PORT OF OAKLAND

Alameda County
DEC 04 2002
Environmental Health

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November 25, 2002

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Subject: **Final Site Investigation Workplan**
UST Site HF-17 at Building H-227 Ninth Avenue Terminal

Dear Mr. Chan:

As you may remember we met last year with the Port's consultant, Susanne von Rosenberg of GAIA to discuss the underground storage tank (UST) cases at 9th Avenue Terminal and the development of workplans for the remediation of the various sites. Please find enclosed for your review the "Final Site Investigation Workplan for UST HF-17."

We are prepared to implement the workplan as soon as approval is received from your office. If you have any questions, please do not hesitate to contact me at (510) 627-1184.

Sincerely,

Douglas P. Herman
Associate Port Environmental Scientist

Encl : Final Site Investigation Workplan
UST Site HF-17 at Building H-227 Ninth Avenue Terminal

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FINAL SITE INVESTIGATION WORK PLAN

UST SITE HF-17 at Building H-227

Ninth Avenue Terminal

October 8, 2002

Prepared for:
Port of Oakland
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Prepared by:

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

The Port of Oakland (Port) has prepared this workplan for underground storage tank (UST) Site HF-17 (at Building H-227), located at the Ninth Avenue Terminal Complex at the Port of Oakland (Figures 1 and 2). This tank site is not currently part of the Local Oversight Program, and does not have a listed street address. The tank site is physically located approximately 375 feet east of the Clinton Basin Shoreline and 900 feet south of Embarcadero Road, between 8th and 9th Avenues. This UST site is part of a larger development area, designated as the Oak to Ninth District, which will be redeveloped. The redeveloped property encompasses 60 acres of property on the Oakland Estuary, including the Ninth Avenue Terminal and Clinton Basin areas. The goals of the redevelopment are to create a mixed-use waterfront neighborhood.[1]

The proposed plan anticipates a significant first phase of development east of the Clinton Basin, including the Ninth Avenue Terminal area. This first phase could include housing at appropriate densities (i.e., 20 to 70 dwelling units per acre), as well as a mix of retail, restaurant, cafes and marine service use. Second-story commercial and residential uses could also be developed. No single-family residential use is being proposed.

This workplan has been prepared in response to a request from the Alameda County Health Services Agency Environmental Health Services Department (Alameda County). The overall objective of this workplan is to obtain regulatory closure of UST Site HF-17 prior to initiation of site redevelopment activities. This workplan is organized into eight sections:

- Section 1.0 – Introduction – presents general information and the purpose of the workplan;
- Section 2.0 – Background – presents background and description, and geologic setting information at UST Site HF-17;
- Section 3.0 – Previous Site Investigations and Results – presents a description of site investigation activities conducted at UST Site HF-17 to date;
- Section 4.0 – Data Gaps – presents a summary of the data gaps that need to be addressed before a closure request and decision can be made;
- Section 5.0 – Proposed Investigation – presents the recommendations for addressing the data gaps identified in Section 4.0;
- Section 6.0 – QA/QC Program;
- Section 7.0 – Proposed Schedule – presents a tentative schedule for completion of the work proposed in Section 5; and,
- Section 8.0 – References – presents the documents reviewed and/or utilized to evaluate UST Site HF-17.

The information presented in this workplan integrates information from prior reports and draws on studies conducted by the Port and by others. The health and safety plan is provided in Appendix A.

2.0 BACKGROUND

The Ninth Avenue Terminal is a break bulk cargo facility located on the Oakland Inner Harbor in East Oakland, California. The Terminal has been owned by the Port since at least the late 1920s. The Terminal study area is an irregularly shaped parcel of land, encompassing approximately 25 acres

[1] This information reflects the conceptual redevelopment plan. The public participation process has not been completed and modifications to the proposed plan may occur.

excluding the wharves. It was leased to a variety of tenants, and continues to have limited light industrial and commercial activity. The Terminal is bordered by Embarcadero Road, Interstate 880, and railroad tracks to the north, Clinton Basin to the west, the Inner Harbor Channel/Oakland Estuary to the south, and Brooklyn Basin to the east. The land use in the Terminal vicinity is commercial/industrial. The majority of the Terminal is paved with asphaltic concrete. The remainder of the Terminal is occupied by buildings or concrete foundation slabs remaining from former buildings. Wharves constructed of concrete or asphalt over a wood frame extend along the southeast and southwest sides of the Terminal.

Various aboveground and underground utilities exist throughout the Terminal. Storm water runoff is collected by numerous catch basins; the majority of the storm water is conveyed to a main storm drain collector system below Eighth Avenue that discharges to the Inner Harbor. The storm drains in the vicinity of UST Site HF-17 are the primary collectors under Eighth and Ninth Avenues. Sanitary sewer improvements consist of laterals extending from buildings to main sewer lines below Eighth and Tenth Avenues. The main sanitary sewer lines flow toward Embarcadero Road where a large collector pipe exists. Other on-site subsurface utilities include domestic and fire protection water supply, natural gas, electricity, fire alarm, and telephone lines, and abandoned fuel pipes.

Site investigations have been conducted at the Terminal since 1992. Multiple companies have conducted numerous rounds of investigation (see references). Investigation activities included tank removals, soil borings, hydropunch sampling, monitoring well installation, subsurface utility investigations, geophysical investigations, and tide studies. Flux chamber sampling, to evaluate the flux of volatile organic compounds through a specific area of site soils, has also been conducted. Regular groundwater monitoring on site has been conducted since late 1996.

Due to the large size of the property, and the diverse nature of tenant activities, the investigation efforts were classified into various investigation areas (Areas A through R). UST site HF-17 is located in Area A (Figure 2).

Site Groundwater and Geology

The Ninth Avenue Terminal is generally flat with elevations ranging from approximately 9 to 14 feet above Port datum, which is the mean lower low water mark, or 3.2 feet below mean sea level. The soils beneath the site consist primarily of an organic-rich clay (Young Bay Mud) overlain by approximately 3 to 6 feet of fill materials. The fill material consists primarily of an angular gravel with silt and sand lenses. Shoreline areas tend to be underlain by up to 7 to 9 feet of fill consisting of interbedded layers of sand, gravel, silt and clay. The majority of the borings installed at the Terminal terminate in the Young Bay Mud (they extend to depths between 10 and 20 feet below ground surface [bgs]). Based on the limited number of deeper borings installed, the Young Bay Mud extends to depths of 23 to 27 feet bgs at the Ninth Avenue Terminal. It is underlain by another series of clay layers. Immediately below the Young Bay Mud is a thin layer of stiff greenish clay approximately 3 feet thick. This layer is underlain by a pale brown silty clay with sand that grades into a silty sand. This formation is most likely the Merritt Sand.

Shallow groundwater is typically encountered at 3 to 10 feet below ground surface. Recent groundwater elevation contours are found in references 39, 42, and 43. General groundwater elevation contour patterns have remained relatively consistent since 1996, although localized mounds and depressions have appeared and disappeared in certain areas. In general, groundwater elevations tend to be higher in the central portion of the site, with flow radiating outward toward the shorelines of Clinton Basin and Brooklyn Basin. The bulkhead wall extending along the southeastern and southwestern portions of the site appears to act as a barrier to the flow of groundwater (SCI 1997b). In the deep boring SCIMW 31D,

groundwater was first encountered at a depth of 40 feet bgs; the stable elevation was at 9 feet bgs (SCI 1998), indicating a strong upward vertical gradient.

Tidal influence on groundwater elevations and storm drains has been observed at the site. Wells located along the Clinton and Brooklyn Basin shorelines are tidally influenced, while interior wells and those adjacent to the concrete bulkhead are not. Tidal fluctuations of as much as two feet have been observed in near-shore wells. Research suggests that tidal influence extends inland more than 80 feet along that portion of the northern shoreline that is not protected by the concrete bulkhead. Very minor changes in groundwater levels were recorded approximately 10 feet from the bulkhead during tidal changes. UST Site HF-17 is located too far inland of the shoreline to be subject to direct tidal influence.

Tidal waters have been observed to extend throughout the storm drainage system, as far inland as the drainage catchment north of the Embarcadero along the sanitary sewer main line. Elevated groundwater levels measured along selected utilities during tide studies indicate that there may be exfiltration from the storm drain pipelines.

3.0 PREVIOUS SITE INVESTIGATIONS AND RESULTS

Tank Summary

In 1962, Union Oil Company of California installed a 10,000-gallon underground storage tank at the site, for use by H.A.C. Transportation Company. According to a 1965 Port of Oakland map, the UST existed in the yard area to the northeast of Building H-227. Exploratory test pit excavation activities were conducted in the area of a subsurface anomaly located in this area. The subsurface anomaly was detected in the course of clearing several boring locations in the area. A wire-reinforced concrete slab was unearthed just beneath the asphalt pavement, but no UST was found. However, a petroleum hydrocarbon odor was detected within the excavated soil (up to 10 ppm of organic vapors were detected by the OVM). Analytical testing of soil samples collected from the test pit indicated the presence of low level diesel-range hydrocarbons. Research indicates that the yard area was used by H.A.C. Trucking until 1964, and by C.D. Ericson from 1964 to 1975.

The UST site is located approximately 25 feet west of a former aboveground storage tank farm, and approximately 80 feet north-northeast of another former AST farm (Area J). These areas were formerly leased by Port Petroleum and American Bitumens/Chevron, respectively, and are not considered part of UST Site HF-17. Elevated levels of total petroleum hydrocarbons as diesel (TPH-d) and as motor oil (TPH-mo) have been detected in the Area J AST farm; however, these detections are associated with a known release that flowed toward the south (away from UST HF-17). Data relevant to UST Site HF-17 are presented in Tables 1 through 6, and are shown in Figures 3 and 4.

Investigation Results and History

As noted earlier, extensive investigations have been completed at the Ninth Avenue Terminal. As part of the geophysical survey for the Terminal, California Utility (C.U.) Surveys also performed a sweep of the area around Building H-227, specifically targeted at clearing proposed boring and test pit locations. The sweep included sampling locations in the vicinity of a UST associated with a gasoline engine operated by the Pacific Lumber Company and in the vicinity of the suspect 10,000-gallon UST located northeast of former Building H-227. A metallic anomaly was detected in the vicinity of the suspected 10,000-gallon UST location. As noted above, in February 1997, SCI excavated test pit SCITP-8 to explore the area of the 10,000-gallon UST site located northeast of Building H-227. A wire-reinforced concrete slab was unearthed just beneath the asphalt pavement, but no UST was found.

SCITP-8 was excavated to a depth of 6 feet. Soil samples were collected at 4.5 and 6 feet bgs. The samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-g), diesel (TPH-d), and motor oil (TPH-mo). In addition, they were analyzed for benzene, toluene, ethylbenzene and xylene (BTEX) and lead. BTEX and TPH-g were not detected. Lead concentrations were 12 mg/kg and 22 mg/kg at 4.5 and 6 feet, respectively. Although a petroleum hydrocarbon odor was noted during excavation and organic vapors were detected as described earlier, analytical results showed only very low levels of TPH-d (10 mg/kg and 32 mg/kg, respectively at 4.5 and 6.0 feet bgs) and relatively low concentrations of TPH-mo (120 mg/kg and 340 mg/kg, respectively). No groundwater samples were collected from SCITP-8.

