Bay West

Bay West Inc.
Five Empire Drive
St Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

January 2, 1991

Ms. Dawn Davidson
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155-3898

Re: Underground Fuel Oil Line Leak at the Cargill Molasses Facility - Port Cargill, Savage, Minnesota
LEAK 4526

Dear Ms. Davidson:

At the request of the Cargill Liquid Products, Bay West conducted a subsurface investigation and line excavation at the referenced site. Enclosed is a copy of the report.

If you have any questions or need any additional information, please call me or Paul at 291-0456.

Sincerely,

Shirley McMaster

Shirley McMaster, P.E.
Manager, Engineering/Groundwater

Paul L. Schumann

Paul L. Schumann
Hydrogeologist

c/enc.: S. Larson, Cargill
R. Rarick, Cargill Molasses
G. Rimy, Cargill Molasses

Bay West

Subsurface Investigation and Line Excavation Cargill Molasses Facility Port Cargill, Savage, Minnesota LEAK No. 4526

Submitted to:

Cargill Molasses Liquid Products

Submitted by:

Bay West, Inc.

Shirley McMaster, P.E.
Manager, Engineering/Ground Water

Paul L. Schumann
Hydrogeologist

December 19, 1991

Bay West

TABLE OF CONTENTS

1.0 INTRODUCTION

At the request of Cargill Molasses Liquid Products (Cargill), Bay West, Inc. conducted a subsurface investigation and monitored the excavation of a fuel oil line at the Port Cargill facility in Savage, Minnesota. The leak number for this site is LEAK 00004526.

The site is located in the NW 1/4 of the SE 1/4 of the NE 1/4 of Section 31, Township 27N, Range 21W, in Scott County (Figure 1). The latitude is 45° 47' 15" and the longitude is 93° 20' 10".

In September 1991, following a precipitation event, Cargill personnel noted sheens on standing water in the vicinity of an aboveground fuel oil tank. The tank holds standby boiler fuel. The source of the sheens was thought to be either the supply or return lines from the tank to the boiler. These lines were installed underground and crossed beneath two railroad tracks. The quantity of oil discharged was estimated to be 50 to 60 gallons.

This subsurface investigation was conducted to determine if an underground fuel oil line had leaked, and if so, the extent of contamination.

This report summarizes the results of the pipeline excavation conducted on September 21, 1991 and the subsurface investigation conducted on October 17 and 20, 1991.

Scope of Work

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

- Monitoring the excavation and removal of fuel oil lines
- Monitoring the excavation of contaminated soil associated with the lines
- Collection of soil samples during the excavation for headspace analysis
- Collection of soil samples beneath the lines and from the soil piles for chemical analysis
- Completion of eight soil borings
- Collection of soil samples within each borehole for physical characterization and headspace analysis
- Collection of soil samples within selected boreholes for chemical analyses

2.0 METHODOLOGY

2.1 Line/Soil Excavation Monitoring

Following detection of the release, arrangements were made to excavate and remove the underground piping. During the excavation, soil samples were collected from the excavation cavities at varying depths for headspace analysis to determine the presence of soil contamination.

At the completion of the excavation, soil samples were collected from selected locations in the trenches where the contamination

was removed for chemical analysis. In addition, one discrete soil sample was collected from the soil pile.

2.2 Soil Borings

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 in the field. 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

Samples were collected every two feet, starting at three feet below grade (bg), for headspace analysis using an HNU photoionization detector capable of reading organic vapors in concentrations ranging from 1 to 2000 parts per million (ppm). Headspace analyses were performed in general accordance with MPCA's "Jar Headspace Analytical Screening Procedure."

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.

2.3 Chemical Analysis

Soil samples were analyzed for benzene, ethyl benzene, toluene, and total xylenes (BETX) and total petroleum hydrocarbons (TPH) as fuel oil using EPA Methods 8010/8020.

3.0 RESULTS AND DISCUSSION

3.1 Line/Soil Removal

As the lines were excavated, they were inspected for any corrosion or damage. Both lines were pitted with pinholes visible.

Due to the location of the lines (Figure 2), two separate excavations were completed on either side of the western railroad tracks to expose the lines. The east trench extended about 20 feet on either side of the lines before it was decided that any further excavation would endanger the integrity of the the railroad tracks and risk the intersecting of any other underground utilities. A smaller western trench was excavated between the railroad tracks and building.

Contamination was detected in both trenches. Any soil exhibiting odors, visible staining, or jar headspace results above 10 ppm was excavated and stockpiled on site. The soil was stored on and under plastic sheeting.

The headspace readings collected during the excavations are summarized in Table 1 and contained in Appendix 1. Figure 2 shows the collection points for the samples. All of the excavation headspace results were above MPCA's guideline of 10 ppm.

Soil samples were collected from the south and north ends of the east trench (S-1 and S-2, respectively), the bottom of the west trench (S-3), and the contaminated soil pile (Figure 3). The laboratory report containing the results is contained in Appendix 2. Petroleum constituents were present above the detection limits in all the samples. Sample S-1 exhibited detectable concentrations of total xylenes (4.3 mg/kg) and TPH (1400 mg/kg), S-2 exhibited ethyl benzene (1.7 mg/kg), total xylenes (4.5 mg/kg), and TPH (1400 mg/kg), and S-3 exhibited TPH (62 mg/kg).

Approximately 25 cubic yards of contaminated soil was removed and stored on and under plastic sheeting. The MPCA "Excavation Report for Petroleum Release Sites" is attached as Appendix 3.

3.2 Soil Borings

Eight borings were completed on site at the locations shown in Figure 4. Logs of these borings are located in Appendix 4. The borings were completed to depths ranging from 5 to 8 feet bg. The soils beneath the site vary from boring to boring. All borings consist of varying amounts of three soil units: cobbles with interstitial silty clay, a dark colored gravely sand with clay intermixed, and a variably colored organic clay.

Ground water was encountered in all the soil borings at depths ranging from 4 to 7.5 feet bg. Odors were noted on the boring logs for SB-1 (4 to 6 feet bg) and SB-2 (3 to 4 feet bg). The headspace results for the soil borings are contained in Appendix 5. A readings above 1 ppm was recorded for SB-2 at 4 to 5.5 feet bg (3.5 ppm). None of the other borings had headspace readings above 1 ppm.

Selected samples were collected from borings SB-3 (5 to 7 feet bg), SB-4 (5 to 7 feet bg), SB-5 (4 to 6 feet bg), SB-6 (3 to 5 feet bg), SB-7 (3 to 5 feet bg), and SB-8 (3 to 5 feet bg). These samples were analyzed for BETX and TPH as fuel oil using EPA Methods 8010/8020. The laboratory report dated December 5, 1991 is contained in Appendix 6 and shows that all the compounds analyzed were below detection limits in the borings.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The goal of the investigation was to supervise the removal of contaminated soil associated with the fuel oil line and to determine the extent of contaminated subsurface soil at the Port Cargill facility. To that end, Bay West completed eight soil borings, collected soil samples during the fuel oil line and soil excavations, and analyzed selected soil samples for hydrocarbon contaminants.

Field observations, headspace readings, and chemical analyses of the soil samples would suggest that the most highly contaminated soil was removed during removal of the two lines. The pitting in the lines infers that the release occurred slowly over an extended period of time. This is supported by the observation of odors in SB-1 and SB-2, with corresponding headspace results just above background, suggesting that biodegradation/volatilzation of the "lighter" hydrocarbon constituents has taken place.

The approximate extents of contamination remaining on the site are delineated in Figure 5. Fuel oil-impacted soil remains confined to the immediate vicinity of the release location. To completely remove the contamination, active railroad tracks would need to be removed and replaced and structures temporarily supported.

The release site and surrounding property are used for industrial purposes. The contamination is below grade and human exposure is limited. Ground water monitoring wells located at Cargo Carriers

to the west of the site have not indicated any contamination outside their release area. Bay West recommends no further action.

