



3900 Northwoods Drive  
Suite 200  
St. Paul, MN 55112  
612/486-8022  
FAX: 612/486-8021

November 22, 1994

Mr. E. Edwin Balcos  
Minnesota Pollution Control Agency  
Tanks and Spills Section  
Hazardous Waste Division  
520 Lafayette Road North  
St. Paul, MN 55155

RECEIVED

NOV 23 1994

MPCA, HAZARDOUS  
WASTE DIVISION

Subject: Subsurface Investigation Results  
U S West Facility  
3317 24th Avenue South  
Minneapolis, Minnesota  
MPCA Leak No. 7651  
Delta No. A094-215

Dear Mr. Balcos:

Delta Environmental Consultants, Inc. (Delta), is pleased to submit the results of a subsurface investigation conducted at the above-referenced site. The investigation was conducted in response to the Minnesota Pollution Control Agency's (MPCA), July 28, 1994, letter to U S West Business Resources, Inc. (U S West), requesting a remedial investigation (RI).

## 1.0 INTRODUCTION

During removal of one 1,000-gallon fuel oil underground storage tank (UST) at U S West's, 3317 24th Avenue South, Minneapolis, Minnesota, facility (Figure 1), organic vapors were detected at levels of 10 to 50 parts per million (ppm) and diesel range organics were detected at a concentration of 1,300 ppm in soil samples from the west end of the tank basin at 10 feet below ground surface (bgs). Samples from the east end of the tank basin were not impacted (Appendix A). Upon receipt of the RI request letter from the MPCA, U S West authorized Delta, on October 6, 1994, to complete a subsurface investigation utilizing a geoprobe drilling rig.

## 2.0 ENVIRONMENTAL GEOPROBE INVESTIGATION

Three geoprobe borings were advanced by Matrix Technologies, Inc. (Matrix), near the tank basin at the southeast corner of the site (Figures 1 and 2) on October 20, 1994. The borings were concentrated to the east as ground water flow is believed to be to the east to southeast due to the general slope in elevation and the Mississippi river being approximately 1.5 miles to the east. In addition, the former UST was replaced by a vaulted UST and borings between the vaulted UST and the building were not possible.

Mr. E. Edwin Balcos  
Delta No. A094-215  
November 22, 1994  
Page 2

Soil samples were collected at 5-foot intervals and screened (headspace method) with a photoionization detector (PID) equipped with a 11.8 eV bulb to detect diesel fuel and higher molecular weight petroleum hydrocarbons. Soil lithologies were also characterized (see boring logs, Appendix B).

Ground water was not encountered to 25 feet bgs in borings, GP-1 or Gp-3. Ground water was encountered at 29.5 feet bgs and a sample was collected at 30 feet bgs and analyzed. Soil and ground water samples were analyzed for total petroleum hydrocarbons as fuel oil, benzene, toluene, ethylbenzene, and xylenes.

PID readings obtained from headspace methods indicated no petroleum-hydrocarbon impacts in the vadose zone or unsaturated zone. Unimpacted soil samples collected at 25 feet bgs in GP-1 and GP-3, are believed to be from the vadose zone and representative of ground water condition at those locations. Laboratory results confirmed no detectable petroleum hydrocarbons in the soil or ground water samples.

### 3.0 CONCLUSIONS

- During removal of a 1,000-gallon fuel oil UST, organic vapors and soil samples from the west end of the UST basin at 10 feet bgs indicated that a fuel oil release had occurred.
- Organic vapor readings, soil analytical, and ground water analytical results in borings at the southwest, southeast, and northeast corners of the former tank basin indicate that petroleum-hydrocarbon impacts from the UST are restricted to shallow soils near the building and have not affected ground water.

### 4.0 RECOMMENDATIONS

- Closure of Leak No. 7651 with no further investigative or remedial activities.

### 5.0 Remarks

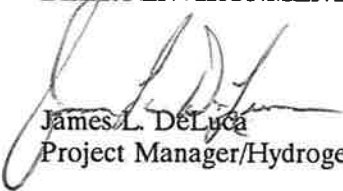
The recommendations contained in this report represent our professional opinions. These opinions are based on currently-available information and are arrived at in accordance with currently-accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

Mr. E. Edwin Balcos  
Delta No. A094-215  
November 22, 1994  
Page 3

If you have any questions or comments, please do not hesitate to contact me at (612) 486-5727.

Sincerely,

**DELTA ENVIRONMENTAL CONSULTANTS, INC.**

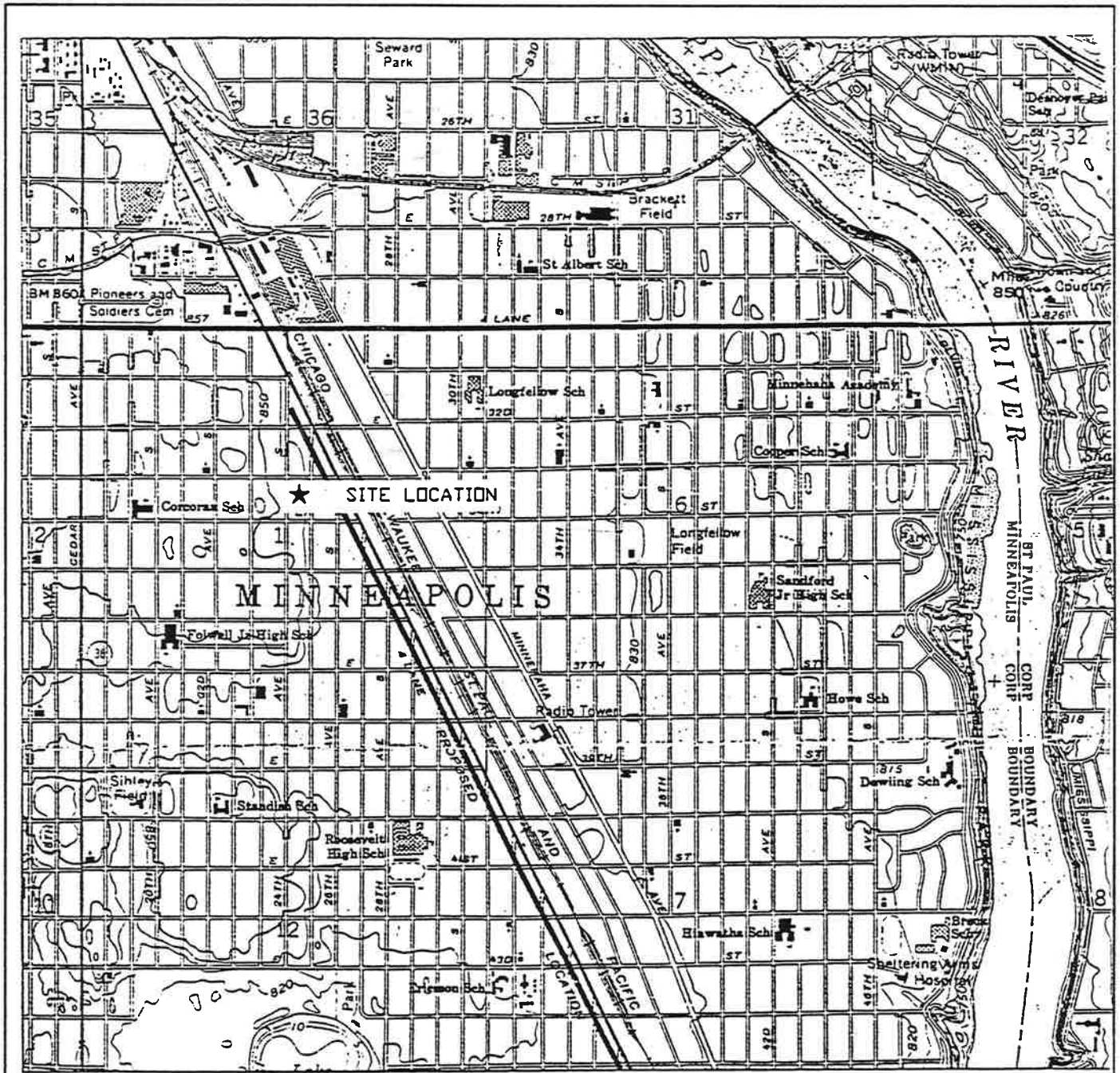


James L. DeLuca  
Project Manager/Hydrogeologist

JLD/jp

Enclosures

cc: Mr. Doug Swanson, U S West Business Resources, Inc.



