Industrial Compliance

9719 Lincoln Village Drive, Suite 310 Sacramento, CA 95827 916/369-8971 Fax 916/369-5370

SOIL REMEDIATION AND GROUND WATER INVESTIGATION WORKPLAN

Southern Pacific Transportation Company
1399 Wood Street
Oakland, California

3-1-94

IC Project No. 05100535

Prepared For:

Southern Pacific Transportation Company
One Market Plaza
San Francisco, CA 94105

March 1, 1994

SOIL REMEDIATION AND GROUND WATER INVESTIGATION WORKPLAN

Southern Pacific Transportation Company
1399 Wood Street
Oakland, California

Prepared By:

James G. Jensen, R.G.
Project Geologist

Reviewed By:

Mark S. Dockum, C.E.G.
Project Manager

STATE OF CALIFORNIA
MARK STEVEN DOCKUM
No. 1675
CERTIFIED ENGINEERING GEOLOGIST
6/94

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9719 Lincoln Village Drive, Suite 310 Sacramento, CA 95827 916/369-8971 Fax 916/369-8370

March 1, 1994

IC Project Nos. 0519.0535

Ms. Jennifer Eberle
Alameda County Health Care Services Agency
Department of Environmental Health
Division of Hazardous Materials
80 Swan Way, Room 350
Oakland, California 94621

VIA OVERNIGHT MAIL

MAR 4 AM 10: 16

Re: Submittal of Soil Remediation and Ground Water Investigation Workplan
Southern Pacific Transportation Company
1399 Wood Street - Oakland, California

Dear Ms. Eberle:

Industrial Compliance (IC), on behalf of Southern Pacific Transportation Company (SPTCo), has prepared the attached soil remediation and ground water investigation workplan for the SPTCo property located at 1399 Wood Street, Oakland, California. This workplan is being submitted in response to your letter dated January 27, 1994 and entitled: *1399 Wood Street, Oakland, California 94607.* Please review this workplan at your earliest convenience and provide IC with any comments or questions you may have. IC anticipates initiating the field activities as outlined in this workplan in April, 1994.

If you should have any further questions regarding this information, or if you would like to discuss this in greater detail, please do not hesitate to contact the undersigned at your earliest convenience at (916) 369-8971.

Sincerely,

INDUSTRIAL COMPLIANCE

James G. Jensen, R.G.
Project Geologist

Mark S. Dockum, C.E.G.
Project Manager

JGJ/MSD/dao

Attachment

STATE OF CALIFORNIA
MARK STEVEN DOCKUM
No. 1675
CERTIFIED ENGINEERING GEOLOGIST
exp. 6/94

i880-115.ltr/03-01-94/u/mdocku/i-880/letters

cc: Mr. John Moe, Southern Pacific Transportation Company (with attachment)
Mr. Darrell Maxey, Oakland Program Office, Southern Pacific Transportation Company (with attachment)
Mr. R. Webb Garey, Industrial Compliance (without attachment)

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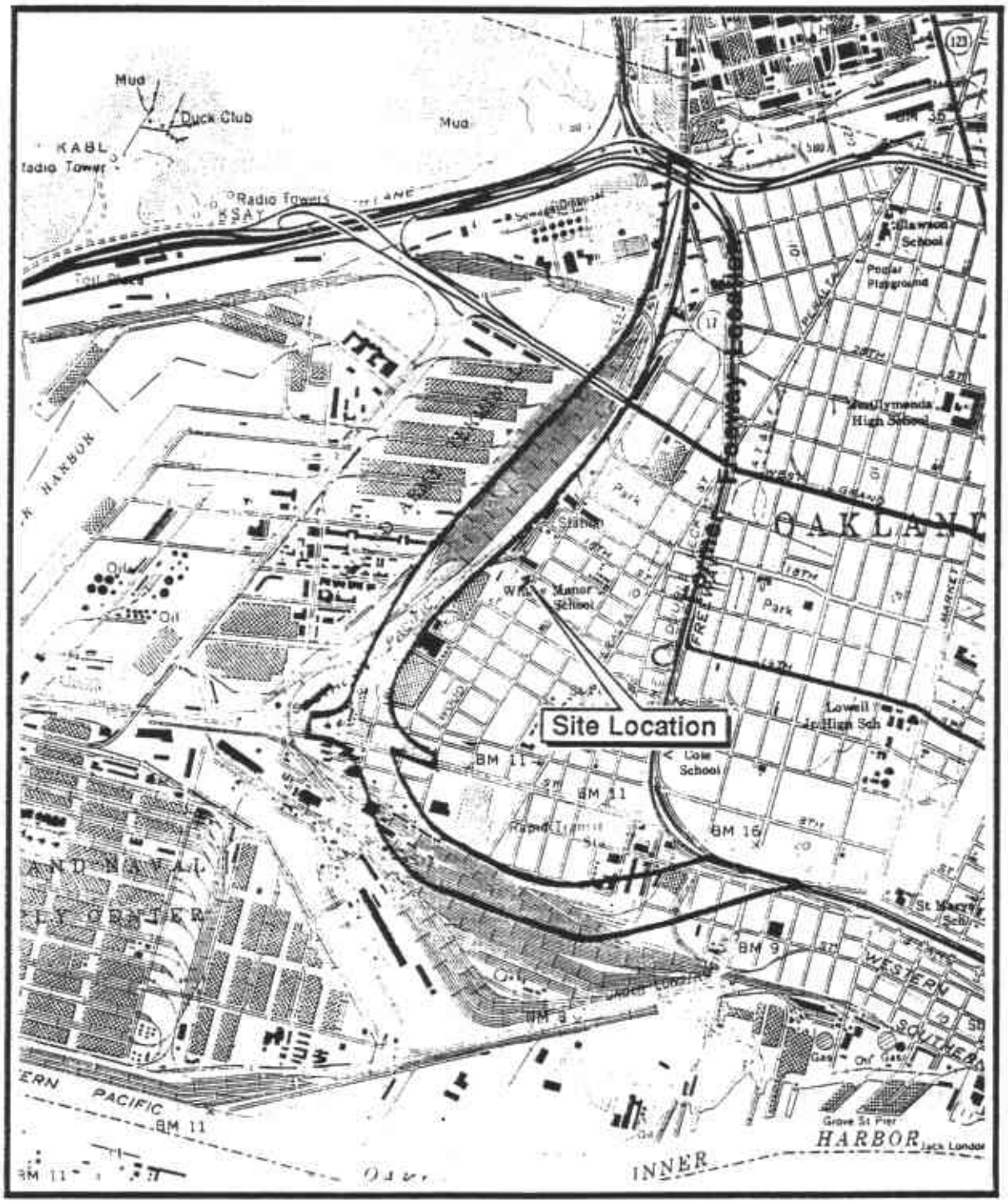
TABLES

1.0 INTRODUCTION

This workplan for the Southern Pacific Transportation Company (SPTCo) property at 1399 Wood Street in Oakland, California (see Figure 1) has been prepared by Industrial Compliance (IC) following completion of the preliminary soil investigation. This workplan includes recommendations for soil remediation and a ground water investigation and is being submitted in response to two letters from the Alameda County Health Care Services Agency (dated April 28, 1992 and June 23, 1992, entitled: *Southern Pacific Site, 1399 Wood Street, Oakland, California 94607*, and *Southern Pacific Trans. Co., 1399 Wood Street, Oakland, California, 94607*, respectively). The site formerly had 3 underground fuel storage tanks.



Reference:
USGS 7.5 Minute Topographic Map
Oakland West Quadrangle
California

Approximate Scale in Feet
0 2000

Industrial Compliance A Subsidiary of SP Environmental Systems, Inc.	SITE LOCATION MAP SOUTHERN PACIFIC TRANSPORTATION COMPANY 1399 WOOD STREET OAKLAND, CALIFORNIA	Figure: 1
Project No.: 05100535	Date: 10/25/93	Page No.: 2
Drawn By: Dennis Hollenberg	Checked By: James G. Jensen	Scale: as shown

