June 20, 2012

Andy Eddy
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155-4194

RE: Former Union 76, 329 East First Avenue South, Cambridge, Minnesota – Leak #8001

Dear Andy:

Please find one copy of the Focused Investigation Work Plan (GD 7-03), completed for the above-referenced site. Please contact me at (763) 489-3147 with any questions.

Sincerely,

LIESCH ASSOCIATES, INC.

Aaron Benker
Project Manager

Enclosure (1)

cc: Maria Olson, Mille Lacs Oil Company w/encl.

w:\ts\65677\2010 field work\cvr ltr 07202010.doc

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Focused Investigation Work Plan

Petroleum Remediation Program
Guidance Document 7-03

Doc Type: Corrective Action Design

Instructions: Complete this work plan to propose a focused investigation. See Guidance Document 7-01 *Corrective Action Design and Implementation* for more information and requirements. Do not revise or delete any text or questions from this work plan. Items may be added if they are needed to support the proposed focused investigation work. If an item is not applicable, provide a brief explanation.

MPCA Leak ID: 8001 Report date: 11/2/1994

Responsible Party Information

Name: Mille Lacs Oil Company – Maria Olson Phone: 763-689-2220

Mailing address: 102 Main Street

City: Cambridge State: MN Zip code: 55008

Alternate contact (if any) for responsible party: Phone:

Leak Site Information

Leak site name: Cambridge Union 76 Phone: NA

Leak site address: 329 East First Avenue South

City: Cambridge MN Zip code: 55008 County: Isanti

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 leak site. 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 a reduction in Petrofund reimbursement. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leak site 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 (2007) or Minn. R. 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.

Company name: Liesch Associates, Inc.

Mailing address: 13400 15th Avenue North

City: Plymouth State: MN Zip code: 55441

Project manager name: Aaron Benker Phone: 763-489-3100

Fax: 763-489-3101 E-mail: Aaron.benker@liesch.com

Report Author(s)

Print name: Dan Larson Title: Hydrogeologist

Signature: Dan Larson Date: 6/20/2012

Print name: Title:

Signature: Date:

Report Reviewer(s)

Print name: Aaron Benker Title: Project Manager

Signature: [signature] Date: 6-26-2012

Print name: _____ Title: _____

Signature: _____ Date: _____

Name of field technician(s): Dan Larson

Section 1: Site Conceptual Model Update

Include updated cumulative tables and figures from Guidance Document 4-06 *Investigation Report Form* in Appendix A. Include documentation of additional site investigation, site monitoring, and interim corrective actions in Appendix B.

1. Describe any additional site investigation, site monitoring, and/or interim corrective actions completed since the last submitted report.

   Liesch Hydrogeologist Dan Larson completed checks for LNAPL (MW-3 and MW-7) on the following dates:
   - *March 29, 2012 (no product in either well)*
   - *April 27, 2012 (no product in either well)*
   - *May 30, 2012 (no product in MW-7, 3.5" product in MW-3. Remove/dispose of 4 gallons product/water mix)*

2. Discuss the results of the additional site investigation, site monitoring, and/or interim corrective actions.

   No product was found in monitoring wells MW-3 or MW-7.

3. Provide an updated and comprehensive site conceptual model.

   LNAPL
   LNAPL has not been detected in MW-7since March 31, 2011. LNAPL had not been detected in monitoring well MW-3 since January 20, 2010 until the recent product discovery of 3.5 inches on May 30, 2012.

   A LIF investigation, conducted in March 2011, provided a better understanding of the occurrence of LNAPL beneath the site and adjacent Property to the west (American Legion). The LIF investigation also provided vertical and horizontal delineation of the most significant LNAPL beneath the site; however, complete delineation of NAPL has not occurred north of L-19 and south of 2nd Avenue southwest of the site.

   One finding of the LIF investigation is that there is no shallow LNAPL west of the east curb line separating South Buchanan Street and the Union 76 Property. This observation is important since utilities are not buried deeper than 12 feet beneath Buchanan Street; this significantly reduces the risk these utilities pose as a receptor. Further, the EC plots do not indicate heterogeneous soil conditions in the presence of shallow LNAPL which could lead to preferential migration of LNAPL. The LIF Investigation report was submitted to the MPCA under separate cover.

   Groundwater
   Groundwater monitoring has been occurring at the site since June 1995. The groundwater contamination plume appears to be relatively stable.

   Vapor Intrusion
   Liesch collected three soil vapor samples to assess off-site vapor intrusion potential. Vapor Pt #1 was collected west of the Midwest Environmental Consulting building located at 145 Second Avenue SE, Vapor Pt #2 was collected on the east side of the American Legion Building located at 200 Second Avenue SE, and Vapor Pt #3 was collected to the east of the Cambridge Bible Bookstore located at 220

Main Street South. All vapor samples were collected at depths between 6-8 feet below grade.

Vapor Pt #1, #2 and #3. No detectable concentrations of VOCs were identified in Vapor Pt #1 and Vapor Pt #3. Vapor Pt #2 (American Legion) detected several VOCs of which benzene at 84.6 ug/m3 was detected above the ISV of 4.5 ug/m3 and 1,3-butadine was detected at 64.5 ug/m3 above the ISV of 0.3 ug/m3. MPCA guidance document 4-01a provides guidelines for comparing soil gas sample results to 10 times the ISV and 100 times the ISV. Benzene detected at 86.6 ug/m3 in Vapor Pt #2 exceeds 10 times the ISV of 45 ug/m3 but does not exceed 100 times the ISV 450 ug/m3. While 1,3 Butadiene exceeds 100 times the ISV of 30 ug/m3 1,3-Butadine is not anticipated to be a contaminant of concern for the petroleum release. Liesch recommends that an additional vapor intrusion assessment be completed at the American Legion Building which would include completion of an Indoor Building Survey and collection of sub-slab vapor samples to determine if a vapor pathway exists for this potential receptor.

Liesch collected a subslab vapor sample beneath the basement of the American Legion building to assess the potential for vapor migration into the building. Based on results of the Subslab-1 sample beneath the American Legion building, there does not appear to be a vapor pathway between the deeper (18-20') dissolved phase petroleum impacts and the American Legion's subslab. A Vapor Intrusion Interior Building Survey Form was also included to address the potential vapor intrusion risk to the American Legion Building.

In addition, an updated utility vapor survey was conducted and no petroleum vapors were identified.

4. Provide recommendations for additional site investigation, site monitoring, and/or interim corrective actions to be completed prior to corrective action design approval, including their purpose and schedule for completion.

   Additional site investigation recommendations are the same as requested in the MPCA "Request for Additional Work" letter dated February 16, 2012 – See Section 3.

Section 2: Focused Investigation Overview

1. If the proposed focused investigation work is different than requested by the Minnesota Pollution Control Agency, identify the differences and explain why. *NA*

2. Discuss how the focused investigation results will be used to design the pilot test, if applicable, and advance the detailed design of the proposed corrective action. *NA*

Section 3: Focused Investigation Description

Provide a site map and cross sections showing the proposed locations and depths of data collection points, such as borings, probes, and wells, in Section 4.

1. Discuss the proposed focused investigation scope, including what data will be collected, where the data will be collected (locations and depths), and the rationale for their collection.

   LIF / EC Probes

   Prior to conducting the LIF / EC probes, one soil probe will be advanced at the location of one of the proposed LIF / EC probe locations for purposes of calibrating the EC probe. This probe will be completed to a depth of 30 feet using the macro-core and closed-piston macro-core sampler. Soils will be screened with a PID and no laboratory samples will be collected. Seven LIF / EC probes will be initially completed (first tier) to delineate the horizontal extent of NAPL; two probes will be completed north of the Union 76 building, two probes will be completed north of LIF probe L-19, and three probes will be completed south of 2nd Avenue southwest of the site. In the event there are signal readings above 2%, additional delineation probes (second tier) will be completed. The LIF probes will be completed to depths of 10 feet below the water table or 10 feet below the deepest measureable LNAPL (>2%), whichever is deeper. Most probes are anticipated to be completed to depths of approximately 30 feet below grade. The proposed first and second tier LIF / EC probes are shown on ***Figure 2****.*

Monitoring Wells

*Four monitoring wells are proposed to be installed as follows (See **Figure 2**):*

- *MW-8 will be installed at the TH-15 location to define the extent of mobile NAPL;*
- *MW-9 will be installed at the TH-16 location to define the extent of mobile NAPL;*
- *MW-10 will be installed on the south side of the Union 76 site to provide a triangular monitoring arrangement to allow for better evaluating the groundwater flow direction;*
- *MW-11 will be installed approximately halfway between MW-6 and Kluck Oil to provide an additional down-gradient permanent monitoring point.*

The monitoring wells will be completed between approximately 24 to 29 feet below grade. Soil samples will be screened continuously before or during drilling the well with hollow-stem augers. Soil samples will not be submitted for laboratory analysis unless field screening indicates potential soil impacts above the water table. Wells will be constructed with 10-slot, 10-foot PVC screens such that they straddle the water table. Wells will be completed above-grade if possible or at-grade if site conditions and use do not allow for above-grade completion.

All of the new and existing monitoring wells and several other surface points will be surveyed for elevation control.

Groundwater Sampling

Two rounds of quarterly groundwater monitoring will be conducted on the new and existing monitoring well network.

Monthly NAPL Checks

Monthly NAPL checks are being and will continue to be conducted on monitoring wells MW-3 and MW-7. MW-8 and MW-9 will be included in the NAPL checks after they are installed. If NAPL is consistently absent in wells MW-8 and MW-9, NAPL checks will only be completed during quarterly sampling.

2. Discuss focused investigation data collection methods and procedures, including field-generated data, sample collection, laboratory analyses, and bench-scale tests. Methods and procedures must be specific to the planned data collection activities and locations.

LIF / EC Probes

LIF

The delineation investigation will be accomplished using an Ultra-Violet Optical Screening Tool (UVOST), which is a laser-induced fluorescence (LIF) screening tool designed to detect NAPL (free product) in the subsurface. The UVOST system sends light (via 308 nm laser) through a fiber optic cable strung within probe rods. The light, reflected by a parabolic mirror, then exits through a sapphire window in the side of the probe. As the probe is advanced, the soil is exposed to the UV laser light. If PAHs are present, longer wavelength light is emitted by the contaminants. PAHs are compounds in petroleum-oil lubricants (POLs) that fluoresce, i.e. LNAPL. This "signal" light is transmitted through a return fiber, back up hole to be analyzed. Responses are indicated in real-time on a graph of signal vs. depth. The UVOST log displays "color mixed" signal logs (contributions from 4 channels) and waveforms ("fingerprint" of multi-wavelength) to aid in identification and relative quantity of the contaminant present.

Prior to every log the UVOST system is checked for optical quality by observing the background signal for sources of signal in the fiber, filter, mirror and sapphire window. Also, the reference emitter (a standard proprietary NAPL mixture called the "RE") is placed on the window to determine the qualitative and semi-quantitative properties of the laser system. This is to assure that the RE response has the correct shape and intensity and that the UVOST system is ready to log. Typically the RE will fall between 10,000 and 12,000 picovolt-seconds (PVs, a measure of waveform area) and the background can vary from 0.1% to 1% (area of about 0-100 pVs). It is important to remember that the relationship between the NAPL in the ground and the RE depends on that particular NAPL. The calibration of the system is not to a concentration, but to a known fluorescence signature.

EC

Electical Conductivity (EC) is a measure of the soils ability to conduct an electrical current between two dipoles on the LIF/EC probe. Conductivity is the reciprocal of the electrical resistivity and has the units (in our application) of millisiemens per meter (mS/m). Since soil is in the pathway of the charge flow, the grain size can be determined by comparing the EC log to a soil boring. Conductivity readings in the 100s indicate smaller grain (size such as clay). Larger grain size (sand and gravels) are typically in the 10s of mS/m range. Prior to every log the EC point of the UVOST probe is checked for the proper operation by performing a voltage test with a voltage meter and a conductivity test with a test block.

Decontamination (LIF and Monitoring Well Installation)

All drilling/probing/sampling equipment will be decontaminated prior to arrival on site and between sampling points and drilling locations. The decontamination procedure consisted of an Alconox wash and a water rinse.

Soil Borings and Soil Sample Collection (EC calibration probe and Monitoring Well Installation)

Soil borings will be completed utilizing a Geoprobe hydraulic push probe or a hollow-stem auger drill rig. The borings will be completed under the direction of a Liesch Hydrogeologist. Soil samples collected during soil boring completion will be classified in accordance with the Unified Soil Classification System using visual-manual procedures. Soil samples were collected in accordance with Part II of MPCA fact sheet 4-04 "Soil Sample Collection and Analysis Procedures". Soil samples will be collected directly from the soil sample liner retrieved by the geoprobe or the split-spoon sampler from the hollow-stem auger rig. Soils will be immediately containerized in laboratory provided sample jars and placed in an ice-chilled cooler. Soil samples will be submitted for laboratory analysis at depths exhibiting noticeable odor, visible soil staining, or elevated PID readings. Dedicated, disposable polyethylene gloves will be used to containerize each soil sample in laboratory-provided containers.

Soil Screening(EC calibration probe and Monitoring Well Installation)

Soil samples collected during the soil boring activities will be screened for the presence of organic vapors using the methods described in Part I of MPCA fact sheet 4-04 "Soil Collection and Analysis Procedures." A photoionization detector (PID) equipped with a 10.6 electron volt lamp will be used to screen soil samples for the presence of organic vapors. The PID will be calibrated prior to analysis on each day of field screening. A quart-size polyethylene freezer bag will be filled approximately ½ full with a portion of the sample to be analyzed. Soil clumps will be broken and the bag will be shaken for approximately 15 seconds. After allowing the headspace to develop for a minimum of 10 minutes, each field screening sample will be analyzed using the PID. Soil samples will be categorized in the field following the Unified Soil Classification System (USCS) using visual-manual procedures.

Monitoring well installation

Monitoring wells will be installed at four locations on and off site using 8-inch OD hollow-stem augers. Monitoring wells will be completed in compliance with the Minnesota Department of Health regulations, under the supervision of a licensed well contractor. The wells will be completed with 10 slot, 10 foot, PVC screen, set in Redflint #30 sandpack. Screen intervals will be placed at depths such that they straddled the water table. PVC risers will be completed just below ground surface for flush-mount wells and approximately 2 feet above ground surface for protop wells. The annular space above the sandpack will be filled in with Enviroplug grout. A lockable cap will be placed on top of the PVC riser pipes. A steel cover will be cemented in over the PVC riser for flush-mount wells and a lockable steel protop will be cemented in over the above-grade wells. After completion of the monitoring wells, they will be developed to remove excessive sediment and any water introduced during drilling.

Groundwater sampling (monitoring wells)

Approximately 5 gallons of water will be purged prior to sampling using dedicated, disposable polytetrafluorethylene bailers. The water sample will be collected using the same bailer used to purge the well. Disposable polyethylene gloves will be used during handling of all sampling equipment. Groundwater samples will be placed in laboratory-provided containers. The sample containers will then immediately placed in an ice-chilled cooler for transportation to the analytical laboratory. Samples will

be submitted to the laboratory within appropriate holding times.

3. Describe any existing sampling or monitoring points that will be used during the focused investigation and include copies of their boring logs and/or well construction diagrams in Appendix C.

   MW-1, MW-3, MW-6, MW-6A, and MW-7.

4. Discuss how the focused investigation data will be presented in Guidance Document 7-04 *Focused Investigation Report*. Include example copies of data source documents (e.g., boring logs, well construction diagrams, field data sheets) and example data summary tables and figures in Appendix D.

   Data will be presented as requested in GD 7-04, similar in format to this Focused Investigation Work Plan.

5. Discuss the methods that will be used to evaluate the focused investigation data in the *Focused Investigation Report*. Include example tables, figures, and calculations (e.g., graphs, contour maps, cross sections) in Appendix D.

   Liesch will compare the new focused investigation data with historical data along with contour maps and cross sections to assist with interpretations and preparation of the Focused Investigation Report.

6. Propose a schedule for completing the focused investigation, including submittal of the *Focused Investigation Report*.

   Liesch anticipates the LIF / EC probes and monitoring well installation will be completed in August 2012. One round of groundwater monitoring will be completed in September 2012 and the second round is anticipated to be completed in December 2012. The Focused Investigation Report will be submitted in January or February, 2012.

Section 4: Figures

Attach new figures specific to this report in order of discussion in the text. All figures must include a north arrow, scale, and legend as applicable. Approximate scales are not acceptable. Figures required in Appendix A should not be included in this section. New figures must include those listed below. Attach additional figures as needed and list below.

☒ One or more site maps showing (as applicable):

- Structures
- Boring and well locations (including any drinking water wells on site)
- Suspected source(s) of light non-aqueous phase liquid (LNAPL)
- Locations and depths of on-site buried utilities
- All past and present petroleum storage tanks, piping, dispensers, and transfer areas
- Estimated target-zone footprint
- Proposed focused investigation data collection points

Distinguish sequential elements of investigations by dates, symbols, etc. in the legend.

☐ Cross sections depicting depths of proposed focused investigation data collection points in relation to known contamination extents, geology, subsurface structures, and previous site investigation borings or wells.

Section 5: Tables

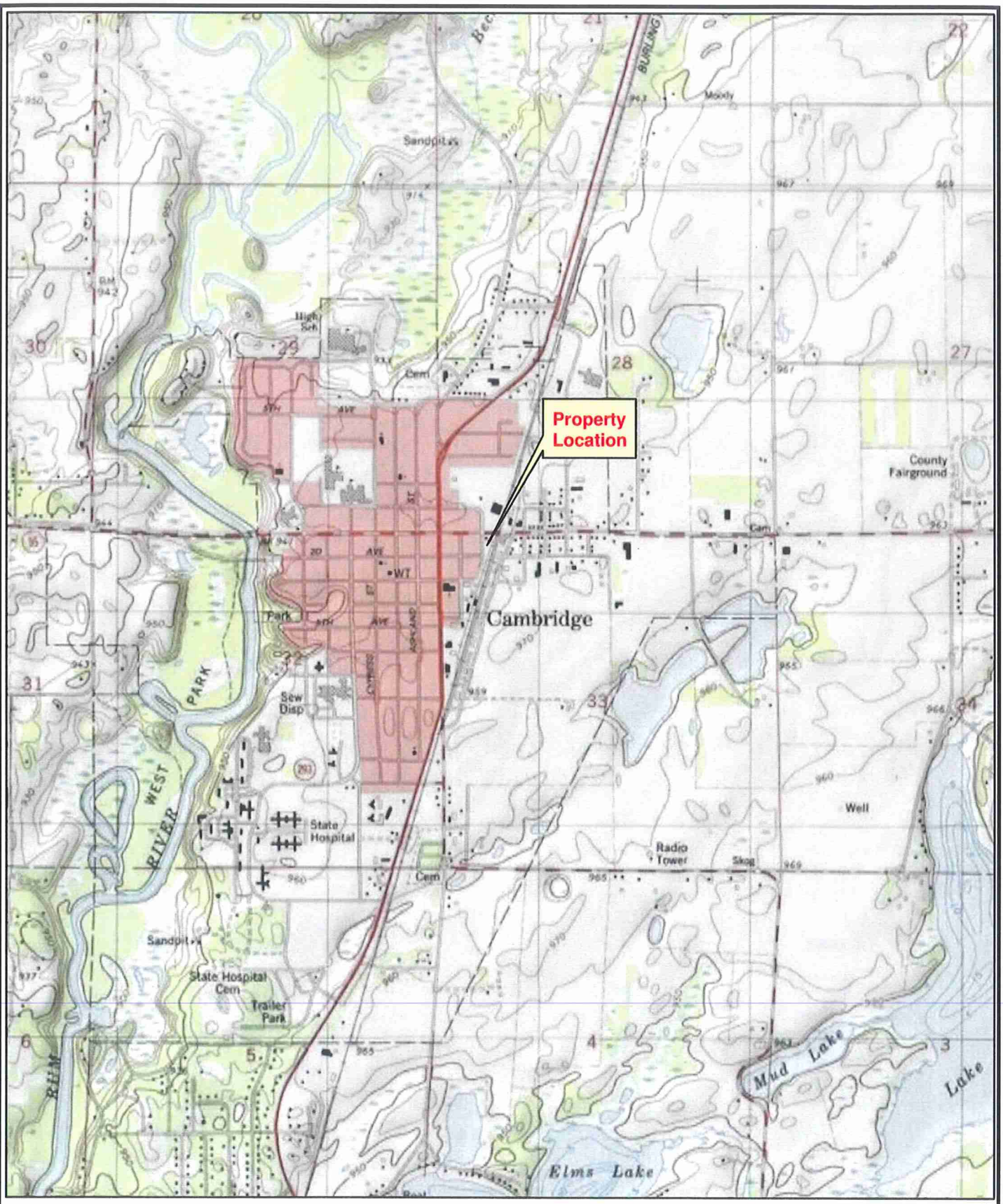
Attach new tables specific to this report in order of discussion in the text and list below. Tables required in Appendix A should not be included in this section.

