test and during the full-scale application. The pilot test results will also be used to determine an optimum pumping rate. The pilot test and monitoring program results will be used to determine the minimum amount of molasses solution to be injected into the impacted aquifer.
3. Impacts to Public Health or Welfare: The remedial material will be prepared from extracted groundwater (that presently contains dissolved hydrocarbons) and food-grade molasses. The affected aquifer is not utilized as a potable water source and the treatment area is located beneath the facility and adjacent pavement. Thus, the proposed process does not represent a threat to public health or welfare. A site health and safety plan will also be prepared to address exposure during the pilot test and full-scale implementation. As part of the health and safety plan, public access to the work area will be limited during field activities.

4. Injection into Areas of Floating Non-Aqueous Liquid: Light non-aqueous phase liquid was not observed during the investigation. Therefore, this prerequisite is not applicable.
5. Expansion of Groundwater Contamination: The injection process will target the area of impacted groundwater. Injection will only occur in the area of known or suspected groundwater contamination. The proposed injection methodology will introduce small volumes of molasses solution into the impacted area of the aquifer (estimated volume of injection solution to be a maximum of 3 percent of the total volume of groundwater within the targeted treatment zone). During the 6-month pilot test, approximately 3,600 gallons of the dilute molasses solution will be injected. During subsequent injection events, the remedial system will inject approximately 2,200 gallons of the dilute molasses solution on a monthly basis. The injection volume and frequency will be adjusted based on the groundwater monitoring results.

Due to the low injection volumes relative to the volume of water being treated, it is not expected that the remedial system will create mounding of the groundwater table or otherwise have a significant effect on groundwater flow. Water levels will be measured at the monitoring wells on a quarterly basis to evaluate groundwater flow patterns at the site and whether the injections are affecting groundwater flow.

6. Other Permits and Licenses: A general permit, WPDES Permit No. 0046566-3, is available for discharges associated with the remediation of contaminated groundwater from remedial action operations. A WPDES permit application for the injection system was submitted to Mr. Corey Heckel of the WDNR on May 30, 2003.

#### **NR140.28(5)(d) - Remedial Action Design, Operation, and Monitoring Criteria**

This section addresses the design, operation and monitoring criteria listed in paragraphs 1 through 5 of NR140.28(5)(d):

1. Procedures for Monitoring Compliance: Procedures will be established to evaluate compliance with this exemption. As indicated earlier, a groundwater-monitoring program will be implemented to evaluate the progress of remediation and system parameters. VOC results will provide an indication of the rate of biodegradation, contraction or expansion of the dissolved plume, and constituent concentrations relative to Chapter NR 140 Enforcement Standards. Water level data, collected quarterly, will be used to evaluate the remedial system's effect, if any, on groundwater flow. Natural attenuation indicator data (including organic carbon and TDS) will be used to adjust the amount of molasses solution being injected.

Reporting of the monitoring results will be conducted in accordance with Chapter NR 724 of the WAC. A completed WDNR Form 4400-194 will be submitted to the WDNR on a semiannual basis. In addition, reporting will be conducted in accordance with the WPDES General Permit.

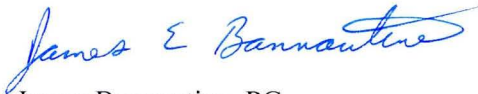
2. Pre-Treatment of Contaminated Groundwater for Reinfiltration: The remedial system will utilize a solution of extracted groundwater and molasses. No pretreatment will be performed since the groundwater will be injected into the aquifer for in-situ treatment.
3. Remedial Material Proposed for Injection: A 25:1 solution of extracted groundwater and food-grade molasses will be used as the remedial material at the site.
4. Volume and Rate of Injection: An initial injection rate of 2 to 7 gallons per minute has been assumed. Approximately 600 gallons of the dilute molasses solution will be injected during the pilot test for the system. Initial estimates indicate approximately 440 to 1,100 gallons will be injected monthly for the first 6 months of operation. Actual quantities of the dilute molasses solution to be injected will be determined following the pilot test study and will be adjusted based on TDS and TOC measurements taken from the wells on the Norman Getz property. Based on the results of the monitoring program, the volume of solution injected during subsequent injection events may be varied.
5. Locations of Injection. Figure 3 illustrates the locations of the pilot test injection and extraction wells. After the pilot test is completed and the data is reviewed a layout for the full-scale remediation plan will be designed and the number and locations of wells in the full-scale system may vary, based on the pilot test results. The WDNR will be notified of any changes in the proposed well layout.

