

#2572

2572 MEK

Ground Water Monitoring and closure request Report.

The depth to the static water table level is approximately 35'

Ground water flows SE with a hydraulic gradient of 0.001 ft/ft.

Groundwater Contamination

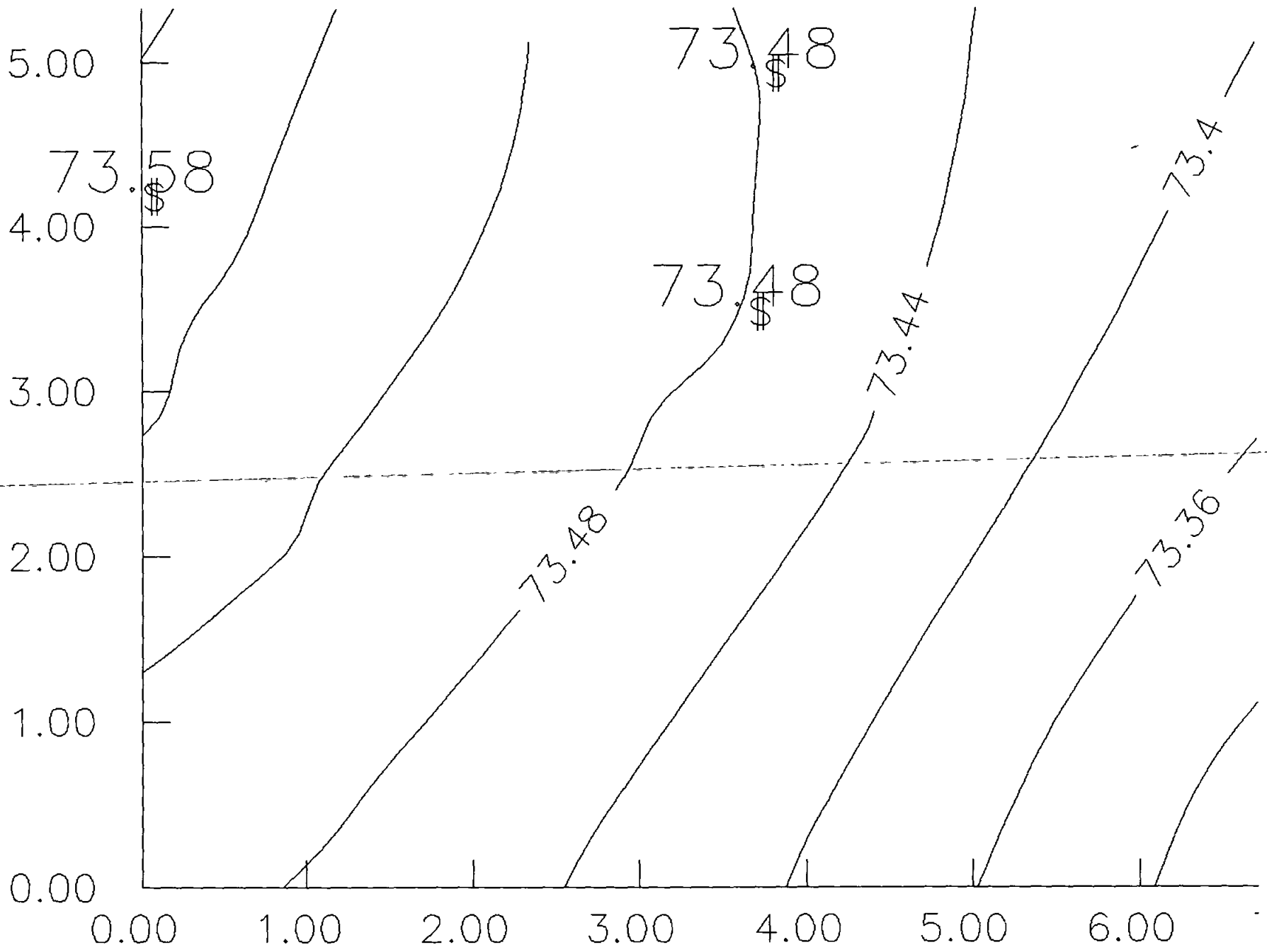
MW's were sampled on 12/2/91, 2/11/92, and 5/5/92.