Section 6: Appendices

Attach all required or applicable appendices in the following order. Indicate those appendices that are included in this report by marking the check box. All reproduced data must be legible. Attach additional appendices as needed and list below.

☒	*Appendix A*	Cumulative and updated tables and figures from Guidance Document 4-06 *Investigation Report Form*.
☐	*Appendix B*	Additional site investigation, site monitoring, and interim corrective action methods and procedures and associated documentation (boring logs, sampling information forms, laboratory analytical reports, etc.).
☒	*Appendix C*	Boring logs and/or well construction diagrams for any existing sampling or monitoring points that will be used during the focused investigation.
☒	*Appendix D*	Example data products requested in Section 3.

APPENDIX A



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Source: MS Virtual Eath Topographic Quad
Projection: NAD83 UTM Zone 15N

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Former Union 76 Fuel Station
329 East First Avenue, Cambridge, Minnesota

Jun 12

Property Location

Figure 1

1st AVENUE

2nd AVENUE

3rd AVENUE

MAINSTREET

ALLEY

SOUTH ADAMS STREET

ALLEY

SOUTH BUCHANAN STREET

RR ROW / PROPERTY BOUNDARY

RAILROAD TRACKS

UNION 76

CASEY'S

NORDBERG ELECTRIC

SHED

AMERICAN LEGION

KLUCK OIL

TH-2 TH-3 TH-4 TH-5 MW-1/TH-4 MW-2/TH-6 TH-7 TH-9 TH-10 TH-11 TH-12 TH-13 TH-14 TH-15 MW-8 MW-7 TH-16 MW-9 TH-17 TH-18 TH-19 TH-20 MW-6 MW-6A TH-21 TH-22 TH-23 TH-24 MW-3/TH-8 TH-25 TH-26 TH-27 TH-28 TH-29 TH-30 TH-31 TH-32 MW-11 TH-33 TH-34 TH-35 MW-5 MW-5A TH-36 TH-37 TH-38 TH-39 MW-10

LEGEND

- TH-7 SOIL BORING
- MW-7 MONITORING WELL
- LIF/EC PROBE
- FIRST TIER LIF PROBES
- PROPOSED SECOND TIER LIF PROBES (as necessary)
- PROPOSED MONITORING WELL LOCATION

N

0 20 50 75 100

SCALE IN FEET

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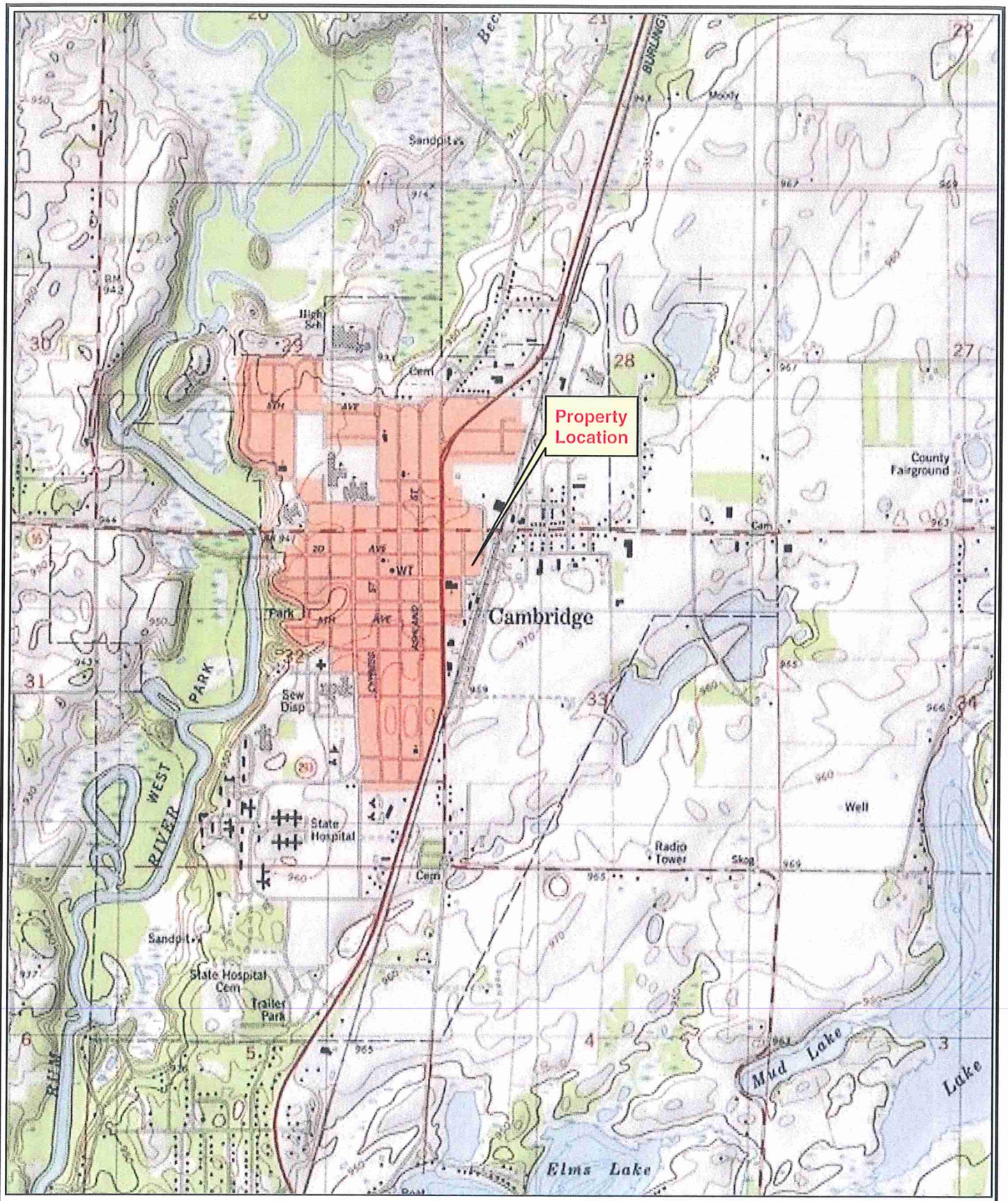
FORMER UNION 76 FUEL STATION
CAMBIRDGE, MN

JUN 12

PROPOSED LIF and MONITORING WELL LOCATIONS

FIGURE 2

MK 3-12-2012 1=1 w:\ts\65677\cadd\figure probe map mar2012



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Projection: NAD83 UTM Zone 15N

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Former Union 76 Fuel Station
329 East First Avenue, Cambridge, Minnesota

Nov 11

Property Location

Figure 1

LEGEND

- TH–7 SOIL BORING
- MW–7 MONITORING WELL
- L–8 LIF/EC PROBE
- SS — SANITARY SEWER
- SW — STORM SEWER
- T — PHONE/FIBER OPTIC
- E — ELECTRIC
- GAS — GAS
- W — WATER
- MANHOLE
- STORM SEWER CATCH BASIN
- (1) VAPOR SURVEY LOCATION
- ✳ SUBSLAB VAPOR SAMPLE

ALLEY

CASEY'S

NORDBERG ELECTRIC

UNION 76

AMERICAN LEGION

SHED

SUBLAB–1

SOUTH BUCHANAN STREET

2nd AVENUE

RR ROW / PROPERTY BOUNDARY

RAILROAD TRACKS

TH–12, TH–17, TH–22, TH–13, TH–15, TH–16, TH–14, TH–11, TH–7, TH–23, TH–24, TH–9, TH–10

MW–2/TH–6, MW–7, MW–3/TH–8

L–1, L–2, L–3, L–4, L–5, L–6, L–7, L–8, L–9, L–10, L–11, L–12, L–13, L–14, L–15, L–16, L–17, L–18, L–19, L–20, L–21, L–22, L–23, L–24, L–25, L–26, L–27, L–28, L–29, L–30, L–31, L–32, L–33, L–34, L–35, L–36, L–37, L–38, L–39, L–40, L–41

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MK 11-22-2011=1 w:\ta\65677\cadd\fig-sampling and util locations

1st AVENUE

ASHLAND STREET

ALLEY

MAIN STREET

ALLEY

SOUTH ADAMS STREET

ALLEY

SOUTH BUCHANAN STREET

2nd AVENUE

3rd AVENUE

TH-1 TH-2 TH-3 TH-4 TH-5 TH-6 TH-7 TH-8 TH-9 TH-10 TH-11 TH-12 TH-13 TH-14 TH-15 TH-16 TH-17 TH-18 TH-19 TH-20 TH-21 TH-22 TH-23 TH-24 TH-25 TH-26 TH-27 TH-28 TH-29 TH-30 TH-31 TH-32 TH-33 TH-34 TH-35 TH-36 TH-37 TH-38 TH-39 TH-40 TH-41 TH-42 TH-43 TH-44 TH-45

MW-1/TH-1

MW-2/TH-6

MW-3/TH-8

GP-1

GP-2

Vapor Pt. 1

Vapor Pt. 2

Vapor Pt. 3

UNION 76

CASEY'S

SHED

SHED

VFW

LEGEND:

- TEST HOLE LOCATION
- EXCAVATION LIMITS
- RAILROAD TRACKS
- Liesch 2010 Vapor Sample
- Liesch 2010 Geoprobe

N

Source: WCEC Environmental Consultants

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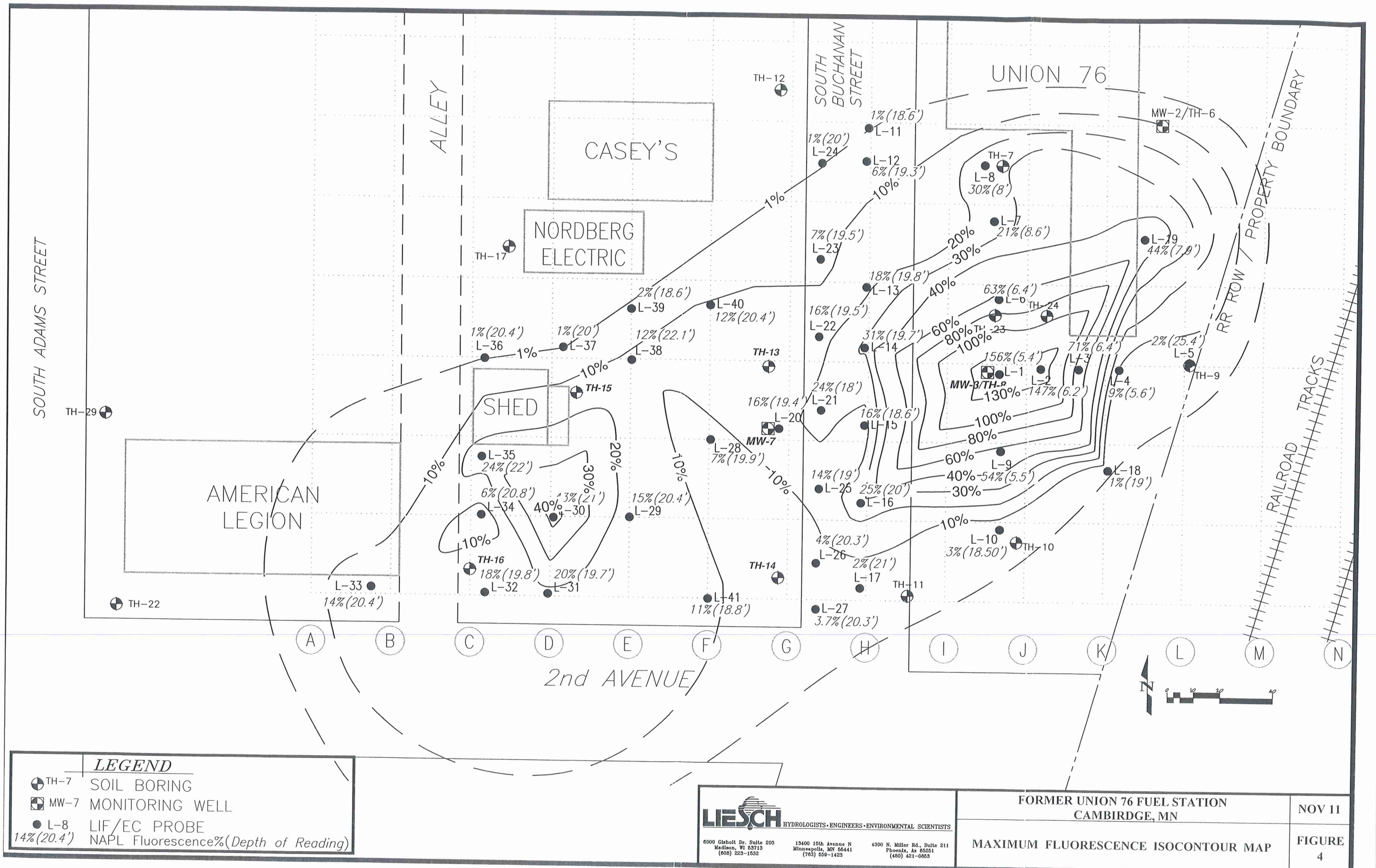
Former Union 76 Fuel Station
329 East First Ave, Cambridge, Minnesota

Jul 10

Former Temporary Sampling Locations

Figure 3



LEGEND

- TH-7 SOIL BORING
- MW-7 MONITORING WELL
- L-8 LIF/EC PROBE
- 14%(20.4') NAPL Fluorescence%(*Depth of Reading*)

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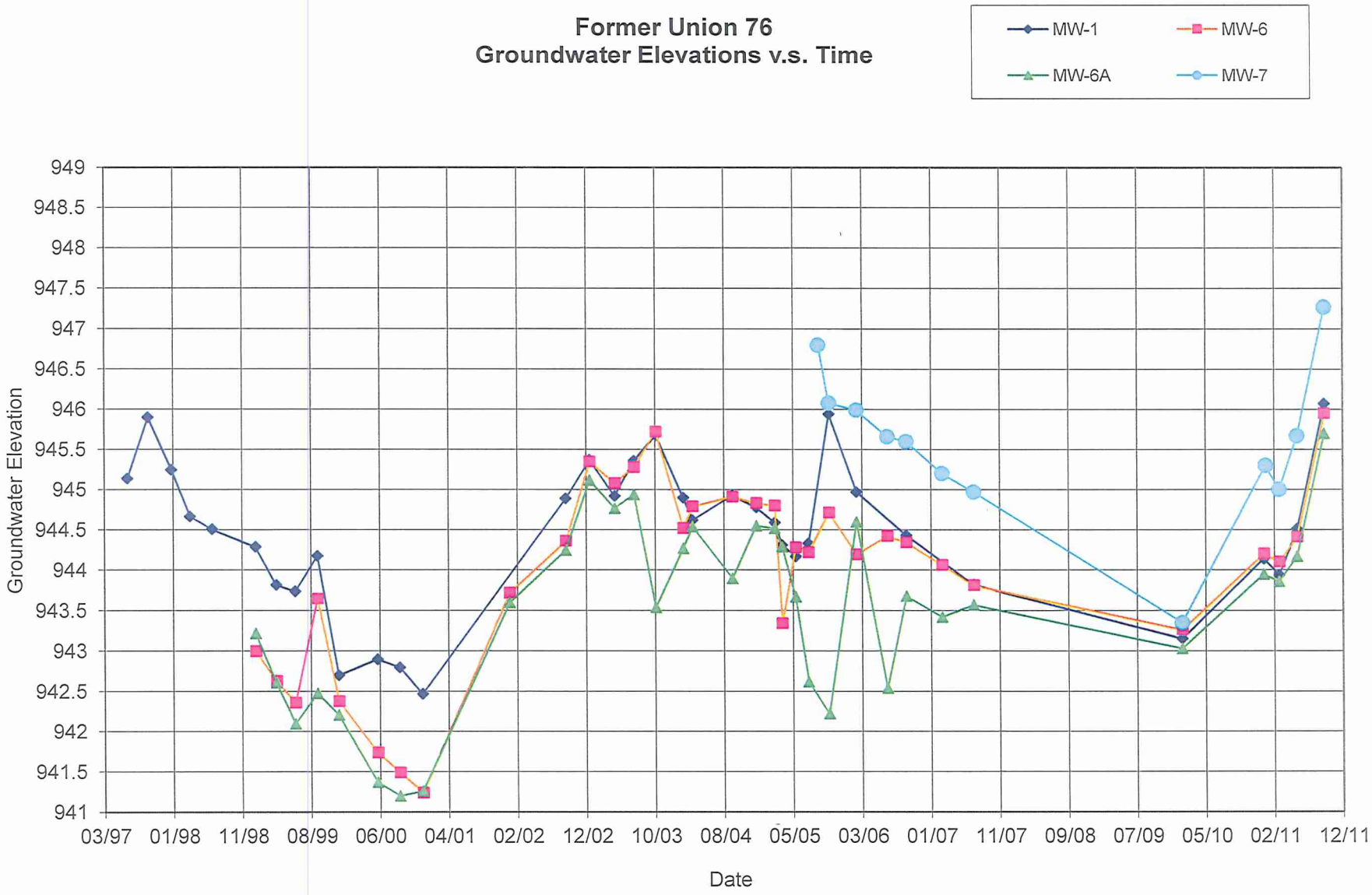
FORMER UNION 76 FUEL STATION
CAMBIRDGE, MN