MINNEAPOLIS NORTH QUADRANGLE  
MINNESOTA  
7.5 MINUTE SERIES (TOPOGRAPHIC)

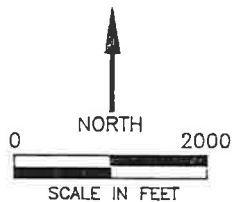
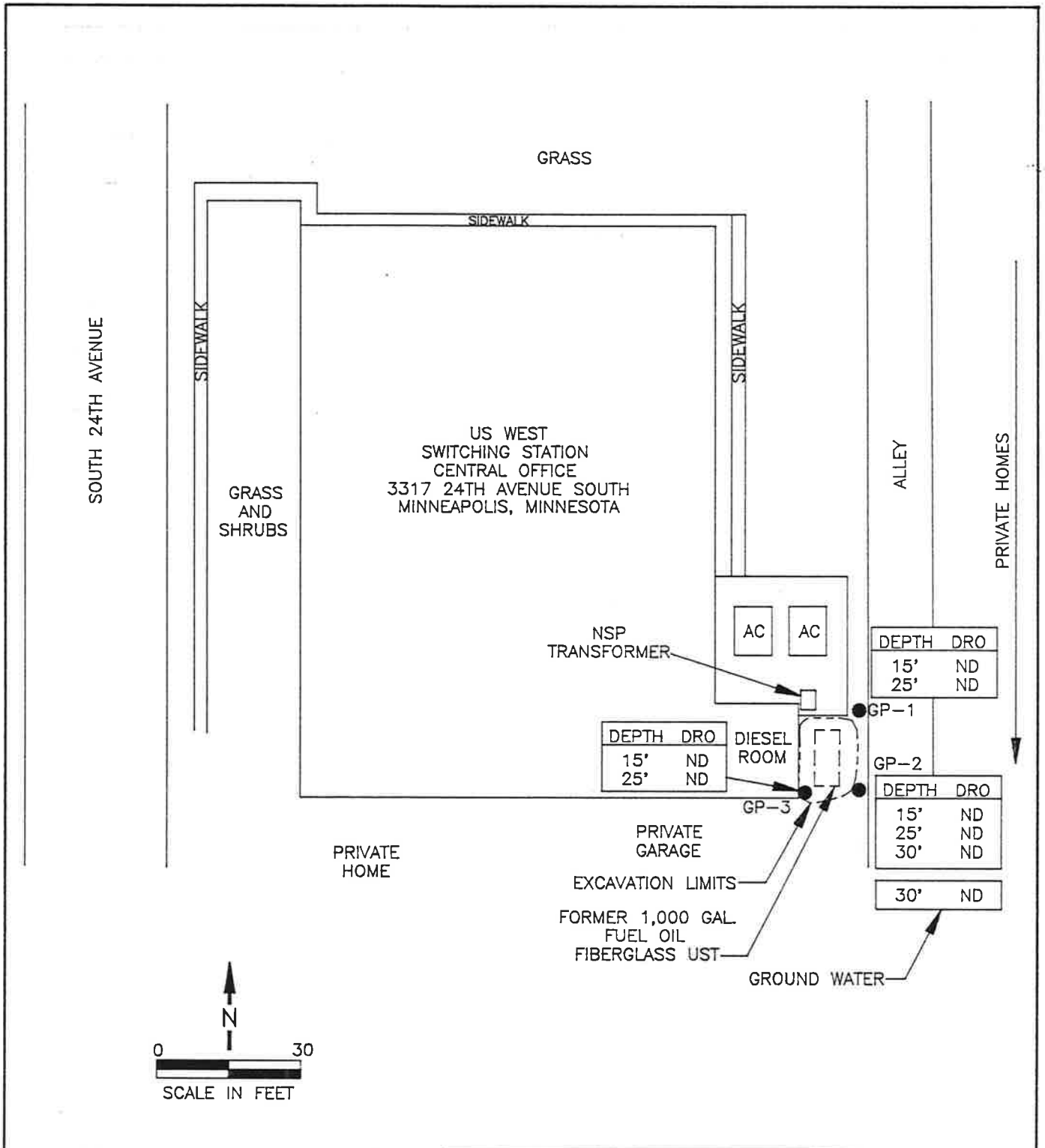


FIGURE 1  
SITE LOCATION MAP  
US WEST FACILITY  
3317 24TH AVENUE SOUTH  
MINNEAPOLIS, MINNESOTA

PROJECT NO. A094-215	PREPARED BY JLD	DRAWN BY DL
DATE 11/14/94	REVIEWED BY	FILE NAME






LEGEND:

- GEOPROBE BORING
- DRO DIESEL RANGE ORGANICS
- ND NOT DETECTED

CONCENTRATIONS FOR GROUNDWATER  
ARE IN ug/L

CONCENTRATIONS FOR SOIL  
ARE IN mg/KG

**FIGURE 2**  
DRO CONCENTRATIONS  
GEOPROBE INVESTIGATION  
US WEST FACILITY  
3317 24TH AVENUE SOUTH  
MINNEAPOLIS, MINNESOTA

PROJECT NO. A094-215	PREPARED BY JLD	DRAWN BY DL	
DATE 11/14/94	REVIEWED BY	FILE NAME 94215	

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MPCA, HAZARDOUS  
WASTE DIVISION

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## **REPORT**

### **EXCAVATION REPORT FOR PETROLEUM RELEASE SITES**

**US WEST FACILITY  
3317 24TH AVENUE SOUTH  
MINNEAPOLIS, MINNESOTA**

**MPCA LEAK# 7651  
PROJECT NO.: M94-646**

**October 3, 1994**

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**Nova**   
Environmental Services, Inc.

**EXCAVATION REPORT FOR  
PETROLEUM RELEASE SITES  
US WEST - FACILITY  
3317 24TH AVENUE SOUTH  
MINNEAPOLIS, MINNESOTA  
LEAK # 7651  
NOVA PROJECT NO.: M94-646**

**October 3, 1994**

**RECEIVED**

NOV 23 1994

MPCA, HAZARDOUS  
WASTE DIVISION

**Prepared for:**

**US WEST - BUSINESS RESOURCES  
ATTN: MR. DOUG SWANSON  
2800 WAYZATA BLVD., ROOM 370  
MINNEAPOLIS, MINNESOTA 55405**

**Prepared by:**

**NOVA ENVIRONMENTAL SERVICES, INC.  
1107 HAZELTINE BOULEVARD, SUITE 400  
CHASKA, MINNESOTA 55318  
(612) 448-9393**

## INTRODUCTION

Nova Environmental Services, Inc. (Nova) is submitting the enclosed Excavation Report for Petroleum Release Sites for the US West Switching Station located at 3317 24th Avenue South, Minneapolis, Minnesota. Nova was on-site on July 13 and 14, 1994 to observe the removal of the 1,000 gallon fuel oil underground storage tank (UST).

## UST REMOVAL

The 1,000 gallon fuel oil UST was constructed of fiberglass with hold down straps connected to a concrete pad. The UST was removed and disposed of by Robin Contracting, Inc. The tank appeared to be in good condition with no visible holes. The release may have been due to piping failure or overfilling.

## SOIL MONITORING AND SAMPLING

The excavated soil and gravel exposed along the sidewalls and bottom of the excavation was monitored for organic vapors using a photoionization detector (PID). Physical observations were also used to identify impacted soil.

Organic vapors were detected in soil samples collected from the northwest bottom of the excavation basin at concentrations ranging from 10 to 50 parts per million (ppm).

Samples were collected from the base and sidewalls of the excavation and from the soil stockpile. Approximately 20 cubic yards of contaminated pea gravel was stockpiled on-site, until approval for treatment was obtained from the MPCA. Selected soil samples were submitted to Horizon Laboratories, Inc. for analysis of benzene, ethyl benzene, toluene and xylenes (BETX), and diesel range organics (DRO).



Laboratory analysis of soil samples collected from the base of the excavation beneath the west end of the UST detected the presence of DRO compounds.

Laboratory analysis of soil sample BS-W (10'), collected from the west side of the UST tank pad, detected DRO at a concentration of 1,300 ppm. Soil sample BS-E (10'), collected from the east side of the tank pad, did not reveal any petroleum compounds above laboratory detection limits.

### BEDROCK AND GROUND WATER OBSERVATIONS

Bedrock was not encountered in the excavation basin. Ground water was not observed in the excavation basin, however, very moist to wet soil was present at the bottom of the excavation basin at a depth of 10 feet.

### CONCLUSIONS AND RECOMMENDATIONS

Soil remaining in-place was shown to contain DRO compounds at concentrations above the MPCA action levels (50 ppm DRO, sandy soils).

Based on the laboratory analysis results, a Remedial Investigation is necessary to define the extent of the impacted soil and ground water.