Three other sample locations (SCI-5, RMA-12, and SCIMW-10) are found within 75 feet of the suspect tank location. RMA-12 is located immediately south of the suspect tank location (between the suspect UST location and the southern AST farm), SCI-5 is located approximately 15 feet southwest, and SCIMW-10 is located approximately 50 feet southeast. In 1997, well SCIMW-10 was upgradient of UST Site HF-17; since then, it appears that the UST site has been upgradient of the well. SCIMW-10 is located within the AST farm located east of the UST site.

Soil boring RMA-12 was installed in November 1996. One soil sample (collected at 6.5 feet) and one grab groundwater sample were analyzed for TPH-g and TPH-d. The soil sample was also analyzed for selected VOCs. No constituents were detected in soil. An elevated concentration of TPH-d (53,900 µg/L) was detected in groundwater; TPH-g was non-detect in groundwater.

Boring SCI-5 and well SCIMW-10 were installed by SCI in 1996. One shallow soil sample was collected from each location (at 3.5 and 3.0 feet bgs, respectively), and analyzed for total TPH-g, TPH-d, TPH-mo, and BTEX. The soil sample from SCIMW-10 was also analyzed for polychlorinated biphenyls (PCBs), metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). Only trace levels of TPH-d and TPH-mo were detected in soil at SCI-5; no BTEX were detected. In the soil sample from SCIMW-10 TPH-d was detected at a concentration of 100 mg/kg, and TPH-mo was detected at a concentration of 810 mg/kg. Only trace levels of metals were detected, and PCBs and BTEX were non-detect. The only VOC detected was acetone at a concentration of 0.021 mg/kg. Elevated concentrations of polynuclear aromatic hydrocarbons (PNAs) were detected in SCIMW-10 (30 mg/kg).

A grab groundwater sample was collected from boring SCI-5 and analyzed for TPH-g, TPH-d, TPH-mo, both total and dissolved metals, and VOCs. Elevated levels of TPH-d (35,000 µg/L) and TPH-mo (42,000 µg/L) were detected. Only trace levels of metals were detected and BTEX concentrations were non-detect. MEK was detected at a concentration of 210 µg/L.

Groundwater samples have been collected from SCIMW-10 annually since 1996. During the 1996 and 1997 monitoring events, groundwater samples from this well were analyzed for TPH-g, TPH-d, and TPH-mo, BTEX, metals, and VOCs. The groundwater was also tested for PCBs during the first monitoring event. Since 1998, groundwater samples from this well have only been analyzed for TPH-d and TPH-mo. Elevated concentrations of TPH-d (1,100 µg/L and 1,400 µg/L) and TPH-mo (1,200 µg/L and 2,500 µg/L) were detected during the first two monitoring events. PCBs, TPH-g, BTEX, metals (except arsenic and selenium), and VOCs were not detected. Monitoring well SCIMW-10 was last sampled in December 2001. TPH-d and TPH-mo have not been detected in groundwater since 1998.

In addition to the sample points in the vicinity of the tank, an additional 11 sample points are located within 75 to 150 feet of the tank location. These data points include 6 borings, 2 test pits, 1 trench, and 1

monitoring well. Storm sewer lines, a sanitary sewer line, and a fuel line are located within 75 to 150 feet of the tank site. Most of the sample locations located within 75 to 150 feet of the UST Site HF-17 are pertinent to other concerns, such as storm drain lines (B-3, SCI-7, and SCIMW-18) and the former AST farm at Area J (RMA-13, RMA-14, SCI-6, and SCITP-11). SCITP-21 is located east of the eastern AST tank farm. No samples were collected from Trench #4. Only a groundwater sample was collected from SCI-39.

Type of Sample Location	Within 75 Feet	Within 75 to 150 Feet
Borings	RMA-12, SCI-5	B-3, RMA-13, RMA-14, SCI-6, SCI-7, SCI-39
Test Pits/Pot Holes	SCITP-8	SCITP-11, SCITP-21, Trench #4 (no data)
Monitoring Wells	SCIMW-10	SCIMW-18

The current upgradient well for the UST site is monitoring well SCIMW-18, located approximately 90 feet northwest of the UST site. This monitoring well is located within 10 feet of a storm drain. No soil samples were collected from SCIMW-18 during installation. Analytical results from the first two groundwater sampling events (1996 and 1997) showed TPH-d and TPH-mo in the range of 1,600 µg/L to 2,200 µg/L, however, concentrations have been non-detect since 1998. Similarly, concentrations of target constituents north of the tank area are also low. The grab groundwater sample collected from soil boring SCI-39 contained 1,000 µg/L TPH-d, and 730 µg/L TPH-mo.

Thus, based on the available information for this suspect UST site, there does not appear to be any significant UST-related contamination in soil. The AST farm located to the south of the UST area has known contamination. Samples collected in these areas show elevated levels of TPH-d and TPH-mo in both soil and groundwater. The elevated levels of TPH-d and TPH-mo found in groundwater at borings SCI-5 and RMA-12 are consistent with the elevated concentrations found at the Area J tank farm. The low levels of TPH constituents in the overlying soil suggests that the TPH detected in groundwater in the vicinity of the suspect UST site is not associated with the UST site, but with other historic releases.

4.0 DATA GAPS

Based on the results of the investigations and historical information discussed above, and the proposed future use of the property, one data gap still exists. It is unclear whether the tank is still present. Once this data gap has been addressed, GAIA will either recommend additional work to characterize the site and/or recommend that formal closure be requested for this site.

NO UST EVIDENCE, NO SUPSITE

5.0 PROPOSED INVESTIGATION PROGRAM

Because the tank was a large tank, and prior work has not located the tank, it is unlikely that the tank is still present in the area. However, because the geophysical work done in the area was limited in scope, GAIA proposes to do a more complete geophysical survey to verify that the tank is no longer present. In addition to performing geophysical work, GAIA proposes to excavate a minimum of three potholes with a backhoe in the area of the geophysical survey. Pothole excavation will be conducted in areas that show geophysical anomalies, or will be distributed evenly over the area shown in Figure 5, if no anomalies are identified. At least one soil sample, and if possible, one groundwater sample will be collected from each pothole and analyzed for TPH (all ranges).

Should a tank be encountered, it will be removed as expeditiously as possible. Associated piping will also be removed to the degree possible without undermining utilities in the area. Piping that is too close to existing utilities will be capped. Obviously contaminated soil will be removed from the tank removal excavation, appropriately stockpiled, and disposed of off-site by the Port hazardous waste contractor. Confirmation soil samples will be collected at the limits of the tank removal excavation, and a grab groundwater sample will be collected from the tank removal excavation. Soil samples will be collected every 20 feet along any UST-related pipeline alignments

6.0 QA/QC PROGRAM

During this investigation, field quality assurance/quality control (QA/QC) will be ensured by following standard sampling protocols and field documentation requirements. To ensure valid and representative samples, drilling and sampling equipment will be decontaminated between borings and waste materials generated during sampling will be properly contained. The analytical laboratory is subject to its own QA/QC program. Four formats will be used to document the implementation of field activities, as follows:

- Field log book;
- Field Data Sheets;
- Sample Labels; and,
- Chain-of-custody form.

Field Log Book

All field data will be recorded in a logbook while in the field. Logged data includes pothole locations and size and sample-collection information including sample date and time, location, depth, client, analytical methods, samplers' initials, and the name and address of the laboratory. In addition, other pertinent information, such as descriptions of anomalous conditions, will be recorded.

Field Data Sheets

Geologic trench logs will be completed in the field to describe the lithology of each pothole installed. These indicate the depth of the fill-bay mud interface, the depth of encountered groundwater, and any anomalies such as hydrocarbon odors.

Sample Labels

Sample labels will be completed in waterproof ink at the time of sample collection and before the sample is placed in the cooler. The following information will be included on the sample label: sample ID number, date and time, sample location, depth, client, analyses, preservative, and sampler's initials.

Chain-of-Custody Procedures

A chain-of-custody (COC) form will be used to record all samples collected. The COC will be checked for completeness at the end of each day and signed by the sampler. Information on the chain-of-custody record includes: sample date and time, sample ID and location, matrix, number of containers, required analyses, preservative, turnaround time, project manager's name, project number, project name and location, client and laboratory names, and sampler signature(s).

Equipment Decontamination

Decontaminated sampling equipment (trowels) will be used at each pothole to prevent cross-contamination, or brass tubes may be driven directly into the soil. A new pair of disposable nitrile gloves will be donned before each sample is collected.

Investigation-Derived Waste

Investigation-derived waste will be placed in labeled, 55-gallon, United States Department of Transportation (DOT) 17H drums. These drums will be left on the site pending receipt of final laboratory data and subsequent disposal by the Port. The Port will have the IDW removed by their hazardous waste contractor for proper waste disposal.

Laboratory QA/QC Procedures

All analytical testing will be performed by a Cal-EPA ELAP-accredited hazardous-waste laboratory. Each laboratory is required to maintain its own QA/QC program. The laboratory is responsible for maintaining custody of the samples, and for maintaining all associated records documenting that custody. Upon receipt of the samples, the laboratory checks the original chain-of-custody documents and compares them with the labeled contents of each sample container for accuracy and traceablity. The laboratory checks all sample containers for integrity, and records any observations on the original COC record; the COC form is then signed and dated by the laboratory.

Each sample is logged into the laboratory by assigning it a unique sample number. All samples received as part of the same shipment receive the same work order. Each container of the sample is identified by appending sequential letters to the end of the sample number. The laboratory number and the sample ID number are recorded on the laboratory report.

7.0 PROPOSED INVESTIGATION SCHEDULE

The proposed schedule is dependent on the review cycle by Alameda County. We anticipate that mobilization for the geophysical survey and pothole excavation would be completed within one to two weeks following approval of the workplan by the County. A draft investigation report, including recommendations for future actions, will be submitted within eight weeks of the completion of the field investigation and laboratory analysis.

