

**3M Environmental Engineering
and Pollution Control**

PO Box 33331
St. Paul, MN 55133-3331
612/778 4335

November 25, 1992



Subject: Excavation Report for Underground Tank Removal at 3M Center

Mr. Dave Holst
Minnesota Pollution Control Agency
Hazardous Waste Division
Tanks and Spills Section
520 Lafayette Road
St. Paul, Minnesota 55155

(2266-399)

Dear Mr. Holst:

Enclosed please find a copy of an excavation report with attachments detailing the sampling and analytical information obtained during the removal of an underground tank and the subsequent investigation at the 3M Center Building 223 in Maplewood. Based on the results of the soil borings, the contamination appears to have been removed. Thirty one tons of contaminated soil were removed from the backfill and thermally treated at CleanSoils in St. Paul. No further action is recommended for this site.

If you have any questions or require further information, please call me at 778-5104.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Lowell Miller Stolte', is written over the typed name.

Lowell Miller Stolte, P.E.
Senior Environmental Engineer

- attachments:
1. Excavation Report
 2. Petroleum Tank Release Report Checklist
 3. Subsurface Investigation Report, Bay West

4112
5748

EXCAVATION REPORT FOR PETROLEUM RELEASE SITES

Minnesota Pollution Control Agency
Tanks and Spills Section
May 1991

I. BACKGROUND

- A. Site: 3M Center, Building 223
Street: 11th Street
City, Zip: Maplewood 55109
County: Ramsey
MPCA Site ID# LEAK00004267
- B. Tank Owner/Operator: *ATTN: LA STOLTE*
3M Company
Mailing Address:
P.O. Box 33331
Building 21-2W-05
City, Zip:
St. Paul, MN 55133-3331
Telephone: 612/778-6130
- C. Excavating Contractor:
Bay West, Inc.
Contact: Jan Williams
Telephone: 612/291-0456
Tank Contractor Certification
Number: 0128
- D. Consultant:
Bay West, Inc.
5 Empire Drive
St. Paul, MN 55103-1867
(612) 291-0456
Project Manager:
Jan Williams
- E. Others on-site during site work (e.g., fire marshal, local officials, MPCA staff, etc.):

Note: If person other than tank owner and/or operator is conducting the the cleanup, provide name, address, and relationship to site on a separate attached sheet.

II. DATES

A. Date release reported to MPCA: *7/17/91*

B. Dates site work performed:

<u>Work Performed</u>	<u>Date</u>
Excavate to expose tank, remove piping	7/15/91
Remove tank, excavate contaminated soil	7/16/91
Enlarge excavation, screen soils, collect samples	7/23/91
Install new tank and pressure test	7/30/91 thru 7/31/91

III. RELEASE INFORMATION

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

Tank 1: Capacity 1,000 gal Type steel Age _____

Condition: Poor

Product history:

Diesel fuel for standby generator.

Approximate quantity of petroleum released, if known:

Unknown

Cause of release:

Holes in west side of tank.

Tank 2: Capacity _____ Type _____ Age _____

Condition: _____

Product history:

Approximate quantity of petroleum released, if known:

Cause of release:

Tank 3: Capacity _____ Type _____ Age _____

Condition: _____

Product history:

Approximate quantity of petroleum released, if known:

Cause of release:

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>
_____	_____ gals.	_____	_____	_____
_____	_____ gals.	_____	_____	_____

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

Not associated.

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

Not associated.

IV. EXCAVATION

A. Dimensions of excavation: 30' x 28' x 12' deep

B. Original tank backfill material (sand, gravel, etc.): Sand

C. Native soil type (clay, sand, etc.): Poorly sorted clay.

D. Quantity of contaminated soil removed: 40 cubic yards

E. Was ground water encountered or was there evidence of a seasonally high ground water table? At what depth? No

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.
see attached.

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.
No

H. Was bedrock encountered in the excavation? At what depth?

No.

I. Were there other unique conditions associated with this site? If so, explain.

Majority of contamination was in a 3" sand layer, approximately 10' below grade on west side of excavation.

V. SAMPLING

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

Used an HNu photoionization detector and followed MPCA's "Jar Headspace Analytical Screening Procedure."

- B. List soil vapor headspace analysis results. Indicate sampling locations using sample codes (with sampling depths in parentheses), e.g. SV-1 (2'), SV-2 (10'), etc. Samples that were taken at different depths at the same location should be labelled SV-1A (2'), SV-1B (4'), SV-1C (6'), etc. These should correspond with the codes on the site map in part VI. If sample represents soil from the final extent of the excavation, indicate "bottom" or "sidewall" in the bottom/sidewall column.

Sample Code	Soil Type	Reading, ppm	Bottom/Sidewall	Sample Code	Soil Type	Reading, ppm	Bottom/Sidewall
SV-1A (2')	Topsoil	0	Bottom	SV-3C (11')	Clay	0	Bottom
SV-1B (5')	Clay	0	Bottom	SV-4A (34')	Clay	0	Sidewall
SV-1C (9')	Clay	0	Bottom	SV-4B (6')	Clay	8	Sidewall
SV-1D (12')	Clay	0	Bottom	SV-4C (9')	Sand	6	Sidewall
SV-2A (3')	Clay	0	Sidewall	SV-4D (12')	Clay	0	Bottom
SV-2B (6')	Clay	0	Sidewall	SV-5A (3')	Clay	0	Sidewall
SV-2C (9')	Sand	0	Sidewall	SV-5B (5')	Clay	0	Sidewall
SV-2D (12')	Clay	0	Bottom	SV-5C (8')	Clay	6	Sidewall
SV-3A (3')	Clay	0	Sidewall	SV-5D (10')	Sand	50	Sidewall
SV-3B (7')	Sand	12	Sidewall	SV-5E (12')	Clay	0	Bottom

Excavation Report for Petroleum Release Sites

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May 1991

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

All samples were discrete grab samples from freshly exposed soil. Samples were collected wearing clean, disposable gloves. Then 3-40 ml sample jars were filled for each sample. All samples were labeled and stored in a cooler on ice until transferred to the Lab.

