PORT OF OAKLAND

Alameda County
MAY 28 2003
Environmental Health

May 22, 2003

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

RE: Final Site Investigation Workplan (Including Signed, Stamped Transmittal Letter)
UST Site HF-02 at Building H-213 - Ninth Avenue Terminal, Oakland, CA

Dear Mr. Chan:

As you may remember, you previously met with Douglas Herman of the Port and Susanne von Rosenberg of GAIA, the Port's consultant, to discuss underground storage tank (UST) cases at 9th Avenue Terminal and the development of workplans for remediation of various sites. Please find enclosed for your review the Final Site Investigation Workplan for UST Site HF-02 at Building H-213. A signed, stamped transmittal letter is also enclosed. The workplan and letter are being submitted in accordance with Alameda County Health Care Services Agency (ACHCSA) requirements.

We are prepared to implement the workplan as soon as approval is received from you office. If you have any questions, please do not hesitate to contact me at (510) 627-1134.

Sincerely,

Jeffrey L. Rubin, CPSS, REA
Port Associate Environmental Scientist
Environmental Health and Safety Compliance

Enclosure: Final Site Investigation Workplan - UST HF-02 at Building H-213
Signed, Stamped Transmittal Letter for Workplan

Cc (w/o encl.): Susanne von Rosenberg, GAIA
Jeriann Alexander, Fugro West
Jonathan Redding, Wendel Rosen Black & Dean
Michael Ghielmetti, Signature Properties
Jack Hochwarter, Zurich American
Diane Mims, URS Corporation
Gretchen Snoey, Lowney Associates
Anona Dutton, Erler & Kalinowski, Inc.
Lydia Huang, Baseline Environmental
Diane Heinze, Port of Oakland, EH&SC

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May 19, 2003

Mr. Jeff Rubin
Port of Oakland
530 Water Street
Oakland, California 94607

SUBJECT: **Final Site Investigation Work Plan for UST Site HF-02 at Building H-213 Ninth Avenue Terminal, Oakland**

Dear Mr. Rubin:

GAIA Consulting, Inc (GAIA) is pleased to present this final site investigation work plan, dated May 13, 2003, for underground storage tank HF-02 located adjacent to Building H-213 at the Ninth Avenue Terminal. The work plan has been reviewed and approved by the Port and is ready for submittal to Alameda County.

We appreciate the opportunity to serve the Port of Oakland on this project. Please contact me at (510) 663-4177 if you have any questions.

Cordially,
GAIA Consulting, Inc.

Susanne M. von Rosenberg, P.E.
Project Manager

CH2M HILL

Keith Sheets, R.G.
Senior Geologist

cc: Jeriann Alexander, Fugro West
Michael J. Ghielmetti, Signature Properties
Jack Hotchwarter, Zurich American
Diane Mims, URS Corporation
Jonathan Redding, Wendel Rosen Black & Dean
Gretchen Snoey, Lowney Associates

Alameda County
MAY 28 2003
Environmental Health

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FINAL SITE INVESTIGATION WORK PLAN

UST SITE HF-02 at Building H-213

Ninth Avenue Terminal

May 13, 2003

Prepared for:
Port of Oakland
530 Water Street
Oakland, California 94607

Prepared by:

GAIA consulting, inc.

GAIA Consulting, Inc.
2101 Webster Street, 12th Floor
Oakland, California 94612

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1.0 INTRODUCTION

The Port of Oakland (Port) has prepared this workplan for underground storage tank (UST) site HF-02 and AST Site H-213, located at Building H-213 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 on 8th Avenue, approximately 200 feet south of Embarcadero Road. This UST/AST site is part of a larger area, the Oak to Ninth District, which will be redeveloped. The redeveloped property would encompass 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 a concentration of housing at appropriate densities (e.g., 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-02/AST Site H-213 site prior to initiation of site redevelopment activities. This workplan is a combined UST and AST workplan, as the proximity of the two sites means that the UST and AST sites cannot be investigated or remediated separately. 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 UST Site HF-02/AST Site H-213 background and description, and geologic setting information;
- Section 3.0 – Previous Site Investigations and Results – presents a description of site investigation activities conducted at UST Site HF-02/AST Site H-213 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;
- 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-02/AST Site H-213.

The information presented in this workplan integrates information from prior reports and draws on studies conducted by the Port and by others. All reports relevant to this workplan are listed in bold in Section 8. 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 facility has been owned by the Port since at least the late 1920s. The Terminal

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

study area is an irregularly shaped parcel of land, encompassing approximately 25 acres 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/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. There are several storm drains in the vicinity of the tank site, and these storm drains are known to have acted as conduits for migration of diesel fuel. Sanitary sewer improvements consist of laterals extending from buildings to main sewer lines below Eighth and Tenth Avenues. The sanitary sewer main lines flow toward a large collector pipe under Embarcadero Road. 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 tidal 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 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-02/AST Site H-213 is located in the southern portion of Area F (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 bgs). Based on the limited number of deeper borings installed, the Young Bay Mud in this area extends to depths of 23 to 27 feet below ground surface (bgs) in the area of the Ninth Avenue Terminal. It is underlain by another series of clay layers. Immediately below the Young Bay Mud is a thin layer of a stiff greenish clay approximately 3 feet thick. This layer 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 bgs. Groundwater elevation contours for the Years 1999, 2000, and 2001 are found in references 38, 41, and 43. Groundwater elevation contour patterns have remained relatively consistent since 1996. 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, indicating confined conditions exist at that depth. The groundwater elevation recorded in well SCIMW-31D was approximately 3 feet higher than the elevation recorded in the shallow wells in the same area, which indicates an upward gradient (SCI 1998).

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 shoreline, which is not protected by the concrete bulkhead. Very minor changes in groundwater levels were recorded approximately 10 feet from the bulkhead during tidal changes. The tank site is located approximately 350 east of the Clinton Basin shoreline; thus no direct tidal influence is expected at this site.

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 TANK SITE HISTORY AND PREVIOUS SITE INVESTIGATIONS

Tank Background

This tank site was identified as a result of a diesel fuel release. In October 1992 the United States Coast Guard (USCG) found diesel fuel in the Clinton Basin. A subsequent investigation by the Port identified diesel fuel in the storm drains at the Ninth Avenue Terminal, and the Port immediately began remediation and clean up activities of the storm drains. Subsequent investigations by the Port indicated the source of diesel fuel to be a leaking underground piping system associated with a diesel aboveground storage tank (AST) used by Keep on Trucking (KOT). The AST was located immediately adjacent to the northeast corner of Building H-213. Video footage of the storm drains identified a section of broken pipe in the vicinity of the source area; subsequent excavations confirmed the breakage.

Large planks of wood were discovered in various parts of the excavation, at depths of approximately one to three feet below the depth of the leaking underground pipe. These planks were apparently remnants of an old pier and acted as conduits for the lateral movement of the diesel fuel through the Bay Mud. Many of the planks led directly to the shattered portions of the storm drain. Diesel fuel entered the storm drain in these locations and flowed toward the outfall to the Oakland Inner Harbor, approximately 1,000 feet west beneath the Ninth Avenue Terminal. Bay currents pushed the floating product northward into the Clinton Basin where it was discovered by the USCG.

From November 1992 through April 1993, Uribe and Associates (Uribe) conducted subsurface investigations within the vicinity of the leaky underground piping system. The underground piping from the AST and the diesel fuel dispenser system was completely uncovered and a pinhole size leak was discovered. The dispenser system was consequently taken out of service in December 1992. In April 1993, Uribe excavated and removed the AST piping and the contaminated soil in the vicinity of the fuel dispenser area. The area was excavated to a depth of 10 feet. The excavation was bounded to the west-northwest by the storm drain line, to the east by the lateral loop, and to the south by Building H-213 (Figure 3). The former section of cannery line located to the north of the fuel system area was also removed. During excavation activities, a previously unknown 1,000 gallon underground storage tank (UST), approximately eight feet long by four feet wide, was discovered slightly west of the fuel system

associated with the AST. The UST, which historically stored diesel, was removed. There were no connections between the AST piping system and the UST, although it is believed that the piping to the fuel dispenser was formerly connected to the UST.

During the excavation, soil and groundwater from the UST/AST area was tested for total petroleum hydrocarbons as diesel (TPH-d), and benzene, toluene, ethyl benzene and total xylenes (BTEX). The extent of the excavation was determined by the results of the testing. The area was excavated to non-detect levels for TPH-d, except for an area located along the excavation wall directly adjacent to Building H-213. A sample collected along the southern wall beneath the damaged elbow of the AST pipeline had a TPH-d concentration of 210 mg/kg. The building foundation prevented further excavation southward. A representative from Alameda County was present during the removal of the UST and the soil excavation. The UST that was removed was in excellent condition with no apparent holes or leaks, which indicated that the UST itself was not a source of the diesel release. The Alameda County representative determined that no further excavation was needed in the area. A total of 450 cubic yards of contaminated soil was removed from this location. After the UST excavation was complete, four monitoring wells, MW-1, MW-2, MW-3, and MW-4, were installed in September 1993 around the perimeter of the excavation. No fresh diesel has entered the storm drains or Clinton Basin since KOT's AST dispenser system was taken out of service.

The UST and AST sites at Building H-213 are closely linked. Although the UST was removed and little contamination was found in the immediate vicinity of the UST, the UST was located only 20 feet north of the AST. Thus, it is not possible to effectively separate the two sites. In addition, while the AST piping was the probable source of the diesel fuel to the subsurface in this area, diesel fuel from the AST was able to enter the UST through an open bung directly beneath the damaged elbow of the AST. Because the UST and AST sites at Building H-213 are so closely linked, this workplan addresses the combined UST/AST site. Data relevant to UST Site HF-02/AST Site H-213 are presented in Tables 1 through 6, and are presented in Figures 3 and 4.

Investigation Results and History

This tank site has received the most extensive investigation of any of the tank sites on the Ninth Avenue Terminal. Soil and groundwater sampling were first conducted in 1992; groundwater monitoring has been on-going since 1994. There are 23 sample locations located within 75 feet of the UST/AST site; another 17 are located within 75 to 150 feet of the site. Six of the 17 sample locations located within 75 to 150 feet of this UST/AST site are considered to be associated with USTs HF-12 and HF-13 (the Cannery tanks at Building H-211) which are located less than 100 feet to the northeast. The relevant sample locations applicable to this UST/AST site are summarized below.

Type of Sample	Within 75 Feet	Within 75 to 150 Feet
Borings	B-11, B-12, B-13, B-15, B-16, B-17, RMA-4, RMA-5, RMA-8, RMA-9, SCI-22, SCI-23, SCI-24, SCI-25	B-5, B-6, B-14, SCI-16, SCI-28, SCI-36*, SCI-37* SCI-65, RMA-7*
Test Pits/Pot Holes/ Trenches	None	Trench 1 (no data), SCIPH-1*, SCIPH-2*, SCITP-5* SCITP-35, SCITP-37
Monitoring Wells	MW-1, MW-2, MW-3, MW-4, MW-5, MW-6	SCIMW-26, SCIMW-29

*These sample points are associated with USTs HF-12 and HF-13.

Six monitoring wells (MW-1 through MW-6) surround the UST/AST area. Groundwater flow has generally been toward the north-northwest in this area; however, the localized groundwater flow direction has fluctuated. Based on the available data, this UST/AST site is generally located in a

groundwater depression centered around monitoring wells MW-1/MW-3, located northwest of the former UST/AST. Monitoring well MW-4 which is located south of the former UST and within the footprint of former Building H-213, has had higher groundwater elevations than the other five wells in the area. The reason for the groundwater depression in this area has not been explained; however, it may be associated with the numerous sewer lines located in this area.

Soil and groundwater samples from the vicinity of this UST/AST area have been analyzed for total petroleum hydrocarbons as gasoline (TPH-g), as diesel (TPH-d), and as motor oil (TPH-mo). They have also been analyzed for total recoverable petroleum hydrocarbons (TRPH), benzene, ethylbenzene, toluene, and xylene (BTEX), other volatile organic compounds (VOCs), and metals. Several soil and groundwater samples were analyzed for pesticides and PCBs, and two groundwater samples each were analyzed for semivolatile organic compounds (SVOCs) and methyl-tertbutyl ether (MTBE).