**Closing**

We appreciate your continued assistance with this project. The injection phase of the pilot test is tentatively scheduled for late May 2003. To maintain the project schedule, we look forward to your review of this exemption request at your earliest convenience. We hope that this information meets your needs. Should you have any questions or require any additional information, please contact us at your convenience.

Sincerely,

ARCADIS G&M, Inc.



James Bannantine, PG  
Senior Hydrogeologist



James F. Drought, PH  
Principal Hydrogeologist

Copies:

Mr. Corey Heckel - Wisconsin Department of Natural Resources  
Mr. Donald P. Gallo - Reinhart Boerner Van Dueren, S.C.  
Mr. Jonathon Ward - City of Wet Allis

DRAFTER: LMB

APPROVED:

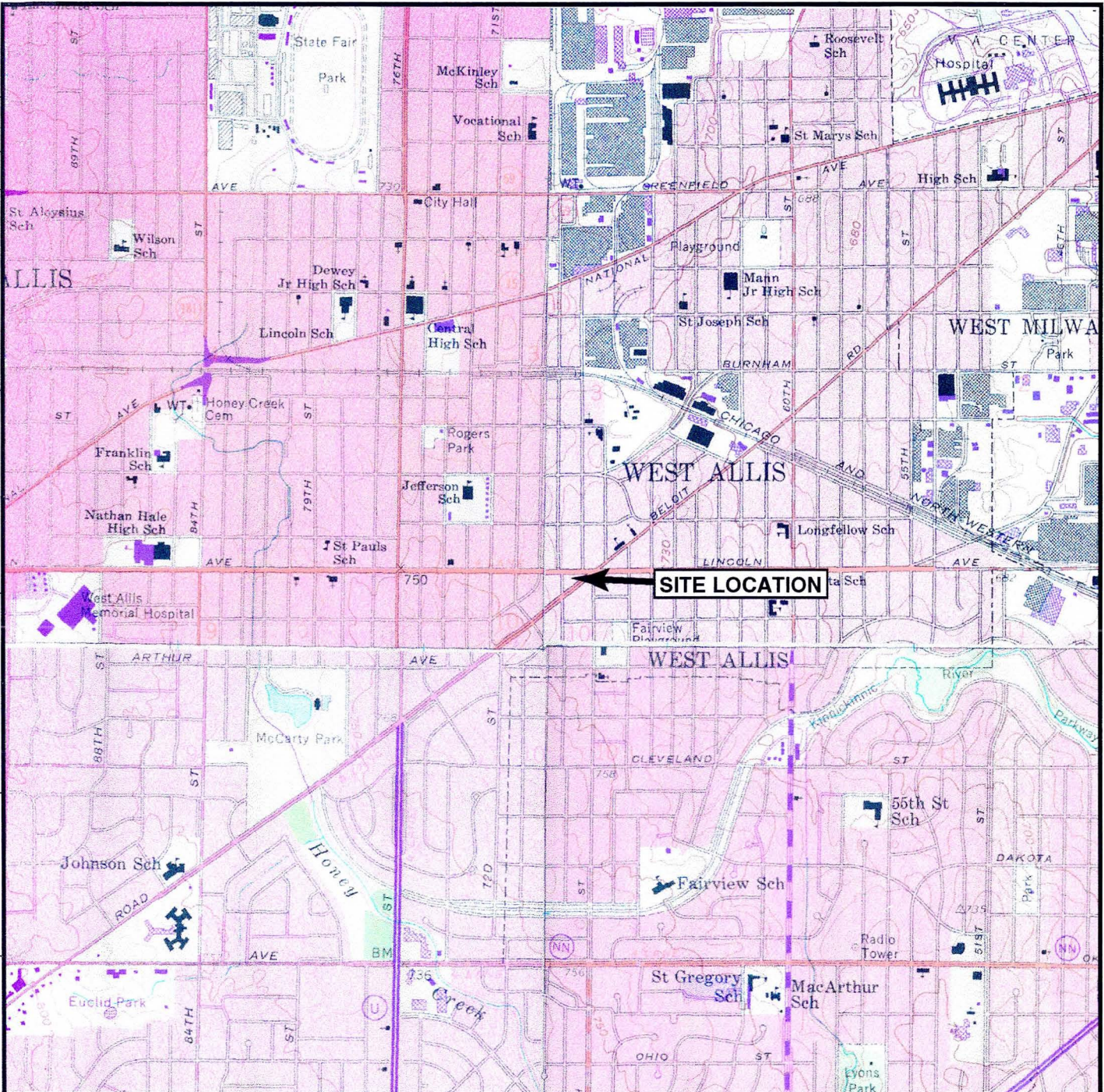
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DRAWING: SITE\_LOC.A1