05100539 Fig 01/disk 228/SI WP 1090

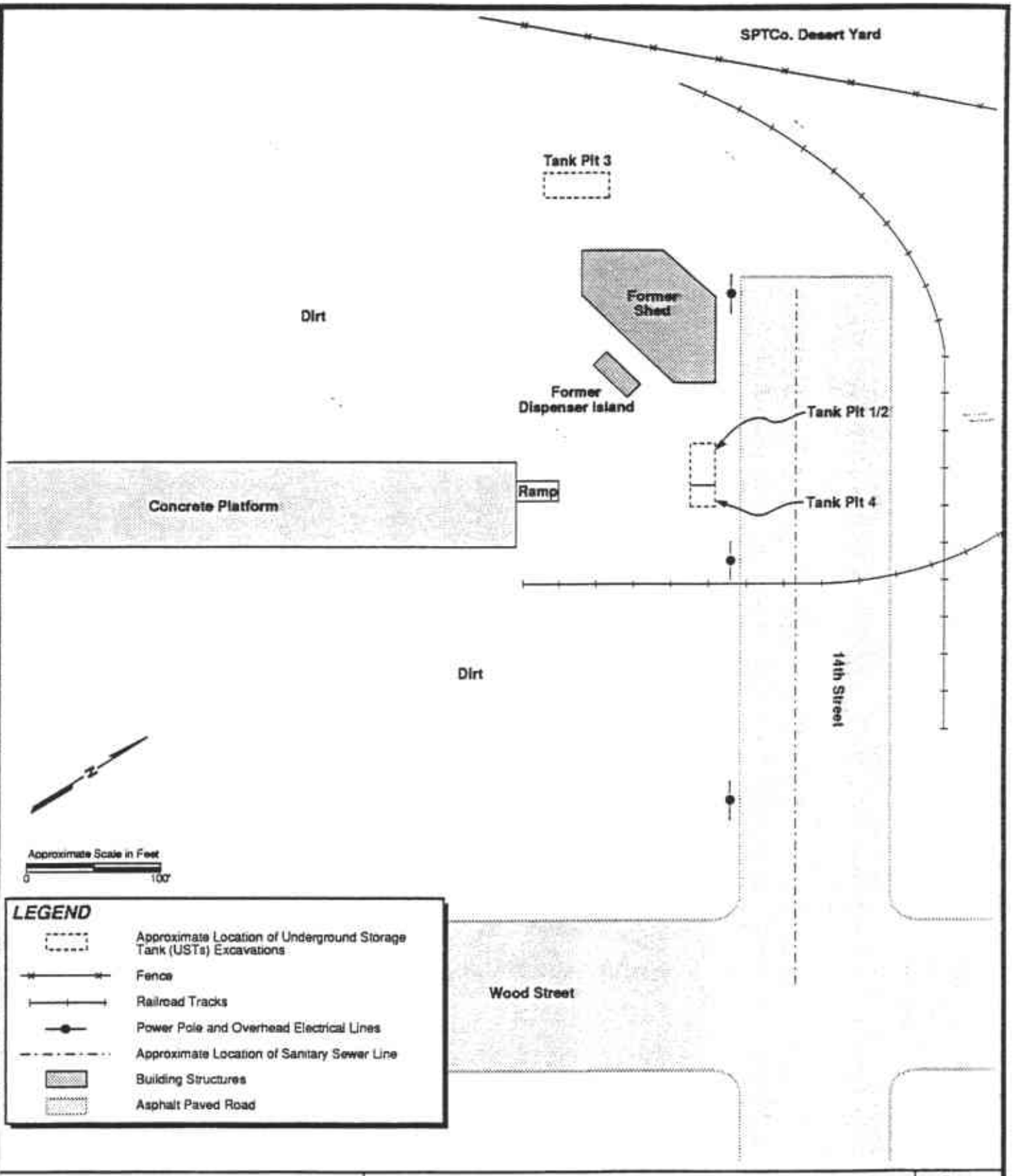
2.0 BACKGROUND

The site is located at 1399 Wood Street in Oakland, California (see Figure 2).

In September, 1989, Canonie Environmental Services Corporation (Canonie) removed 3 underground storage tanks (USTs), the fuel dispensing island, and associated piping from the site. Canonie referenced the USTs as Tank 1/2, Tank 3, and Tank 4 (see Figure 2). Tank 1/2 was a 12,000-gallon, split-compartment diesel-gasoline UST; Tank 3 was a 7,300-gallon diesel UST; and Tank 4 was a 550-gallon waste oil UST. The procedures and results of this work were presented in a Canonie report dated December 18, 1989 (report entitled: *Final Site Report, Underground Storage Tank Removal, Southern Pacific Transportation Company, Oakland, California*).

A total of 5 soil samples were collected from the 3 excavations and 1 soil sample was collected from the fuel dispenser location. Laboratory analyses performed on these soil samples identified maximum concentrations of 6,500 parts per million (ppm) of total extractable petroleum hydrocarbons (TEPH), 360 ppm of total volatile petroleum hydrocarbons (TVPH), 6.7 ppm of benzene, 31 ppm of toluene, 40 ppm of ethylbenzene, 230 ppm of xylenes, 37 ppm of polychlorinated biphenyls (PCBs), 9.9 ppm of total lead, and 0.99 ppm of bis(2-ethylhexel)phthalate. The locations of the soil samples collected are shown on Figure 3. The results of laboratory analyses for the soil samples are summarized on Table 1.

Two grab ground water samples were collected from the base of the excavation of Tank 1/2. Laboratory analyses performed on these ground water samples identified maximum concentrations of 330 ppm of TEPH, 2.7 ppm of toluene, 1.1 ppm of ethylbenzene, and 5.1 ppm of xylenes. No concentrations of PCBs were identified at or above the method detection limit. One grab ground water sample was collected from the base of the excavation at



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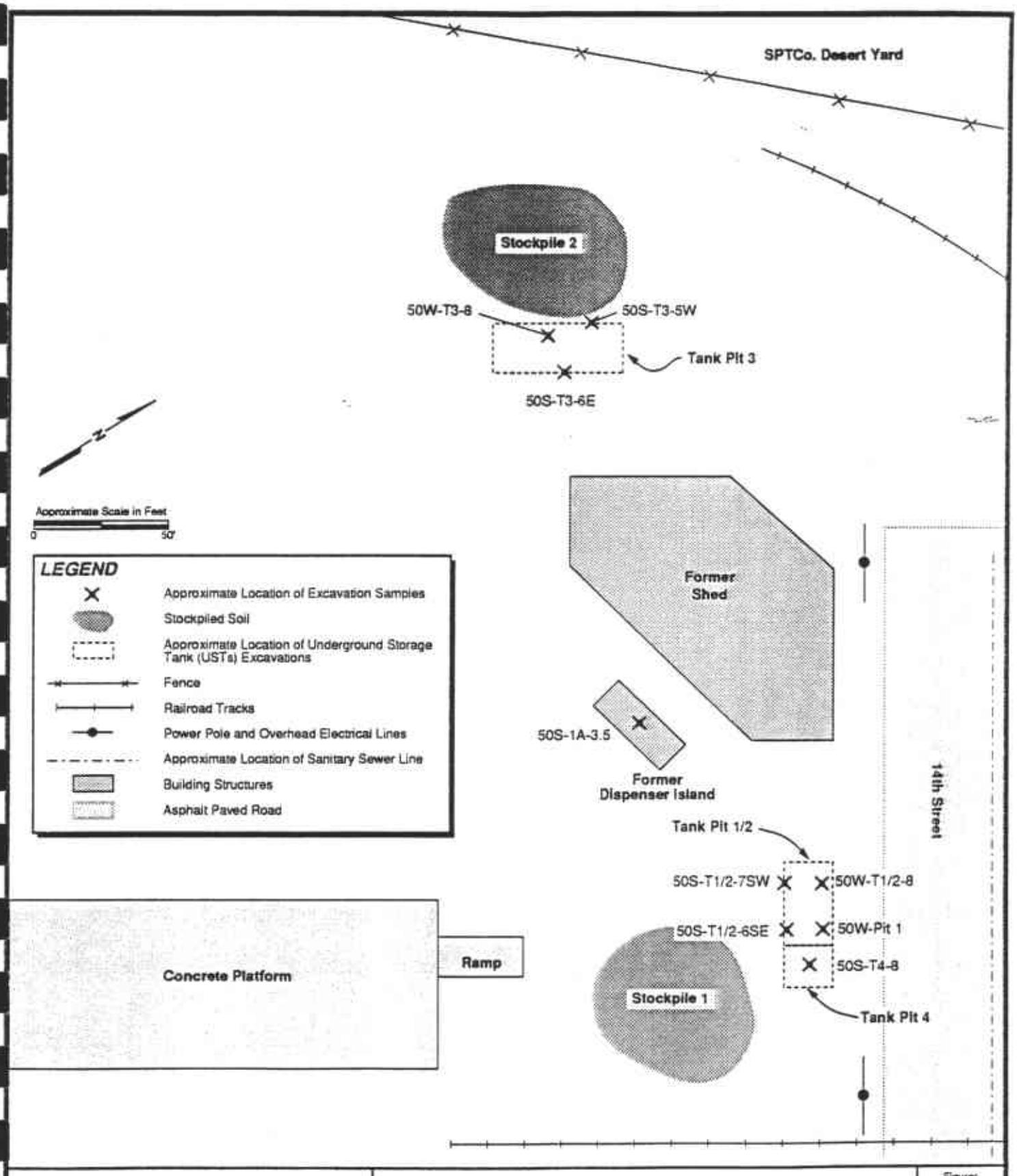
Project No.: 05100535	Date: 03/01/94
Drawn By: Patti Decker	Checked By: James G. Jensen