The sample data indicate that TRPH, VOCs, metals, MTBE, pesticides/PCBs, and SVOCs are not of concern for this UST/AST site. In addition, BTEX are not of concern in soil; the maximum detected concentrations were less than 0.1 mg/kg. Concentrations of BTEX in groundwater were correlated with the presence of free product in well MW-4. Due to the presence of free product in this well during each monitoring event, the well has not been sampled since 1996. Monitoring well MW-6, which also contains free product and has not been sampled since 1997, has only had low levels (less than 20 µg/L) of BTEX constituents. Concentrations of BTEX in the remaining wells were very sporadic, and all below 5 µg/L. Thus, constituents of concern at this UST/AST site are limited to TPH-g, TPH-d, and TPH-mo. TPH-g is only of concern in groundwater (the highest concentration detected in soil was 240 mg/kg; all other detections in soil were less than 100 mg/kg).

Elevated levels of TPH in soil and groundwater are found primarily south and southeast of the former UST/AST area. The extent of contamination in soil is bounded to the west-southwest (SCI-22, MW-3, SCITP-37), north-northwest (MW-1 and B-13), and northeast-east (borings MW-2, RMA-8, B-11, B-12, and B-15). However, the extent of groundwater contamination associated with this tank site has not been fully defined.

In soil, the highest concentrations of TPH-d and TPH-mo are found between 5 and 6.5 feet bgs, in samples collected from MW-4, MW-6, SCI-23, and SCI-25. Monitoring wells MW-4 and MW-6 (located south-southeast of the UST site) contain free product. TPH-d concentrations in groundwater at monitoring well MW-5 (located southeast of the UST and approximately 20 feet east of MW-4) have fluctuated over the past year. During the most recent round of sampling (Jan 2003), concentrations of TPH-d were elevated at 3,900 µg/L. Only low levels (180 mg/kg) of TPH-d were detected in soil at MW-5. Grab groundwater samples from borings RMA-4, SCI-23, SCI-25, B-16, and B-17 contained elevated levels of TPH constituents as well, ranging from 6,200 µg/L to 350,000 µg/L. Boring SCI-24, located approximately 60 feet south of the former UST and approximately 40 feet west of the storm drain line, also contained elevated levels of TPH compounds (1,100 µg/L) in groundwater. Soil samples however, were non-detect. TPH-g in groundwater was detected only in locations where high levels of TPH-d and/or TPH-mo in groundwater were also detected. The continuing presence of free product in wells MW-4 and MW-6 and the fluctuating levels of TPH-d in MW-5, suggests the presence of a residual source of TPH in this area. Sample locations MW-4, RMA-5, B-16, B-17, MW-5, MW-6, and SCI-25 are also located within 15 feet of a storm drain line. It is unknown whether this storm drain line or the backfill along the line is potentially acting as an on-going source or a conduit for contaminant migration.

SCIMW-29, located approximately 100 feet southeast of the UST/AST site and on the east side of the storm drain line, contained only 150 µg/L TPH-d when it was sampled in 1997; SCIMW-29, has only been tested for BTEX and MTBE since 1997. TPH-d and TPH-mo concentrations were less than 25

mg/kg in soil. The extent of contamination in this area does not appear to have impacted the soil or groundwater beyond 100 feet south-southeast of the UST/AST site.

The northeastern-eastern extent of contamination in soil is bounded by borings MW-2, RMA-8, B-11, B-12, and B-15. TPH compounds were not detected in soil samples from MW-2, RMA-8, B-11, B-12, and B-15. During the last four rounds of groundwater monitoring, TPH-d and TPH-mo in MW-2 (located north of the UST site) were not detected. No groundwater samples were collected from borings B-11 and B-12. TPH compounds were not detected in groundwater samples from RMA-8 and RMA-9 (no soil samples were collected from RMA-9). However, TPH-d was detected in groundwater at B-15 (located immediately adjacent to RMA-9 and approximately 50 feet east-northeast of the UST site) at a concentration of 2,700 µg/L. The extent of groundwater contamination to the east-northeast of the UST/AST area still needs to be defined.

One boring and one monitoring well (B-13 and MW-1) are located to the north-northwest of the UST/AST area. MW-1 contained less than 10 mg/kg of TPH-d in soil. Boring B-13, located approximately 15 feet northeast of MW-1 contained insignificant levels of TPH-d in soil as well. However, a grab groundwater sample taken from B-13 contained an elevated level (2,000,000 µg/L) of TPH-d. During the initial rounds of sampling at MW-1, elevated levels of TPH-d were detected. Concentrations of TPH-d were non-detect in 1998 and 1999; the well was abandoned in 2001. The extent of groundwater contamination to the north-northwest is undefined.

The southwestern extent of contamination in soil is bounded by SCI-22 and MW-3 (located approximately 25 to 50 feet to the west-southwest), and SCITP-37 (located 80-90 feet west-southwest from the former UST site). Soil samples from SCI-22 (located approximately 50 feet west-southwest of the UST/AST area) contained slightly elevated concentration of TPH-d and TPH-mo at 1,000 mg/kg and 810 mg/kg, respectively. The soil samples from MW-3 contained only low levels of TPH-d (maximum concentration of 120 mg/kg). Concentrations of TPH in soil at SCITP-37 were very low (less than 100 mg/kg total in each sample).

TPH–d concentrations in groundwater at MW-3 from 1994 through 1996 ranged from 460 µg/L to 2,100 µg/L; TPH-d has been non-detect during the last four monitoring events. The grab groundwater sample from SCI-22 contained high levels of TPH-d (13,000 µg/L) and TPH-mo (9,100 µg/L) as well. Groundwater samples were not collected from SCITP-37. A groundwater sample collected at SCITP-35, located approximately 120 feet to the southwest (within former Building H-213), contained 320 µg/L TPH-d and 320 µg/L TPH-mo. The extent of impacted groundwater to the west-southwest requires further definition.

4.0 DATA GAPS

Based on the results of the investigations and historical information discussed above, and the proposed future use of the property, several data gaps still exist before site closure can be completed. These data gaps are as follows:

- The extent of TPH in groundwater has not been fully defined to the north, west, south, and east of the UST/AST site.
- The potential effect of the sanitary sewer line located to the east of the site (running southeast to northwest) has not been fully evaluated. It is unknown whether this sewer line may be acting as a source of TPH constituents to groundwater in this area, and/or whether it is acting as a migration pathway.

Once these data gaps have been addressed, GAIA will either recommend additional work to characterize the site and/or recommend that formal closure be requested for this site.

5.0 PROPOSED INVESTIGATION PROGRAM

To address the data gaps outlined above, the Port of Oakland proposes to install seven borings in the vicinity of the UST/AST site. The boring locations are shown on Figure 5. The seven borings are intended to define the subsurface conditions to the west, south, north and east of the former tank area. In order to assess the impacts to soil and groundwater from around this UST site, two of the borings will be drilled on the east side of the lateral loop line, and one will be drilled on the north side of the storm drain line.

On-site personnel will be required to review the health and safety plan included in Attachment A prior to commencement of field activities. GAIA will also contact Underground Service Alert (USA) a minimum of 72 hours prior to drilling activities. In addition, GAIA will contract with a private utility locator to mark the vicinity of former Building H-213 where drilling is anticipated. GAIA will coordinate with the Port to obtain any necessary permits to complete the work.

All drilling and sampling equipment will be decontaminated between sample intervals to minimize the possibility of cross-contamination. All samples designated for chemical analysis will be handled and transported in accordance with proper regulatory protocol. All investigation-derived waste (IDW) will be properly labeled and contained in DOT-approved 55-gallon drums and stored on-site. The Port will have the IDW removed by their contractor for proper waste disposal.

Soil and Groundwater Sample Collection

Soil and groundwater samples will be collected using a Geoprobe-type truck-mounted hydraulically driven soil coring system. Direct-push borings will be drilled at seven locations to the southeast, south, southwest, north, east, and west of the tank location, as indicated on Figure 5. The borings will be advanced to approximately 12 feet bgs at each location (to 2 feet below first encountered groundwater). Up to two soil samples and one grab groundwater sample will be submitted for analysis from each boring, depending on field screening results. Additional soil and/or groundwater samples may be collected and held by the laboratory for follow-up analysis.

Soil samples will be collected with a stainless steel sample barrel attached to the drilling rod. The soil samples will be collected using a sampling barrel nested within a large diameter drive casing, which will be hydraulically advanced into the underlying soils. The smaller-diameter sampling barrel will be lined with polyethylene tubes that will be used to collect samples for chemical analysis and for lithologic description. The sampling barrel will be placed at the end of the sampling rods and inserted into the drive casing to collect undisturbed soil cores as the drive casing is driven into the underlying soils.

Soil sample tubes will be cut at the desired depth and immediately sealed with Teflon™ film and plastic caps, labeled and placed in a cooler. The remaining sample core will be used for lithologic description. The samples will be transported under chain-of-custody protocol to a state-certified analytical laboratory for chemical analysis. To monitor for evidence of contamination during drilling, a portion of the sample will be placed into resealable plastic bags, and the headspace will be monitored for volatile organic vapors using an organic vapor analyzer (OVA). In addition, the soil will be visually classified in accordance with the Unified Soil Classification System (USCS). Bentonite grout will be placed in the annular space utilizing a tremmie pipe to within 2 feet of the surface grade upon completion of each

boring. Each boring will be patched with asphalt. Each soil boring location will be measured from features at the Terminal that will ensure accurate mapping of the boring locations on site figures.

Groundwater samples will be obtained from each boring location, from near the top of the water table, if feasible. A temporary screened casing will be advanced into the soil by the direct-push sampling barrel, to allow groundwater to enter the boring. A disposable bailer will then be inserted into each casing to retrieve a groundwater sample. The samples will be immediately decanted into laboratory-supplied bottles and placed on ice in a cooler for delivery to the project laboratory.

All soil and grab groundwater samples from the borings will be analyzed for TPH-d, TPH-mo, and TPH-g using EPA Methods 8015M and BTEX using EPA Method 8021. Samples will also be analyzed for fuel oxygenates via EPA Methods 8260.

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 soil boring specifications 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 boring logs will be completed in the field to describe the lithology of each boring sample taken. 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 soil 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 drilling equipment will be used at each boring to prevent cross-contamination. The drilling equipment will be steam cleaned prior to arriving on site and between borings. The decontamination procedures for all down-hole drilling equipment will include removing residue by scraping, steam cleaning with a high-pressure steam washer, and air drying. 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 would be completed within two to three 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 investigation activities.

8.0 REFERENCES

Note: the references relevant to this report are shown in bold.

1. Arcadis Geraghty & Miller, Inc. *Results of Subsurface Vapor Characterization Activities, Port of Oakland, Ninth Avenue Terminal, Oakland, California*, June 1998.

2. Baseline. *Soil Sampling Activities, Midland Ross Corporation Facility, 845 Embarcadero*, January 1988.

3. Clayton Environmental Consultants. (Clayton 1993). *Subsurface Investigation at Liquid Carbonic Corporation, 901 Embarcadero, Oakland*, February 1993.

4. **Clayton Environmental Consultants. (Clayton 1994). *Work Plan for Limited Subsurface Investigation, Quarterly Sampling, and Free Phase Recovery at the Keep on Trucking Site,* December 1994.**

5. **Clayton Environmental Consultants. (Clayton 1995a). *Work Plan for Limited Subsurface Investigation at the Keep on Trucking Site,* February 1995.**

6. **Clayton Environmental Consultants. (Clayton 1996c). *Limited Subsurface Investigation at the Keep on Trucking Site,* June 22, 1995.**

7. **Clayton Environmental Consultants. (1995d). *Limited Subsurface Investigation at the Keep on Trucking Site,* July 1995.**

8. **Clayton Environmental Consultants. (Clayton 1995e). *Limited Subsurface Investigation, Quarterly Sampling, and Free Phase Product Recovery at the Keep on Trucking Site,* July 25, 1995.**

9. **Clayton Environmental Consultants. (Clayton 1996a). *July and November 1995 Quarterly Groundwater Sampling Report at Former Underground Storage Tank Facility, Keep on Trucking Facility,* February 1996.**

10. Clayton Environmental Consultants. (Clayton 1996b). *Groundwater Sampling at Liquid Carbonic Corporation, 901 Embarcadero, Oakland*, May 1996.