Upon receiving approval from the MPCA, the stockpiled pea gravel was used as grading for a parking lot at the US West facility, located at 500 North Carlton, Maplewood, Minnesota.

EXCAVATION REPORT FOR PETROLEUM RELEASE SITES

EXCAVATION REPORT FOR PETROLEUM RELEASE SITES

Minnesota Pollution Control Agency  
Tanks and Spills Section

The information below should be completed and submitted to the Minnesota Pollution Control Agency (MPCA) Tanks and Spills Section to document excavation of petroleum contaminated soil. Excavations must be done in accordance with the MPCA document "Excavation of Petroleum Contamination Soil". Preliminary site investigation reports (if conducted) should be included with this report.

Additional pages may be attached. Please type or print clearly.

**I. BACKGROUND**

- A. **Site:** US West Switching Station  
**Street:** 3317 24th Ave. S.  
**City, Zip:** Minneapolis  
**County:** Hennepin  
**MPCA Site ID#:** LEAK00007651
- B. **Tank Owner/Operator:**  
US West - Business Resources  
**Mailing Address:** 2800 Wayzata Blvd.  
**City, Zip:** Minneapolis, 55405  
**Telephone:** (612) 374-2708  
Attn: Mr. Doug Swanson
- C. **Excavating Contractor:**  
Robin Contracting, Inc.  
**Contact:** Mr. Harlo Edelstien  
**Telephone:** (612) 545-7437  
  
**Tank Contractor**  
**Certification Number:** 0172
- D. **Consultant:** Nova Environmental Services, Inc.  
**Contact:** Mr. Davison C. Nagle  
**Mailing Address:** 1107 Hazeltine Blvd., Suite 400  
**City, Zip:** Chaska, 55318  
**Telephone:** (612) 448-9393
- E. **Others on-site during site work (e.g., fire marshal, local officials, MPCA staff, etc.):**  
  
No others on-site during site work.

**II. DATES**

- A. **Date release reported to MPCA:** July 14, 1994
- B. **Dates site work performed:**

<u>Work Performed</u>	<u>Date</u>
UST removed.	July 13, 1994

**III. RELEASE INFORMATION**

A. Provide the following information for all tanks which have been removed.

Tank 1: Capacity: 1,000 gallon Type: Fiberglass Age: Unknown

Condition: Good

Product History: Fuel oil

Approximate quantity of petroleum released, if known: Unknown

Cause of Release: Overfills - Piping failure?

B. Provide the following information for all existing tanks.

<u>Tank No.</u>	<u>Capacity</u>	<u>Contents</u>	<u>Type</u>	<u>Age</u>
002	1,000 gallons	Fuel Oil	Steel in vault	new 94'

C. If the release was associated with the lines or dispensers, briefly describe the problem:

Release may have been associated with piping failure.

D. If the release was a surface spill, briefly describe the problem:

Release may have been associated with overfilling.

**IV. EXCAVATION**

- A. *Dimensions of excavation:* 20' NS x 15' EW x 10' deep
- B. *Original tank backfill material (sand, gravel, etc.):* Gravel, pebbles, cobbles
- C. *Native soil type (clay, sand, etc.):* Sand
- D. *Quantity of contaminated soil removed (cubic yards):* <20 cubic yards of pea gravel
- E. *Was ground water encountered or was there evidence of a seasonally high ground water table? At what depth?*

Groundwater was not observed, however soils were moist at 10 feet below grade.

- F. *If a soil boring was necessary (as indicated in part VI of "Excavation of Petroleum Contaminated Soil" for sand and silty sand native soils) describe the soil analytical and soil vapor headspace results. Attach the boring logs and laboratory results to this report.*
- G. *If ground water was encountered or if a soil boring was conducted, was there evidence of ground water contamination? Specify, e.g., free product (specify thickness), product sheen, ground water in contact with petroleum contaminated soil, water analytical results, etc.*
- H. *Was bedrock encountered in the excavation? At what depth?*
- I. *Were there other unique conditions associated with this site? If so, explain.*

No, bedrock was not encountered during excavation activities.

Gravel, pebble, and cobble fill made excavation difficult due to cave in. Shoring was placed in the excavation and a concrete vault was installed for a new fuel oil tank.

V. SAMPLING

A. Briefly describe the field methods (including use of a photoionization detector) used to distinguish contaminated from uncontaminated soil:

Field methods used to distinguish contaminated soil from uncontaminated soil included PID jar headspace screening and physical observations.

B. List soil vapor headspace analysis results. Indicate sampling locations using sample codes (with sampling depths in parenthesis), e.g. SV-1 (2 feet), SV-2 (10 feet), etc. Samples that were taken at different depths at the same location should be labeled SV-1A (2 feet), SV-1B (4 feet), SV-1C, (6 feet), etc. These should correspond with the codes on the site map in part VI.

<u>Sample Code</u>	<u>Soil Type</u>	<u>Reading ppm</u>	<u>Bottom Sidewall</u>	<u>Sample Code</u>	<u>Soil Type</u>	<u>Reading ppm</u>	<u>Bottom/ Sidewall</u>
SV-1(8')	Gravel	50	Bottom	SV-10(9')	Gravel	10	Pile
SV-2(8')	Gravel	35	Bottom	SV-11(9')	Gravel	45	Pile
SV-3(8')	Gravel	45	Bottom	SV-12(9')	Gravel	15	Pile
SV-4(6')	Gravel	ND	N Sidewall	SV-13(9')	Gravel	18	Pile
SV-5(6')	Gravel	ND	S Sidewall	SV-14(9')	Gravel	20	Pile
SV-6(6')	Gravel	ND	E Sidewall	SV-15(10')	Sand	150	W of Pad
SV-7(6')	Gravel	ND	W Sidewall	SV-16(10')	Sand	ND	S of Pad
SV-8(8')	Gravel	ND	E side of tank	SV-17(10')	Sand	ND	E of Pad
SV-9(9')	Gravel	ND	E side of tank	SV-18(10')	Sand	ND	SW of Pad

C. Briefly describe the soil sampling and handling procedures used:

Grab samples were collected from freshly exposed soil. Sample locations were selected to best represent soil conditions within the excavation and to comply with current MPCA guidelines. The soil samples were collected and stored in clean laboratory supplied glass containers. The samples were preserved in coolers with ice. Soil samples were submitted to Horizon Laboratories, Inc. for analysis.

D. List the appropriate soil sample analytical results below (refer to the MPCA document "Soil and Ground Water Analysis at Petroleum Release Sites"). If the petroleum was not gasoline or fuel oil attached a separate table. Code the samples (with sampling depths in parenthesis) SS-1 (8 feet), SS-2 (4 feet), etc. These should correspond with the codes on the site map in part VI.

<u>Sample Code</u>	<u>DRO (ppm)</u>	<u>Benzene (ppm)</u>	<u>Ethyl benzene (ppm)</u>	<u>Toluene (ppm)</u>	<u>Xylene (ppm)</u>
BSE (10')	ND	ND	ND	ND	ND
BSW (10')	1,300	0.00039	0.055	0.027	0.31

NOTE: ATTACH COPIES OF LABORATORY REPORTS AND CHAIN OF CUSTODY FORMS

VI. FIGURES

Attach the following figures to this report:

1. Site location map.
2. Site map(s) drawn to scale illustrating the following:
  - a. location (or former location) of all present and former tanks, lines, and dispensers.
  - b. location of other structures (buildings, canopies, etc.).
  - c. adjacent city, township, or county roadways.
  - d. final extent of excavation.
  - e. location of soil vapor analyses (e.g., SV-1), soil samples (e.g., SS-1), and soil borings (e.g. SB-1). Also, attach all boring logs.
  - f. north arrow and map legend.

**VII. SUMMARY**

*Briefly summarize evidence indicating whether or not additional investigation is necessary at the site, as discussed in part VI of the MPCA document "Excavation of Petroleum Contaminated Soil".*

Based on the laboratory results, it appears that soil has been impacted as a result of the petroleum release at this site. A remedial investigation is recommended as outlined in MPCA guidelines. The remedial investigation should define the vertical and horizontal extent of the release.