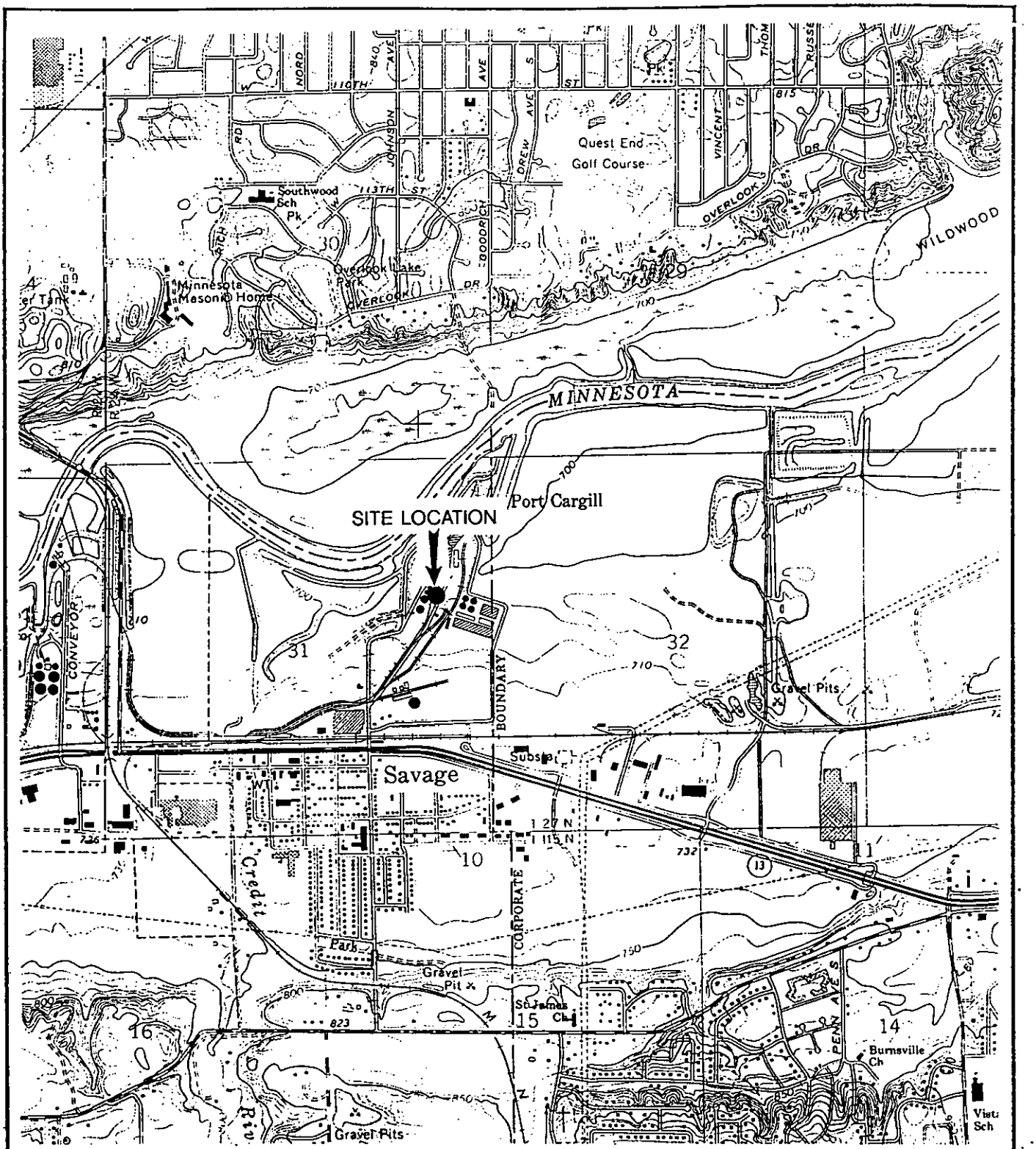
5.0 DISCLAIMER

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.

Bay West

Table 1.
Excavation Headspace Analytical Results

Sample Code	Depth	Soil Type	Reading (ppm)	Bottom/Sidewall
SV-1	1.5 ft	silt	24.0	final sidewall
SV-2	3 ft	sand	54.0	final bottom
SV-3	5 ft	silt	119.0	final bottom
SV-4	5 ft	silt	212.0	final bottom
SV-5	1.5 ft	sand	25.0	final sidewall
SV-6	3 ft	silt	63.0	final sidewall
SV-7	5 ft	silt	79.0	final bottom
SV-8	1.5 ft	sand	130.0	final sidewall
SV-9	2.5 ft	silt	130.0	final sidewall



SCALE 1:24 000

0 1 MILE

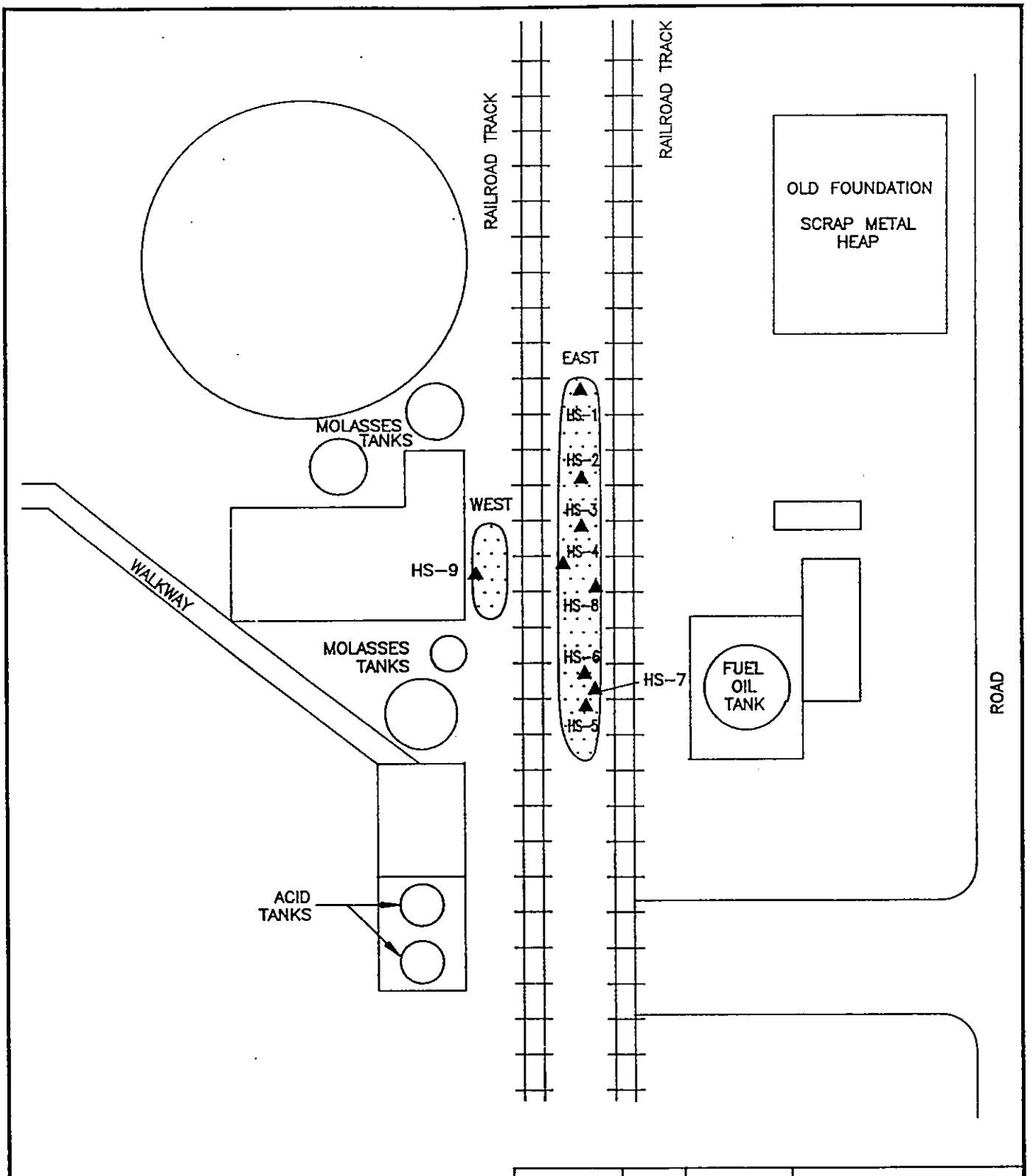
CONTOUR INTERVAL 10 FEET

SOURCE:
USGS 7.5 MINUTE
TOPOGRAPHIC
BLOOMINGTON, MN.
QUADRANGLE

N

QUADRANGLE LOCATION

ENGR'G S.M.	DATE		BAY WEST Inc. ENVIRONMENTAL SERVICES St PAUL MN
DRAWN K.M.	12/3/91		
REV.			
PROJECT NAME CARGILL- MOLASSES			
TITLE SITE LOCATION MAP			
DWG. NO. 2436-A1	SCALE	FIGURE # 1	