11. Cummings Environmental. *Closure Plan for Midland Ross Corporation Superstrut Division, 845 Embarcadero Road, Oakland, California*, May 1987.

12. Cummings Environmental. *Post Closure Report for Midland Ross Corporation Superstrut Division, 845 Embarcadero Road, Oakland, California*, August 1987.

13. Cummings Environmental. *Follow-up Report for Midland Ross Corporation Superstrut Division, 845 Embarcadero Road, Oakland, California*, December 1987.

14. Environ International Corporation. *Human Health Risk Assessment Work Plan, Ninth Avenue Terminal, Oakland California*, October 2001.

31. Subsurface Consultants Inc. (SCI 1997a). *December 1996 Quarterly Groundwater Sampling Report for Former Underground Storage Tank, Keep on Trucking Facility (H-107) 370 8th Avenue, Oakland, California*, Jan 9, 1997.

32. **Subsurface Consultants, Inc. (SCI 1997b). *Third Interim Report, Site Characterization, Ninth Avenue Terminal Study Area, Port of Oakland,* August 1997.**

33. **Subsurface Consultants, Inc. (SCI 1998). *Fourth Interim Report, Additional Site Characterization, October 1997 to June 1998, Ninth Avenue Terminal Study Area,* August 1998.**

34. **Subsurface Consultants, Inc. (SCI 1999a). *Groundwater Monitoring Report, September 1998 Event, Ninth Avenue Terminal, Oakland, California,* January 1999.**

35. **Subsurface Consultants, Inc. (SCI 1999b). *Groundwater Monitoring Report, December 1998 Event, Ninth Avenue Terminal, Oakland, California,* March 1999.**

36. **Subsurface Consultants, Inc. (SCI 2000a). *Groundwater Monitoring Program Report, May and August 1999 Events and October 1999 Waste Removal Activities, Ninth Avenue Terminal, Oakland, California,* March 2000.**

37. Subsurface Consultants, Inc. (SCI 2000b). *Memorandum - Preliminary Review of Environmental Conditions at 901 Embarcadero, Ninth Avenue Terminal, Oakland, California*, May 2000.

38. **Subsurface Consultants, Inc. (SCI 2000c). *December 1999 Annual Event, April 2000 Quarterly Event, Ninth Avenue Terminal, Oakland, California,* June 19, 2000.**

39. Subsurface Consultants, Inc. (SCI 2000d). *Memorandum - Preliminary Review of Supplemental Documents Regarding Environmental Conditions at 901 Embarcadero, Ninth Avenue Terminal, Oakland, California*, September 2000.

40. Subsurface Consultants, Inc. (SCI 2001a). *Results of Soil Gas and Surface Vapor Flux Testing Study, Port of Oakland, Ninth Avenue Terminal, Oakland, California*, March 2001.

41. **Subsurface Consultants, Inc. (SCI 2001b). *Groundwater Monitoring Program Report, October 2000 Annual Event, Ninth Avenue Terminal, Oakland, California,* April 13, 2001.**

42. **Subsurface Consultants, Inc. (SCI 2001c). *Groundwater Monitoring Program Report, May 2001 Semi-Annual Event, Ninth Avenue Terminal, Oakland, California,* November 30, 2001.**

43. **Subsurface Consultants, Inc. (SCI 2002a). *Groundwater Monitoring Program Report, November 2001 Annual Event, Ninth Avenue Terminal, Oakland, California,* June 26, 2002.**

44. **Subsurface Consultants, Inc. (SCI 2002b). *Groundwater Monitoring Program Draft Tables, July 2002 Semi-Annual Event, Ninth Avenue Terminal, Oakland, California,* September 20, 2002.**

45. **Subsurface Consultants, Inc. (SCI 2003). *Groundwater Monitoring Program Draft Tables, January 2003 Annual Event, Ninth Avenue Terminal, Oakland, California,* March, 2003.**

46. Tetra Tech. *845 Embarcadero,Hazardous Waste Removal,* June 1991.

47. United States Environmental Protection Agency. Memorandum from Director, Surveillance & Analysis Division regarding 1973 Oil Spill from Port Petroleum, Ref: ER 10.5, undated.

48. **Uribe & Associates. (U&A 1992a).** ***Storm Drain Investigation Work Plan,*** **December 1992.**

49. JR Associates for Uribe & Associates. (U&A 1992b). *Geophysical Investigation at the Keep on Trucking Site, Port of Oakland,* Dec 15, 1992.

50. **Uribe & Associates. (U&A 1993a).** ***Source Investigation Summary and Workplan to Delineate Soil and Groundwater Contamination,*** **January 1993.**

51. **Uribe & Associates. (U&A 1993b).** ***Report of the Source Area Primary Pathway Investigation at Keep on Trucking, 370 8th Avenue, Oakland, California,*** **March 1993.**

52. **Uribe & Associates. (U&A 1993c).** ***Report of the Source Area Primary Pathway Investigation at Keep on Trucking,*** **March 30, 1993.**

53. **Uribe & Associates. (U&A 1993d).** ***Investigation of Diesel Spill at Keep on Trucking, 370 8th Avenue, Oakland, California,*** **April 1993.**

54. **Uribe & Associates. (U&A 1993e).** ***Weekly Summary of Investigation Activities at Keep on Trucking Company, Inc. Facility,*** **March 7 through March 20, 1993, March 21 through April 3, 1993.**

55. **Uribe & Associates. (U&A 1993f).** ***Summary of Investigation Activities at Keep on Trucking Company, Inc. Facility,*** **April 3 through May 1993.**

56. **Uribe & Associates. (U&A 1993g).** ***Final Report: Report of Monitoring Well Installations at Keep on Trucking,*** **Dec 2, 1993.**

57. **Uribe & Associates. (U&A 1994a).** ***Report of Quarterly Groundwater Monitoring at Keep on Trucking,*** **February 9 1994, July 27, 1994, and August 26, 1994.**

58. **Uribe & Associates. (U&A 1994b).** ***Quarterly Groundwater Monitoring Report,*** **July 18,1994, August 26, 1994, and November 1994.**

FIGURES

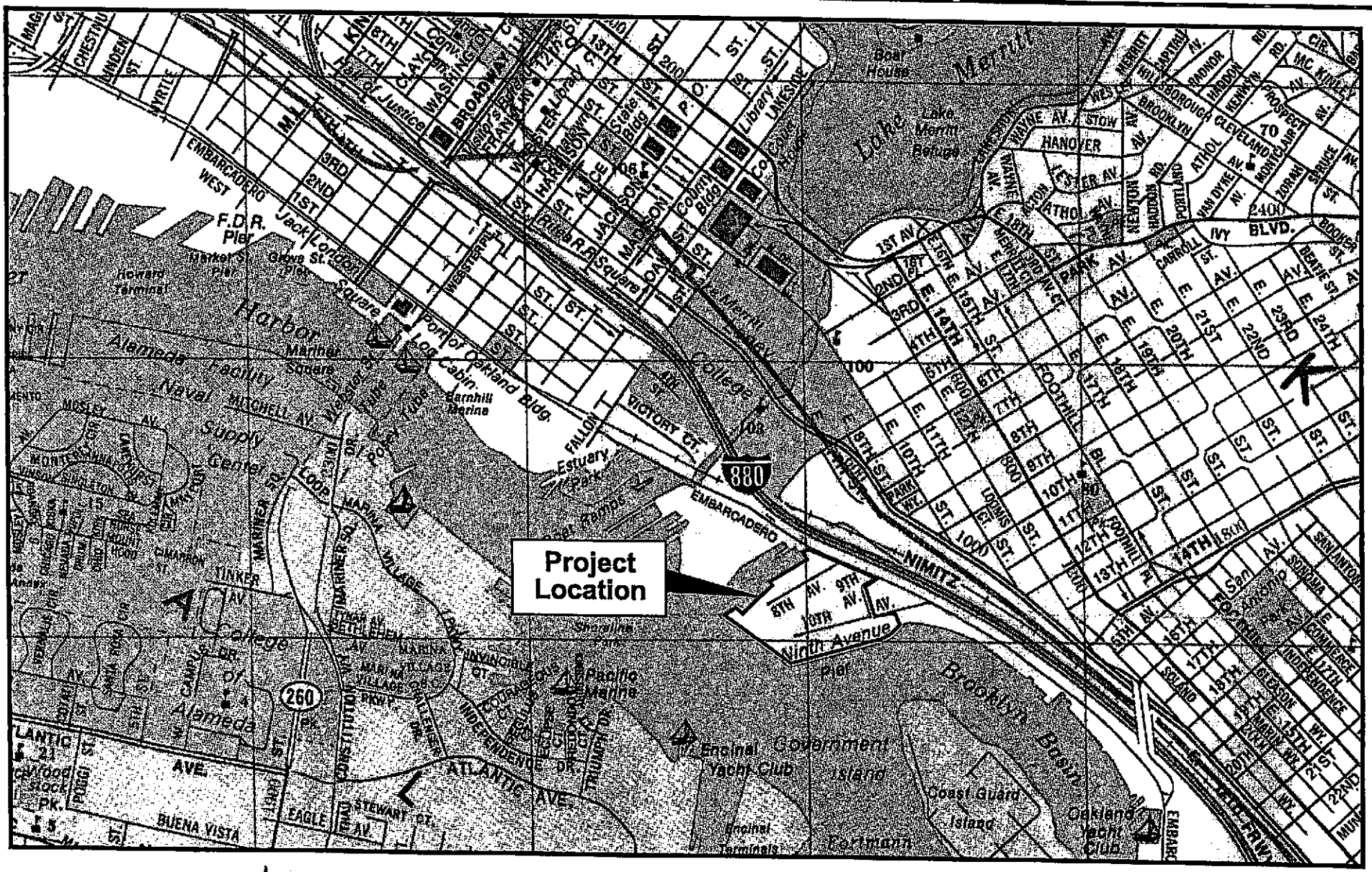
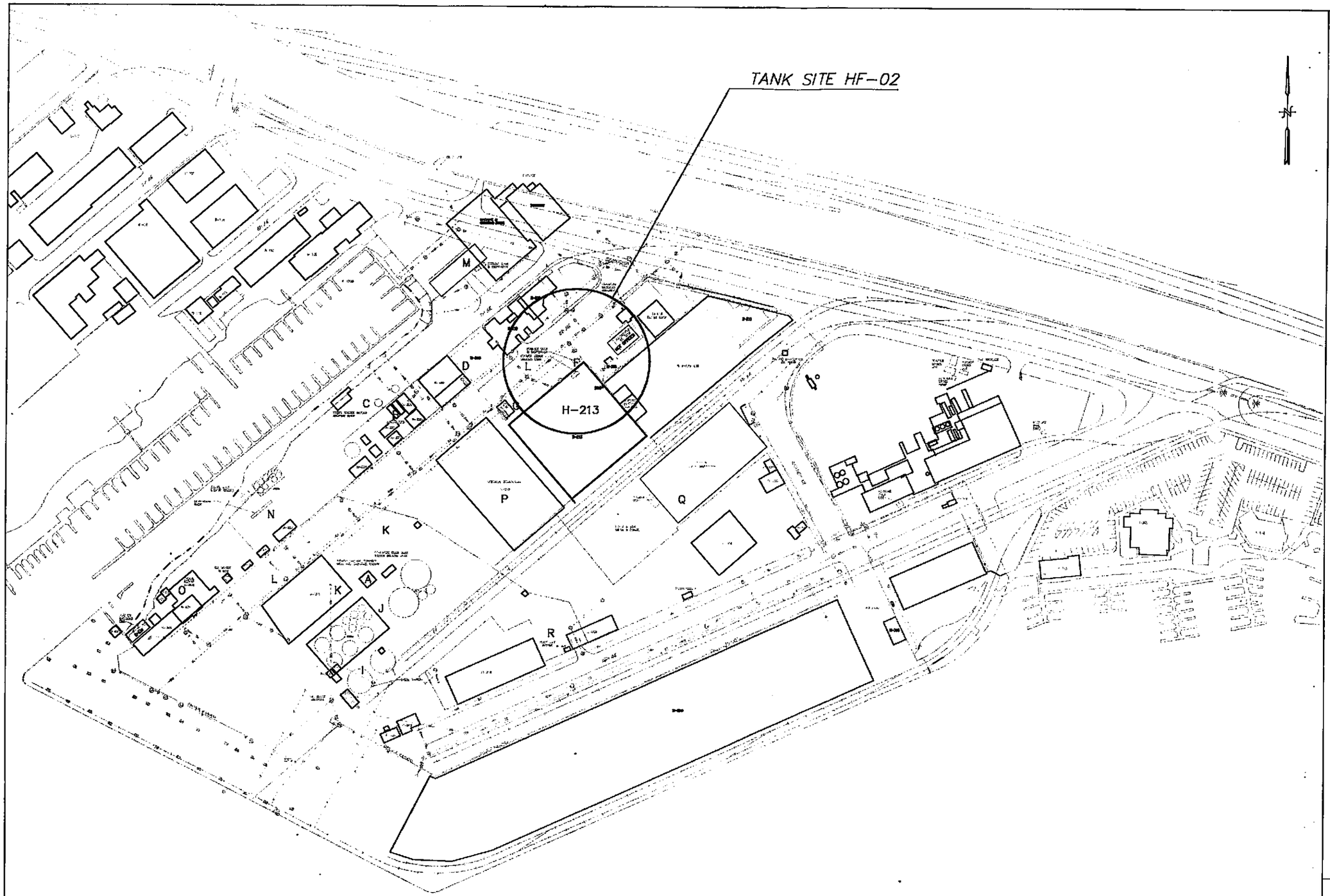