**VIII. CONSULTANT**

*Company Name:* Nova Environmental Services, Inc.  
*Street/Box:* 1107 Hazeltine Blvd.  
*City, Zip:* Chaska, MN 55318  
*Telephone:* (612) 448-9393  
*Contact:* Mr. Davison C. Nagle

*Signature* \_\_\_\_\_



*Date:* \_\_\_\_\_

10/4/94

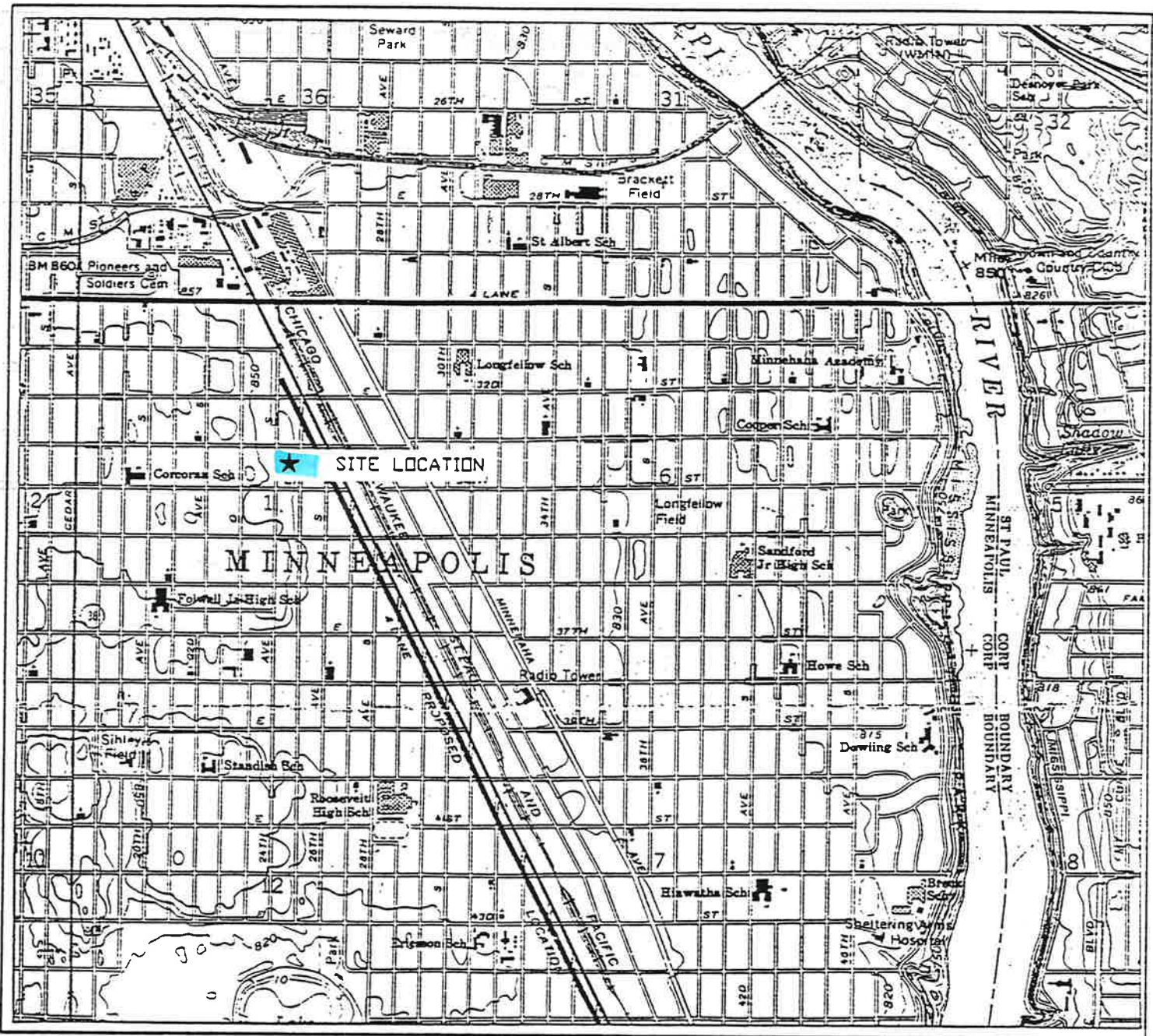
*If additional investigation is not required at the site, please mail this form and all necessary attachments to:*

*Minnesota Pollution Control Agency  
Attn: Edwin Balcos - Project Manager  
Hazardous Waste Division  
Tanks and Spills Section  
520 Lafayette Road  
St. Paul, MN 55155*

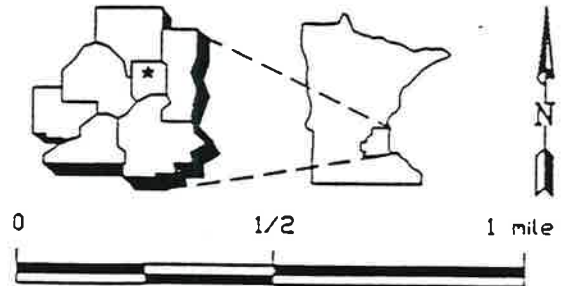
*If additional investigation is required at the site, this form should be included as a section in the Remedial Investigation/Corrective Action Design report. Excavation reports which indicate that a remedial investigation (RI) is necessary will not be reviewed by MPCA staff until the RI has been completed.*



FIGURES



★ SITE LOCATION



SCALE

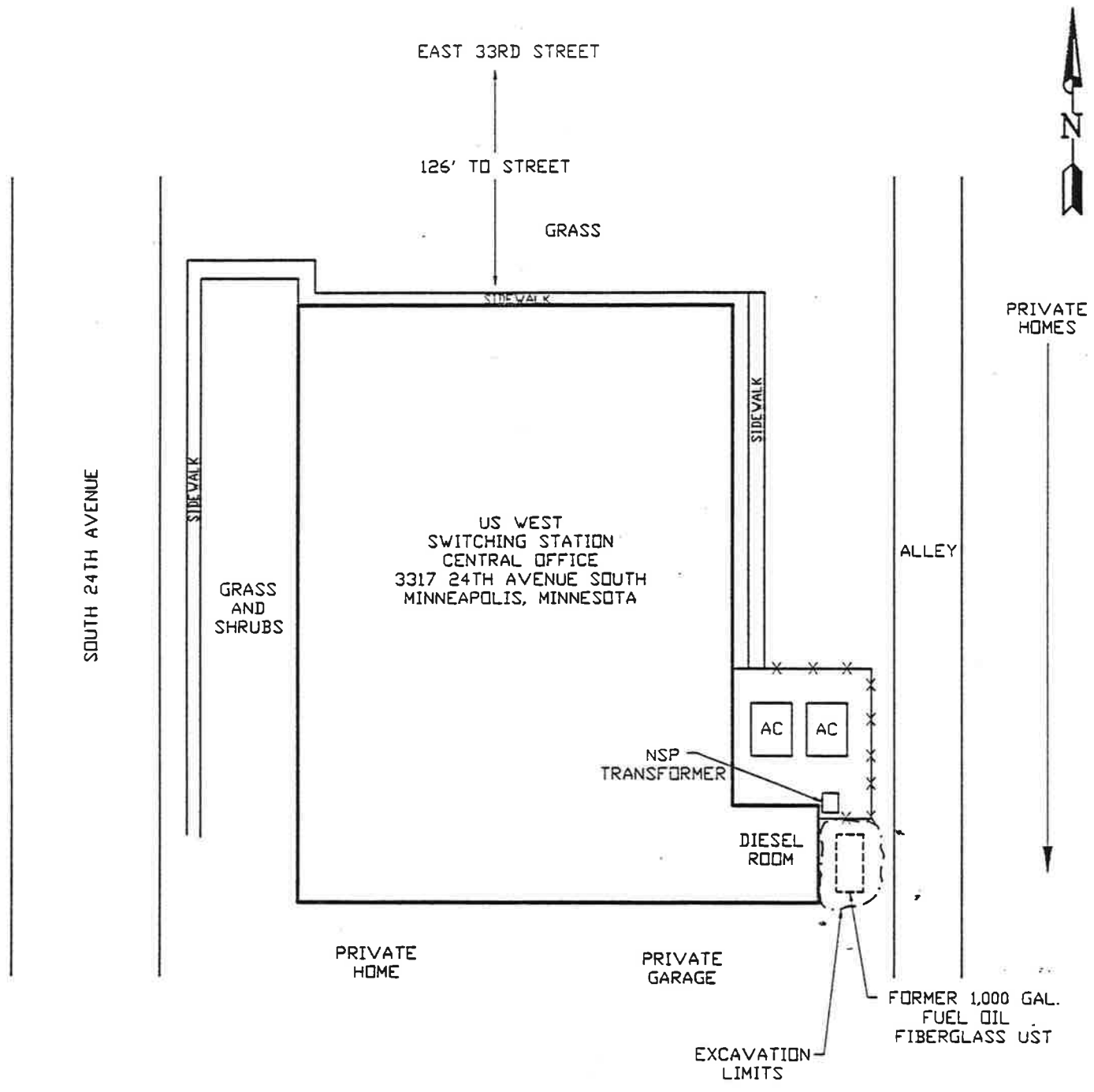
SITE LOCATION DIAGRAM  
 JS WEST FACILITY  
 3317 24TH AVENUE SOUTH  
 MINNEAPOLIS, MINNESOTA