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TABLES

TABLE 1
NINTH AVENUE TERMINAL, UST SITE HF-17
PETROLEUM HYDROCARBON, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN SOIL

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	SAMPLE DEPTH (ft)	DATE SAMPLED	PROXIMITY (Feet)	OIL & GREASE (mg/kg)	TPH-GAS (mg/kg)	TPH-DIESEL (mg/kg)	TPH-MOTOR OIL (mg/kg)	TRPH (mg/kg)	BENZENE (mg/kg)	ETHYL-BENZENE (mg/kg)	TOLUENE (mg/kg)	TOTAL XYLENES (mg/kg)	4,4'-DDD (mg/kg)	4,4'-DDE (mg/kg)	4,4'-DDT (mg/kg)	OTHER HERBS/ PESTS (mg/kg)	AROCLOR 1260* (mg/kg)	OTHER PCBs (mg/kg)
9AV-B3-5	Uribe	L	5	11/19/1992	150	--	--	<2	--	**30**	--	--	--	--	--	--	--	--	--	--
9AV-B3-7	Uribe	L	7	11/19/1992	150	--	--	<2	--	**100**	--	--	--	--	--	--	--	--	--	--
9AV-B4-4	Uribe	L	4	11/19/1992	150	--	--	<5	--	**320**	--	--	--	--	--	--	--	--	--	--
9AV-B4-7	Uribe	L	7	11/19/1992	150	--	--	<1H	--	<30	--	--	--	--	--	--	--	--	--	--
SCI-5@3.5	SCI	A/K	3.5	5/21/1996	75	<50	<1	**47YH**	**71Y**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-6@3.5	SCI	J	3.5	5/21/1996	150	--	**9.2Y**	**2,000H**	**1,100 L**	--	<0.005	**0.022**	<0.005	**0.020**	--	--	--	--	--	--
SCI-7@6	SCI	L	6	5/22/1996	150	--	--	**15YH**	**100YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCIMW-10@3	SCI	J	3	8/21/1996	75	<50	<1	**100YH**	**810**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	<0.020	ND
SCITP-8@4.5	SCI	A/K	4.5	2/3/1997	75	--	<1	**10YH**	**120H**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCITP-8@6	SCI	A/K	6	2/3/1997	75	--	<1	**32YH**	**340**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCITP-11@1.5	SCI	J	1.5	2/4/1997	150	--	**6.6YH**	**1,500YH**	**4,500 L**	--	<0.005	**0.0074**	<0.005	**0.0068J**	<0.24	<0.24	<0.24	ND	**4.3**	ND
SCITP-11@4.5	SCI	J	4.5	2/4/1997	150	--	**95YH**	**1,700**	**830**	--	<0.010	<0.010	<0.010	<0.010	<0.006	<0.006	<0.006	ND	<0.012	ND
SCITP-21@2	SCI	I	2	4/25/1997	150	**3,500**	<1	**30YH**	**230YHL**	--	<0.005	<0.005	<0.005	<0.005	<0.06	<0.06	<0.06	ND	<0.12	ND
SCITP-21@7	SCI	I	7	4/25/1997	150	**62**	<1	**12YH**	**82YHL**	--	<0.005	<0.005	<0.005	<0.005	<0.006	<0.006	<0.006	ND	<0.012	ND
RMA-12@6.5-7	RMA	A/K	6.5	11/20/1996	75	--	<10	<10	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
mg/kg = milligrams per kilogram
<1 = Compound not detected at or above stated reporting limit
-- = Not tested
ND = Not detected
* = specifically tested for Aroclor 1242/1254
All detected concentrations in bold

TPH = Total Petroleum Hyrocarbons
TRPH = Total Recoverable Petroleum Hydrocarbons
DDD = Dichlorodiphenyldichloroethane
DDT = Dichlorodiphenyltrichloroethene
PCBs = Polychlorinated Biphenyls

Y = Sample exhibits fuel pattern which does not resemble standard
H = Heavier hydrocarbons than indicated standard
L= Lighter hydrocarbons than indicated standard
Z = Sample exhibits unknown single peak or peaks
J = estimated value

TABLE 2
NINTH AVENUE TERMINAL, UST SITE HF-17
pH and HEAVY METAL CONCENTRATIONS IN SOIL

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	SAMPLE DEPTH (ft)	DATE SAMPLED	PROXIMITY (Feet)	pH	ANTIMONY (mg/kg)	ARSENIC (mg/kg)	BARIUM (mg/kg)	BERYLL-IUM (mg/kg)	CADMIUM (mg/kg)	TOTAL CHROMIUM (mg/kg)	CHROMIUM VI (mg/kg)	COBALT (mg/kg)	COPPER (mg/kg)	LEAD (mg/kg)	Soluble LEAD (µg/L)	MERCURY (mg/kg)	MOLYB-DENUM (mg/kg)	NICKEL (mg/kg)	POTAS-SIUM (mg/kg)	SELEN-IUM (mg/kg)	SILVER (mg/kg)	THALL-IUM (mg/kg)	VANAD-IUM (mg/kg)	ZINC (mg/kg)
9AV-B3-5	Uribe	L	5	11/19/1992	150	--	--	**1.0**	**58**	--	**0.2**	**58**	--	--	--	**17**	--	**0.2**	--	--	--	**1.1**	<0.5	--	--	--
9AV-B3-7	Uribe	L	7	11/19/1992	150	--	--	**1.1**	**80**	--	**0.3**	**49**	--	--	--	**13**	--	<0.1	--	--	--	<0.4	<0.5	--	--	--
9AV-B4-4	Uribe	L	4	11/19/1992	150	--	--	**1.0**	**160**	--	**0.3**	**35**	--	--	--	**18**	--	**0.2**	--	--	--	**1.2**	<0.5	--	--	--
9AV-B4-7	Uribe	L	7	11/19/1992	150	--	--	**4.0**	**21**	--	**0.2**	**42**	--	--	--	**4**	--	<0.1	--	--	--	**2.1**	<0.5	--	--	--
SCI-5@3.5	SCI	A/K	3.5	5/21/1996	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-6@3.5	SCI	J	3.5	5/21/1996	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-7@6	SCI	L	6	5/22/1996	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10@3	SCI	J	3	8/21/1996	75	--	**8.4**	**2.0**	**28**	**0.28**	<0.1	**2.4**	--	**4.0**	**12**	**5.9**	--	<0.1	<1.0	**3.7**	--	**1.4**	<0.5	<0.25	**10**	**69**
SCITP-8@4.5	SCI	A/K	4.5	2/3/1997	75	--	--	--	--	--	--	--	--	--	--	**12**	--	--	--	--	--	--	--	--	--	--
SCITP-8@6	SCI	A/K	6	2/3/1997	75	--	--	--	--	--	--	--	--	--	--	**22**	--	--	--	--	--	--	--	--	--	--
SCITP-11@1.5	SCI	J	1.5	2/4/1997	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-11@4.5	SCI	J	4.5	2/4/1997	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-21@2	SCI	I	2	4/25/1997	150	--	--	--	--	--	--	--	--	--	--	**23**	--	--	--	--	--	--	--	--	--	--
SCITP-21@7	SCI	I	7	4/25/1997	150	--	--	--	--	--	--	--	--	--	--	**360**	**1,500**	--	--	--	--	--	--	--	--	--
RMA-12@6.5	RMA	A/K	6.5	11/20/1996	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

mg/kg = milligrams per kilogram
µg/L = micrograms per liter
All detected concentrations in bold

<0.1 = Compound not detected at or above stated reporting limit
-- = Not tested
ND = Not detected

TABLE 3
NINTH AVENUE TERMINAL, UST SITE HF-17
PETROLEUM HYDROCARBON, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN GROUNDWATER

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oakland Datum (Feet)	PROXIMITY (Feet)	OIL & GREASE (µg/L)	TPH-GAS (µg/L)	TPH-DIESEL (µg/L)	TPH-MOTOR OIL (µg/L)	BENZENE (µg/L)	ETHYL-BENZENE (µg/L)	TOLUENE (µg/L)	TOTAL XYLENES (µg/L)	4,4'-DDD (µg/L)	4,4'-DDE (µg/L)	4,4'-DDT (µg/L)	OTHER HERBS/ PESTS (µg/L)	AROCLOR-1260 (µg/L)	OTHER PCBs (µg/L)
9AV-B3-W1	Uribe	L	11/20/1992	--	150	--	--	<500	--	--	--	--	--	--	--	--	--	--	--
RMA-12	RMA	A/K	11/20/1996	--	75	--	<500	**53,900Y**	--	--	--	--	--	--	--	--	--	--	--
RMA-13	SCI	J	11/20/1996	--	150	--	--	**46,000**	**36,000**	--	--	--	--	--	--	--	--	--	--
RMA-14	RMA	J	11/20/1996	--	150	<500	**440,100Y**	--	--	--	--	--	--	--	--	--	--	--	--
SCI-39	SCI	P/J	8/30/1996	--	150	<5,000	<50	**1,000Y**	**730Y**	<5.0	<5.0	<5.0	<5.0	--	--	--	--	<1.0	ND
SCI-5	SCI	A/K	5/22/1996	--	75	**28,000**	**250Y**	**35,000YHL**	**42,000YL**	<25	<25	<25	<25	--	--	--	--	--	--
SCI-6	SCI	J	5/22/1996	--	150	**140,000**	**14,000YH**	**240,000H**	**46,000YL**	<50	<50	<50	<50	--	--	--	--	--	--
SCI-7	SCI	L	5/23/1996	--	150	--	--	**3,000YH**	**3,600**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
SCIMW-10	SCI	J	8/26/1996	7.95	75	<5,000	<50	**1,100YH**	**1,200YL**	<5.0	<5.0	<5.0	<5.0	--	--	--	--	<1.0	ND
SCIMW-10	SCI	J	1/23/1997	7.87	75	--	<50	**1,400YH**	**2,500**	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--
SCIMW-10	SCI	J	9/18/1998	7.64	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	12/1/1999	5.98	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	10/10/2000	6.57	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	12/3/2001	5.85	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	9/6/1996	5.22+	75	<5,000	<50	**2,200YH**	**1,600YL**	<5.0	<5.0	<5.0	<5.0	--	--	--	--	<1.0	ND
SCIMW-18	SCI	L	1/20/1997	6.98	75	--	<50	**1,900YH**	**1,900Y**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
SCIMW-18	SCI	L	9/24/1998	7.23	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	12/1/1999	6.67	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	10/11/2000	7.11	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	12/3/2001	4.76	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--
SCITP-11	SCI	J	2/4/1997	--	150	**8,400YH**	**4,000,000H**	**1,800,000 L**	**1.7**	**18**	**2.4**	**10J**	<3.8	<3.8	<3.8	ND	**35**	ND	--
SCITP-21	SCI	I	4/25/1997	--	150	<5,000	<50	**660YH**	**1,200 L**	<0.5	<0.5	<0.5	<0.5	<0.094	<0.094	<0.094	ND	<0.47	ND

Notes:

µg/L = micrograms per liter
<1 = Compound not detected at or above stated reporting limit
-- = Not tested
ND = Not detected
* = specifically tested for Aroclor 1242/1254
+ = Groundwater level may not be stabilized

TPH = Total Petroleum Hyrocarbons
TRPH = Total Recoverable Petroleum Hydrocarbons
DDD = Dichlorodiphenyldichloroethane
DDT = Dichlorodiphenyltrichloroethene
PCBs = Polychlorinated Biphenyls
All detected concentrations in bold

Y = Sample exhibits fuel pattern which does not resemble standard
H = Heavier hydrocarbons than indicated standard
L= Lighter hydrocarbons than indicated standard
Z = Sample exhibits unknown single peak or peaks
J = estimated value