Figure 1
Vicinity Map
Port of Oakland
Ninth Avenue Terminal

GAIA consulting, inc.

158344.A5.01 •Vicinity Map •11/9/01 •cco•SFD



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

NINTH AVENUE TERMINAL
PORT OF OAKLAND
TANK HF-02
TANK LOCATION

GAIA consulting, Inc.

Project No.	Figure
168344	2

Plot Date: 12-03-02 Filename: TANKLOC_FIG2-HF-02.Dwg

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
MW–2@6	––	ND	––	––
MW–2@15.5	––	ND	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	Benzene	Ethyl–benzene	Toluene	Total Xylenes
B13@4	––	2	––	0.006	<0.005	0.009	0.006
B13@7.5	––	81	––	<0.005	0.006	0.008	0.037

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
MW–1@10.5	––	9	––	––
MW–1@16	––	ND	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
B–17@3.5	––	<1	––	<0.005
B–17@7.0	––	20H	––	<0.005
B–17@9.5	––	35H	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
MW–4@5.5	––	7,100	––	––
MW–4@10.5	––	520	––	––
MW–4@15.5	––	6	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
MW–3@5	––	120	––	––
MW–3@15	––	3	––	––
MW–3@20	––	ND	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
RMA–4@3	<10	<10	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
SCI–22@3.5	<1	1,000H	810YH	<0.005

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
SCI–23@6.5	<1	790YH	4,800YH	<0.005

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
RMA–5@6.5	<10	<10	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	Benzene	Ethyl–benzene	Toluene	Total Xylenes
B16@3.5	––	<1	––	<0.005	<0.005	<0.005	<0.005
B16@7	––	92	––	<0.030	<0.030	<0.030	<0.030
B16@7.5	––	260	––	<0.030	0.030	<0.030	0.030
B16@9.5	––	49	––	<0.005	<0.005	<0.005	<0.005

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
SCI–24@4.5	<1	<1	<5	<0.005

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
MW–6@5	240	1,600	––	<0.005

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
B11	––	ND	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
B12	––	ND	––	––

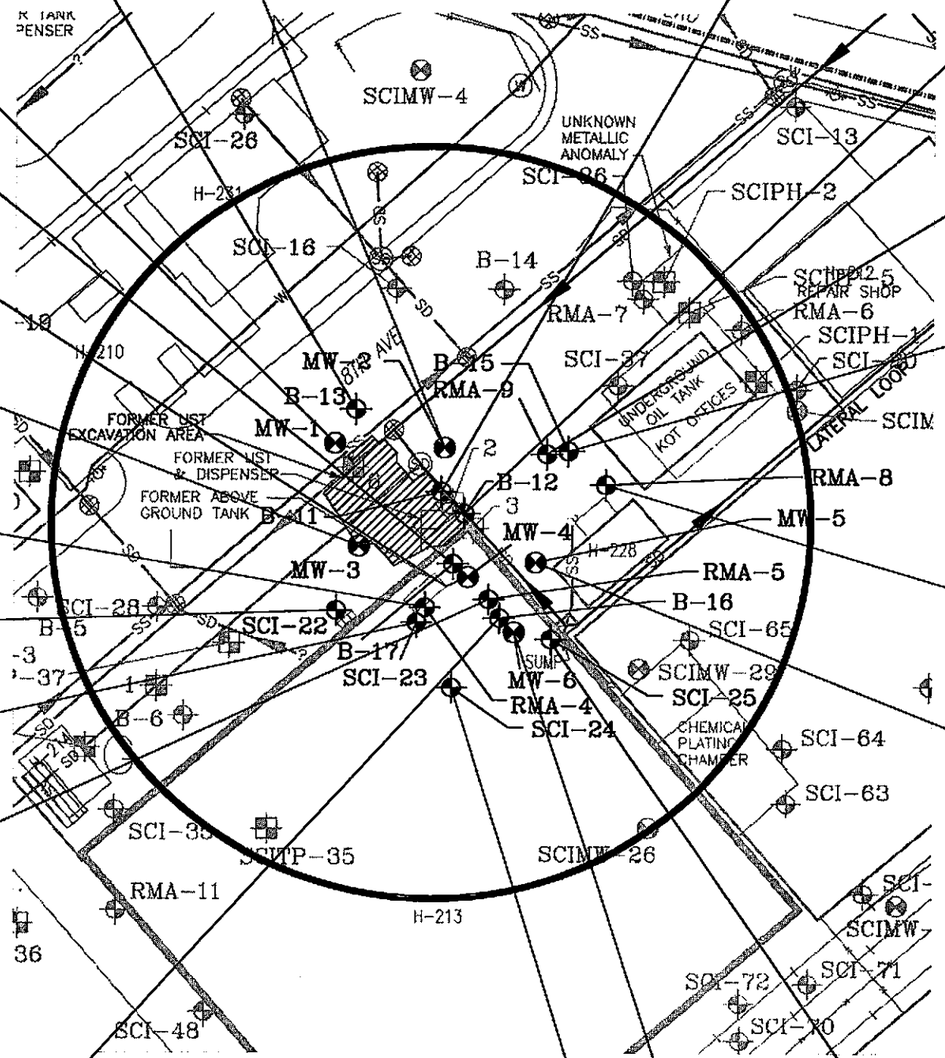
SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
RMA–9	––	––	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
B15@2.5	––	<3	––	<0.005
B15@5	––	<20	––	<0.005
B15@9.5	––	39H	––	<0.005

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX
RMA–8@3.5	<10	<10	––	––
RMA–8@7.5	<10	<10	––	––

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	Benzene	Ethyl–benzene	Toluene	Total Xylenes
MW–5@5	6	180	––	0.020	0.020	0.008	0.065

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	Benzene	Ethyl–benzene	Toluene	Total Xylenes
SCI–25@6	24YH	2,400	<150	<0.005	0.027	<0.005	0.062J



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
BTEX	BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES
Y	SAMPLE EXHIBITS FUEL PATTERN WHICH DOES NOT RESEMBLE STANDARD
H	HEAVIER HYDROCARBONS THAN INDICATED STANDARD
L	LIGHTER HYDROCARBONS THAN INDICATED STADARD
Z	SAMPLE EXHIBITS UNKNOWN SINGLE PEAK OR PEAKS
J	ESTIMATED VALUE

NOTE: ALL CONCENTRATIONS IN mg/kg

GRAPHIC SCALE

0 60 120 180

NINTH AVENUE TERMINAL
PORT OF OAKLAND
TANK HF–02
SOIL DATA

GAIA consulting, inc.

Project No. 168344

Figure 3

Plot Date: 05–14–03 Filename: 02SOILFIG3–HF–02.Dwg

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
RMA–8	<500	<500	--	--	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
B–15	--	2,900	--	<0.4	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
RMA–9	<500	<500	--	--	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
MW–2	--	<50	<300	--	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	Benzene	Ethyl–benzene	Toluene	Total Xylenes	MTBE
B–13	--	2,000,000	--	300	<200	400	400	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
MW–1	(WELL ABANDONED MAY 2001)				

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
MW–5	--	510	<300	<0.5	0.5

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	Benzene	Ethyl–benzene	Toluene	Total Xylenes	MTBE
B–17	--	59,000	--	2	<2	<2	<2	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
MW–3	--	<50	<300	--	<0.5

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
MW–4	FREE PRODUCT (0.5")				

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
RMA–5	331,600Y	8,668,000Y	--	--	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
SCI–22	170Z	13,000YHL	9,100YL	<5.0	--

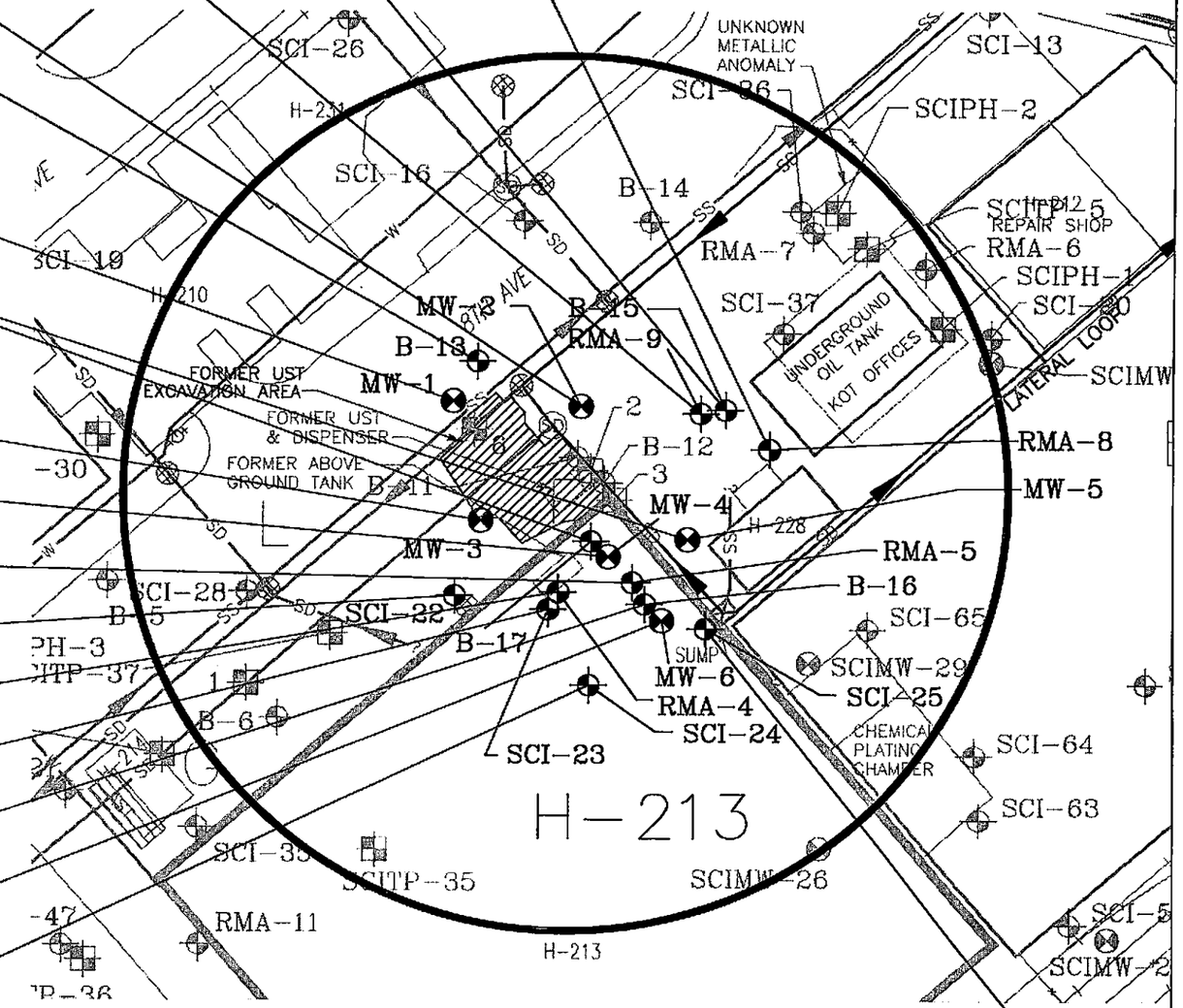
SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
RMA–4	584Y	29,370Y	--	--	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
SCI–23	1,600YH	350,000	8,300YL	<13	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
B–16	--	310,000	--	<40	--

