Sent 1/7/00
Including cc's

AMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9432

January 7, 2000
StID # 1420

REMEDIAL ACTION COMPLETION CERTIFICATION

Crowley Marine Services
Mr. Stephen Wilson
2401 Fourth Ave., 11th Floor
P.O. Box 2287
Seattle, WA 98111-2287

Port of Oakland
Ms. Diane Heinze
530 Water St.
Oakland CA 94604-3064

RE: Pacific Dry Dock Yard I, 1441 Embarcadero, Oakland CA 94606

Dear Ms. Heinze and Mr. Wilson:

This letter confirms the completion of site investigation and remedial action for the one (1) 400 gallon UL gasoline and the one (1) 500 gallon tank of unknown contents at the above described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground tank is greatly appreciated.

Based upon the available information and with provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank releases is required.

This notice is issued pursuant to a regulation contained in Title 23, Division 3, Chapter 16, Section 2721 (e) of the California Code of Regulations.

Please contact Barney Chan at (510) 567-6765 if you have any questions regarding this matter.

Sincerely,

Mee Ling Tung
Director, Environmental Health

c: B. Chan, Hazardous Materials Division-files
Chuck Headlee, RWQCB
Mr. Dave Deaner, SWRCB Cleanup Fund
Mr. Leroy Griffin, City of Oakland OES, 1605 Martin Luther King Dr., Oakland CA 94612

RACC1441Embarcadero

Sent 1/7/00
Including cc's
w/ Closure Summary

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6700
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January 7,2000
StID# 1420

Crowley Marine Services
Mr. Stephen Wilson
2401 Fourth Ave., 11th Floor
P.O. Box 2287
Seattle, WA 98111-2287

Port of Oakland
Ms. Diane Heinze
530 Water St.
Oakland CA 94604-3064

RE: Fuel Leak Site Case Closure, 1441 Embarcadero, Oakland CA 94606

Dear Ms. Heinze and Mr. Wilson:

This letter transmits the enclosed underground storage tank (UST) case closure letter in accordance with the Health and Safety Code, Chapter 6.75 (Article 4, Section 25299.37 h). The State Water Resources Control Board adopted this letter on February 20, 1997. As of March 1, 1997, the Alameda County Health Services, Local Oversight Program (LOP) is required to use this case closure letter. We are also enclosing the case closure summary and the site Risk Management Plan. These documents confirm the completion of the investigation and cleanup of the reported release at the subject site.

Site Investigation and Cleanup Summary:

Please be advised that the following conditions exist at the site:

* 72 parts per million (ppm) Total Petroleum Hydrocarbons as diesel (TPHd), remain in the soil at the site.

* 440 parts per billion (ppb) TPHd remain in groundwater at the site.

This site should be included in the City's permit tracking system. You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

enclosures: Case Closure Letter, Case Closure Summary

c: Mr. L. Griffin, City of Oakland OES, 1605 MLK Jr. Way, Oakland CA 94612
B. Chan, files (letter only) **Trlt1441Embarcadero**

RB# 01-1119

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program

12/11/99

I. AGENCY INFORMATION

Date: ~~October 3,~~ 1999

Agency name: Alameda County-HazMat Address: 1131 Harbor Bay Parkway Rm 250

City/State/Zip: Alameda, CA 94502 Phone: (510) 567-6700

Responsible staff person:Barney Chan Title: Hazardous Materials Spec.

II. CASE INFORMATION

Site facility name: Pacific Dry Dock, Yard I

Site facility address: 1441 Embarcadero, Oakland CA 94606

RB LUSTIS Case No: N/A Local Case No./LOP Case No.: 1420

ULR filing date: 1/18/91 SWEEPS No: N/A

Responsible Parties:	Addresses:	Phone Numbers:
1. Crowley Marine Services c/o Mr. R. Stephen Wilson	2401 Fourth Ave., 11th Floor P.O. Box 2287 Seattle, WA 98111-2287	206-443-8100
2. Port of Oakland c/o Ms. Diane Heinze	530 Water St. Oakland CA 94604-2064	510-272-1467

Tank No:	Size in gal.:	Contents:	Closed in-place or removed?:	Date:
1	400	UL gasoline	removed	9/24/91
2	500	unknown	removed	2/17/94

III RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: possibly from leaks in tanks
Site characterization complete? Yes

Date approved by oversight agency:

Monitoring Wells installed? Yes Number: 6

Proper screened interval? Yes, from approximately 3-14' bgs, a minimum amount of blank screen was required for proper surface seal

Leaking Underground Fuel Storage Program

Highest GW depth: 2.65' bgs Lowest: 9.81' bgs

Flow direction: varies, however gw is tidally influenced with the Oakland-Alameda estuary immediately adjacent to the site

Most sensitive current use: commercial/industrial

Are drinking water wells affected? No Aquifer name: NA

Is surface water affected? No Nearest affected SW name:

Off-site beneficial use impacts (addresses/locations): NA

Report(s) on file? Yes
Alameda County
1131 Harbor Bay Parkway,Room 250
Alameda CA 94502-6577

Where is report(s) filed?
City of Oakland
Fire Dept., OES Division
1605 MLK Jr. Way
Oakland CA 94612

Treatment and Disposal of Affected Material:

Material	Amount (include units)	Action (Treatment of Disposal w/destination)	Date
Tanks	1-400 gallon	Disposed @Erickson, Richmond	9/24/91
	1-500 gallon	" " "	2/17/94
Soil	Approx 10cy	Reused as backfill for tank	
	Approx 10cy	Disposed @ Livermore BFI landfill	
Free Product	40 gallon	Pumped out & reused (gas)	
Groundwater	940 gallon	Recycled, PRC Patterson	2/17/94

Maximum Documented Contaminant Concentrations - - Before and After Cleanup

Contaminant	Soil (ppm)		Water (ppb)		
	1 Before	2 After *	3 Before	4	After 5
TPH (Gas)	130	ND	380	34,000,000	ND
TPH (Diesel)		72	8400		440
Benzene	2.0	ND	28	<9400	ND
Toluene	1.4	ND	120	170,000	ND
Ethylbenzene	3.8	ND	11	480,000	ND
Xylenes	3.8	ND	35	1,900,000	ND
MTBE					ND
Oil and Grease		ND	ND		
Org lead/lead	**0.95**	18		390	ND
TDS					>3,000,000

Comments (Depth of Remediation, etc.):
1 Soil sample 7703.26-S1 (400 gallon UST)
2 Soil sample SW1 (500 gallon UST)
3 Grab gw sample UST 1 (500 gallon UST)
4 Grab gw sample 400 gallon UST
5 Groundwater samples from MW1 and MW6
* No over-excavation performed on the UST pits

IV. CLOSURE
Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Undetermined

Does corrective action protect public health for current land use? YES

Site management requirements: site should be included in the City of Oakland Permit Tracking System. A site health and safety plan will be required for any subsurface work.

Should corrective action be reviewed if land use changes? Yes

Monitoring wells Decommisioned: No

Number Decommisioned: 0 , awaiting site closure Number Retained: 6

List enforcement actions taken: none
List enforcement actions rescinded: NA

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Barney M. Chan Title: Hazardous Materials Specialist

Signature: Barney Chan Date: 12/1/99

Reviewed by

Name: Tom Peacock Title: Manager

Signature: Tom Peacock Date: 11-29-99

Leaking Underground Fuel Storage Tank Program

Name: Eva Chu Title: Hazardous Materials Specialist

Signature: [signature] Date: NOV-05-1999

VI. RWQCB NOTIFICATION

Date Submitted to RB: 12/8/99 RB Response: [signature]

RWQCB Staff Name: C. Headlee Title: AEG Date: 12/10/99

VII. ADDITIONAL COMMENTS, DATA, ETC.

See attached site summary.

