



# Minnesota Pollution Control Agency

September 15, 2000

Mr. Tom Green  
Mills Properties, Incorporated  
512 Laurel Street  
Brainerd, MN 56401

RE: Petroleum Tank Release Site File Closure  
Site: Mills Fleet Farm, 300 Dellwood Drive, Brainerd  
Site ID#: LEAK00011422

Dear Mr. Green:

We are pleased to let you know that the Minnesota Pollution Control Agency (MPCA) staff has determined that your investigation and/or cleanup has adequately addressed the petroleum tank release at the site listed above. Based on the information provided, the MPCA staff has closed the release site file.

Closure of the file means that the MPCA staff does not require any additional investigation and/or cleanup work at this time or in the foreseeable future. Please be aware that file closure does not necessarily mean that all petroleum contamination has been removed from this site. However, the MPCA staff has concluded that any remaining contamination, if present, does not appear to pose a threat to public health or the environment.

The MPCA reserves the right to reopen this file and to require additional investigation and/or cleanup work if new information or changing regulatory requirements make additional work necessary. If you or other parties discover additional contamination (either petroleum or nonpetroleum) that was not previously reported to the MPCA, Minnesota law requires that the MPCA be immediately notified.

You should understand that this letter does not release any party from liability for the petroleum contamination under Minn. Stat. ch. 115C (Supp. 1997) or any other applicable state or federal law. In addition, this letter does not release any party from liability for nonpetroleum contamination, if present, under Minn. Stat. ch. 115B (1996), the Minnesota Superfund Law.

Because you performed the requested work, the state may reimburse you for a major portion of your costs. The Petroleum Tank Release Cleanup Act establishes a fund that may provide partial reimbursement for petroleum tank release cleanup costs. This fund is administered by the

FILE

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Mr. Tom Green

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Department of Commerce Petro Board. Specific eligibility rules are available from the Petro Board at (651) 297-1119 or 1-800-638-0418.

If future development of this property or the surrounding area is planned, it should be assumed that petroleum contamination may still be present. If petroleum contamination is encountered during future development work, the MPCA staff should be notified immediately.

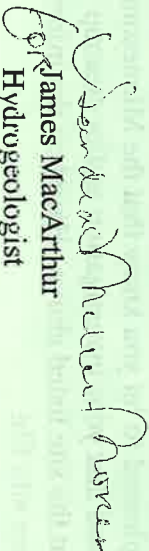
For specific information regarding petroleum contamination that may remain at this leak site, please call the Leaking Underground Storage Tank File Request Program at (651) 297-8499. The MPCA fact sheet *Request to Bill for Services Performed* must be completed prior to arranging a time for file review.

Thank you for your response to this petroleum tank release and for your cooperation with the MPCA to protect public health and the environment. If you have any questions regarding this letter, please call me at (218) 828-6118 or the site hydrogeologist at (218) 828-6116.

Sincerely,



Sandra L. Miller-Moren  
Project Manager  
Remediation Unit



North District – Brainerd Subdistrict Office  
North District – Brainerd Subdistrict Office

SLM:tgt

cc: Daniel Vogt, City Clerk, Brainerd  
Kevin Mahl, Fire Chief, Brainerd  
Iain Olness, Wadseth Smith Nolting, Baxter  
Dean Williams, Crow Wing County Zoning Administrator, Brainerd  
Minnesota Department of Commerce Petrofund Staff, St. Paul

STANDARD OF CARE  
REMEDIAL INVESTIGATION REPORT

Mills Convenience Store - Baxter  
MPCA LEAK #11422

The report was prepared following Minnesota Pollution Control Agency (MPCA) guidance materials for excavation of petroleum contaminated soils, laboratory analysis, field screening methods, groundwater monitoring protocols, and petroleum tank release reports. The conclusions are based on field observations, field screening results, and laboratory analytical reports as presented in the report. Recommendations follow MPCA guidance and represent the professional opinions of Widseth Smith Nolting (WSN) staff. These opinions were arrived at with currently accepted geologic, hydrogeologic, and engineering practices at this time and location. The report was prepared or reviewed by a registered WSN professional with a background in engineering, environmental, and/or the natural sciences. This report was prepared by:



Iain A. Olness  
Hydrogeologist

8 February 1999

Date

Reviewed By:



Brian A. Ross, P. G.  
Senior Geologist

2/8/99

Date

RECEIVED

FEB 09 1999

**WIDSETH  
SMITH  
NOLTING**

ENGINEERS  
ARCHITECTS  
LAND SURVEYORS  
ENVIRONMENTAL SERVICES

MPCA - BRAINERD  
BRAINERD, MN

8 February 1999

*Stacy Miller-Olness*

Mr. Jason Chan, Project Manager  
Minnesota Pollution Control Agency  
1601 Minnesota Drive  
Brainerd, MN 56401

**RE: Mills Fleet Farm Convenience Store  
300 Dellwood Drive  
Baxter, MN 56425  
Leak No. 11422**

Dear Mr. Chan:

Enclosed is the Remedial Investigation/Corrective Action Design (RI/CAD) Report for the above-referenced site. Per our phone conversation, an Excavation Report has not been included as no tanks were removed from the site and no soil was excavated from the site for treatment.

Although a resource aquifer has been impacted, there are no actual or potential impacts to any existing water supply wells. In addition, all properties surrounding the subject-property are connected to the City of Baxter municipal water supply system. Based on the results of the limited site investigation, the remaining soil and groundwater contamination is minimal, has not migrated to any adjacent properties, and does not pose a risk to human health or the environment. Widseth Smith Nolting, therefore, recommends that no further action be required at the site and the site file be closed.

Should you have any questions or concerns, please feel free to contact me at 829-5117.

Sincerely,

WIDSETH SMITH NOLTING

*Jain A. Olness*

Jain A. Olness  
Hydrogeologist

cc: Thomas W. Green, Mills Properties, Inc.

H:\JOB\115MILLS\0331\ENVIR\TRANSUC020399 LTR

**BRAINERD**

2000 Industrial Park Rd. S.  
P.O. Box 2720  
Baxter, MN 56425  
218-829-5117  
Fax: 218-829-2517

## Remedial Investigation Report Form

Fact Sheet #3.24

April 1996

This form must be completed for all sites in which a remedial investigation (RI) is conducted--this includes either a *Limited Site Investigation (LSI)* or a *full RI*. Completing this form will provide the MPCA with the minimum amount of information necessary for a *full RI*. Additional information should be included if deemed important for making a site cleanup decision. If the consultant has concluded that a *Limited Site Investigation* is applicable to this site, Section 6 and Section 7 may be deleted from this report.

Refer to MPCA fact sheet #3.19 "Leaking Underground Storage Tank Investigation and Cleanup Policy" for guidance for the overall objectives of an RI and other MPCA fact sheets regarding investigations.

When a tank has been excavated, refer to fact sheets #3.6 "Excavation of Petroleum Contaminated Soil" and #3.7 "Excavation Report Worksheet for Petroleum Release Sites" for reporting requirements.

If free product is discovered the initial reporting should be done in accordance with fact sheet #3.3 "Free Product: Evaluation and Recovery" and factsheet #3.4 "Free Product Recovery Report Worksheet."