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
MW–6	FREE PRODUCT (2.0")				

SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	BTEX	MTBE
SCI–24	<50	1,100YHL	750YL	<0.5	--



SAMPLE LOCATION	TPH–g	TPH–d	TPH–mo	Benzene	Ethyl–benzene	Toluene	Total Xylenes	MTBE
SCI–25	2,700YH	210,000	6,200YL	12J	<13	<13	<13	--

GRAPHIC SCALE

0 50 100 150

LEGEND:

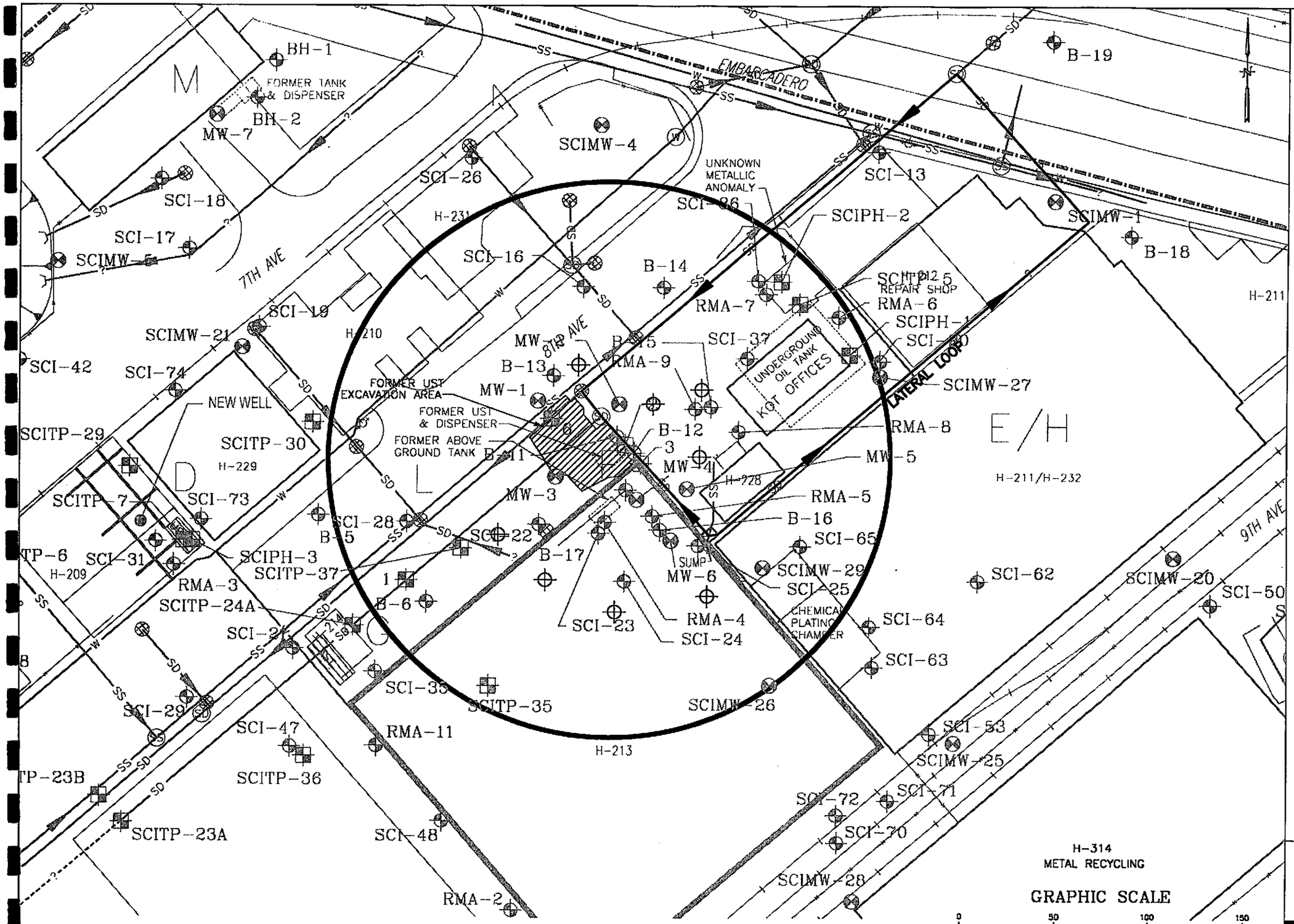
- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- DEMOLISHED BUILDING
- EXISTING BUILDING
- EXISTING BUILDING FOUNDATION
- FENCE LINE
- RAILROAD
- BOUNDARY LINE
- OVERHEAD LIGHT STANDARD
- EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- FORMER ABOVE OR UNDERGROUND STORAGE TANK
- <0.5 — 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, AND TOTAL XYLENES
- Y — SAMPLE EXHIBITS FUEL PATTERN WHICH DOES NOT RESEMBLE STANDARD
- H — HEAVIER HYDROCARBONS THAN INDICATED STANDARD
- L — LIGHTER HYDROCARBONS THAN INDICATED STADARD
- J — ESTIMATED VALUE
- Z — SAMPLE EXHIBITS UNKNOWN SINGLE PEAK OR PEAKS

NOTE: MWs LAST SAMPLED IN JAN. 2003. (ALL CONCENTRATIONS IN µg/L)

NINTH AVENUE TERMINAL PORT OF OAKLAND TANK HF–02 GROUNDWATER DATA

GAIA consulting, inc | Project No. 168344 | Figure 4

Plot Date: 05–14–03 Filename: 01GWFIG4–H213.Dwg



LEGEND:

- PROPOSED BORING 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

GRAPHIC SCALE

0 50 100 150

NINTH AVENUE TERMINAL
PORT OF OAKLAND
TANK HF-02
PROPOSED INVESTIGATION

GAIA consulting, inc

Project No.	Figure
168344	5

Plot Date: 05-14-03 Filename: 02FIG5-HF-02.Dwg

TABLE 1
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
PETROLEUM HYDROCARBON, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN SOIL

SAMPLE DESIGNATION	CONSULTANT	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-B6-4	Uribe	L	4	11/20/1992	150	--	--	<300	--	640	--	--	--	--	--	--	--	--	--	--
9AV-B6-7	Uribe	L	7	11/20/1992	150	--	--	<5	--	30	--	--	--	--	--	--	--	--	--	--
9AV-B11	Uribe	F	7.5	12/17/1992	75	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B12	Uribe	F	8	12/17/1992	75	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B13-1-4	Uribe	L	4	3/1/1993	75	--	--	2	--	--	0.006	<0.005	0.009	0.006	--	--	--	--	--	--
9AV-B13-2-7.5	Uribe	L	7.5	3/1/1993	75	--	--	81	--	--	<0.005	0.006	0.008	0.037	--	--	--	--	--	--
9AV-B14-1-3.5	Uribe	L	3.5	3/1/1993	150	--	--	<1	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B14-2-6.5	Uribe	L	6.5	3/1/1993	150	--	--	<10	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B14-3-9.5	Uribe	L	9.5	3/1/1993	150	--	--	<6	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B15-1-2.5	Uribe	F	2.5	3/1/1993	75	--	--	<3	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B15-2-5	Uribe	F	5	3/1/1993	75	--	--	<20	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B15-3-9.5	Uribe	F	9.5	3/1/1993	75	--	--	39H	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B16-1-3.5	Uribe	F	3.5	3/1/1993	75	--	--	<1	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B16-2-7	Uribe	F	7	3/1/1993	75	--	--	92	--	--	<0.030	<0.030	<0.030	<0.030	--	--	--	--	--	--
9AV-B16-3-7.5	Uribe	F	7.5	3/1/1993	75	--	--	260	--	--	<0.030	0.030	<0.030	0.030	--	--	--	--	--	--
9AV-B16-4-9.5	Uribe	F	9.5	3/1/1993	75	--	--	49	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B17-1-3.5	Uribe	F	3.5	3/2/1993	75	--	--	<1	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B17-2-7	Uribe	F	7	3/2/1993	75	--	--	20H	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
9AV-B17-3-9.5	Uribe	F	9.5	3/3/1993	75	--	--	35H	--	--	--	--	--	--	--	--	--	--	--	--
MW-1 @ 10.5	Uribe	F	10.5	8/26/1993	75	--	--	9	--	--	--	--	--	--	--	--	--	--	--	--
MW-1 @ 16	Uribe	F	16	8/26/1993	75	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--
MW-2 @ 6	Uribe	F	6	8/26/1993	75	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--
MW-2 @ 15.5	Uribe	F	15.5	8/26/1993	75	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--
MW-3 @ 5	Uribe	F	5	8/26/1993	75	--	--	120	--	--	--	--	--	--	--	--	--	--	--	--
MW-3 @ 15	Uribe	F	15	8/26/1993	75	--	--	3	--	--	--	--	--	--	--	--	--	--	--	--
MW-3 @ 20	Uribe	F	20	8/26/1993	75	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--
MW-4 @ 5.5	Uribe	F	5.5	9/8/1993	75	--	--	7,100	--	--	--	--	--	--	--	--	--	--	--	--
MW-4 @ 10.5	Uribe	F	10.5	9/8/1993	75	--	--	520	--	--	--	--	--	--	--	--	--	--	--	--
MW-4 @ 15.5	Uribe	F	15.5	9/8/1993	75	--	--	6	--	--	--	--	--	--	--	--	--	--	--	--
MW-5 at 5ft	Clayton	F	5	3/30/1995	75	--	6	180	--	--	0.020	0.020	0.006	0.065	--	--	--	--	--	--
MW-6 at 5ft	Clayton	F	5	3/30/1995	75	--	240	1,600	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
RMA-4@3-3.5	RMA	F	3	11/18/1996	75	--	<10	<10	--	--	--	--	--	--	--	--	--	--	--	--
RMA-5@6.5-7	RMA	F	6.5	11/18/1996	75	--	<10	<10	--	--	--	--	--	--	--	--	--	--	--	--
RMA-6@7.5-8	RMA	E	7.5	11/19/1996	150	--	<10	<10	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 1
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
PETROLEUM HYDROCARBON, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN SOIL