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

Sample Code	THC as gas or fuel oil ppm (circle one)	Benzene ppm	Ethyl-benzene ppm	Toluene ppm	Xylene ppm	MTBE ppm	Lead ppm
SS-1(10')	3.900	< 0.93	2.6	< 0.93	4.7		
SS-2(12')	< 1.25	< 0.025	< 0.025	< 0.025	< 0.025		
SS-3(12')	< 1.25	< 0.025	< 0.025	< 0.025	< 0.025		
SS-4(12')	2.5	< 0.027	< 0.027	< 0.027	< 0.027		

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

VI. FIGURES

Attach the following figures to this report:

1. Site location map: (See Figure 1)
2. Site map(s) drawn to scale illustrating the following: (See Figure 1)
 - a. location (or former location) of all present and former tanks, lines, and dispensers
 - b. location of other structures (building, 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 additional investigation is necessary at the site, as discussed in part VI of "Excavation of Petroleum Contamination Soil" (Guidance Document 6). If no further action is recommended, the MPCA staff will review this report following notification of soil treatment.

A localized pocket of contaminated soil was excavated from the west side of the tank excavation. Three soil borings completed along the west side indicated no DRO or VOCs. The contaminated soil was disposed of at CleanSoils. No further action is warranted.

VII. SOIL TREATMENT INFORMATION

- A. Soil treatment method used (thermal, land application, other). If you choose "other" specify treatment method: thermal
- B. Location of treatment site/facility: CleanSoils
- C. Date MPCA approved soil treatment (if thermal was used after May 1, 1991, indicate that the MPCA permitted thermal treatment facility agreed to accept soil: 7-21-92
- D. Identify the location of any stockpiled contaminated soil: None currently.

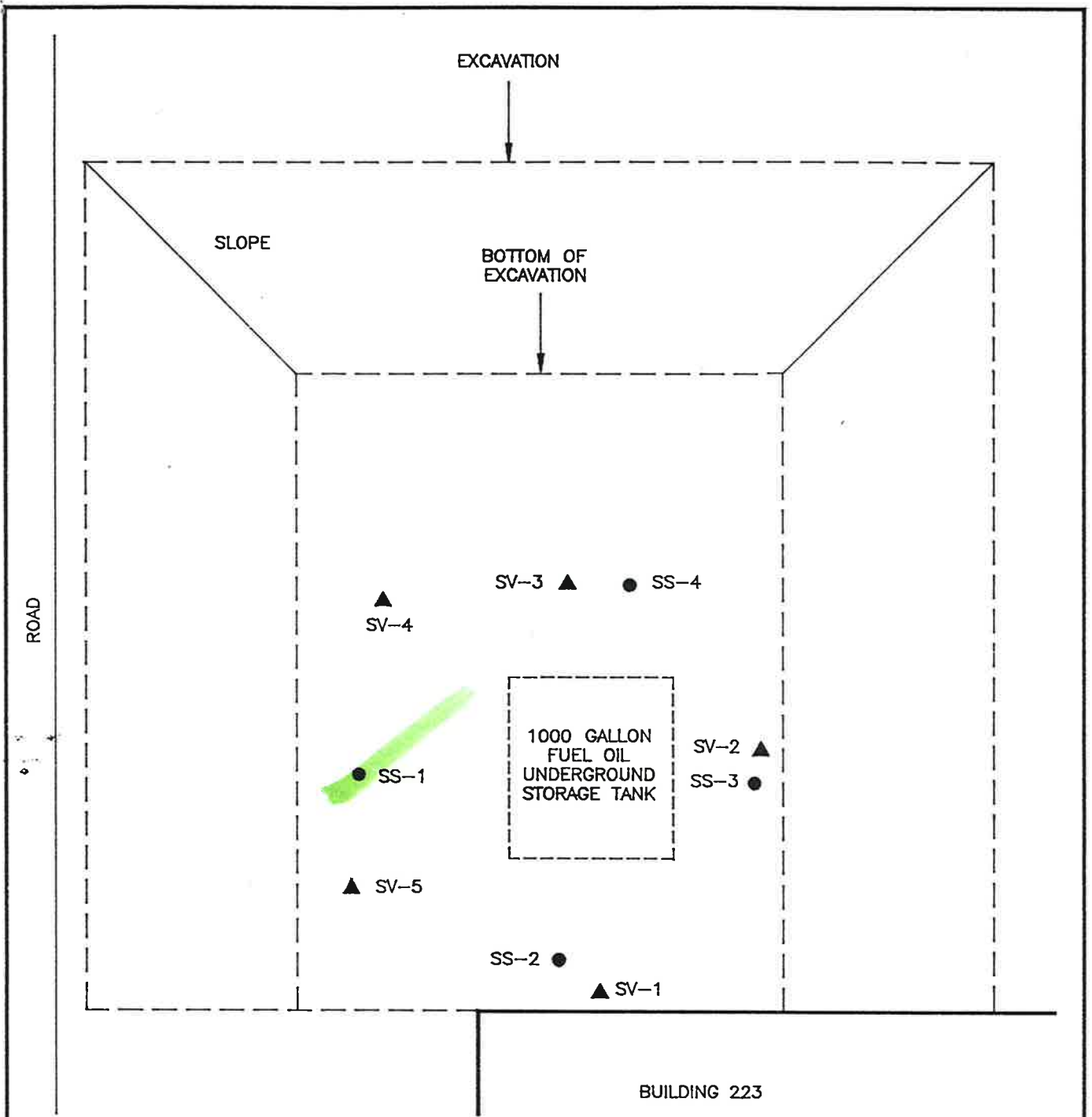
IX. CONSULTANT (OR OTHER) PREPARING THIS REPORT