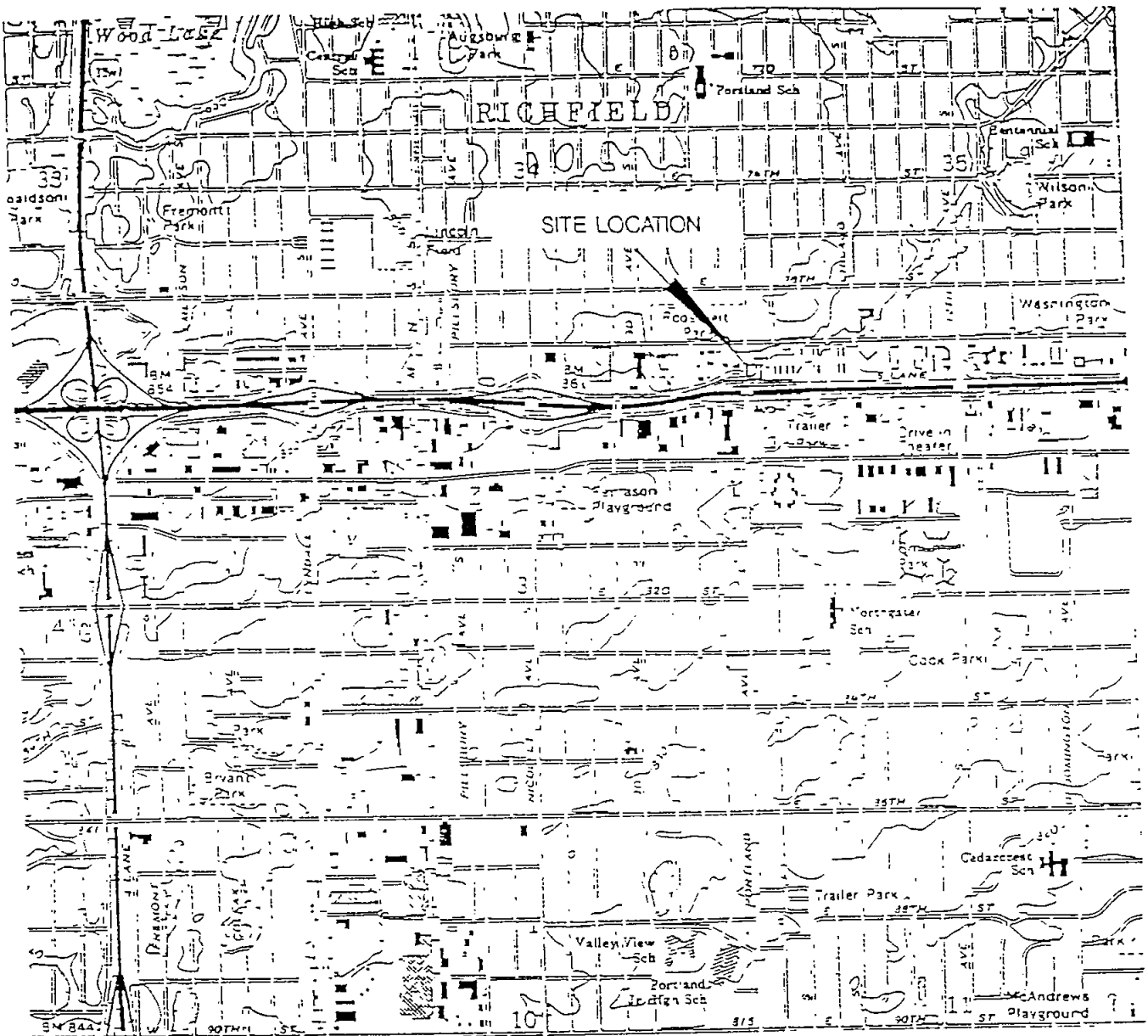
Petroleum Cont was not detected in MW-1, 2, and 4

MW-3-

0.89 - 3.2 ppb 1,2-dichloroethane.

close it. Pavement no leaching, considerable depth to GWT, cont soil levels drop off fast with depth.