Site summary for 1441 Embarcadero, Oakland 94606
Pacific Dry Dock Yard I

This site, located between the Oakland Inner Harbor and Embarcadero , operated as a boat repair and marine railway facility from approximately 1911 to 1991, when all repair activity ceased. **See Figure 1 for a site location map**. Before 1913, the yard consisted of mostly soft mud where an old creek had emptied into the Oakland Inner Harbor. With the approval of the city, Crowley Marine Services (Crowley) deposited approximately 36,000 cubic yards of fill to cover the entire site. Because of the ship repair activities, surface contamination occurred over time, in addition to that from the two underground tanks addressed in this closure. In fact, the majority of the contamination experienced at this site occurred from surface releases. An extensive SLIC investigation was performed and the SLIC investigation was closed on June 28, 1999. The data from the SLIC investigation was augmented to characterize the releases from the two underground tanks. The site is a narrow piece of land, approximately 250'x 850' and can be divided into an east and west portion with one underground tank formerly located on each.

On **September 24, 1991**, the 400 gallon gasoline tank was removed from the northwest corner of the west portion of the site. **See Figure 2**. The tank laid in the east-west direction and was approximately 2.5' x 12' in dimension. The top four feet of the excavation consisted of fill material with a noticeable hydrocarbon odor. The native soil, at approximately 6', was grey-green clay. A small amount of groundwater appeared within the excavation upon which a film of gold-brown fluid floated. Soil samples, 7703.26-N1 and 7703.26-S1, were collected above the capillary fringe from north and south ends of the tank, respectively. **See Figure 3 and Table 1**. A grab groundwater sample, 7703.26-Water, was also collected from the standing water. Up to 130 ppm TPHg, and 2.0, 1.4, 3.8 and 3.8 ppm BTEX, respectively, was detected in the soil samples. The grab groundwater sample exhibited 34,000 ppm TPHg, 9.4, 170, 480 and 1900 ppm, BTEX, respectively. The TPHg concentration indicates that the liquid sample entrapped some free product.

At this same time, Crowley realized that the entire site required investigation due to past site activities and surface staining. Therefore a site-wide subsurface investigation was performed in October 1991 and January 1992. This investigation included the advancement of borings B8-B12, near the former 400 gallon UST area. Borings BH10-BH12, located on the east, west and south sides of the former UST, respectively, were sampled for oil and grease, TPHd and TPHg. The highest petroleum concentrations were detected in BH12, which ultimately lead to the decision to install MW1 in this same general location. See **Figure 4 &5 and Table 2.**

Between **August 17 and 18, 1992**, Crowley's consultant, Versar, conducted an additional investigation on the eastern portion of the site. A total of 16 borings were advanced from which, soil and groundwater was collected. The soil samples, however, were not within the immediate vicinity of the 500 gallon UST. However, a liquid sample was collected from the UST for characterization of its former contents. This sample exhibited 4,700 ppm TPHg, 2000 ppm TPHd and 270, 1100, 64 and 300 ppm, BTEX, respectively. **See Table 3.**

Between **June 23 and 24, 1993**, five monitoring wells were installed at the site. One, MW5, was located up-gradient of the site, on the north side of Embarcadero. MW1 was located within ten feet of the former 400 gallon UST (near BH12). Two soil samples were collected from the boring for MW1, one at 2' and one at 5.5'. These samples exhibited low TPHd, TPHg and BTEX, but high (7,800 ppm) oil and grease. **See Figure 5 and Table 4.**

On February 17, 1994 the 500 gallon UST was removed in the presence of Ms. Eva Chu of ACHCSA, Mr. Stephen Wilson of Crowley and Mr. Dan Schoenholz of the Port of Oakland. The UST laid in the north-south direction in the extreme southeast corner of the property. The tank was approximately 10' x 3'. Approximately 500 gallons of water was removed from the tank. The lower portion of the tank was below the water table exposed in the excavation. Three soil samples were collected just above the groundwater level from the south, west and north walls. A groundwater sample was also collected after the initial water was removed and allowed to recharge the tank pit. **See Figure 6 and 7 and Tables 5 and 6.** The soil samples were virtually ND for TOG, TPHg and BTEX with only minor amounts of TPHd reported (up to 72 ppm). The grab groundwater sample exhibited 380 ppb TPHg, 8400 ppb TPHd, ND for TOG and 28, 120, 11, 35 ppb, BTEX, respectively.

Groundwater monitoring of MW1 through MW5 was started in July 1993. For MW1, the monitoring continued quarterly up to the first quarter of 1996. Very low concentrations of the tested parameters; TOG, TPHd, TPHg and BTEX were detected. Total Dissolved Solids was detected up to 31,000 ppm and salinity reported as 29 parts per thousand. This concentration is comparable to the salinity in ocean water and indicates that surface water intrusion from the estuary is occurring.

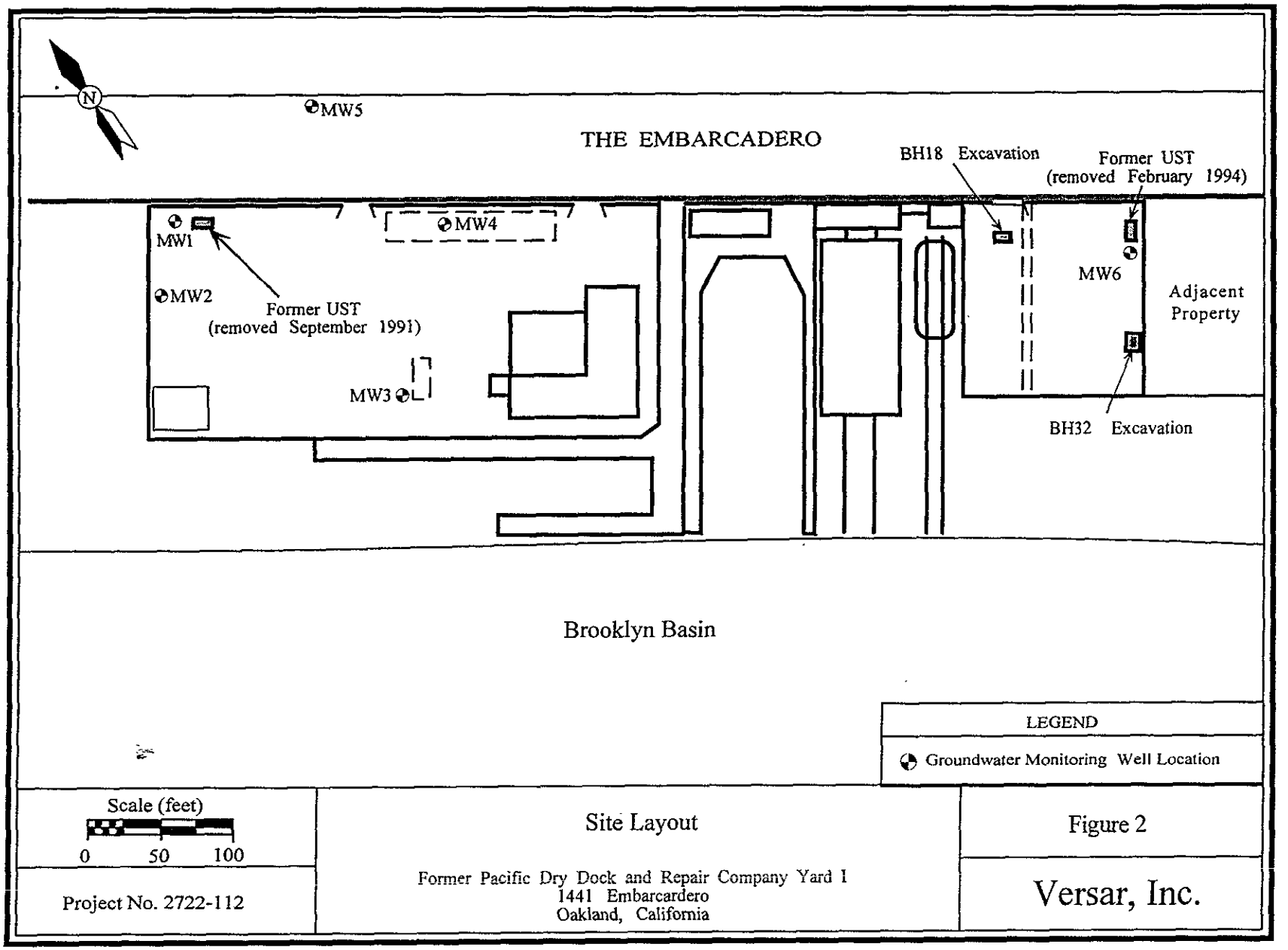
On February 28, 1996 MW6 was installed on the eastern portion of the site, just southwest of the former 500 gallon UST. MW6 was initially installed to determine the presence of lead in groundwater. Soil samples from this well were not analyzed for TPH constituents. On two separate occasions, 3/96 and 3/97, groundwater from this well was sampled for TPHg, TPHd, BTEX and filtered lead. With the exception of 77 ppb TPHd on 3/96, all other analytes were ND. **See Figure 8 and Table 7,** for a site map and a summary of groundwater sampling results for all six wells. Although MTBE was not run in any of the monitoring wells, four hydropunch samples were advanced in the eastern portion of the site, around the former 500 gallon UST. These samples, HP1 through HP4, were all ND for MTBE. **See Table 8 and Figure 9.**