Company Name: 3M
Street/Box: P.O. BOX 33331 ; ~~ST. PAUL~~ BLDG 21-2W-05
City, Zip: ST. PAUL, MN 55133
Telephone: 612-778-5104
Contact: LOWELL MILLER STOLTE

Signature:  Date: 11-25-92

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

(Project Manager)
Minnesota Pollution Control Agency
Hazardous Waste Division
Tanks and Spills Section
520 Lafayette Road
St. Paul, MN 55155



LEGEND:

- SOIL SAMPLE LOCATION
- ▲ HEADSPACE SAMPLE LOCATION




ENGR'G T.L.	DATE		BAY WEST Inc. ENVIRONMENTAL SERVICES ST. PAUL, MN.
DRAWN K.M.	9/18/91		
REV.			
PROJECT NAME		3M- BUILDING 223	
TITLE		SITE MAP	
DWG. NO.	2288-A1	SCALE	1"=5'
			FIGURE # 1

Table 1

Bay West Environmental Services Project No.: **2288**
 Bay West Laboratory Project ID: **5-1424**

Parameter	Target Reporting Limit mg/Kg	North wall 4 (13324) mg/Kg	Bottom below 2 (13327) mg/Kg	East wall 3 (13330) mg/Kg	Side on west 1 (13333) mg/Kg
Benzene	0.025	<0.027	<0.025	<0.025	<0.93
Toluene	0.025	<0.027	<0.025	<0.025	<0.93
Ethyl Benzene	0.025	<0.027	<0.025	<0.025	2.6
Xylenes	0.025	<0.027	<0.025	<0.025	4.7
Total Petroleum Hydrocarbons (Fuel Oil)	1.25	2.7	<1.25	<1.25	3900.
Extraction Factor (Normalized)		1.07	0.967	0.931	37.0

Extracted: July 29, 1991
 Analyzed : July 30, 1991

Method : EPA 5030/8020 Modified

Target Reporting Limits are provided for reference purposes. The reporting limits that are applicable to a sample are obtained by multiplying the Target Reporting Limit by the Extraction Factor for the sample.

GROUND WATER CHAIN-OF-CUSTODY RECORD

BW-GW-690



LAB: <u>587</u>	PROJECT NUMBER: <u>2088</u>	PROJECT MANAGER: <u>SC</u>	SEND RESULTS TO: <u>AN</u>	CHAIN-OF-CUSTODY NO: <u>GW-1010</u>
TURNAROUND REQUEST: <u>Normal</u>		SAMPLE RETENTION: <u>2</u>		DISPOSE: <u>2</u>

ITEM NO.	SAMPLE NUMBER (PROJECT NO. - SAMPLE ID)	TIME	MATRIX	NUMBER & TYPE OF CONTAINER	ANALYSIS CODE(S)	DESCRIPTION / COMMENTS	ANALYSIS CODES	
							RETURN	DISPOSE
1	2088 - 1			3X40ml	01	THHae base oil	BTEX, MTBE, TPH	01
2	2088 - 2			3X110ml	01	TPH at ground level	VOCs- Drinking Water (EPA 502.2)	02
3	2088 - 3			3X40ml	01	TPH at ground level	VOCs- Ground Water (EPA 601/602)	03
4	2088 - 4			3X40ml	01	TPH at ground level	VOCs- Soil/Solids (EPA 8010/8020)	04
5	-			-	-	-	VOCs (by GC/MS) (EPA 624/8240)	05
6	-			-	-	-	Semi-Volatiles (by GC/MS) (EPA 625/8270)	06
7	-			-	-	-	VOCs- Water/Soil (MDH 465 list)	07
8	-			-	-	-	Pentachlorophenol (PCP) (EPA 604/8040)	08
SAMPLER							AFFILIATION	
DATE: <u>7/25/91</u>							TIME: <u>9:55 am</u>	
TRANS NO.	ITEM NO.	RELINQUISHED BY	ACCEPTED BY	DATE	TIME	PRESERVATIVE:		
1	10311	<i>[Signature]</i>	<i>[Signature]</i>	7/25/91	9:55 am	All samples must be preserved on ice (4°C), unless specified otherwise.		
2						Matrix:		
3						W = Water		
4						L = Liquid Sample		
5						S = Soil Sample		
						SD = Solids Sample		
						SL = Sludge Sample		
						O = Other (Specify _____)		
						Priority Pollutant Metals (13)		
						MWCC Metals (4)		
						RCRA Metals (8)		
						BOD, COD (EPA 405.1/410.1)		
						pH, TSS (EPA 150.1/160.2)		
						Oil/Grease (EPA 413.1/9071)		
						_____ 21		
						_____ 22		
						_____ 23		
						_____ 24		