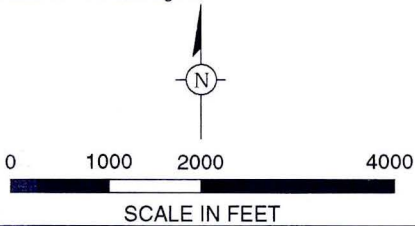
FILE NO.: GRAPHICS

PN: REINHARTW11027/GETZ

DWG DATE: 30APR03



SOURCE: Composite of USGS 7.5 Minute Topographic Maps, Wauwatosa 1994, Hales Corners 1976, Greendale 1976 and Milwaukee 1971, Wisconsin Quadrangles.



**SITE LOCATION MAP**

FIGURE



NORMAN GETZ PROPERTY  
6854 WEST BELOIT ROAD  
WEST ALLIS WI 53214

**1**



FILIPPO'S RESTAURANT  
6915 W. LINCOLN AVE.

KRUETER'S  
6900 W. LINCOLN AVE.

SOUTH 69TH STREET

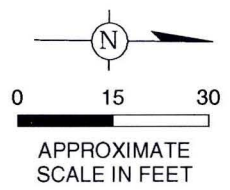
COLLECTORS EDGE  
6854 W. LINCOLN AVE.

SOUTH 69TH STREET (60' R.O.W.)

WEST LINCOLN AVENUE (VAR. R.O.W.)

WEST BELOIT ROAD (110' R.O.W.)

- LEGEND**
- ⊕ MONITORING WELL LOCATION
  - ⊗ GEOPROBE BORING LOCATION
  - ⊕ PIEZOMETER LOCATION
  - HAND AUGER BORING LOCATION
  - UNDERGROUND COMMUNICATION LINE
  - OVERHEAD COMMUNICATION LINE
  - UNDERGROUND COMBINED SANITARY/STORM SEWER LINE
  - UNDERGROUND ELECTRIC LINE
  - UNDERGROUND WATER LINE
  - UNDERGROUND GASE LINE