M444/M94-646

**Nova**   
 Environmental Services, Inc.

JULY - 94

1



KEY

—x—x— FENCE



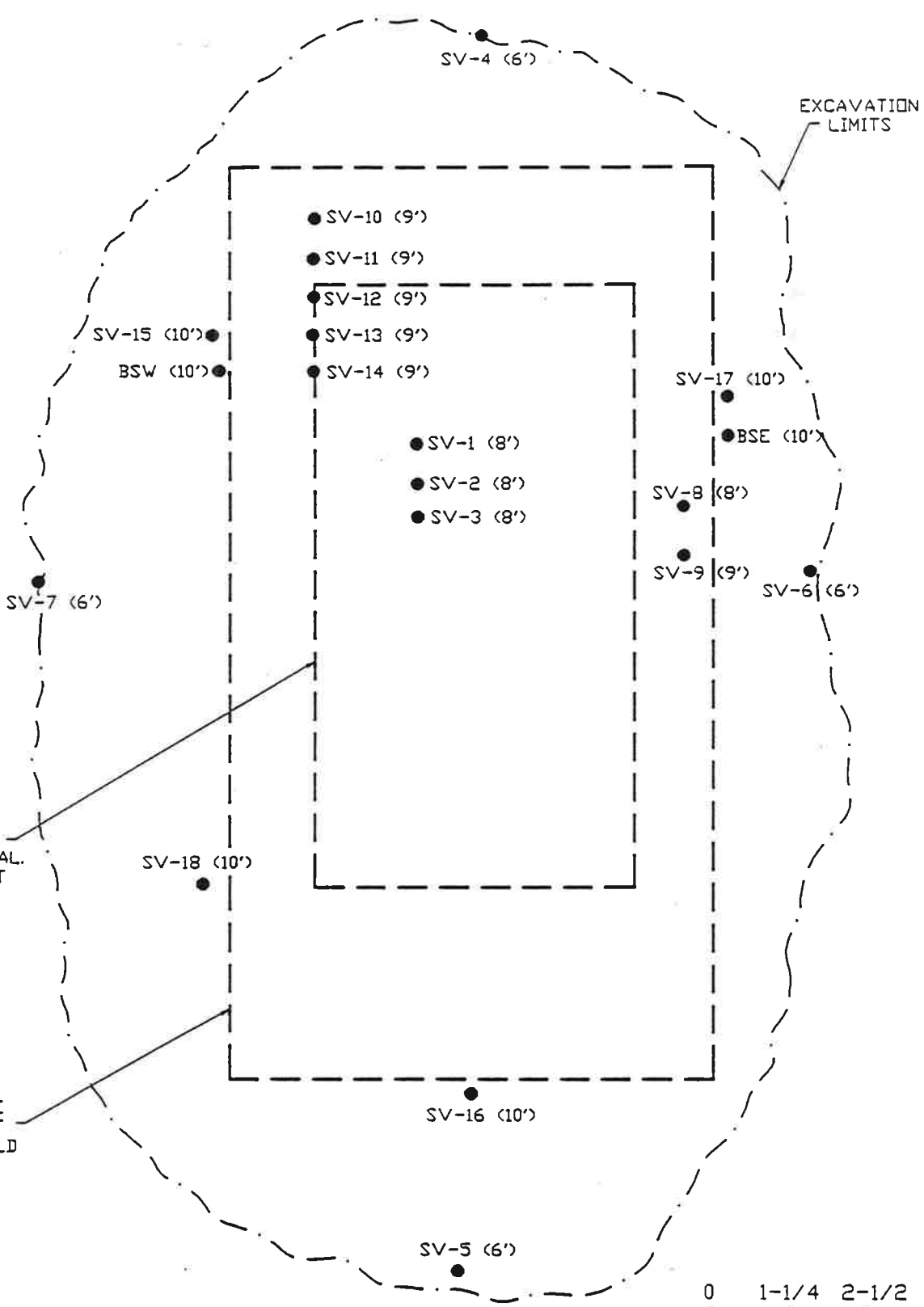
SCALE: 1" = 30'

SITE DIAGRAM  
US WEST FACILITY  
3317 24TH AVENUE SOUTH  
MINNEAPOLIS, MINNESOTA

M444/M94-646

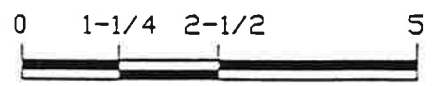


JULY - 94



APPROXIMATE  
LOCATION OF  
FORMER 1,000 GAL.  
FUEL OIL UST

APPROXIMATE  
LOCATION OF  
CONCRETE HOLD  
DOWN PAD



SCALE: 1" = 2-1/2'

SAMPLE LOCATIONS  
IS WEST FACILITY  
3317 24TH AVENUE SOUTH  
MINNEAPOLIS, MINNESOTA

M444/M94-646



JULY - 94

3

LABORATORY RESULTS

## LABORATORY REPORT

**Client:** Nova Environmental Services, Inc.  
Suite 400, Hazeltine Gates  
1107 Hazeltine Blvd.  
Chaska, MN 55318

**Date Sampled:** 07/14/94  
**Date Received:** 07/15/94  
**Date Analyzed:** 07/18/94  
**Physical State:** Soil

**Project:** US West  
3317 24th Ave. S.  
Minneapolis, MN

**Report Date:** 07/22/94  
**Lab P.N.:** 1057-3  
**Client P.N.:** M94-627

### Quality Assurance / Quality Control Summary

<u>Parameter (Method)</u>	<u>QC Type</u>	<u>Percent Recovery</u>	<u>Acceptable Range</u>	<u>Percent Reproducibility</u>	<u>Acceptable Range</u>
Benzene (EPA 8020)	M	95	127 - 76	106	127 - 76
Toluene (EPA 8020)	M	97	125 - 76	105	125 - 76
Ethylbenzene (EPA 8020)	M	102	125 - 76	100	125 - 76
m,p-Xylenes (EPA 8020)	M	103	125 - 76	101	125 - 76
o-Xylenes (EPA 8020)	M	102	125 - 76	101	125 - 76

M = Matrix Spike / Matrix Spike Duplicate

L = Laboratory Control Sample

  
\_\_\_\_\_  
Reviewed

  
\_\_\_\_\_  
Approved

Compounds were identified by column retention time and quantified by peak area of known standards using a Hewlett Packard ChemStation Data System. The samples were received by HORIZON LABORATORIES, INC. and accompanied by the Chain-of-Custody record. The Laboratory Report is the sole property of the client to whom it is addressed. The Laboratory Results are only a part of the Laboratory Report.

## LABORATORY RESULTS

**Client:** Nova Environmental Services, Inc.  
Suite 400, Hazeltine Gates  
1107 Hazeltine Blvd.  
Chaska, MN 55318

**Date Sampled:** 07/14/94  
**Date Analyzed:** 07/18/94  
**Physical State:** Soil

**Project:** US West  
3317 24th Ave. S.  
Minneapolis, MN

**Report Date:** 07/22/94  
**Lab P.N.:** 1057-3  
**Client P.N.:** M94-627

<u>Sample I.D.</u>	<u>Benzene</u> mg/kg <u>EPA 8020</u>	<u>Toluene</u> mg/kg <u>EPA 8020</u>	<u>Ethyl- benzene</u> mg/kg <u>EPA 8020</u>	<u>Total, Xylenes</u> mg/kg <u>EPA 8020</u>	<u>DRO</u> mg/kg <u>Wis. DNR</u>	<u>% Moisture</u>
BSE, 10'	<.0002	<.0005	<.0002	<.0008	<0.6	4.9
BSW, 10'	0.00039	0.027	0.055	0.31	1,300	4.2
MDL, mg/kg	.0002	.0005	.0002	.0008	0.6	

MDL; Method Detection Limit

DRO; Diesel Range Organics

All results are in mg/kg which is equal to parts-per-million (ppm) and are based on a "dry weight" basis.

The Laboratory Results are only a part of the Laboratory Report.



# CHAIN-OF-CUSTODY RECORD

Horizon Laboratories, Inc.