Table 1

Bay West Environmental Services Project No.: **2288**
Bay West Laboratory Project ID: **5-1552**

Parameter	Units	Reporting Limit	Stock Pile/ Diesel Fuel SP-#1 (14467)
Benzene ^a	mg/Kg	0.0005	<0.018
Toluene ^a	mg/Kg	0.0005	<0.018
Ethyl Benzene ^a	mg/Kg	0.0005	<0.018
Xylene ^a	mg/Kg	0.0005	<0.018
Total Petroleum Hydrocarbons ^a (Fuel Oil)	mg/Kg	0.025	100.
Lead	mg/Kg	5.0	12.9
Sieve Analysis:			
Mesh #4 (4.75 mm)	% Passing		26.59
Mesh #4 (4.75 mm)	% Retained		73.41
Mesh #10 (2.00 mm)	% Passsing		55.03
Mesh #10 (2.00 mm)	% Retained		44.97
Mesh #20 (0.850 mm)	% Passing		44.91
Mesh #20 (0.850 mm)	% Retained		55.09
Mesh #40 (0.425 mm)	% Passing		32.52
Mesh #40 (0.425 mm)	% Retained		67.48
Mesh #60 (0.250 mm)	% Passing		23.33
Mesh #60 (0.250 mm)	% Retained		76.67
Mesh #200 (0.075 mm)	% Passing		14.90
Mesh #200 (0.075 mm)	% Retained		85.10

Method

Analysis Date

BTEX	EPA 5030/8020 Modified	August 29, 1991
Lead	EPA 3050/6010	September 9, 1991
Sieve	ASTM D422 Modified	August 29, 1991

^aExtraction Factor = 36.4 mg/Kg. Reporting Limits are provided for reference purposes. The reporting limits that are applicable to a sample are obtained by multiplying the Reporting Limit by the Extraction Factor for the sample.

SITE NAME: 3M Building 223

SITE ID NUMBER: 4267

PETROLEUM TANK RELEASE REPORT CHECKLIST

In order to facilitate report review, the MPCA staff requests your assistance in completing this form which should be attached to all incoming reports. The form will be used to screen reports for completeness and to characterize the degree of contamination at the site.

SITE CHARACTERIZATION

	<u>YES</u>	<u>NO</u>
Emergency:		
Vapor or explosive hazard?	___	<u>X</u>
- if yes, has this been addressed	___	___
Actual drinking water supply impacts	___	<u>X</u>
- if yes, has alternate supply been provided?	___	___
Ground Water and Soil:		
Has ground water been impacted?	___	<u>X</u>
Is there free product?	___	<u>X</u>
- if yes, has recovery been initiated?	___	___
Are there downgradient receptors at risk?	___	<u>X</u>
Did you answer "yes" to any question, 7 through 14, on the Hydrogeologic Setting and Ground Water Characterization Worksheet?	___	<u>X</u>
Is this a progress report?	___	___
- if yes, is it quarterly or annual?	___	___

REPORT CONTENTS

Check the appropriate report type and completed sections (as outlined in the "Petroleum Tank Release Reports" document).

() Excavation Report Form	(X) IR Report	() CAD Report	() Progress Reports
[] All Applicable section completed	[X] Introduction	[] Proposed CAD	[] Introduction
[] Figures	[X] Background, incl Twp/Rng, Lat/Long	[] Appropriate sections of appendices	[] Background
[] Lab reports with chain of custody forms	[] Excavation form	[] Figures	[] Corrective action
	[X] RI Results		[] Ground Water monitoring results
	[X] Discussion		[] Discussion
	[X] Conclusions		[] Conclusions
	[X] Recommendations		[] Recommendations
	[] Proposed CAD		[] Appendices
	[] Appendices, incl IGWIS form		[] Tables, figures
	[X] Tables, figures		
	[] Hydrogeologic Characterization Worksheet		

If recommendations are included in the report, provide a brief description (e.g., no further action, modification of ground water recovery system, additional monitoring, etc.): No further action. *no further action*

If a CAD is proposed, provide a brief description (e.g., soil venting, pump and treat, bioremediation, etc.): _____

SUBSURFACE INVESTIGATION
Former Underground Storage Tank
3M Company
Building 223 3M Center
St. Paul, Minnesota
Leak 00004267

Submitted to:

3M COMPANY

Submitted by:

BAY WEST, INC.

Shirley McMaster, P.E.
Vice President, Technical Services

November 18, 1992

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Figures
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1.0 INTRODUCTION

At the request of 3M Company (3M), Bay West, Inc. performed a subsurface investigation at an underground storage tank (UST) location near Building 223 at the 3M Center located in Maplewood, Minnesota. The purpose of this report is to summarize the results of the subsurface investigation conducted on October 21, 1992.

The location of the site corresponds to the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 36, Township 29N, Range 22W in Ramsey County (Figure 1). The latitude is 44° 57' 07", the longitude is 92° 59' 45".