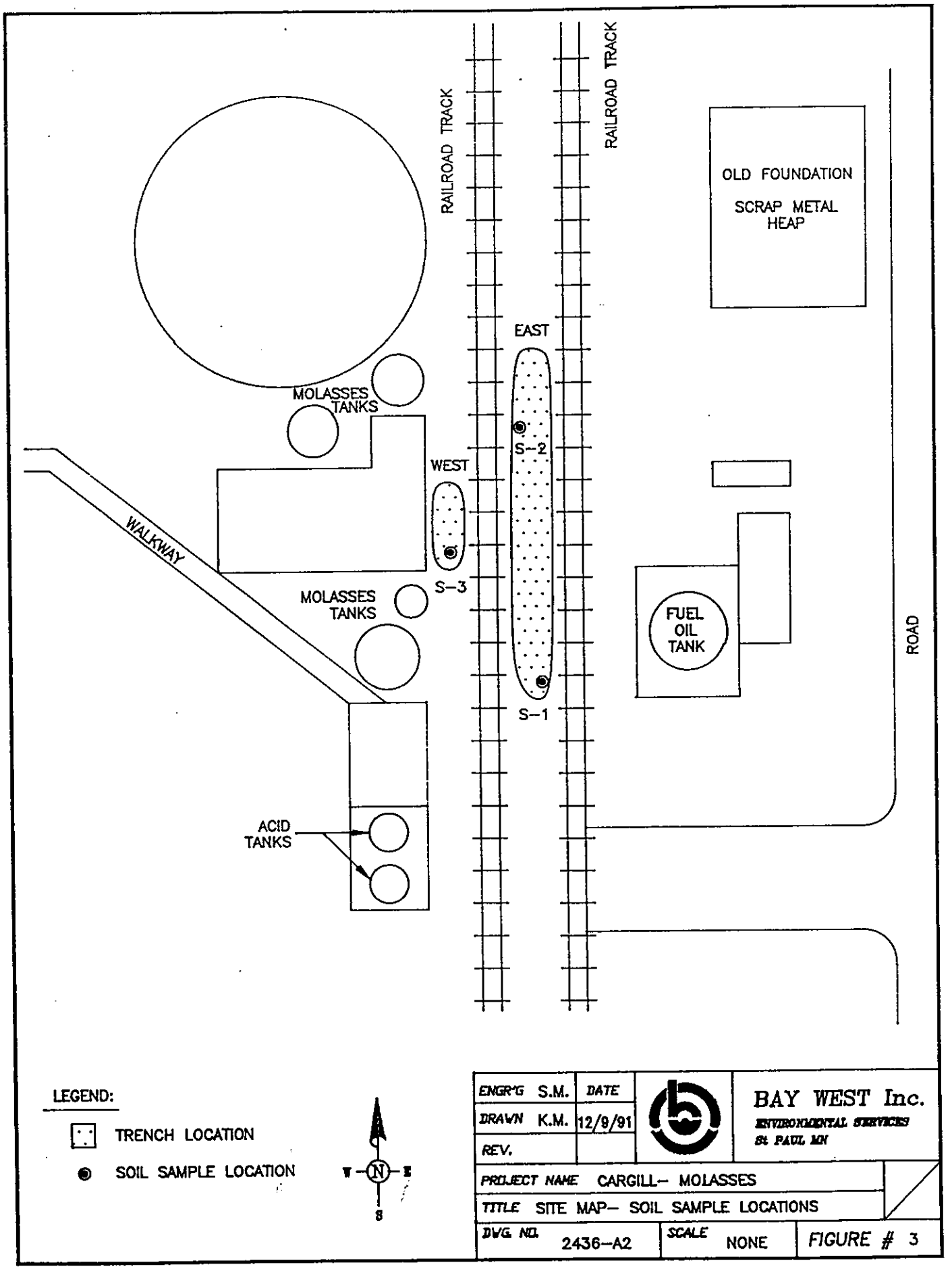


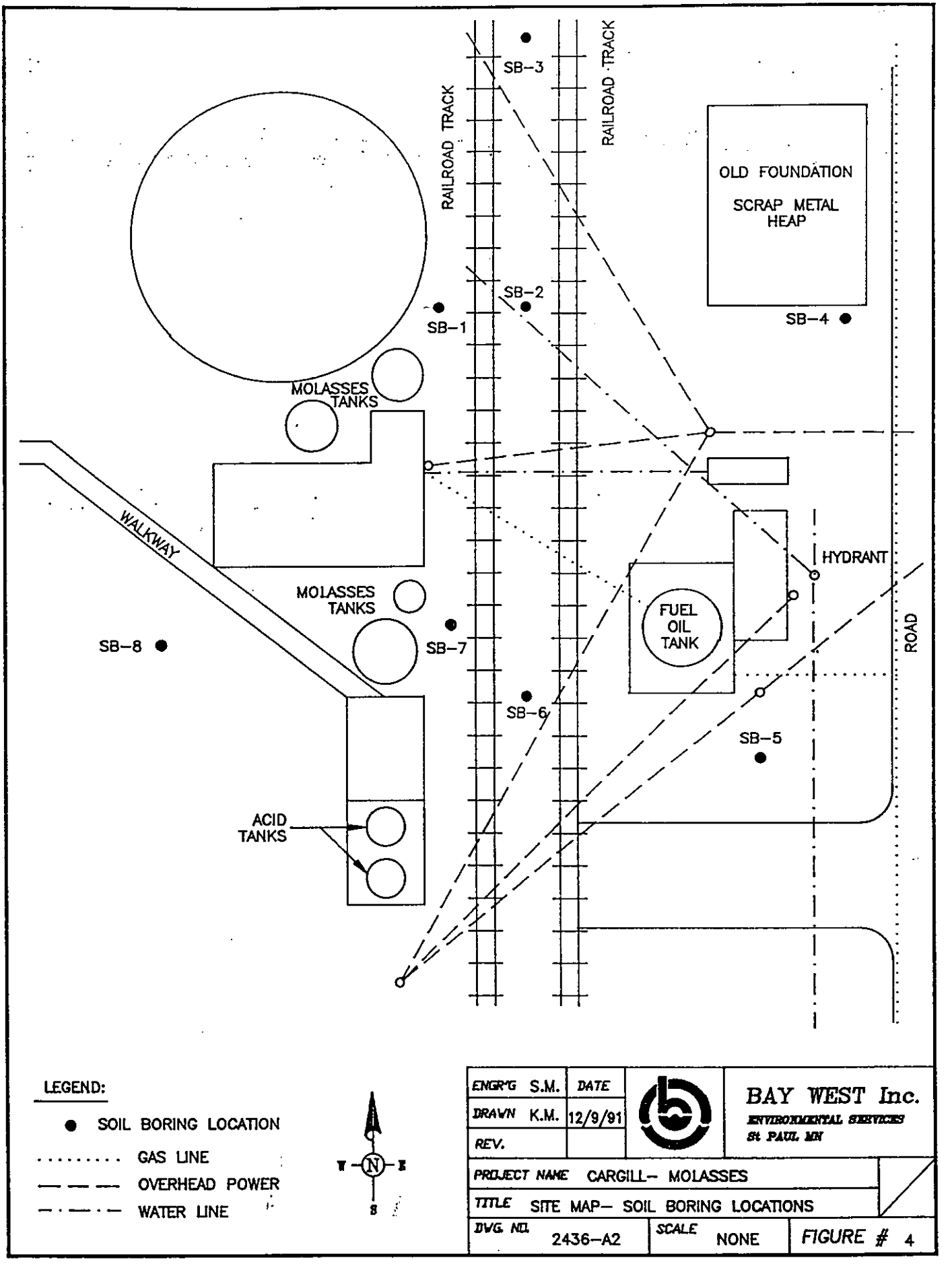
LEGEND:

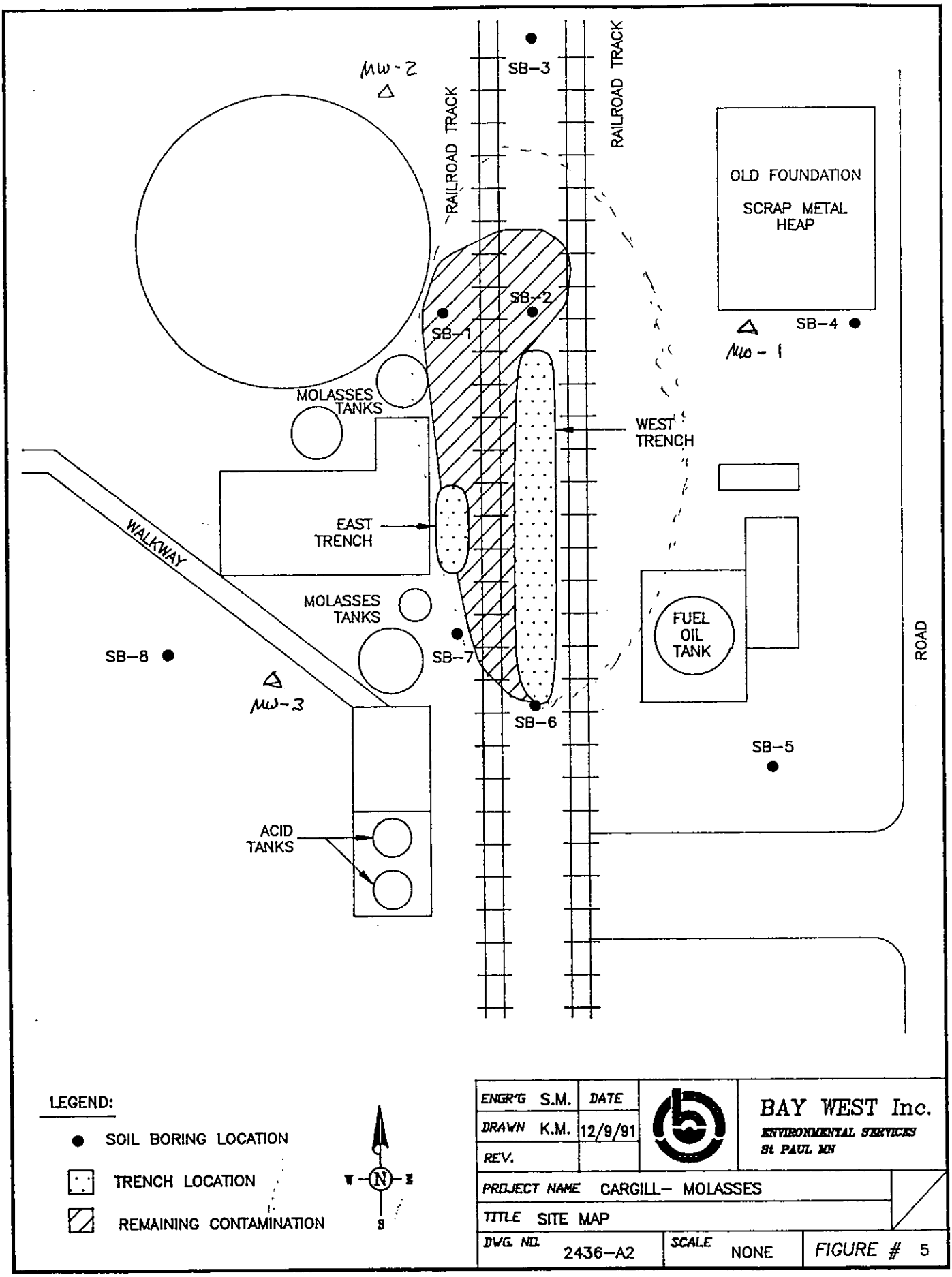
- TRENCH LOCATION
- ▲ HEADSPACE SAMPLE LOCATION

N

ENGR'G S.M.	DATE		BAY WEST Inc. ENVIRONMENTAL SERVICES St. PAUL, MN
DRAWN K.M.	12/9/91		
REV.			
PROJECT NAME CARGILL-- MOLASSES			
TITLE SITE MPA-- HEADSPACE SAMPLE LOCATIONS			
DWG. NO. 2436-A2	SCALE NONE	FIGURE # 2	


RAILROAD TRACK
RAILROAD TRACK
OLD FOUNDATION
SCRAP METAL
HEAP
EAST
MOLASSES
TANKS
S-2
WEST
WALKWAY
S-3
MOLASSES
TANKS
FUEL
OIL
TANK
ROAD
S-1
ACID
TANKS
LEGEND:
TRENCH LOCATION
SOIL SAMPLE LOCATION
W
N
E
S
ENGR'G S.M.
DATE
DRAWN K.M.
12/9/91
REV.
BAY WEST Inc.
ENVIRONMENTAL SERVICES
St. PAUL MN
PROJECT NAME CARGILL- MOLASSES
TITLE SITE MAP- SOIL SAMPLE LOCATIONS
DWG NO. 2436-A2
SCALE NONE
FIGURE # 3


RAILROAD TRACK
RAILROAD TRACK
SB-3
SB-2
SB-1
SB-4
OLD FOUNDATION
SCRAP METAL
HEAP
MOLASSES
TANKS
WALKWAY
MOLASSES
TANKS
SB-8
SB-7
SB-6
SB-5
FUEL
OIL
TANK
HYDRANT
ROAD
ACID
TANKS
LEGEND:
SOIL BORING LOCATION
GAS LINE
OVERHEAD POWER
WATER LINE
W
N
E
S
ENGR'G S.M.
DATE
DRAWN K.M.
12/9/91
REV.
BAY WEST Inc.
ENVIRONMENTAL SERVICES
St PAUL MN
PROJECT NAME CARGILL- MOLASSES
TITLE SITE MAP- SOIL BORING LOCATIONS
DWG. NO. 2436-A2
SCALE NONE
FIGURE # 4


MW-2
SB-3
RAILROAD TRACK
RAILROAD TRACK
OLD FOUNDATION
SCRAP METAL
HEAP
SB-2
SB-1
SB-4
MW-1
MOLASSES
TANKS
WEST
TRENCH
WALKWAY
EAST
TRENCH
MOLASSES
TANKS
FUEL
OIL
TANK
ROAD
SB-8
SB-7
MW-3
SB-6
SB-5
ACID
TANKS
LEGEND:
SOIL BORING LOCATION
TRENCH LOCATION
REMAINING CONTAMINATION
N
W
E
S
ENGR'G S.M.
DATE
DRAWN K.M.
12/9/91
REV.
BAY WEST Inc.
ENVIRONMENTAL SERVICES
St PAUL MN
PROJECT NAME CARGILL- MOLASSES
TITLE SITE MAP
DWG. NO. 2436-A2
SCALE NONE
FIGURE # 5

APPENDIX 1

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- FUEL OIL TANK
Project Number: 2436
Driller: _____
Geologist: A. NELSON
Soil Boring #: _____

Background Sample:
Location, Depth _____

	TLV	HNU	OVM	OVA
Result (ppm):	____	____	____	____

SAMPLE #	DATE	TIME	DEPTH	OVM (ppm)	ANALYTICAL SAMPLE - (Y / N)
1	9-21-91	12:24	1.5'	24	NO- BLACK ORGANIC SILT
2	9-21-91	12:28	3'	54	YES- DARK BROWN MEDIUM SAND
3	9-21-91	12:32	5'	119	NO- BLACK ORGANIC SILT AND VERY FINE SAND
4	9-21-91	12:45	5'	212	NO- BLACK ORGANIC SILT AND VERY FINE SAND
5	9-21-91	12:48	1.5'	25	NO- BROWN CLEAN MEDIUM SAND
6	9-21-91	12:53	3'	63	NO- DARK BROWN ORGANIC SILT
7	9-21-91	12:57	5'	79	YES- BROWN CLEAN MEDIUM SAND W/ COBBLES
8	9-21-91	13:03	1.5'	130	YES- GRAY MEDIUM SAND
9	9-21-91	13:40	2.5'	130	YES- GRAY SANDY SILT

COMMENTS AND NOTES: _____

APPENDIX 2

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

October 16, 1991

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

Attn: Ms. Shirley McMaster

Bay West Environmental Services Project No.: **2436** **(COC: GW-1107)**
Bay West Project ID: **5-1660**
Samples Collected : September 21, 1991

The following are results from the samples you submitted for analysis on September 23, 1991.

The data is reported in Tables 1 and 2.

Please contact me if you have any questions or comments.

Sincerely,

Grant Paul
Project Manager/Organic Chemist

GP/ps

encl.

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

Table 1

Bay West Environmental Services Project No.: **2436**
Bay West Laboratory Project ID: **5-1660**

Parameter	Target Reporting Limit mg/Kg	So. end of East trench 4' S-1 (15536) mg/Kg	No. end of East trench 3' S-2 (15538) mg/Kg	West trench bottom 2.5' S-3 (15542) mg/Kg	Soil pile center West pile SP-4 (15544) mg/Kg
Benzene	0.001	<0.9	<0.8	<0.9	<0.9
Toluene	0.001	<0.9	<0.8	<0.9	<0.9
Ethyl Benzene	0.001	<0.9	1.7	<0.9	<0.9
Xylenes	0.001	4.3	4.5	<0.9	2.1
Total Petroleum Hydrocarbons (Fuel Oil)	0.025	1400.	1400.	62.	670.
Extraction Factor (Normalized)		937.7	838.9	900.8	976.9

Analyzed: September 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.

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St. Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

Table 2

Bay West Environmental Services Project No.: **2436**
Bay West Laboratory Project ID: **5-1660**

Parameter	Reporting Limit mg/Kg	Soil pile center of West pile SP-4 (15546) mg/Kg
Total Metals:		
Lead	3.3	16.8

Analyzed: October 8, 1991

Method : EPA 3050/6010

1660

GROUND WATER CHAIN-OF-CUSTODY RECORD

BW-GW: 8/91

Bay West

LAB: Bay West | SEND RESULTS TO: Shirley McMaster | CHAIN-OF-CUSTODY NO: GW- 1107

PROJECT NUMBER	PROJECT MANAGER	TURNAROUND REQUEST	SAMPLE RETENTION	
			RETURN	DISPOSE
2346 ~~2346~~	S.M.	Normal	X	

ITEM NO.	SAMPLE NUMBER (PROJECT NO. - SAMPLE ID)	SAMPLE DATE / TIME	MATRIX	NUMBER & TYPE OF CONTAINER	ANALYSIS CODE(S)	DESCRIPTION / COMMENTS
1	2346 - S-1	9-21-91 13:47	S	2-60ml 1-500ml	01	South end of east trench 4' deep
2	2346 - S-2	9-21-91 13:52	S	2-60ml 1-500ml	01	North end of east trench 3' deep
3	2346 - S-3	9-21-91 13:58	S	2-60ml 1-500ml	01	West trench bottom 2.5' deep
4	2346 - SP-4	9-21-91 14:04	S	2-60ml 1-500ml	01, 12	Soil pile center of west pile
5	-					
6	-					
7	-					
8	-					

an exception SP-1 with this name

SAMPLER: Andrew Nelson | AFFILIATION: Bay West | DATE: 9-21-91

TRANS NO.	ITEM NO.	RELINQUISHED BY	ACCEPTED BY	DATE	TIME
1	1-4	Andy Nelson	D Kastick	9-23	11:30
2					
3					
4					
5					

Preservative:

All samples must be preserved on ice (4°C), unless specified otherwise.