SITE LAYOUT MAP
SOUTHERN PACIFIC TRANSPORTATION COMPANY
1399 WOOD STREET
OAKLAND, CALIFORNIA

Figure: 2
Page: 4
Scale: as shown

Oak-535/SRWP.0394/F.02 #100



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LOCATION OF UNDERGROUND STORAGE TANK EXCAVATION SAMPLES PREVIOUS INVESTIGATION OF SEPTEMBER, 1989 SOUTHERN PACIFIC TRANSPORTATION COMPANY 1399 WOOD STREET OAKLAND, CALIFORNIA

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Drawn By: Patti Decker	Checked By: James G. Jensen	Page: 5
		Scale: as shown

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TABLE 1
ANALYTICAL RESULTS
UNDERGROUND STORAGE TANK EXCAVATIONS - SOIL SAMPLES
PREVIOUS INVESTIGATION OF SEPTEMBER, 1989

Sample Location	Sample ID[a]	Date Collected	Sample Depth (feet)	TEPH[b] (mg/kg)	TVPH[c] (mg/kg)	O & G[d] (mg/kg)	Benzene[e] (mg/kg)	Toluene[e] (mg/kg)	Ethylbenzene[e] (mg/kg)	Xylenes[e] (mg/kg)	PCBs[f] (mg/kg)	Metals[g] (mg/kg)			VOCs[h] (mg/kg)	SVOCs[i] (mg/kg)
												Cr	Pb	Zn		
Tank Pit 1/2	50S-T1/2-7SW	09-14-89	7	NA	360	NA	0.84	1.4	2.8	9.6	NA	NA	NA	NA	NA	NA
	50S-T1/2-6SE		6	6,500	NA	NA	6.7	31	40	230	NA	NA	NA	NA	NA	NA
Tank Pit 3	50S-T3-5W	09-14-89	5	210	NA	NA	<0.025	<0.025	<0.025	<0.025	NA	NA	NA	NA	NA	NA
	50S-T3-6E		6	210	NA	NA	<0.025	<0.025	<0.025	0.21	NA	NA	NA	NA	NA	NA
Tank Pit 4	50S-T4-8	09-14-89	8	<10	<1.0	<500	<0.025	<0.025	<0.025	0.064	37	36	9.9	56	BDL	0.99[j]
Dispenser Island	50S-1A-3.5	09-14-89	3.5	4,900	180	NA	6.1	24	37	170	NA	NA	NA	NA	NA	NA
Tank Pit 1/2 Stockpile	50S-SP1/2-COMP1	09-15-89	Comp.[k]	1,300	630	NA	<0.25	4.7	12	27	NA	NA	NA	NA	NA	NA
	50S-SP1/2-COMP2		Comp.[k]	830	180	NA	0.49	3.5	1.7	25	NA	NA	NA	NA	NA	NA
Tank Pit 3 Stockpile	50S-SP3-COMP1	09-15-89	Comp.[k]	3,100	NA	NA	<0.025	<0.025	<0.025	0.37	NA	NA	NA	NA	NA	NA

a See Figure 3 for approximate sample locations.

b Total extractable petroleum hydrocarbons (TEPH) analyzed by EPA Method 8015.

c Total volatile petroleum hydrocarbons (TVPH) analyzed by EPA Method 8015.

d Oil and grease (O & G) analyzed by EPA Method 9071.

e Benzene, toluene, ethylbenzene, and xylenes (BTEX) analyzed by EPA Method 8020.

f Polychlorinated biphenyls (PCBs) analyzed by EPA Method 8080.

g Metals analyzed by EPA Method 6010.

h Volatile organic compounds (VOCs) analyzed by EPA Method 8240.

i Semivolatile organic compounds (SVOCs) analyzed by EPA Method 8270.

j Concentration of bis(2-ethylhexyl)phthalate, the only SVOC constituent identified at or above analytical method detection limits.

k Composited soil sample.

BDL All constituents were at or below method detection limits.

NA Not analyzed

< Indicates the analyte was not detected at a concentration at or above the method detection limit as listed.

mg/kg Milligrams per kilogram, approximately equal to parts per million (ppm)

Tank 3. Laboratory analyses performed on this sample identified xylenes as the only constituent present at a concentration of 0.0013 ppm. The locations of the ground water samples collected are shown on Figure 3. The results of laboratory analyses for the ground water samples are summarized on Table 2.

Canonie reported approximately 200 cubic yards (cy) of soil was generated from the UST excavations and this soil was placed into 2 stockpiles on the site (see Figure 3). Stockpile 1 contained soil removed from Tank 1/2, Tank 4, and the fuel dispenser and piping excavations. Stockpile 2 contained soil removed from the Tank 3 excavation. Two composite soil samples were collected from Stockpile 1. Laboratory analyses performed on these 2 soil samples identified maximum concentrations of 1,300 ppm of TEPH, 630 ppm of TVPH, 0.49 ppm of benzene, 4.7 ppm of toluene, 12 ppm of ethylbenzene, and 27 ppm of xylenes. One composite soil sample was collected from stockpile 2. Laboratory analyses performed on this soil sample identified maximum concentrations of 3,100 ppm of TEPH and 0.37 ppm of xylenes. Both stockpiles were left onsite. All excavated areas were backfilled with clean imported fill and compacted. The results of laboratory analyses for the composite soil samples collected from the 2 stockpiles are summarized on Table 1.

The Alameda County Health Care Services Agency (the County), in a letter dated April 28, 1992, requested SPTCo to forward a copy of Canonie's 1989 investigation report and to provide a workplan for a soil and ground water investigation of the site. In response to the County's request, IC, on behalf of SPTCo, prepared a workplan dated June 11, 1992 (workplan entitled: *Preliminary Soil Investigation Workplan, Southern Pacific Transportation Company, 1399 Wood Street, Oakland, California*). The workplan proposed drilling 10 soil boreholes to assess the lateral and vertical extent of petroleum hydrocarbon-impacted soil at the site. IC further proposed postponing the ground water investigation until any potential soil remediation was complete.

TABLE 2
ANALYTICAL RESULTS
UNDERGROUND STORAGE TANK EXCAVATIONS - GRAB GROUND WATER SAMPLES
PREVIOUS INVESTIGATION OF SEPTEMBER, 1989

Sample Location	Sample ID[a]	Date Collected	Sample Depth (feet)	TEPH[b] (mg/L)	TVPH[c] (mg/L)	Benzene[d] (mg/L)	Toluene[d] (mg/L)	Ethylbenzene[d] (mg/L)	Xylenes[d] (mg/L)	PCBs[e] (mg/L)
Tank Pit 1/2	50W-T1/2-8	09-15-89	8	330	<2.0	<0.05	2.7	1.1	5.1	NA
	50W-Pit 1	10-16-89	8	NA	NA	NA	NA	NA	NA	<0.01
Tank Pit 3	50W-T3-8	09-15-89	8	<2.5	NA	<0.0005	<0.0005	<0.0005	0.0013	NA

a See Figure 3 for approximate sample locations.

b Total extractable petroleum hydrocarbons (TEPH) analyzed by EPA Method 8015.

c Total volatile petroleum hydrocarbons (TVPH) analyzed by EPA Method 8015.

d Benzene, toluene, ethylbenzene, and xylenes (BTEX) analyzed by EPA Method 602.

e Polychlorinated biphenyls (PCBs) analyzed by EPA Method 8080.

NA Not analyzed.