SAMPLE DESIGNATION	CONSULTANT	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)
RMA-7@3.5-4	RMA	E	3.5	11/19/1996	150	--	<10	<10	--	--	--	--	--	--	--	--	--	--	--	--
RMA-8@3.5-4	RMA	E	3.5	11/19/1996	75	--	<10	<10	--	--	--	--	--	--	--	--	--	--	--	--
RMA-8@7.5-8	RMA	E	7.5	11/19/1996	75	--	<10	<10	--	--	--	--	--	--	--	--	--	--	--	--
RMA-9	RMA	E	--	11/19/1996	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCI-16@2.5	SCI	L	2.5	5/23/1996	150	**570**	<1	**40YH**	**1,700YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-22@3.5	SCI	F	3.5	5/31/1996	75	--	<1	**1,000H**	**810YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-23@6.5	SCI	F	6.5	5/31/1996	75	--	<1	**790YH**	**4,800YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-24@4.5	SCI	F	4.5	5/31/1996	75	--	<1	<1	<5	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-25@6	SCI	F	6	5/31/1996	75	--	**24YH**	**2,400**	<150	--	<0.005	**0.027**	<0.005	**0.062J**	--	--	--	--	--	--
SCI-28@3.5	SCI	L	3.5	6/3/1996	150	--	--	**3.1YH**	**22YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-35@3	SCI	G	3	8/29/1996	150	--	**2.6Y**	**6,700Y**	**5,200YL**	--	<0.005	**0.038**	<0.005	**0.42**	--	--	--	--	--	--
SCI-36@3.5	SCI	E	3.5	8/30/1996	150	**120**	--	**12YH**	**100**	--	<0.005	<0.005	**0.0068**	<0.005	--	--	--	--	--	--
SCI-37@2.5	SCI	E	2.5	8/30/1996	150	<50	--	**10YH**	**46**	--	<0.005	<0.005	**0.0066**	<0.005	--	--	--	--	--	--
SCI-64@5	SCI	H	5	2/9/1997	150	--	--	**1.6YH**	**17YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-64@7	SCI	H	7	2/9/1997	150	--	--	**17**	**140**	--	--	--	--	--	--	--	--	--	--	--
SCI-65@4.5	SCI	H	4.5	2/9/1997	150	--	--	<1	<5	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCI-65@7	SCI	H	7	2/9/1997	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIMW-26@3.5	SCI	H	3.5	4/30/1997	150	<50	<1	<1	**7.5YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCIMW-27@3.5	SCI	E/H	3.5	4/30/1997	150	**210**	<1	**11YH**	**190YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCIMW-29@4.6	SCI	H	4.6	5/14/1997	150	**170**	<1	**2.6YH**	**23YH**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCIPH-1@3.5	SCI	E	3.5	1/20/1997	150	**1,300**	--	**1,300yh**	**2,800y**	--	--	--	--	--	--	--	--	--	--	--
SCIPH-2@4	SCI	E	4	1/20/1997	150	**1,500**	--	**1,800YH**	**2,100Y**	--	<0.005	<0.005	<0.005	<0.005	<0.24	<0.24	<0.24	ND	<0.48	ND
SCITP-5@1.5	SCI	E	1.5	1/28/1997	150	--	<1	**2,800yh**	**14,000hl**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCITP-5@4	SCI	E	4	1/28/1997	150	--	<1	**5.7yh**	**59yh**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCITP-30@3	SCI	D	3	4/29/1997	150	**940**	<1	**38YH**	**430**	--	<0.005	<0.005	<0.005	<0.005	<0.03	<0.006	<0.006	ND	<0.012	ND
SCITP-35@5	SCI	G	5	5/3/1997	150	**120**	<1	**15YH**	**48HL**	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
SCITP-37@7	SCI	F/G/L	7	5/3/1997	150	**2,800**	<1	**8.1YH**	**51YHL**	--	<0.005	<0.005	<0.005	<0.005	--	<0.018	<0.018	ND	<0.036	ND

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

mg/kg = milligrams per kilogram
Y = Sample exhibits fuel pattern which does not resemble standard
H = Heavier hydrocarbons than indicated standard
L= Lighter hydrocarbons than indicated standard
J = Estimated value

All detected concentrations shown in bold
ND = Not detected
-- = Not tested
<number, i.e. <50 = Compound not detected at or above stated reporting limit

TABLE 2
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
pH AND HEAVY METAL CONCENTRATIONS IN SOIL

SAMPLE DESIGNATION	CONSULTANT	SITE REF AREA	SAMPLE DEPTH (ft)	DATE SAMPLED	PROX-IMITY (Feet)	pH	ANTIMONY (mg/kg)	AR-SENIC (mg/kg)	BAR-IUM (mg/kg)	BERY-LIUM (mg/kg)	CAD-MIUM (mg/kg)	TOTAL CHROMIUM (mg/kg)	CHROMIUM VI (mg/kg)	COBALT (mg/kg)	COPPER (mg/kg)	LEAD (mg/kg)	MERCURY (mg/kg)	MOLYB-DENUM (mg/kg)	NICKEL (mg/kg)	POTAS-SIUM (mg/kg)	SELE-IUM (mg/kg)	SIL-VER (mg/kg)	THAL-LIUM (mg/kg)	VANA-DIUM (mg/kg)	ZINC (mg/kg)
9AV-B6-4	Uribe	L	4	11/20/1992	150	--	--	**1.9**	**29**	--	**0.2**	**47**	--	--	--	**16**	**0.2**	--	--	--	<0.4	<0.5	--	--	--
9AV-B6-7	Uribe	L	7	11/20/1992	150	--	--	**3.3**	**26**	--	**0.2**	**47**	--	--	--	**9**	**0.1**	--	--	--	<0.4	<0.5	--	--	--
SCI-64@5	SCI	H	5	2/9/1997	150	8.3	<2.9	**2.8**	**97**	**0.51**	**0.47**	**24**	**0.29**	**10**	**11**	**9.3**	<0.095	<0.98	**30**	--	**1.1**	<0.49	**1.2**	**24**	**35**
SCI-65@4.5	SCI	H	4.5	2/9/1997	150	8.9	<2.8	**1.7**	**170**	**0.44**	**0.46**	**41**	**0.10**	**9.3**	**16**	**5.2**	<0.095	<0.94	**52**	--	**1.1**	<0.47	<0.24	**17**	**38**
SCIMW-29@4.6	SCI	H	4.6	5/14/1997	150	**9.2**	<2.9	**2.7**	**77**	**0.45**	**0.16**	**27**	<0.05	**12**	**8.8**	**8.7**	**0.15**	<0.96	**31**	--	**0.85**	<0.48	<0.24	**24**	**39**

Notes:
-- = Not tested
All detected concentrations in bold

Only samples analyzed for metals are presented in table
mg/kg = milligrams per kilogram
<number, i.e. <50 = Compound not detected at or above stated reporting limit

TABLE 3
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
PETROLEUM HYDROCARBONS, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN GROUNDWATER

SAMPLE DESIGNATION	CONSULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oak. 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)	MTBE (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-B11	Uribe	F	12/17/1992	--	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B12	Uribe	F	12/17/1992	--	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9AV-B13	Uribe	L	3/1/1993	--	75	--	--	**2,000,000**	--	**300**	<200	**400**	**400**	--	--	--	--	--	--	--
9AV-B14	Uribe	L	3/1/1993	--	150	--	--	**940**	--	<0.4	<0.3	**0.4**	<0.4	--	--	--	--	--	--	--
9AV-B15	Uribe	F	3/1/1993	--	75	--	--	**2,900**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
9AV-B16	Uribe	F	3/2/1993	--	75	--	--	**310,000**	--	<40	<30	<30	<40	--	--	--	--	--	--	--
9AV-B17	Uribe	F	3/2/1993	--	75	--	--	**59,000**	--	**2**	<2	<2	<2	--	--	--	--	--	--	--
MW-1	Uribe	F	9/21/1993	4.79	75	--	ND	**1600Y**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-1	Uribe	F	1/12/1994	5.13	75	--	ND	**610Y**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-1	Uribe	F	4/4/1994	5.90	75	--	<50	**510**	--	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
MW-1	Uribe	F	10/3/1994	4.36	75	--	--	**390Y**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-1	Clayton	F	4/10/1995	5.05	75	--	<50	**330**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-1	Clayton	F	7/24/1995	4.97	75	--	<50	**230**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-1	Clayton	F	11/10/1995	4.47	75	--	<50	**430**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-1	Clayton/SCI	F	2/20/1996	5.50	75	--	<50	**590YH**	--	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
MW-1	SCI	F	5/24/1996	4.95	75	--	<50	**870YH**	**630Y**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-1	SCI	F	9/6/1996	4.34	75	--	<50	**850YH**	**490YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-1	SCI	F	12/5/1996	5.19	75	--	<50	**4,500YHL**	**2,100YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-1	SCI	F	9/25/1998	4.68	75	--	--	<47	<280	--	--	--	--	--	--	--	--	--	--	--
MW-1	SCI	F	12/3/1999	4.59	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
MW-1	SCI	F	5/31/02001	**Well Abandoned**																
MW-2	Uribe	F	9/21/1993	5.92	75	--	ND	**1,900Y**	--	**0.5**	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-2	Uribe	F	1/12/1994	5.94	75	--	ND	**1,800Y**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-2	Uribe	F	4/4/1994	5.31	75	--	<50	**1,800**	--	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
MW-2	Uribe	F	10/5/1994	5.39	75	--	--	**1,200Y**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-2	Clayton	F	4/10/1995	6.29	75	--	<50	**550**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-2	Clayton	F	7/24/1995	5.91	75	--	**70**	**960**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-2	Clayton	F	11/10/1995	5.73	75	--	<50	**920**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-2	Clayton/SCI	F	2/20/1996	6.51	75	--	<50	**1,700H**	--	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
MW-2	SCI	F	5/24/1996	5.91	75	--	<50	**2,800YH**	**1,200Y**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	SCI	F	9/5/1996	6.34	75	--	**58z**	**2,900**	**760YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	SCI	F	12/4/1996	6.02	75	--	<50	**1,600Y**	**1,000YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	SCI	F	9/23/1998	5.29	75	--	--	**80YL**	<300	--	--	--	--	--	--	--	--	--	--	--
MW-2	SCI	F	12/3/1999	5.27	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
MW-2	SCI	F	10/13/2000	5.04	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
MW-2	SCI	F	12/3/2001	5.15*	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
MW-2	SCI	F	1/21/2003	5.10	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
MW-3	Uribe	F	9/21/1993	-5.02+	75	--	ND	**680Y**	--	<0.4	<0.3	**0.3**	<0.4	--	--	--	--	--	--	--
MW-3	Uribe	F	1/12/1994	4.84	75	--	ND	**430Y**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-3	Uribe	F	4/4/1994	5.95	75	--	<50	**690**	--	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
MW-3	Uribe	F	10/4/1994	4.74	75	--	--	**480Y**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-3	Clayton	F	4/10/1995	2.54	75	--	<50	**830**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-3	Clayton	F	7/24/1995	6.56	75	--	<50	**460**	--	<0.4	<0.3	<0.3	<0.4	--	--	--	--	--	--	--
MW-3	Clayton	F	11/10/1995	5.07	75	--	<50	**2,100**	--	<0.4	<0.3	**0.7**	<0.4	--	--	--	--	--	--	--

TABLE 3
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
PETROLEUM HYDROCARBONS, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN GROUNDWATER