Matrix:

W= Water
L = Liquid Sample
S = Soil Sample
SD = Solids Sample
SL = Sludge Sample
O = Other (Specify _____)

ANALYSIS CODES

- Cross out any unwanted parameter.
- List any additional parameters in the "Description / Comments" column.

BTEX, ~~MTBE,~~ TPH	01
VOC'S- Drinking Water (EPA 502.2)	02
VOC'S- Ground Water (EPA 601/602)	03
VOC'S- Soil/Solids (EPA 8010/8020)	04
VOC'S (by GC/MS) (EPA 624/8240)	05
Semi-Volatiles (by GC/MS) (EPA 625/8270)	06
VOC'S- Water/Soil (MDH 465 list)	07
Pentachlorophenol (PCP) (EPA 604/8040)	08
Phenols (EPA 604/8040)	09
Phthalates (EPA 606/8060)	10
PCBs/Pesticides (EPA 608/8080)	11
PAHs (EPA 610/8100/8310)	12
Herbicides (EPA 615/8150)	13
Lead (total)	14
Priority Pollutant Metals (13)	15
MWCC Metals (4)	16
RCRA Metals (8)	17
BOD, COD (EPA 405.1/410.1)	18
pH, TSS (EPA 150.1/160.2)	19
Oil/Grease (EPA 413.1/9071)	20
_____	21
_____	22
_____	23
_____	24

APPENDIX 3

EXCAVATION REPORT FOR PETROLEUM RELEASE SITES

Minnesota Pollution Control Agency
Tanks and Spills Section
May 1991

I. BACKGROUND

A. Site: Port Cargill-Molasses Division
Street: 12120 Lynn Ave. S.
City, Zip: Savage, 55378
County: Scott

MPCA Site ID# LEAK0000

B. Tank Owner/Operator:
Cargill
Molasses Division
12120 Lynn Ave. S.
Savage, 55378
612/890-2050

C. Excavating Contractor: Cargill, Inc.
Contact: Rudy Rerrich
Telephone: 612/890-2050
Tank Contractor Certification Number:

D. Consultant:
Bay West, Inc.
5 Empire Drive
St. Paul, MN 55103
612/291-0456
Field Representative:
Tom Dahl
Project Manager:
Shirley McMaster

E. Others on-site during site work (e.g., fire marshal, local staff, etc.):

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

II. DATES

A. Date release reported to MPCA: 9/12/91

B. Dates site work performed:

Work Performed	Date
Removal of pipe and excavation of soil	9/21/91
Installation of soil boring	10/17/91 & 10/20/91

III. RELEASE INFORMATION

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

Tank 1: Capacity: _____ Type: _____ Age: _____

Condition: _____

Product history:

Approximate quantity of petroleum released, if known:

Cause of release:

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.

Tank No.	Capacity	Contents	Type	Age
001	10,000 gals.	Fuel Oil	Aboveground	20+ years

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

Contamination was noticed above the fuel oil lines. The lines and surrounding contaminated soil were removed. The lines were in poor condition with corrosion and pitting.

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

IV. EXCAVATION

A. Dimensions of excavation: 40' x 6' x 5' Deep and 3' x 5' x 5' Deep

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

C. Native soil type (clay, sand, etc.): silt and peat

D. Quantity of contaminated soil removed: 25 cubic yards

E. Was ground water encountered or was there evidence of a seasonally high ground water table? At what depth?

Ground water encountered at five feet.

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.

Boring report 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.

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

No bedrock encountered.

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

V. SAMPLING

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

To the extent possible, all soil exhibiting visible staining or odors was removed. Headspace analysis using an HNU photoionization detector with a 10 eV lamp was performed on soil removed from the excavation and final walls and bottom of the excavation. All soil above background was considered contaminated.

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-1 (1.5')	silt	24.0	sidewall	SV-9 (2.5')	silt	130.0	sidewall
SV-2 (3')	sand	54.0	bottom				
SV-3 (5')	silt	119.0	bottom				
SV-4 (5')	silt	212.0	bottom				
SV-5 (1.5')	sand	25.0	sidewall				
SV-6 (3')	silt	63.0	sidewall				
SV-7 (5')	silt	79.0	bottom				
SV-8 (1.5')	sand	130.0	sidewall				

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

Soil was collected from newly exposed surfaces or from a depth of one foot. Samples were placed in clean glass jars with teflon-lined lids, leaving as little headspace as possible. Samples were placed in coolers on ice for transfer to the laboratory. Chain-of-custody forms accompanied all samples.

D. List the appropriate soil sample analytical results from the bottom 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 fuel oil ppm	Benzene ppm	Ethyl-benzene ppm	Toluene ppm	Xylene ppm	MTBE ppm	Lead ppm
S-1(5')	1400	BDL	BDL	BDL	4.3	NA	NA
S-2(5')	1400	BDL	1.7	BDL	4.5	NA	NA
S-3(5')	62	BDL	BDL	BDL	BDL	NA	NA
SP-4	670	BDL	BDL	BDL	2.1	NA	NA

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 Figures 2 & 3)
   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 or not additional investigation is necessary at the site, as discussed in part VI of the MPCA document "Excavation of Petroleum Contaminated Soil".

Subsequent soil borings indicate some contamination remains outside the limits of excavation. Due to limited migration of contamination and the industrial nature of the facility, no further action is required.

VIII. SOIL TREATMENT INFORMATION

A. Soil treatment method used (thermal, land application, other). If you choose other, specify treatment method: To be determined

B. Location of treatment site/facility:_____

C. Date MPCA approved soil treatment (if thermal treatment was used after May 1, 1991, indicate date that the MPCA permitted thermal treatment facility agreed to accept soil):_____

IX. CONSULTANT (OR OTHER) PREPARING THIS REPORT

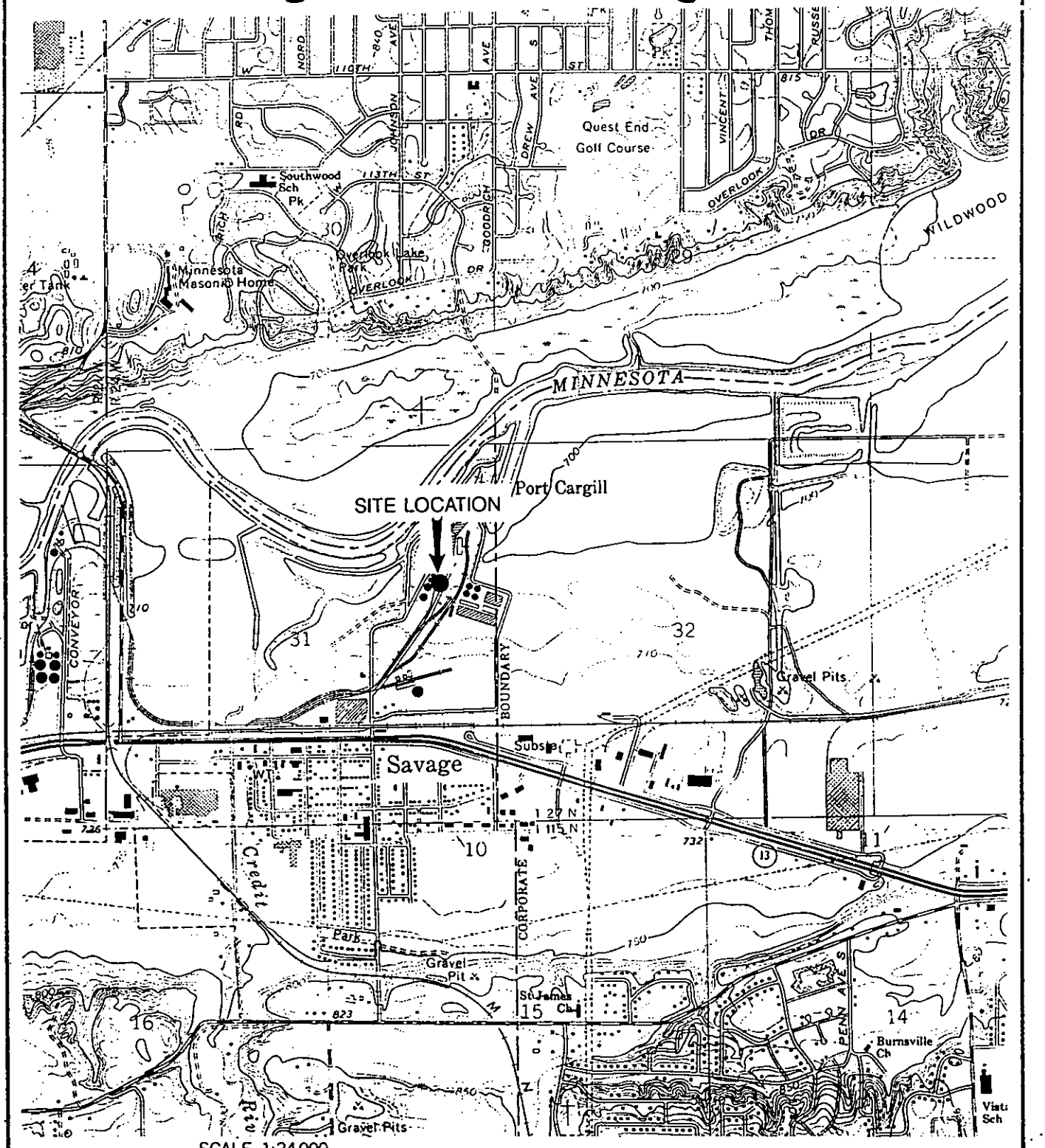
Bay West, Inc.
5 Empire Drive
St. Paul, MN 55013
(612) 291-0456
Project Manager: S. McMaster