NOV 11

MAXIMUM FLUORESCENCE ISOCONTOUR MAP

FIGURE 4


Former Union 76
Groundwater Elevations v.s. Time
MW-1
MW-6
MW-6A
MW-7
Groundwater Elevation
949
948.5
948
947.5
947
946.5
946
945.5
945
944.5
944
943.5
943
942.5
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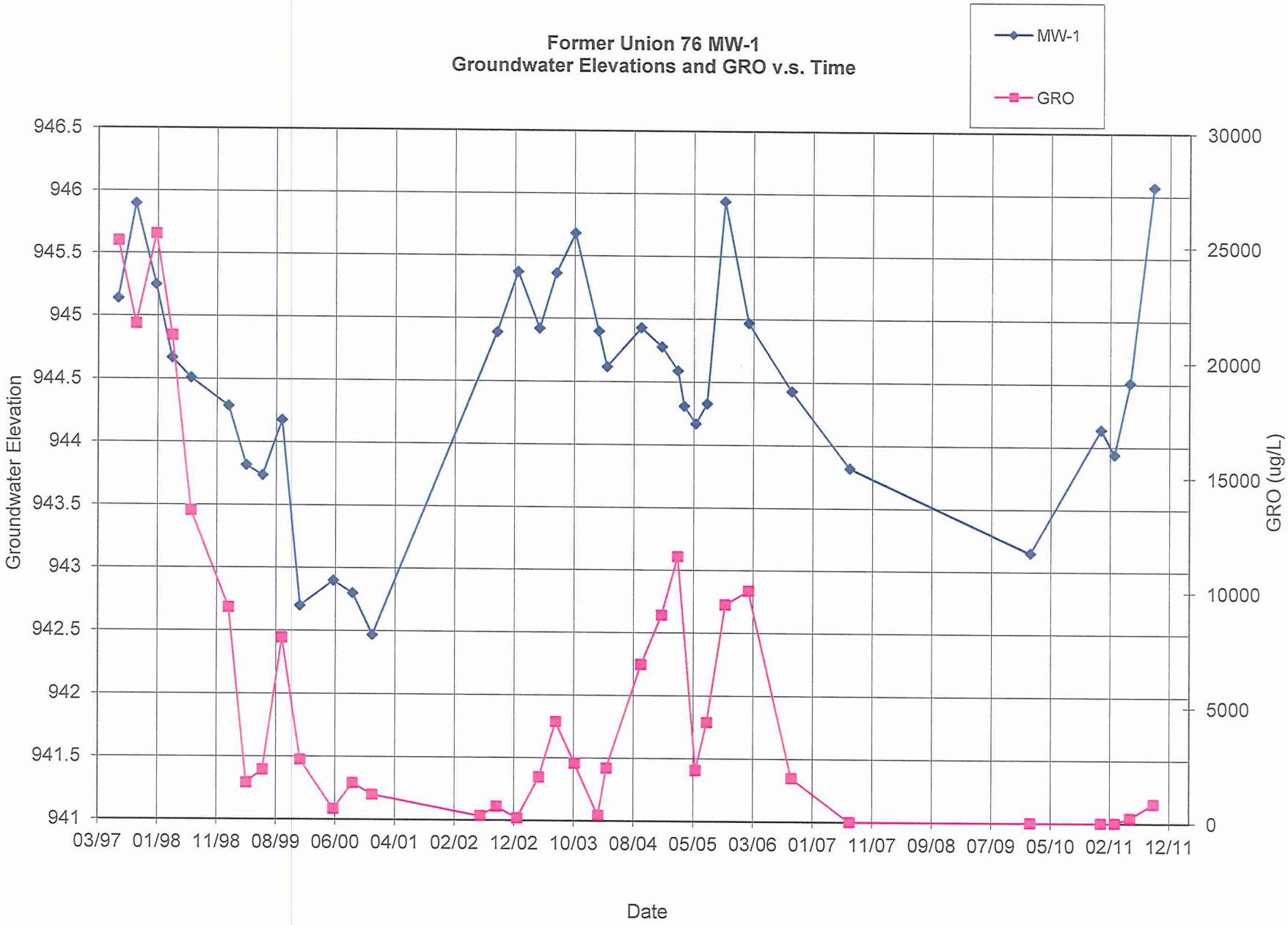
Former Union 76 MW-1
Groundwater Elevations and GRO v.s. Time
MW-1
GRO
Groundwater Elevation
GRO (ug/L)
Date
946.5
946
945.5
945
944.5
944
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15000
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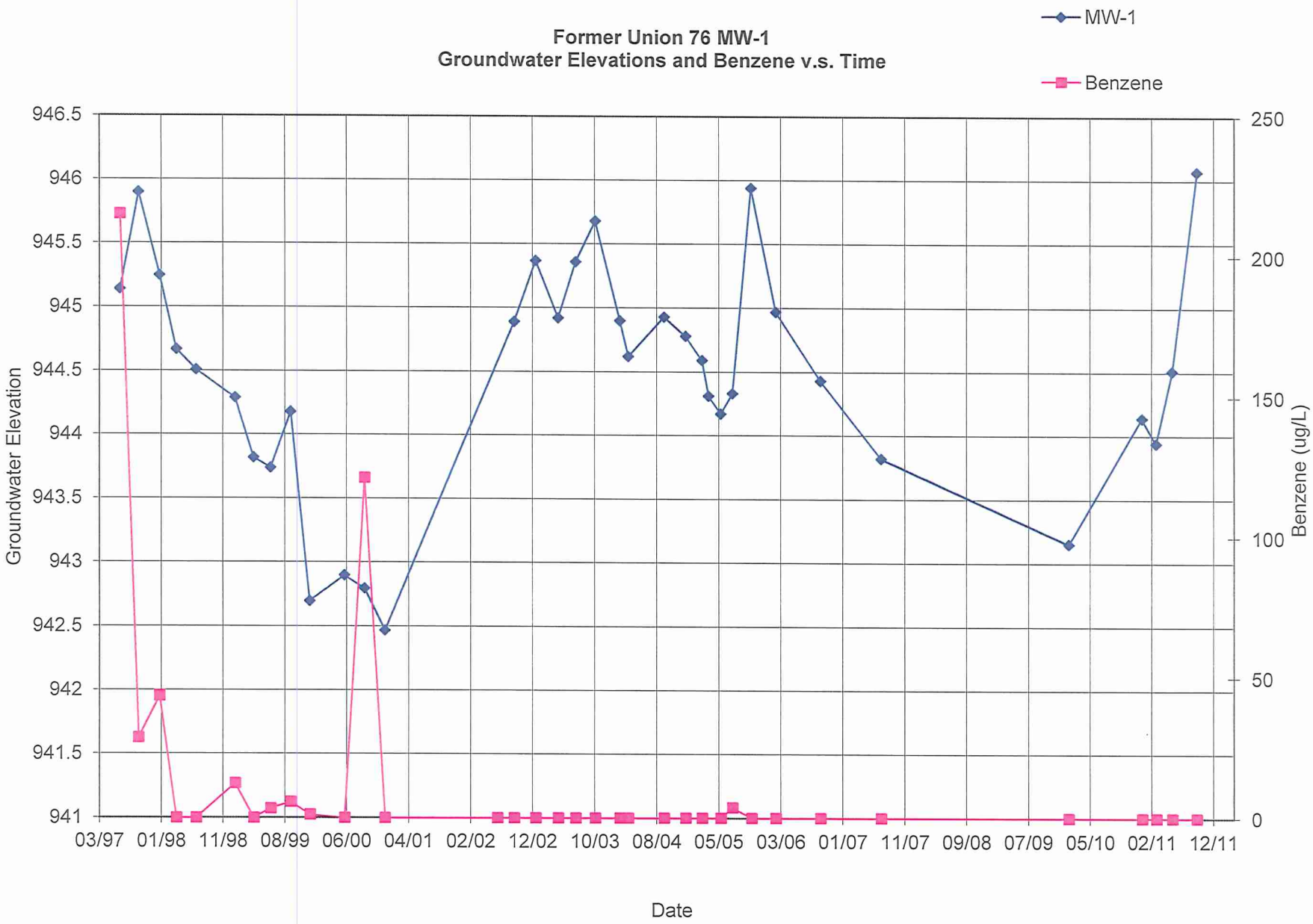
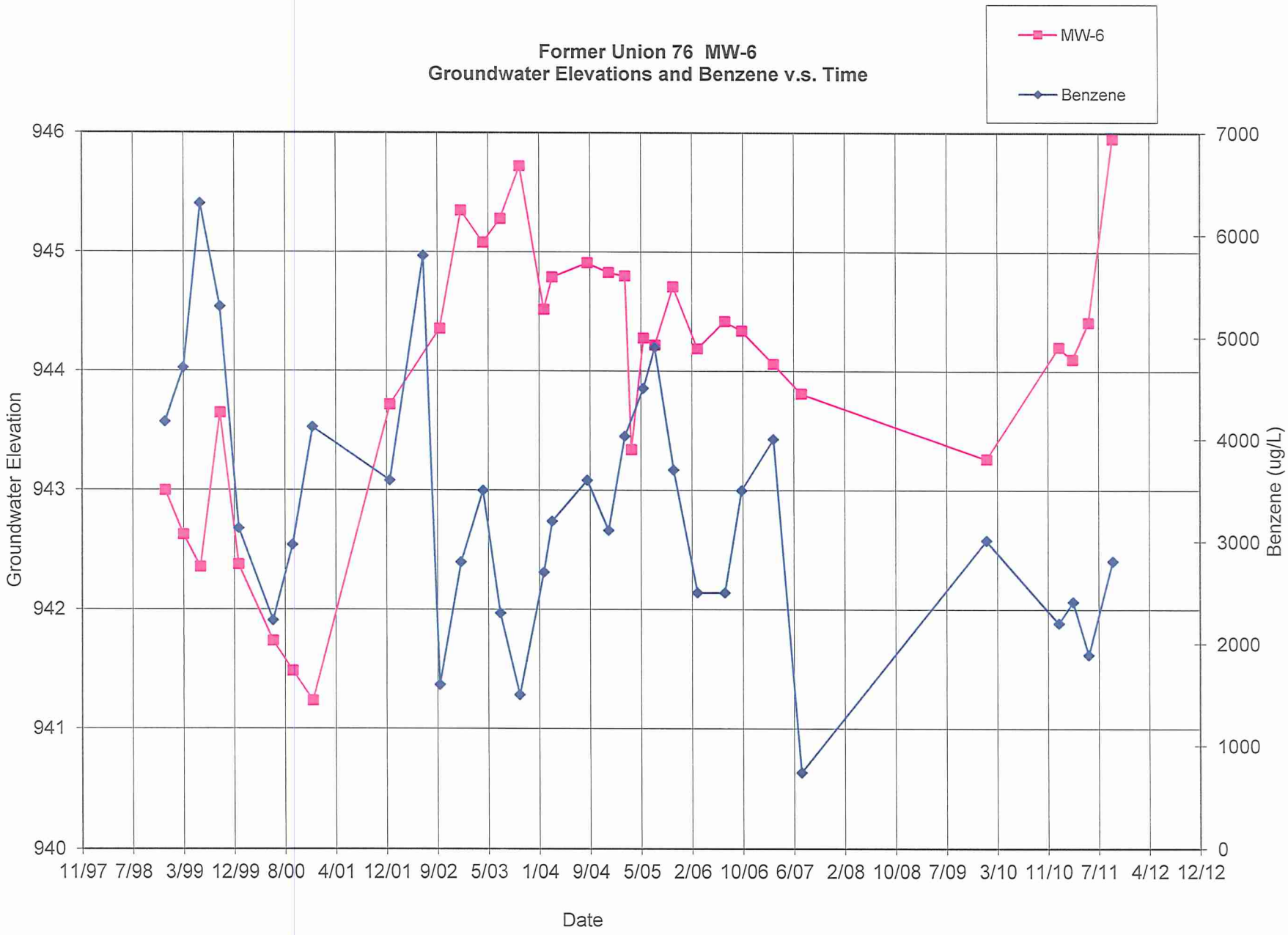
03/97
01/98
11/98
08/99
06/00
04/01
02/02
12/02
10/03
08/04
05/05
03/06
01/07
11/07
09/08
07/09
05/10
02/11
12/11


Former Union 76 MW-1
Groundwater Elevations and Benzene v.s. Time
MW-1
Benzene
Groundwater Elevation
Benzene (ug/L)
946.5
946
945.5
945
944.5
944
943.5
943
942.5
942
941.5
941
250
200
150
100
50
0
03/97
01/98
11/98
08/99
06/00
04/01
02/02
12/02
10/03
08/04
05/05
03/06
01/07
11/07
09/08
07/09
05/10
02/11
12/11
Date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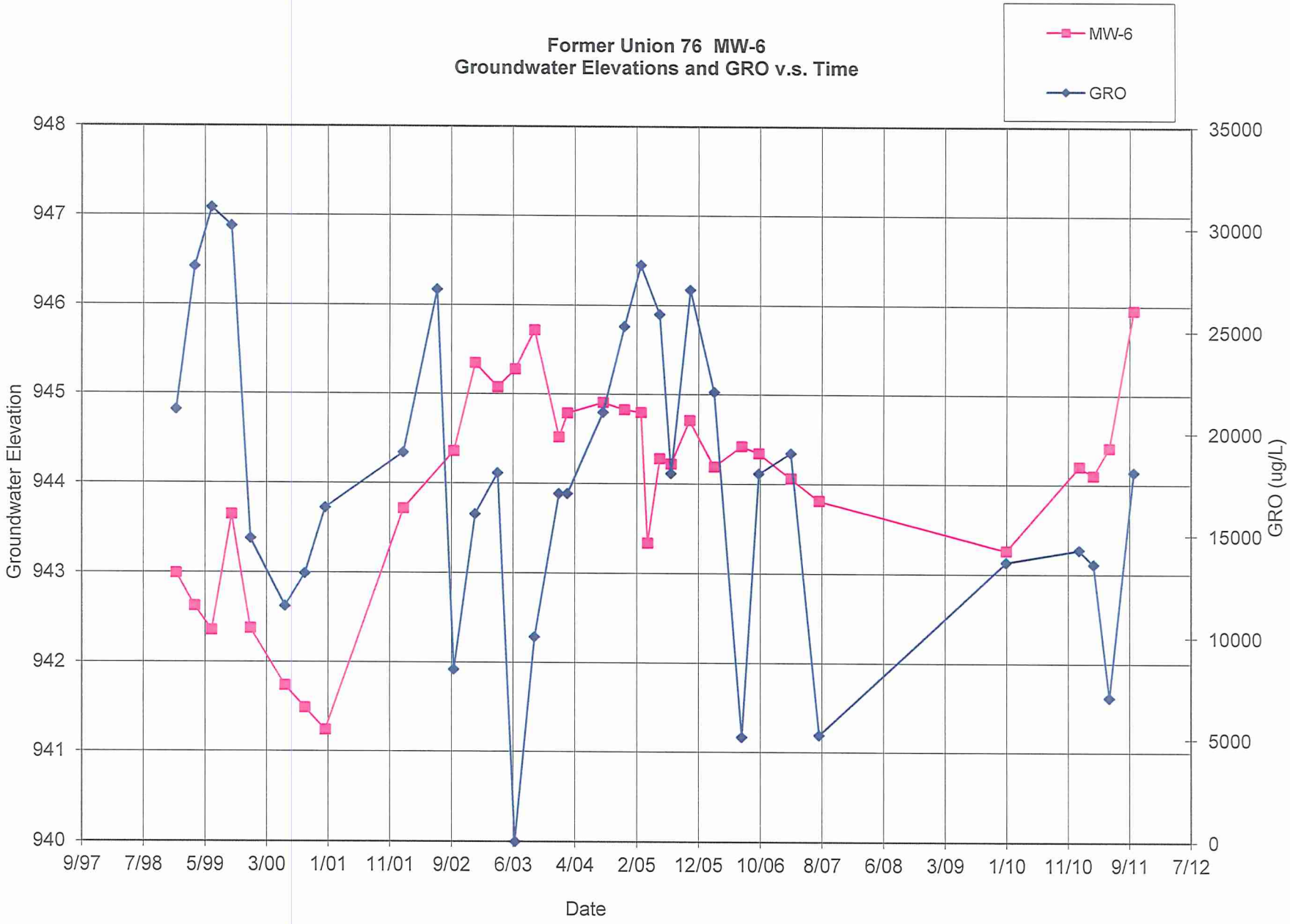
Groundwater Elevations and Benzene v.s. Time
MW-6
Benzene
Groundwater Elevation
Benzene (ug/L)
946
945
944
943
942
941
940
7000
6000
5000
4000
3000
2000
1000
0
11/97 7/98 3/99 12/99 8/00 4/01 12/01 9/02 5/03 1/04 9/04 5/05 2/06 10/06 6/07 2/08 10/08 7/09 3/10 11/10 7/11 4/12 12/12
Date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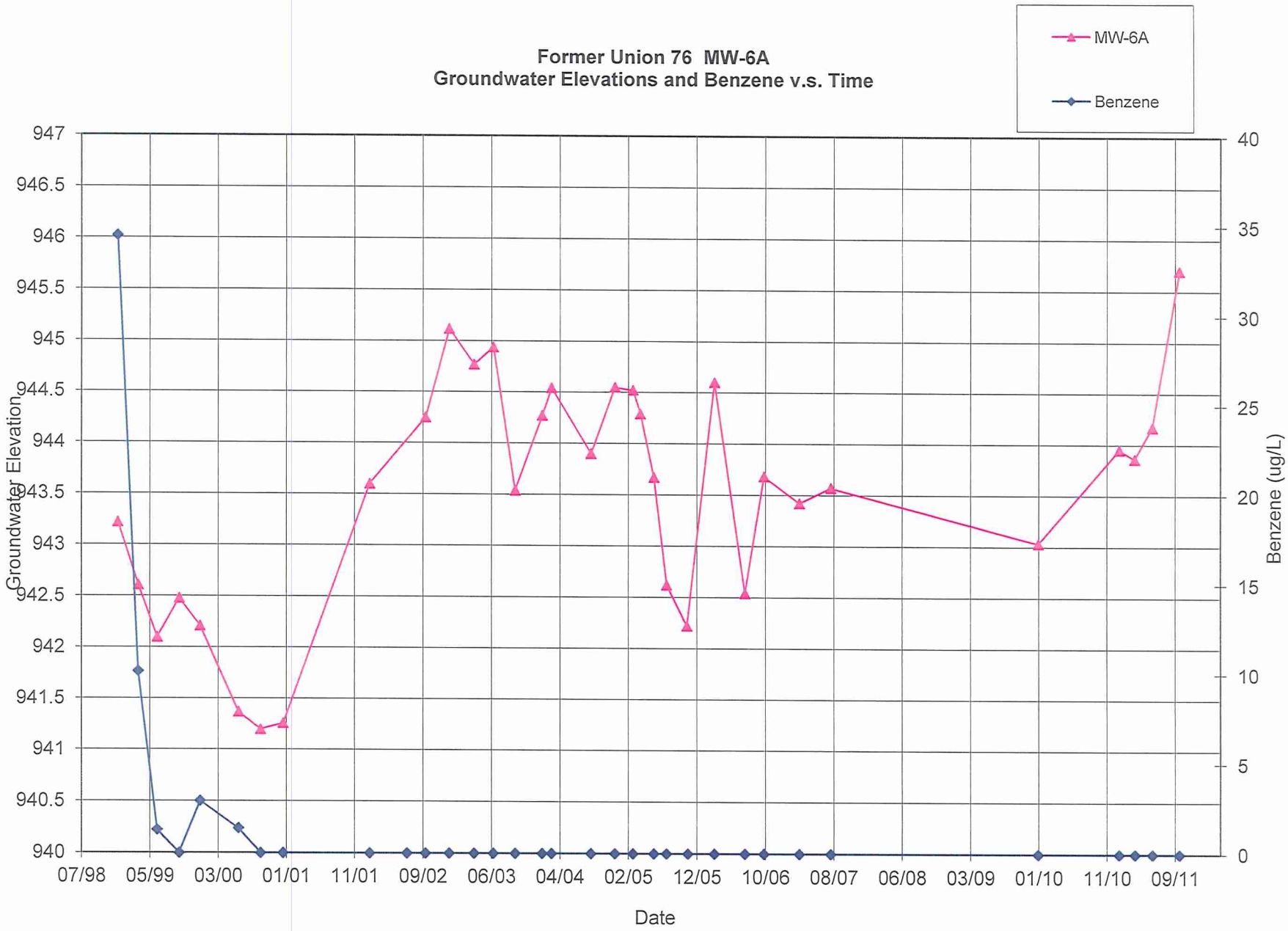
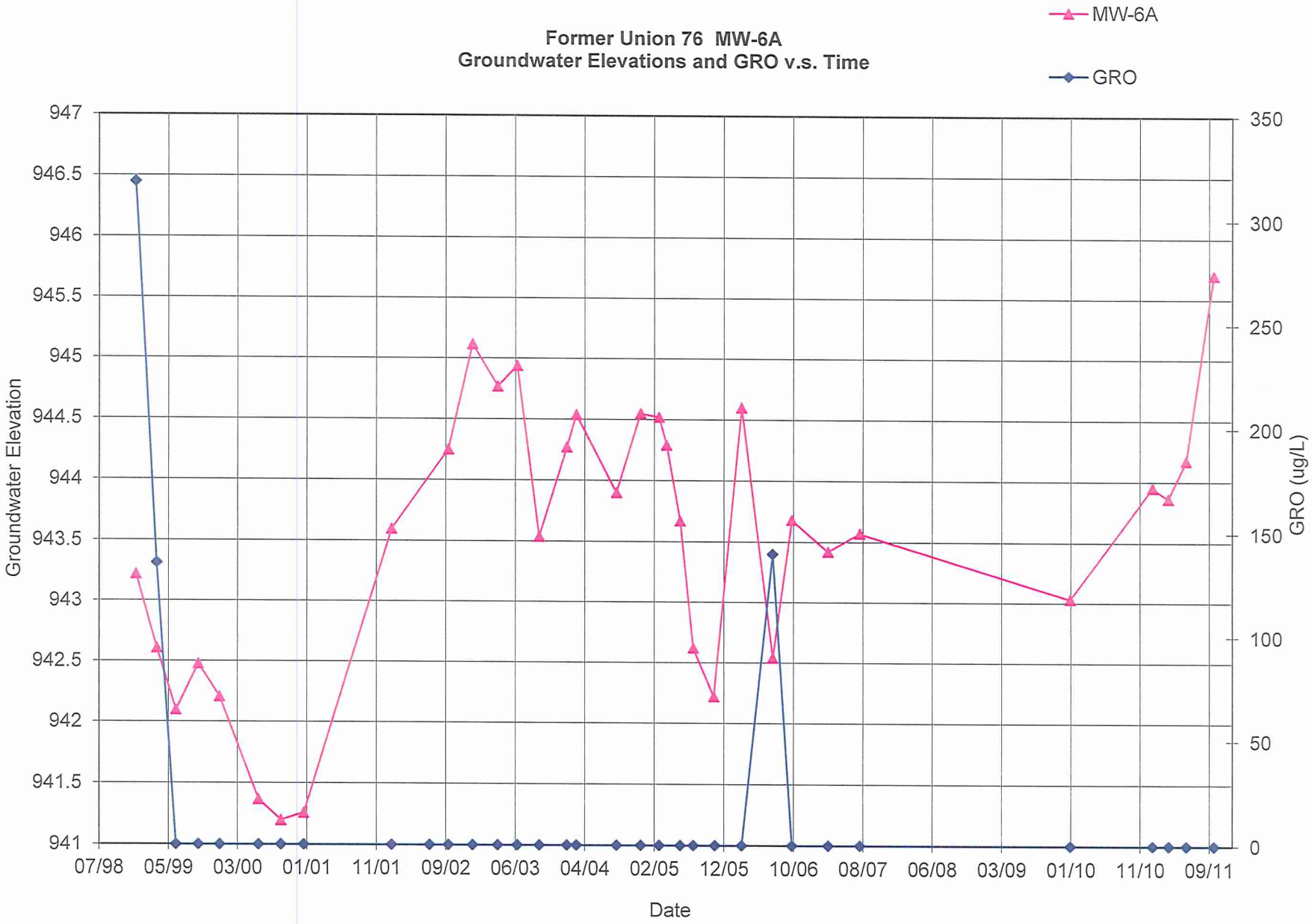
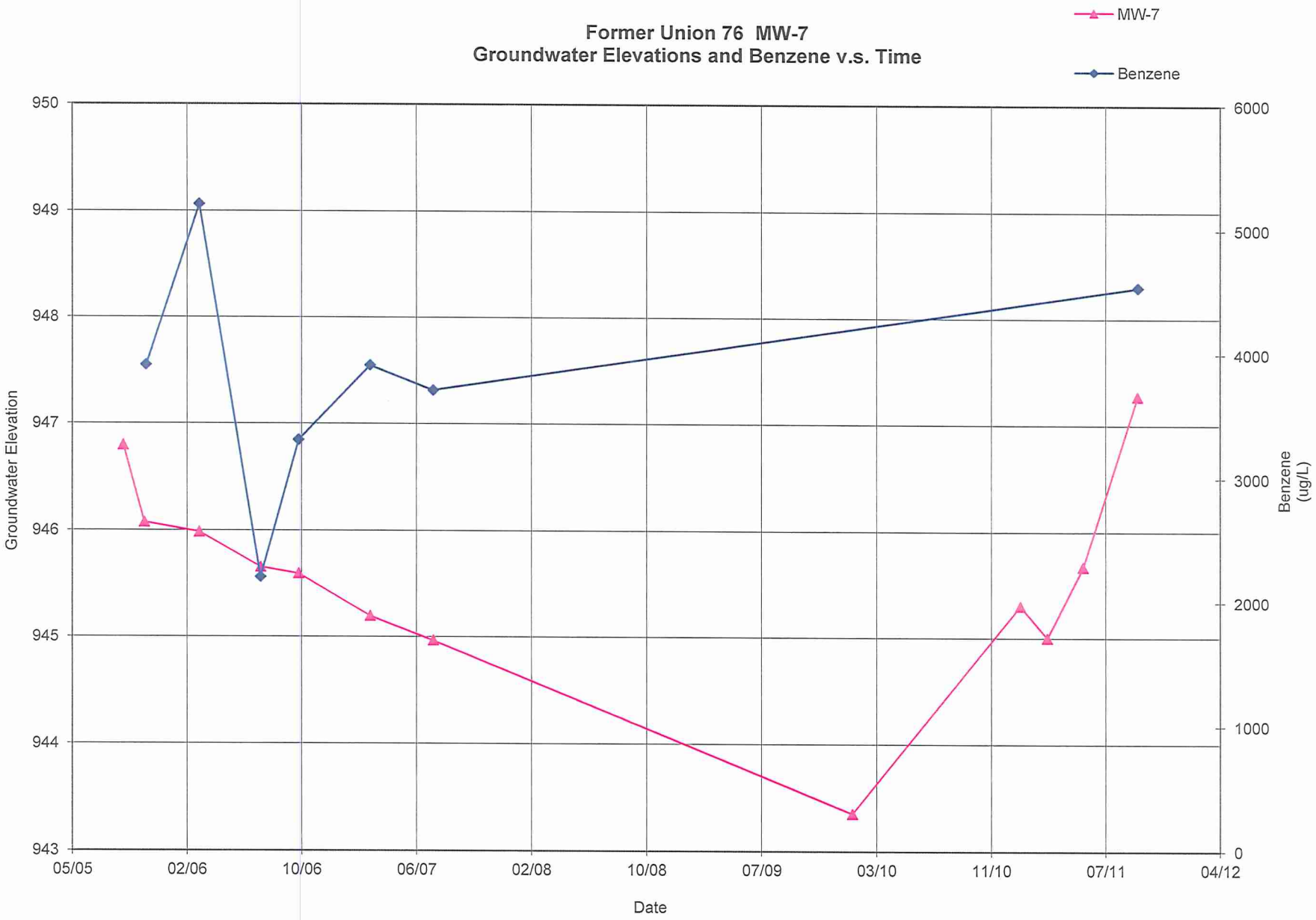
Groundwater Elevations and GRO v.s. Time
MW-6
GRO
Groundwater Elevation
GRO (ug/L)
Date
948
947
946
945
944
943
942
941
940
35000
30000
25000
20000
15000
10000
5000
0
9/97
7/98
5/99
3/00
1/01
11/01
9/02
6/03
4/04
2/05
12/05
10/06
8/07
6/08
3/09
1/10
11/10
9/11
7/12