Site closure is recommended based upon:

- Underground tank removals
- Extensive site characterization
- Long term monitoring indicates very little impact from the UST release
- The soil samples taken during the tank removal were at a depth of approximately 5'bgs, which is within the capillary fringe. Therefore, the 2 ppm benzene exhibited in these soil samples really is not a volatilization threat. The site is currently asphalt capped. If site usage changes, risk should be re-evaluated. Soil samples taken as part of a site-wide investigation show that the extent of TPH and benzene contamination is limited to around the former tank. The Human Health Risk Assessment , performed on the entire site, concluded there is no unacceptable health risk. The HHRA was reviewed by Ms. Madhulla Logan of our office, who concurred with this conclusion. Albeit, most of the chemicals of concern were not from the underground tanks and the underground tank areas comprise only a minor portion of the entire site. In addition, all groundwater monitoring results has been ND for TPHg and less than the SFIA ecological Tier 1 standard for TPHd.

SOURCE: USGS TOPO 1959

Approximate Scale 0 0.25 0.50 mi	Site Location	Figure 1
Project No. 7703.26	Pacific Dry Dock Yard I Oakland, California	Versar Inc.



p;\crowley\ydl\2722112

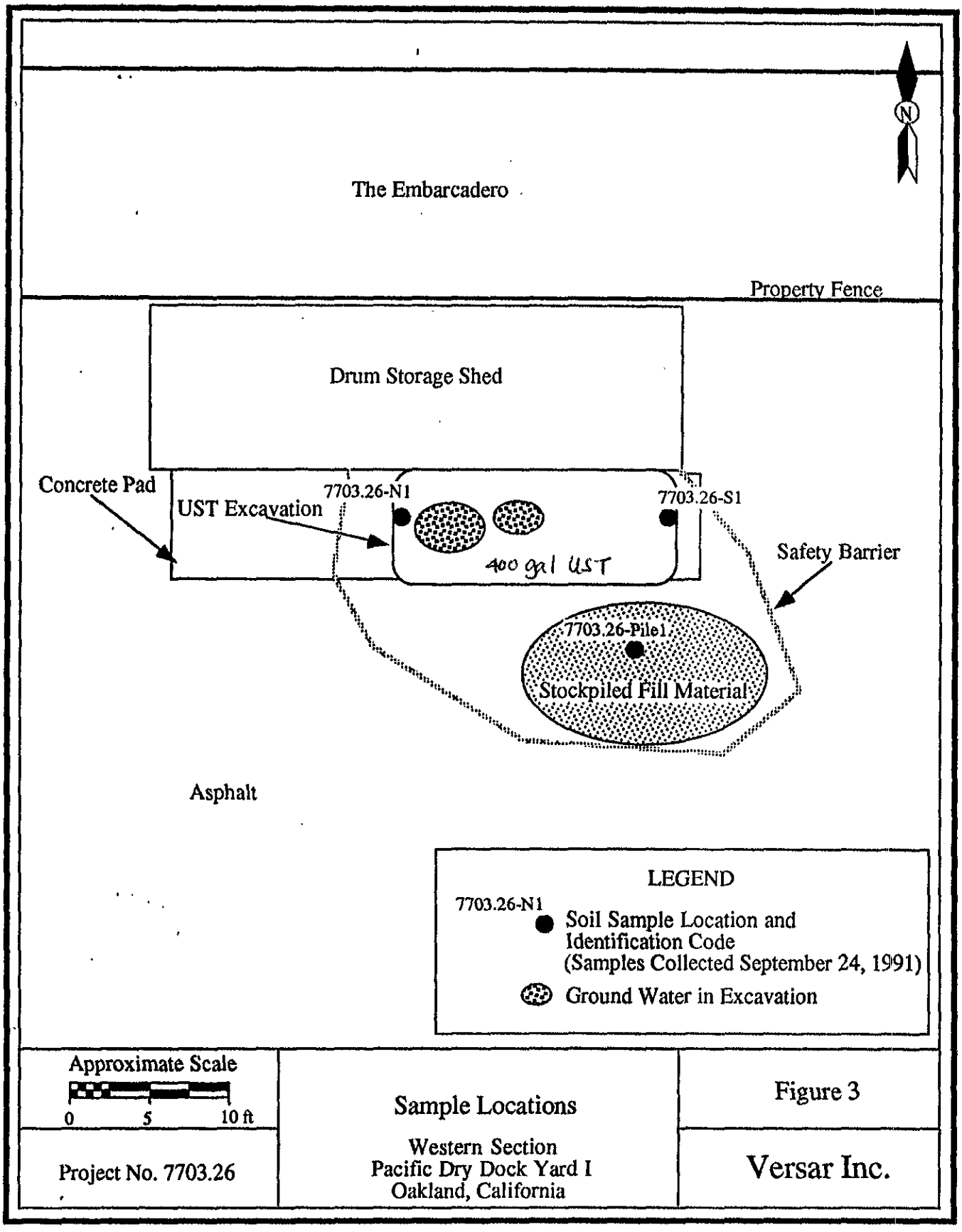

N
The Embarcadero
Property Fence
Drum Storage Shed
Concrete Pad
UST Excavation
7703.26-N1
7703.26-S1
400 gal UST
Safety Barrier
7703.26-Pile1
Stockpiled Fill Material
Asphalt
LEGEND
7703.26-N1
Soil Sample Location and Identification Code (Samples Collected September 24, 1991)
Ground Water in Excavation
Approximate Scale
0
5
10 ft
Sample Locations
Western Section
Pacific Dry Dock Yard I
Oakland, California
Figure 3
Project No. 7703.26
Versar Inc.

Table 1

Summary of Analytical Laboratory Analysis[1]

Pacific Dry Dock and Repair Yard I
Oakland, California

400 gal gas UST

Sample No.	Date of Sampling	Medium	TPH-G[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Xylenes[3]	Organic Lead[4]
7703.26-N1	9/24/91	Soil	11,000	1,100	110	460	850	<500
7703.26-S1	9/24/91	Soil	130,000	2,000	1,400	3,800	3,800	950
7703.26-Pile1	9/24/91	Soil	13,000	620	110	1,100	6,200	4,400
7703.26-Water	9/24/91	Water	34,000,000	<9,400	170,000	480,000	1,900,000	390

[1]All results reported in micrograms per kilogram for soils, and micrograms per liter for water (ppb)