**Leak Number:** LEAK0000\_11422      **Date:** 29 January 1999

**Responsible Party:** Mills Properties, Inc.      **R.P. phone #:** (218) 829-3521

**Facility Name:** Mills Convenience Store Baxter

**Facility Address:** 300 Dellwood Drive      **City:** Baxter

**County:** Crow Wing      **Zip Code:** 56425

**Location of site:** LAT: 94°10'23"      LONG: 46°21'18"      **Circle one:** UTM      State

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APPENDICES

<b>Appendix A:</b>	<b>Laboratory Analytical Reports and Chain-of-Custody Forms</b>
<b>Appendix B:</b>	<b>Field Methods and Procedures</b>
<b>Appendix C:</b>	<b>Soil Boring Logs</b>
<b>Appendix D:</b>	<b>Water Supply Well Logs</b>
<b>Appendix E:</b>	<b>Well Receptor Survey</b>



**Section 1: Emergency and High Priority Sites**

1. Is an existing drinking water well impacted?      YES      NO
2. Are there existing vapor impacts?      YES      NO
3. Is there an existing surface water impact as indicated by 1) a product sheen on the surface water or 2) a product sheen or volatile organic compounds in the part per million range in ground water in a well located close to the surface water.      YES      NO
4. Has the release occurred in the last 30 days?      YES      NO
5. Has free product been detected at the site?      YES      NO
6. Is sand or gravel aquifer impacted which is tapped by water wells within or potentially within 500 feet from the edge of the plume or does impacted soil overlie a karsted limestone or fractured bedrock?  
If yes, explain:      YES      NO

**If you answered YES to any of questions 1 through 6 above describe below the actions taken to date to reduce or eliminate the risk posed by the release.**

## Section 2: Site and Release Information

### 2.1 Describe the land use and pertinent geographic features within 1000 feet of the site.

The property within a 1,000-foot radius of the site is zoned as commercial C-2, with the exception of Pine Meadows Golf Course located east of the site which is zoned as residential R-1.

Table 1.

Provide the following for all tanks that have been at the site:

Tank #	UST or AST	Capacity	Contents	Age	Status*	Condition
1	UST	10K	Unleaded Gasoline	16	in use	Excellent
2	UST	8K	Anti-freeze	16	in use	Excellent
3	UST	10K	Regular Gasoline	16	in use	Excellent
4	UST	10K	Diesel	16	in use	Excellent
5	UST	15K	Unleaded Gasoline	16	in use	Excellent
6	UST	10K	Kerosene	16	in use	Excellent

\*Indicate: *removed (date), abandoned in place (date), or currently used*  
*Notes: All six USTs are single wall fiberglass tanks.*

### 2.2 Describe the status of the other components of the tank system(s), (i.e., piping and dispensers) for those tanks listed above.

The ancillary piping and dispensers were replaced on September 1997.

### 2.3 Identify and describe the source or suspected source(s) of the release.

The suspected sources of the release are believed to be loose fittings associated with the dispensers which were removed in September 1997.

2.4 What was the volume of the release? (if known): Unknown gallons

2.5 When did the release occur? (if known): Unknown



**Section 3: Excavated Soil Information**

3.1 Was soil excavated for off-site treatment?

YES NO

If YES then complete the fact sheet #3.7 "Excavation Report Worksheet for Petroleum Release Sites" and include it as an appendix.

Date excavated: \_\_\_\_\_

Volume removed:

\_\_\_\_\_ cubic yards

3.2 Indicate soil treatment type:

\_\_\_\_\_ land treatment

\_\_\_\_\_ thermal treatment

\_\_\_\_\_ composting/biopiling

\_\_\_\_\_ other ( \_\_\_\_\_ )

Name and location of treatment facility:

\_\_\_\_\_  
\_\_\_\_\_

### Section 4: Extent and Magnitude of Soil Contamination

4.1 Were soil borings conducted in or immediately adjacent to all likely source areas (e.g., UST basins, AST areas, piping, dispensers, remote fill pipes, known spill areas)? YES *NO*

4.2 To adequately define the vertical extent of contamination soil borings should be completed at least five feet below the water table or ten feet below the deepest measurable (field screening and visual observation) contamination, whichever is deeper. Were all soil borings completed to the required depth? YES *NO*

4.3 To adequately evaluate site stratigraphy at least one boring should be completed 20 feet below the water table, unless a confining layer is present. Was this done? YES *NO*

If you answered *NO* to any of the three previous questions, explain why the borings were not conducted in the required locations or to the required depths (see fact sheet #3.19 "Soil and Ground Water Investigations Performed During Remedial Investigations" regarding exceptions and MPCA approval for depth of drilling):

4.4 Indicate the drilling method:  hollow-stem auger  
 sonic drilling  
 push probes  
 other ( \_\_\_\_\_ )

*Note: contact MPCA staff hydro before use of flight augers)*

**Table 2.**

Complete the following table indicating jar headspace results (in ppm) for soil samples from soil borings.

Soil Boring ID	Boring Interval (ft.)	Headspace Results (ppm)	Soil Classification	Soil Type
HA-1	0.5 - 1	160	SP	Sand
	2.5 - 3	180	SP	Sand
	3.5 - 4	220	SP	Sand
	4 - 4.5	200	SP	Sand

Soil Boring ID	Boring Interval (ft.)	Headspace Results (ppm)	Soil Classification	Soil Type
HA-2	0.5 - 1	0.0	SP	Sand
	2.5 - 3	0.0	SP	Sand
	3 - 3.5	0.0	SP	Sand
	3.5 - 4.0	0.0	SP	Sand
HA-3	0.5 - 1	0.8	SP	Sand
	1.5 - 2	35	SP	Sand
	2.5 - 3	52	SP	Sand
	3.5 - 4	80	SP	Sand
HA-4	0.5 - 1	150	SP	Sand
	2 - 2.5	350	SP	Sand
	3 - 3.5	250 - 300	SP	Sand
	4 - 4.5	400	SP	Sand
HA-5	0.5 - 1	0.0	SP	Sand
	1.5 - 2	0.1	SP	Sand
	2 - 2.5	0.0	SP	Sand
	3.5 - 4	0.0	SP	Sand
HA-6	0.5 - 1	60	SP	Sand
	1.5 - 2	130	SP	Sand
	3.5 - 4	150	SP	Sand
	4.5 - 5	130	SP	Sand
	5.5 - 6	130	SP	Sand
	6.5 - 7	150	SP	Sand
SB-1	7.5 - 8	60	SP	Sand
	8.5 - 9	170	SP	Sand
	9 - 9.5	50	SP	Sand
	9.5 - 10	100	SP	Sand
SB-1	10.5 - 11	30	SP	Sand
	5 - 7	4.0	SP	Sand
	10 - 12	5.6	SP	Sand

Soil Boring ID	Boring Interval (ft.)	Headspace Results (ppm)	Soil Classification	Soil Type
SB-1 (cont.)	15 - 17	5.4	SP	Sand
	20 - 22	4.4	SP	Sand
	25 - 27	4.6	SP	Sand
	30 - 32	4.8	SP	Sand
	35 - 37	3.8	SP	Sand
SB-2	5 - 7	23.1	SP	Sand
	10 - 12	12.1	SP	Sand
SB-3	15-17	8.6	SP	Sand
	5 - 7	11.3	SP	Sand
	10 - 12	6.2	SP	Sand
SB-4	15 - 17	6.8	SP	Sand
	5 - 7	4.8	SP	Sand
SB-5	10 - 12	4.0	SP	Sand
	5 - 7	7.3	SP	Sand
	10 - 12	6.8	SP	Sand
	15 - 17	4.2	SP	Sand

*Notes: (type of PID/FID) A PID was used to screen the soil samples for petroleum contamination.*

Soils were visually and manually classified using ASTM D2488-93 ppm = parts per million

**Table 3.**

**Indicate the laboratory analytical results for soil samples in mg/kg.**

Well/Boring, Depth(ft)	Date Analyzed	Benzene	Toluene	Ethylbenzene	Xylene	GRO	DRO
HA-1 (4'-4.5')	09/11/97	<0.05	1.5	12	50	3,000	--
HA-4 (4'-4.5')	09/11/97	<0.05	0.07	3.7	41	1,600	--
HA-6 (10'-11')	09/16/97	--	--	--	--	--	130

Well/Boring, Depth(ft)	Date Analyzed	Benzene	Toluene	Ethylbenzene	Xylene	GRO	DRO
SB-1 (10'-12')	06/24/98	<0.025	<0.025	<0.025	<0.06	<1.2	<3.0
SB-2 (10'-12')	06/24/98	<0.025	<0.025	<0.025	<0.06	<1.2	<3.3
SB-2 (15'-17')	06/24/98	<0.025	<0.025	<0.025	<0.06	<1.2	<3.6
SB-3 (10'-12')	06/24/98	<0.025	<0.025	<0.025	<0.06	<1.2	<5.4

Notes: - - = Sample not analyzed for this analyte.

Table 4.