Former Union 76 MW-6A
Groundwater Elevations and Benzene v.s. Time
MW-6A
Benzene
Groundwater Elevation
Benzene (ug/L)
Date
947
946.5
946
945.5
945
944.5
944
943.5
943
942.5
942
941.5
941
940.5
940
40
35
30
25
20
15
10
5
0
07/98
05/99
03/00
01/01
11/01
09/02
06/03
04/04
02/05
12/05
10/06
08/07
06/08
03/09
01/10
11/10
09/11


Former Union 76 MW-6A
Groundwater Elevations and GRO v.s. Time
MW-6A
GRO
Groundwater Elevation
GRO (ug/L)
947
946.5
946
945.5
945
944.5
944
943.5
943
942.5
942
941.5
941
350
300
250
200
150
100
50
0
07/98
05/99
03/00
01/01
11/01
09/02
06/03
04/04
02/05
12/05
10/06
08/07
06/08
03/09
01/10
11/10
09/11
Date


Former Union 76 MW-7
Groundwater Elevations and Benzene v.s. Time
MW-7
Benzene
Groundwater Elevation
Benzene (ug/L)
Date
950
949
948
947
946
945
944
943
6000
5000
4000
3000
2000
1000
0
05/05
02/06
10/06
06/07
02/08
10/08
07/09
03/10
11/10
07/11
04/12

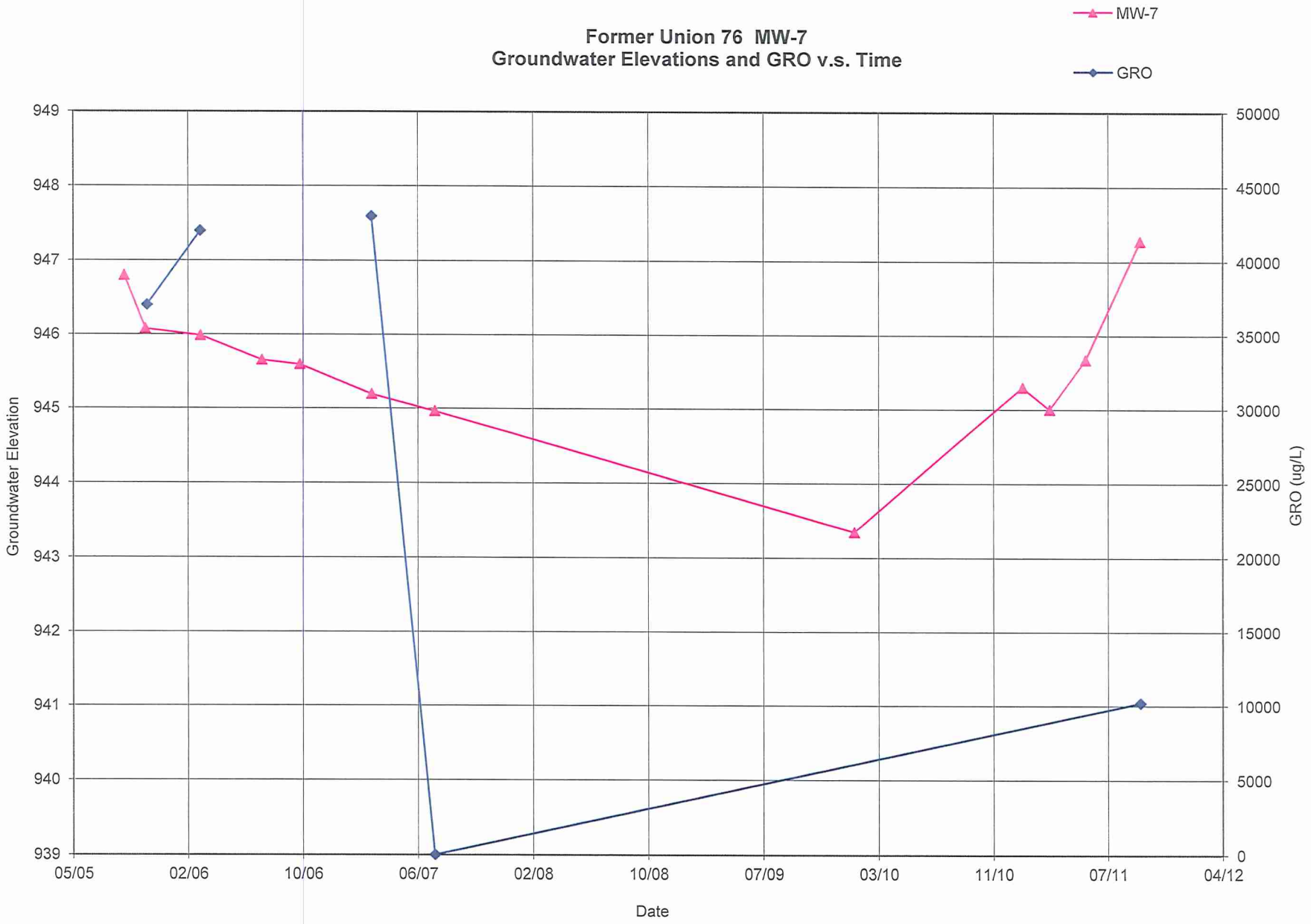

Former Union 76 MW-7
Groundwater Elevations and GRO v.s. Time
MW-7
GRO
Groundwater Elevation
GRO (ug/L)
Date
949
948
947
946
945
944
943
942
941
940
939
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
05/05
02/06
10/06
06/07
02/08
10/08
07/09
03/10
11/10
07/11
04/12

Table 1
Tank Information

Tank #	Tank Material[1]	UST or AST	Capacity (gallons)	Contents (product type)	Year Installed	Tank Status[2]	Tank Condition
001		UST	1,000	Diesel Fuel	Unknown	Removed	Good
002		UST	5,000	Gasoline	Unknown	Removed	Good
003		UST	5,000	Gasoline	Unknown	Removed	Good

[1] "F" for fiberglass or "S" for Steel
[2] Indicate: removed (date), abandoned in place (date), or currently in use.
Add additional rows as needed.
Notes:

Table 2
Results of Soil Headspace Screening

Depth (ft)	Soil Boring ID									
	1	2	3	4	5	6	7	8	9	10
4										
5	80	6.0			210		170			
6						0.0		150		
8										
9										
11	1000+	5.0	5.0	0.0	310	4.0	160	180		
12									66	450
15							135			
16					400	50		160	32	12
17			5.0	0.0						
18	1000+	68								
20	1000+		7.5	0.0					1000+	1000+
21					200	30	140	130		
26					240	0.5	5.0	250		
29	5.0									

Depth (ft)	Soil Boring ID									
	11	12	13	14	15	16	17	18	19	20
4	0.5	1.0	5.0	9.5						
5										
6										
8	0.0	0.5	1000+	36						
9			1000+			0.0	0.0	0.0	0.0	
11					390					
12	0.0	0.0	580	240						
15	0.5									
16		0.0	1000+	550	1000+					
17										
18										360
20		9.0	1000+	1000+	1000+	105	136	0.0	480	
21										
26										
29										

Depth (ft)	Soil Boring ID									
	21	22	23	24	25	26	27	28	29	30
4										
5			1999	1999	5.0					
6										
8										
9			1999	1999	5.0					
11										
12										
15			1999	1999	5.4					
16										
17										
18	360									
20		698								
21										
26										
29										

List instruments used and discuss field methods and procedures in Section 6. Add additional rows as needed, and copy the entire table if more columns are needed.
Notes:

Table 3
Analytical Results of Soil Samples[1]

Boring ID	Sampled Depth (ft)	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	GRO	DRO	Lab Type[2]
TH-1	17.5-19.5	4/19/95	<0.05	0.078	<0.05	<0.15		<10*	334	Fix
TH-1	28-30	4/19/95	4.97	52	45.9	322		2140	<10	Fix
TH-2	17.5-19.5	4/19/95	<0.05	0.101	<0.05	0.159		<10	<10	Fix
TH-3	17.5-19.5	4/19/95	<0.05	<0.05	<0.05	<0.15		<10	<10	Fix
TH-4	18.5-20.5	4/19/95	<0.05	0.069	<0.05	<0.15		<10	<10	Fix
TH-6	15-16.5	6/27/95	<0.05	<0.05	<0.05	<0.15		<10	<10	Fix
TH-7	5-6.5	6/27/95	<0.05	<0.145	0.109	<0.15		86.6	155	Fix
TH-7	25-26.5	6/27/95	<0.05	0.089	<0.05	<0.15		<10	<10	Fix
TH-8	5-6.5	6/27/95	326	794	183	955		14700	3470	Fix

[1] Report results in mg/kg. Use less than symbols to show detection limit.
[2] Indicate "mobile" or "fixed" in the lab type column.
Add additional rows as needed.
Notes:

~~Table 4~~
~~Other Contaminants Detected in Soils (Petroleum or Non-petroleum Derived)~~[1]

Boring ID	Sampled Depth (ft)	Date Sampled								Lab Type[2]

[1] Report results in mg/kg. Use less than symbols to show detection limit.
[2] Indicate "mobile" or "fixed" in the lab type column.
Indicate other contaminants (either petroleum or non-petroleum derived) detected in soil collected from borings. Add additional rows as needed, and copy the entire table if more columns are needed.
Notes:

~~Table 5~~
~~Contaminated Surface Soil Results~~

Sample ID	Headspace 10 ppm or Greater[1] (Y/N)	Petroleum Saturated (Y/N)

[1] As measured with a photoionization detector (PID).
Add additional rows as needed.
Notes:

Table 6
Water Level Measurements and Depths of Water Samples Collected from Borings

	Soil Boring									
	1	2	3	4	5	6	7	8	9	10
Static Water Level Depth[1] (ft)										
Sampled Depth (ft)										
Sampling Method[2]										

[1] Describe the methods used to measure water levels in borings in Section 6.
[2] Refer to Guidance Document 4-05 for acceptable ground water sampling methods.
Notes:

Table 7
Analytical Results of Water Samples Collected from Borings[1]