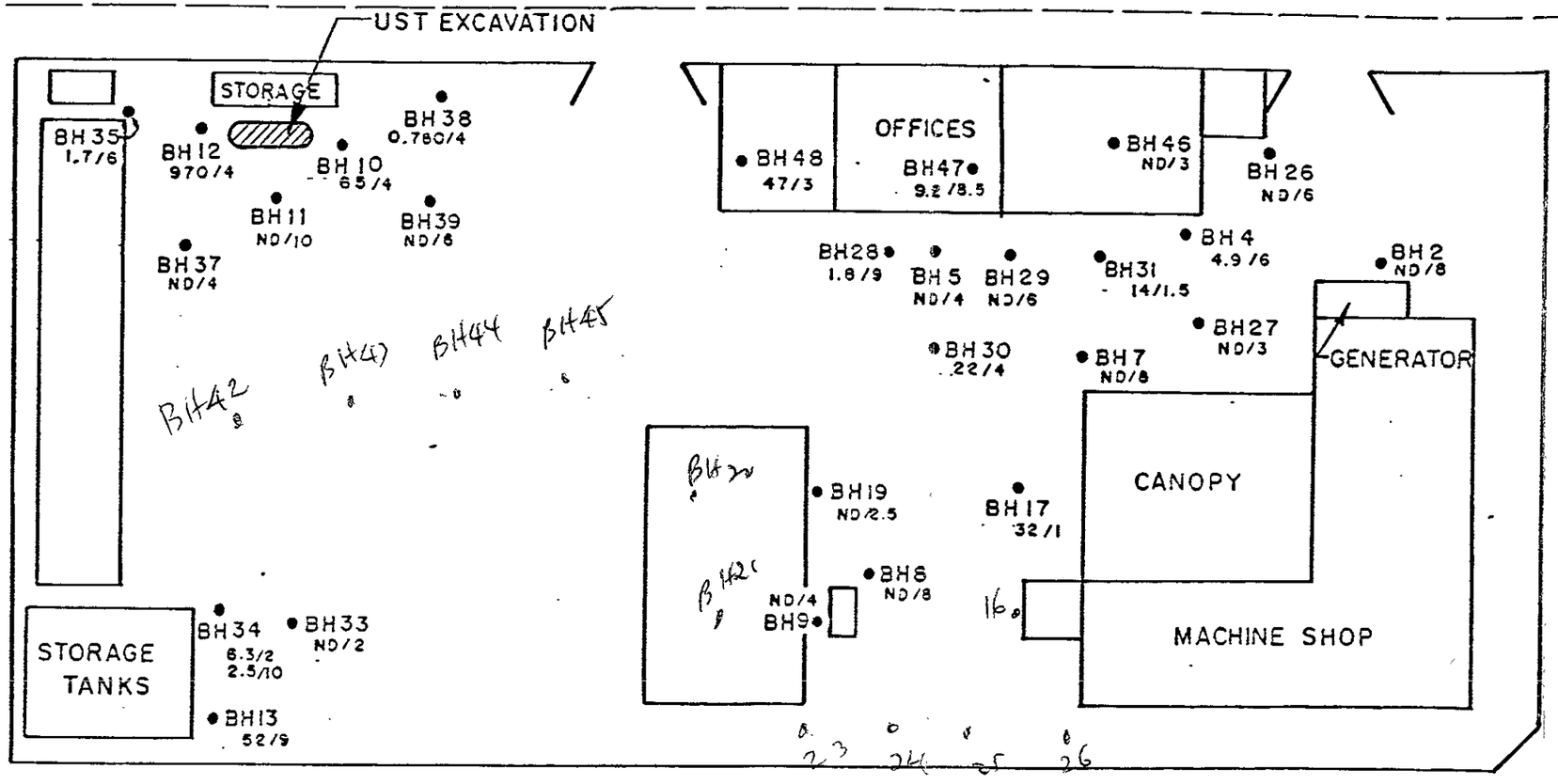
[2]Total Petroleum Hydrocarbons as Gasoline by DHS Method; detection limit dependant on sample

[3]Analytical method - EPA Method 8020/602; detection limit dependant on sample

[4]Analytical method - DHS Method; detection limit 500 micrograms per kilogram for soils and 100 micrograms per liter for water.

Versar INC. SACRAMENTO

THE EMBARCADERO



Scale (feet)

0 50 100

LEGEND:

14/1.5 = Milligrams per Kilogram/Depth in Feet

ND = Not Detected

Samples Collected : October 25,1991 and January 6, 7, and 8, 1992

REVISIONS

ITEM	DATE	DESCRIPTION	BY	APPR.

Versar, INC.
ENVIRONMENTAL RISK MANAGEMENT
5330 PRIMROSE DRIVE, STE. 228
FAIR OAKS, CALIFORNIA, 95628
TELEPHONE: (916)962-1612

DRAWN BY: B HAMILTON

SCALE: AS SHOWN

CHECKED/APPROVED:

DATE: FEB 1992

PACIFIC DRY DOCK YARD 1
OAKLAND, CALIFORNIA

TITLE:
Total Petroleum Hydrocarbons (as gasoline) In Soils

JOB NO. 7703.26

FIGURE 4

Versar Inc.	DRILLING LOG	PROJECT NO.
Supervising Geologist: L. Kleinecke	Site Name: Crowley	
Log By: P. Wabsack	Boring No: MW-1	
Date: 6/23/93	Boring Diameter: 8"	
Drilling Contractor: Turner	Boring Depth: 14.0'	
Contractor Lic. No.	Boring Location: NE site inside fence	
Rig Type: mobile B-34		
Driller: John / Al		

Depth (ft)	Advanced/ Recovered	Blow Counts	First Water/ Water Table	Well Construction	USCS Group	Lithology	USCS SOIL DESCRIPTION / SOIL CONDITION AND GEOLOGIC INTERPRETATION SOIL TYPE, ROUNDING, SORTING, PERCENT: GRAVEL, SANDS, FINES COLOR, MOISTURE, DENSITY, SECONDARY POROSITY, ODORS, STAINING GEOLOGY: FILL, ALLUVIUM, BEDROCK	Headspace (ppm)
1							0-6" gravel road base, asphalt	
2	X	20					2.0 - 5.0 gravelly silt. Silt: low plasticity	
3	A	24					Gravel: angular, up to 0.5 inch, orange mottling, lt grey to lt green, Black	
	A	18					staining at 2.0 - 5.0, looks very	
4							oily w/ evidence of black liquid / sludge.	
5							5.0 - 6.5 silty sandy gravel. Gravel: angular,	
6	X	14					up to 1.5 inch, Silt: < 20%, Sand	
	B	13					well graded, subangular. low plasticity,	
7	X	5					black staining as above.	
							6.5 - 7.0 interface. gravel with clay	
							7.0 - 10.0 gravelly clay. clay: high	
8							plasticity, stiffly. Gravel: subangular	
							up to 0.5 inch, < 20%. Black grading	
9							to dark grey to lt grey w/ depth.	
							Organic odor.	
10								
11	X	2					10.0-15.5 clay, high plasticity, lt grey, moist	
	C	1						

Versar Inc.	DRILLING LOG	PROJECT NO.

Supervising Geologist: L. Kleinecke	Site Name: Cumberland
Log By: P. Walsh	Boring No: MW-1
Date: 6/23/93	Boring Diameter: 8"
Drilling Contractor: Turner	Boring Depth: 14.0'
Contractor Lic. No.	Boring Location: NE site inside fence
Rig Type: mobile B-34	
Driller: John / Al	

Depth (ft)	Advanced/ Recovered	Blow Counts	First Water / Water Table	Well Construction	USCS Group	Lithology	USCS SOIL DESCRIPTION / SOIL CONDITION AND GEOLOGIC INTERPRETATION SOIL TYPE, ROUNDING, SORTING, PERCENT: GRAVEL, SANDS, FINES COLOR, MOISTURE, DENSITY, SECONDARY POROSITY, ODORS, STAINING GEOLOGY: FILL, ALLUVIUM, BEDROCK	Headspace (ppm)
12	X	1					Clay as above	
13								
14							14.0 End Boring	
15	X D	1 2					Clay as above	NA
16	X	1						

Versar Inc.	DRILLING LOG	PROJECT NO. 2722-112

Supervising Geologist: Paul Graff	Site Name: Former Pacific Dry Dock & Repair Yard I
Log By: Philip Cox	Boring No: MW6
Date: 2/28/96	Boring Diameter: 8 inches
Drilling Contractor: West Hazmat	Boring Depth: 13.5 feet
Contractor Lic. No. C57-554979	Boring Location: Eight feet south of former UST excavation.
Rig Type: CME 75	
Driller: Jeff	

Depth (ft)	Advanced/ Recovered		First Water/ Water Table	Well Construction	USCS Group	Lithology	USCS SOIL DESCRIPTION SOIL CONDITION AND GEOLOGIC INTERPRETATION SOIL TYPE, ROUNDING, GRADING, PERCENT: GRAVEL, SANDS, FINES COLOR, MOISTURE, DENSITY, SECONDARY POROSITY, ODORS, STAINING GEOLOGY: FILL, ALLUVIUM, BEDROCK		Headspace (ppm)
2					SW		0.0'-0.5' Asphalt with gravel base. 0.5'-3.0' Gravelly sand: dark brown, gravel up to 1.5" in diameter,		
4		6 8 9	▽		SC		subrounded, content approximately 30% decreasing with depth, sand fine grained, clay present at approximately 10%, saturated at approximately 4.0' bgs, fill.	3.0	0
6		1 2					3.0'-6.0' Clayey sand: gray, no hydrocarbon odor or staining, shells, clay increasing with depth from 10 to 40%, saturated, sand moderately graded fine to medium-grained.	5.5	0
8		1			CH		6.0'-14.5' Bay muds: clay with shells, moderate plasticity, no hydrocarbon odor or staining, saturated.		
10		2 8 4						9.0	0
12									
14		1 2							
16		3						14.5	0
							Well construction: 10' of 2 inch 0.020 inch slotted screen, 3' blank, 11' sand, 1 foot bentonite chips, and cement grout to 6" bgs.		