**Indicate other notable contaminants (either petroleum or non-petroleum derived) detected in soil samples. Indicate contaminant and list in reported units mg/kg.**

Well/Boring, Depth (ft)	Date Analyzed						

Notes:

**4.5 If any non-petroleum compounds were detected list them below and identify possible sources of these compounds.**

The samples were analyzed for gasoline range organics (GRO), diesel range organics (DRO), and/or benzene, toluene, ethylbenzene, and total xylenes (BTEX constituents).

**4.6 Describe the vertical and horizontal extent and magnitude of soil contamination.**

Based on field observations and analyses and laboratory analyses, it appears that there are low to moderate levels of petroleum impacted soil beneath four of the six former fuel dispensers located at the site (reference Figure 2b). Field analyses indicate petroleum impacted soil extends to a depth of 4 to 4.5 feet beneath ground surface (BGS) in hand auger borings HA-1, HA-3, HA-4, and HA-6 with organic vapor concentrations ranging from 35 parts per million (ppm) in hand auger boring HA-3 from 1.5 to 2 feet BGS to 400 ppm in hand auger boring HA-4 from 4 to 4.5 feet BGS. Hand auger boring HA-6 was advanced to a depth of 11 feet BGS. Samples, collected at various intervals, indicated organic vapor concentrations ranged from 30 ppm from 10.5 to 11 feet BGS to 170 ppm from 8.5 to 9 feet BGS. Organic vapors were not detected in hand auger borings HA-2 and HA-5.

Soil samples were collected from hand auger borings HA-1, HA-4, and HA-6 and submitted to an independent laboratory for quantification of GRO, DRO, and/or BTEX constituents. Analytical results for the soil sample collected from hand auger boring HA-1 at 4 to 4.5 feet BGS indicated BTEX constituent concentrations of 63.5 ppm and GRO concentrations of 3,000 ppm. Analytical results for the soil sample collected from hand auger boring HA-4 at 4 to 4.5 feet BGS indicated BTEX constituent concentrations of 44.77 ppm and GRO concentrations of 1,600 ppm. Analytical results for the soil sample collected from hand auger boring HA-6 at 10 to 11 feet BGS indicated DRO concentrations of 130 ppm. Due to the presence of petroleum impacted soil, five additional soil borings were advanced around the

site to delineate the vertical and horizontal extents of contamination (reference Figure 2a). Organic vapors ranging from 3.8 ppm in soil boring SB-1 at 35 to 37 BGS to 23.1 ppm in soil boring SB-2 at 5 to 7 feet BGS were detected during the advancement of the soil borings. Four soil samples were collected from the soil borings and submitted to an independent laboratory for quantification of GRO, DRO, and BTEX constituents. Analytical results were non-detects (ND) for all analytes at or above each analytes method detection limit (MDL). Based on field observations and analytical results, it appears that the soil contamination is limited to areas surrounding four of the six former fuel dispensers to depths of at least 11 feet BGS.

## Section 5: Aquifer Characteristics/Ground Water Contamination Assessment

5.1 Indicate the hydraulic conductivity and the method used to determine it. Attach all supporting information for the determination in the Methodologies appendix:

- 1.16 x 10<sup>-5</sup> to 1.16 cm/sec  estimate from reference  
 slug test  
 permeability test  
 Hazen approximation from grain-size distribution

5.2 Indicate the thickness of the aquifer. If the investigation does not provide enough information to determine the aquifer thickness, assume the aquifer is greater than 20 feet thick:

- less than 10 feet  
 between 10 and 20 feet  
 20 feet or greater

5.3 Describe in detail the geology underlying the site including confining layers, bedrock formations and the lateral extent of these formations:

The geology underlying the site consists of coarse alluvium extending to a depth of at least 20 feet BGS and appears to be laterally extensive based on information from other drilling locations in the area. The coarse alluvium consists of yellow-brown to grey, soft, fine to medium-grained sand. The coarse alluvium is underlain by brown to gray clay unit that has an average thickness of approximately 28 feet with a minimum thickness of 14 feet. This unit was not encountered in the soil boring completed to a depth of 37 below ground surface (BGS) at the leak site; however, it was encountered in all the wells installed within a 1,300-foot radius of the leak site. This unit was not encountered in the wells installed outside the 1,300-foot radius from the leak site. Bedrock is encountered at a depth of approximately 100 feet BGS at the site, based on information from other drilling locations in the area.

**The impacted aquifer or the aquifer that is likely to be impacted at the site is considered a resource aquifer if one of the following situations exist:**

- The aquifer is a current water supply source.
- The water bearing unit has a hydraulic conductivity greater than  $1 \times 10^{-2}$  cm/sec and a minimum thickness of 10 feet.
- The water bearing unit has a hydraulic conductivity between  $1 \times 10^{-4}$  cm/sec and  $1 \times 10^{-2}$  cm/sec and a minimum thickness of 20 feet.
- The water bearing unit has a hydraulic conductivity less than  $1 \times 10^{-4}$  cm/sec and no other viable source of water supply is available. (*Bedrock may be considered a resource aquifer if it is the only water supply available.*)



**5.4 Based on the aquifer characteristics and water supply availability, is the YES NO aquifer at the site a resource aquifer?**

Based on aquifer characteristics, the aquifer at the site would be considered a resource aquifer.

**5.5 If other water supplies are available, explain.**

The site and surrounding properties are connected to the Baxter municipal water supply system.

**5.6 Are there any other reasons the impacted aquifer should not be considered a resource aquifer?**

There are no reasons why the impacted unit should not be considered a resource aquifer, other than it is not utilized for potable water supplies.

**Table 5.**

**Indicate the water level measured in all of the soil borings.**

	Soil Boring										
	HA-1	HA-2	HA-3	HA-4	HA-5	HA-6	SB-1	SB-2	SB-3	SB-4	SB-5
Water level depth, ft	--	--	--	--	--	10.5	10.5	11	12	11.5	11

Notes: -- = No measurement taken as soil boring did not intercept the watertable.

**5.7 Is contaminated soil in contact with ground water? YES NO**

If YES or if ground water contamination appears likely then complete tables 6 and 7 below.

**Table 6.**

**Indicate the laboratory analytical results for water samples collected from the borings, temporary wells or push probes.**

Well/Boring Number	Date Analyzed	Benzene		Toluene		Ethylbenzene		Xylene		DRO	
		<0.4	<0.4	<0.4	<0.4	<1.3	<1.3	<20	<20	<80	<110
SB-1	06/26/98	<0.4	<0.4	<0.4	<0.4	<1.3	<1.3	<20	<20	<80	<110
SB-2	06/26/98	<0.4	<0.4	<0.4	<0.4	<1.3	<1.3	<20	<20	<80	<110

Well/Boring Number	Date Analyzed	Benzene	Toluene	Ethylbenzene	Xylene	GRO	DRO
SB-3	06/26/98	<0.4	<0.4	<0.4	<1.3	<20	<100
SB-4	06/26/98	<0.4	<0.4	<0.4	<1.3	<20	<160
SB-5	06/26/98	<0.4	<0.4	<0.4	<1.3	<20	<150
Site Blank	06/26/98	<0.4	<0.4	<0.4	<1.3	<20	<60

Notes: All results are in micrograms/liter (ug/L) which is equivalent to parts per billion (ppb).

Table 7.

Indicate other notable contaminants (either petroleum or non-petroleum derived) detected in water samples collected from the borings, temporary wells or push probes. Indicate contaminant and report in units of ug/l (ppb).

Well/Boring Number	Date Analyzed						

Notes:

5.8 If any non-petroleum compounds were detected list them below and indicate whether they exceed the HRLs. Also, identify possible sources of these compounds.

The water samples were analyzed for GRO, DRO, and BTEX constituents.

5.9 If contaminated soil is not in contact with ground water, what is the distance separating the deepest contamination from the surface of the water table? Was this distance measured during site activities, referenced from geologic information, or estimated based on professional opinion during a site visit? \_\_\_\_\_ feet

Based on field observations and analytical results, groundwater has been impacted by the release.

5.10 Describe observations of any evidence of a fluctuating water table and a seasonal high water table (e.g., mottling). Also, from other sources of information describe the range of natural water table fluctuations in the area.