TAKEN FROM BLOOMINGTON USGS 7.5' TOPOGRAPHICAL MAP



SCALE 1:24000

ENECOTECH

Minneapolis, Minnesota

Project

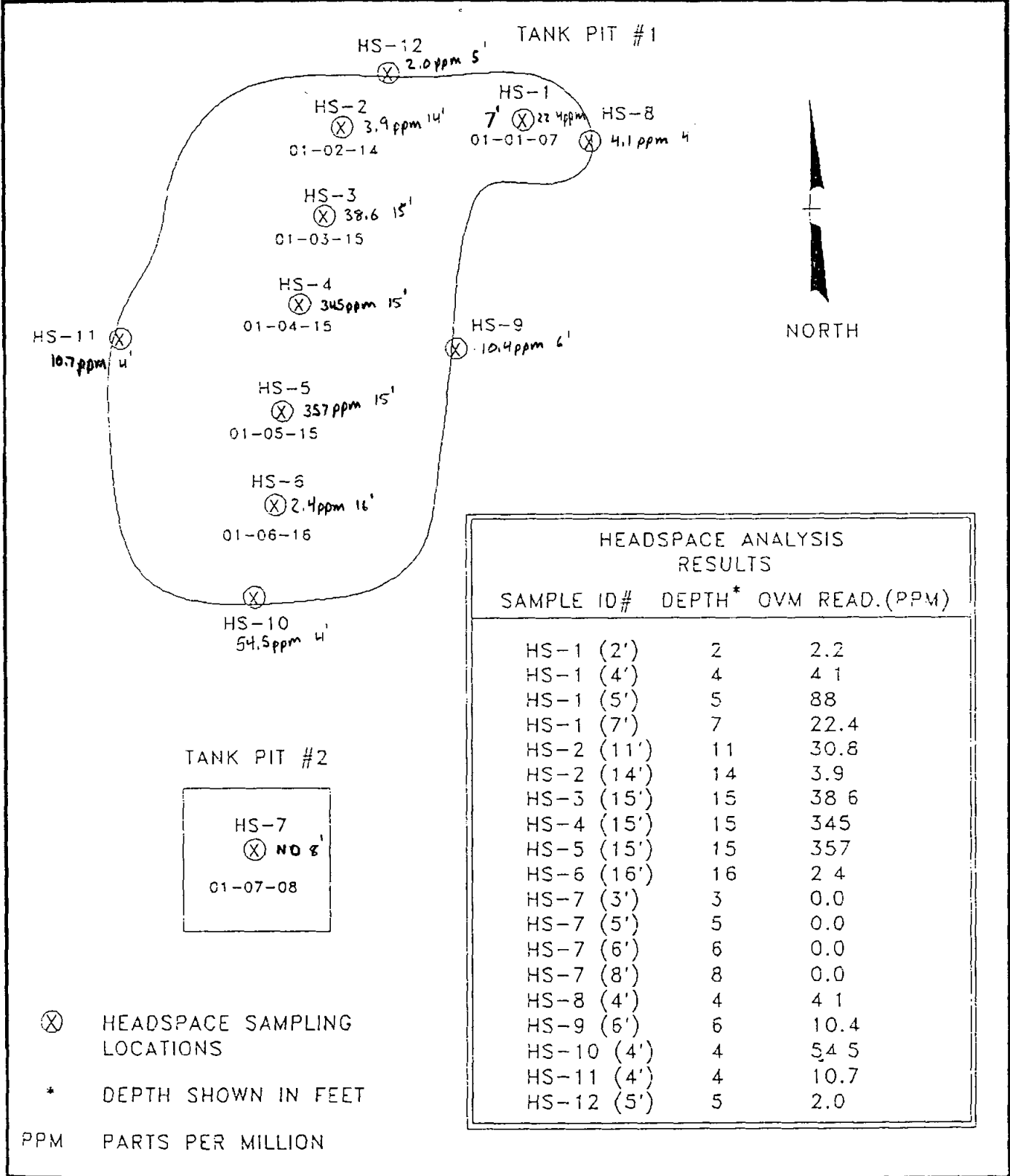
SINCLAIR STATION - RICHFIELD, MINNESOTA

SITE LOCATION MAP

SINCLAIR STATION

7733 PORTLAND AVENUE SOUTH

RICHFIELD, MINNESOTA



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 BLOOMINGTON, MINNESOTA

FIGURE
 HEADSPACE SAMPLE LOCATION MAP
 SINCLAIR GAS STATION
 7733 PORTLAND AVE SOUTH
 RICHFIELD, MINNESOTA

PROJECT NO	DATE	SCALE	PREPARED BY	REVIEWED BY	DATE	REVISION
711-017	12/90	1" = 15'	EFW			U2



TANK PIT #1

HS-12

(X) 2.0 ppm

A

HS-8

(HS-1) (X)