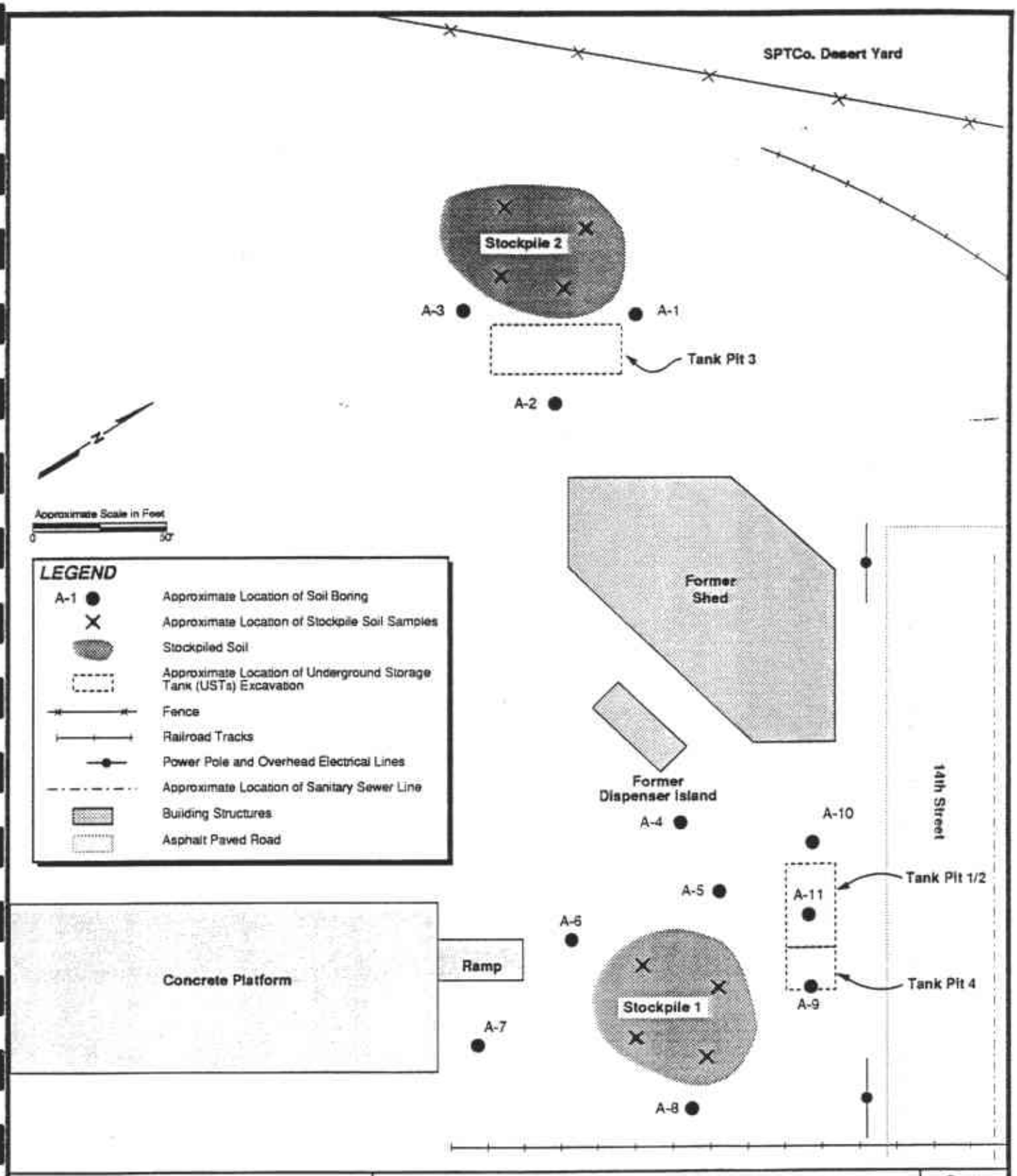
< Analyte was not detected at or above the method detection limit as listed.

mg/L Milligrams per liter, approximately equal to parts per million (ppm).

The County approved the workplan in a letter dated June 23, 1992. The County additionally requested SPTCo to address the issues of PCB-impacted soil and the disposition of the 2 soil stockpiles still located on site.

In October, 1992, IC conducted a preliminary soil investigation at the site. The results of the investigation were presented in IC's report dated January 17, 1994 (report entitled: *Preliminary Soil Investigation Report, Southern Pacific Transportation Company, 1399 Wood Street, Oakland, California*). As part of this investigation, 11 borings (A-1 through A-11) were drilled. Figure 4 shows the approximate location of the soil borings relative to the existing structures and UST excavations at the site. Total petroleum hydrocarbons as gasoline (TPH-G), TPH as diesel (TPH-D), and benzene, toluene, ethylbenzene, and xylenes (BTEX) were not identified at or above the method detection limits in soil samples collected from 5 of the 11 borings (A-2, A-4, A-6, A-7, and A-8). PCBs were not identified at or above the method detection limits in the soil sample collected from A-9, drilled at Tank 4, the former location of the waste oil UST. TPH-G was identified in soil samples collected from 3 of the 11 borings at concentrations ranging from 1.5 parts per million (ppm) to 5,000 ppm. TPH-D was identified in soil samples collected from 4 of the 11 borings at concentrations ranging from 0.7 ppm to 19 ppm. The results of laboratory analyses for the soil samples are summarized on Table 3. Figure 5 is a chemical distribution map for constituents identified in soil samples during all investigations conducted at the site. The approximate lateral extent of TPH-G- and TPH-D-impacted soil has been estimated as shown on Figures 6 and 7, respectively. Based on the results of the soil investigation, IC has prepared this workplan which recommends excavation of the apparent impacted soil and a subsequent ground water investigation.

In April, 1993, IC collected 8 soil samples from the 2 stockpiles to characterize the soil prior to disposition of the stockpiles. Figure 4 shows the approximate location of the stockpile soil samples. The soil samples were composited by the laboratory into 3 composite soil samples.



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Project No.: 05100535	Date: 03/01/94
Drawn By: Patti Decker	Checked By: James G. Jensen

LOCATION OF SOIL BORINGS AND STOCKPILE SOIL SAMPLES PREVIOUS INVESTIGATION OF OCTOBER, 1992 SOUTHERN PACIFIC TRANSPORTATION COMPANY 1399 WOOD STREET OAKLAND, CALIFORNIA

Figure: 4
Page: 10
Scale: as shown

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TABLE 3
ANALYTICAL RESULTS
SOIL BORING SOIL SAMPLES
PREVIOUS INVESTIGATION OF OCTOBER, 1992

Soil Boring Number[a]	Date Collected	Sample Depth (feet)	TPH[b] (mg/kg)		Volatile Organic Compounds[c] (mg/kg)				PCBs[d] (mg/kg)
			Gasoline	Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	
A-1	10-22-92	2-2.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
	10-22-92	5-5.5	<0.5	1.4	<0.005	<0.01	<0.005	<0.005	NA
A-2	10-22-92	4-4.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
	10-22-92	5.5-6	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
A-3	10-22-92	5.5-6	<0.5	0.7	<0.005	<0.01	<0.005	<0.005	NA
A-4	10-22-92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
A-5	10-22-92	3.5-4	5,000[e]	<50[f]	3.9	6.9	28	150	NA
	10-22-92	5-5.5	11	<0.5	0.62	0.1	0.49	1.3	NA
A-6	10-22-92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
A-7	10-23-92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
A-8	10-23-92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
A-9	10-23-92	5-5.5	9.0[e]	19	0.016	<0.01	0.050	0.22	<0.1[f]
A-10	10-23-92	2.5-3	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
	10-23-92	4.5-5	1.5[e]	4.3	<0.005	<0.01	0.008	0.029	NA

a See Figure 4 for approximate boring locations.

b Total petroleum hydrocarbons (TPH) analyzed by EPA Method 8260 Modified.

c Analyzed by EPA Method 8260 Modified.

d Polychlorinated biphenyls (PCBs) analyzed by EPA Method 8080.

e TPH in this sample identified as weathered gasoline.

f High concentration of some analytes caused the sample to be run diluted resulting in raised method detection limits for analytes.

mg/kg Milligrams per kilogram, approximately equal to parts per million (ppm).

NA Not analyzed.

< Indicates the analyte was not detected at a concentration at or above the method detection limit as listed.

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/22/92	5.5-6	<0.5	0.7	<0.005	<0.01	<0.005	<0.005	NA

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/22/92	4-4.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
10/22/92	5.5-6	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA

Date Sampled	Depth	Constituents (mg/kg) TEPH	TVPH	Oil and Grease	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs	Metals: Chromium	Lead	Zinc	VOCs	SVOCs
9/14/89	3.5	4900	180	NA	3.1	24	37	170	NA	NA	NA	NA	NA	NA

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/22/92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/22/92	3.5-4	5000	<50	3.9	6.9	28	150	NA
10/22/92	5-5.5	11	<0.5	0.62	0.1	0.48	1.3	NA

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/22/92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/23/92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA

Date Sampled	Depth	Constituents (mg/kg) TEPH	TVPH	Oil and Grease	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs	Metals: Chromium	Lead	Zinc	VOCs	SVOCs
9/14/89	5	210	NA	NA	<0.025	<0.025	<0.025	<0.025	NA	NA	NA	NA	NA	NA

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/22/92	2-2.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
10/22/92	5-5.5	<0.5	1.4	<0.005	<0.01	<0.005	<0.005	NA

Date Sampled	Depth	Constituents (mg/kg) TEPH	TVPH	Oil and Grease	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs	Metals: Chromium	Lead	Zinc	VOCs	SVOCs
9/14/89	5	210	NA	NA	<0.025	<0.025	<0.025	0.21	NA	NA	NA	NA	NA	NA

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/23/92	2.5-3	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA
10/23/92	4.5-5	1.5	4.3	<0.005	<0.01	0.008	0.029	NA