River Road Business Center Bldg. IV 5155 East River Road, Suite #416 Fridley, MN. 55421 Tel. (612) 572-0425 Fax (612) 572-0441

Lab Sample Number	Field Sample ID	Sampling Site Identification	Collection Date / Time	Sample Matrix: Soil(S), Sludge(SL), Aqueous(A)	Analysis Requested	Number of Containers	Total Number of Containers
9818	BSE, 10'	Bottom Sample East, 10'	7-14-94 PM	S	DRO BETX	4	4
9819	BSW, 10'	Bottom Sample West, 10'	7-14-94 PM	S	✓ ✓	4	4

Client: US West

Project Name: US West

Project Address: 3317 24th Ave, S.  
Mpls., MN.

Sample Collector's Signature / Date: Klauson C. Nagle 7-15-94

Horizon Laboratories Job No. 1057-3

Client Project No. M94-627 Page 1 of 1

CHAIN-OF-CUSTODY RECORD NUMBER

Container / Comments

1.) Relinquished by: (Signature) <u>Klauson C. Nagle</u>	Date	Time	2.) Received by: (Signature)
Company: <u>NOVA</u>	<u>7-15-94</u>	<u>8:44</u>	Company: <u>Horizon Labs</u>
3.) Relinquished by: (Signature)	Date	Time	4.) Received by Laboratory: (Signature)
Company:			<u>[Signature]</u>
Disposed by: (Signature)	Date	Time	Comments: <u>Horizon Labs</u>

Temperature of Shipping Container: On Ice °C

Custody Seal Intact? yes / no

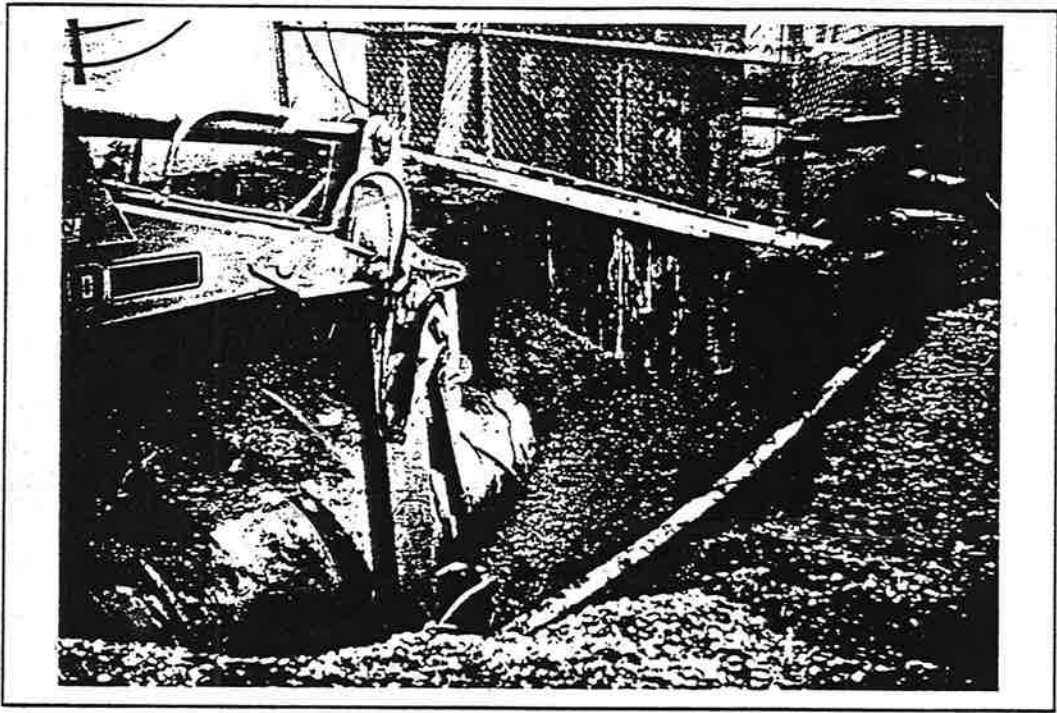
If yes, Custody Seal No.:

Sample(s) Condition:

Laboratory Receiving Notes: On Ice

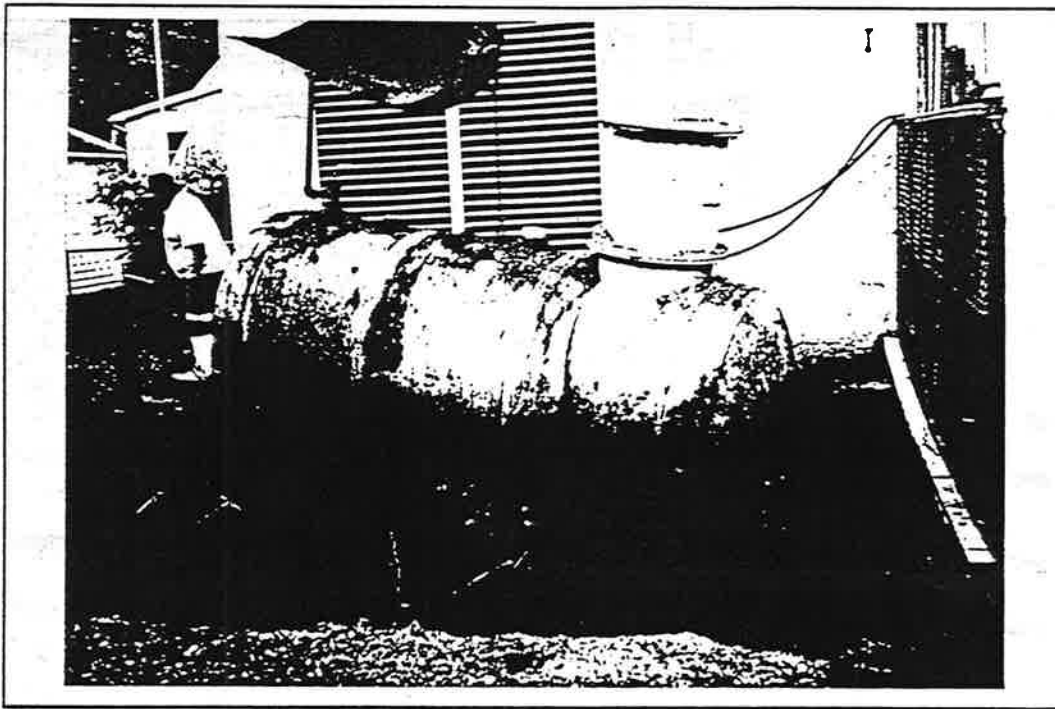


PHOTOGRAPHIC DOCUMENTATION

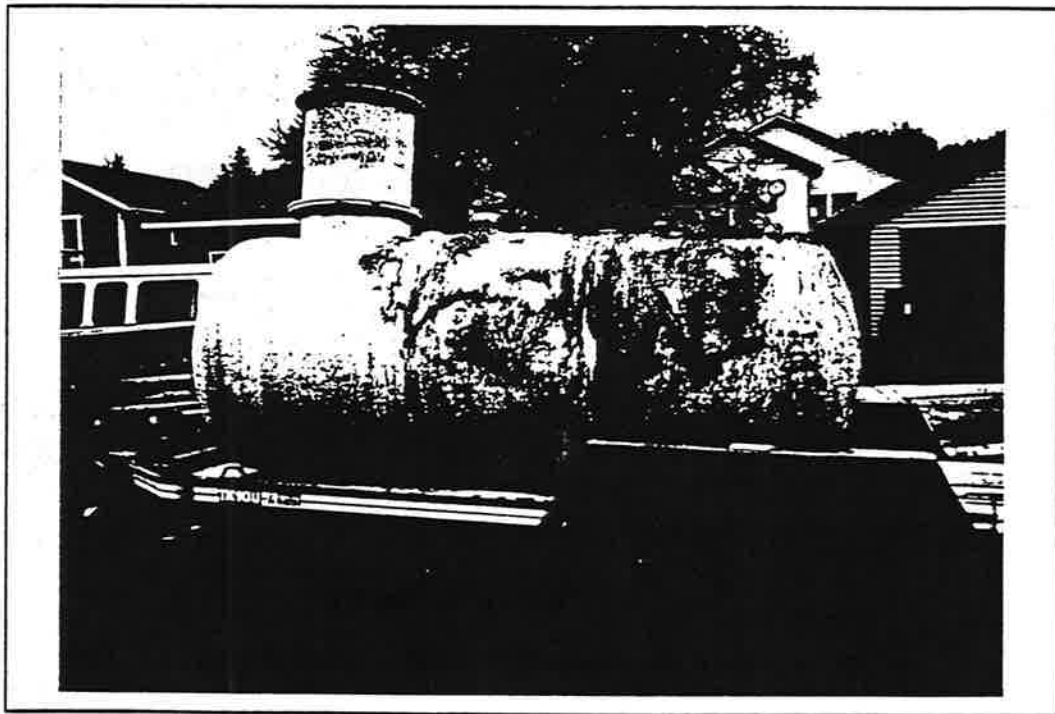


Exposing Tank #1.