The impacted aquifer is an unconfined aquifer and as such the water table fluctuates with seasonal precipitation. However, it is believed the average water table is present at approximately 10 to 11 feet below ground surface.

**YES** **NO**

**5.11 In your judgment, is there a sufficient distance separating the petroleum contaminated soil (or an impacted non-resource aquifer) from the underlying resource aquifer to prevent petroleum contamination of the resource aquifer? Please explain in detail. In your explanation consider the data and information of this section as well as the nature of the petroleum release (i.e., volume, when it occurred, petroleum product).**

The impacted unit is a resource aquifer situated in a coarse alluvium extending to a depth of at least 20 feet below ground surface (BGS). Underlying this unit in some areas is a clay layer which has an average thickness of 28 feet with a minimum thickness of 14 feet. This clay layer was not encountered at leak site; however, all the well logs for the wells completed within a 1,300-foot radius of the site indicate the clay layer is present (reference Appendix D and Figure 3). The well logs for the wells completed outside the 1,300-foot radius and within the half-mile radius of the leak site did not indicate that the clay layer was present. Based on this information, it is assumed that the impacted unit is connected with the underlying regional resource aquifer.

Although the regional resource aquifer has been impacted, the contamination is minimal and the wells in the area are not believed to be at any risk of becoming impacted due to the release of petroleum products at the subject-property.

**Additional Ground Water Investigation**

Complete Section 6 and Section 7 only if: 1) a resource aquifer has been impacted at or above Minnesota Department of Health Health Risk Limits (HRLs), 2) a resource aquifer has been impacted below the HRLs, but the levels are likely to reach the HRLs, or 3) there is an insufficient distance separating the petroleum contaminated soil (or an impacted non-resource aquifer) from the underlying resource aquifer. Regardless of whether you are submitting a Limited Site Investigation or a full RI, all sections following Section 7 must be completed.

**Section 6. Extent and Magnitude of Groundwater Contamination**

**Table 8.**

**Monitoring well construction.**

Well Number	Unique Well Number	Date Installed	Relative Surface Elevation	Riser Height Above Grade	Bottom of Well (Elevation)	Screen Interval (Elev. - Elev.)

Notes: (location and elevation of benchmark)

**Table 9.**

Water table summary.

Well Number	Date	Depth of Water from Top of Casing	Product Thickness	Depth of Water Below Grade	Relative Groundwater Elevation
MW-1					
MW-2					
MW-3					
MW-4					

Notes: (GW above/below screen, etc.)

**6.1** Were any deep monitoring wells completed at the site?

If YES, which are deep wells?

YES NO

Before a deep well is installed contact the MPCA project hydrologist for guidance on its necessity and placement. A deep monitoring well may be necessary if 1)contamination exist more than 10 feet below the water table or 2) the impacted aquifer is a resource aquifer or is hydraulically connected to a resource aquifer presently utilized by a water supply well located within 500 feet of the site.

Provide estimates of the following additional aquifer parameters:

Horizontal Gradient (dh/dl): \_\_\_\_\_

Vertical Gradient (dv/dl): \_\_\_\_\_

Porosity: \_\_\_\_\_

Flow direction: \_\_\_\_\_

Hydraulic Conductivity (K) \_\_\_\_\_m/s

Pore velocity: \_\_\_\_\_meters/year

**Table 10.**

All ground water monitoring data should be collected from a minimum of *two quarterly sampling events*.

**Indicate the laboratory analytical results for water samples.**

Well #	Date	Benzene	Toluene	Ethylbenzene	Xylene	MTBE	GRO	DRO
MW-1								
MW-2								
MW-3								
MW-4								

*Notes: (e.g., free product, dry well, units etc.)*

**Table 11.**

**Indicate other notable contaminants (either petroleum or non-petroleum derived) detected in water samples.**

Well #	Date Analyzed						

*Notes: units*

**6.2 If any non-petroleum compounds were detected list them below and indicate whether they exceed the HRLs. Also, identify possible sources of these compounds.**

**6.3 Is there a clean or nearly clean (below HRLs) downgradient monitoring well located along the longitudinal axis of the contaminant plume? (approximately 20 degrees plus or minus the axis)**      YES    NO

**6.4 Is there a worst case well completed through the source area of the release?**      YES    NO

If you have answered *NO* to any of the above three questions, please explain why a well was not completed in the required location.

**6.5 Provide an estimate of the longitudinal length of the dissolved contaminant plume: \_\_\_\_\_ feet**

**6.6 Describe the extent and magnitude of the ground water contamination:**



**Section 7: Evaluation of natural attenuation**

**Table 12.**

Complete the bioactivity data in the table below. Data should be from two quarterly rounds of sampling. Refer to the fact sheet #3.21 “Assessment of Natural Biodegradation at Petroleum Tank Release Sites” for acceptable methodologies and indicate the chosen method in the Methodologies appendix.

Monitoring Well	Temp. °C	pH	Dissolved oxygen (mg/l)	Nitrate (mg/l)	(Fe II) (mg/l)	(H <sub>2</sub> S, HS <sup>-</sup> ) (mg/l)
MW-1						
MW-2						
MW-3						
MW-4						

Notes:

**7.1 Discuss the results of the bioactivity evaluation. Specifically, compare the concentrations of the inorganic parameters inside and outside the plume.**

**7.2 In your judgment, is natural biodegradation occurring at this site? Please Explain. YES NO**

### Section 8: Well Receptor Information/Assessment

Include in the appendices of this report: 1) a list of addresses within 500 feet from the edge of the plume and confirmation of status of water supply from the city utility billing department; 2) well logs; and 3) map showing ½ mile radius, 500 foot radius, water supply wells, other potential petroleum sources, and addresses for properties within 500 feet.

**Table 13.**

**Complete the following table for all water supply wells located within 500 feet of the edge of the plume and any municipal or industrial wells found within ½ mile.**

Unique Well #	Ground Elevation	Total Draft (ft)	Base of Casing (ft)	Static Elevation	Aquifer	Use	Owner	Distance & Direction from site
105916	1,196±5	70	63	10'	Buried Alluvium	Unknown	Paul Bunyan Motel	1,000' SE
109020	1,196±5	57	48	12'	Buried Alluvium	Irrigation	Paul Bunyan Center	800' SE
116495	1,195±5	58	49	9'	Buried Alluvium	Sealed	Lakeland Vet Clinic	600' SW
117752	1,195±5	60	52	15'	Buried Alluvium	Unknown	First Baptist Church	2,300' SW
117978	1,196±5	312	109	14'	Bedrock	Sealed	Day's Inn	1,000' S
133647	1,200±5	132	72	9'	Buried Alluvium	Public Supply	City of Baxter	2,200' SE
180690	1,195±5	46	31	6'	Buried Alluvium	Heat Pump	Beasley, Olson DDS	1,200' NE
508623	1,195±5	36	28	6'	Buried Alluvium	Cooling System	Universal Pensions, Inc.	1,300' NE
582559	1,200±5	83	79	20'	Buried Alluvium	Irrigation	Widseth Smith Nolting	1,900' S

Notes:

- 8.1 Is municipal water available in the area?** YES NO
- 8.2 Were all property owners within 500 feet of the nearest edge of the contaminant plume successfully contacted to determine if water wells are present? If No, please explain.** YES NO
- 8.3 Discuss the results of the ground water receptor survey and any analytical results from sampling conducted at nearby water wells. Comment on the risks to water supply wells identified within 500 feet from the edge of the plume as well as the risk posed by or to any municipal or industrial wells found within ½ mile. Specifically indicate whether water supply wells identified utilize the impacted aquifer. (Note:**

**an impacted aquifer separated from another aquifer by a clay lens is not considered a separate aquifer.)**

Results of the groundwater receptor survey indicated that there are no wells located within a 500-foot radius of the leaksite. Nine wells were located that are situated within a half-mile radius of the leaksite. All these wells are cased to a depth of at least 28 feet below ground surface (BGS), with an average casing depth of 60 feet BGS. It does not appear that there are any wells at risk due to the release of petroleum products from this site.