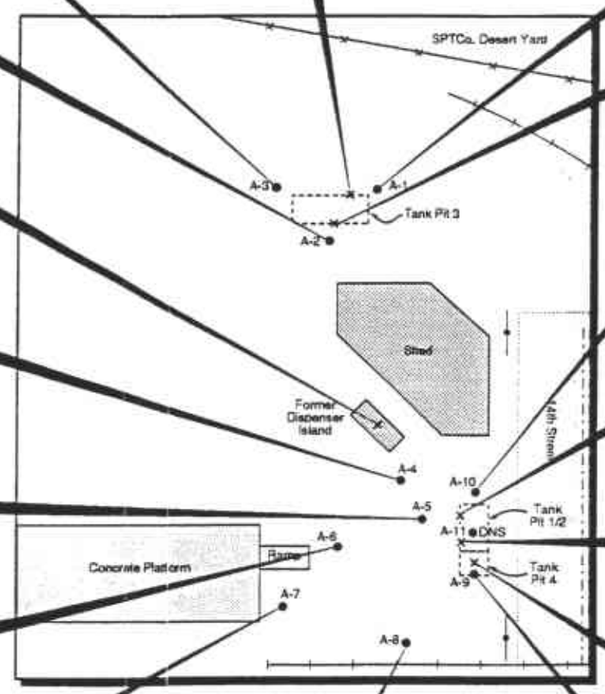
Date Sampled	Depth	Constituents (mg/kg) TEPH	TVPH	Oil and Grease	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs	Metals: Chromium	Lead	Zinc	VOCs	SVOCs
9/14/89	7	NA	360	NA	0.84	1.4	2.8	9.6	NA	NA	NA	NA	NA	NA

Date Sampled	Depth	Constituents (mg/kg) TEPH	TVPH	Oil and Grease	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs	Metals: Chromium	Lead	Zinc	VOCs	SVOCs
9/14/89	6	6500	NA	NA	6.7	31	40	230	NA	NA	NA	NA	NA	NA

Date Sampled	Depth	Constituents (mg/kg) TEPH	TVPH	Oil and Grease	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs	Metals: Chromium	Lead	Zinc	VOCs	SVOCs
9/14/89	4	<10	<1	<500	<0.025	<0.025	<0.025	0.064	37	36	9.9	56	BDL	0.99

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/23/92	5-5.5	9.0	19	0.016	<0.01	0.05	0.22	<0.1

Date Sampled	Depth	Constituents (mg/kg) TPH-G	TPH-D	Benzene	Toluene	Ethyl-benzene	Xylenes	PCBs
10/23/92	5-5.5	<0.5	<0.5	<0.005	<0.01	<0.005	<0.005	NA



NOTES:
a. Depth in feet below ground surface.
b. Total petroleum hydrocarbons as gasoline (TPH-G) analyzed by EPA Method 8260 modified.
c. Total petroleum hydrocarbons as diesel (TPH-D) analyzed by EPA Method 8260 modified.
d. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) analyzed by EPA Method 8260 modified.
e. Polychlorinated biphenyls (PCBs) analyzed by EPA Method 8080.
f. Total extractable petroleum hydrocarbons (TEPH) analyzed by EPA Method 8015.
g. Total volatile petroleum hydrocarbons (TVPH) analyzed by EPA Method 8015.
h. Oil and grease (O&G) analyzed by EPA Method 9071.
i. BTEX analyzed by EPA Method 8020.
j. Metals analyzed by EPA Method 6010.
k. Volatile organic compounds (VOCs) analyzed by EPA Method 8240.
l. Semivolatile organic compounds (SVOCs) analyzed by EPA Method 8270.
m. Concentration of bis (2-ethylhexyl)phthalate, the only SVOC constituent identified at or above the analytical method detection limits.
n. NA = Not analyzed
o. BDL = no constituents were identified at or above the analytical method detection limits.
p. < = Indicates the analyte was not detected at a concentration at or above the method detection limits as noted.
q. All sample results reported in milligrams per kilogram (mg/kg), approximately equal to parts per million (ppm).
r. Laboratory analytical data summarized on Tables 1 and 3.

LEGEND

- A-1 ● Approximate Location of Soil Boring
- × Approximate Location of Excavation Soil Samples
- ●DNS Did Not Sample
- Approximate Location of Underground Storage Tank (USTs) Excavation
- Fence
- Railroad Tracks
- Power Pole and Overhead Electrical Lines
- Approximate Location of Sanitary Sewer Line
- Building
- Asphalt Paved Road

N

Approximate Scale in Feet
0 50

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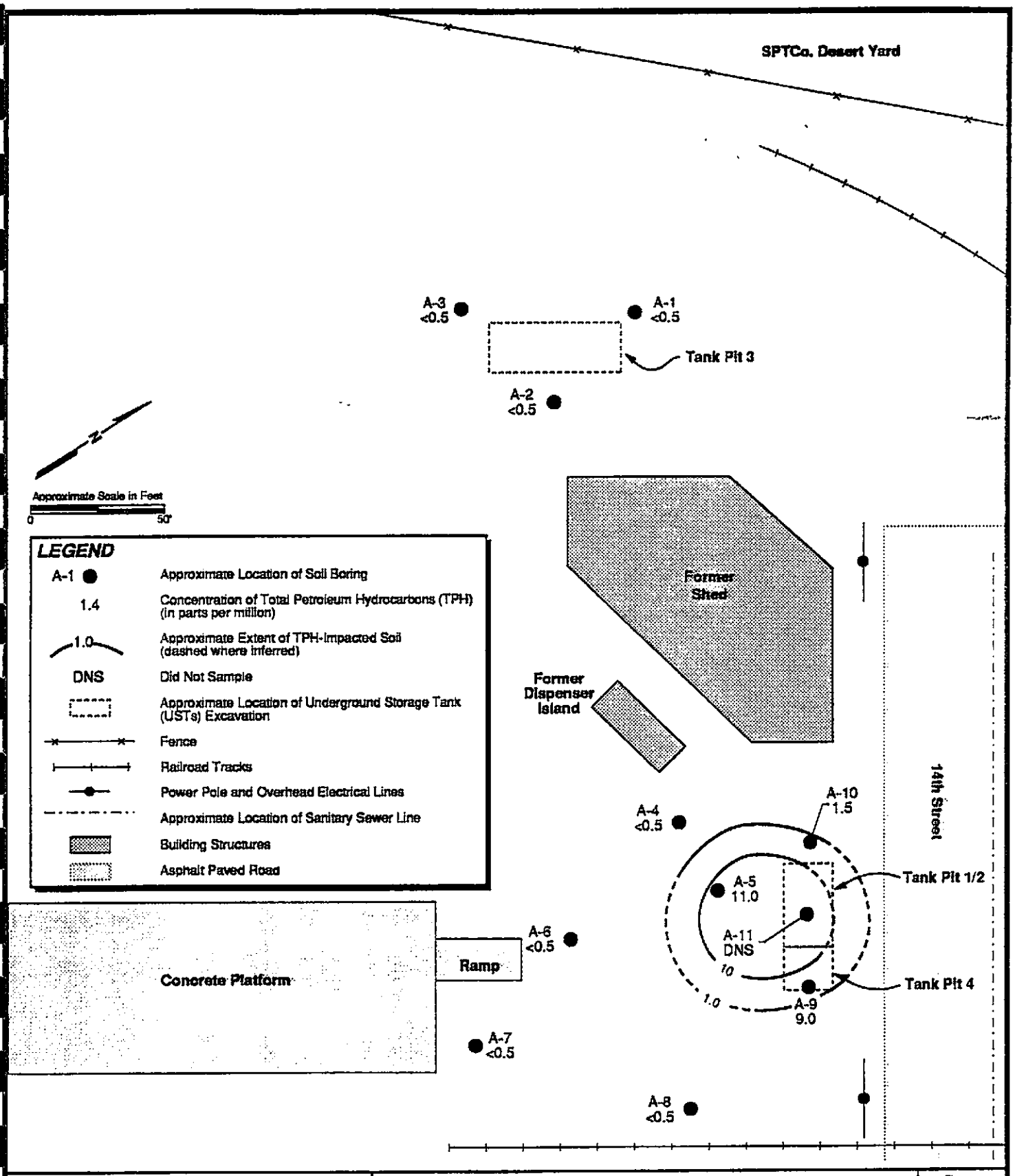
Project No.: 05100535	Date: 03/01/94
Drawn By: Patti Decker	Checked By: James G. Jensen

CHEMICAL DISTRIBUTION MAP FOR CONSTITUENTS IN SOIL SAMPLES IDENTIFIED DURING SITE INVESTIGATIONS SOUTHERN PACIFIC TRANSPORTATION COMPANY 1399 WOOD STREET OAKLAND, CALIFORNIA

Figure: 5
Page No.: 12
Scale: as shown

Oak-535/SRWP.0394/F.05 #100



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Project No.: 05100535	Date: 03/01/94
Drawn By: Patti Decker	Checked By: James G. Jensen