TABLE 4
NINTH AVENUE TERMINAL, UST SITE HF-17
pH and HEAVY METAL CONCENTRATIONS IN GROUNDWATER

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oakland Datum (Feet)	PROXIMITY (Feet)	pH	ANTIMONY (µg/L)	ARSENIC (µg/L)	BARIUM (µg/L)	BERYLL-IUM (µg/L)	CADMIUM (µg/L)	TOTAL CHROMIUM (µg/L)	CHROMIUM VI (µg/L)	COBALT (µg/L)	COPPER (µg/L)	LEAD (µg/L)	MERCURY (µg/L)	MOLYB-DENUM (µg/L)	NICKEL (µg/L)	POTAS-SIUM (µg/L)	SELEN-IUM (µg/L)	SILVER (µg/L)	THALL-IUM (µg/L)	VANAD-IUM (µg/L)	ZINC (µg/L)
9AV-B3-W1	Uribe	L	11/20/1992	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-12	RMA	A/K	11/20/1996	--	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-13	SCI	J	11/20/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-14	RMA	J	11/20/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-39	SCI	P/J	8/30/1996	--	150	--	<60	**10**	**89**	**3.0**	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	**20**	--	**21**	<5.0	<5.0	<10	<20
SCI-5 (Total)	SCI	A/K	5/22/1996	--	75	--	<60	**15**	**270**	<2.0	<2.0	**12**	--	<20	<10	**11**	**0.59**	<20	**24**	--	**8.5**	<5.0	<5.0	**12**	**49**
SCI-5	SCI	A/K	5/22/1996	--	75	--	<60	<5.0	**240**	<2.0	<2.0	<10	--	<20	**34**	<3.0	**2.8**	<20	**32**	--	**6.9**	<5.0	<5.0	<10	**80**
SCI-6	SCI	J	5/22/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-7	SCI	L	5/23/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	8/26/1996	7.95	75	--	<60	**15**	**55**	<2.0	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	<20	--	**42**	<5.0	<5.0	<10	<20
SCIMW-10	SCI	J	1/23/1997	7.87	75	--	<60	**24**	**49**	**2.3**	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	<20	--	**48**	<5.0	<5.0	<10	<20
SCIMW-10	SCI	J	9/18/1998	7.64	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	12/1/1999	5.98	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	10/10/2000	6.57	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	12/3/2001	5.85	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	9/6/1996	5.22+	75	--	<60	**20**	**160**	<2.0	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	**26**	--	**22**	<5.0	<5.0	**19**	<20
SCIMW-18	SCI	L	1/20/1997	6.98	75	--	<60	**21**	**250**	<2.0	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	<20	--	**38**	<5.0	<5.0	<10	<20
SCIMW-18	SCI	L	9/24/1998	7.23	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	12/1/1999	6.67	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	10/11/2000	7.11	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	12/3/2001	75.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-11	SCI	J	2/4/1997	--	150	--	<60	**25**	**550**	<2.0	<2.0	<10	--	<20	<10	**11**	<0.20	<20	<20	--	**68**	<5.0	<5.0	<10	<20
SCITP-21	SCI	I	4/25/1997	--	150	--	<60	**23**	**360**	<2.0	<5.0	<10	**20**	<20	**10**	<3.0	<0.20	<20	<20	--	**35**	<5.0	<5.0	<10	<20

Notes:
µg/L = micrograms per liter
<0.1 = Compound not detected at or above stated reporting limit
+ = Groundwater level may not be stabilized
All concentrations are dissolved concentrations unless otherwise noted.

ND = Not detected
-- = Not tested
All detected concentrations in bold

TABLE 5
NINTH AVENUE TERMINAL, UST SITE HF-17
VOLATILE AND SEMIVOLATILE ORGANIC COMPOUNDS IN SOIL

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	SAMPLE DEPTH (ft)	DATE SAMPLED	PROXIMITY (Feet)	ACETONE (mg/kg)	MEK or 2-BUTANONE (mg/kg)	CARBON DISULFIDE (mg/kg)	CHLORO-BENZENE (mg/kg)	1,1-DI-CHLORO-ETHANE (mg/kg)	1,1-DI-CHLORO-ETHENE (mg/kg)	cis-1,2-DI-CHLORO-ETHENE (mg/kg)	trans-1,2-DI-CHLORO-ETHENE (mg/kg)	METHYL-ENE CHLORIDE (mg/kg)	1,1,1-TRI-CHLORO-ETHANE (mg/kg)	TRI-CHLORO-ETHENE (mg/kg)	1,2-DI-CHLORO-ETHANE (mg/kg)	VINYL CHLORIDE (mg/kg)	OTHER 8240s (mg/kg)
9AV-B3-5	Uribe	L	5	11/19/1992	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B3-7	Uribe	L	7	11/19/1992	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B4-4	Uribe	L	4	11/19/1992	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B4-7	Uribe	L	7	11/19/1992	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-5@3.5	SCI	A/K	3.5	5/21/1996	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-6@3.5	SCI	J	3.5	5/21/1996	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-7@6	SCI	L	6	5/22/1996	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10@3	SCI	J	3	8/21/1996	75	**0.021**	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.010	ND
SCITP-8@4.5	SCI	A/K	4.5	2/3/1997	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-8@6	SCI	A/K	6	2/3/1997	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-11@1.5	SCI	J	1.5	2/4/1997	150	**0.028**	**0.0051J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.010	ND
SCITP-11@4.5	SCI	J	4.5	2/4/1997	150	**0.062**	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.040	<0.010	<0.010	<0.010	<0.020	ND
SCITP-21@2	SCI	I	2	4/25/1997	150	**0.046**	**0.0094J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.010	ND
SCITP-21@7	SCI	I	7	4/25/1997	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-12@6.5-7	RMA	A/K	6.5	11/20/1996	75	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	<0.005	<0.005	<0.005	<0.005	ND**

TABLE 5
NINTH AVENUE TERMINAL, UST SITE HF-17
VOLATILE AND SEMIVOLATILE ORGANIC COMPOUNDS IN SOIL

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	SAMPLE DEPTH (ft)	DATE SAMPLED	ACENAPH-THYLENE (mg/kg)	ANTRA-CENE (mg/kg)	BENZO(A) ANTH-RACENE (mg/kg)	BENZO (B) FLOUR-ANTHENE (mg/kg)	BENZO(A) PYRENE (mg/kg)	BENZO (G,H,I) PERYLENE (mg/kg)	BENZO (K) FLOUR-ANTHENE (mg/kg)	CHRY-SENE (mg/kg)	FLUOR-ANTHENE (mg/kg)	INDENO (1,2,3-CD) PYRENE (mg/kg)	PHENAN-THRENE (mg/kg)	PYRENE (mg/kg)	TOTAL PNAs (mg/kg)	OTHER 8270s (mg/kg)
9AV-B3-5	Uribe	L	5	11/19/1992	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B3-7	Uribe	L	7	11/19/1992	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B4-4	Uribe	L	4	11/19/1992	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B4-7	Uribe	L	7	11/19/1992	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-5@3.5	SCI	A/K	3.5	5/21/1996	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-6@3.5	SCI	J	3.5	5/21/1996	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-7@6	SCI	L	6	5/22/1996	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10@3	SCI	J	3	8/21/1996	**0.9**	**0.52J**	**1.9**	**2.3**	**4.1**	**2.4**	**3.1**	**2.9**	**3.5**	**2.0**	**1.2**	**5.3**	**30**	ND
SCITP-8@4.5	SCI	A/K	4.5	2/3/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-8@6	SCI	A/K	6	2/3/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-11@1.5	SCI	J	1.5	2/4/1997	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SCITP-11@4.5	SCI	J	4.5	2/4/1997	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SCITP-21@2	SCI	I	2	4/25/1997	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SCITP-21@7	SCI	I	7	4/25/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-12@6.5-7	RMA	A/K	6.5	11/20/1996	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

mg/kg = milligrams per kilogram
-- = Not tested
ND = Not detected
<0.005 = Compound not detected at or above stated reporting limit
MEK = Methylethylketone
PNA = polynuclear aromatic hydrocarbons
J = estimated value
All detected concentrations in bold
** = Only EPA 8010 compounds not detected

TABLE 6
NINTH AVENUE TERMINAL, UST SITE HF-17
VOLATILE AND SEMIVOLATILE ORGANIC COMPOUNDS IN GROUNDWATER

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oakland Datum (Feet)	PROXIMITY (Feet)	ACETONE (µg/L)	MEK or 2-BUTAN-ONE (µg/L)	CARBON DISULFIDE (µg/L)	CHLORO-BENZENE (µg/L)	CHLORO-ETHANE (µg/L)	1,1-DI-CHLORO-ETHANE (µg/L)	1,2-DI-CHLORO-ETHANE (µg/L)	1,1-DI-CHLORO-ETHENE (µg/L)	cis-1,2-DI-CHLORO-ETHENE (µg/L)	trans-1,2-DI-CHLORO-ETHENE (µg/L)	4-METHYL-2-PENTAN-ONE (µg/L)	1,1,1-TRI-CHLORO-ETHANE (µg/L)	TRI-CHLORO-ETHENE (µg/L)	VINYL CHLORIDE (µg/L)	OTHER 8240s	TOTAL PNAs (µg/L)	OTHER 8270s
9AV-B3-W1	Uribe	L	11/20/1992	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-12	RMA	A/K	11/20/1996	--	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-13	SCI	J	11/20/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RMA-14	RMA	J	11/20/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-39	SCI	P/J	8/30/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
SCI-5	SCI	A/K	5/22/1996	--	75	<100	**210**	<25	<25	<50	<25	<25	<25	<25	<25	<50	<25	<25	<50	ND	ND	ND
SCI-6	SCI	J	5/22/1996	--	150	<200	<100	<50	<50	<100	<50	<50	<50	<50	<50	<100	<50	<50	<100	ND	**190***	ND
SCI-7	SCI	L	5/23/1996	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	8/26/1996	7.95	75	<20	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	ND	ND	ND
SCIMW-10	SCI	J	1/23/1997	7.87	75	<20	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	ND	ND	ND
SCIMW-10	SCI	J	9/18/1998	7.64	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	12/1/1999	5.98	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	10/10/2000	6.57	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-10	SCI	J	12/3/2001	5.85	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	9/6/1996	5.22+	75	<20	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	ND	ND	ND
SCIMW-18	SCI	L	1/20/1997	6.98	75	<20	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	ND	ND	ND
SCIMW-18	SCI	L	9/24/1998	7.23	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	12/1/1999	6.67	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	10/11/2000	7.11	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-18	SCI	L	12/3/2001	4.76	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-11	SCI	J	2/4/1997	--	150	<50	<25	<13	<13	<25	<13	<13	<13	<13	<13	<25	<13	<13	<25	ND	**1350***	ND
SCITP-21	SCI	I	4/25/1997	--	150	<20	<10	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	ND	ND	ND

Notes:

µg/L = micrograms per liter
-- = Not tested
ND = Not detected
<50 = Compound not detected at or above stated reporting limit
MEK = Methylethylketone
PNA = polynuclear aromatic hydrocarbons
J = estimated value
All detected concentrations in bold
* = low levels of non-carcinogenic PNAs

FIGURES

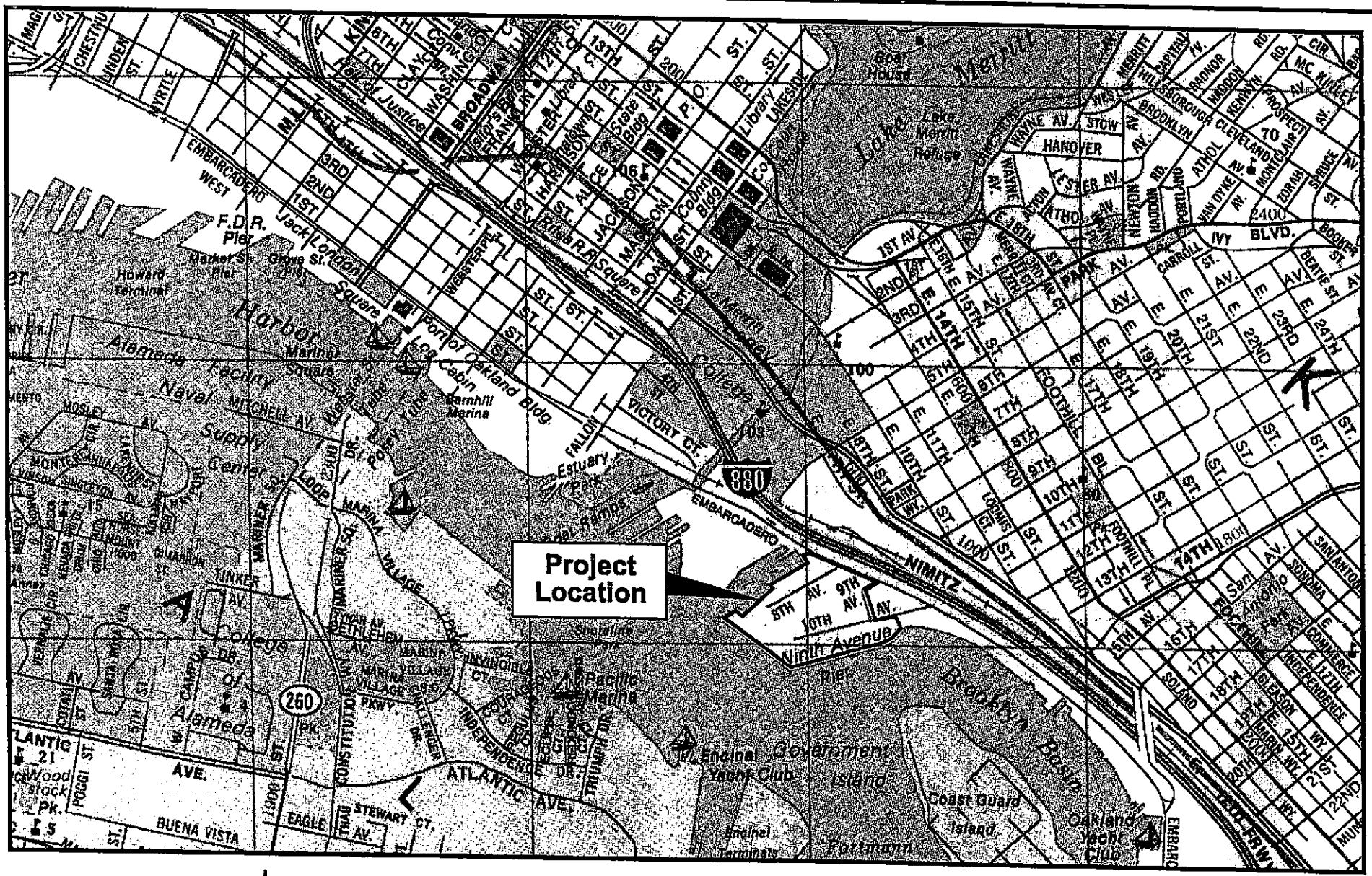

Figure 1
Vicinity Map
Port of Oakland
Ninth Avenue Terminal

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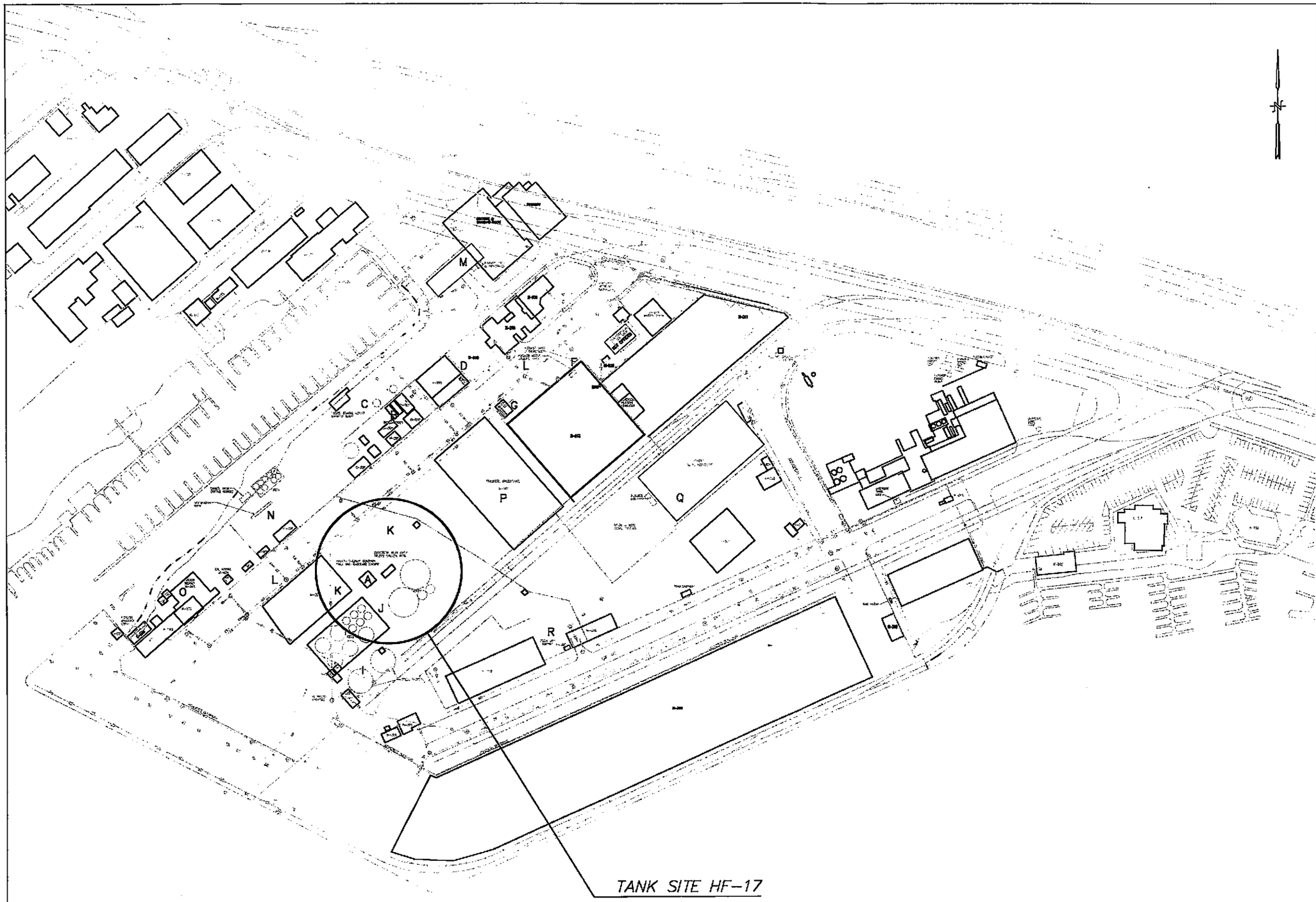


LEGEND:

- DEMOLISHED BUILDING
- EXISTING BUILDING
- EXISTING BUILDING FOUNDATION
- FENCE LINE
- RAILROAD
- BOUNDARY LINE
- EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- FORMER ABOVE OR UNDERGROUND STORAGE TANK

GRAPHIC SCALE

NINTH AVENUE TERMINAL
PORT OF OAKLAND
UST HF-17
TANK LOCATION

GAIA consulting, inc.