**8.4 Are there any plans for groundwater development in the impacted aquifer within one half mile of the site, or one mile down gradient of the site if the aquifer is fractured? Please give the name, title and phone number of the person that was contacted for this information.**      **YES**      **NO**

There are no plans for groundwater development in the impacted unit; however, the City of Baxter is in the process of adopting a new landscape ordinance that will require City residents to water their lawns. Once this ordinance is passed, it is believed that the impacted unit will be utilized for irrigation purposes.

Kevin Wernberg, Baxter City Engineer      Phone (218) 829-5117

### Section 9: Surface Water Risk Assessment

9.1 Are there any surface waters or wetlands located within  $\frac{1}{4}$  mile of the site? YES NO

If YES, indicate its name: \_\_\_\_\_

9.2 If surface water is present downgradient of the site, is there a clean down gradient soil boring or monitoring well located between the site and the surface water? YES  
NO  
N/A

If NO, we assume that contamination discharges to surface water. Therefore, complete the following information:

Name of receiving water: \_\_\_\_\_

Plume width, (W): \_\_\_\_\_ feet

Plume thickness, (H): \_\_\_\_\_ feet

Hydraulic conductivity, (K): \_\_\_\_\_ gal/day/ft<sup>2</sup>

Horizontal gradient, (dh/dl): \_\_\_\_\_ (unitless)

Discharge, (Q) =  $H*W*K*(dh/dl)/1440$  \_\_\_\_\_ gal/min

If YES, identify them and indicate the distance to these features and discuss the contamination risk potential.

### Section 10: Vapor Risk Assessment/Survey

10.1 Is there a history of vapor impacts in the vicinity of the site?      YES      NO

If YES, describe:

10.2 Is there any indication that free product or highly contaminated groundwater may be traveling offsite within the utility corridors?      YES      NO  
If YES, have they been investigated with borings or push probes?

10.3 Discuss the potential for vapor migration/accumulation near the site. In your discussion consider: soil types, product type, presence and distribution of free product or high concentrations of dissolved product. Also, compare the depth of contamination with the location of underground utility lines, location and depth of storm and sanitary sewers and location of nearby basements.

Based on field observations and analytical results, the remaining contamination is minimal and, although there are utility trenches in the vicinity, there is minimal potential for organic vapors to migrate or accumulate at or near the site. This supposition is based on the fact that, although the impacted unit consists of fine to coarse grained sand, the releases appear to be laterally limited to areas surrounding the former dispensers (reference Figure 2b).

If the vapor risk assessment indicated a risk of vapor impacts to buildings or utilities, complete the following table with vapor monitoring data collected. Location numbers should be mapped on an accompanying figure of the surveyed area.

Table 14.

Location #	Date	PID reading (ppm)	Percent of the LEL

Notes:

10.4 Describe and interpret the results of the vapor survey.

As the results of the vapor risk assessment indicated that there was minimal potential for organic vapors to migrate or accumulate at or near the site, a vapor survey was not completed.

## **Section 11: Discussion**

### **11.1 Discuss the risks associated with the remaining soil contamination?**

The remaining petroleum impacted soil is limited laterally to the former locations of four of the fuel dispensers and vertically to approximately 12 feet BGS. Although the quantity and time of the release is unknown, it is believed that the release was minimal. The sources of the releases (fuel dispensers) have been replaced, therefore, there is no more contribution to increase the quantities of the petroleum impacted soil. In addition, the entire site is covered with impervious (i.e. cement, bituminous, etc.) And as such, no precipitation/runoff will infiltrate the subsurface to convey the contaminants downward to the water table.

It is believed, based on the aforementioned facts, that the risks posed to human health or the environment due to this release are minimal.

### **11.2 Discuss the risks associated with the impacted ground water?**

Five groundwater samples, obtained from soil borings SB-1 through SB-5, were submitted for quantification of GRO, DRO, and BTEX constituents. Analytical results were non-detect (ND) at or above each analytes respective method detection limit. Groundwater was encountered at approximately 11 feet below ground surface (BGS) in each of these borings. Analytical results for the soil sample obtained from hand auger boring HA-6 (10'-11') indicated DRO concentrations of 130 parts per million. Based on groundwater levels in the five soil borings, it is assumed that there have been some groundwater impacts due to the release of petroleum products at the site. However, based on analytical results from the groundwater samples obtained from soil borings SB-1 through SB-5, it does not appear that there are any significant groundwater impacts. Although there are numerous wells located within a half-mile radius of the leak site, it is believed that none of these wells are at risk of becoming impacted by the release. This is based on the facts that the sources of the releases (i.e. pump dispensers) have been replaced, the remaining contamination is minimal, and the site is covered with impermeable surfaces (i.e. bituminous, concrete, buildings, etc.) and as such, no precipitation or runoff will penetrate the subsurface and convey the remaining petroleum contaminants to the water table.

Therefore, it is believed, based on the above mentioned facts, that the risks posed to human health or the environment due to this release are minimal.

### **11.3 Discuss other concerns not mentioned above:**

There are no other concerns related to the release of petroleum products from this site.

## Section 12: Conclusions and Recommendations

Recommendation for site:     site closure  
    additional vapor monitoring  
    additional ground water monitoring  
    active cleanup

**The recommendation above should be based on fact sheet #3.1 "Leaking Underground Storage Tank Investigation and Cleanup Policy." Describe below how you applied the policy to support your recommendation.**

A resource aquifer has been impacted by a release of petroleum products at the site; however, there are no actual or potential impacts to any existing water wells. In addition, all properties surrounding the subject-property are connected to the City of Baxter municipal water supply system. Based on the results of the limited site investigation, the plume is stable and less than 200 feet long. There does not appear to be any risks to human health or the environment and as such, Widseth Smith Nolting recommends the site file be closed and no further action be required at the site.

**If additional monitoring is recommended, indicate the proposed monitoring schedule and frequency:**

**If active cleanup is proposed then MPCA staff will review this remedial investigation report at a higher than normal priority to determine if active cleanup is required. We will respond with either a request for proposal for additional monitoring or a corrective action design report. Please indicate below what cleanup technology you are considering at this time.**



### Section 13: Required Figures

Indicate attached figures:

- Figure 1, 1a:* Site location map (*approximate scale is not acceptable*) and a large scale site map show all potential receptors within 300 feet of the site. The large scale site map should show those properties with basements and wells.
- Figure 2, 2a, 2b, etc.:* One or more site map showing: structures; all past and present petroleum storage tanks, piping, and dispensers; extent of soil excavation; boring and well locations (including any drinking water wells on site); horizontal extent of soil contamination; horizontal extent of ground water contamination; and location of end points for all geologic cross sections.
- Figure* Ground water gradient contour maps (for sites with monitoring wells).
- Figure 3:* Well receptor survey map showing 1/2 mile radius, 500 foot radius, water supply wells, other potential sources of contamination.
- Figure* Vapor survey map showing utilities and buildings with basements and monitoring locations (if a survey was required).
- Figure* Geologic cross sections.



### Section 14: Appendices

Indicate attached appendices.

- Appendix* Excavation Report Worksheet for Petroleum Release Sites.
- Appendix A* Laboratory analytical reports for soil and ground water.
- Appendix B* Methodologies and procedures, including field screening of soil, other field analyses, soil boring, soil sampling, well installation, and water sampling.
- Appendix C* Geologic logs for each well or boring using attached template.
- Appendix* Well construction diagrams and copies of the Minnesota Department of Health Well Record using attached template.
- Appendix D* Copies of water supply well logs with legible unique numbers.
- Appendix E* A list of addresses within 500 feet from the edge of the plume and confirmation of status of water supply from the city utility billing department.