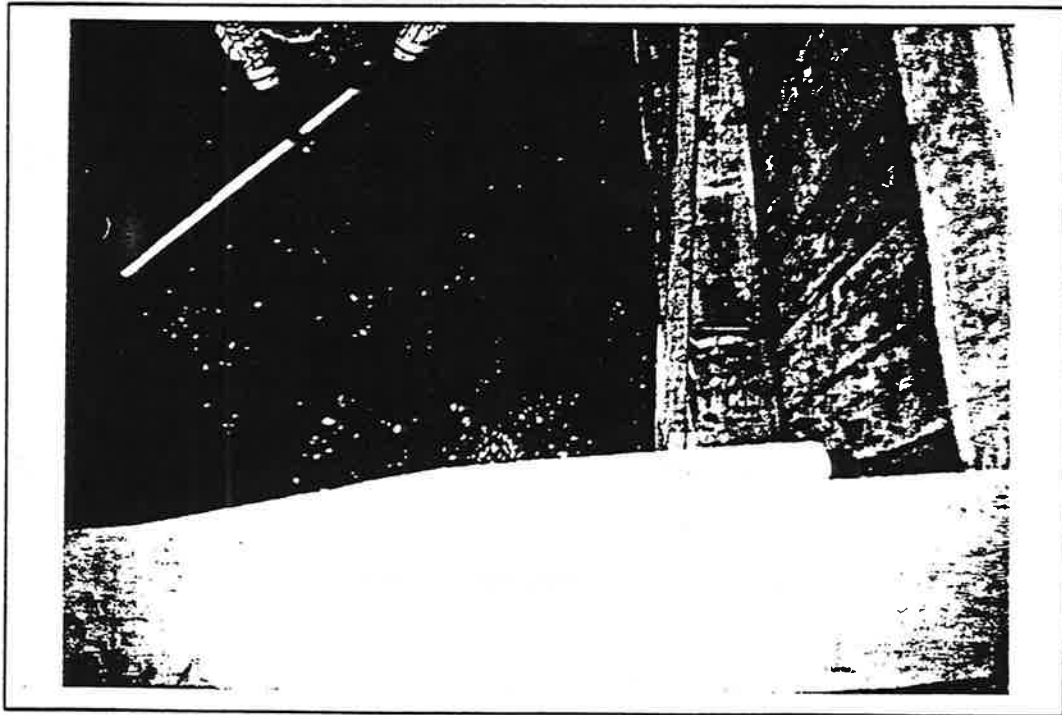


Removal of Tank #1.





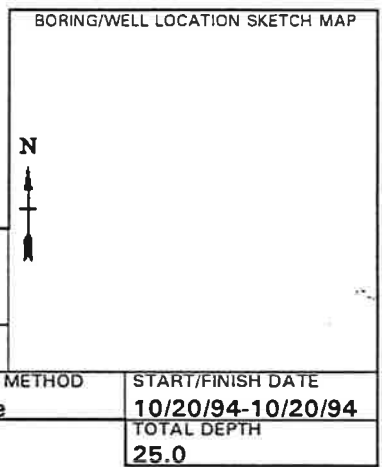
Final sample locations.





**SOIL BORING LOG**

BORING/WELL NO. <b>GP-1</b>		PROJECT NO./NAME <b>A094-215/US West Switching Station</b>		LOCATION <b>3317 24th Ave. So.</b>	
DRILLING CONTRACTOR/DRILLER <b>Matrix/Rand Satorski</b>		GEOLOGIST/OFFICE <b>Jared Otto/St. Paul</b>		APPROVED BY	
DRILLING EQUIPMENT/METHOD <b>Geoprobe/Geoprobe</b>		SIZE/TYPE OF BIT	SAMPLING METHOD <b>Geoprobe</b>	START/FINISH DATE <b>10/20/94-10/20/94</b>	
				TOTAL DEPTH <b>25.0</b>	



**LITHOLOGY**

**SAMPLING DATA**

Depth, feet	Graphic Log	Visual Description	Sample No. and Interval	Penetration Rate (Blows/)	PID Values (ppm)
		Topsoil			
5		SAND (SP), fine to medium grained with trace silt, brown, moist, moderate to well sorted.	5		0
10		SAND (SW), fine to coarse grained sand with minor fine grained gravel, light brown, dry to slightly moist, moderately sorted.	10		0
15		SAND/GRAVEL (SW/GW), fine to coarse grained sand with fine grained gravel, brown, dry to slightly moist, poor to moderately sorted.	GP-1 13-15		0
20		SAND (SW), fine to coarse grained sand with minor fine grained gravel, brown, dry to slightly moist, moderately sorted.	20		0
25		-same as above	GP-1 23-25		0
end of boring at 25 feet					



Page 1 of 1

**SOIL BORING LOG**

BORING/WELL NO. <b>GP-2</b>		PROJECT NO./NAME <b>A094-215/US West Switching Station</b>		LOCATION <b>3317 24th Ave. So. Minneapolis, MN</b>	
DRILLING CONTRACTOR/DRILLER <b>Matrix/Rand Satorski</b>		GEOLOGIST/OFFICE <b>Jared Otto/St. Paul</b>		APPROVED BY	
DRILLING EQUIPMENT/METHOD <b>Geoprobe/Geoprobe</b>		SIZE/TYPE OF BIT	SAMPLING METHOD <b>Geoprobe</b>	START/FINISH DATE <b>10/20/94-10/20/94</b>	
				TOTAL DEPTH <b>30.0</b>	

**LITHOLOGY**

**SAMPLING DATA**

Depth, feet	Graphic Log	Visual Description	Sample No. and Interval	Penetration Rate (Blows/)	PID Values (ppm)
0		Topsoil			
5		SAND (SP), fine to coarse grained, brown, moist, moderate to well sorted.			0
10		SAND (SW), fine to coarse grained sand with minor fine grained gravel, light brown, dry to slightly moist, moderately sorted.			0
15		SAND/GRAVEL (SW/GW), fine to coarse grained sand with fine grained gravel, brown, dry to slightly moist, poor to moderately sorted.	GP-2 13-15		0
20		SAND (SW), fine to coarse grained sand with minor fine grained gravel, brown, moist, moderately sorted.			0
25		-same as above	GP-2 23-25		0
30		-same as above	GP-2 28-30		0
30		-wet			

end of boring at 30 feet



Page 1 of 1

**SOIL BORING LOG**

BORING/WELL NO. <b>GP-3</b>				
PROJECT NO./NAME <b>A094-215/US West Switching Station</b>		LOCATION <b>3317 24th Ave. So. Minneapolis, MN</b>		
DRILLING CONTRACTOR/DRILLER <b>Matrix/Rand Satorski</b>		APPROVED BY		
GEOLOGIST/OFFICE <b>Jared Otto/St. Paul</b>				
DRILLING EQUIPMENT/METHOD <b>Geoprobe/Geoprobe</b>		SIZE/TYPE OF BIT	SAMPLING METHOD <b>Geoprobe</b>	START/FINISH DATE <b>10/20/94-10/20/94</b>
				TOTAL DEPTH <b>25.0</b>

**LITHOLOGY**

**SAMPLING DATA**

Depth, feet	Graphic Log	Visual Description	Sample No. and Interval	Penetration Rate (Blows/)	PID Values (ppm)
0		Topsoil			
5		-no recovery			0
10		SAND (SW), fine to coarse grained sand with minor fine grained gravel, brown, moist, moderately sorted.			0
15		-same as above	GP-3 13-15		0
20		-same as above			0
25		-same as above	GP-3 23-25		0
end of boring at 25 feet					

SUBSURFACE ASSESSMENT RESULTS

US WEST FACILITY  
MINNEAPOLIS, MINNESOTA

MATRIX PROJECT NO. 94110

Prepared by: MATRIX Technologies, Inc.  
8631 Jefferson Highway  
Osseo, MN 55369  
(612) 424-4803

October 21, 1994



# SUBSURFACE ASSESSMENT RESULTS

US WEST FACILITY  
MINNEAPOLIS, MINNESOTA

MATRIX PROJECT NO. 94110

## 1.0 INTRODUCTION

MATRIX Technologies, Inc. (MATRIX), was authorized by Mr. Jared Otto of Delta Environmental Consultants, Inc. (Delta), to perform a subsurface assessment at the US West Facility Site located in Minneapolis, Minnesota. The purpose of the assessment was to collect soil and ground water samples for on-site laboratory analysis of petroleum hydrocarbons. Probe locations were directed by Mr. Jared Otto of Delta.