Signature: Shirley K McMaster Date: 12/19/91

If 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

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 (if required).



SCALE 1:24 000

0 1 MILE

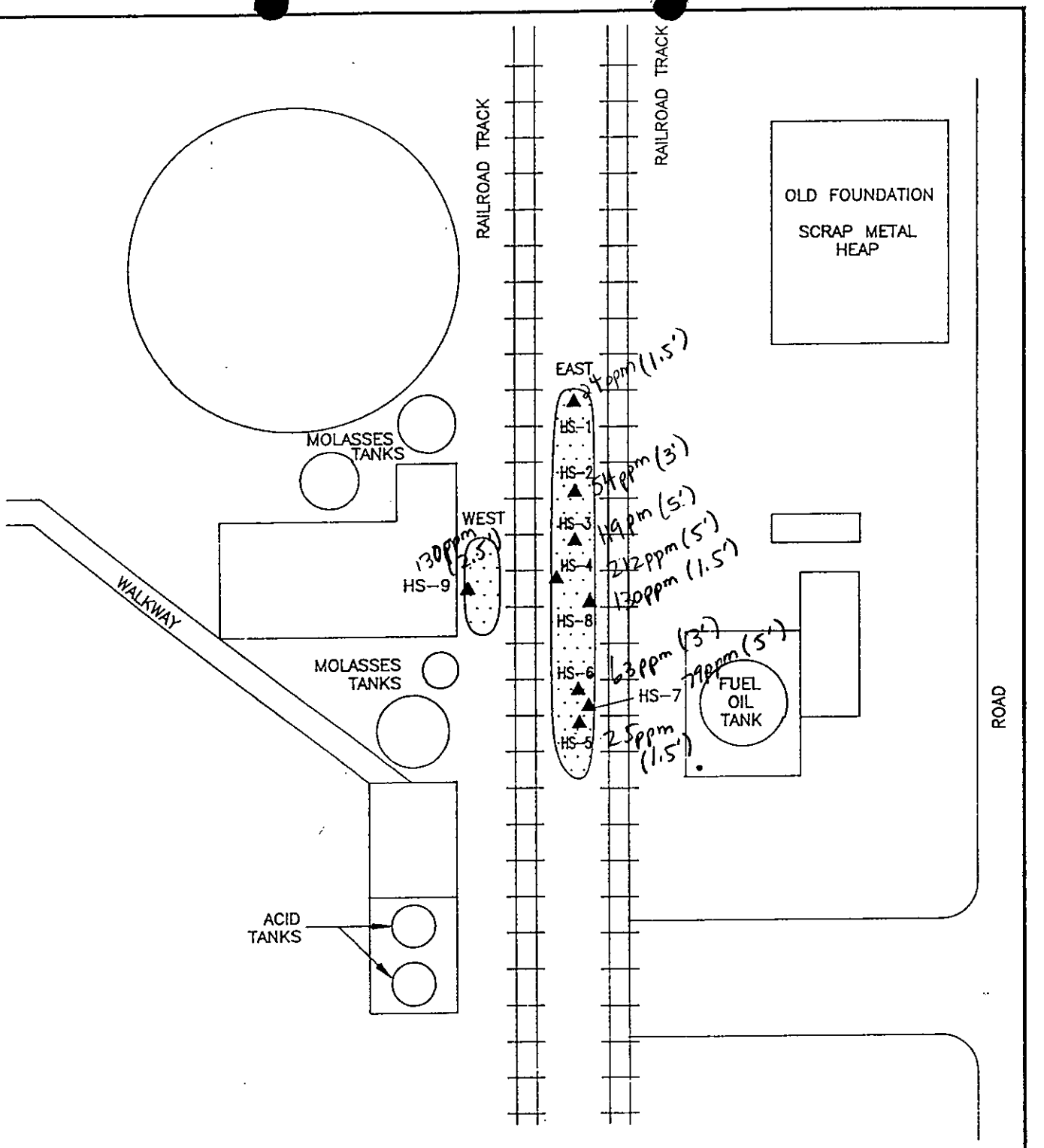
CONTOUR INTERVAL 10 FEET

SOURCE:
USGS 7.5 MINUTE
TOPOGRAPHIC
BLOOMINGTON, MN.
QUADRANGLE

N

QUADRANGLE LOCATION

ENGR'G S.M.	DATE		BAY WEST Inc.
DRAWN K.M.	12/3/91		ENVIRONMENTAL SERVICES
REV.			St PAUL MN
PROJECT NAME	CARGILL- MOLASSES		
TITLE	SITE LOCATION MAP		
DWG. NO. 2436-A1	SCALE	FIGURE # 1	

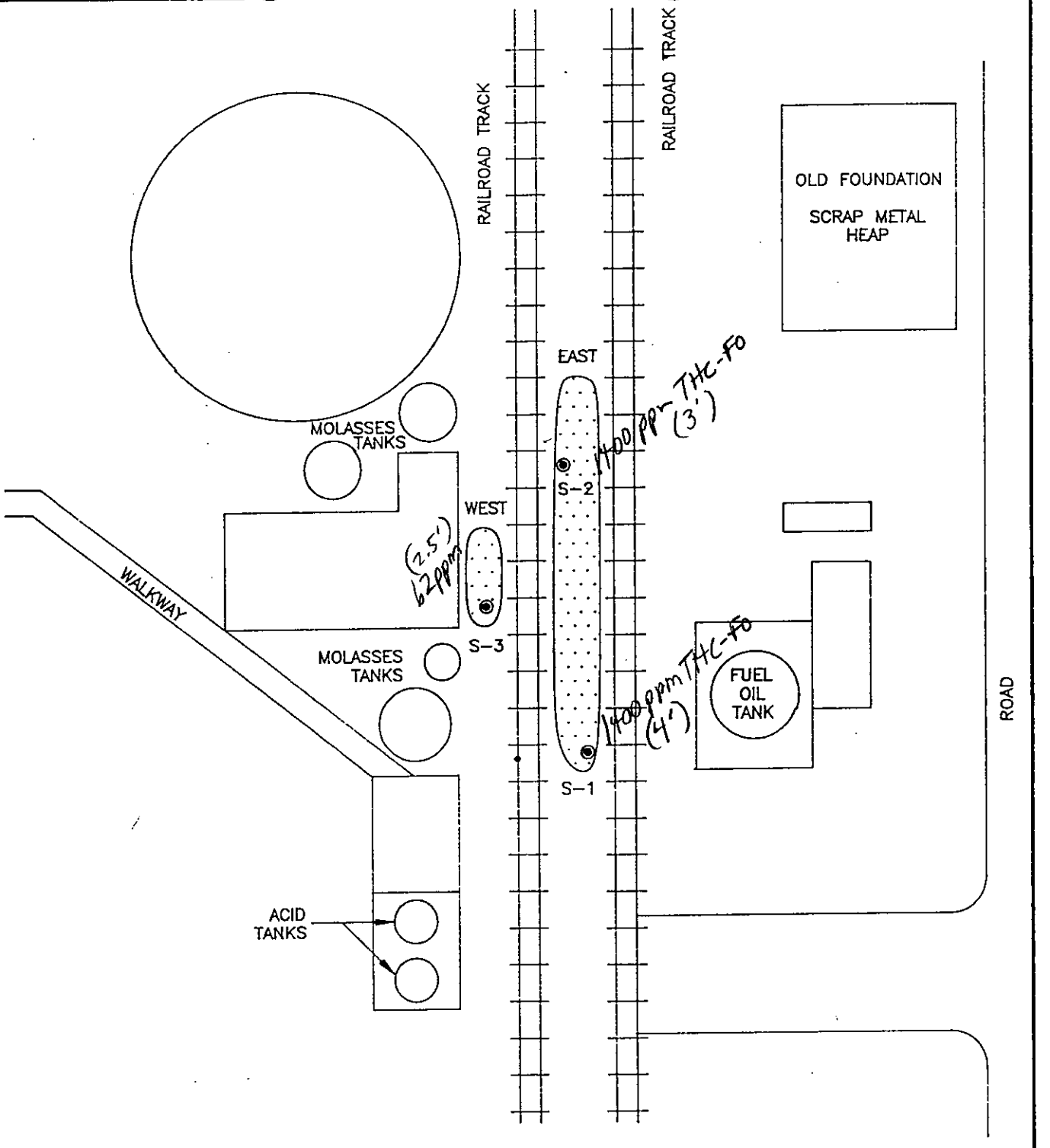


LEGEND:

- TRENCH LOCATION
- ▲ HEADSPACE SAMPLE LOCATION

N E S W

ENGR'G S.M.	DATE		BAY WEST Inc. ENVIRONMENTAL SERVICES St PAUL MN
DRAWN K.M.	12/9/91		
REV.			
PROJECT NAME CARGILL– MOLASSES			
TITLE SITE MPA– HEADSPACE SAMPLE LOCATIONS			
DWG. NO. 2436–A2	SCALE NONE	FIGURE # 2	



LEGEND:

- TRENCH LOCATION
- SOIL SAMPLE LOCATION

N E S W

ENGR'G S.M.	DATE		BAY WEST Inc. ENVIRONMENTAL SERVICES St. PAUL MN
DRAWN K.M.	12/9/91		
REV.			
PROJECT NAME CARGILL– MOLASSES			
TITLE SITE MAP– SOIL SAMPLE LOCATIONS			
DWG. NO. 2436–A2	SCALE NONE	FIGURE # 3	

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

October 16, 1991

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

Attn: Ms. Shirley McMaster

Bay West Environmental Services Project No.: **2436** **(COC: GW-1107)**
Bay West Project ID: **5-1660**
Samples Collected : September 21, 1991

The following are results from the samples you submitted for analysis on September 23, 1991.

The data is reported in Tables 1 and 2.

Please contact me if you have any questions or comments.

Sincerely,

Grant Paul
Project Manager/Organic Chemist

GP/ps

encl.

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

Table 1

Bay West Environmental Services Project No.: **2436**
Bay West Laboratory Project ID: **5-1660**

Parameter	Target Reporting Limit mg/Kg	So. end of East trench 4' S-1 (15536) mg/Kg	No. end of East trench 3' S-2 (15538) mg/Kg	West trench bottom 2.5' S-3 (15542) mg/Kg	Soil pile center West pile SP-4 (15544) mg/Kg
Benzene	0.001	<0.9	<0.8	<0.9	<0.9
Toluene	0.001	<0.9	<0.8	<0.9	<0.9
Ethyl Benzene	0.001	<0.9	1.7	<0.9	<0.9
Xylenes	0.001	4.3	4.5	<0.9	2.1
Total Petroleum Hydrocarbons (Fuel Oil)	0.025	1400.	1400.	62.	670.
Extraction Factor (Normalized)		937.7	838.9	900.8	976.9

Analyzed: September 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.

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

Table 2

Bay West Environmental Services Project No.: **2436**
Bay West Laboratory Project ID: **5-1660**

Parameter	Reporting Limit mg/Kg	Soil pile center of West pile SP-4 (15546) mg/Kg
Total Metals:		
Lead	3.3	16.8

Analyzed: October 8, 1991

Method : EPA 3050/6010

9680

GROUND WATER CHAIN-OF-CUSTODY RECORD

BW-GW: 8/91

Bay West

LAB: Bay West		SEND RESULTS TO: Shirley Mcmaster			CHAIN-OF-CUSTODY NO: GW- 1107
PROJECT NUMBER: 2436 (~~2346~~)	PROJECT MANAGER: S.M.	TURNAROUND REQUEST: Normal	SAMPLE RETENTION — RETURN: X	DISPOSE:	

ITEM NO.	SAMPLE NUMBER (PROJECT NO. - SAMPLE ID)	SAMPLE DATE / TIME	MATRIX	NUMBER & TYPE OF CONTAINER	ANALYSIS CODE(S)	DESCRIPTION / COMMENTS
1	2346 - S-1	9-21-91 / 13:47	S	2-60ml 1-500ml	01	South end of ~~east~~ trench 4' deep
2	2346 - S-2	9-21-91 / 13:52	S	2-60ml 1-500ml	01	North end of east trench 3' deep
3	2346 - S-3	9-21-91 / 13:58	S	2-60ml 1-500ml	01	West trench bottom 2.5' deep
4	2346 - Sp-4	9-21-91 / 14:04	S	2-60ml 1-500ml	01, 14	soil pile center of West pile
5	-					
6	-					
7	-					
8	-					

an exception SP-1 meth[illegible] same

SAMPLER	AFFILIATION	DATE
Andrew Nelson	Bay West	9-21-91

TRANS NO.	ITEM NO.	RELINQUISHED BY	ACCEPTED BY	DATE	TIME
1	1-4	Andy Nelson	D Katten	9-23 / 11:33	11:30
2					
3					
4					
5					

Preservative:

All samples must be preserved on ice (4°C), unless specified otherwise.

Matrix:

W = Water
L = Liquid Sample
S = Soil Sample
SD = Solids Sample
SL = Sludge Sample
O = Other (Specify ____________)

ANALYSIS CODES

- Cross out any unwanted parameter.
- List any additional parameters in the "Description / Comments" column.

Parameter	Code
BTEX, ~~MTBE,~~ TPH	(01)
VOC'S- Drinking Water (EPA 502.2)	02
VOC'S- Ground Water (EPA 601/602)	03
VOC'S- Soil/Solids (EPA 8010/8020)	04
VOC'S (by GC/MS) (EPA 624/8240)	05
Semi-Volatiles (by GC/MS) (EPA 625/8270)	06
VOC'S- Water/Soil (MDH 465 list)	07
Pentachlorophenol (PCP) (EPA 604/8040)	08
Phenols (EPA 604/8040)	09
Phthalates (EPA 606/8060)	10
PCBs/Pesticides (EPA 608/8080)	11
PAHs (EPA 610/8100/8310)	12
Herbicides (EPA 615/8150)	13
Lead (total)	(14)
Priority Pollutant Metals (13)	15
MWCC Metals (4)	16
RCRA Metals (8)	17
BOD, COD (EPA 405.1/410.1)	18
pH, TSS (EPA 150.1/160.2)	19
Oil/Grease (EPA 413.1/9071)	20
____________	21
____________	22
____________	23
____________	24