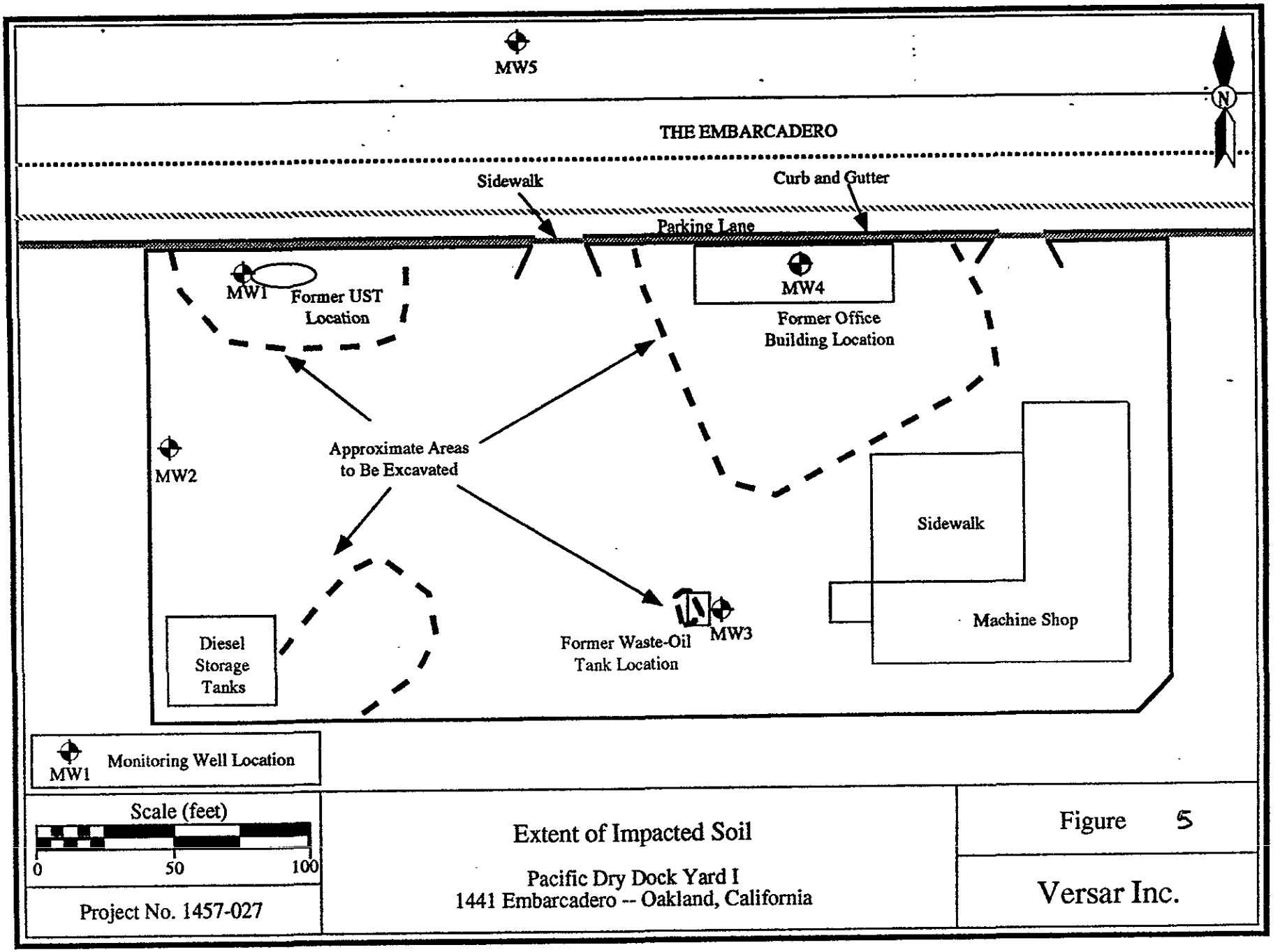

MW5
THE EMBARCADERO
N
Sidewalk
Curb and Gutter
Parking Lane
MW1
Former UST Location
MW4
Former Office Building Location
MW2
Approximate Areas to Be Excavated
Sidewalk
Machine Shop
Diesel Storage Tanks
Former Waste-Oil Tank Location
MW3
MW1 Monitoring Well Location
Scale (feet)
0
50
100
Project No. 1457-027
Extent of Impacted Soil
Pacific Dry Dock Yard I
1441 Embarcadero -- Oakland, California
Figure 5
Versar Inc.

Table 2

(Page 2 of 4)

Laboratory Analytical Results for Soils
(Organics)

Pacific Dry Dock and Repair Yard I
Oakland, California

Sample Number	Sample Depth (feet)	Sample Collection Date	Total Petroleum Hydrocarbons DHS Method, LUFT Field Manual		O&G Hydrocarbons EPA Method 5520EF	Volatile Organics EPA Method 8020			
			Gasoline[1] (mg/kg)	Diesel[2] (mg/kg)	Oil and Grease[3] (mg/kg)	Benzene[4] (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
BH8-6	5.5-6.0	10/25/91	ND	ND	ND	ND	ND	ND	ND
BH9-4	3.5-4.0	10/25/91	ND	ND	370	0.0059	0.027	ND	0.035
BH10-4	3.5-4.0	10/25/91	65	9.8	90	0.022	0.047	0.52	2.3
BH10-8	7.5-8.0	10/25/91	NA	NA	120	NA	NA	NA	NA
BH11-10	9.5-10.0	10/25/91	ND	ND	ND	ND	ND	ND	ND
BH12-4	3.5-4.0	10/25/91	970	1,800	2,500	1.3	1.8	<0.20	55
BH13-9	8.5-9.0	10/25/91	52	2,100	1,800	<0.037	<0.030	<0.033	13
BH14-4	3.5-4.0	10/25/91	NA	ND	ND	NA	NA	NA	NA
BH17-1.0	0.5-1.0	1/6/92	32	1,200	NA	<0.076	<0.080	<0.084	<0.020
BH19-2.5	2.0-2.5	1/6/92	ND	ND	NA	0.0059	0.014	0.031	0.092

[1] Reporting limit for gasoline is 0.50 mg/kg.

[2] Reporting limit for diesel is 1.0 mg/kg.

[3] Reporting limit for oil and grease is 50 mg/kg.

[4] Reporting limits for volatile organics are, unless otherwise noted,: benzene, 0.005 mg/kg; toluene 0.005 mg/kg; ethylbenzene 0.005 mg/kg; xylenes 0.015 mg/kg.

[5] Not Analyzed.

[6] Not detected at or above the reporting limit.