In July 1991, Bay West removed and replaced a 1,000-gallon UST used for the storage of emergency generator diesel fuel. The UST was found to be in poor condition with numerous pits and holes. Approximately 50 cubic yards of contaminated soil were encountered and excavated. Laboratory analyses of a soil sample collected from the west sidewall of the final excavation indicated the presence of contamination. To more completely characterize the presence and extent of the contamination, Bay West executed the investigatory activities described herein.

Scope of Work

Work performed by Bay West during the site investigation included the following:

- Completion of three soil borings
- Collection of soil samples within each borehole for physical characterization and headspace analysis
- Collection of soil samples within each borehole for chemical analyses

2.0 METHODOLOGY

Soil borings were completed with a truck-mounted auger drill rig equipped with 2.75-inch inside diameter (I.D.) hollow-stem augers. All borings were completed in accordance with ASTM D 1452 "Soil Investigation and Sampling by Auger Borings." Soil sampling was conducted with a 2-inch outside diameter (O.D.), 2-foot-long split-barrel sampler in general accordance with ASTM D 1586 "Penetration Tests and Split-Barrel Sampling of Soils."

All soil samples were logged by a Bay West geologist. Information collected during the completion of the soil borings included:

- soil classification
- structural features
- depth to water-bearing zones
- depth, location, and identification of contamination encountered
- blow counts, color, and grain-size distribution

Flight augers, drilling rods, and tools, were decontaminated prior to their use at each boring location. To minimize the potential for cross-contamination, split-barrel samplers were decontaminated between sampling events using a tap water and detergent (alconox) wash followed by a tap water rinse.

Monitoring of soils removed during completion of the soil borings was performed on site using headspace analysis at ambient temperature. Headspace analysis was performed in accordance with MPCA's "Jar Headspace Analytical Screening Procedure." Headspace readings were obtained with an HNU photoionization detector equipped with a 10.2 eV lamp.

Soil samples were collected from all the borings for laboratory analysis. The samples were analyzed by the Bay West Analytical Laboratory for benzene, toluene, ethyl benzene, and xylenes (BTEX) using EPA Methods 5030/8020 modified, and diesel range organics (DROs) using Wisconsin Department of Natural Resources DRO modified methodology.

3.0 RESULTS AND DISCUSSION

Soils in this area are typically lake sediments associated with the Superior Lobe comprised of sands, gravels silts, and clays and are typically 100 feet thick. The surficial water table is approximately 50 feet below grade (bg) in this area. The uppermost bedrock unit beneath the site is the Platteville Formation. This formation is composed of fine-grained dolomite and limestone and has a maximum thickness of 35 feet. The Glenwood Formation, consisting of sandy to dolomite shale, underlies the Platteville and is typically two to five feet thick. This is underlain by Saint Peter Sandstone, typically the uppermost bedrock aquifer.

Borings SB-1 through SB-3 were completed in the locations shown on Figure 2 on October 21, 1992. The borings completion depths ranged from 20 to 25 feet bg. The boring logs are contained in Appendix 1. The soil encountered was predominantly silty clay which was variable in color. Clayey silt was present in borings SB-2 and SB-3 at approximately 14 feet bg. A thin sand lens was present in borings SB-1 and SB-2.

Water-bearing sediments were encountered in borings SB-2 and SB-3 at 18 to 19 feet bg.

There were no notations of odors or staining in the boring logs. Headspace analysis was performed on selected samples from all borings. The results are contained in Appendix 2. All the results were 0 parts per million (ppm).

The following samples were selected for BTEX and DRO analyses:

- SB-1 - 18-20 feet bg
- SB-1 - 23-25 feet bg
- SB-2 - 13-15 feet bg
- SB-2 - 18-20 feet bg
- SB-3 - 13-15 feet bg

The laboratory report is contained in Appendix 3. To summarize, the only constituents detected were DROs in SB-2 at 13 to 15 feet bg (8.6 mg/kg). This is below the MPCA's action level of 100 mg/kg for silts and clays.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The purpose of the investigation was to determine whether contamination is present as a result of UST operations. To that end, Bay West completed three soil borings and performed headspace and chemical analysis.

There was one detection of DROs in the laboratory analysis. The concentration was below the MPCA action level.

During the tank removal there was one detection of total petroleum hydrocarbons above the action level. This sample was taken to the east of SB-1. These results would suggest that the remaining contamination is confined to the general vicinity of the former tank cavity at the