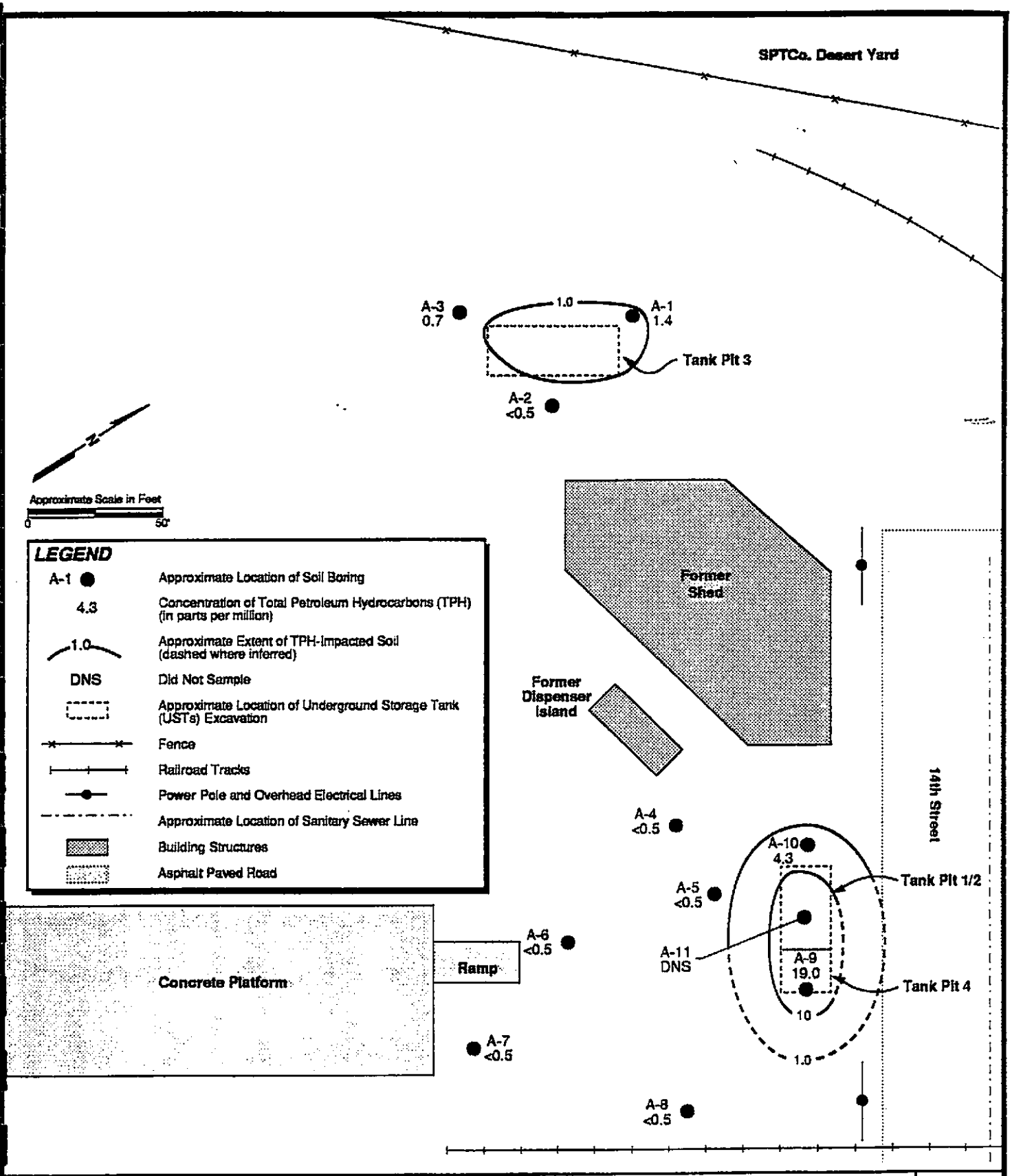
LATERAL EXTENT OF TPH AS GASOLINE IN SOIL SAMPLES AT 5 FEET BGS SOUTHERN PACIFIC TRANSPORTATION COMPANY 1399 WOOD STREET OAKLAND, CALIFORNIA

Figure: 6

Page: 13

Scale: as shown

Oak-535/SRWP.0394/F.06 #100



Industrial Compliance A Subsidiary of SP Environmental Systems, Inc.	LATERAL EXTENT OF TPH AS DIESEL IN SOIL SAMPLES AT 5 FEET BGS SOUTHERN PACIFIC TRANSPORTATION COMPANY 1399 WOOD STREET OAKLAND, CALIFORNIA	Figure: 7
		Page: 14
Project No.: 05100535	Date: 03/01/94	Scale: as shown
Drawn By: Patti Decker	Checked By: James G. Jensen	

Oak-535/SRWP.0394/F.07 #100

The results of these field activities were presented in IC's report dated January 17, 1994 (report entitled: *Preliminary Soil Investigation Report, Southern Pacific Transportation Company, 1399 Wood Street, Oakland, California*). IC supervised the removal and disposition of approximately 300 cubic yards (cy) of stockpiled soils, investigation derived residuals, and miscellaneous debris from the site. Based on the concentrations of petroleum hydrocarbons and metals in the composite soil samples collected from the 2 stockpiles, the stockpiled soils were transported to the Chemical Waste Management landfill at Kettleman Hills, California. The results of laboratory analyses for the composite soil samples are summarized on Table 4.

TABLE 4
ANALYTICAL RESULTS
COMPOSITE SOIL SAMPLES FROM STOCKPILED SOIL
PREVIOUS FIELD ACTIVITIES OF APRIL, 1993

Sample ID[a]	Date Collected	Total Petroleum Hydrocarbons (mg/kg)				Benzene[d] (mg/kg)	Toluene[d] (mg/kg)	Ethylbenzene[d] (mg/kg)	Total Xylenes[d] (mg/kg)	HVOCs[e] (mg/kg)	SVOCs[f] (mg/kg)	Metals[g] (mg/kg)										STLC Lead[h] (mg/L)
		Gasoline[b]	Hydrocarbon Mixture[b]	Diesel[c]	Hydrocarbon Mixture[c]							Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Zinc	
Stockpile 1: Composite 22516 - 22519	03-29-93	<1.0	<1.0	<150[j]	940[j]	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	132	NA	NA	NA	8.1
Stockpile 2: Composite 22520 - 22523	03-29-93	<1.0	<1.0	<15[i]	49[k]	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	60.6	NA	NA	NA	3.5
Stockpile 1 and 2: Composite 22516 - 22523	03-29-93	NA	NA	NA	NA	NA	NA	NA	NA	BDL	BDL	<10	155	<0.5	45.5	6.1	90.5	118	0.19	40.6	171	8.1

a See Figure 4 for approximate sample locations.

b Analyzed by EPA Method 5030/GC/FID.

c Analyzed by Method TPH-D-Trireglonal.

d Benzene, toluene, ethylbenzene and total xylenes (BTEX) analyzed by EPA Method 8020.

e Halogenated volatile organic compounds (HVOCs) analyzed by EPA Method 8010.

f Semivolatile volatile organic compounds (SVOCs) analyzed by EPA Method 8270.

g Metals analyzed by EPA Method 6010, except for mercury which was analyzed by EPA Method 7471.

h Soluble Threshold Limit Concentration (STLC) lead analyzed by STLC - Method 6010 using citrate buffer leachate.

i High concentration of some analytes caused the sample to be run diluted resulting in raised method detection limits for analytes.

j Hydrocarbon pattern present in this sample elutes in the range between C-11 and C-24.

k Hydrocarbon pattern present in this sample elutes in the range between C-11 past C-30.

BDL All constituents were at or below analytical method detection limits.

NA Not analyzed.

< Indicates the analyte was not detected at a concentration at or above the method detection limit as listed.

mg/kg Milligrams per kilogram, approximately equal to parts per million (ppm).

mg/L Milligrams per liter, approximately equal to parts per million (ppm).

3.0 SOIL CONSTITUENT CONCENTRATION CLEANUP LEVEL GUIDELINES

In November, 1992, IC prepared a Risk Assessment report (report entitled: *Risk Assessment for Benzene-Containing Soil, Southern Pacific Transportation Company, Oakland and Desert Yards, Oakland, California*) evaluating the risk caused by the presence of benzene in soil. The benzene soil action level was calculated to be 18.7 ppm based on a benzene concentration that would produce an added cancer risk of 1 in a 1,000,000 (10^{-6}). IC proposed using the 10^{-6} value in conjunction with the previously proposed soil action level of 100 ppm of TPH in a letter to Alameda County dated November 30, 1992. Alameda County, in a letter dated December 31, 1992, concurred with IC's November 1992 Risk Assessment report that there is no health threat to construction workers at the site, but the letter requires that the residual impacted soil and ground water be properly managed. Therefore, IC recommends using soil action levels of 100 ppm for TPH and 18 ppm for benzene as cleanup objectives for impacted soil at the site.