(X) 4.1 ppm

01-02-14 (HS-2)
ND, ND, 14

01-01-07
ND, 1,900, 7

SB-2
ND, ND, 9
ND, ND, 29

01-03-15 (HS-3)
0.12, 840, 15

SB-4
ND, 97, 10
ND, ND, 34

01-04-15 (HS-4)
0.10, 1,100, 15

HS-9

(X) 10.4 ppm

HS-11

10.7 ppm

01-05-15 (HS-5)

ND, ND, 29
0.44, 920, 9

SB-3 0.83, 11, 15

01-06-16 (HS-6)
0.59, ND, 16

A'

HS-10

54.5 ppm




TANK PIT #2

SB-1

ND
ND

ND, 9
ND, 29

01-07-08 (HS-7)
0.09, 190, 8

-  SOIL BORING SAMPLE
-  SB-1 ND, 11, 10
BENZENE THC-GAS DEPTH
-  UST EXCAVATION
SOIL SAMPLE

SCALE 1" = 10'

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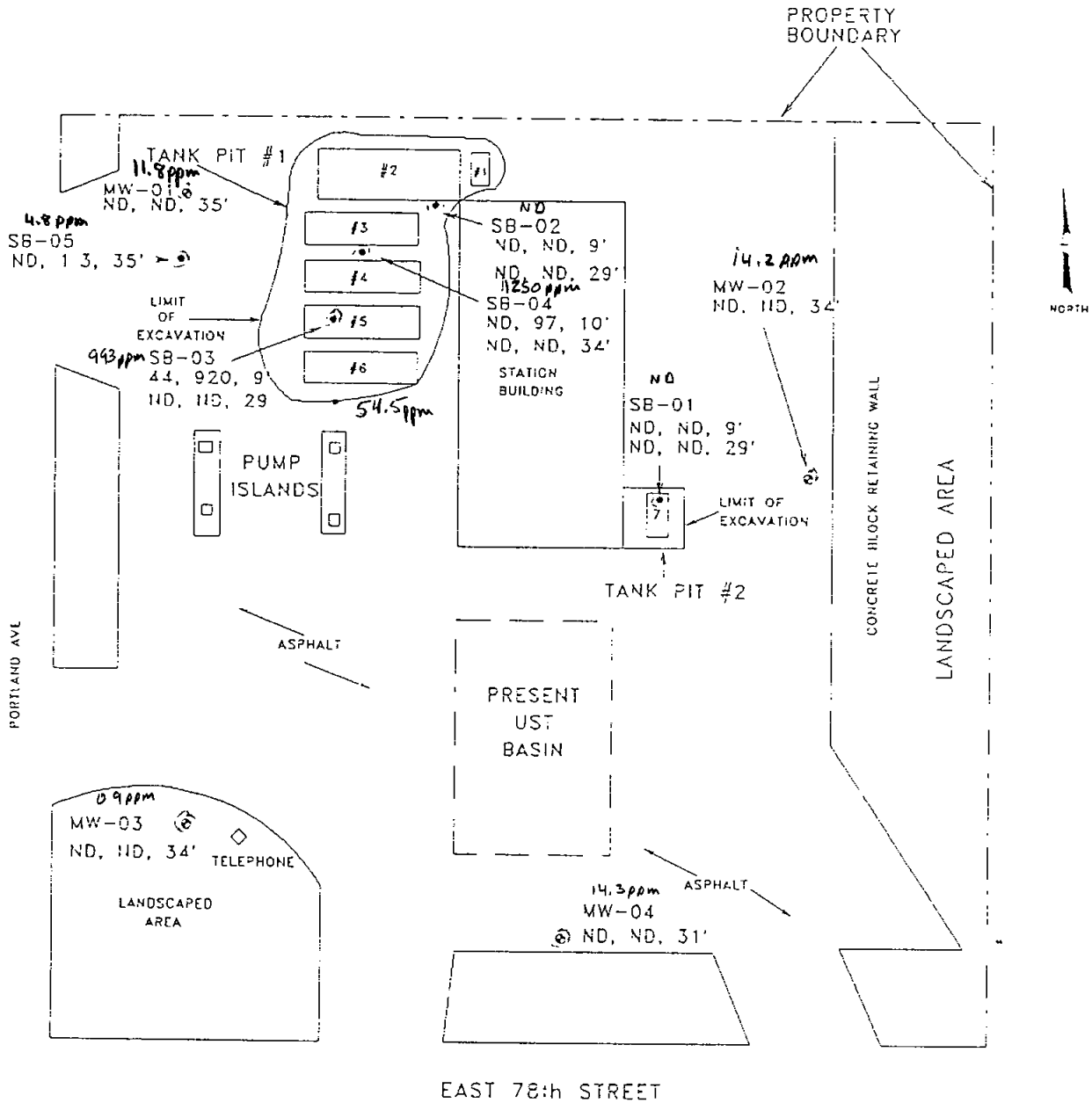
SOIL QUALITY MAP
SINCLAIR SERVICE STATION
7733 PORTLAND AVE S, RICHFIELD, MN