**Section 15: Consultant (or other) information**

*By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leaksite. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in reduction of reimbursement awards. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leaksite that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be found to be in violation of Minn. Stat. § 115.075 (1994) or Minn. Rules 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.*

Name and Title:	Signature:	Date signed:
<u>Iain A. Olness, Hydrogeologist</u>	<u></u>	<u>2 / 8 / 99</u>
<u>Brian A. Ross, Senior Geologist</u>	<u></u>	<u>2 / 2 / 99</u>
_____	_____	<u> / /</u>

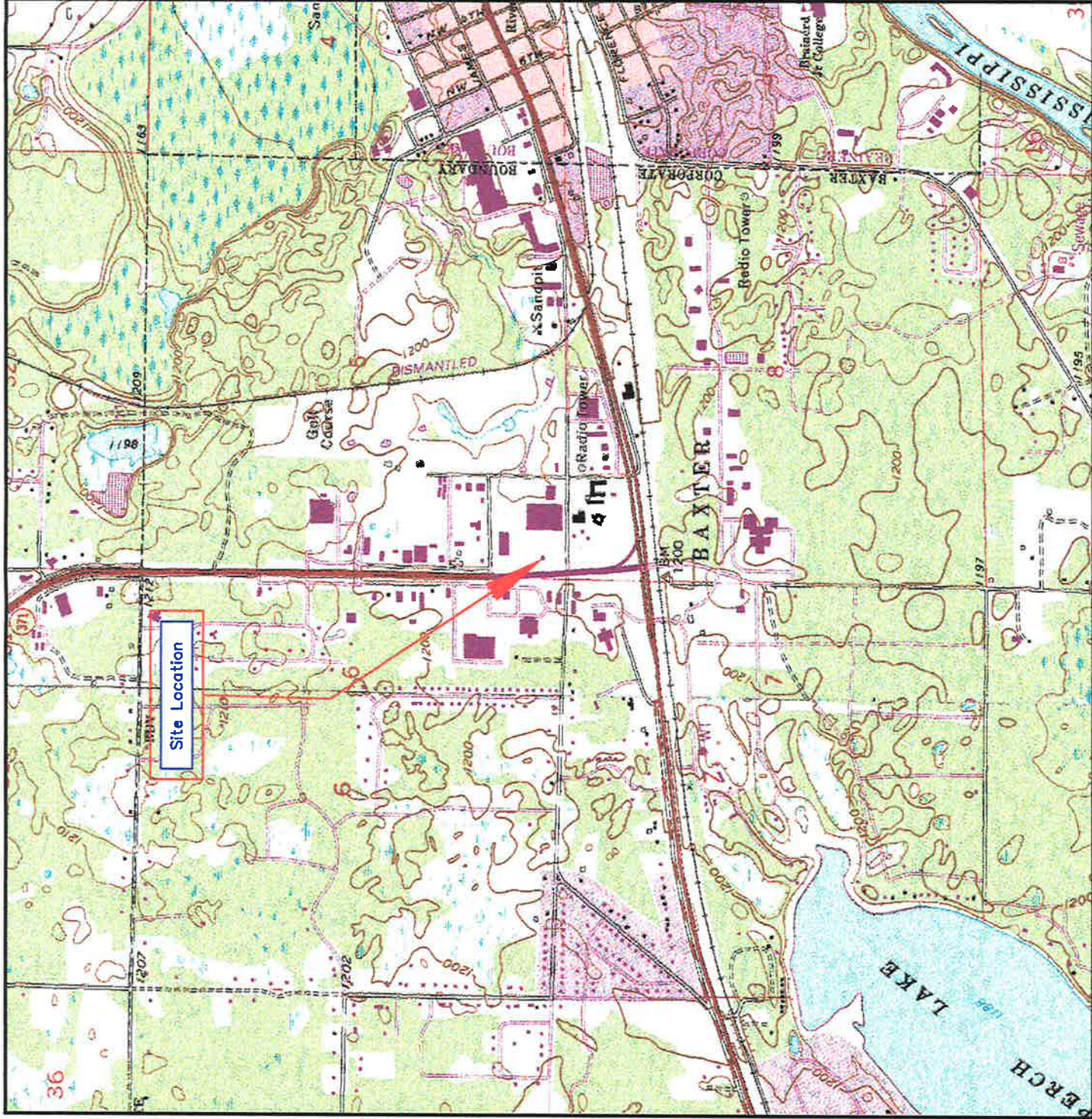
Company and mailing address: Widseth Smith Nolting  
P.O. Box 2720  
Baxter, MN 56425

Phone: 218-829-5117

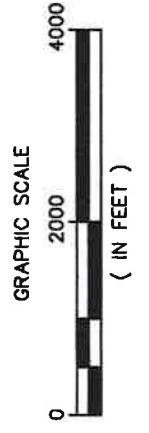
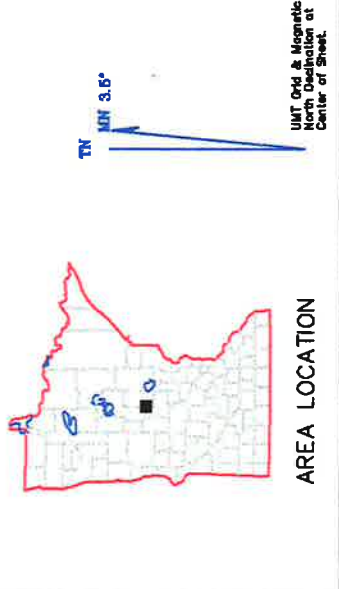
Fax: 218-829-2517

Upon request, this document can be made available in other formats, including Braille, large print and audio tape. TTY users call 612/282-5332 or Greater Minnesota 1-800-657-3864.





U.S.G.S. QUADRANGLE MAPS: Brainerd, MN/Baxter, MN  
 PUBLISHED: 1973/1954  
 PHOTOREVISED: 1994/1994