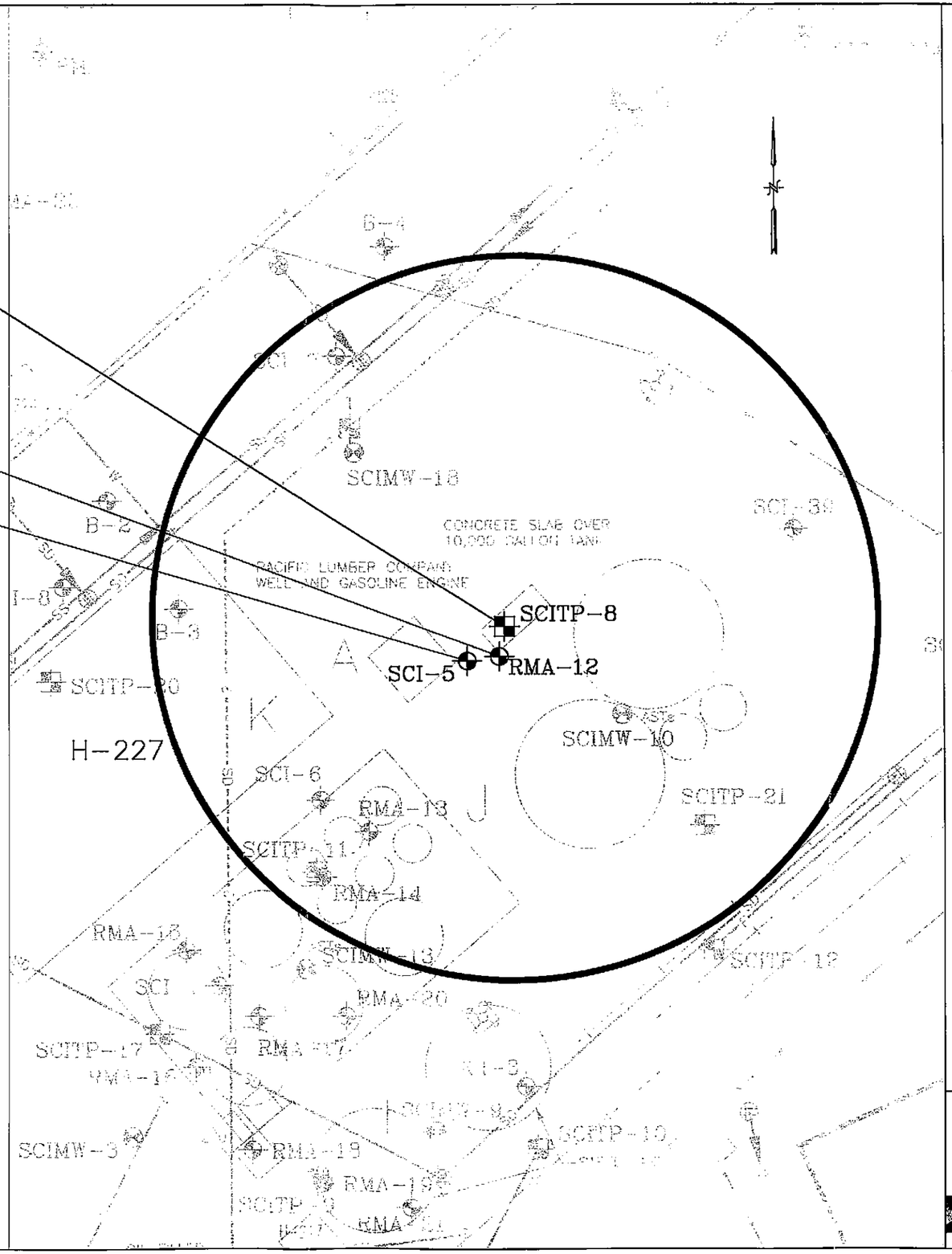
Project No.	Figure
168344	2

Plot Date: 09-03-02 Filename: TANKLOC_FIG2-HF-17.Dwg

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	AROCLOR 1260	Total PNAs
SCITP–8@4.5	<1	10YH	120H	<0.005	––	––
SCITP–8@6	<1	32YH	340	<0.005	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	AROCLOR 1260	Total PNAs
RMA–12@6.5	<10	<10	––	––	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	AROCLOR 1260	Total PNAs
SCI–5@3.5	<1	47YH	71Y	<0.005	––	––



GRAPHIC SCALE

0 50 100 150

LEGEND:

- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- DEMOLISHED BUILDING
- EXISTING BUILDING
- EXISTING BUILDING FOUNDATION
- FENCE LINE
- RAILROAD
- BOUNDARY LINE
- OVERHEAD LIGHT STANDARD
- EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- FORMER ABOVE OR UNDERGROUND STORAGE TANK
- <0.005 — COMPOUND NOT DETECTED AT THE REFERENCED DETECTION LIMIT
- ND — NOT DETECTED
- –– — NOT ANALYZED
- TPH–d — DIESEL–RANGE PETROLEUM HYDROCARBONS
- TPH–g — GASOLINE–RANGE PETROLEUM HYDROCARBONS
- TPH–mo — MOTOR OIL RANGE PETROLEUM HYDROCARBONS
- PNAs — POLYNUCLEAR AROMATICS
- BTEX — BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES
- Y — SAMPLE EXHIBITS FUEL PATTERN WHICH DOES NOT RESEMBLE STANDARD
- H — HEAVIER HYDROCARBONS THAN INDICATED STANDARD

NOTE: ALL CONCENTRATIONS IN mg/kg

NINTH AVENUE TERMINAL
PORT OF OAKLAND
UST HF–17
SOIL DATA

GAIA consulting, inc.

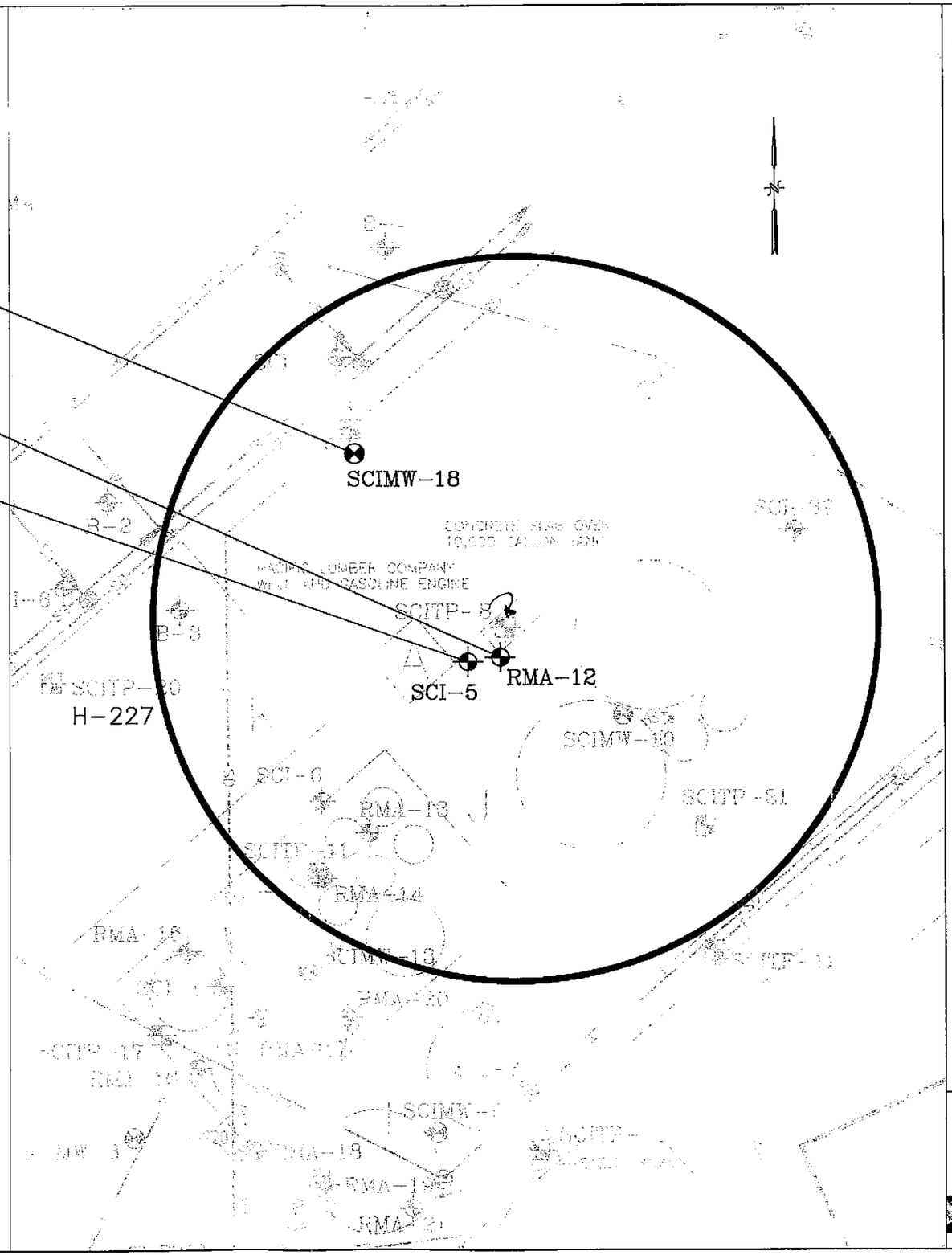
Project No.	Figure
168344	3

Plot Date: 09–03–02 Filename: 02SOILFIG3–HF–17.Dwg

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
SCIMW–18	––	<50	<300	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
RMA–12	<500	53,900Y	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
SCI–5	250Y	35,000YHL	42,000YL	<25



GRAPHIC SCALE

0 50 100 150

LEGEND:

- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- DEMOLISHED BUILDING
- EXISTING BUILDING
- EXISTING BUILDING FOUNDATION
- FENCE LINE
- RAILROAD
- BOUNDARY LINE
- OVERHEAD LIGHT STANDARD
- EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- FORMER ABOVE OR UNDERGROUND STORAGE TANK
- <0.5 COMPOUND NOT DETECTED AT THE REFERENCED DETECTION LIMIT
- –– NOT ANALYZED
- TPH–d DIESEL–RANGE PETROLEUM HYDROCARBONS
- TPH–g GASOLINE–RANGE PETROLEUM HYDROCARBONS
- TPH–mo MOTOR OIL RANGE PETROLEUM HYDROCARBONS
- BTEX BENZENE, TOLUENE, ETHYL BENZENE, ABD TOTAL XYLENES
- Y SAMPLE EXHIBITS FUEL PATTERN WHICH DOES NOT RESEMBLE STANDARD
- H HEAVIER HYDROCARBONS THAN INDICATED STANDARD
- L LIGHTER HYDROCARBONS THAN INDICATED STADARD

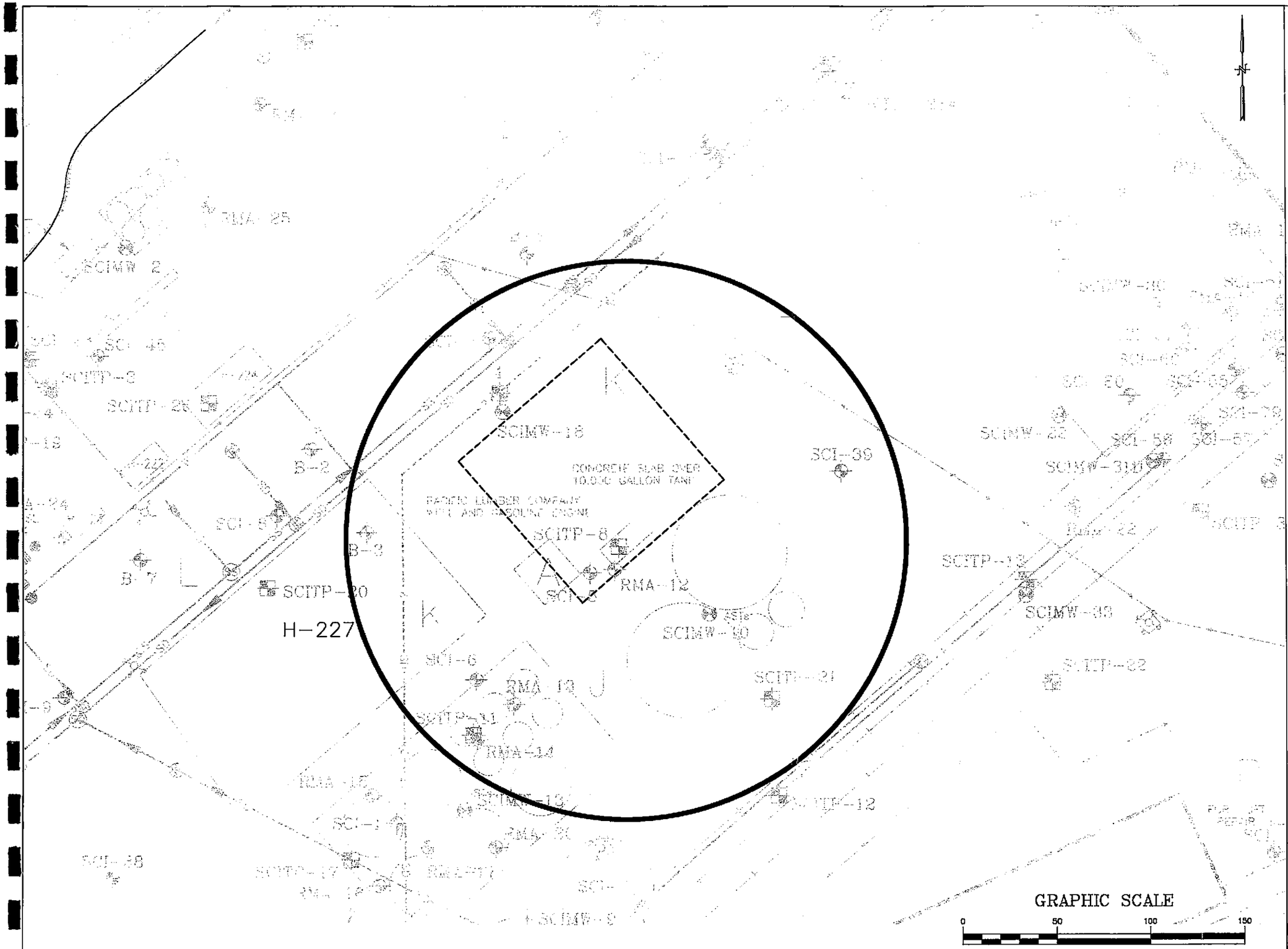
NOTE: ALL CONCENTRATIONS IN µg/L
MW LAST SAMPLED IN DECEMBER 2001