SAMPLE DESIGNATION	CONSULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oak. 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)	MTBE (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)
MW-3	Clayton/SCI	F	2/20/1996	6.04	75	--	<50	**620H**	--	<0.5	<0.5	<0.5	<1	--	--	--	--	--	--	--
MW-3	SCI	F	5/24/1996	5.69	75	--	<50	**1,100YH**	**550Y**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-3	SCI	F	9/18/1996	3.76	75	--	<50	**1,500**	**890YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-3	SCI	F	12/13/1996	5.34	75	--	<50	**580**	<250	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-3	SCI	F	9/29/1998	5.83	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	SCI	F	12/3/1999	5.44	75	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
MW-3	SCI	F	10/6/2000	5.77	75	--	--	<50	<300	--	--	--	--	<0.5	--	--	--	--	--	--
MW-3	SCI	F	12/10/2001	2.31	75	--	--	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
MW-3	SCI	F	1/23/2003	5.16	75	--	--	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
MW-4	Uribe	F	9/20/93 (b)	6.18	75	--	<50	**1300**	--	**140**	**40**	**110**	**235**	--	--	--	--	--	--	--
MW-4	Uribe	F	12/1/93 (b)	7.88	75	--	<50	**32,000**	--	**71**	**20**	**41**	**150**	--	--	--	--	--	--	--
MW-4	Uribe	F	4/4/94 (b)	7.78	75	--	**6,200**	**410,000**	--	**140**	**47**	**20**	**310**	--	--	--	--	--	--	--
MW-4	Clayton	F	4/10/1995	8.18	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.00 inches)														
MW-4	Clayton	F	7/24/1995	8.33 (b)	75	--	**2,400**	**21,000**	--	**140**	**34**	**74**	**40**	--	--	--	--	--	--	--
MW-4	SCI	F	5/24/1996	9.02 (b)	75	--	**690Y**	**37,000**	**2,800YL**	**44**	**18**	<2.5	**7.7**	--	--	--	--	--	--	--
MW-4	SCI	F	9/4/1996	7.33 (b)	75	--	**1,000H**	**240,000**	**26,000YL**	**100**	**5.2**	<0.5	**7.2**	--	--	--	--	--	--	--
MW-4	SCI	F	12/3/1996	8.76 (b)	75	--	**1,500YH**	**13,000**	**2,000YL**	**120**	**33**	**0.9**	**22**	--	--	--	--	--	--	--
MW-4	SCI	F	12/30/1996	9.04	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.25 inches)														
MW-4	SCI	F	1/16/1997	8.76	75	FREE PRODUCT -- NOT SAMPLED (product thickness: trace)														
MW-4	SCI	F	5/5/1997	8.06	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.13 inches)														
MW-4	SCI	F	9/17/1998	7.53	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.25 inches)														
MW-4	SCI	F	8/25/1999	7.33	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.85 inches)														
MW-4	SCI	F	12/3/1999	6.81	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.38 inches)														
MW-4	SCI	F	5/2/2000	8.13	75	FREE PRODUCT -- NOT SAMPLED (product thickness: trace)														
MW-4	SCI	F	7/31/2002	9.13	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.25 inches)														
MW-4	SCI	F	1/23/2003	6.98*	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.5 inches)														
MW-5	Clayton	F	4/10/1995	7.20	75	--	**1,100**	**6,200**	--	**3.1**	**2.9**	**<0.3**	**11.3**	--	--	--	--	--	--	--
MW-5	Clayton	F	7/24/1995	6.60	75	--	**720**	**4,800**	--	**3.1**	**0.6**	**0.5**	**0.7**	--	--	--	--	--	--	--
MW-5	Clayton	F	11/10/1995	6.46	75	--	**260**	**3,700**	--	**0.8**	**0.6**	**0.5**	**1.9**	--	--	--	--	--	--	--
MW-5	Clayton/SCI	F	2/20/1996	9.15	75	--	**150Y**	**440H**	--	<0.5	<0.5	<0.5	<1	--	--	--	--	--	--	--
MW-5	SCI	F	5/24/1996	9.17	75	--	**82Y**	**4,600YH**	**1,900Y**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	SCI	F	9/4/1996	6.40	75	--	<50	**7,700YH**	**1,900YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	SCI	F	12/3/1996	7.20	75	--	**140YH**	**13,000**	**1,900YL**	**1.5**	<0.5	<0.5	**2.6**	--	--	--	--	--	--	--
MW-5	SCI	F	1/20/1997	8.38	75	--	<50	**9,400**	**1,500YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	SCI	F	5/6/1997	6.45	75	<5,000	<50	**8,800**	**2,500YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	SCI	F	9/23/1998	6.40	75	--	<50	**170 L**	<300	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	SCI	F	5/7/1999	6.59	75	--	<50	**660**	<300	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	SCI	F	12/3/1999	6.53	75	--	--	**490YH**	<300	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	SCI	F	10/6/2000	6.56	75	--	<50	**600**	<300	<0.5	<0.5	<0.5	<0.5	**1.3**	--	--	--	--	--	--
MW-5	SCI	F	5/5/2001	6.74	75	--	**91YH**	**2,400**	<300	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
MW-5	SCI	F	12/10/2001	6.45	75	--	<50	**420YH**	<300	<0.5	<0.5	<0.5	<0.5	**0.8**						
MW-5	SCI	F	7/31/2002	6.26	75	--	--	**510YH**	<300	<0.5	<0.5	<0.5	<0.5	**0.5**	--	--	--	--	--	--
MW-5	SCI	F	1/24/2003	6.92	75	--	--	**3,900**	<300	<0.5	<0.5	<0.5	<0.5	**0.5**	--	--	--	--	--	--
MW-6	Clayton	F	4/10/1995	7.74 (b)	75	--	**1,300**	**10,000**	--	**4.4**	**0.7**	**<0.3**	**0.8**	--	--	--	--	--	--	--

TABLE 3
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
PETROLEUM HYDROCARBONS, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN GROUNDWATER

SAMPLE DESIGNATION	CONSULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oak. 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)	MTBE (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)
MW-6	SCI	F	7/24/1995	6.67	75	FREE PRODUCT -- NOT SAMPLED														
MW-6	SCI	F	5/24/1996	7.71 (b)	75	--	**280,000YH**	**240,000**	**5,500YL**	<250	<250	<250	<250	--	--	--	--	--	--	--
MW-6(FP)	SCI	F	5/24/1996	--	75	--	**900,000YH**	**470,000**	**13,000YL**	<250	<250	<250	<250	--	--	--	--	--	<2.0	ND
MW-6	SCI	F	9/5/1996	6.67 (b)	75	**89,000**	**200H**	**50,000**	**3,200YL**	**5.3**	<5.0	<5.0	<5.0	--	--	--	--	--	--	<1.0
MW-6	SCI	F	12/4/1996	7.90 (b)	75	--	**4,700YH**	**140,000**	**7,300YL**	**19**	<10	**11**	<10	--	--	--	--	--	--	--
MW-6	SCI	F	1/16/1997	7.63	75	FREE PRODUCT -- NOT SAMPLED														
MW-6	SCI	F/H	5/6/1997	7.04 (b)	75	**330,000**	**440YH**	**620,000**	**24,000YL**	**2.4**	<0.5	**0.51**	**0.61**	--	--	--	--	--	--	--
MW-6	SCI	F	9/25/1997	7.97	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 7.25 inches)														
MW-6	SCI	F	5/4/1999	7.21	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.5 inches)														
MW-6	SCI	F	12/3/1999	6.98	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 0.67 inches)														
MW-6	SCI	F	10/4/2000	6.25	75	FREE PRODUCT -- NOT SAMPLED (product thickness: NM)														
MW-6	SCI	F	7/31/2002	6.25	75	FREE PRODUCT -- NOT SAMPLED (product thickness: NM)														
MW-6	SCI	F	1/23/2003	6.05	75	FREE PRODUCT -- NOT SAMPLED (product thickness: 2.00 inches)														
RMA-4	RMA	F	11/18/1996	--	75	--	**584Y**	**29,370Y**	--	--	--	--	--	--	--	--	--	--	--	--
RMA-5	RMA	F	11/18/1996	--	75	--	**331,800Y**	**8,668,000Y**	--	--	--	--	--	--	--	--	--	--	--	--
RMA-7	RMA	E	11/19/1996	--	150	--	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--
RMA-8	RMA	E	11/19/1996	--	75	--	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--
RMA-9	RMA	E	11/19/1996	--	75	--	<500	<500	--	--	--	--	--	--	--	--	--	--	--	--
SCI-16	SCI	L	5/24/1996	--	150	<5,000	<50	**960YH**	**1,100Y**	<25	<25	<25	<25	--	--	--	--	--	--	--
SCI-22	SCI	F	5/31/1996	--	75	**14,000**	**170z**	**13,000YHL**	**9,100YL**	<5.0	<5.0	<5.0	<5.0	--	--	--	--	--	--	--
SCI-23	SCI	F	5/31/1996	--	75	--	**1,600YH**	**350,000**	**8,300YL**	<13	<13	<13	<13	--	--	--	--	--	--	--
SCI-24	SCI	F	5/31/1996	--	75	--	<50	**1,100YHL**	**750YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
SCI-25	SCI	F	5/31/1996	--	75	--	**2,700YH**	**210,000**	**6,200YL**	**12J**	<13	<13	<13	--	--	--	--	--	--	--
SCI-28	SCI	L	6/4/1996	--	150	--	<50	--	--	<0.5	<0.5	<0.5	**3.5**	--	--	--	--	--	--	--
SCI-36	SCI	E	8/30/1996	--	150	<5,000	--	**3,800Y**	**3,000YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
SCI-37	SCI	E	8/30/1996	--	150	<5,000	--	**1,300YH**	**650YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
SCI-64	SCI	H	2/9/1997	--	150	--	--	**140Y**	<250	<5.0	<5.0	<5.0	<5.0	--	--	--	--	--	--	--
SCI-65	SCI	H	2/9/1997	--	150	--	--	**79Y**	<250	<5.0	<5.0	<5.0	<5.0	--	--	--	--	--	--	--
SCIMW-26	SCI	H	5/6/1997	8.15	150	<5,000	<50	**140**	<300	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
SCIMW-26	SCI	H	9/22/1998	7.41	150	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
SCIMW-26	SCI	H	12/2/1999	7.92	150	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
SCIMW-26	SCI	H	10/6/2000	7.92	150	--	--	<50	<300	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	--	--	--	--
SCIMW-26	SCI	H	1/21/2003	8.63	150	--	--	<50	<300	<0.5	<0.5	<0.5	<0.5	--	<0.5	--	--	--	--	--
SCIMW-27	SCI	E/H	5/6/1997	6.45	150	<5,000	<50	**3,400**	**1,800YL**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
SCIMW-27	SCI	E/H	9/22/1998	6.58	150	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
SCIMW-27	SCI	E/H	11/29/1999	6.52	150	--	--	<50	<300	--	--	--	--	--	--	--	--	--	--	--
SCIMW-29	SCI	H	5/20/1997	7.48	150	<5,000	<50	**150**	<300	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
SCIMW-29	SCI	H	10/6/2000	7.50	150	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
SCIMW-29	SCI	H	12/10/2001	7.93	150	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5						
SCIMW-29	SCI	H	1/21/2003	7.71	150	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5						
SCIPH-1	SCI	E	1/20/1997	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCIPH-2	SCI	E	1/20/1997	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-5	SCI	E	1/28/1997	--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SCITP-30	SCI	D	4/29/1997	--	150	<5,000	--	**600YH**	**810YLH**	--	--	--	--	--	--	--	--	--	--	--
SCITP-35	SCI	G	5/3/1997	--	150	<5,000	<50	**320YH**	**320YL**	<0.5	<0.5	<0.5	<0.5	--	<0.094	<0.094	<0.094	ND	<0.47	ND

TABLE 3
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
PETROLEUM HYDROCARBONS, BTEX, PESTICIDE AND PCB CONCENTRATIONS IN GROUNDWATER

SAMPLE DESIGNATION	CONSULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oak. 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)	MTBE (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)

Notes:

TPH = Total Petroleum Hydrocarbons
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethene
DDT = Dichlorodiphenyltrichloroethene
PCBs = Polychlorinated Biphenyls

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

µg/L = micrograms per liter
All detected concentrations in bold
ND = Not detected
-- = Not tested
<number i.e. <50 = Compound not detected at or above stated reporting limit

(b) = wells that contained free product at time of sampling.
+ = Elevation is probably not static
NM = not measured
* Well was inaccesible on the first day of sampling, the gw elevation presented was obtained on the day the well was sampled.