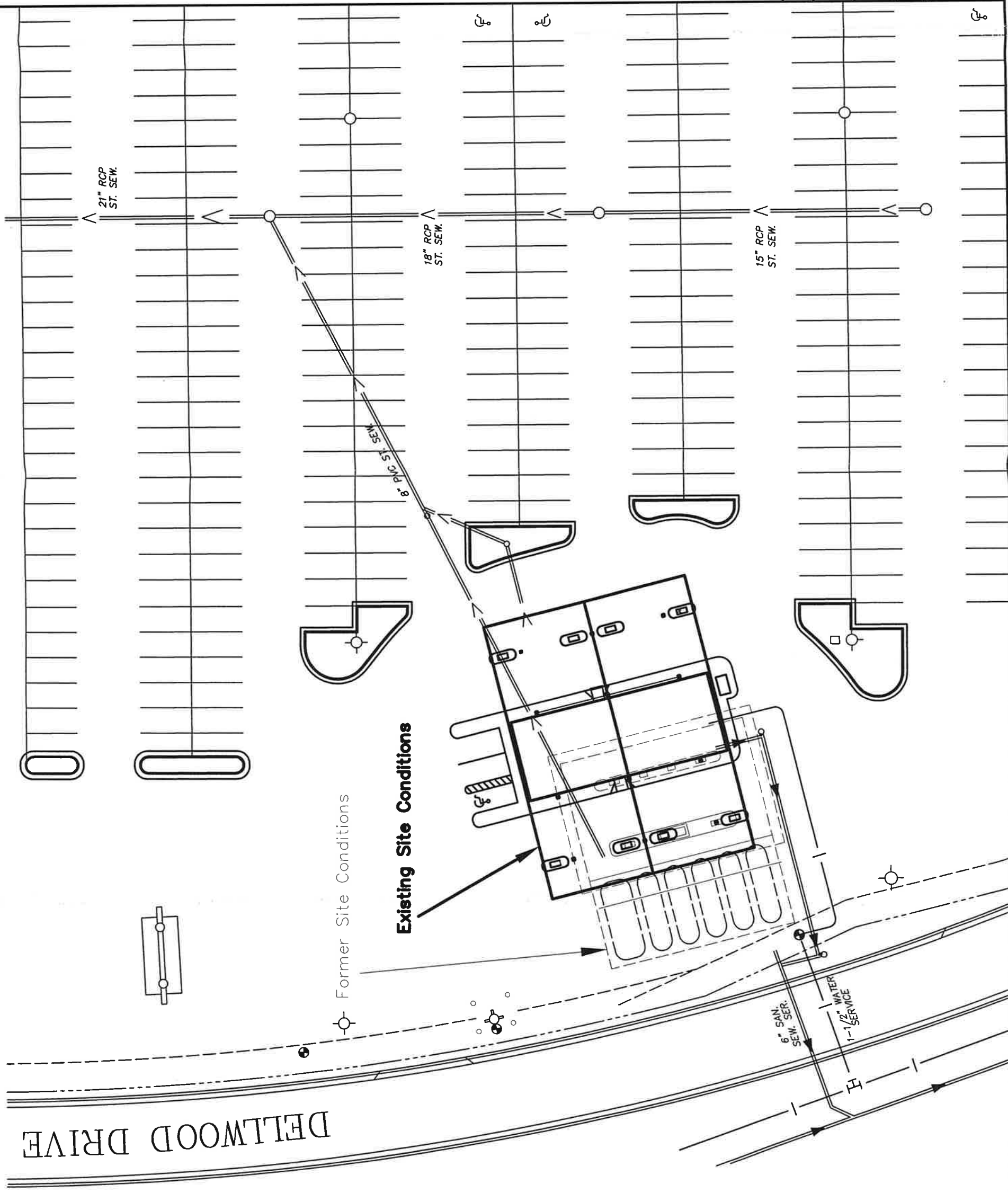


**Engineering**  
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Site Location Map  
 Figure 1a  
 Mills Convenience Store  
 Baxter, Minnesota  
 Sep. 1998



DELLWOOD DRIVE



Former Site Conditions

Existing Site Conditions



**LEGEND:**

- ||| STORM SEWER
- ||| SANITARY SEWER
- ||| WATERMAIN
- ||| OVERHEAD POWER
- POWER POLE
- MANHOLE
- CATCH BASIN

Note: Location of structures and utilities are approximate. Verify utilities before starting any subsurface work.

Figure 1b

Site Map

Mills C-Store  
Baxter, MN

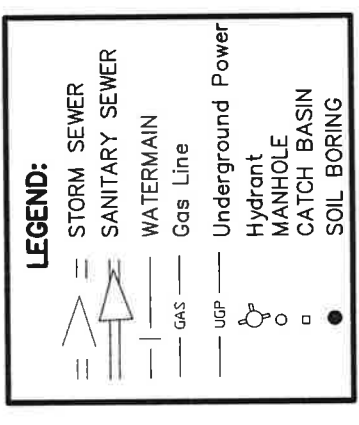
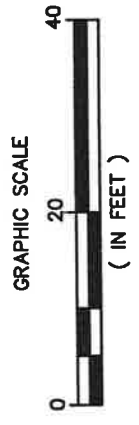
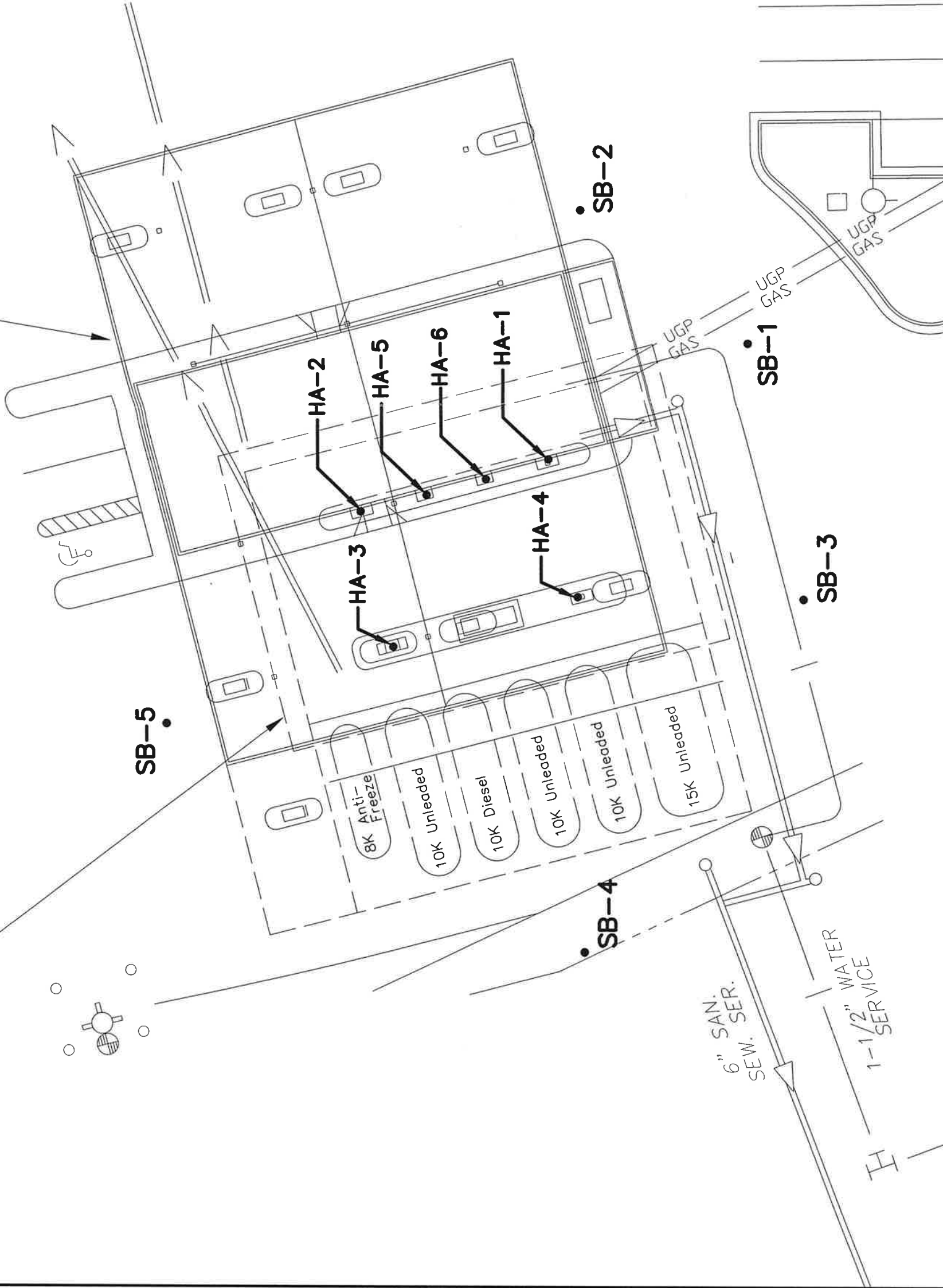
115Mills/033/Figure/Site1 Dec. 1998



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FORMER FUEL STATION STRUCTURE

EXISTING CONVENIENCE STORE STRUCTURE



Note: Location of structures and utilities are approximate. Verify utilities before starting any subsurface work.