APPENDIX 4

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 1
Well No.:
Total Depth: 5'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-17-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE (C&B, G&P, VCS, CS, MS, FS, VFS, SILT, CLAY)	SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1						GM		fragmented cobble fill w/ dark brown (10 YR 7/4) clay and silt, moist
2								
3								black blue swampy silty clay and cobbles, swamp odor
4								black silty clay and coarse sand and gravel,refusal (boulder), odor, saturated
5			1 ppm		3	GM		EOB 5'
6					-			
7					-			
8								
9								
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BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 2
Well No.:
Total Depth: 5.5'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-17-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE (C&B, G&P, VCS, CS, MS, FS, VFS, SILT, CLAY)	PID SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1						GM		pea gravel, hard pan
2								black (10 YR 2/1) silty clay and gravel, moist
3								
4								cobbles, strong odor
5			35 ppm		2	GM		
6								water line at 5.5'
7								EOB 5.5'
8								
9								
10								
11								
12								
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BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 3
Well No.:
Total Depth: 7'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-20-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE (C&B, G&P, VCS, CS, MS, FS, VFS, SILT, CLAY)	SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1								
2						GW		very dark gray brown (10 YR 3/2) rounded cobbles and clay sand mixture, very moist
3						SM		dark brown (10 YR 4/3) moderately sorted, fine to medium sand, moist
4			ND	3	4 4	PT		black (10 YR 2/1) peat, poor yield
5					4 4	OH		very dark gray (10 YR 3/1) organic clay, very moist
6			ND		12 9			saturated
7					6 6			EOB 7'
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BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 4
Well No.:
Total Depth: 8'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-20-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE (C&B G&P VCS CS MS FS VFS SILT CLAY)	PID SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1								
2						SW		yellow brown (10 YR 5/4) fine sand and cobbles, very moist
3						CH		dark gray (10 YR 4/1) clay w/ gravel, very moist
4			NO		2 2	CH		very dark (10 YR 3/1) clay
5					2 1	OH		dark gray (10 YR 4/1) silty organic clay, strong swampy odor, saturated
6			NO		2 2	PT		black (10 YR 2/1) peat, very moist
7					2 3			
8						CH		light brown-gray (10 YR 6/2) limestone fragments, saturated
9					- -			EOB 8' refusal-bedrock
10								
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BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 5
Well No.:
Total Depth: 7'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-20-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE C&B	G&P	VCS	CS	MS	FS	VFS	SILT	CLAY	SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1																grass, black organic topsoil
2														OH		(10 YR 3/2) organic clay
3																
4											ND		4 10	CH		olive brown (2.5 YR 4/4) clay, saturated
5													16 18	CH		olive brown (2.5 YR) limestone fragments, moist
6											ND			CH		yellow brown (10 YR 5/6) fine sand and clay, saturated
7																
8																EOB 7.5' refusal - bedrock
9																
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BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 6
Well No.:
Total Depth: 5'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-20-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE (C&B, G&P, VCS, CS, MS, FS, VFS, SILT, CLAY)	SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1						GW		brown (10 YR 5/3) rounded cobbles and clay, silt and sand, very moist
2						GW		very dark gray (10 YR 3/1) rounded cobbles and clay, silt and sand, very moist
3								
4			0,5		5 13	CH		mottled olive brown clay, (2.5 YR 5/4), moist
5					22 18	CH		dark gray (5 Y 4/1) clay and fragmented lime stone
6								EOB 5'
7								
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BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 7
Well No.:
Total Depth: 5'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-20-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE (C&B, G&P, VCS, CS, MS, FS, VFS, SILT, CLAY)	SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1						CH		light brown (10 YR 5/4) cobbles and clay
2						CH		very dark gray (10 YR 3/1) rounded cobbles and clay, fill
3								
4			NO		2 2	OH		black (10 YR 2/1) organic clay and silt, very moist
5					3 1	SC		black (10 YR 2/1) very coarse sand, moderately sorted, saturated
6								EOB 5'
7								
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BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL

Boring No.: SB - 8
Well No.:
Total Depth: 5'
Drilling Method: 2.75" HSA
Sampling Method: S - SPOON
Grade Elevation:
Date Completed: 10-20-91

DEPTH	GRAPHIC SECTION	GRAIN SIZE (C&B, G&P, VCS, CS, MS, FS, VFS, SILT, CLAY)	SAMPLE	REC. (IN)	N-COUNT	USCS	WELL	DESCRIPTION-REMARKS
1								
2						SW		dark brown (10 YR 4/3) fine to medium sand and cobbles w/silt, very moist
3								
4			ND			PT		black (10 YR 2/1) peat, very moist
5								saturated
6								EOB 5'
7								
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Bay West

APPENDIX 5

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB - 1

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)
10-17-91		4' - 5'		1			N

COMMENTS AND NOTES: _____

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB - 2

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)
10-17-91		4' - 5.5'		3.5			N

COMMENTS AND NOTES: _____

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
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)
10-20-91		3' - 5'		0			N
10-20-91		5' - 7'		0			Y

COMMENTS AND NOTES: _____

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB - 4

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)
10-20-91		3' - 5'		0			N
10-20-91		5' - 7'		0			N

COMMENTS AND NOTES: _____

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB - 5

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)
10-20-91		3'-5'		0			Y
		5'-7'		0			N

COMMENTS AND NOTES: _____

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB - 6

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)
10-20-91		3' - 5'		0.5			Y

COMMENTS AND NOTES: _____

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB - 7

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)
10-20-91		3' - 5'		0			Y

COMMENTS AND NOTES: _____

BAY WEST, INC.
ENVIRONMENTAL SERVICES

5 EMPIRE DRIVE ST. PAUL, MN. 55103

HEADSPACE ANALYSIS

Project Name: CARGILL- MOLASSES
Project Number: 2436
Driller: J. HUBBELL
Geologist: T. DAHL
Soil Boring #: SB - 8

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)
10-20-91		3' - 5'		0			Y

COMMENTS AND NOTES: _____

APPENDIX 6

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St. Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

December 5, 1991

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

Attn: Ms. Shirley McMaster

Bay West Environmental Services Project No.: **2436** **(COC: GW-1234)**
Bay West Project ID: **5-1862**
Samples Collected : November 20, 1991

The following are results from the samples you submitted for analysis on November 20, 1991.

The data is reported in Table 1.

Please contact me if you have any questions or comments.

Sincerely,

Grant Paul
Project Manager/Organic Chemist

GP/ps

encl.

Bay West Analytical Laboratory

Bay West Inc.
Five Empire Drive
St Paul, Minnesota
55103-1867

612-291-0456
FAX 291-0099

Table 1

Bay West Environmental Services Project No.: **2436**
Bay West Laboratory Project ID: **5-1862**

Parameter	Target Reporting Limit mg/Kg	SB-3 (17506) mg/Kg	SB-4 (17508) mg/Kg	SB-5 (17510) mg/Kg	SB-6 (17512) mg/Kg	SB-7 (17514) mg/Kg	SB-8 (17516) mg/Kg
Benzene	0.001	<0.034	<0.036	<0.040	<0.034	<0.035	<0.051
Toluene	0.001	<0.034	<0.036	<0.040	<0.034	<0.035	<0.051
Ethyl Benzene	0.001	<0.034	<0.036	<0.040	<0.034	<0.035	<0.051
Xylenes	0.001	<0.034	<0.036	<0.040	<0.034	<0.035	<0.051
Total Petroleum Hydrocarbons (Fuel Oil)	0.025	<0.85	<0.88	<0.99	<0.83	<0.88	<1.3
		ND	ND	ND	ND	ND	ND
Extraction Factor (Normalized)		34.1	35.3	39.5	33.3	35.2	50.5

Analyzed: November 26, 1991 and December 2, 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.

1862

GROUND WATER CHAIN-OF-CUSTODY RECORD

BW-GW: 8/91

Bay West

LAB: Bay West | SEND RESULTS TO: Shirley McMaster | CHAIN-OF-CUSTODY NO: GW- 1234

PROJECT NUMBER	PROJECT MANAGER	TURNAROUND REQUEST	SAMPLE RETENTION	
			RETURN	DISPOSE
2436	Shirley McMaster	Normal		

ITEM NO.	SAMPLE NUMBER (PROJECT NO. - SAMPLE ID)	SAMPLE DATE / TIME	MATRIX	NUMBER & TYPE OF CONTAINER	ANALYSIS CODE(S)	DESCRIPTION / COMMENTS
1	2436 - SB-3	10:25	S	1 x 60ml	01	TPH-GRO Fuel 01
2	2436 - SB-4	11:10	S	2 x 60ml	01	" "
3	2436 - SB-5	11:30	S	2 x 60ml	01	" "
4	2436 - SB-6	12:15	S	2 x 60ml	01	" "
5	2436 - SB-7	1:35	S	2 x 60ml	01	" "
6	2436 - SB-8	1:00	S	2 x 60ml	01	" "
7	-					
8	-					

SAMPLER: Tom Dost | AFFILIATION: Bay West | DATE: 11-20-91

TRANS NO.	ITEM NO.	RELINQUISHED BY	ACCEPTED BY	DATE	TIME
1	1-6	Tom Dost	Paula Nathan	11-20-91	2:55 PM
2					
3					
4					
5					

Preservative:

All samples must be preserved on ice (4°C), unless specified otherwise.

Matrix:

W= Water
L = Liquid Sample
S = Soil Sample
SD = Solids Sample
SL = Sludge Sample
O = Other (Specify _____)

ANALYSIS CODES

- Cross out any unwanted parameter.
- List any additional parameters in the "Description / Comments" column.

BTEX, ~~MTBE~~, TPH	01
VOC'S- Drinking Water (EPA 502.2)	02
VOC'S- Ground Water (EPA 601/602)	03
VOC'S- Soil/Solids (EPA 8010/8020)	04
VOC'S (by GC/MS) (EPA 624/8240)	05
Semi-Volatiles (by GC/MS) (EPA 625/8270)	06
VOC'S- Water/Soil (MDH 465 list)	07
Pentachlorophenol (PCP) (EPA 604/8040)	08
Phenols (EPA 604/8040)	09
Phthalates (EPA 606/8060)	10
PCBs/Pesticides (EPA 608/8080)	11
PAHs (EPA 610/8100/8310)	12
Herbicides (EPA 615/8150)	13
Lead (total)	14
Priority Pollutant Metals (13)	15
MWCC Metals (4)	16
RCRA Metals (8)	17
BOD, COD (EPA 405.1/410.1)	18
pH, TSS (EPA 150.1/160.2)	19
Oil/Grease (EPA 413.1/9071)	20
_____	21
_____	22
_____	23
_____	24