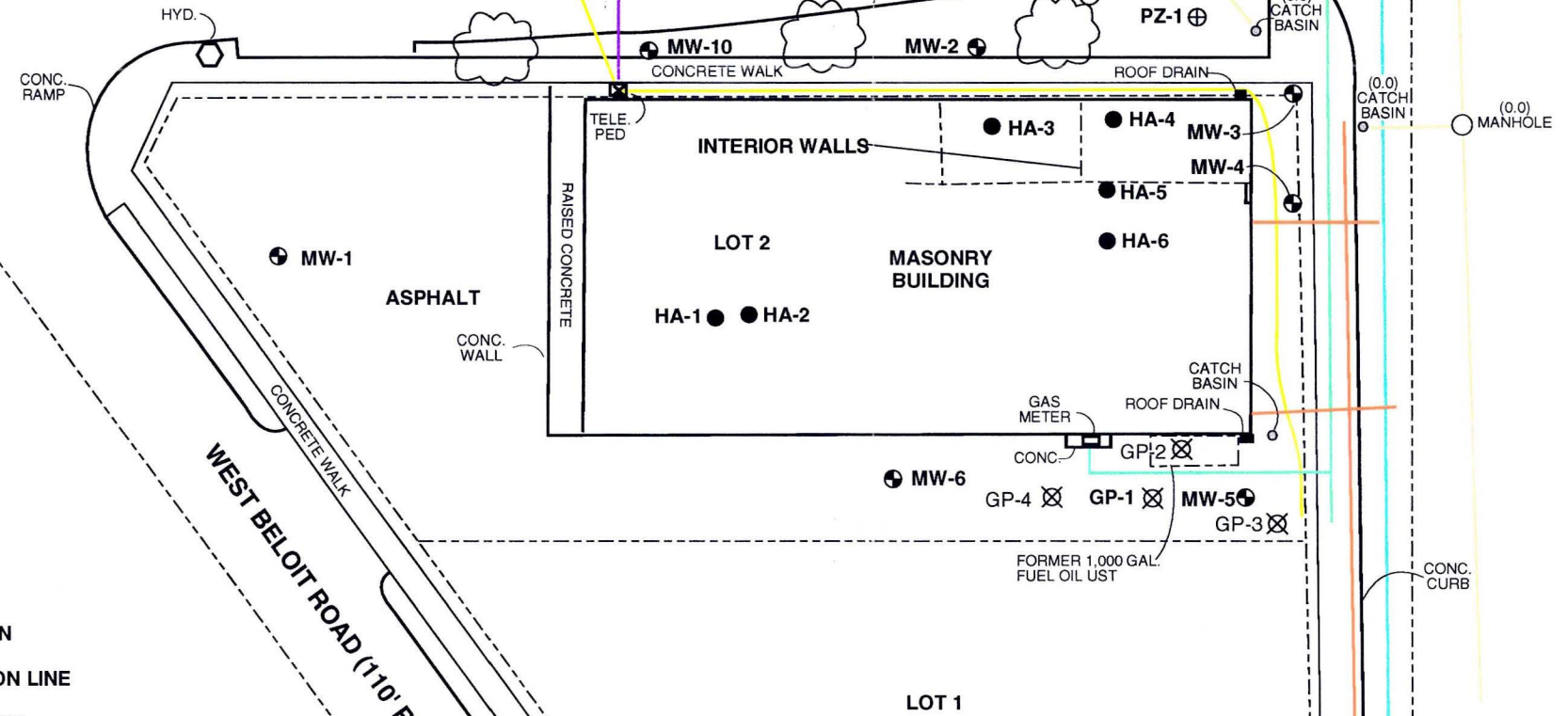


**SITE LAYOUT MAP**

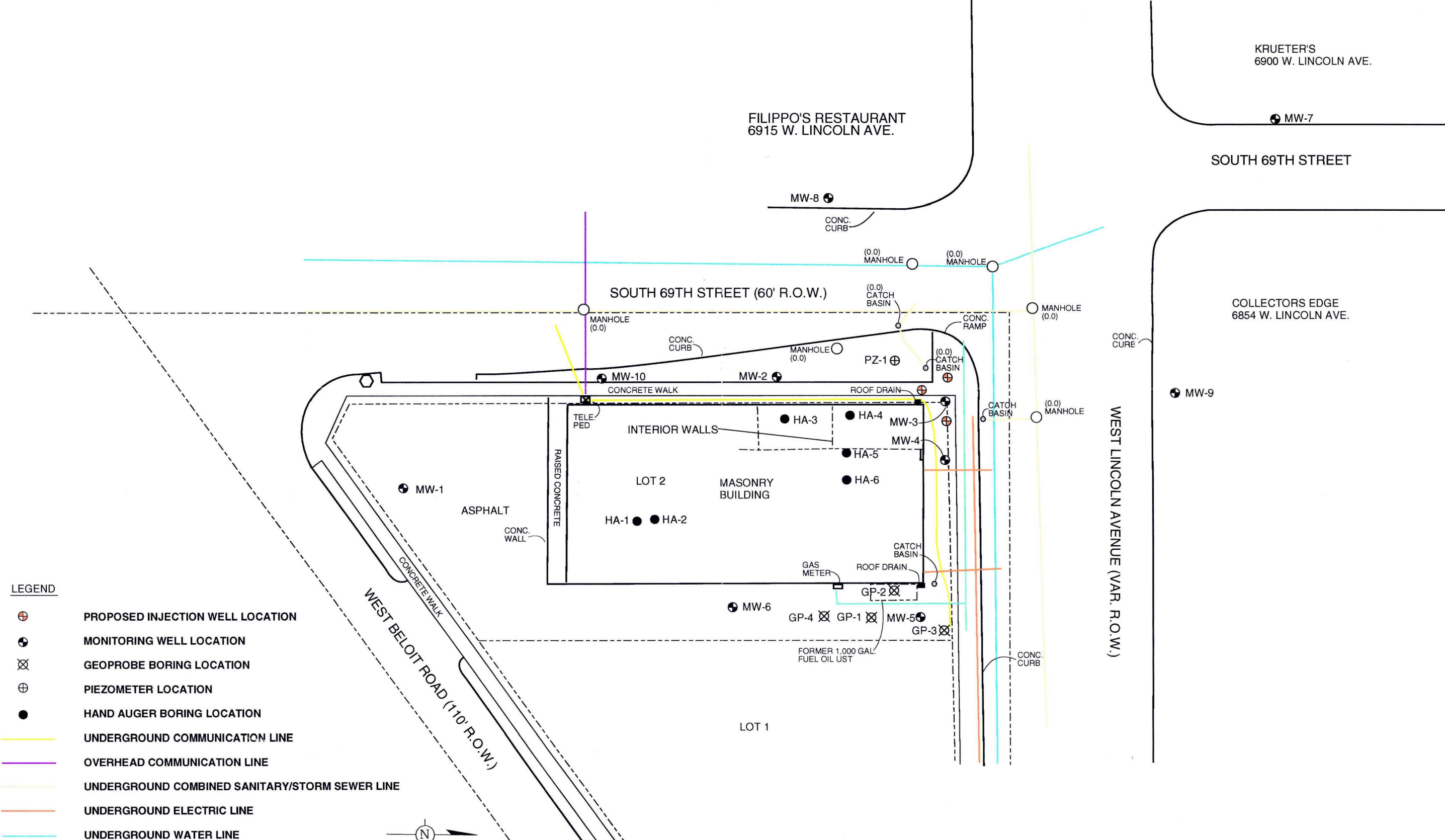
NORMAN GETZ PROPERTY  
6854 W. BELOIT ROAD  
WEST ALLIS, WISCONSIN

FIGURE

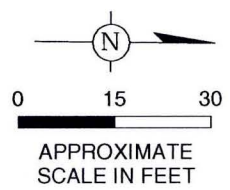
**2**



DWG DATE: 05MAY03 | PN:REINHARTTW11027GETZ | FILE NO.: GRAPHICS | DRAWING: WELL\_LOC.A1 | CHECKED: JG | APPROVED: | DRAFTER: LMB



- LEGEND**
- PROPOSED INJECTION WELL LOCATION
  - MONITORING WELL LOCATION
  - GEOPROBE BORING LOCATION
  - ⊕ PIEZOMETER LOCATION
  - HAND AUGER BORING LOCATION
  - UNDERGROUND COMMUNICATION LINE
  - OVERHEAD COMMUNICATION LINE
  - UNDERGROUND COMBINED SANITARY/STORM SEWER LINE
  - UNDERGROUND ELECTRIC LINE
  - UNDERGROUND WATER LINE
  - UNDERGROUND GASE LINE



	<p><b>PROPOSED WELL LOCATIONS FOR PILOT STUDY TEST</b></p> <p>NORMAN GETZ PROPERTY 6854 W. BELOIT ROAD WEST ALLIS, WISCONSIN</p>	<p>FIGURE <b>3</b></p>
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