The volume of impacted soil with hydrocarbon concentrations greater than 100 ppm is estimated to be 190 cy, distributed as follows:

* Tank 1/2 and 4: 90 cy
* Tank 3: 70 cy
* Former dispenser island: 30 cy

4.0 PROPOSED SCOPE OF WORK

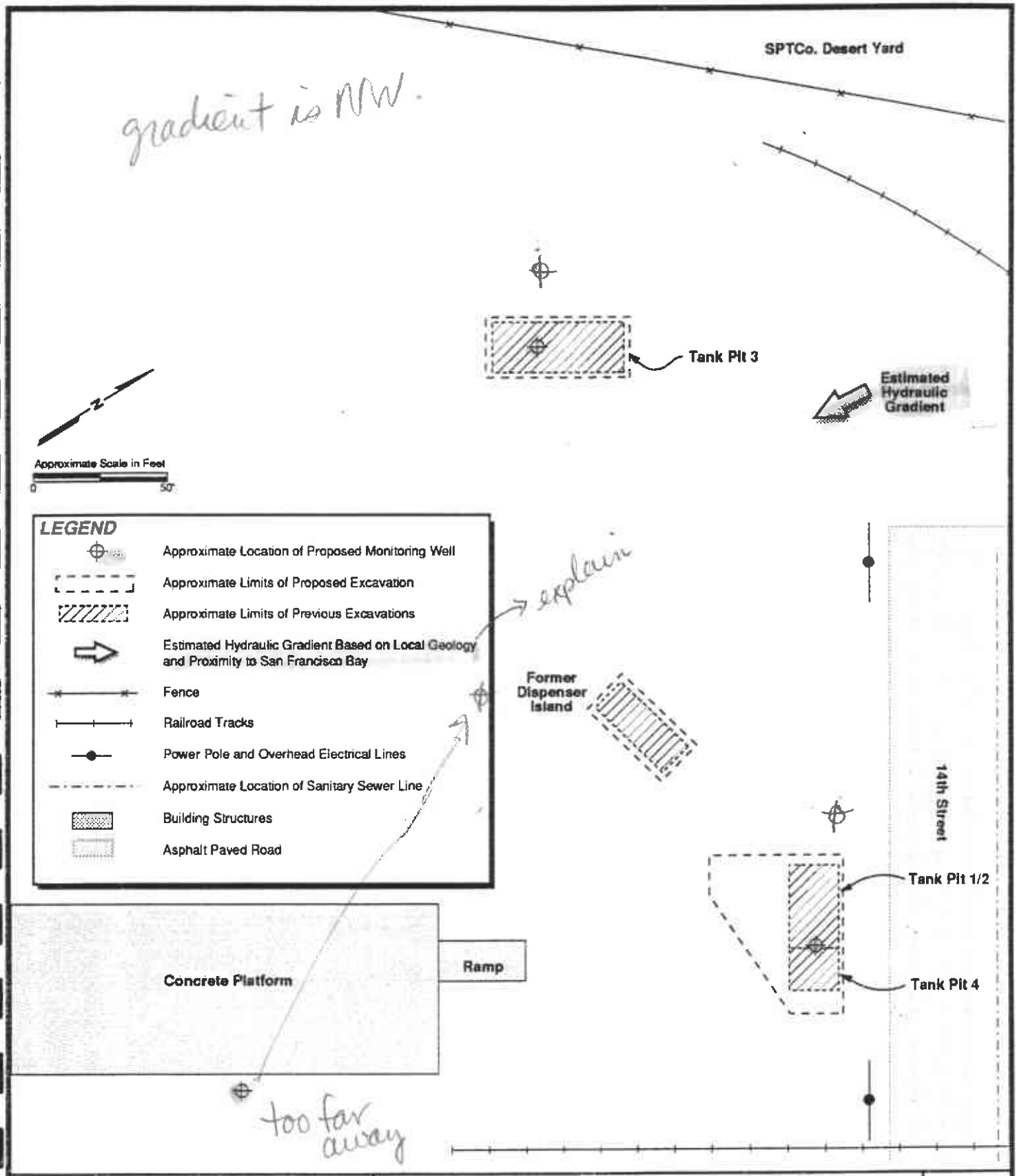
The following tasks are proposed for the remediation of the hydrocarbon-impacted soil at the site: Task 1) Soil Excavation and Disposition; Task 2) Monitoring Well Installation, Development, and Sampling; Task 3) Preparation of a Summary Report; and Task 4) Quarterly Ground Water Sampling. The following sections present the procedures to be followed for each task.

4.1 Task 1 - Soil Excavation and Disposition

It is proposed to excavate the impacted soil with a TPH concentration greater than 100 ppm and a benzene concentration greater than 18 ppm from the previous locations of Tank 1/2/Tank 4, Tank 3, and the former dispenser island (see Figure 8). Soil from each excavation will be separately stockpiled.

The soil lying above the impacted soil which has no observable characteristics of being impacted (odor and/or discoloration) and which does not register a positive reading with a portable photoionization detector (PID) will be excavated and stockpiled. The apparent impacted soil will be excavated, characterized, and appropriately handled as discussed in Section 4.1.1. Confirmation samples will be collected from the side walls and base of each excavation at a frequency of approximately 1 sample per 20 linear feet. Approximately 40 confirmation samples in total will be collected. Soil from an appropriate depth and location within the excavation will be collected in the bucket of the excavator and soil samples will be collected from soil retained within the bucket. The IC field representative will drive a 2-inch by 6-inch precleaned brass tube into the undisturbed soil with a mallet. The sample tube will be removed from the soil and the ends will be covered with Teflon sheeting and tight-fitting plastic endcaps. The sample will be labelled, placed in a resealable plastic bag, and stored in a cooled ice chest for transport to a California state-certified analytical laboratory. A chain-

in the pits or including SP?



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PROPOSED LOCATIONS OF GROUND WATER MONITORING WELLS TO BE INSTALLED SOUTHERN PACIFIC TRANSPORTATION COMPANY 1399 WOOD STREET OAKLAND, CALIFORNIA

Project No.: 05100535	Date: 03/01/94	Figure: 8
Drawn By: Patti Decker	Checked By: James G. Jensen	Page: 19
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Oak-535/SRWP.0394/F.08 #100

DL for O+G was 500 ppm

of-custody form will be completed for all samples collected and will accompany these samples to the laboratory. These samples will be analyzed on an expedited 24-hour turn-around-time since excavation equipment will be on standby until results of confirmation samples have been received. Confirmation samples from the excavation of Tank Pit 1/2/Tank Pit 4 will be analyzed for TPH-G, TPH-D, and BTEX using EPA Method 8260 Modified and for PCBs using EPA Method 8080. OK Confirmation samples from the excavation at Tank Pit 3 will be analyzed for TPH-D and BTEX OK using EPA Method 8260 Modified. Confirmation samples from the excavation at the former fuel dispenser location will be analyzed for TPH-G, TPH-D, and BTEX OK using EPA Method 8260 Modified. Temporary fencing will be placed around the perimeter of the open excavations until the results of the excavation confirmation samples have been received and the excavation backfilled. If the confirmation samples indicate TPH and benzene concentrations in the soil are below the soil action levels, then the open excavation pit will be backfilled with the previously removed non-impacted soil and with clean imported soil and compacted by wheel-rolling with a loader.

4.1.1 Soil Stockpile Sampling and Analytical Methods

Soil samples will be collected by digging approximately 2 feet into each of the 3 stockpiles with a clean shovel. The soil from this depth will be packed into a precleaned 2-inch by 6-inch brass tube. The ends of the brass tube will immediately be covered with Teflon sheeting and tight-fitting plastic endcaps. The sample will be labelled, placed in a resealable plastic bag, and stored in a cooled ice chest for transport to a California state-certified analytical laboratory. A chain-of-custody form will be completed for all samples collected and will accompany these samples to the laboratory.

Six soil samples will be collected from the apparent non-impacted soil stockpile (size?). Two composite samples will be prepared by the laboratory and submitted for laboratory analysis

does this 2 3-pt. composites?

for TPH-G, TPH-D, and BTEX by EPA Method 8260 Modified. These samples will be analyzed on an expedited 24-hour turnaround time. If the analytical results identify concentrations of TPH less than 100 ppm, this non-impacted soil will be used to partially backfill the excavation.

Characterization samples from the apparent impacted soil stockpiles will be collected at a frequency of one composite sample per 50 cubic yards of material and analyzed as follows:

how many points?