Boring ID	Date Sampled	Sampled Depth (ft)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	GRO	DRO	Lab Type
TH-1	4/19/95		1,080	1,520	943	9,000		5,840		Fixed
TH-9	8/01/95	20	129	133	38.5	68.7		3,200	1,500	Fixed
TH-10	8/01/95	20	318	314	49.9	295		15,100		Fixed
TH-11	8/01/95	20	<1.0	<1.0	<1.0	<3.0		<100		Fixed
TH-12	8/01/95	20	1.1	1.9	1.1	3.1		<100		Fixed
TH-13	8/01/95	20	130,000	349,000	162,000	244,000		9,100,000		Fixed
TH-14	8/01/95	20	19,600	37,200	11,200	66,200		1,660,000		Fixed
TH-15	8/01/95	20	10,100	20,500	5,160	23,100		597,000		Fixed
TH-16	8/01/95	20	2,130	5,210	1,230	5,910		135,000		Fixed
TH-17	11/28/95	20	3.6	<0.4	<0.4	<0.5		<100	300	Fixed
TH-18	11/28/95	20	<0.5	<0.4	<0.4	<0.5		<100	<100	Fixed
TH-19	11/28/95	20	1,900	5,470	3,350	25,730		57,900	7,300	Fixed
TH-20	11/28/95	20	1,450	85.6	75.1	494.7		10,900	1,500	Fixed
TH-21	11/28/95	22	328	55.5	377	910		12,900		Fixed
TH-22	11/28/95	22	122	69.9	17.1	99.6		1,100	100	Fixed
TH-23	6/23/97	20-24	1,346	11,900	990	6,590		49,880		Fixed
TH-24	6/23/97	20-24	1,310	2,650	674	4,200		26,930		Fixed
TH-25	6/23/97	20-24	<1.0	2.1	<1.0	<3.0		<100		Fixed
TH-26	6/23/97	20-24	1.0	3.4	<1.0	<3.0		<100		Fixed
TH-27	6/23/97	22-26	2,260	899	774	1,540		13,100		Fixed
TH-28	6/23/97	22-26	4,160	2,520	538	2,880		22,800		Fixed
TH-29	6/23/97	22	11.3	3.3	<1.0	<3.0		180		Fixed
TH-30	6/23/97	22	<1.0	<1.0	<1.0	<3.0		<100		Fixed
TH-31	6/24/97	22-26	88.2	3.1	<1.0	7.1		730		Fixed
TH-32	6/24/97	22-26	2,550	9,080	1,350	7,190		33,000		Fixed
TH-33	6/24/97	22-26	3,340	5,230	1,980	9,320		50,200		Fixed
TH-34	6/24/97	22-26	28.5	39.5	43.2	209		1,380		Fixed
TH-35	6/24/97	20-22	3,540	9,690	1,370	8,380		37,600		Fixed
TH-36	6/24/97	22-26	1,720	298	294	754		8,360		Fixed
TH-37	7/21/97	24-25	313	3.5	2.2	10.8		1,800		Fixed
TH-38	7/21/97	22-26	209	<1.0	1.2	8.8		700		Fixed
TH-39	7/21/97	28-32	147	<1.0	<1.0	<3.0		500		Fixed
TH-40	7/21/97	24-28	42	<1.0	<1.0	1.8		100		Fixed
TH-41	7/21/97	24-28	<1.0	<1.0	<1.0	<3.0		<100		Fixed
TH-42	8/02/97	24-26	<1.0	<1.0	<1.0	<3.0		<100		Fixed
TH-43	7/23/97	21-26	291	<1.0	1.1	5.3		670		Fixed
TH-44	7/23/97	24-26	36	<1.0	<1.0	<3.0		<100		Fixed
TH-45	7/23/97	26-28	4.9	<1.0	<1.0	<3.0		<100		Fixed
GP-1	1/21/2010	24-29	895	613	508	2,200	<25	10,200	3.6	Fixed
GP-2	1/21/2010	25-30	10.4	3.5	<1.0	8.6	5.7	1,240	0.42	Fixed
Trip Blank	1/21/2010		<1.0	<1.0	<1.0	<1.0	<5.0	<100		Fixed
Equip. Blank										
Lab Blank										
HRL[3]			10	200	50	300		200		

[1] Report results in µg/L. Use less than symbols to show detection limit.
[2] Indicate "mobile" or "fixed" in the lab type column.
[3] See http://www.health.state.mn.us/divs/eh/groundwater/hrltable.html for list of current HRLs.
Add additional rows as needed.
Notes:

Table 8
Other Contaminants Detected in Water Samples
Collected from Borings (Petroleum or Non-petroleum Derived)[1]

Boring ID	Date Sampled	Sampled Depth (ft)	Acetone	Methylethyl ketone	1,2-di-chloroethane	Methyl isobutylethane	1,2-Dibromoethane	Chlorobenzene	Isopropylbenzene	N-propylbenzene	1,3,5-TMB	Tert-Butylbenzene	1,2,4-TMB	Sec-Butylbenzene	p-Isopropyltoluene	n-butylbenzene	Napthalene	Lab Type[2]
TH-17	20	11/20/1995	4.5	<2.8	<0.3	<0.7	<0.8	<0.4	<0.7	<0.8	<0.2	<0.6	<0.7	<0.5	<0.4	<0.3	<0.7	
TH-18	20	11/20/1995	<0.3	<2.8	<0.3	<0.7	<0.8	<0.4	<0.7	<0.8	<0.2	<0.6	<0.7	<0.5	<0.4	<0.3	<0.7	
TH-19	20	11/20/1995	820	52,200	<0.3	<0.7	<0.8	<0.4	7,780	3,010	3,680	1,430	10,200	2,110	968	5,330	2,200	
TH-20	20	11/21/1995	52.3	529	41.9	12	15.9	<0.4	19.4	2.2	70.1	<0.6	375	<0.5	<0.4	28.7	172	
TH-21	22	11/21/1995	56.8	1630	24	<0.7	<0.8	112	302	384	491	120	1500	224	77.5	505	361	
TH-22	22	11/21/1995	29	63	<0.3	<0.7	<0.8	<0.4	4.1	0.9	4.6	<0.6	20.7	<0.5	<0.4	4.8	5.8	
GP-1											113		413					
GP-2	25-30	1/21/2010											1.1					
Trip Blank																		
Equip. Blank																		
Lab Blank																		
HRL[3]																		

[1] Report results in µg/L. Use less than symbols to show detection limit.
[2] Indicate "mobile" or "fixed" in the lab type column.
[3] See http://www.health.state.mn.us/divs/eh/groundwater/hrltable.html for list of current HRLs.
Indicate other contaminants (either petroleum or non-petroleum derived) detected in water samples collected from soil borings and temporary wells. Add additional rows as needed, and copy the entire table if more columns are needed.
Notes:

Table 9
Monitoring Well Completion Information[1]

Well Number	MDH Unique Well Number	Date Installed	Surface Elevation	Top of Casing Elevation	Bottom of Well Elevation	Screen Interval (Elev. - Elev.)	Total Well Depth from Surface (ft)
MW-1	554377	6/15/1995	963.07	963.10	939.07	939.07–949.07	
MW-2	554378	6/15/1995	963.67	963.37	939.67	939.67–949.67	
MW-3	554379	6/15/1995	961.97	963.72	934.97	934.97–944.97	
MW-4	617207	9/01/1998	964.87	964.62	935.87	935.87–945.87	
MW-5	617205	9/02/1998	963.84	963.68	934.84	934.84–944.84	
MW-5A	617206	9/02/1998	963.81	963.62	919.81	919.81–929.81	
MW-6	617203	9/02/1998	963.94	963.93	934.94	934.94–944.94	
MW-6A	617204	9/02/1998	963.76	963.73	922.76	922.76–932.76	
MW-7	731591	9/19/2005	963.27	963.29	939.29	939.29–949.29	

[1] Include well construction diagrams and MDH well logs in Section 6.
Add additional rows as needed.
Notes: (location and elevation of benchmark)

Table 10
Water Level Measurements in Wells[1]

Well Number	Date Sampled	Depth to Water from Top of Riser	Product Thickness	Depth to Water Below Grade	Relative Groundwater Elevation	Water Level Above Screen (Y/N)
MW-1	1/11/2002	NR	NR	NR	NR	NR
	6/24/2002	NR	ND	NR	NR	N
	9/13/2002	18.21	ND	18.18	944.89	N
	12/26/2002	17.73	ND	17.70	945.37	N
	4/14/2003	18.18	ND	18.15	944.92	N
	7/7/2003	17.74	ND	17.71	945.36	N
	10/10/2003	17.42	ND	17.39	945.68	N
	2/6/2004	18.20	ND	18.17	944.9	N
	3/18/2004	18.48	ND	18.45	944.62	N
	6/18/2004	NR	ND	NR	NR	NR
	9/7/2004	18.17	ND	18.14	944.93	N
	9/14/2004	NR	ND	NR	NR	NR
	12/20/2004	18.32	ND	18.29	944.78	N
	2/23/2005	NR	ND	NR	NR	NR
	3/10/2005	18.51	ND	18.48	944.59	N
	4/11/2005	18.79	ND	18.76	944.31	N
	6/9/2005	18.93	ND	18.90	944.17	N
	8/4/2005	18.77	ND	18.74	944.33	N
	11/1/2005	17.16	ND	17.13	945.94	N
	3/1/2006	18.13	ND	18.1	944.97	N
	7/13/2006	Dry	ND	NR	NR	N
	10/4/2006	18.67	ND	18.64	944.43	N
	3/9/2007	NS Covered w snow pile	NA	NR	NR	NA
	7/24/2007	19.28	ND	19.25	943.82	N
	1/20/2010	19.95	ND	19.92	943.15	N
	1/12/2011	18.96	0.15	18.93	944.14	N
	3/21/2011	19.16	ND	19.13	943.94	N
	6/7/2011	18.59	ND	18.56	944.51	N
	10/4/2011	17.03	ND	17.00	946.07	N
MW-3	10/10/2003	18.11	ND	16.36	945.61	Y
	2/6/2004	20.19	1.3'	18.44	943.53	N
	3/18/2004	20.21	1.3	18.46	943.51	N
	6/18/2004	19.65	0.56	17.90	944.07	N
	9/7/2004	18.97	ND	17.22	944.75	N
	9/14/2004	18.82	NR	17.07	944.90	N
	12/20/2004	19.13	0.05	17.38	944.59	N
	2/23/2005	10.94	0.77	9.19	952.78	N

Table 10
Water Level Measurements in Wells[1]

Well Number	Date Sampled	Depth to Water from Top of Riser	Product Thickness	Depth to Water Below Grade	Relative Groundwater Elevation	Water Level Above Screen (Y/N)
	3/10/2005	19.61	0.47	17.86	944.11	Y
	4/11/2005	20.13	0.86	18.38	943.59	N
	6/9/2005	20.46	1.03	18.71	943.26	N
	7/12/2005	20.22	0.82	18.47	943.50	N
	8/4/2005	20.15	0.79	18.4	943.57	N
	9/28/2005	N/R	N/R	NR	NR	
	10/5/2005	16.76	0.3	15.01	946.96	Y
	11/1/2005	17.44	0	15.69	946.28	Y
	3/1/2006	17.65	ND	15.9	946.07	Y
	7/13/2006	18.34	.52'	16.59	945.38	Y
	10/4/2006	18.92	ND	17.17	944.8	N
	3/9/2007	19.98	5.5"	18.23	943.74	N
	7/24/2007	NA	0.8"	NR	NR	N
	1/20/2010	TOC Broken	4"	NR	NR	N
	3/21/2011	17.89	ND	16.14	945.83	Y
	6/7/2011	17.29	ND	15.54	946.43	Y
	10/4/2011	15.77	ND	14.02	947.95	Y
MW-6	1/11/2002	20.21	ND	20.22	943.72	N
	6/24/2002	NR	ND	NR	NR	N
	9/13/2002	19.57	ND	19.58	944.36	N
	12/26/2002	18.58	ND	18.59	945.35	Y
	4/14/2003	18.85	ND	18.86	945.08	Y
	7/7/2003	18.65	ND	18.66	945.28	Y
	10/10/2003	18.21	ND	18.22	945.72	Y
	2/6/2004	19.41	ND	19.42	944.52	N
	3/18/2004	19.14	ND	19.15	944.79	N
	6/18/2004	NR	ND	NR	NR	NR
	9/7/2004	19.02	ND	19.03	944.91	N
	9/14/2004	NR	ND	NR	NR	N
	12/20/2004	19.1	ND	19.11	944.83	N
	2/23/2005	NR	ND	NR	NR	NR
	3/10/2005	19.13	ND	19.14	944.80	N
	4/11/2005	20.59	ND	20.60	943.34	N
	6/9/2005	19.65	ND	19.66	944.28	N
	8/4/2005	19.71	ND	19.72	944.22	N
	11/1/2005	19.22	ND	19.23	944.71	N
	3/1/2006	19.74	ND	19.75	944.19	N
	7/13/2006	19.51	ND	19.52	944.42	N
	10/4/2006	19.59	ND	19.60	944.34	N

Table 10
Water Level Measurements in Wells[1]

Well Number	Date Sampled	Depth to Water from Top of Riser	Product Thickness	Depth to Water Below Grade	Relative Groundwater Elevation	Water Level Above Screen (Y/N)
	3/9/2007	19.87	ND	19.88	944.06	N
	7/24/2007	20.12	ND	20.13	943.81	N
	1/20/2010	20.67	ND	20.68	943.26	N
	1/12/2011	19.73	ND	19.74	944.2	N
	3/21/2011	19.83	ND	19.84	944.1	N
	6/7/2011	19.52	ND	19.53	944.41	N
	10/4/2011	17.98	ND	17.99	945.95	Y
MW-6A	1/11/2002	20.13	ND	20.16	943.6	N
	6/24/2002	NR	ND	NR	NR	Y
	6/24/2002	NR	ND	NR	NR	Y
	9/13/2002	19.48	ND	19.51	944.25	Y
	12/26/2002	18.61	ND	18.64	945.12	Y
	4/14/2003	18.96	ND	18.99	944.77	Y
	7/7/2003	18.79	ND	18.82	944.94	Y
	10/10/2003	20.19	ND	20.22	943.54	Y
	2/6/2004	19.46	ND	19.49	944.27	Y
	3/18/2004	19.19	ND	19.22	944.54	Y
	6/18/2004	NR	ND	NR	NR	NR
	9/7/2004	19.83	ND	19.86	943.9	Y
	9/14/2004	NR	ND	NR	NR	NR
	12/20/2004	19.18	ND	19.21	944.55	Y
	2/23/2005	NR	ND	NR	NR	NR
	3/10/2005	19.21	ND	19.24	944.52	Y
	4/11/2005	19.44	ND	19.47	944.29	Y
	6/9/2005	20.06	ND	20.09	943.67	Y
	8/4/2005	21.11	ND	21.14	942.62	Y
	11/1/2005	21.51	ND	21.54	942.22	Y
	3/1/2006	19.13	ND	19.16	944.6	Y
	7/13/2006	21.19	ND	21.22	942.54	Y
	10/4/2006	20.05	ND	20.08	943.68	Y
	3/9/2007	20.31	ND	20.34	943.42	Y
	7/24/2007	20.16	ND	20.19	943.57	Y
	1/20/2010	20.70	ND	20.73	943.03	Y
	1/12/2011	19.78	ND	19.81	943.95	Y
	3/21/2011	19.87	ND	19.9	943.86	Y
	6/7/2011	19.56	ND	19.59	944.17	Y
	10/4/2011	18.03	ND	18.06	945.7	Y
MW-7	9/16/2005	17.00	ND	16.98	946.29	N
	11/1/2005	17.72	ND	17.70	945.57	N

Table 10
Water Level Measurements in Wells[1]

Well Number	Date Sampled	Depth to Water from Top of Riser	Product Thickness	Depth to Water Below Grade	Relative Groundwater Elevation	Water Level Above Screen (Y/N)
	3/1/2006	17.81	ND	17.79	945.48	N
	7/13/2006	18.14	ND	18.12	945.15	N
	10/4/2006	18.20	ND	18.18	945.09	N
	3/9/2007	18.60	ND	18.58	944.69	N
	7/24/2007	18.83	ND	18.81	944.46	N
	1/20/2010	20.45	16"	20.43	942.84	N
	1/21/2011	18.50	0.15	18.48	944.79	N
	3/21/2011	18.8	0.15	18.78	944.49	N
	6/7/2011	18.13	ND	18.11	945.16	N
	10/4/2011	16.53	ND	16.51	946.76	N

[1] Describe the methods used to measure water levels in Section 6.
Add additional rows as needed.
Notes:

Table 11
Analytical Results of Water Samples Collected from Wells[1]

Well Number	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	GRO	DRO	Lab Type[2]
MW-1	1/11/2002	NS	NS	NS	NS	NS	NS	NS	Fixed
	6/24/2002	<1.0	<1.0	2.6	26/15	<1.0	200	NA	Fixed
	9/13/2002	<1.0	5.6	14	240	NA	610 H	NA	Fixed
	12/26/2002	<1.0	<1.0	<1.0	67	NA	110	NA	Fixed
	4/14/2003	<1.0	2.1	4.1	131	<1.0	1,900	NA	Fixed
	7/7/2003	<1.0	17	8	2,100	<1.0	4,300	NA	Fixed
	10/10/2003	<1.0	10	19	580	<1.0	2,500	NA	Fixed
	2/6/2004	ND	2.1	9.1	192	ND	240	NS	Fixed
	3/18/2004	ND	14	63	1120	ND	2,300	NA	Fixed
	9/7/2004	ND	32	220	2400	ND	6,800	NA	Fixed
	12/20/2004	ND	51.9	300	4660	ND	8,940	NA	Fixed
	3/10/2005	ND	ND	72.8	2940	ND	11,500	NA	Fixed
	6/9/2005	ND	ND	16.4	905	ND	2,220	NA	Fixed
	8/4/2005	3.8	ND	94	2100	ND	4,300	NA	Fixed
	11/9/2005	<0.50	ND	ND	100	ND	9,400	NA	Fixed
	3/1/2006	<1.0	<5.0	110	3,900	NS	10,000	NA	Fixed
	7/13/2006	Well dry	NS	NS	NS	NS	NS	NS	Fixed
	10/4/2006	<0.05	<5.0	2.7	100	<1.0	190	680	Fixed
	3/9/2007	NS	NS	NS	NS	NS	NS	NS	Fixed
	7/24/2007	<0.5	<0.5	0.55	1.93	<1.0	<100	NS	Fixed
	1/20/2010	<1.0	<1.0	<1.0	<3.0	<5.0	<100	180	Fixed
	1/12/2011	<1.0	<1.0	<1.0	23.4	<5.0	<100	2600	Fixed
	3/23/2011	<1.0	<1.0	<1.0	4.7	<5.0	<100	1610	Fixed
	6/8/2011	<1.0	<1.0	1.5	59.2	<5.0	218	2230	Fixed
	10/4/2011	<1.0	<1.0	8.6	272	<5.0	838	1960	Fixed
MW-3	3/1/2006	1,600	<5,000	<1,000	5,100	NS	260,000	NA	Fixed
	3/23/2011	159	209	46.9	777	ND	8,320	8270	Fixed
	6/8/2011	493	521	71.8	2,900	<50	15,600	12800	Fixed
	10/5/2011	2,420	1780	156	6,800	<50	22,600	7630	Fixed
MW-6	1/11/2002	3,600	3,100	680	1,200/490	<1.0	19,000	NA	Fixed
	6/24/2002	5,800	5,800	1,200	3,100/1,100	<50	27,000	NA	Fixed
	9/13/2002	1,600	1,100	360	1,100	NA	8,400 H	NA	Fixed
	12/26/2002	2,800	750	3,200	2,800	NA	16,000	NA	Fixed

Table 11
Analytical Results of Water Samples Collected from Wells[1]