Table 3 (Contents)

Laboratory Analytical Results from Underground Storage Tank Sampling

Pacific Dry Dock and Repair Yard I
Eastern Section
Oakland, California

Sample Number	Sample Collection Date	Total Petroleum Hydrocarbons[1]		Salinity	Volatile Organics[2]			
		Gasoline (mg/L)[3]	Diesel (mg/L)		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
UST-E	08/18/92	4,700	2,000	0.86	278	1,100	64	300

[1] California DHS/LUFT Manual Method

[2] EPA Method 602

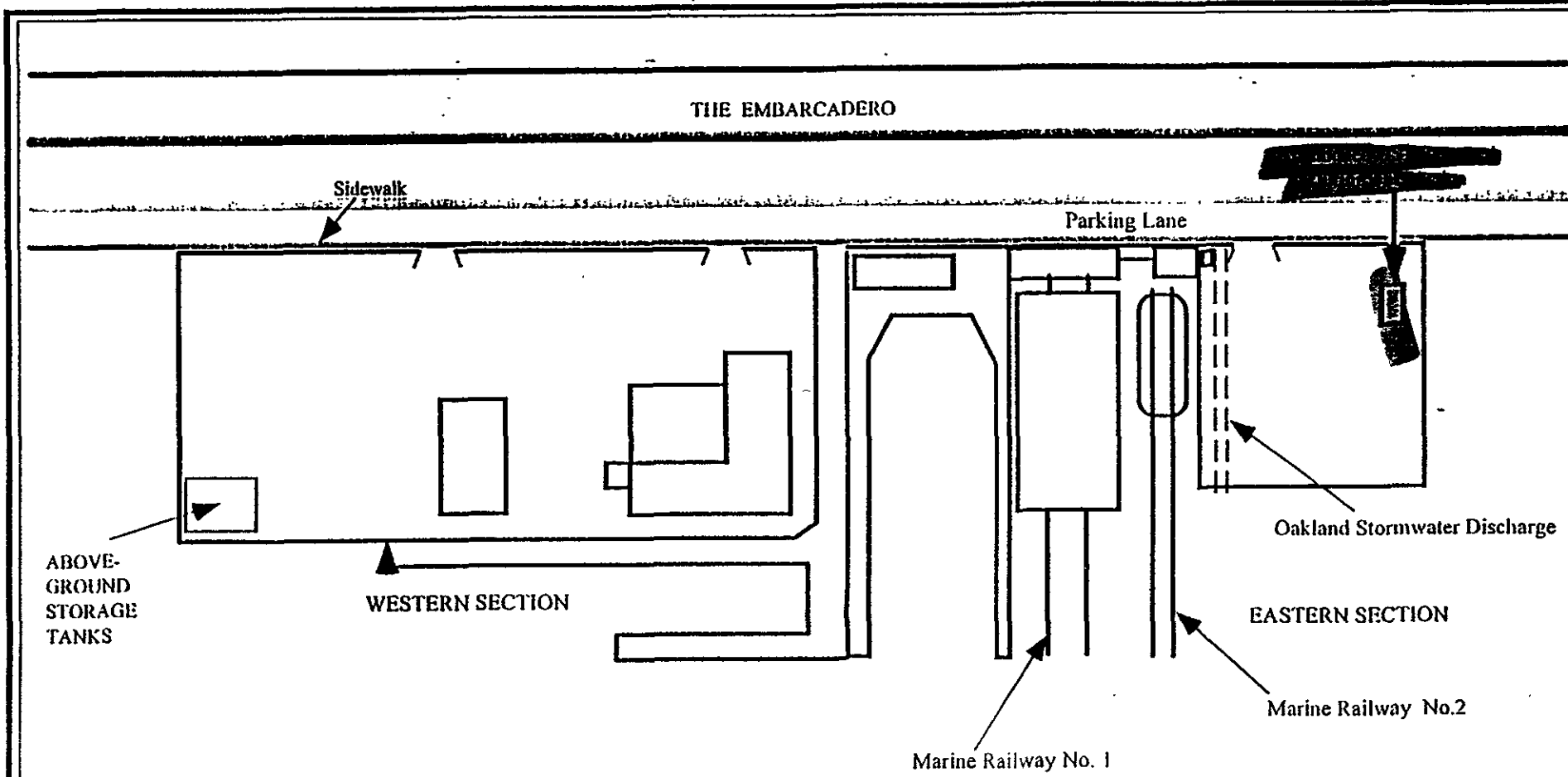
[3] Milligrams per liter

Laboratory Analytical Results for Soils
(Petroleum Hydrocarbons)

Pacific Dry Dock Yard I
Oakland, California

Table 4.

Sample Number	Sample Depth (feet)	Sample Collection Date	Total Petroleum Hydrocarbons DHS Method LUFT Field Manual		O&G Hydrocarbons EPA Method 5520CF	Volatile Organics Modified EPA Method 8020			
			Gasoline (mg/kg)	Diesel (mg/kg)	Oil and Grease (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
MW1-2.0	2.0-2.5	6/23/93	11	2.6	710	<0.012	0.10	<0.018	<0.048
MW1-5.5	5.5-6.0	6/23/93	1.4	20	7,800	0.110	0.810	0.019	0.096
MW2-2.5	2.5-3.0	6/23/93	0.580	2.2	790	<0.005	0.170	<0.005	<0.015
MW2-5.5	5.5-6.0	6/23/93	<0.5	1.1	<50	<0.005	0.043	<0.005	<0.015
MW3-2.0	2.0-2.5	6/24/93	<0.5	2.2	<50	<0.005	0.0046	<0.006	<0.015
MW3-5.5	5.5-6.0	6/24/93	<0.5	32	<50	<0.005	<0.005	<0.005	<0.015
MW4-1.5	1.5-2.0	6/23/93	<0.5	<1.0	<50	<0.005	0.031	<0.005	<0.015
MW4-5.5	5.5-6.0	6/23/93	17	3,000	440	<0.036	0.078	0.130	0.30
MW5-2.0	2.0-2.5	6/24/93	<0.5	<1.0	<50	<0.005	0.094	<0.005	<0.015
MW5-5.5	5.5-6.0	6/24/93	<0.5	<1.0	<50	<0.005	0.022	<0.005	<0.015



Scale (feet)