* Tank Pit 1/2/Tank Pit 4 excavation soil samples will be analyzed for:
    * 8-RCRA metals using EPA 6000/7000 Series Methodology
    * Volatile organic compounds (VOCs) using EPA Methods 8010 and (8020 or 8240) — BTEX
    * TPH-D and TPH-G using EPA Method 8260 Modified
    * PCBs using EPA Method 8080
* Fuel dispenser island excavation soil samples will be analyzed for:
    * 8-RCRA metals using EPA 6000/7000 Series Methodology
    * VOCs using EPA Methods 8010 and 8020 or 8240 — BTEX
    * TPH-D and TPH-G using EPA Method 8260 Modified
* Tank Pit 3 excavation soil samples will be analyzed for:

* 8-RCRA metals using EPA 6000/7000 Series Methodology

* VOCs using EPA Methods 8010 and 8020 or 8240

* TPH-D using EPA Method 8260 Modified

After the soil has been characterized, a decision will be made as to the appropriate disposition of the soil based on the constituent concentrations in the soil samples. IC recommends the following options for disposition of the excavated soil:

* If TPH and benzene concentrations are equal to or below 100 ppm and 18 ppm, respectively, and the 8-RCRA metals and PCB concentrations are equal to or below 10 times the Soluble Threshold Limit Concentration (STLC) values, onsite disposition of the soil is recommended.

* If any of the 8-RCRA metals concentrations exceed 10 times the STLC values, the California Waste Extraction Test should be run.

* If TPH and benzene concentrations exceed 100 ppm and 18 ppm, respectively, and no metals concentrations exceed the STLC values, onsite remediation of the soil is recommended.

* If the PCBs concentration exceeds 50 ppm or if any metals concentrations exceed the STLC values, then disposition of the soil to an appropriate disposal facility will be determined.

2 mws are in backfill of UST pits

4.2 Task 2 - Monitoring Well Installation, Development, and Sampling

Three monitoring wells will be installed in the locations proposed on Figure 8 to assess the lateral extent of impacted ground water. The procedures for installing, developing, and sampling the wells follow.

4.2.1 Ground Water Monitoring Well Installation

gw at 5-8

ok

Borings for the monitoring wells will be drilled to an approximate depth of 15 feet bgs with a truck mounted drill-rig equipped with 6- or 8-inch (nominal outside diameter) hollow-stem augers. A core barrel sampler will be inserted within the hollow stem of the lead auger to provide a continuous core of each 5-foot interval. Each cored section will be examined and logged by an IC geologist for monitoring well construction purposes.

After the boring has been drilled and logged, the 8-inch diameter augers will be retracted and the boring re-drilled with 10-inch diameter hollow-stem augers for the purpose of constructing monitoring wells.

The wells will be constructed of 4-inch inside diameter, Schedule 40 polyvinyl chloride (PVC) casing. Ten feet of slotted (0.020 inch factory cut) 4-inch PVC well screen will be installed from the bottom of the boring (approximately 15 feet bgs) to approximately 2 feet above the water table (estimated to be 5 feet bgs) as measured during the time of drilling, with 4-inch PVC blank casing in the upper portion of the well. The artificial filter pack will consist of a 1C sand or equivalent. The sand will be added down the hollow stem of the drilling augers (between the inner annulus of the augers and the PVC casing) until there is approximately 4 feet of sand within the augers. At this time, the augers will be extracted at 1- to 2-foot intervals which will allow the sand to flow out of the augers, between the PVC well screen and the boring wall. This process will continue until a sand pack has been

emplaced approximately 2 feet above the slotted casing. A 2-foot thick bentonite seal, consisting of ¼-inch bentonite pellets, will be placed above the filter pack and hydrated with 2 to 3 gallons of potable water. The remaining annular space will be filled with a cement/bentonite grout consisting of approximately 2 pounds of powdered bentonite (measured in the field), 6.5 to 7 gallons of water obtained from the site, and 94 pounds (1 bag) of portland cement. The bentonite will be added to the water and allowed to hydrate by circulating the mixture through a grout pump or mixing apparatus. The cement will then be added to the bentonite/water mixture and mixed thoroughly. The cement/bentonite mixture will be emplaced between the inner annulus of the augers and the PVC casing. The augers will be filled to capacity with the cement/bentonite grout and extracted at 1- to 2-foot intervals, following which additional grout will be added to fill the annulus until the grout is at the original ground surface. The well will be finished with a water-tight, locking well cap housed within a flush-mounted traffic box.

After completion of the monitoring wells, the wells will be surveyed by a licensed surveyor. to msl The top of the well casing will be marked on each well and the surveyor will assess the elevation of the top of each well casing and will measure horizontal distances between all monitoring wells.

The residuals generated from the drilling and well installation will be stored in 55-gallon Department of Transportation (DOT) approved drums appropriate for the storage and transportation of hazardous wastes. The drums will be labeled and a drum inventory will be compiled containing the date generated, contents, and the boring from which the contents originated for each drum.

After soil residuals have been characterized, the drummed soil from the borings will be appropriately handled. follow up

Sect-2649(a)(8)
see Title 23

72

4.2.2 Ground Water Monitoring Well Development

After well installation is completed and the well seals have set for a minimum of 24 hours, the wells will be developed. The depth to ground water will be measured in each monitoring well and the well volume calculated. Development initially will be performed by using a bailer to remove coarse sediments that may have entered the well, after which a 4-inch surge block will be inserted into the casing. Surging will be performed by raising and lowering the surge block across the saturated portion of the screen approximately 20 times. The surge block will then be removed and the bailer will be used to remove coarse sediments. After surging, a submersible or surface pump will be used to remove approximately 5 to 10 well volumes. Conductivity, pH, and temperature measurements will be monitored until these parameters have stabilized. These parameters will be judged to have stabilized when 3 consecutive readings show:

* < 10% change in conductivity;
* < 10% unit change in pH; and
* < 10% change in temperature.

Each well will be considered developed when the parameters have stabilized and the water flows clear or when 10 well volumes have been removed (whichever is the lesser amount).

4.2.3 Ground Water Sampling

Ground water samples will be collected after 24 hours following monitoring well development, and quarterly thereafter, for a period of 1 year. The depth to ground water and the total depth of the well will be measured in each monitoring well. This information will be used to calculate the well volume. Prior to sample collection, each well will be purged to ensure that the water sample obtained from the well is representative of the

formation water. Each well will be purged until the total quantity of water removed is approximately 3 times the saturated volume in the well. Conductivity, pH, and temperature will be measured during purging. If parameters have not stabilized after 3 well volumes have been removed, an additional 2 well volumes (for a total of 5 well volumes) will be removed and the well sampled.

After purging, each monitoring well will be allowed to recharge to its approximate original water level prior to sample collection. After recharge, a ground water sample will be collected with a clean acrylic bailer or a new, disposable polyethylene bailer. The water sample from the bailer will be transferred to clean, appropriately preserved laboratory-supplied glass containers.

The samples will be labelled and stored in a cooled ice chest until delivery to the analytical laboratory. A chain-of-custody document will be completed for the collected samples and will accompany these samples to the laboratory. The ground water samples will be analyzed for TPH-G, TPH-D, and BTEX using EPA Method 8260 Modified. In addition, the ground water samples collected at the first ground water sampling event will be analyzed for PCBs using EPA Method 8080. If PCBs are not detected, then PCBs will not be analyzed for at future sampling events.

ok

Development and purge water from all monitoring wells will be stored in 55-gallon DOT-approved drums appropriate for the storage and transportation of hazardous liquids. The drums will be labeled and a drum inventory will be compiled containing the date generated, contents, and the monitoring well from which the contents originated for each drum. It is proposed to dispose of this water at the SPTCo wastewater treatment facility located on the West Oakland Yard.

4.2.4 Quality Assurance/Quality Control (QA/QC)

As part of the QA/QC procedures for the first round of ground water sampling, the following will be submitted to the laboratory for analysis in addition to the ground water samples.

* 1 field blank prepared in the field using deionized water transferred through decontaminated well sampling equipment.

* 1 trip blank consisting of deionized water prepared in the laboratory, transported to the sampling location (in the ice chest to be used for the transport of all samples), and transported back to the laboratory along with the other ground water samples.

* 1 duplicate sample collected from 1 of the wells being sampled.

4.3 Task 3 - Preparation of a Summary Report

Approximately 8 weeks after field work is completed, a summary report will be prepared. This report will include field procedures, analytical results from soil remediation, analytical results from soil borings, and analytical results from the ground water monitoring wells. Provided the soil action levels outlined in Section 3.0 are met, the soil remediation of the 1399 Wood Street property will be considered complete.

4.4 Task 4 - Quarterly Ground Water Sampling

The ground water monitoring wells will be sampled on a quarterly basis for a period of 1 year, at which time continued monitoring will be evaluated. The wells will be sampled using the same protocol described in Section 4.2.3, Task 2.

A report will be prepared after each sampling event and submitted to the appropriate regulatory agencies.