PROJECT SINCLAIR - PORTLAND AVE SO

FILE NO 711-017

DATE MARCH, 1991

FIGURE NO 7



- TANK #1 = 560 GALLON WASTE OIL TANK
- TANK #2 = 6000 GALLON PREM NO LEAD
- TANK #3 = 4000 GALLON REGULAR
- TANK #4 = 4000 GALLON REGULAR
- TANK #5 = 4000 GALLON UNLEADED
- TANK #6 = 4000 GALLON UNLEADED
- TANK #7 = 1000 GALLON #1 FUEL OIL

LEGEND

- = SOIL BOPING LOCATION
- ⊙ = MONITORING WELL LOCATION
ND, ND, 34'

BENZENE, THC-CAS, DEPTH
SCALE 1" = 30'

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BLOOMINGTON, MINNESOTA

PROJECT

SINCLAIR-PORTLAND AVE

SOIL ANALYTICAL DATA
SINCLAIR SERVICE STATION
7753 PORTLAND AVE SOUTH
RICHFIELD, MINNESOTA

FILE NO

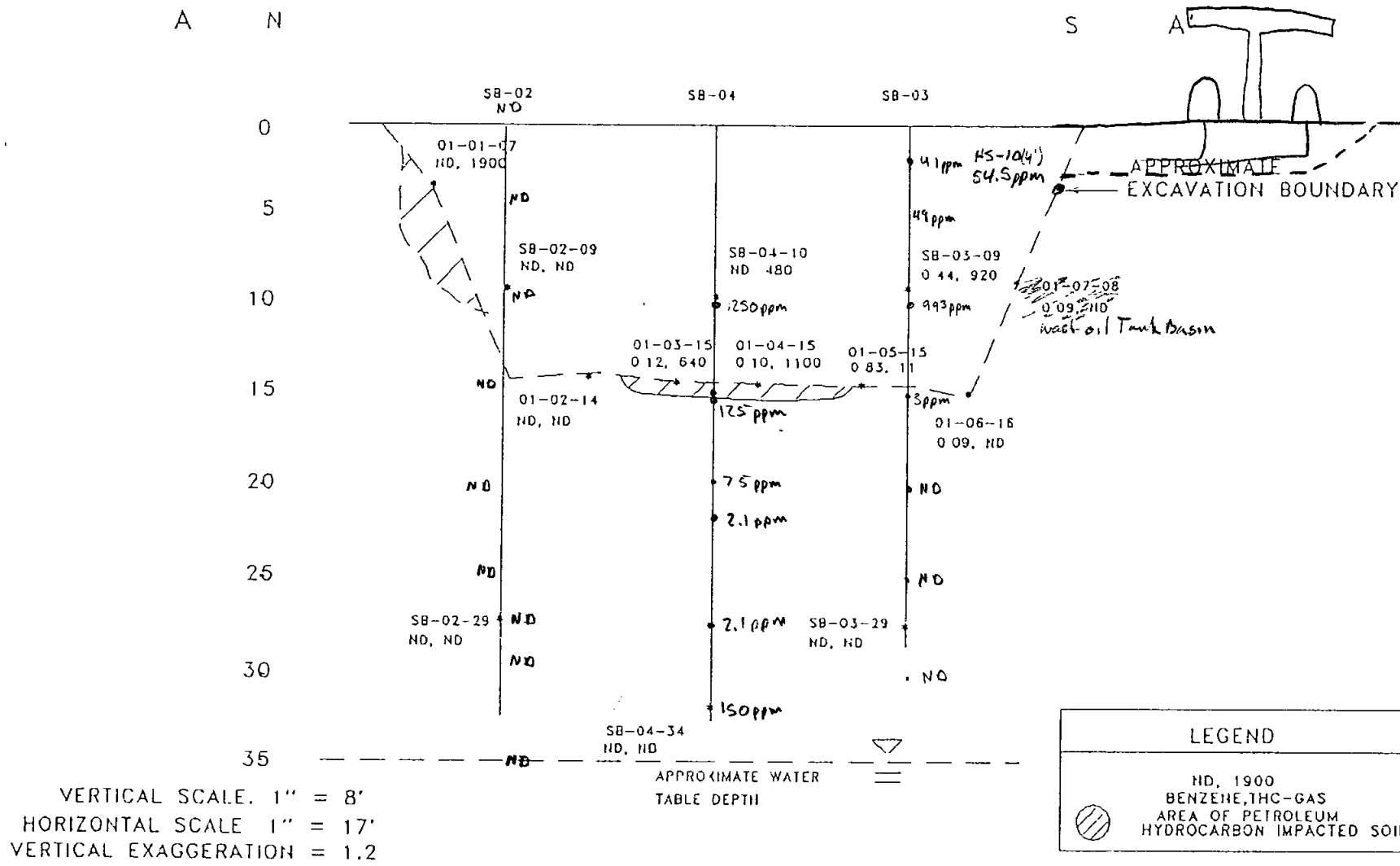
711-017

DATE

MARCH, 1991

FIGURE NO

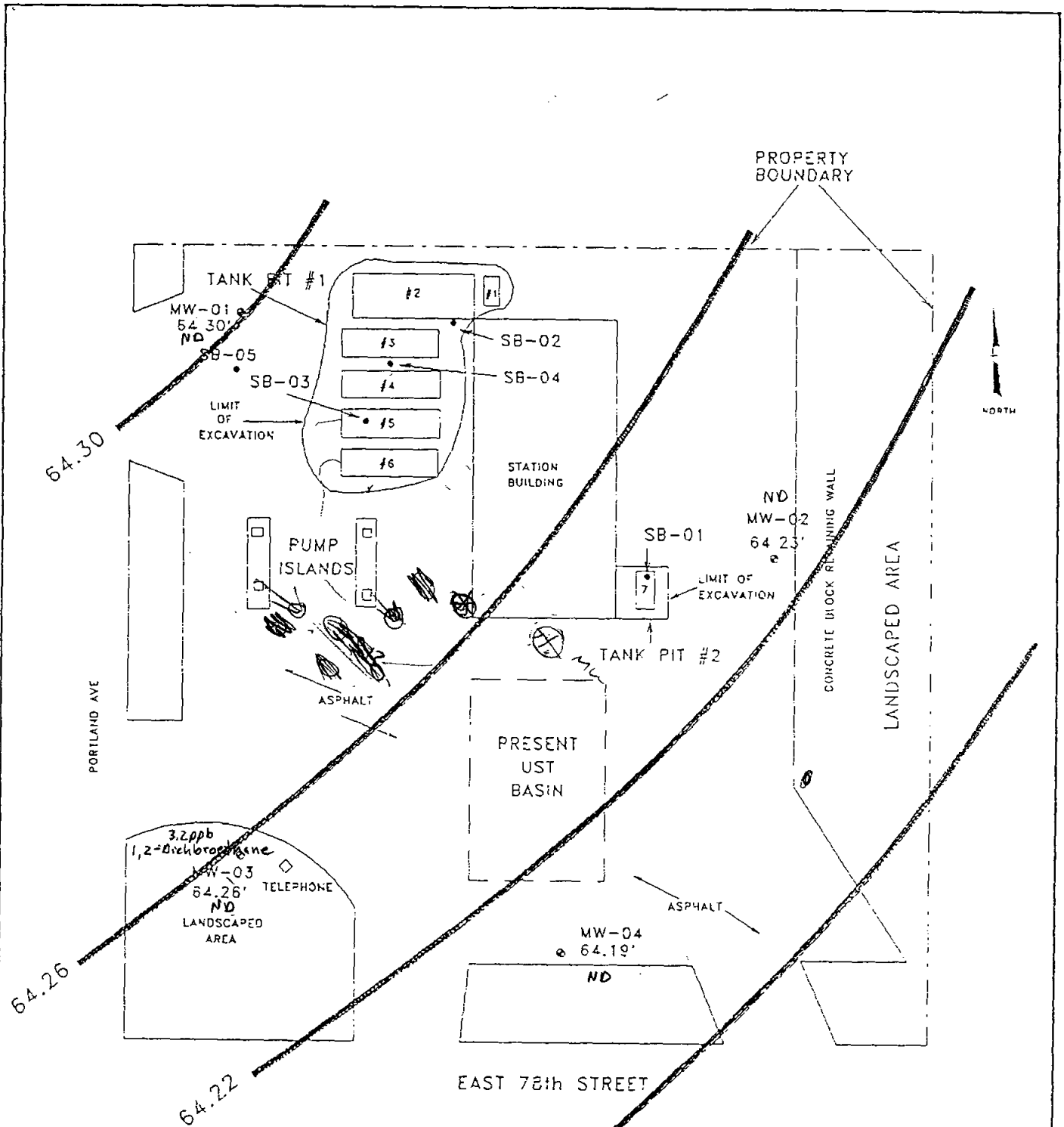
8



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FIGURE 9
 GEOLOGIC CROSS SECTION A-A'
 SINCLAIR SERVICE STATION
 7733 PORTLAND AVE S, RICHFIELD, MN

PROJECT NO	DATE	SCALE	PREPARED BY	REVIEWED BY	DATE	REVISION	
711-017	3/91	SEE DRAWING	GVA			ORIGINAL	C1



- TANK #1 = 560 GALLON WASTE OIL TANK
- TANK #2 = 6000 GALLON PREM NO LEAD
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- TANK #4 = 4000 GALLON REGULAR
- TANK #5 = 4000 GALLON UNLEADED
- TANK #6 = 4000 GALLON UNLEADED