## 2.0 SCOPE OF WORK

The scope of services provided by MATRIX included the following:

- ◆ Contacted the state one call system and arranged for all public utilities in the investigation area to be located (Ticket No. 382460).
- ◆ Advanced three (3) probes to depths ranging from twenty five (25) to thirty (30) feet bgs for the purpose of collecting soil samples for logging, screening, and on-site lab analysis.
- ◆ Analyzed seven (7) soil samples in the field with a laboratory grade gas chromatograph for benzene, toluene, ethyl benzene, xylenes, and TPH as fuel oil in accordance with US EPA Method 8020 Modified.
- ◆ Advanced one (1) probe to a depth of thirty (30) feet bgs for the purpose of collecting a ground water sample for on-site laboratory analysis.
- ◆ Analyzed one (1) ground water sample in the field with a laboratory grade gas chromatograph for benzene, toluene, ethyl benzene, xylenes, and TPH as fuel oil in accordance with US EPA Method 8020 Modified.
- ◆ Abandoned all probe points with a neat cement grout mixture according to Minnesota Department of Health guidelines.

### 3.0 SOIL SAMPLING

On October 20, 1994, MATRIX advanced three (3) probes to depths ranging from twenty five (25) to thirty (30) feet bgs for the purpose of collecting soil samples. Two feet soil core samples were collected at selected intervals below the ground surface at each probe location. This procedure utilizes 1-inch O.D. steel probes and the large bore soil core sampler. The probe rods and sampling unit were driven to the desired sampling depth by a carrier vehicle mounted Geoprobe® sampling unit. The probe rods and sampler were advanced by the static weight of the carrier vehicle and hydraulic hammer percussion.

While driving the soil core sampler to the desired depth, a pin stops the end point and piston from sliding into the collection tube. At the desired sampling depth, the pin was removed and the probe rods were advanced approximately 24-inches. The piston and end point are forced up into the collection tube by the sample being collected. Sample cores were collected in a 1-1/8 inch diameter removable acetate liner. The assembly was then brought back to the surface and the soil sample collected, and placed into a sample jar (Figure 1).

After each sample was collected the probe rods and large bore soil core sampling equipment were washed in a Alconox/water mixture and rinsed with water. Acetate liners were discarded after each sample was collected and a new liner used for the collection of the next sample.

#### 4.0 GROUND WATER SAMPLING

On October 20, 1994, MATRIX advanced one (1) probe to a depth of thirty (30) feet bgs for the collection of ground water samples. The procedure utilizes 1-inch outside diameter steel probes and the screened point ground water sampler driven to the desired sampling depth by a carrier vehicle mounted Geoprobe<sup>®</sup> sampling unit. The probe rods and sampler were advanced by the static weight of the carrier vehicle and hydraulic hammer percussion.

When the sampling depth was reached, small diameter extension rods were run through the steel probe rods to push out the expendable drive point and stainless steel sampling screen. Polyethylene tubing with a check valve in the bottom was then inserted through the steel probe rods and a steady up and down motion repeated until water was captured in the tubing. Ground water samples were then collected in 40-ml vials for laboratory analysis (Figure 2).

After each sample was collected the probe rods and screened point ground water sampler were washed in a Alconox/water mixture and rinsed with water. The polyethylene tubing was discarded after each sample was collected and new tubing used for the collection of the next sample.

Probe locations were abandoned by filling with a neat cement grout mixture. A copy of the Minnesota Department of Health Sealing Report is included in Appendix A (Sealing Report No. 44966).

## 5.0 CHEMICAL ANALYSIS

Soil and ground water samples collected were quantified for benzene, toluene, ethyl benzene, xylenes, and TPH as fuel oil in accordance with US EPA Method 8020 modified. Soil and ground water samples were concentrated with an OI-Analytical Model 4560 purge and trap sample concentrator. The purge and trap sample concentrator is directly connected to a Hewlett Packard 5890 Series II gas chromatograph (GC). The soil and ground water samples were analyzed by PID and FID detectors in series. The results of the chemical analysis are summarized in Table 1.

The following quality assurance/quality control measures were conducted to ensure the validity of the analytical results:


- ◆ A five point calibration curve for the method target compounds was established.
- ◆ A prepared standard was run to verify the calibration curve.
- ◆ A reagent water blank was run to assure the entire analytical system was free of interferences prior to any sample analysis.
- ◆ A surrogate standard (4-bromofluorobenzene) was run with each sample to monitor retention time accuracy and concentration efficiency.
- ◆ A matrix spike and a matrix spike duplicate were run to confirm precision and accuracy of the analytical system and to identify possible matrix effects.

6.0 GENERAL COMMENTS

The analysis and opinions expressed in this report are based upon data obtained from the soil and ground water samples collected at the indicated locations and from other information discussed in this report. This report is prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted practices. No warranties, expressed or implied are intended or made.

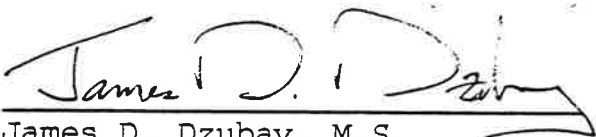
This report was prepared by:

**MATRIX Technologies, Inc.**



James L. St. Mary  
Environmental Chemist

\_\_\_\_\_  
Date



James D. Dzuby, M.S.  
Operations Manager/President

10/21/94  
Date

TABLES

**TABLE 1**

US WEST FACILITY  
MINNEAPOLIS, MINNESOTA

MATRIX PROJECT NO. 94110

ANALYTE	SAMPLE LOCATION						
	GP-1 13'-15' UG/KG <sup>1</sup>	GP-1 23'-25' UG/KG	GP-2 13'-15' UG/KG	GP-2 23'-25' UG/KG	GP-2 28'-30' UG/KG	GP-3 13'-15' UG/KG	GP-3 23'-25' UG/KG
BENZENE <sup>2</sup>	<5.0 <sup>3</sup>	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TOLUENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
ETHYLBENZENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
XYLENES	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TPH AS FUEL OIL	<200.	<200.	<200.	<200.	<200.	<200.	<200.
4- BROMOFLUOROBENZENE <sup>4</sup>	112.%	96.7%	111.%	107.%	112.%	90.4%	110.%

- <sup>1</sup> - Soil sample results reported in micrograms per kilogram (ug/kg).
- <sup>2</sup> - Analyte and TPH as fuel oil results quantified in accordance with US EPA Method 8020.
- <sup>3</sup> - <5.0 represents less than the method practical quantitation limit.
- <sup>4</sup> - Surrogate standard added to confirm retention time and concentration accuracy.

Date(s): October 20, 1994

# TABLE 1

US WEST FACILITY  
MINNEAPOLIS, MINNESOTA

MATRIX PROJECT NO. 94110

ANALYTE	GP - 2 WATER 30' UG/L <sup>1</sup>	SAMPLE LOCATION	SAMPLE LOCATION	SAMPLE LOCATION	SAMPLE LOCATION
BENZENE <sup>2</sup>	<1.0 <sup>3</sup>				
TOLUENE	<1.0				
ETHYLBENZENE	<1.0				
XYLENES	<1.0				
TPH AS FUEL OIL	<100.				
4 - BROMOFLUOROBENZENE <sup>4</sup>	115.8				

- <sup>1</sup> - Water sample results reported in micrograms per liter (ug/L).
- <sup>2</sup> - Analyte and TPH as fuel oil results quantified in accordance with US EPA Method 8020.
- <sup>3</sup> - <1.0 represents less than the method practical quantitation limit.
- <sup>4</sup> - Surrogate standard added to confirm retention time and concentration accuracy.

Date(s): October 20, 1994



**QUALITY ASSURANCE/QUALITY CONTROL DATA**

ANALYTE	SAMPLE ID.		
	MS <sup>1</sup> % RECOVERY	MSD <sup>2</sup> % RECOVERY	RPD <sup>3</sup>
BENZENE	106.	102.5	3.3
TOLUENE	95.9	95.5	0.
ETHYLBENZENE	111.	96.5	13.9
XYLENES	100.	116.6	15.4
TPH AS FUEL OIL	122.	76.3	46.1

MS - Matrix Spike, data reported in percent recovery.  
MSD - Matrix Spike Duplicate, data reported in percent recovery.  
RPD - Relative Percent Difference data