NINTH AVENUE TERMINAL
PORT OF OAKLAND
UST HF–17
GROUNDWATER DATA

GAIA consulting, inc

Project No.	Figure
168344	4

Plot Date: 09–03–02 Filename: 02GWFIG4–HF–17.Dwg



LEGEND:

- PROPOSED GEOPHYSICAL INVESTIGATION LOCATION
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- DEMOLISHED BUILDING
- EXISTING BUILDING
- EXISTING BUILDING FOUNDATION
- FENCE LINE
- RAILROAD
- BOUNDARY LINE
- OVERHEAD LIGHT STANDARD
- EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- FORMER ABOVE OR UNDERGROUND STORAGE TANK

NINTH AVENUE TERMINAL
PORT OF OAKLAND
UST HF-17
PROPOSED INVESTIGATION

GAIA consulting, inc.

Project No.	Figure
168344	5

Plot Date: 09-03-02 Filename: 02FIG5-HF-17.Dwg

APPENDIX A

3. **Site Description and Background (attach site map)**

Extensive site background including results of previous investigations can be found in the attached Work Plan in Sections 2.0 and 3.0.

4. **Planned Site Activities**

- Install four to eight soil borings using an 8-inch Hollow Stem Auger.
- Convert two borings to monitoring wells.
- Soil and groundwater sampling from borings/wells.
- Utility location (done by USA and private utility locator company).
- Removal of tank(s) if present.

5. **Chemical Data Summary**

__X__ Available Chemical Information has been requested from client.

See full table with details of all nearby boring and well location samples and analytical results on data table attached to Workplan.

Known Compounds	Source (soil/water/drum, etc.)	Known Concentrations Range (ppm, mg/kg, mg/l)	
		Lowest	Highest
TPH as gasoline (as diesel and motor oil also detected)	Water	250 ug/l	4,000,000 ug/l
Benzene (EBTX also detected)	Water	<0.5 ug/l	18 ug/l
Lead (other metals also detected)	Water	<3.0 ug/l	11 ug/l
TPH as gasoline (as diesel and motor oil also detected)	Soil	6.6 mg/kg	95 mg/kg
Lead (other metals also detected)	Soil	4 mg/kg	360 mg/kg

6. Potential Physical, Mechanical, Electrical, and Biological Hazards

(Check all boxes that potentially apply to the project)

X	Do not stand near backhoe, drill rig, and/or earthmoving equipment.
X	Wear hard hat, safety glasses, and steel toed boots when working around drill rig.
X	Use noise meter to survey area to determine if the OSHA PEL-TWA of 85 decibels is exceeded in any area. If so, mark area and use earplugs or earmuffs within area.
X	If noise survey is not performed as a precautionary measure, wear ear muffs or plugs when working within 25 feet of operating machinery.
X	Verify that all equipment is in good condition.
☐	Do not stand or walk under elevated loads or ladders.
X	Do not stand near unguarded excavation and trenches.
X	Do not enter excavation or trenches over 4 feet deep that are not properly guarded, shored, or sloped.
X	Consult Health and Safety Director if other mechanical hazards exist.
X	Discuss location of buried utilities with USA and private party utility locator.
X	Locate and mark buried utilities, and notify USA (Date: USA Tag No.
X	Have buried utilities cleared by private utility locating company.
X	Maintain at least 10-foot clearance from overhead power lines.
X	Contact utility company for minimum clearance from high voltage power lines. If unavoidably close to buried or overhead power line, have power turned off, with circuit breaker locked and tagged.
X	Wear protective gloves when handling samples (see Item #10)
☐	Avoid standing in water when operating electrical equipment.
☐	If equipment must be connected by splicing wires, make sure all connections are properly taped.
☐	Be familiar with specific operating instructions for each piece of equipment.
☐	Avoid contact with potentially infectious waste.
☐	Be aware of and avoid contact with potentially rabid animals.
☐	Use appropriate insect repellant to avoid disease carrying or poisonous insects. Avoid breathing dust in dry desert or central valley areas (valley fever, Hanta virus, etc.).

7. Health and Safety Procedures Required by the Facility

(Describe any client-specified safety requirements or check "Not Applicable" if there are none).

Work area may require wearing hard hat and safety vest while on site.

8. Special Procedures and Precautions

	Not Applicable.
☐	Obtain permit for confined space entry.
☐	Monitor oxygen and organic vapors before entering. If following values are exceeded, do not enter: (a. oxygen less than 19.5 percent or greater than 25%; b. LEL greater than 10%).
☐	If radiation meter indicates 2mR/hr or more, leave the area and consult DHS.
X	**Dust Suppression:** Stockpiled soil will be covered to prevent airborne conditions of affected soil.
☐	**Dust Suppression:** Dust suppression for vehicular traffic and earth moving operations will be implemented (area water spray).
☐	**Dust Suppression:** Perimeter ambient air monitoring will be used to analytically measure chemical concentrations of known constituents in fugitive dust. The laboratory analytical results will be used to determine that adequate dust control measures are employed to avoid off-site migration of contaminated dust.

9. Air Monitoring Procedures

Note: If applicable, see last page of this HSP for Total Dust Equivalency calculation instructions.

☐	**Not Applicable**	Because no chemical contamination or excessive dust is expected, no air monitoring will be performed.
X	**Volatile organics only** **Metal levels in soil are too low to warrant dust monitoring, thus only VOCs will be monitored.**	VOC concentrations in the breathing zone will be monitored using a PID or FID, during intrusive activities, or any time activities or site conditions change.
☐	**Uncontaminated dust only**; Total dust monitoring w/Real Time Dust Monitors	Monitoring will be performed when there is visual dust, using a Real Time Total Dust Meter, to detect if total dust levels are above the OSHA PEL for dust of 10 mg/m3.

☐	**Contaminated dust only;** Total dust monitoring w/Real Time Dust Monitors	To obtain current information about potential exposure conditions to contaminated airborne dust, Real Time Total Dust Meter(s) will be used to monitor the breathing zone or immediate work area. Calculations have been done to determine the total airborne dust level necessary to reach the Permissible Exposure Level (Cal/OSHA, PEL-TWA) of given it's highest known concentration in soil. The compound with the highest soil concentration, and the lowest PEL is _____. Subsequently, it has the lowest Total Dust Equivalency Level of _____. This is the amount of total dust necessary in the breathing zone to create an inhalation exposure exceeding the PEL of _____. Since, the number is **above/below** the OSHA PEL for simple Nuisance Dust/Particulate (non-toxic) of 10 mg/m3, then the Action Level to upgrade to respiratory protection during site activities will be the more conservative limit, mg/m3. See item #10 for a detailed description of Action Levels, Activities, and corresponding PPE.

☐	**Volatile organics and uncontaminated dust**	VOC concentrations in the breathing zone will be monitored using a PID or FID, during intrusive activities, or any time activities or site conditions change. Monitoring will be performed when there is visual dust, using a Real Time Total Dust Meter, to detect if total dust levels are above the OSHA PEL for dust of 10 mg/m3.

☐	**Volatile organics and contaminated dust**	VOC concentrations in the breathing zone will be monitored using a PID or FID, during intrusive activities, or any time activities or site conditions change. To obtain current information about potential exposure conditions to contaminated airborne dust, Real Time Total Dust Meter(s) will be used to monitor the breathing zone or immediate work area. Calculations have been done to determine the total airborne dust level necessary to reach the Permissible Exposure Level (Cal/OSHA, PEL-TWA) of _____ given its highest known concentration in soil. The compound with the highest soil concentration, and the lowest PEL is __. Subsequently, it has the lowest Total Dust Equivalency Level of_____. This is the amount of total dust necessary in the breathing zone to create an inhalation exposure exceeding the PEL of _____. Since, the number is **above/below** the OSHA PEL for simple Nuisance Dust/Particulate (non-toxic) of 10 mg/m3, then the Action Level to upgrade to respiratory protection during site activities will be the more conservative limit, _____ mg/m3. See item #10 for a detailed description of Action Levels, Activities, and corresponding PPE.
☐	**Methane**	Methane will be monitored using an LEL/O2 meter (Combustible Gas Indicator such as a GasTech) during excavation or confined space activities, to protect against explosion hazards. Methane is an asphyxiant and is not considered to be an inhalation hazard.

10. Action Levels

☐	**Not Applicable (No air monitoring will be performed)**

Note: If PID/FID readings in the breathing zone exceed 5 ppm consistently and Level C is required, contact the Project Manager before proceeding.

Volatile Organics		**PID/FID**	
	Activities/Locations	**Action Level**	**Level of Protection**
X	Trenching/Drilling/ Sampling of soil and groundwater	0 to 15 ppm	Level D with steel toed boots, safety glasses, hard hat, and latex inner gloves and nitrile or neoprene outer gloves or nitrile index gloves. Regular or polycoated Tyvek is optional.
		15 to 50 ppm	Level C: Level D as above plus a half face respirator with organic vapor/dust combination cartridges, and chemical/safety goggles, and polycoated tyvek.
		50 to 250 ppm	Level C as above EXCEPT with a Full FACE respirator.
		> 250 ppm	Upgrade to Level B or Cease operations until vapors dissipate and readings are below 200 ppm.

Uncontaminated Dust		Total Dust Meter	
	Activities/Locations	**Action Level**	**Level of Protection**
☐	Drilling/sampling of soil and groundwater	0<10 mg/m3	Level D with steel toed boots, safety glasses, hard hat, and latex inner gloves and nitrile or neoprene outer gloves. Regular or polycoated Tyvek is optional.
		> 10 mg/m3	Level C: Level D as above plus a half face respirator with dust/mist cartridges, chemical goggles, and regular or polycoated tyvek. Or use dust suppression methods.