Well Number	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	GRO	DRO	Lab Type[2]
	4/14/2003	3,500	2,600	830	2,750	<20	18,000	NA	Fixed
	7/7/2003	2,300	2,200	660	1,940	<50	16,000	NA	Fixed
	10/10/2003	1,500	1,600	450	1,400	<50	10,000	NA	Fixed
	2/6/2004	2700	2,200	1,000	2,540	ND	17,000	NA	Fixed
	3/18/2004	3,200	2,600	830	2,180	ND	17,000	NA	Fixed
	9/7/2004	3,600	2,800	1,200	4,130	ND	21,000	NA	Fixed
	12/20/2004	3,110	6,110	1,470	5,040	ND	25,200	NA	Fixed
	3/10/2005	4,030	7,650	1,610	6,340	ND	28,200	NA	Fixed
	6/9/2005	4,500	5,800	1,570	5,310	ND	25,800	NA	Fixed
	8/4/2005	4,900	2,400	950	2,870	420	18,000	NA	Fixed
	11/9/2005	3,700	4,400	970	100	ND	27,000	NA	Fixed
	3/1/2006	2,500	1,300	<100	3,500	NS	22,000	NA	Fixed
	7/13/2006	2,500	<500	<50	1,100	<100	<10,000	5,100	Fixed
	10/4/2006	3,500	2,100	1,100	2,260	350	18,000	4,300	Fixed
	3/9/2007	4,000	2,700	350	3,540	780	19,000	5,100	Fixed
	7/24/2007	740	480	72	730	<10	5,200	NS	Fixed
	1/20/2010	3,010	1,430	578	1,510	<50	13,700	4,600	Fixed
	1/12/2011	2,200	2,280	725	2,690	<50	14,300	2,670	Fixed
	3/23/2011	2,410	1,670	490	1,320	13.6	13,600	3,850	Fixed
	6/8/2011	1,890	484	272	748	<50	7,060	3,230	Fixed
	10/4/2011	2,810	3,500	913	4,110	<50	18,100	4,250	Fixed
MW-6A	1/11/2002	<1.0	<1.0	<1.0	<2.0/<1.0	3.4	<100	NA	Fixed
	6/24/2002	<1.0	<1.0	<1.0	<2.0/<1.0	<1.0	<100	NA	Fixed
	9/13/2002	<1.0	<1.0	<1.0	<1.0 total	<1.0	<100	NA	Fixed
	12/26/2002	<1.0	<1.0	<1.0	<1.0 total	<1.0	<100	NA	Fixed
	4/14/2003	<1.0	<1.0	<1.0	<2.0/<1.0	<1.0	<60	NA	Fixed
	7/7/2003	<1.0	<1.0	<1.0	<2.0/<1.0	<1.0	<60	NA	Fixed
	10/10/2003	<1.0	<1.0	<1.0	<2.0/<1.0	<1.0	<60	NA	Fixed
	2/6/2004	ND	ND	ND	ND	ND	ND	NA	Fixed
	3/18/2004	<0.5	<1.0	<1.0	<0.50/<0.50	<1.0	ND	NA	Fixed
	9/7/2004	ND	ND	ND	ND	ND	ND	NA	Fixed
	12/20/2004	ND	ND	ND	ND	ND	ND	NA	Fixed
	3/10/2005	ND	ND	ND	ND	ND	ND	NA	Fixed
	6/9/2005	ND	ND	ND	ND	ND	ND	NA	Fixed
	8/4/2005	ND	ND	ND	ND	ND	ND	NA	Fixed
	11/9/2005	ND	ND	ND	ND	ND	ND	NA	Fixed
	3/1/2006	<1.0	<5.0	<1.0	<3.0	NS	<100	NA	Fixed

Table 11
Analytical Results of Water Samples Collected from Wells[1]

Well Number	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	GRO	DRO	Lab Type[2]
	7/13/2006	<0.5	<5.0	<0.5	<1.0	<10.0	<100	140	Fixed
	10/4/2006	<0.5	<5.0	<0.5	<1.0	<10.0	<100	190	Fixed
	3/9/2007	<0.5	<5.0	<0.5	<1.0	<10.0	<100	170	Fixed
	7/24/2007	<0.5	<5.0	<0.5	<1.0	<10.0	<100	NS	Fixed
	1/20/2010	<1.0	<1.0	<1.0	<3.0	<5.0	<100	170	Fixed
	1/12/2011	<1.0	<1.0	<1.0	<3.0	<5.0	<100	126	Fixed
	3/23/2011	<1.0	<1.0	<1.0	<3.0	<5.0	<100	125	Fixed
	6/8/2011	<1.0	<1.0	<1.0	<3.0	<5.0	<100	312	Fixed
	10/4/2011	<1.0	<1.0	<1.0	<3.0	<5.0	<100	146	Fixed
MW-7	11/9/2005	3900	8600	1200	7800	ND	37000	NA	Fixed
	3/1/2006	5,200	<12,000	<2,500	8,200	<2,500	42,000	NA	Fixed
	7/13/2006	2,200	6,000	1,400	7,700	<1.0	NA	6,900	Fixed
	10/4/2006	3,300	6,000	1,900	8,300	<50	NA	9,100	Fixed
	3/9/2007	3,900	7,300	1,500	7,000	<10	43,000	10,000	Fixed
	7/24/2007	3,700	7,600	1,700	8,600	1,300	<100,000	8,600	Fixed
	10/4/2011	4,540	8,050	1,910	10,200	572	10200	14,200	Fixed
Lab Blank	1/11/2002	ND	ND	ND	ND	NA	ND	NA	Fixed
	6/24/2002	ND	ND	ND	ND	NA	ND	NA	Fixed
	9/13/2002	ND	ND	ND	ND	NA	ND	NA	Fixed
	12/26/2002	ND	ND	ND	ND	NA	ND	NA	Fixed
	4/14/2003	ND	ND	ND	ND	NA	ND	NA	Fixed
	7/7/2003	ND	ND	ND	ND	NA	ND	NA	Fixed
	10/10/2003	ND	ND	ND	ND	NA	ND	NA	Fixed
	2/6/2004	ND	ND	ND	ND	NA	ND	NA	Fixed
	3/18/2004	ND	ND	ND	ND	NA	ND	NA	Fixed
	9/7/2004	ND	ND	ND	ND	NA	ND	NA	Fixed
	12/20/2004	ND	ND	ND	ND	NA	ND	NA	Fixed
	3/10/2005	ND	ND	ND	ND	NA	ND	NA	Fixed
	6/9/2005	ND	ND	ND	ND	NA	ND	NA	Fixed
	8/4/2005	ND	ND	ND	ND	NA	ND	NA	Fixed
	11/9/2005	ND	ND	ND	ND	NA	ND	NA	Fixed
	3/1/2006	ND	ND	ND	ND	NA	ND	NA	Fixed
	7/13/2006	ND	ND	ND	ND	ND	ND	NA	Fixed
	10/4/2006	ND	ND	ND	ND	ND	ND	NA	Fixed
	1/12/2011	ND	ND	ND	ND	ND	ND	NA	Fixed
	3/23/2011	ND	ND	ND	ND	ND	ND	NA	Fixed
	6/8/2011	ND	ND	ND	ND	ND	ND	NA	Fixed
	10/4/2011	ND	ND	ND	ND	ND	ND	NA	Fixed

Table 11
Analytical Results of Water Samples Collected from Wells[1]

Well Number	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	GRO	DRO	Lab Type[2]
HRL(ug/L)		10	1000	700	10000				

[1] Report results in µg/L. Use less than symbols to show detection limit.
[2] Indicate "mobile" or "fixed" in the lab type column.
[3] See http://www.health.state.mn.us/divs/eh/groundwater/hrltable.html for list of current HRLs.
Add additional rows as needed.
Notes:

~~Table 12~~
~~Other Contaminants Detected in Water Samples~~
~~Collected from Wells (Petroleum or Non-petroleum Derived)~~[1]

Well Number	Date Sampled								Lab Type[2]
MW-1									
MW-2									
MW-3									
MW-4									
Trip Blank									
Equip. Blank									
Lab Blank									
HRL[3]									

[1] Report results in µg/L. Use less than symbols to show detection limit.
[2] Indicate "mobile" or "fixed" in the lab type column.
[3] See http://www.health.state.mn.us/divs/eh/groundwater/hrltable.html for list of current HRLs.
Indicate other contaminants (either petroleum or non-petroleum derived) detected in water samples collected from wells.
Add additional rows as needed, and copy the entire table if more columns are needed.
Notes:

~~Table 13~~
~~Natural Attenuation Parameters~~

Well Number	Sample Date	Temp. °C	pH	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	(Fe II) (mg/L)	(H_2S, HS^-) (mg/L)
MW-1							
MW-2							
MW-3							
MW-4							

Describe the methods and procedures used in Section 6. Add additional rows as needed
Notes:

Table 14 - Free Product Recovery MW-3 and MW-7

Monitoring Well	Date	Time	Product Recovered (ml)	Water Level Depth Below Grade	Product Interface Level - Notes
MW-3	1/11/2002	11:30	800	20.73'	0.3"- Gasoline Recovered
MW-3	1/23/2002	2:30	100	-	Gasoline Recovered
MW-3	3/20/2002	2:20	500	21'	0.5" - Gasoline Recovered
MW-3	3/29/2002	2:30	1000	-	Gasoline Recovered
MW-3	5/1/2002	1:50	800	21.22'	0.5" - Gasoline Recovered
MW-3	5/14/2002	2:45	1000	-	Gasoline Recovered
MW-3	6/7/2002	3:00	200	-	Gasoline Recovered
MW-3	6/24/2002	3:50	200	21.3'	None Recorded - Gasoline/Water Mixture
MW-3	8/12/2002	2:30	1000	-	Gasoline/Water Mixture
MW-3	8/28/2002	10:15	1000	-	Gasoline/Water Mixture
MW-3	9/13/2002	12:45	1000	20.0'	None Recorded - Gasoline/Water Mixture
MW-3	9/27/2002	2:00	1000	-	Gasoline/Water Mixture
MW-3	10/11/2002	1:40	1000	-	Gasoline/Water Mixture
MW-3	10/25/2002	3:00	1000	-	Gasoline/Water Mixture
MW-3	11/4/2002	1:00	1000	-	Gasoline/Water Mixture
MW-3	12/6/2002	2:30	1000	-	Gasoline/Water Mixture
MW-3	12/26/2002	11:15	1000	17.1'	None Recorded - Gasoline/Water Mixture
MW-3	1/14/2002	2:00	1000	-	Gasoline/Water Mixture
MW-3	2/6/2004	1:00	11356		Gasoline/Water Mixture
MW-3	3/18/2004	12:30	6435	20.21	DTP = 18.91, DTW = 20.21 (1.3'product)
MW-3	9/7/2004	10:30	10	18.97	
MW-3	9/14/2004	7:40	0	18.82	no measurable free product- after vac truck
MW-3	9/27/2004	12:00	0	18.83	well raiser tilted by car collision, could not send bailor down
MW-3	12/20/2004	9:00	200	19.18	
MW-3	2/23/2005	8:15	2250	10.94	0.77 inches of product in well
MW-3	2/28/2005	7:50	34360	19.72	vac truck removed apporx. 8 gal of free product
MW-3	3/10/2005	8:00	2300	19.61	balied product to a sheen/ waited for well to recover and repeated
MW-3	4/11/2005	13:10	2.7	20.13	bailed product, but well recharged and prod. Still remained
MW-3	6/9/2005	11:30	0.25	20.46	bailed product and well recharged leaving a sheen
MW-3	7/12/2005	11:30	0.2	20.22	bailed product
MW-3	8/4/2005	12:00	0	20.15	no product removed
MW-3	9/28/2005	12:30	4000	N/A	vac truck removed approximately 1 gallon of product from well
MW-3	10/5/2005	10:30	0	16.76	no product removed
MW-3	11/1/2005	11:00	0	17.44	no product present in well
MW-3	3/1/2006	NA	0	17.65	no product present in well
MW-3	7/13/2006	NA	1000	18.34	0.52 inches of product in well
MW-3	10/4/2006	NA	0	18.92	no product present in well
MW-3	3/9/2007	NA	1200	19.88	5.5 inches of product in well
MW-3	7/24/2007	NA	800	NA	0.8 inches of product in well
MW-3	1/20/2010	NA	1200	NA	4 inches of product in well
MW-3	1/12/2011	NA	0	NA	no product present in well
MW-3	3/21/2011	NA	0	17.89	no product present in well
MW-3	6/7/2011	NA	0	17.29	no product present in well
MW-3	10/4/2011	NA	0	15.77	no product present in well
MW-3	3/29/2012	9:20	0	18.00	no product present in well
MW-3	4/27/2012	2:30	0	NA	no product present in well
MW-3	5/30/2012	10:00	1894	NA	3.5 inches of product in well
MW-3 Total (ml)			**81608**		
MW-3 Total (Gal)			**21.6**		
MW-7	9/16/2005	NA	0	17.00	no product present in well
MW-7	11/1/2005	NA	0	17.72	no product present in well
MW-7	3/1/2006	NA	0	17.81	no product present in well
MW-7	7/13/2006	NA	0	18.14	no product present in well
MW-7	10/4/2006	NA	0	18.2	no product present in well
MW-7	3/9/2007	NA	0	18.6	no product present in well
MW-7	7/24/2007	NA	0	18.83	no product present in well
MW-7	1/20/2010	NA	2500	20.45	16 inches of product in well
MW-7	1/12/2011	NA	2000	18.5	1.8 inches of product in well
MW-7	3/21/2011	NA	1700	18.8	1.8 inches of product in well
MW-7	6/7/2011	NA	0	18.13	no product present in well
MW-7	10/4/2011	NA	0	16.53	no product present in well
MW-7	3/29/2012	9:40	0	19.05	no product present in well
MW-7	4/27/2012	2:30	0	NA	no product present in well
MW-7	5/30/2012	10:00	0	17.55	no product present in well
MW-7 Total (ml)			**6,200**		
MW-7 Total (Gal)			**1.6**		

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Focused Investigation Work Plan

Petroleum Remediation Program
Guidance Document 7-03

Doc Type: Corrective Action Design

Instructions: Complete this work plan to propose a focused investigation. See Guidance Document 7-01 *Corrective Action Design and Implementation* for more information and requirements. Do not revise or delete any text or questions from this work plan. Items may be added if they are needed to support the proposed focused investigation work. If an item is not applicable, provide a brief explanation.

MPCA Leak ID: 8001 Report date: 11/2/1994

Responsible Party Information

Name: Mille Lacs Oil Company – Maria Olson Phone: 763-689-2220

Mailing address: 102 Main Street

City: Cambridge State: MN Zip code: 55008

Alternate contact (if any) for responsible party: Phone:

Leak Site Information

Leak site name: Cambridge Union 76 Phone: NA

Leak site address: 329 East First Avenue South

City: Cambridge MN Zip code: 55008 County: Isanti

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 leak site. 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 a reduction in Petrofund reimbursement. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leak site 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 (2007) or Minn. R. 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.

Company name: Liesch Associates, Inc.

Mailing address: 13400 15th Avenue North

City: Plymouth State: MN Zip code: 55441

Project manager name: Aaron Benker Phone: 763-489-3100

Fax: 763-489-3101 E-mail: Aaron.benker@liesch.com

Report Author(s)

Print name: Dan Larson Title: Hydrogeologist

Signature: Date:

Print name: Title:

Signature: Date:

Report Reviewer(s)

Print name: Aaron Benker Title: Project Manager

Signature: _____ Date: _____

Print name: _____ Title: _____

Signature: _____ Date: _____

Name of field technician(s): Dan Larson

Section 1: Site Conceptual Model Update

Include updated cumulative tables and figures from Guidance Document 4-06 *Investigation Report Form* in Appendix A. Include documentation of additional site investigation, site monitoring, and interim corrective actions in Appendix B.

1. Describe any additional site investigation, site monitoring, and/or interim corrective actions completed since the last submitted report.

   Liesch Hydrogeologist Dan Larson completed checks for LNAPL (MW-3 and MW-7) on the following dates:
   - *March 29, 2012 (no product in either well)*
   - *April 27, 2012 (no product in either well)*
   - *May 30, 2012 (no product in MW-7, 3.5" product in MW-3. Remove/dispose of 4 gallons product/water mix)*

2. Discuss the results of the additional site investigation, site monitoring, and/or interim corrective actions.

   No product was found in monitoring wells MW-3 or MW-7.

3. Provide an updated and comprehensive site conceptual model.

   LNAPL
   LNAPL has not been detected in MW-7since March 31, 2011. LNAPL has not been detected in monitoring well MW-3 since January 20, 2010.

   A LIF investigation, conducted in March 2011, provided a better understanding of the occurrence of LNAPL beneath the site and adjacent Property to the west (American Legion). The LIF investigation also provided vertical and horizontal delineation of the most significant LNAPL beneath the site; however, complete delineation of NAPL has not occurred north of L-19 and south of 2nd Avenue southwest of the site.

   One finding of the LIF investigation is that there is no shallow LNAPL west of the east curb line separating South Buchanan Street and the Union 76 Property. This observation is important since utilities are not buried deeper than 12 feet beneath Buchanan Street; this significantly reduces the risk these utilities pose as a receptor. Further, the EC plots do not indicate heterogeneous soil conditions in the presence of shallow LNAPL which could lead to preferential migration of LNAPL. The LIF Investigation report was submitted to the MPCA under separate cover.

   Groundwater
   Groundwater monitoring has been occurring at the site since June 1995. The groundwater contamination plume appears to be relatively stable.

   Vapor Intrusion
   Liesch collected three soil vapor samples to assess off-site vapor intrusion potential. Vapor Pt #1 was collected west of the Midwest Environmental Consulting building located at 145 Second Avenue SE, Vapor Pt #2 was collected on the east side of the American Legion Building located at 200 Second Avenue SE, and Vapor Pt #3 was collected to the east of the Cambridge Bible Bookstore located at 220 Main Street South. All vapor samples were collected at depths between 6-8 feet below grade.

   Vapor Pt #1, #2 and #3. No detectable concentrations of VOCs were identified in Vapor Pt #1 and Vapor Pt #3. Vapor Pt #2 (American Legion) detected several VOCs of which benzene at 84.6 ug/m3 was detected above the ISV of 4.5 ug/m3 and 1,3-butadine was detected at 64.5 ug/m3 above the ISV of 0.3 ug/m3. MPCA guidance document 4-01a provides guidelines for comparing soil gas sample results to 10 times the ISV and 100 times the ISV. Benzene detected at 86.6 ug/m3 in Vapor Pt #2 exceeds 10 times the ISV of 45 ug/m3 but does not exceed 100 times the ISV 450 ug/m3. While 1,3 Butadiene exceeds 100 times the ISV of 30 ug/m3 1,3-Butadine is not anticipated to be a contaminant of concern for the petroleum release. Liesch recommends that an additional vapor intrusion assessment be completed at the American Legion Building which would include completion of an Indoor Building Survey and collection of sub-slab vapor samples to determine if a vapor pathway exists for this potential receptor.

   Liesch collected a subslab vapor sample beneath the basement of the American Legion building to assess the potential for vapor migration into the building. Based on results of the Subslab-1 sample beneath the American Legion building, there does

not appear to be a vapor pathway between the deeper (18-20') dissolved phase petroleum impacts and the American Legions subslab. A Vapor Intrusion Interior Building Survey Form was also included to address the potential vapor intrusion risk to the American Legion Building.

In addition, an updated utility vapor survey was conducted and no petroleum vapors were identified.

4. Provide recommendations for additional site investigation, site monitoring, and/or interim corrective actions to be completed prior to corrective action design approval, including their purpose and schedule for completion.

   Additional site investigation recommendations are the same as requested in the MPCA "Request for Additional Work" letter dated February 16, 2012 – See Section 3.

Section 2: Focused Investigation Overview

1. If the proposed focused investigation work is different than requested by the Minnesota Pollution Control Agency, identify the differences and explain why. *NA*

2. Discuss how the focused investigation results will be used to design the pilot test, if applicable, and advance the detailed design of the proposed corrective action. *NA*

Section 3: Focused Investigation Description

Provide a site map and cross sections showing the proposed locations and depths of data collection points, such as borings, probes, and wells, in Section 4.

1. Discuss the proposed focused investigation scope, including what data will be collected, where the data will be collected (locations and depths), and the rationale for their collection.