- TANK #7 = 1000 GALLON #1 FUEL OIL

SCALE 1" = 30'

- = SOIL BORING LOCATION
- ⊗ = MONITORING WELL LOCATION

ENECOTECH		GROUNDWATER ELEVATION CONTOUR MAP (3/08/91) SINCLAIR SERVICE STATION 7753 PORTLAND AVE. SOUTH RICHFIELD, MINNESOTA
BLOOMINGTON, MINNESOTA		
PROJECT	SINCLAIR-PORTLAND AVE	

SB-1 and SB-2 - NO

~~SB~~ MW-1, 2, 3, 4 and SB-5 < 14.3 ppm

SB-3 + SB-4 49-1250 ppm 4-36'

Soil Samples

SB-3 920 ppm THCl/g 9'

SB-4 97 ppm THCl/g + 480 ppm THCl/FO - 10'

SB-5 1.3 ppm THCl/g 35'

MW-3 2.6 ppm THCl/FO 34'

Monitoring Wells

Water Table 35'

GW flows South east

Ground water Contamination

NO BTEX, TPIT - MW's

3.2 ppb 1,2-Dichloroethane in MW-3 - Marke off-site source.

Vapor Assessment

None

Ground Water Receptor

none - not required

HydroGeologic Setting

none - not required.

appears that the increase in benzene levels in the water found in the sump pit immediately adjacent to the tank basin is the result of continuous petroleum releases from the tank system after Total Petroleum acquired the property. Buoyant forces working on the large USTs and freeze-thaw cycles cause the large USTs to heave and may result in leaks from weak joints in fill pipes and pipe lines. The petroleum release has impacted the water table aquifer above the Minnesota Department of Health Recommended Allowable Limits (RALs) for benzene and toluene. The downgradient extent of ground water contamination is currently unknown. Ground water contamination increases in MW-2 and MW-3 when the water table rises in the spring and summer and comes in contact with residual petroleum contamination in the soil. ~~The residual petroleum contamination is probably the result of petroleum releases which occurred while Q-Petroleum was operating the tanks. Some of the residual petroleum contamination may be the result of petroleum releases which occurred after Total Petroleum acquired the property in June 1988.~~ It is impossible to determine if the subsequent petroleum releases which occurred after Total Petroleum acquired the property are contributing to the level of contamination in the water table aquifer. The water wells located within a mile radius of the site are completed in Quaternary sand and gravel sediments, and the Prairie du Chien Group and Jordan Sandstone. All the aquifers utilized by the water wells are separated from the impacted water table aquifer by 6 to 85 feet of a confining clay layer, therefore it is very unlikely that the drinking water aquifers will be impacted by the petroleum release.