Contaminated Dust		Total Dust Meter	
	Activities/Locations	**Action Level**	**Level of Protection**
☐	Drilling/sampling of soil and groundwater	0<10 mg/m3 or _____ mg/m3 level calculated in Item #9	Level D with steel toed boots, safety glasses, hard hat, and latex inner gloves and nitrile or neoprene outer gloves. Regular or polycoated Tyvek is optional.
		>10 mg/m3 or _____ mg/m3 level calculated in Item #9	Level C: Level D as above plus a half face respirator with dust/mist cartridges, chemical goggles, and regular or polycoated tyvek. Or use dust suppression methods.

Other			
	Activities/Locations	**Action Level**	**Level of Protection**
☐	Drilling/sampling of soil and groundwater		

11. Decontamination

☐	**Not Applicable.**
X	**General:** A designated decontamination area will be setup within the Contamination Reduction Zone prior to the commencement of work. The designated area will accommodate both personnel and vehicles that have been in the Exclusion Zone and then pass through the Contamination Reduction Zone to enter the Support zone.
X	**Specific:** Set up decon as necessary before work begins. Decon in the following order (as appropriate): Wash/Rinse/Remove: Outer boots, outer gloves, tyvek, respirator, inner gloves. Wash and rinse hands and face.

12. Sample Handling and Investigation – Derived Waste Management

☐	Chemical contamination not suspected. If contamination is encountered, contact the project manager regarding special sample handling or waste management requirements.
X	Sample contamination known or suspected. Wear gloves when handling samples.
X	Place soil cuttings and equipment rinsate wastewater in labeled 55 gallon drums or other appropriate containers.

13. Emergency Contacts (names and telephone numbers)

Police:	911
Fire:	911
Ambulance:	911
Hospital: Alameda Hospital	510-522-3700
Facility Health and Safety Officer (if applicable):	
GAIA Health and Safety Director:	June Dougherty 510-774-6972

Written Directions to Nearest Hospital (attach route map)

See attached written directions and map.

14. **By my signature below, I hereby indicate that I have read and understand this HSP and I agree to follow the guidelines therein.**

Name (Print) Name (Signature) Date

TO THE SUBCONTRACTOR: ***This plan has been prepared solely for the use of GAIA Consulting personnel. It is supplied to you for informational purposes only. You are responsible for your own health and safety program.***

15. Checklist

This HSP contains the following attachments.

X Site Map

X Hospital Route Map

X Data/Sample Results (see workplan)

16. Signatures

Note: For sites with known or suspected chemical contamination, the HSP must be reviewed and approved by the Health and Safety Director or her designee.

Laura Dougherty 7/24/02

GAIA Consulting, Inc. Health and Safety Director Date

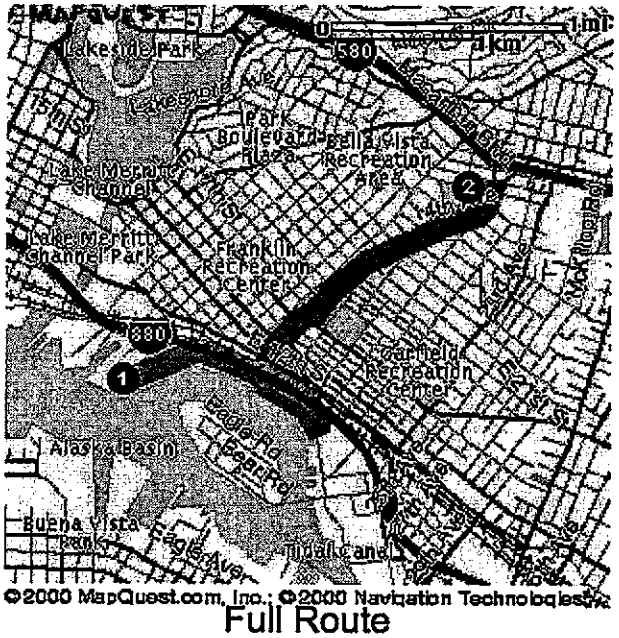
YAHOO! Maps

Welcome, czeff7

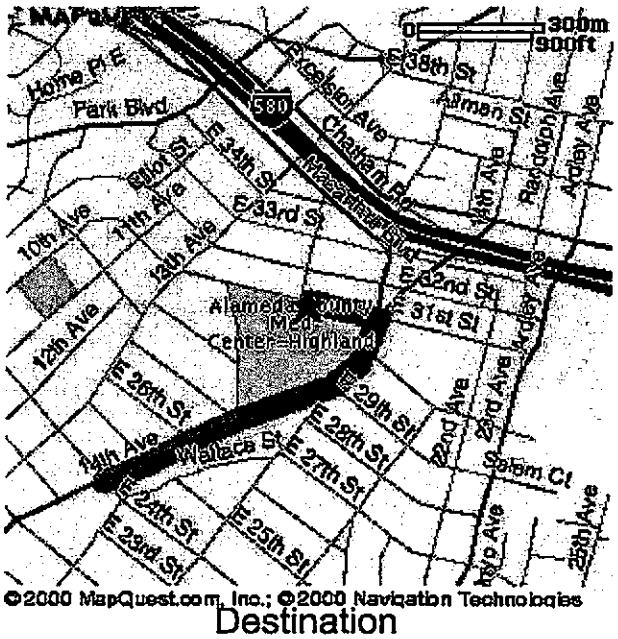
Yahoo! Maps - Driving Directions

Starting from: 101 10th Ave, Oakland, CA 94606-5135
Arriving at: ★ 1411 E 31st St, Oakland, CA 94602-1018
Distance: 2.7 miles **Approximate Travel Time:** 8 mins

- Email Directions
- Get Reverse Directions
- Text Only Driving Directions

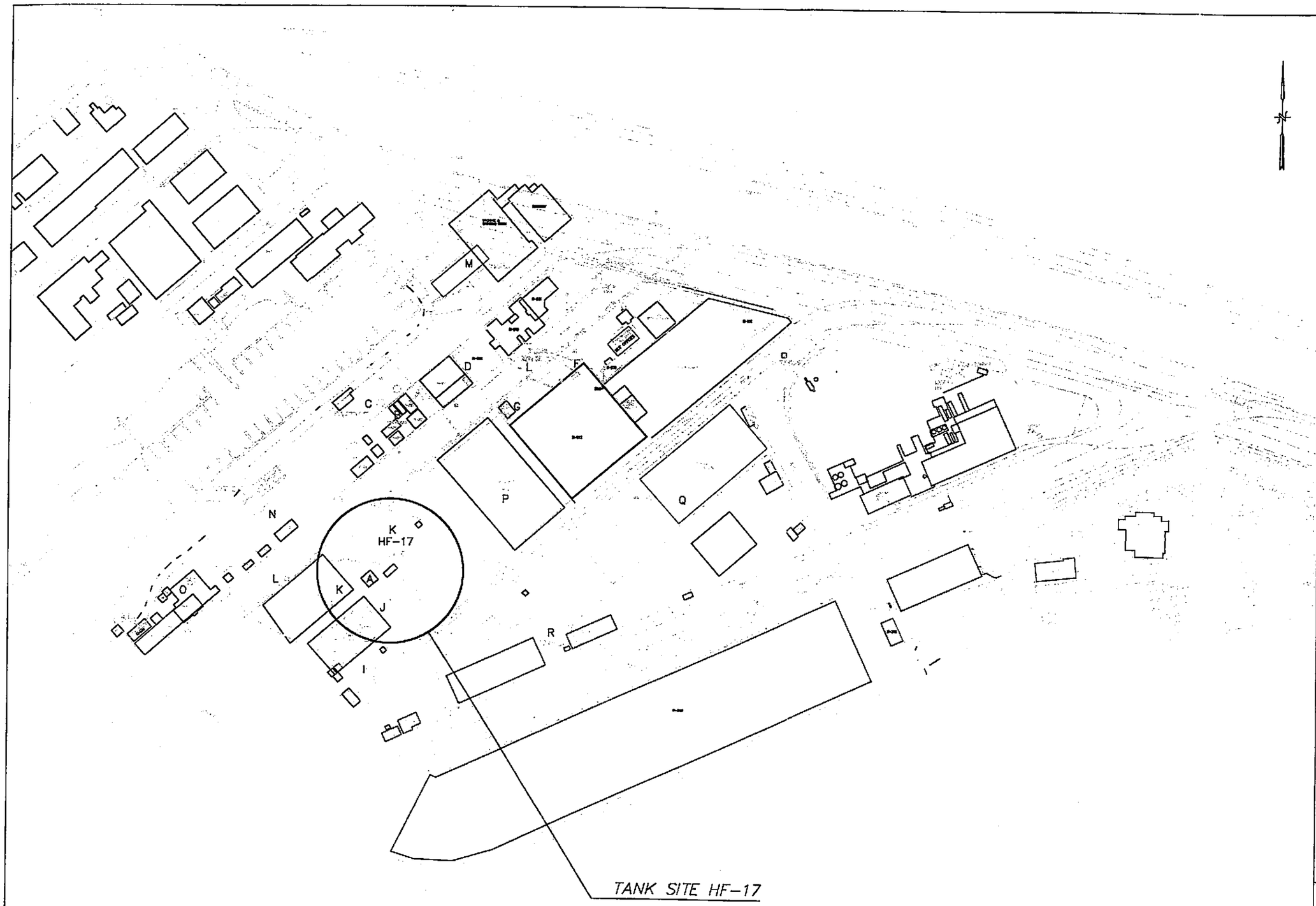


Full Route



Destination

	Directions	Miles
1.	Start out going Northeast on **10TH AVE** towards **DEFREMERY AVE.**	0.3
2.	Take the **I-880 SOUTH** ramp towards **SAN JOSE.**	0.1
3.	Merge onto **I-880 S.**	0.2
4.	Take the **EMBARCADERO** exit towards **16TH AVE.**	0.1
5.	Turn LEFT onto **EMBARCADERO E.**	0.2
6.	Turn LEFT onto **16TH AVE.**	0.3
7.	Turn LEFT onto **E 12TH ST.**	0.1
8.	Turn RIGHT onto **14TH AVE.**	0.3
9.	Turn SLIGHT LEFT onto **15TH AVE.**	0.1
10.	Turn SLIGHT RIGHT onto **14TH AVE.**	0.8
11.	Turn LEFT onto **E 31ST ST.**	0.1



LEGEND:

- DEMOLISHED BUILDING
- EXISTING BUILDING
- EXISTING BUILDING FOUNDATION
- FENCE LINE
- RAILROAD
- BOUNDARY LINE
- EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- FORMER ABOVE OR UNDERGROUND STORAGE TANK

GRAPHIC SCALE

NINTH AVENUE TERMINAL
PORT OF OAKLAND
TANK HF-17
TANK LOCATION

	Project No.	Figure
	168344	

Plot Date: 07-23-02 Filename: TANKLOC_FIG2-HF-17.Dwg