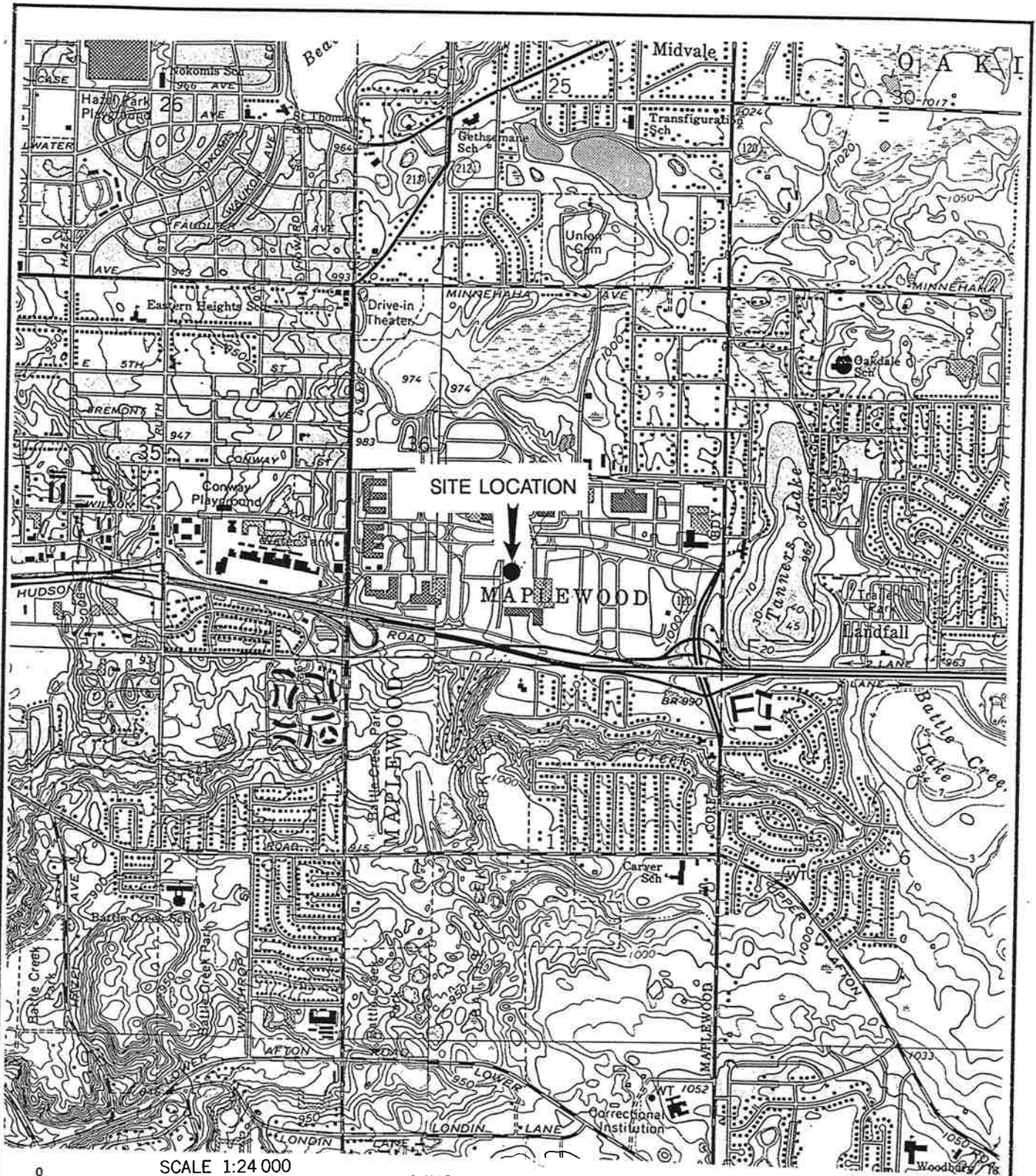
approximate depth of the former tank. There were no detectable concentration of petroleum constituents at the bottom of the borings.

Regional information would suggest that the water encountered is likely perched due to the presence of the slightly more permeable silts and, therefore, not a continuous water-bearing zone.

For these reasons, we feel no further action is warranted.

5.0 DISCLAIMER

The conclusions 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.