**Figure 2a**

**Soil Boring Location Map**

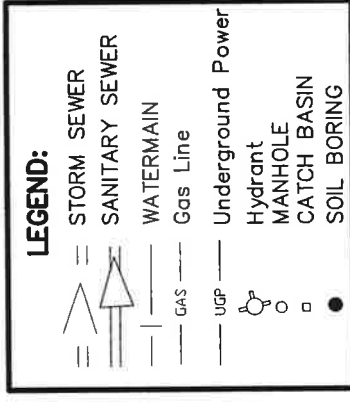
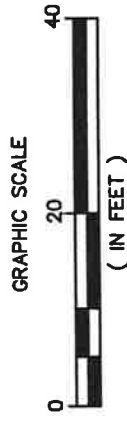
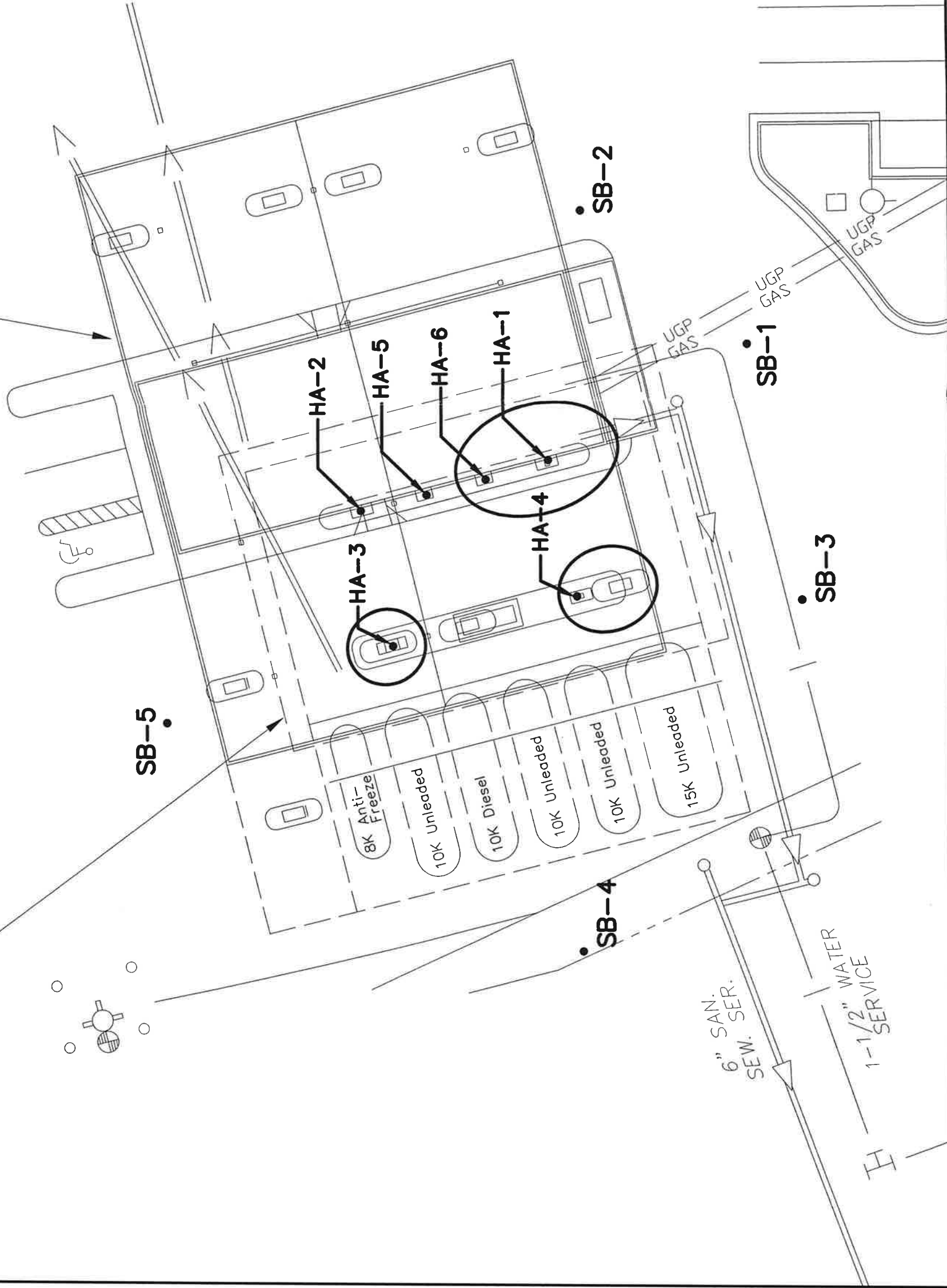
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FORMER FUEL  
STATION STRUCTURE

EXISTING CONVENIENCE  
STORE STRUCTURE



Note: Location of structures and utilities are approximate. Verify utilities before starting any subsurface work.

Figure 2b

Estimated Extent of Petroleum Impacted Soil

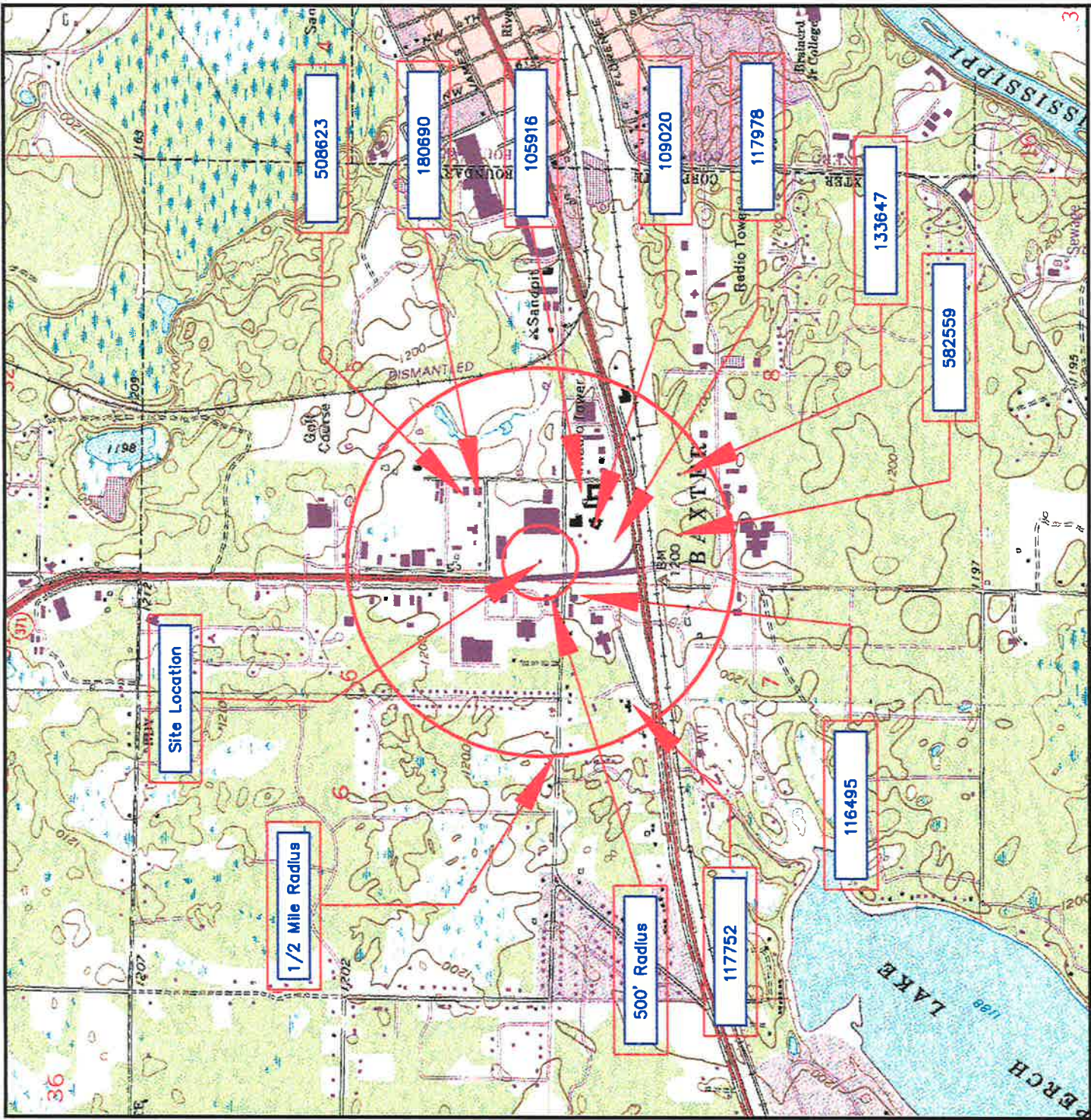
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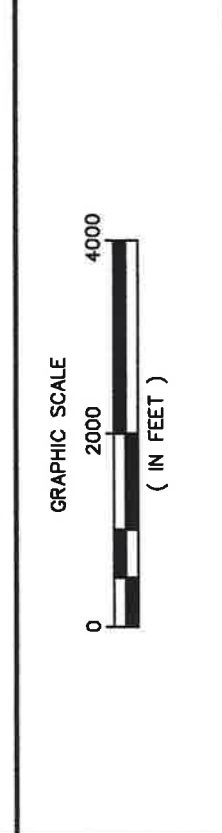


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AREA LOCATION

UTM Grid & Magnetic North Presentation at Center of Sheet

TN 3.5°



Well Receptor Survey  
 Mills Convenience Store  
 Baxter, Minnesota

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