Increasing levels of petroleum contamination detected in the water found in the sump pit immediately adjacent to the tank basin may be due to continuous petroleum releases from the tank system after Total Petroleum acquired the property. Therefore, the MPCA is requesting both Q-Petroleum and Total Petroleum to proceed with the necessary additional investigation to identify and prevent any continuous petroleum releases and determine the magnitude and extent of ground water contamination and the potential vapor impact to underground structures and utilities.

The following comments present our response to the conclusions and recommendations in the report, and outline the performance objectives, technical recommendations, and motivation for the additional work.

1. The water table aquifer is not a drinking water aquifer or a potential drinking water aquifer because of the impermeable nature of the sandy lean clay aquifer material and its inability to yield sufficient quantities of water. Therefore, the cleanup goal will be 100 times the RALs and the compliance boundary will generally be the property boundary.
2. Q-Petroleum should work in conjunction with Total Petroleum to identify, prevent and mitigate any continuous petroleum releases from the tank system. Please submit any information regarding the identification and prevention of any continuous petroleum releases.
3. An adequate number of monitoring well(s) should be installed to define the downgradient extent of ground water contamination. The additional monitoring well(s) should be installed downgradient of MW-3. Please notify MPCA hydrogeologist Larry Quandt (612-297-8602) of the proposed location and construction of the downgradient monitoring well(s) a minimum of 10 working days prior to installation.
4. Ground water monitoring is required to determine the magnitude and extent

#25.72

Tank Excavation

2 - 4,000 gallon regular gasoline Tank

2 - 4,000 gallon unleaded gasoline Tank

1 - 6,000 gallon premium unleaded gasoline Tank

1 - 1,000 gallon fuel oil Tank

1 - 560 gallon waste oil Tank.

Corroded w. $\frac{1}{2}$ "

Soil conditions - Fine to coarse grained sand

Organic vapors 2.2 = 357 ppm 2-16 feet

Soil samples 190 - 1900 ppm THC/FO 7-16 feet.
11-1100 ppm THG/g

most of the contaminated soil was removed.

300 cubic yds was removed.

Remedial Investigation

5 soil borings

4 monitoring wells 31-60' deep.

General Geology

9' silty, fine to medium grained sand

27' fine to coarse grained sand with trace of gravel

Organic vapors

of ground water contamination. Investigation ground water monitoring should be conducted in accordance with the MPCA new guidance document entitled "Leaking Underground Storage Tank Program Ground Water Monitoring" dated May 1991. The new monitoring well(s) and MW-2, MW-3, and MW-4 should be sampled a minimum of two quarters. The ground water samples should be analyzed for benzene, ethylbenzene, toluene, xylenes, methyl tertiary butyl ether, and total hydrocarbons as gasoline.

5. High levels of volatile hydrocarbons are present in the soil and ground water beneath the site. A vapor risk assessment should be conducted in accordance with the MPCA guidance document "Petroleum Vapor Risk Assessment and Survey" dated May 8, 1990 to determine if a vapor survey is necessary.

6. Inventory control records for the last 12 months should be reconciled, summarized, and submitted to the MPCA. Results of all previous tank tightness tests (including data and worksheets or calculations) should be included with the inventory control records.

7. The MPCA agrees with DPRA's recommendation to continue pumping the water from the sump pit and tank basin until the leak has been identified and repaired because buoyant forces and freeze-thaw cycles cause the large USTs to heave which may result in leaks from weak joints in fill pipes and pipe lines. Water samples pumped from the sump pit should be analyzed for benzene, ethylbenzene, toluene, xylenes and total hydrocarbons as gasoline. Please submit all data regarding the dewatering system and sump pit and the analytical results and volume of water treated to date.

8. A report summarizing and documenting the results of the work described in comments 2, 3, 4, 5, 6 and 7 should be submitted to the MPCA. The report should follow the format outlined in the MPCA guidance document "Petroleum Tank Release Reports" dated May 1991. The ground water monitoring program and need for additional corrective action will be reevaluated based on the results of this report.

9. If ground water contaminants exceed the cleanup goal in any of the monitoring wells, please notify MPCA hydrogeologist Larry Quandt (612-297-8602).