0 100 200

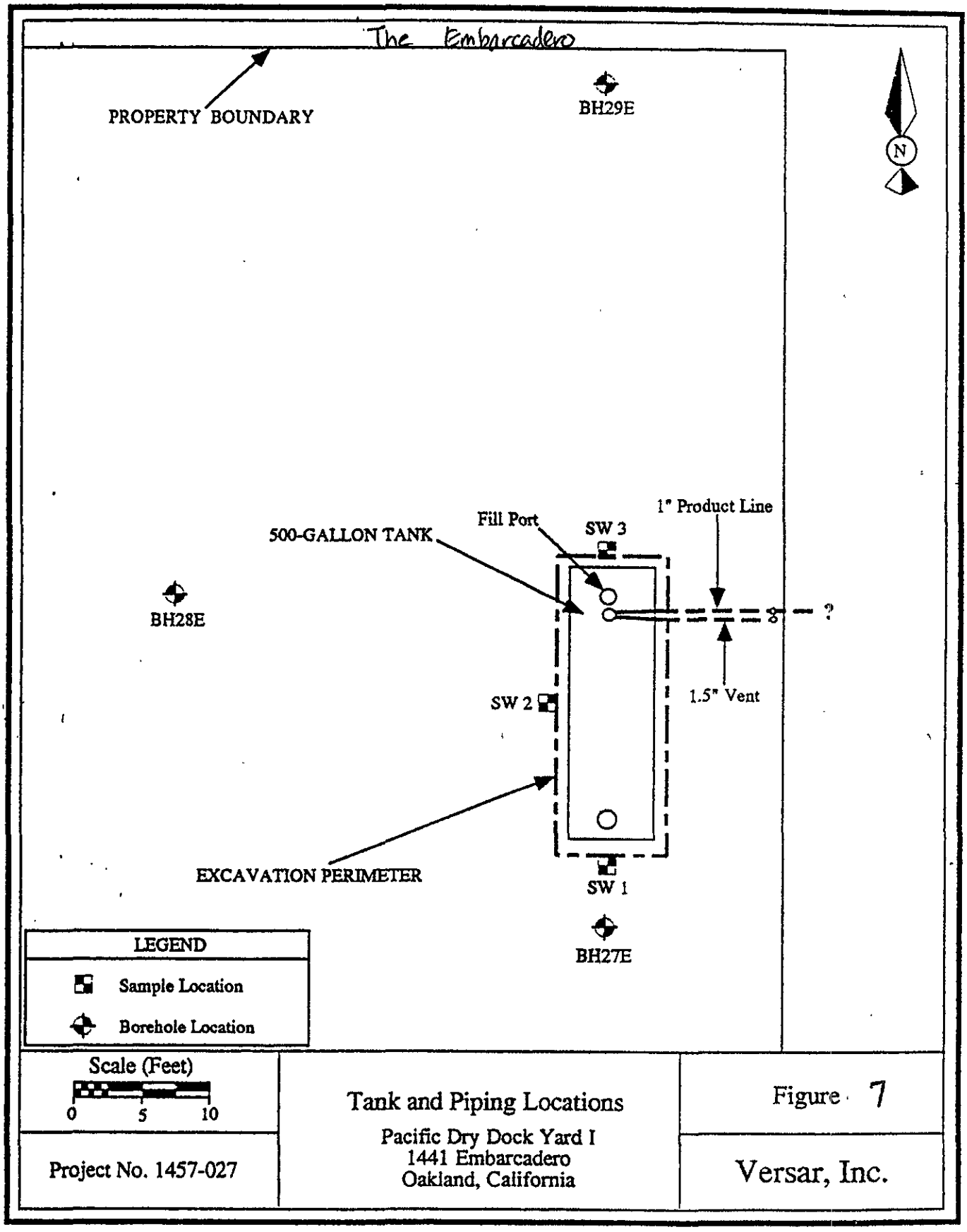
Project No. 1457-027

Site Layout

Pacific Dry Dock Yard I
1441 Embarcadero
Oakland, California

Figure 6

Versar, Inc.



Tank and Piping Locations

Pacific Dry Dock Yard I
1441 Embarcadero
Oakland, California

Figure 7

Project No. 1457-027

Versar, Inc.

Table 5

Laboratory Analytical Results for Soils

Pacific Dry Dock and Repair Yard I
Oakland, California

Sample Number	Sample Collection Date	Total Petroleum Hydrocarbons[1]		T O G[2]	Volatile Organics[3]				Lead[5] (mg/kg)
		Gasoline (mg/kg)[4]	Diesel (mg/kg)	Total Oil and Grease (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	
COMP-1	02/17/94	0.51	57	<5.0	<0.005	0.010	<0.005	0.047	18
SW1	02/17/94	<0.5	72	<5.0	<0.005	<0.005	<0.005	<0.015	8.2
SW2	02/17/94	<0.5	<1.0	<5.0	<0.005	<0.005	<0.005	<0.015	6.9
SW3	02/17/94	<0.5	<1.0	<5.0	<0.005	<0.005	<0.005	<0.015	5.1

[1] California DHS/LUFT Manual Method

[2] EPA Method 5220C&F

[3] EPA Method 8020

[4] Milligrams per kilogram (equivalent to parts per million)

[5] EPA Method 7420

Table 6

Laboratory Analytical Results for Groundwater (grab)

Pacific Dry Dock and Repair Yard I
Oakland, California

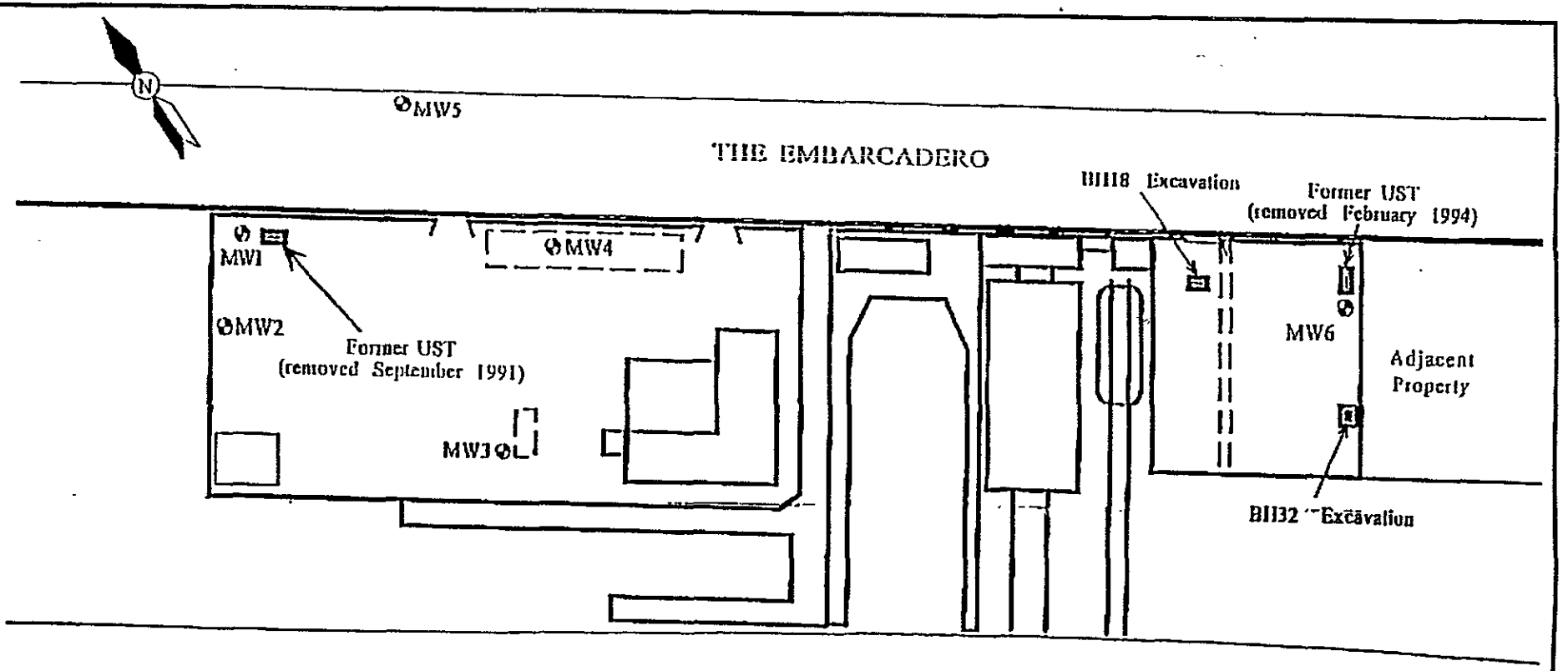
Sample Number	Sample Collection Date	Total Petroleum Hydrocarbons[1]		T O G [2]	Volatile Organics[3]			
		Gasoline (mg/L)[4]	Diesel (mg/L)	Total Oil and Grease (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
UST1	02/17/94	0.38	8.4	<5.0	0.028	0.12	0.011	0.035

[1] California DHS/LUFT Manual Method

[2] EPA Method 5220C&F

[3] EPA Method 8020

[4] Milligrams per liter (equivalent to parts per million)



Scale (feet)

0 50 100

LEGEND

Groundwater Monitoring Well Location

Site Layout

Former Pacific Dry Dock and Repair Company Yard I
1441 Embarcadero
Oakland, California

FIGURE 8

THE GAUNTLETT GROUP, INC.
INDUSTRY ADVISORS FOR SUSTAINABLE DEVELOPMENT

TABLE 7

Historical Groundwater Chemistry Data
Former Pacific Dry Docks and Repair Company Yard I
Port of Oakland, California