SCALE 1:24 000

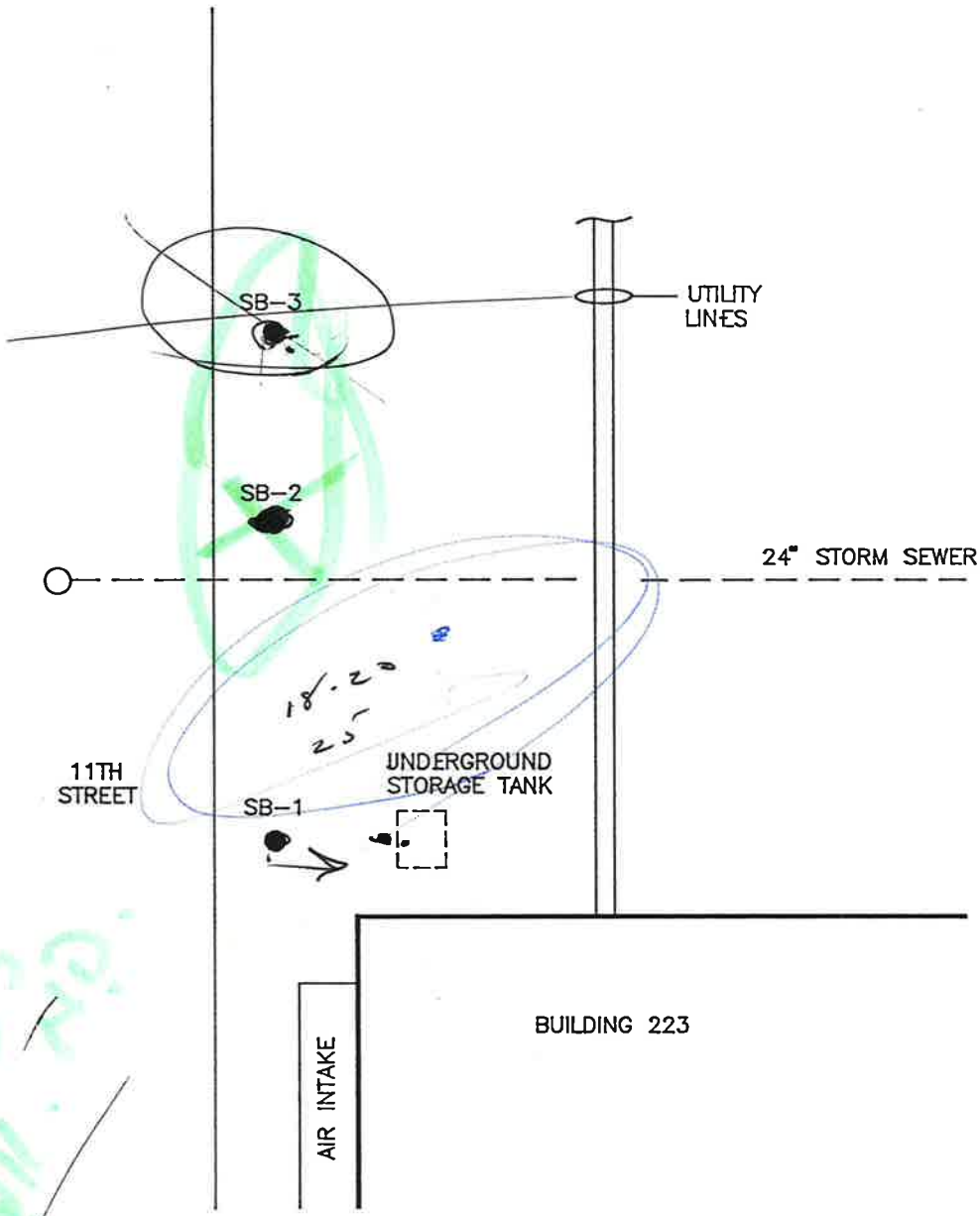
1 MILE

CONTOUR INTERVAL 10 FEET

SOURCE:
USGS 7.5 MINUTE
TOPOGRAPHIC
ST. PAUL EAST &
LAKE ELMO, MN
QUADRANGLES



ENGR'G S.M.	DATE		BAY WEST Inc. ENVIRONMENTAL SERVICES ST. PAUL MN
DRAWN K.M.	11/16/92		
REV.			
PROJECT NAME		3M- BUILDING 223	
TITLE		SITE LOCATION MAP	
DWG. NO.	920405A1	SCALE	FIGURE # 1

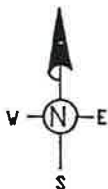
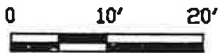



Handwritten green note: @ 11th St.

Handwritten green notes:
 1350 Hwy 96. #
 taken 1 - 1/4 North.
 Susan Schulten Summit-

LEGEND:

- SOIL BORING LOCATION



ENGR'G S.M.	DATE		BAY WEST Inc. ENVIRONMENTAL SERVICES ST. PAUL, MN
DRAWN K.M.	10/23/92		
REV.			
PROJECT NAME 3M- BUILDING 223			
TITLE SITE MAP			
DWG. NO.	920405A1	SCALE	1"=20' FIGURE # 2



BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: 3M- BUILDING 223
 Project Number: 920405
 Driller: J. HUBBELL
 Geologist: T. DAHL

Boring No.: SB-1
 Well No.: _____
 Total Depth: 25'
 Drilling Method: 2-3/4" HSA
 Sampling Method: 2" SS
 Grade Elevation: _____
 Date Completed: 10-21-92

DEPTH	GRAPHIC SECTION	GRAIN SIZE								SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
		C&B	G&P	VCS	CS	MS	FS	VFS	SILT						
1													CL		dark gray brown (10YR 4/2) silty clay, w/ 5-10% fine to medium sand, moist, medium soft
2															
3										20	4				gray brown (10YR 5/2) silty clay, w/ 10-15% sand and pebbles, moist, medium hard
4											5				
5											6				
6															
7															
8										24	2				brown (10YR 5/3) silty clay, w/ 10-20% well graded, fine to medium sand, moist to very moist, medium soft
9											2				
10											2				
11															
12															
13										20	2				moist
14											2				
15											1	SW			4" well graded fine to coarse sand lens
16											1	CL			brown (10YR 5/3) silty clay, w/ 5-10% fine to medium sand, moist, medium soft
17															
18										20	1				brown (10YR 5/3) silty clay, w/ 5-10% fine to medium sand, very moist, soft
19											1				
20											1				
21															
22															
23										22	3				brown (10YR 5/3) silty clay, medium soft, moist
24											5				
25											4				very moist to saturated, very soft
26											4				EOB
27															
28															
29															
30															



**BAY WEST, INC.
ENVIRONMENTAL SERVICES**

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: 3M- BUILDING 223
 Project Number: 920405
 Driller: J. HUBBELL
 Geologist: T. DAHL
 Soil Boring #: SB-1

Background Sample:
 Location, Depth _____

 Result (ppm): TLV HNU OVM OVA

DATE	TIME	DEPTH	TLV (ppm)	HNU (ppm)	OVM (ppm)	OVA (ppm)	ANALYTICAL SAMPLE - (Y-N)
10-21-92		3'-5'		0			NO
		8'-10'		0			NO
		13'-15'		0			NO
		18'-20'		0			YES
		23'-25'		0			YES

COMMENTS AND NOTES: _____



BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: 3M- BUILDING 223
Project Number: 920405
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB-2

Background Sample:
Location, Depth _____
Result (ppm): TLV HNU OVM OVA

DATE	TIME	DEPTH	TLV (ppm)	HNU (ppm)	OVM (ppm)	OVA (ppm)	ANALYTICAL SAMPLE - (Y-N)
10-21-92		3'-5'		0			NO
		8'-10'		0			NO
		13'-15'		0			YES
		18'-20'		0			YES