TABLE 4
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
pH AND HEAVY METAL CONCENTRATIONS IN GROUNDWATER

SAMPLE DESIGNATION	CON-SULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oak. Datum (FEET)	PROX-IMITY (Feet)	pH	ANTI-MONY (µg/L)	ARS-ENIC (µg/L)	BAR-IUM (µg/L)	BERYLL-IUM (µg/L)	CAD-MIUM (µg/L)	TOTAL CHROMIUM (µg/L)	CHROM-IUM 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-B17	Uribe	F	3/2/1993	--	150	--	<60	**130**	**1,700**	**17**	**11**	**990**	--	**250**	**390**	**230**	**3.6**	<20	**1,100**	--	**31**	<5.0	<5.0	**780**	**1,100**
MW-1	Uribe	F	4/4/1994	5.90	75	--	<60	**5.1**	**310**	<2.0	<2.0	<10	--	<20	<10	<3.0	<2.0	**30**	<20	--	**18**	<5.0	<5.0	**26**	<20
MW-1	Uribe	F	10/3/1994	4.36	75	--	<60	**210**	**4,400**	**22**	**23**	**1,400**	--	**470**	**910**	**570**	**2.9**	<20	**1,600**	--	**46**	<5.0	<5.0	**1,100**	**1,900**
MW-1	Clayton	F	4/10/1995	5.05	75	--	<60	**6.7**	**440**	**2.2**	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	<20	--	**22**	<5.0	<5.0	<10	<20
MW-1	Clayton	F	7/24/1995	4.97	75	--	<60	<5.0	**420**	<2.0	<2.0	<10	<10	**54**	<10	<3.0	<0.20	<20	**32**	--	**12**	<5.0	<5.0	<10	**160**
MW-1	Clayton	F	11/10/1995	4.47	75	--	<60	<5.0	**160**	<2.0	<5.0	<10	<10	<20	**12**	<3.0	<0.20	<20	<20	--	**34**	<5.0	<5.0	<10	**50**
MW-1	Clayton/SCI	F	2/20/1996	5.50	75	--	--	--	--	--	--	--	--	--	--	<3.0	--	--	--	--	--	--	--	--	--
MW-1	SCI	F	5/24/1996	4.95	75	--	<60	<5.0	**49**	<2.0	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	<20	--	**6.4**	<5.0	<5.0	<10	<20
MW-1	SCI	F	9/6/1996	4.34	75	--	<60	<5.0	**260**	<2.0	<2.0	<10	--	<20	<10	**3.4**	<0.20	<20	<20	--	**7.3**	<5.0	<5.0	**<10**	<20
MW-5	SCI	F	1/20/1997	8.38	75	--	<60	**10**	**49**	<2.0	<2.0	<10	--	<20	<10	<3.0	<0.20	<20	<20	--	**6.5**	<5.0	<5.0	<10	**26**
MW-6 (FP) (total)	SCI	F	5/24/1996	--	75	--	<60	<5.0	**170**	<2.0	<2.0	<10	--	<20	<10	**3.3**	**0.28**	<20	<20	--	**14**	<5.0	<5.0	<10	**34**
MW-6(FP)	SCI	F	5/24/1996	--	75	--	<60	<5.0	**320**	<2.0	<2.0	<10	--	<20	<10	<3.0	**0.43**	<20	<20	--	**13**	<5.0	<5.0	<10	<20
MW-6	SCI	F	9/5/1996	6.67 (b)	75	ND	<60	**8.9**	**420**	<2.0	<2.0	<10	--	<20	<10	**3.5**	<0.20	<20	<20	--	**27**	<5.0	<5.0	<10	<20
SCI-64	SCI	H	2/9/1997	--	150	6.8	<60	**16**	**520**	**2.9**	<2.0	<10	<10	<20	<10	<3.0	<0.20	<20	<20	--	**35**	<5.0	<5.0	**14**	**22**
SCIMW-26	SCI	H	5/6/1997	8.15	150	--	<60	**20**	**2,900**	<2.0	<5.0	<10	**140**	<20	<10	<3.0	<0.20	<20	<20	--	**15**	<5.0	<5.0	<10	<20
SCIMW-27	SCI	E/H	5/6/1997	6.45	150	--	<60	**10**	**480**	<2.0	<5.0	<10	**60**	<20	<10	<3.0	<0.20	<20	<20	--	**21**	<5.0	<5.0	<10	<20
SCITP-30	SCI	D	4/29/1997	--	150	--	--	--	--	--	--	--	--	--	--	<3.0	--	--	--	--	--	--	--	--	--

Notes:
-- = Not tested
µg/L = micrograms per liter

Only samples analyzed for metals are presented in table
<number, i.e. <50 = Compound not detected at or above stated reporting limit
All detected concentrations in bold

All concentrations are dissolved unless otherwise noted

TABLE 5
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
VOLATILE ORGANIC COMPOUNDS AND SEMIVOLATILE ORGANIC COMPOUNDS in SOIL

SAMPLE DESIGNATION	CONSULTANT	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)	8240s (mg/kg)	TOTAL PNAs (mg/kg)	OTHER 8270s (mg/kg)
RMA-4@3-3.5	RMA	F	3	11/18/1996	75	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	<0.005	<0.005	<0.005	<0.005	ND*	--	--
RMA-5@6.5-7	RMA	F	6.5	11/18/1996	75	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	<0.005	<0.005	<0.005	<0.005	ND*	--	--
RMA-6@7.5-8	RMA	E	7.5	11/19/1996	150	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	<0.005	<0.005	<0.005	<0.005	ND*	--	--
RMA-7@3.5-4	RMA	E	3.5	11/19/1996	150	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	<0.005	<0.005	<0.005	<0.005	ND*	--	--
RMA-8@3.5-4	RMA	E	3.5	11/19/1996	75	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	<0.005	<0.005	<0.005	<0.005	ND*	--	--
RMA-8@7.5-8	RMA	E	7.5	11/19/1996	75	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	<0.005	<0.005	<0.005	<0.005	ND*	--	--
SCI-65@4.5	SCI	H	4.5	2/9/1997	150	<0.020	<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	--	--
SCIMW-26@3.5	SCI	H	3.5	4/30/1997	150	<0.020	<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	--	--
SCIMW-27@3.5	SCI	E/H	3.5	4/30/1997	150	<0.020	<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	--	--
SCIMW-29@4.6	SCI	H	4.6	5/14/1997	150	<0.020	<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	--	--
SCIPH-2@4	SCI	E	4	1/20/1997	150	**0.25**	**0.051**	**0.0026J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.010	ND	--	--

Notes:

Only samples analyzed for VOCs or SVOCs are presented in table
mg/kg = milligrams per kilogram
MEK = Methylethylketone
PNAs = Polynuclear Aromatics
J = estimated value

<number, i.e. <50 = Compound not detected at or above stated reporting limit
All detected concentrations in bold
-- = Not tested
ND = Not detected
* = Only EPA 8010 compounds not detected

TABLE 6
NINTH AVENUE TERMINAL, UST SITE HF-02 (H-213)
VOLATILE ORGANIC COMPOUNDS AND SEMIVOLATILE ORGANIC COMPOUNDS in GROUNDWATER

SAMPLE DESIGNATION	CONSULTANT	SITE REF AREA	DATE SAMPLED	GROUNDWATER ELEVATION Port of Oak. 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-B5	Uribe	L	11/20/1992	--	75	<20	<20	<5	<5	<5	<5	<5	<5	<5	<5	<20	<5	<5	<5	ND	--	--
MW-5	SCI	F	1/20/1997	8.38	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
MW-5	SCI	F	5/6/1997	6.45	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	--	--
MW-5	SCI	F	5/4/2001	6.74	75	**11**	<10	<0.5	<0.5	<1.0	<0.5	<0.5	<0.5	<1.0	<0.5	<10	<0.5	<0.5	<0.5	ND	--	--
MW-6(FP)	SCI	F	5/24/1996	--	75	<100,000	<50,000	<25,000	<25,000	<50,000	<25,000	<25,000	<25,000	<25,000	<25,000	<50,000	<25,000	<25,000	<50,000	ND	**400**	ND
MW-6	SCI	F	9/5/1996	6.67 (b)	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	**410J**	ND
MW-6	SCI	F	5/6/1997	7.04 (b)	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	--	--
SCI-16	SCI	L	5/24/1996	--	75	<100	**640**	<25	<25	<50	<25	<25	<25	<25	<25	<50	<25	<25	<50	ND	--	--
SCI-22	SCI	F	5/31/1996	--	75	<20	**88**	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	ND	--	--
SCI-23	SCI	F	5/31/1996	--	75	<50	**310**	<13	<13	<25	<13	<13	<13	<13	<13	<25	<13	<13	<25	ND	--	--
SCI-35	SCI	G	8/30/1996	--	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NDe	ND
SCI-64	SCI	H	2/9/1997	--	75	<20	**5.2J**	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<10	ND	--	--
SCI-65	SCI	H	2/9/1997	--	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	--	--
SCIMW-26	SCI	H	5/6/1997	8.15	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	--	--
SCIMW-26	SCI	H	10/6/2000	7.92	150	<10	<10	<0.5	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	ND	--	--
SCIMW-27	SCI	E/H	5/6/1997	6.45	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	--	--
SCIMW-29	SCI	H	5/20/1997	7.48	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	--	--
SCITP-35	SCI	G	5/3/1997	--	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	--	--

Notes:
-- = Not tested
µg/L = micrograms per liter
PNAs = Polynuclear Aromatics
All detected concentrations in bold

Only samples analyzed for VOCs or SVOCs are presented in table
<number, i.e. <50 = Compound not detected at or above stated reporting limit
J = Estimated value
(b) = wells that contained free product at time of sampling.
e = Sample extracted 3 days after prescribed holding time

MEK = Methylethylketone

APPENDIX A

GAIA Consulting, Inc.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Project Title: 9th Avenue UST Site HF-02 (H-213)

Project No.: 180

Client: Port of Oakland

530 Water Street

Oakland, CA 94607

Date: April 4, 2003

This form may be used for those site activities that pose a significant threat of exposure to site contaminants or hazards (e.g., well installation, soil borings, water/soil sampling, excavation/ trenching). The GAIA Consulting, Inc. Health and Safety Director will determine whether or not this form is appropriate for any given activity at the site. It is the responsibility of the Project Manager to complete the Health and Safety Plan (HSP). The Health and Safety Director must sign the HSP. All project personnel must receive a copy of this form, familiarize themselves with its contents, and sign the signature page before work begins.

1. **Site Name and Address**

   9th Avenue Terminal
   Oakland, CA

2. **Site Personnel and Assigned Responsibilities**

   Principal-in-Charge: June Dougherty

   Project Manager: Susanne von Rosenberg, P.E.

   Site Safety Officer: Melba Policicchio

   Other Field Personnel:

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**

- Installation of 7 soil borings
- Soil and groundwater sampling

5. **Chemical Compounds at the Site (complete 5a and/or 5b, as appropriate)**

5a. **Chemical Data Summary**

__X__ Chemical Information Available.

_____ No Known or Suspected Chemical Contamination

Known Compounds	Source (soil/water/drum, etc.)	Known Concentrations Range (ppm, mg/kg, mg/l)	
		Lowest	Highest
TPH as gasoline	Water	ND	900,000 ug/l
TPH as gasoline	Soil	<1 mg/kg	240 mg/kg
Benzene	Soil	ND	2 mg/kg
Lead	Soil	4.2 mg/kg	17 mg/kg

5b. **Chemical Data Tables**

Note that metals levels in soil are too low to be significant for a contaminated dust inhalation hazard. See full table with details of all nearby boring, test pit, and well location samples on data table attached to Workplan.

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

(Check all boxes that potentially apply to the project)

X	Wear hard hat, safety glasses, and steel toed boots when working around drill rig.
	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	Properly ground all electrical equipment.
X	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 poison oak and poison ivy.
☐	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).

_X **Not Applicable**

8. Special Procedures and Precautions

X	**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.
☐	**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 that metals levels in soil are too low to be significant for a contaminated dust inhalation hazard

☐	**Not Applicable**	Because no chemical contamination or excessive dust is expected, no air monitoring will be performed.
X	**Volatile organics only**	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 10 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	Drilling soil borings, soil and GW sampling	0 to 10 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.
X	Drilling soil borings, soil and GW sampling	10 to 50 ppm	Level C: Level D as above plus a half face respirator with organic vapor cartridges, and chemical goggles, and polycoated tyvek.
X	Drilling soil borings, soil and GW sampling	50 to 250 ppm	Level C as above EXCEPT with a Full FACE respirator.
X	Drilling soil borings, soil and GW sampling	> 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, Inc. 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 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.

Jane Dougherty 4/7/03

GAIA Consulting, Inc. Health and Safety Director Date