Groundwater Monitoring Well	Sample Date	TPH-G[1] (µg/L)[3]	TPH-D[2] (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Filtered Lead (mg/L)[4]
MW-1	07/01/93	ND[5]	ND	ND	ND	ND	ND	NA[6]
	10/14/93	ND	63	ND	ND	ND	ND	NA
	01/18/94	ND	60	NA	1.0	1.4	1.5	NA
	03/30/94	ND	110	2.5	1.7	0.56	1.9	NA
	07/15/94	ND	60	ND	ND	ND	ND	NA
	10/19/94	ND	830	ND	ND	ND	ND	NA
	02/02/95	ND	ND	ND	ND	ND	ND	NA
	05/03/95	ND	78	1.6	0.58	ND	ND	NA
	09/07/95	ND	ND	ND	ND	ND	ND	NA
	03/05/96	ND	320	7.5	ND	ND	ND	ND
	03/28/97	ND	440[7]	ND	ND	ND	ND	<0.05[8]
MW-2	07/01/93	ND	ND	ND	ND	ND	ND	NA
	10/14/93	ND	ND	ND	ND	ND	ND	NA
	01/18/94	ND	ND	ND	ND	ND	ND	NA
	03/30/94	ND	ND	ND	2.2	ND	ND	NA
	07/15/94	ND	ND	ND	ND	ND	ND	NA
	03/05/96	ND	53	ND	ND	ND	ND	ND
	03/28/97	ND	ND	ND	ND	ND	ND	ND
MW-3	07/01/93	ND	ND	ND	ND	ND	ND	NA
	10/14/93	ND	840	ND	ND	ND	ND	NA
	01/18/94	ND	64	ND	ND	ND	ND	NA
	03/30/94	ND	ND	ND	0.90	ND	ND	NA
	07/15/94	ND	ND	ND	ND	ND	ND	NA
	10/19/94	ND	ND	ND	ND	ND	ND	NA
	02/02/95	100	ND	38	0.55	ND	ND	NA
	05/03/95	ND	ND	ND	ND	ND	ND	NA
	09/07/95	ND	ND	ND	ND	ND	ND	NA
	03/05/96	ND	ND	ND	ND	ND	ND	ND
	03/28/97	ND	230[7]	ND	ND	ND	ND	<0.05[8]
MW-4	07/01/93	ND	ND	ND	ND	ND	ND	NA
	10/14/93	ND	ND	ND	ND	ND	ND	NA
	01/18/94	ND	ND	ND	ND	ND	ND	NA
	03/30/94	ND	ND	ND	1.5	ND	1.5	NA
	07/15/94	ND	ND	ND	ND	ND	ND	NA
	03/05/96	ND	ND	ND	ND	ND	ND	ND
	03/28/97	ND	340[7]	ND	ND	ND	ND	ND
MW-5	07/01/93	ND	ND	ND	ND	ND	ND	NA
	10/14/93	ND	ND	ND	ND	ND	ND	NA
	01/18/94	ND	ND	ND	ND	ND	ND	NA
	03/30/94	ND	ND	ND	0.87	ND	ND	NA
	07/15/94	ND	ND	ND	ND	ND	NA	NA
	03/05/96	ND	98	ND	ND	ND	ND	ND
	03/28/97	ND	ND	ND	ND	ND	ND	ND
MW-6	03/05/96	ND	77	ND	ND	ND	ND	ND
	03/28/97	ND	ND	ND	ND	ND	ND	ND

1 TPH-G = Total Petroleum Hydrocarbons as Gasoline
2 TPH-D = Total Petroleum Hydrocarbons as Diesel
3 (µg/L) = micrograms per liter
4 (mg/L) = milligrams per liter
5 ND = not detected at or above method reporting limit
6 NA = not analyzed
7 Diesel in sample appeared to be weathered
8 The method reporting limit was elevated because of matrix interferences

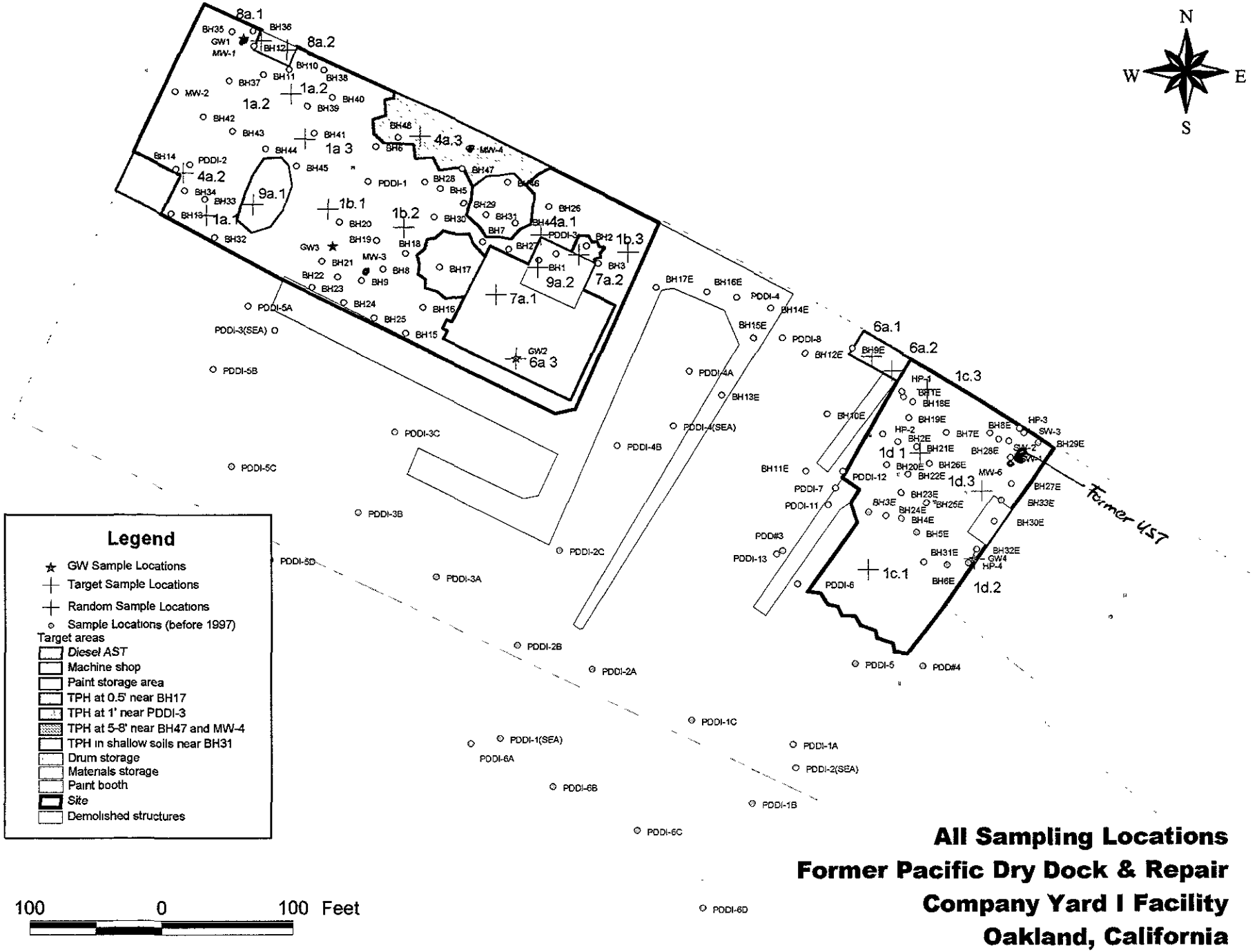
TABLE 3

ANALYTICAL RESULTS FOR GRAB GROUNDWATER SAMPLES COLLECTED FEBRUARY 28, 1996

Former Pacific Dry Dock and Repair Company Yard I
Oakland, California

Groundwater Sample Identified	Sample Date	TPH-G (µg/L)[1]	Dissolved TPH-D (µg/L)	MTBE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes	Filtered Lead (µg/L)
HP1	2/28/96	ND[2]	450	ND	ND	ND	ND	ND	ND
HP2	2/28/96	100	2,000	ND	ND	ND	ND	1.8	100
HP3	2/28/96	ND	ND	ND	ND	ND	ND	ND	ND
HP4	2/28/96	70	150	ND	ND	ND	1.1	2.0	ND

[1] µg/L = micrograms per liter
[2] ND = Not Detected at or above method reporting limits.


N
W
E
S
Legend
GW Sample Locations
Target Sample Locations
Random Sample Locations
Sample Locations (before 1997)
Target areas
Diesel AST
Machine shop
Paint storage area
TPH at 0.5' near BH17
TPH at 1' near PDDI-3
TPH at 5-8' near BH47 and MW-4
TPH in shallow soils near BH31
Drum storage
Materials storage
Paint booth
Site
Demolished structures
Former UST
100 0 100 Feet
All Sampling Locations
Former Pacific Dry Dock & Repair
Company Yard I Facility
Oakland, California