COMMENTS AND NOTES: _____



BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: 3M- BUILDING 223
 Project Number: 920405
 Driller: J. HUBBELL
 Geologist: T. DAHL
 Soil Boring #: SB-3

Background Sample:
 Location, Depth _____
 _____ TLV HNU OVM OVA
 Result (ppm): _____

DATE	TIME	DEPTH	TLV (ppm)	HNU (ppm)	OVM (ppm)	OVA (ppm)	ANALYTICAL SAMPLE - (Y-N)
10-21-92		3'-5'		0			NO
		8'-10'		0			NO
		13'-15'		0			YES
		18'-20'		0			NO

COMMENTS AND NOTES: _____

November 4, 1992

Bay West Environmental Services
5 Empire Drive
St. Paul, MN 55103

Attn: Ms. Shirley McMaster

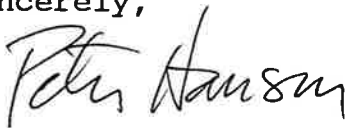
Bay West Environmental Services Project No.: 920405 (COC: GW-1667)
Bay West Laboratory Project ID: 5-2944
Samples Collected: October 21, 1992

The following are results from the samples you submitted for analysis on October 21, 1992.

The data is reported in Tables 1 and 2.

Please contact me if you have any questions or comments.

Sincerely,



Peter Hanson
Laboratory Manager

PH/ly

encl.

Table 1

Bay West Environmental Services Project No.: 920405
Bay West Laboratory Project ID: 5-2944

Parameter	Quantitation Limit mg/Kg	SB-1	SB-1	SB-2	SB-2	SB-3
		18-20' (28356) mg/Kg	23-25' (28359) mg/Kg	13-15' (28362) mg/Kg	18-20' (28365) mg/Kg	13-15' (28368) mg/Kg
Benzene	0.001	<0.04	<0.04	<0.05	<0.03	<0.03
Toluene	0.001	<0.04	<0.04	<0.05	<0.03	<0.03
Ethyl Benzene	0.001	<0.04	<0.04	<0.05	<0.03	<0.03
Xylenes	0.001	<0.04	<0.04	<0.05	<0.03	<0.03
Extraction Factor		37.7	36.1	45.9	30.3	32.2

Analyzed: October 27, 1992

Method: EPA 5030/8020 Modified

Quantitation Limits are provided for reference purposes. The limits that are applicable to a sample are obtained by multiplying the Quantitation Limit by the Extraction Factor for the sample.

Table 2

Bay West Environmental Services Project No.: **920405**
 Bay West Laboratory Project ID: **5-2944**

DROs (Soil)

Parameter	Quantitation Limit mg/Kg	SB-1 18-20' (28357) mg/Kg	SB-1 23-25' (28360) mg/Kg	SB-2 13-15' (28363) mg/Kg	SB-2 18-20' (28366) mg/Kg	SB-3 13-15' (28369) mg/Kg
Diesel Range Organics (DRO's)	0.1	<0.1	<0.10	8.6	<0.10	<0.10
Other (See key)		--	--	--	--	--
Date Collected		10/21/92	10/21/92	10/21/92	10/21/92	10/21/92

Analyzed: October 27, 1992

Method: WIDNR DRO Modified

All samples were received on ice.


Key:

1. Sample odor
2. Improper Preservative
3. Holding times exceeded
4. Cooler temperature
5. QC failure
6. Unidentified but detected compound

2944

BW-GW-891

GROUND WATER CHAIN-OF-CUSTODY RECORD

		LAB: <u>Bay West</u>		SEND RESULTS TO: <u>Shirley McMeister</u>		CHAIN-OF-CUSTODY NO: <u>GW-1667</u>		
ITEM NO.	SAMPLE NUMBER (PROJECT NO. - SAMPLE ID)	SAMPLE DATE TIME	MATRIX	NUMBER & TYPE OF CONTAINER	ANALYSIS CODE(S)	DESCRIPTION / COMMENTS	SAMPLE RETENTION	
							TURNAROUND REQUEST	DISPOSE
1	920405-18-20-18-20-1	10-21-92 9:30	S	3x6one	21,22		Normal	
2	"-23-25-13-15-1	" 9:40	S	3x6one	21,22			
3	"-13-15-18-20-1	" 10:20	S	3x6one	21,22			
4	"-18-20-13-15-2	" 10:30	S	3x6one	21,22			
5	"-13-15-18-20-3	" 11:00	S	3x6one	21,22			
6	-							
7	-							
8	-							
SAMPLER: <u>Tom Dahl</u>		AFFILIATION: <u>Bay West, Inc.</u>		DATE: <u>10-21-92</u>		ANALYSIS CODES - Cross out any unwanted parameter. - List any additional parameters in the "Description / Comments" column.		
TRANS NO.	ITEM NO.	RELINQUISHED BY	ACCEPTED BY	DATE	TIME	Preservative: All samples must be preserved on ice (4°C), unless specified otherwise.		
1	1-75	<u>Tom Dahl</u>	<u>Tom Dahl</u>	10/21	2:23	Matrix: W = Water L = Liquid Sample S = Soil Sample SD = Solids Sample SL = Sludge Sample O = Other (Specify _____)		
2								
3								
4								
5								
21						<u>BTEX</u>		
22						<u>DRO'S</u>		
23								
24								