   LIF / EC Probes
   Prior to conducting the LIF / EC probes, one soil probe will be advanced at the location of one of the proposed LIF / EC probe locations for purposes of calibrating the EC probe. This probe will be completed to a depth of 30 feet using the macro-core and closed-piston macro-core sampler. Soils will be screened with a PID and no laboratory samples will be collected. Seven LIF / EC probes will be initially completed (first tier) to delineate the horizontal extent of NAPL; two probes will be completed north of the Union 76 building, two probes will be completed north of LIF probe L-19, and three probes will be completed south of 2nd Avenue southwest of the site. In the event there are signal readings above 2%, additional delineation probes (second tier) will be completed. The LIF probes will be completed to depths of 10 feet below the water table or 10 feet below the deepest measureable LNAPL (>2%), whichever is deeper. Most probes are anticipated to be completed to depths of approximately 30 feet below grade. The proposed first and second tier LIF / EC probes are shown on Figure 2.

   Monitoring Wells
   Four monitoring wells are proposed to be installed as follows:
   - *MW-8 will be installed at the TH-15 location to define the extent of mobile NAPL;*
   - *MW-9 will be installed at the TH-16 location to define the extent of mobile NAPL;*
   - *MW-10 will be installed on the south side of the Union 76 site to provide a triangular monitoring arrangement to allow for better evaluating the groundwater flow direction;*
   - *MW-11 will be installed approximately halfway between MW-6 and Kluck Oil to provide an additional down-gradient permanent monitoring point.*

   The monitoring wells will be completed between approximately 24 to 29 feet below grade. Soil samples will be screened continuously before or during drilling the well with hollow-stem augers. Soil samples will not be submitted for laboratory analysis unless field screening indicates potential soil impacts above the water table. Wells will be constructed with 10-slot, 10-foot PVC screens such that they straddle the water table. Wells will be completed above-grade if possible or at-grade if site conditions and use do not allow for above-grade completion.

   All of the new and existing monitoring wells and several other surface points will be surveyed for elevation control.

   Groundwater Sampling
   Two rounds of quarterly groundwater monitoring will be conducted on the new and existing monitoring well network.

   Monthly NAPL Checks
   Monthly NAPL checks are being and will continue to be conducted on monitoring wells MW-3 and MW-7. MW-8 and MW-9 will be included in the NAPL checks after they are installed. If NAPL is consistently absent in wells MW-8 and MW-9, NAPL checks will only be completed during quarterly sampling.

2. Discuss focused investigation data collection methods and procedures, including field-generated data, sample collection, laboratory analyses, and bench-scale tests. Methods and procedures must be specific to the planned data collection activities and locations.

Decontamination (LIF and Monitoring Well Installation)
All drilling/probing/sampling equipment will be decontaminated prior to arrival on site and between sampling points and drilling locations. The decontamination procedure consisted of an Alconox wash and a water rinse.

Soil Borings and Soil Sample Collection (EC calibration probe and Monitoring Well Installation)
Soil borings will be completed utilizing a Geoprobe hydraulic push probe or a hollow-stem auger drill rig. The borings will be completed under the direction of a Liesch Hydrogeologist. Soil samples collected during soil boring completion will be classified in accordance with the Unified Soil Classification System using visual-manual procedures. Soil samples were collected in accordance with Part II of MPCA fact sheet 4-04 "Soil Sample Collection and Analysis Procedures". Soil samples will be collected directly from the soil sample liner retrieved by the geoprobe or the split-spoon sampler from the hollow-stem auger rig. Soils will be immediately containerized in laboratory provided sample jars and placed in an ice-chilled cooler. Soil samples will be submitted for laboratory analysis at depths exhibiting noticeable odor, visible soil staining, or elevated PID readings. Dedicated, disposable polyethylene gloves will be used to containerize each soil sample in laboratory-provided containers.

Soil Screening(EC calibration probe and Monitoring Well Installation)
Soil samples collected during the soil boring activities will be screened for the presence of organic vapors using the methods described in Part I of MPCA fact sheet 4-04 "Soil Collection and Analysis Procedures." A photoionization detector (PID) equipped with a 10.6 electron volt lamp will be used to screen soil samples for the presence of organic vapors. The PID will be calibrated prior to analysis on each day of field screening. A quart-size polyethylene freezer bag will be filled approximately ½ full with a portion of the sample to be analyzed. Soil clumps will be broken and the bag will be shaken for approximately 15 seconds. After allowing the headspace to develop for a minimum of 10 minutes, each field screening sample will be analyzed using the PID. Soil samples will be categorized in the field following the Unified Soil Classification System (USCS) using visual-manual procedures.

Monitoring well installation
Monitoring wells will be installed at four locations on and off site using 8-inch OD hollow-stem augers. Monitoring wells will be completed in compliance with the Minnesota Department of Health regulations, under the supervision of a licensed well contractor. The wells will be completed with 10 slot, 10 foot, PVC screen, set in Redflint #30 sandpack. Screen intervals will be placed at depths such that they straddled the water table. PVC risers will be completed just below ground surface for flush-mount wells and approximately 2 feet above ground surface for protop wells. The annular space above the sandpack will be filled in with Enviroplug grout. A lockable cap will be placed on top of the PVC riser pipes. A steel cover will be cemented in over the PVC riser for flush-mount wells and a lockable steel protop will be cemented in over the above-grade wells. After completion of the monitoring wells, they will be developed to remove excessive sediment and any water introduced during drilling.

Groundwater sampling (monitoring wells)
Approximately 5 gallons of water will be purged prior to sampling using dedicated, disposable polytetrafluorethylene bailers. The water sample will be collected using the same bailer used to purge the well. Disposable polyethylene gloves will be used during handling of all sampling equipment. Groundwater samples will be placed in laboratory-provided containers. The sample containers will then immediately placed in an ice-chilled cooler for transportation to the analytical laboratory. Samples will be submitted to the laboratory within appropriate holding times.

3. Describe any existing sampling or monitoring points that will be used during the focused investigation and include copies of their boring logs and/or well construction diagrams in Appendix C.

   MW-1, MW-3, MW-6, MW-6A, and MW-7.

4. Discuss how the focused investigation data will be presented in Guidance Document 7-04 *Focused Investigation Report.* Include example copies of data source documents (e.g., boring logs, well construction diagrams, field data sheets) and example data summary tables and figures in Appendix D.

   Data will be presented as requested in GD 7-04, similar in format to this Focused Investigation Work Plan.

5. Discuss the methods that will be used to evaluate the focused investigation data in the *Focused Investigation Report.* Include example tables, figures, and calculations (e.g., graphs, contour maps, cross sections) in Appendix D.

   Liesch will compare the new focused investigation data with historical data along with contour maps and cross sections to assist with interpretations and preparation of the Focused Investigation Report.

6. Propose a schedule for completing the focused investigation, including submittal of the *Focused Investigation Report.*

   Liesch anticipates the LIF / EC probes and monitoring well installation will be completed in August 2012. One round of groundwater monitoring will be completed in September 2012 and the second round is anticipated to be completed in December 2012. The Focused Investigation Report will be submitted in January or February, 2012.

Section 4: Figures

Attach new figures specific to this report in order of discussion in the text. All figures must include a north arrow, scale, and legend as applicable. Approximate scales are not acceptable. Figures required in Appendix A should not be included in this section. New figures must include those listed below. Attach additional figures as needed and list below.

☒ One or more site maps showing (as applicable):

- Structures
- Boring and well locations (including any drinking water wells on site)
- Suspected source(s) of light non-aqueous phase liquid (LNAPL)
- Locations and depths of on-site buried utilities
- All past and present petroleum storage tanks, piping, dispensers, and transfer areas
- Estimated target-zone footprint
- Proposed focused investigation data collection points

Distinguish sequential elements of investigations by dates, symbols, etc. in the legend.

☐ Cross sections depicting depths of proposed focused investigation data collection points in relation to known contamination extents, geology, subsurface structures, and previous site investigation borings or wells.

Section 5: Tables

Attach new tables specific to this report in order of discussion in the text and list below. Tables required in Appendix A should not be included in this section.

Section 6: Appendices

Attach all required or applicable appendices in the following order. Indicate those appendices that are included in this report by marking the check box. All reproduced data must be legible. Attach additional appendices as needed and list below.

☒	*Appendix A*	Cumulative and updated tables and figures from Guidance Document 4-06 *Investigation Report Form.*
☒	*Appendix B*	Additional site investigation, site monitoring, and interim corrective action methods and procedures and associated documentation (boring logs, sampling information forms, laboratory analytical reports, etc.).
☒	*Appendix C*	Boring logs and/or well construction diagrams for any existing sampling or monitoring points that will be used during the focused investigation.
☒	*Appendix D*	Example data products requested in Section 3.

Table 14 - Free Product Recovery MW-3 and MW-7

Monitoring Well	Date	Time	Product Recovered (ml)	Water Level Depth Below Grade	Product Interface Level - Notes
MW-3	1/11/2002	11:30	800	20.73'	0.3"- Gasoline Recovered
MW-3	1/23/2002	2:30	100	-	Gasoline Recovered
MW-3	3/20/2002	2:20	500	21'	0.5" - Gasoline Recovered
MW-3	3/29/2002	2:30	1000	-	Gasoline Recovered
MW-3	5/1/2002	1:50	800	21.22'	0.5" - Gasoline Recovered
MW-3	5/14/2002	2:45	1000	-	Gasoline Recovered
MW-3	6/7/2002	3:00	200	-	Gasoline Recovered
MW-3	6/24/2002	3:50	200	21.3'	None Recorded - Gasoline/Water Mixture
MW-3	8/12/2002	2:30	1000	-	Gasoline/Water Mixture
MW-3	8/28/2002	10:15	1000	-	Gasoline/Water Mixture
MW-3	9/13/2002	12:45	1000	20.0'	None Recorded - Gasoline/Water Mixture
MW-3	9/27/2002	2:00	1000	-	Gasoline/Water Mixture
MW-3	10/11/2002	1:40	1000	-	Gasoline/Water Mixture
MW-3	10/25/2002	3:00	1000	-	Gasoline/Water Mixture
MW-3	11/4/2002	1:00	1000	-	Gasoline/Water Mixture
MW-3	12/6/2002	2:30	1000	-	Gasoline/Water Mixture
MW-3	12/26/2002	11:15	1000	17.1'	None Recorded - Gasoline/Water Mixture
MW-3	1/14/2002	2:00	1000	-	Gasoline/Water Mixture
MW-3	2/6/2004	1:00	11356		Gasoline/Water Mixture
MW-3	3/18/2004	12:30	6435	20.21	DTP = 18.91, DTW = 20.21 (1.3' product)
MW-3	9/7/2004	10:30	10	18.97	
MW-3	9/14/2004	7:40	0	18.82	no measurable free product- after vac truck
MW-3	9/27/2004	12:00	0	18.83	well raiser tilted by car collision, could not send bailor down
MW-3	12/20/2004	9:00	200	19.18	
MW-3	2/23/2005	8:15	2250	10.94	0.77 inches of product in well
MW-3	2/28/2005	7:50	34360	19.72	vac truck removed apporx. 8 gal of free product
MW-3	3/10/2005	8:00	2300	19.61	balied product to a sheen/ waited for well to recover and repeated
MW-3	4/11/2005	13:10	2.7	20.13	bailed product, but well recharged and prod. Still remained
MW-3	6/9/2005	11:30	0.25	20.46	bailed product and well recharged leaving a sheen
MW-3	7/12/2005	11:30	0.2	20.22	bailed product
MW-3	8/4/2005	12:00	0	20.15	no product removed
MW-3	9/28/2005	12:30	4000	N/A	vac truck removed approximately 1 gallon of product from well
MW-3	10/5/2005	10:30	0	16.76	no product removed
MW-3	11/1/2005	11:00	0	17.44	no product present in well
MW-3	3/1/2006	NA	0	17.65	no product present in well
MW-3	7/13/2006	NA	1000	18.34	0.52 inches of product in well
MW-3	10/4/2006	NA	0	18.92	no product present in well
MW-3	3/9/2007	NA	1200	19.88	5.5 inches of product in well
MW-3	7/24/2007	NA	800	NA	0.8 inches of product in well
MW-3	1/20/2010	NA	1200	NA	4 inches of product in well
MW-3	1/12/2011	NA	0	NA	no product present in well
MW-3	3/21/2011	NA	0	17.89	no product present in well
MW-3	6/7/2011	NA	0	17.29	no product present in well
MW-3	10/4/2011	NA	0	15.77	no product present in well
MW-3	3/29/2012	9:20	0	18.00	no product present in well
MW-3 Total (ml)			**79714**		
MW-3 Total (Gal)			**21.1**		
MW-7	9/16/2005	NA	0	17.00	no product present in well
MW-7	11/1/2005	NA	0	17.72	no product present in well
MW-7	3/1/2006	NA	0	17.81	no product present in well
MW-7	7/13/2006	NA	0	18.14	no product present in well
MW-7	10/4/2006	NA	0	18.2	no product present in well
MW-7	3/9/2007	NA	0	18.6	no product present in well
MW-7	7/24/2007	NA	0	18.83	no product present in well
MW-7	1/20/2010	NA	2500	20.45	16 inches of product in well
MW-7	1/12/2011	NA	2000	18.5	1.8 inches of product in well
MW-7	3/21/2011	NA	1700	18.8	1.8 inches of product in well
MW-7	6/7/2011	NA	0	18.13	no product present in well
MW-7	10/4/2011	NA	0	16.53	no product present in well
MW-7	3/29/2012	9:40	0	19.05	no product present in well
MW-7 Total (ml)			**6,200**		
MW-7 Total (Gal)			**1.6**		

~~Table 15~~
~~Properties Located within 500 feet of the Release Source~~

Prop ID[1]	Property Address	Distance From Site (ft)	Water Supply Well			Public Water Supply		Base-ment (Y/N)	Sump (Y/N)	Possible Petroleum Sources (Y/N)	Comments (including property use)
			Well Present (Y/N)	How Determined[2]	Well Use[3]	Utilized (Y/N)	Confirmed by City (Y/N)				
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

[1] Property IDs should correspond to labeled properties in the Potential Receptor Map.
[2] For example, visual observation, personal contact, telephone, returned postcard, assumed (i.e., no postcard returned).
[3] For example, domestic, industrial, municipal, livestock, lawn/gardening, irrigation.
Add additional rows as needed.
Notes:

~~Table 16~~
~~Water Supply Wells Located within 500 feet of the Release Source and Municipal or Industrial Wells within ½ mile~~

Property ID[1]	MDH Unique Well Number	Ground Elevation	Total Depth (ft)	Base of Casing (ft)	Static Elevation	Aquifer	Use	Owner	Distance and Direction from Source (ft)

[1] Property IDs should correspond to properties listed in Table 15 and labeled properties in the Potential Receptor Map if known or applicable.

Add additional rows as needed.

Notes:

~~Table 17~~
~~Surface Water Receptor Information~~

Map ID[1]	Name and Type[2]	Distance and Direction from Plume Edge (ft)	Clean Boring/Well Between?[3] (Y or N)

[1] Map ID should correspond to a surface water feature ID on the Potential Receptor Map.
[2] Type includes, but is not limited to, lake, retention pond, infiltration pond, ditch, intermittent stream, river, creek, rain garden, etc.
[3] If the surface water feature is upgradient or cross-gradient from the site, indicate so with "NA" for not applicable.
Add additional rows as needed.
Notes:

Table 18
Utility Receptor Information

Utility ID[1]	Description	Construction Material	Depth to Top of Structure	Diameter	Flow Direction (for liquids)	Year Installed	Backfill Material	Distance to Water Table
1	*Sanitary sewer main beneath S. Buchanan Street between 1st Ave. E. and 2nd Ave SE*	*PVC*	*10'*	*21 inches*	*South*	*2001-2002*	*Native soil*	*8'*
2	*Water main beneath S. Buchanan Street between 1st Ave. E. and 2nd Ave SE*	*Ductile Iron*	*7-8'*	*16 inches*	*North*	*2001-2002*	*Native soil*	*10'*
3	*Storm sewer beneath S. Buchanan Street between 1st Ave. E. and 2nd Ave SE*	*Concrete*	*4.5-5' ft*	*21 inches*	*South*	*unknown*	*Native soil*	*13'*
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

[1] ID should correspond to an identified utility line on the Potential Receptor Map.
Add more rows as needed.
Notes:

Utility ID[1]	Name, title, and telephone number for public entity contacted to obtain information or other source of information
1, 2, 3	As built drawings provided by utility locator with City of Cambridge.

[1] IDs should correspond to the same IDs in the above table.
Add more rows as needed.
Notes:

Table 19
Vapor Survey Results

Location ID[1]	Description[2]	Monitoring Date	PID Reading (ppm)	Percent of the LEL[3]
1	Storm Sewer catch basin	3/23/11	0	0
2	Storm Sewer manhole	3/23/11	0	0
3	Storm Sewer catch basin	3/23/11	0	0
4	Storm Sewer manhole	3/23/11	0	0
5	Storm Sewer catch basin	3/23/11	0	0
6	Storm Sewer catch basin	3/23/11	0	0
7	Storm Sewer catch basin	3/23/11	0	0
8	Storm Sewer manhole	3/23/11	0	0
9	Legion basement ambient	3/23/11	0	0

[1] Location IDs must match labeled locations on the Vapor Survey Map.
[2] Provide a brief description of the monitoring point (e.g., sump, basement corner, sanitary sewer manhole, storm sewer basin, etc.).
[3] LEL = Lower Explosive Limit.
Add additional rows as needed.
Notes:

Table 20
Results of Soil Gas Sampling for Vapor Intrusion Screening[1]

Sample ID[2]	Vapor Pt 1		Vapor Pt 2		Vapor Pt 3		Subslab-1				
Date	1/21/2010		1/21/2010		1/21/2010		3/22/2011				
Depth (feet)											
PID (ppm)											
COMPOUNDS	Result	Report Limit	Result	Report Limit	Result	Report Limit	Result	Report Limit	Result	Report Limit	Intrusion Screening Value[3]
Acetone	<0.64	0.64	83.6	0.64	<0.64	0.64	64.4	0.86			31,000
Benzene	<0.87	0.87	84.6	0.87	<0.87	0.87	1.5	1.2			4.5
2-Butanone (MEK)							5.1	1.1			5000
1,3-Butadiene	<0.6	0.6	64.5	0.6	<0.6	0.6	<0.81	0.81			0.3
Carbon Disulfide	<0.84	0.84	3.7	0.84	<0.84	0.84	<1.1	1.1			700
Chloroform							10.2	1.8			100
Cyclohexane	<0.91	0.91	12.8	0.91	<0.91	0.91	3.2	1.2			6,000
Dichlorodifluoromethane							14.5	1.8			200
Ethanol	<2.5	2.5	15.0	2.5	<2.5	2.5	341	3.4			15,000
Ethylbenzene	<1.2	1.2	42.1	1.2	<1.2	1.2	5.7	1.6			1,000
4-Ethyltoluene	<3.4	3.4	7.4	3.4	<3.4	3.4	<4.5	4.5			NA
n-Heptane	<1.1	1.1	78	1.1	<0.96	0.96	4.5	1.5			NA
n-Hexane							12.2	1.3			2000
Methylene Chloride							13.8	1.3			20
2-Propanol							18.1	4.5			7000
Propylene							2.7	0.63			3000
Styrene	<1.2	1.2	44.7	1.2	<1.2	1.2	<1.6	1.6			1,000
Tolunene	<1.0	1.0	132	1.0	<1.0	1.0	22	1.4			5,000
1,2,4-Trimethylbenzene	<1.3	1.3	9.3	3.4	<3.4	3.4	<1.8	1.8			4
M&p-Xylene	<2.4	2.4	88.9	2.4	<2.4	2.4	24.8	3.2			100
o-Xylene	<1.2	1.2	27	1.2	<1.2	1.2	5.1	1.6			100

[1] Report results in $\mu g/m^3$.
[2] Sample IDs should correspond to labeled locations on the Vapor Intrusion Assessment Map.
[3] The Intrusion Screening Values can be found in Guidance Document 4-01a *Vapor Intrusion Assessments Performed during Site Investigations*.
Add additional rows as needed, and copy the entire table if more columns are needed.
Notes:

Table 14 - Free Product Recovery MW-3 and MW-7

Monitoring Well	Date	Time	Product Recovered (ml)	Water Level Depth Below Grade	Product Interface Level - Notes
MW-3	1/11/2002	11:30	800	20.73'	0.3"- Gasoline Recovered
MW-3	1/23/2002	2:30	100	-	Gasoline Recovered
MW-3	3/20/2002	2:20	500	21'	0.5" - Gasoline Recovered
MW-3	3/29/2002	2:30	1000	-	Gasoline Recovered
MW-3	5/1/2002	1:50	800	21.22'	0.5" - Gasoline Recovered
MW-3	5/14/2002	2:45	1000	-	Gasoline Recovered
MW-3	6/7/2002	3:00	200	-	Gasoline Recovered
MW-3	6/24/2002	3:50	200	21.3'	None Recorded - Gasoline/Water Mixture
MW-3	8/12/2002	2:30	1000	-	Gasoline/Water Mixture
MW-3	8/28/2002	10:15	1000	-	Gasoline/Water Mixture
MW-3	9/13/2002	12:45	1000	20.0'	None Recorded - Gasoline/Water Mixture
MW-3	9/27/2002	2:00	1000	-	Gasoline/Water Mixture
MW-3	10/11/2002	1:40	1000	-	Gasoline/Water Mixture
MW-3	10/25/2002	3:00	1000	-	Gasoline/Water Mixture
MW-3	11/4/2002	1:00	1000	-	Gasoline/Water Mixture
MW-3	12/6/2002	2:30	1000	-	Gasoline/Water Mixture
MW-3	12/26/2002	11:15	1000	17.1'	None Recorded - Gasoline/Water Mixture
MW-3	1/14/2002	2:00	1000	-	Gasoline/Water Mixture
MW-3	2/6/2004	1:00	11356		Gasoline/Water Mixture
MW-3	3/18/2004	12:30	6435	20.21	DTP = 18.91, DTW = 20.21 (1.3' product)
MW-3	9/7/2004	10:30	10	18.97	
MW-3	9/14/2004	7:40	0	18.82	no measurable free product- after vac truck
MW-3	9/27/2004	12:00	0	18.83	well raiser tilted by car collision, could not send bailor down
MW-3	12/20/2004	9:00	200	19.18	
MW-3	2/23/2005	8:15	2250	10.94	0.77 inches of product in well
MW-3	2/28/2005	7:50	34360	19.72	vac truck removed apporx. 8 gal of free product
MW-3	3/10/2005	8:00	2300	19.61	balied product to a sheen/ waited for well to recover and repeated
MW-3	4/11/2005	13:10	2.7	20.13	bailed product, but well recharged and prod. Still remained
MW-3	6/9/2005	11:30	0.25	20.46	bailed product and well recharged leaving a sheen
MW-3	7/12/2005	11:30	0.2	20.22	bailed product
MW-3	8/4/2005	12:00	0	20.15	no product removed
MW-3	9/28/2005	12:30	4000	N/A	vac truck removed approximately 1 gallon of product from well
MW-3	10/5/2005	10:30	0	16.76	no product removed
MW-3	11/1/2005	11:00	0	17.44	no product present in well
MW-3	3/1/2006	NA	0	17.65	no product present in well
MW-3	7/13/2006	NA	1000	18.34	0.52 inches of product in well
MW-3	10/4/2006	NA	0	18.92	no product present in well
MW-3	3/9/2007	NA	1200	19.88	5.5 inches of product in well
MW-3	7/24/2007	NA	800	NA	0.8 inches of product in well
MW-3	1/20/2010	NA	1200	NA	4 inches of product in well
MW-3	1/12/2011	NA	0	NA	no product present in well
MW-3	3/21/2011	NA	0	17.89	no product present in well
MW-3	6/7/2011	NA	0	17.29	no product present in well
MW-3	10/4/2011	NA	0	15.77	no product present in well
MW-3	3/29/2012	9:20	0	18.00	no product present in well
MW-3 Total (ml)			**79714**		
MW-3 Total (Gal)			**21.1**		
MW-7	9/16/2005	NA	0	17.00	no product present in well
MW-7	11/1/2005	NA	0	17.72	no product present in well
MW-7	3/1/2006	NA	0	17.81	no product present in well
MW-7	7/13/2006	NA	0	18.14	no product present in well
MW-7	10/4/2006	NA	0	18.2	no product present in well
MW-7	3/9/2007	NA	0	18.6	no product present in well
MW-7	7/24/2007	NA	0	18.83	no product present in well
MW-7	1/20/2010	NA	2500	20.45	16 inches of product in well
MW-7	1/12/2011	NA	2000	18.5	1.8 inches of product in well
MW-7	3/21/2011	NA	1700	18.8	1.8 inches of product in well
MW-7	6/7/2011	NA	0	18.13	no product present in well
MW-7	10/4/2011	NA	0	16.53	no product present in well
MW-7	3/29/2012	9:40	0	19.05	no product present in well
MW-7 Total (ml)			**6,200**		
MW-7 Total (Gal)			**1.6**		

APPENDIX B

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APPENDIX C

BORING LOG

Boring No: TH - 8/MW-3

Site: Cambridge 76

Project Number: 94-858-30

Sheet 1 Of 1

Drilling Method: Geoprobe

Company: Barrott Drilling

Foreman: Mike

Rig Model:

Geol/Engr: Dan Hunter

Ground Surface Elevation:

Physical Setting:

Date/Time Started: 6/15/95 1440

Date/Time Completed: 6/15/95 1530

Grid Coordinates:

Water Level Info

Date	Time	Depth

SOIL LOG	DEPTH (FEET)	SAMPLING INFORMATION NO.	T	A	R	B	N	USCS	SOIL DESCRIPTION	TIME	PID / FID SMP	PID / FID HS	O2/ LEL
ML	5	1						ML	Silt, gray - Light gray, moist, soft, fine grained sand strong petro. odor 54 6/1 light olive gray OUTWASH		150		
SP	10	2						SP	Sand, fine gravel, poorly graded, moist, silty, petro. odor OUTWASH		180		
SM	15	3						SM	Sand, light gray - gray/brn, fine grained, silty, poorly graded, petro odor OUTWASH		160		
	20	4						SM	Sand, gray - light gray, fine to med grained, poor grade, wet 10 YR 6/2 OUTWASH		130		
	25	5						SM	Silty sand, gray/brn, fine wet, fine grained, OCC coarse sand with top slightly clayey OUTWASH		250		
									26.5 ft EOB				

BORING LOG

Boring No: MW-6A

Site: Former Cambridge 76

Project Number: 94-858-30

Sheet 1 Of 1

Drilling Method: HSA 4 1/4"

Company: Thein Well Co.

Foreman: Nathan

Rig Model: B-59

Geol/Engr: D. Schwandt

Ground Surface Elevation:

Physical Setting:

Date/Time Started: 9/2/98 940

Date/Time Completed: 9/2/98 1145

Grid Coordinates:

Water Level Info

Date	Time	Depth
09/02/98		23'

SOIL LOG	DEPTH (FEET)	SAMPLING INFORMATION NO.	T	A	R	B	N	USCS	SOIL DESCRIPTION	TIME	PID / FID SMP	PID / FID HS	O2/ LEL
									blind drill to 34 feet				
	10												
	20												
SM													
	30												
		1	ss						(0-39') fine silty sand, med brown			73.8	
CL	40	2	ss						(39' - 41') silty clay, gray, saturated, med density			6.2	
									E.O.B. @ 41' bgs				
	50												

BORING LOG

Boring No: MW-6

Site: Former Cambridge 76

Project Number: 94-858-30

Sheet 1 Of 1

Drilling Method: HSA 4 1/4 "

Company: Thein Well Co.

Foreman: Nathan

Rig Model: B-59

Geol/Engr: D. Schwandt

Ground Surface Elevation:

Physical Setting:

Date/Time Started: 9/2/98 1225

Date/Time Completed: 9/2/98 1500

Grid Coordinates:

Water Level Info

Date	Time	Depth
09/02/98		23'

SOIL LOG	DEPTH (FEET)	SAMPLING INFORMATION NO.	T	A	R	B	N	USCS	SOIL DESCRIPTION	TIME	PID / FID SMP	PID / FID HS	O2/ LEL
									blind drill to 29'				
	10								obstructions at 3-7 feet bgs on two previous attempts at drilling this hole				
	20												
	30								E.O.B. @ 29' bgs				
	40												
	50												

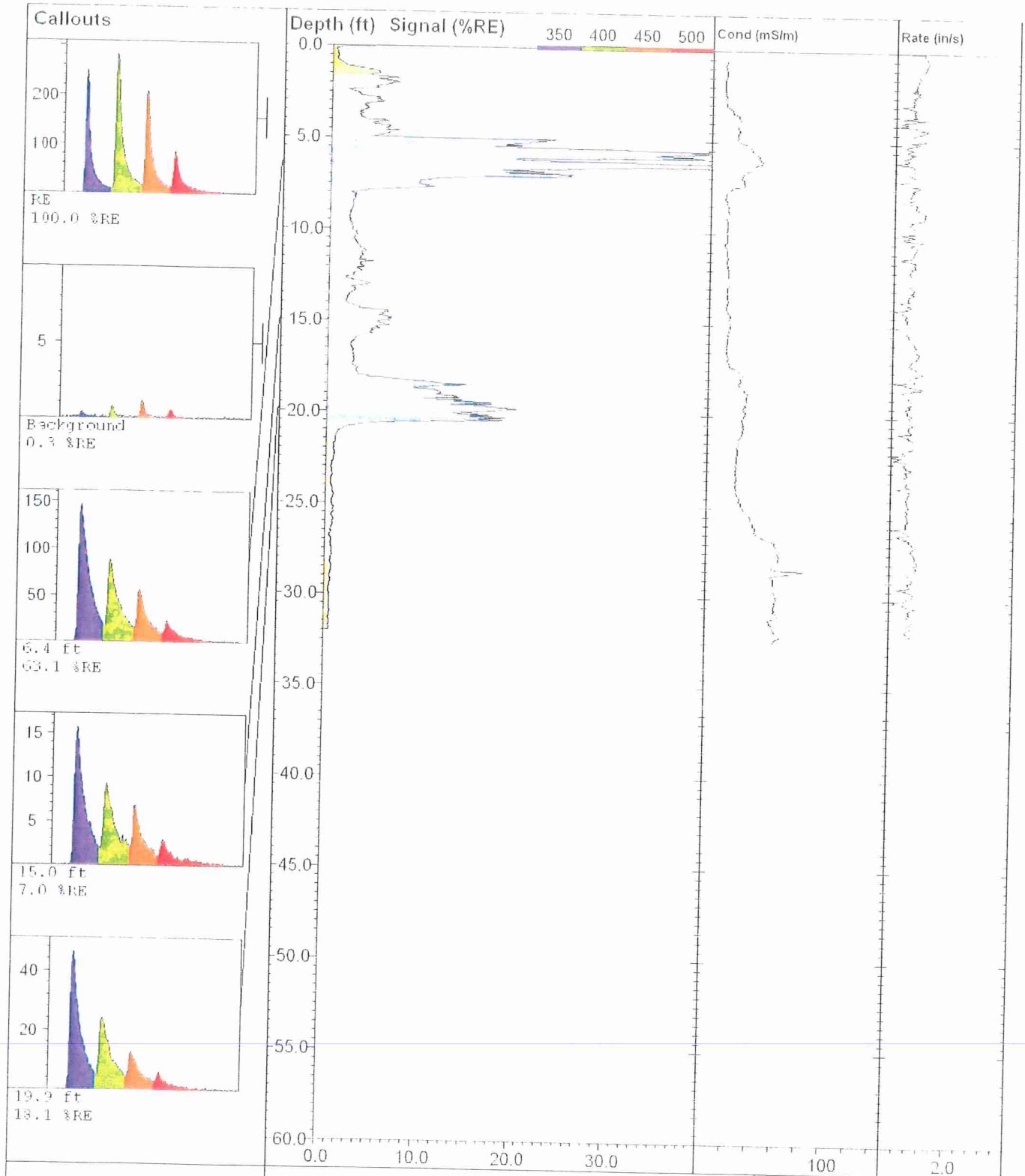
Project: Former Clark Oil - Cambridge	**Logged by: Rubens Modelli**
Date: September 16, 2005	**Drilling Contractor: Traut Well Drilling**
Boring ID: MW-7	**Driller/Assistant Name:**
Boring Depth (feet): 24'	**Drilling Method: Hollow Stem Auger**
Depth to groundwater (feet): 17'	**Weather:**

Boring Location: American Legion Parking Lot

Depth	Sample Lithology: color, grain size, grain size distribution, stiffness and other sample / drilling notes	Moisture (dry/moist/wet/ saturated)	Chemical staining or odor	USCS	Sample Recovery-feet (I.e. 1.5 of 2)	PID (ppm)	Lab Sample Collected
0-2	Dark brown fine sand	moist	N	SP		0	
5-7'	Green-gray fine sand	moist	Slight Petro	SP		39.4	
10-12'	Brown / Tan Fine Sand	Dry	Petro	SP		127	
12.5-14.5	Fine Gray Sand	Dry	Strong Petro	SP		1035	
15-17	Fine Gray Sand	Dry	Strong Petro	SP		1494	
15.5-17.5	Fine Gray Sand	Sat. at 17'	Strong Petro	SP		1598	X

Notes: 2" PVC Screen set 14 - 24'

APPENDIX D



MATRIX ENVIRONMENTAL LLC

L-6

UVOST By Dakota
www.DakotaTechnologies.com

Site: Former Union 76	*Latitude / Datum:* Unavailable / NA	*Final depth:* 32.00 ft
Client: Liesch	*Longitude / Fix:* Unavailable / NA	*Max signal:* 63.1 % @ 6.36 ft
Job: 024-MNDS-11UV	*Operator/Unit:* MJ/DT/UVOST1003	*Date & Time* 2011-03-21 15:02 CDT

AQUA-PLUS,INC

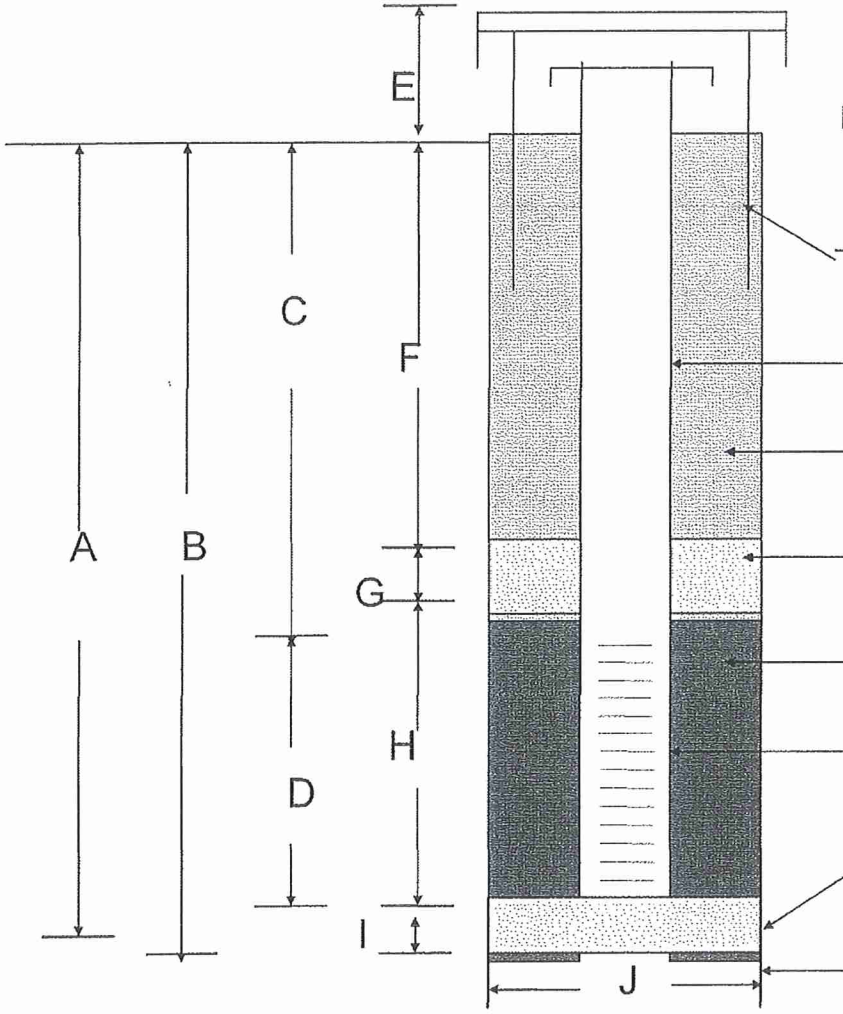
MW-1

MONITORING WELL CONSTRUCTION DETAIL

UNIQUE NUMBER 743495

PROJECT: Anoka, MN

INSTALLATION DATE: 03/14/07



PROTOP: 6-inch locking steel

CASING: 2-inch PVC

GROUT: Bentonite Grout

SEAL: Bentonite Chips

GRAVEL PACK: No. 45-55

WELLSCREEN: 2-inch PVC 10-slot

BOTTOM PLUG: N/A

BOREHOLE: Auger

A:	TOTAL WELL DEPTH:	27-feet
B:	BOREHOLE DEPTH:	27-feet
C:	DEPTH OF CASING:	17-feet
D:	SCREEN LENGTH:	10-feet
E:	STICK-UP:	2-feet
F:	BOREHOLE GROUT:	15-feet
G:	GRAVEL PACK SEAL:	2-feet
H:	GRAVEL PACK:	12-feet
I:	BOTTOM SEAL:	N/A
J:	BOREHOLE SIZE:	8-inch

Project No. 65677.00
Project Name: Mille Lacs Oil Company
Weather Conditions
Completed By: Dan Larson

GROUNDWATER MONITORING DATA SHEET

Location ID	MW-1	MW-3	MW-6	MW-6A	MW-7			
Unique #	554377	554379	617203	617204	731591			
Date:	6/7/2011	6/7/2011	6/7/2011	6/7/2011	6/7/2011			
Times Sampled:	11:00	11:30	9:40	9:00	--			
Chronology:	3	5	2	1	4			
Casing Diameter (in):	2"	2"	2"	2"	2"			
Static Depth (ft):	18.59	17.29	19.52	19.56	18.13			
Casing Length (ft):	24	29	29	41	24			
Column Length (ft):	24	29	29	41	24			
Column Volume (gal):	3.9	4.7	4.7	6.7	3.9			
Gallons Removed:	5	5	5	10	5			
TOC Elevation	963.1	963.72	963.93	963.73	963.8			
Ground Elevation	963.07	961.97	963.94	963.76	961.35			
Bottom of Screen Elevation	939.07	934.97	934.94	922.76	939.8			
Screen Elevation Interval	949.07-939.07	944.97-934.97	944.94-934.94	932.76-922.76	949.80-939.80			
Static Water Elevation	**963.1**	**963.72**	**963.93**	**963.73**	**963.8**			
Sample Appearance								
Color:	Light Yellow	Clear	Clear	Clear	Clear to Gray			
Phases:	None	None	None	None	None			
Odor:	Petroleum	Petroleum	Slight Old Gas Odor	None	Petroleum			
Sample Parameters								
VOCs								
DRO	X		X	X				
GRO/PVOCs	X		X	X				
Notes:								