

I EXECUTIVE SUMMARY

In 1992, the United States Coast Guard traced the source of an estuary hydrocarbon release to an active, above ground storage tank system at the Keep-on-Trucking (KOT) Facility located at 370-8th Avenue, within the Ninth Avenue Terminal. Subsequent investigations at the facility were limited to areas immediately adjacent to the purported point of release. Preliminary site research suggested the likely potential for preferential migration pathways exist for the KOT spill. It is also suggested that other sources of contamination do exist within the study area.

Pursuant to presentation and discussion of the data to Alameda County, a characterization study was implemented. Petroleum hydrocarbon impacted soils and groundwater were identified throughout the Ninth Avenue Terminal. Other potentially hazardous chemicals were also identified. Several underground tanks and a variety of tenants have also been present at the site. In addition, numerous underground utilities were identified in the area. Further site characterization is necessary to better define the 1992 source area impacts and impacts from other site potential sources.

II INTRODUCTION

This is an interim report for a Site Characterization study conducted by Subsurface Consultants, Inc. (SCI) at the KOT facilities and within the Eighth Avenue area of the Port of Oakland's (PORT) Ninth Avenue Terminal. Eighth Avenue extends through the western portion of the Ninth Avenue Terminal. The terminal is bordered by the Embarcadero, Interstate 880 and Southern Pacific Railroad tracks to the north, Clinton Basin to the west, the Inner Harbor Channel to the south and Brooklyn Basin to the east. The general location of the Ninth Avenue Terminal is shown on the Vicinity Map, Plate 1.

The study described herein was performed in general accordance with a work plan prepared by SCI entitled "Work Plan for Further Site Characterization, Keep-On-Trucking Diesel Release and Eighth Avenue Area" dated June 4, 1996. The primary purpose of the study was to evaluate the extent of petroleum hydrocarbon impacts resulting from the 1992 diesel releases at the Keep-On-Trucking facility located at 370-Eighth Avenue, at the Ninth Avenue Terminal. Secondly, potential impacts from other possible source areas, apparent from a review of historical data, were also evaluated.

III SITE DESCRIPTION AND HISTORY

A. Site Description

The Ninth Avenue Terminal area is a flat, irregularly-shaped parcel encompassing approximately 30 acres as shown on the Site Plan, Plate 2. The area is currently owned by the PORT. However, the majority of the area is leased to tenants. Tenants presently occupy the following buildings.

Keep-on-Trucking Maintenance Shop	H-107
Keep-on-Trucking Warehouse	H-229
Keep-on-Trucking Offices	H-228
National Furniture Liquidators	H-232
Lakeside Recycling	H-314
Harbor Forklift	H-318
Liquid Carbonic	

Rail spurs extend partially through the area along Seventh Avenue and in between the structures occupied by National Furniture Liquidators and Lakeside Recycling.

Concrete wharfs extend along the south and east sides of the terminal. Ninth and Tenth Avenues are predominately improved (i.e. paved). The majority of Seventh and Eighth Avenues are unimproved.

Storm water runoff is collected by numerous catch basins on-site and conveyed via below grade storm drains, along Eighth Avenue, to the Inner Harbor and the Clinton Basin. Storm water runoff from a segment of the Embarcadero is also conveyed to the Eighth Avenue storm drain system. Sanitary sewer improvements consist of laterals extending from buildings to a main

sewer line below Eighth Avenue. The sanitary sewer mainline flows toward the Embarcadero. Other subsurface utilities in the area include, but are not necessarily limited to, the following: gas, electric, water and fire alarm.

B. Site Development and Use History

According to an Official Historical Atlas Map of Alameda County by Thompson & West dated 1878, the terminal area originally consisted of tidal flats and marshlands, completely unconnected to the mainland. By 1911 the terminal area was almost completely filled in to its current boundaries. The 1911 Sanborn Fire Insurance Map shows that Clinton Basin was formerly called Sessions Basin. Concrete marginal wharfs previously existed along the Inner Harbor Channel to the south and along the east terminal boundary as early as 1950. Several configurations of timber wharfs have existed along the Clinton Basin side of the terminal. Numerous structures existed throughout the terminal area since 1911, as shown on Plate 2. Most of these structures have since been demolished.

Numerous tenants with various and diverse businesses have occupied buildings and areas at the terminal. Significant uses initially identified with the potential to environmentally impact the Ninth Avenue Terminal Area are listed below. They are also shown on Plate 2.

<u>Site Ref. Area</u>	<u>Business/Use</u>	<u>Circa</u>	<u>Potential Environmental Concerns</u>
A/K	Pacific Lumber Co. H-227 Yard Area	1910 1960	Oil House, Well, Gasoline Engine UST, Gasoline
B	Cleaning Compound Mfg. Polish Factory	1950	Heavy Metals
C	Liquid Fertilizer Mfg.	1950	Fertilizers/Pesticides, Petroleum Hydrocarbons
D	Vic Adelsons's Drayage Silk-screen Printing Diesel Fuel Injector Repair Fertilizer Bagging	1950 1950 1950 1960	2 USTs w/Pumps Unknown Concrete Vault, Petroleum Hydrocarbons, PNAs Petroleum Hydrocarbon/Solvent Use Fertilizers, Heavy Metals
D,F,G,H,M	Keep on Trucking	1970 to	2 ASTs, 1 UST, Truck Repair Shop, ongoing Petroleum
	Hydrocarbon/Solvent Use		
E,H	United Packing Corp. Rexford Pre-Pakt Co./ Safeway CD Erickson Western Tube & Conduit Midland Ross Corp.	1930 1950 1960 1980	Repair Shop, Boiler Room Repair Shop, Boiler Room, UST-Oil Tanks 2 ASTs, UST Plating Activities, Heavy Metals, Waste Oil,
Acids			
G	Fiberglass Forming	1960	Solvent Use
I,J	American Bitumuls Port Petroleum	1940 1950	ASTs - Heavy Oils and Waste Oils ASTs - Heavy Oils and Waste Oils
L	Storm Drain Lines/ Outfalls	NA	Infiltration/Exfiltration
N	Bay City Fuel Co. East Bay Oil Co.	1950 1960	Oil House, ASTs, Gas/Oil Storage Oil House, ASTs and UST, Gas/Oil Storage
O	Repair Garage	1950	UST
P	Chemical, Pipe & Fittings Warehouses	1950	Misc. Chemicals, Heavy Metals

C. **Documented Environmental Impacts**

Review of regulatory agency files, PORT files, and interviews with past PORT employees indicate there were documented releases of petroleum hydrocarbons within the Ninth Avenue Terminal area. In addition, there was a regulated closure of a former plating business which operated in H232. A summary of our findings, to date, regarding these issues is presented below.

①. **1973 Oil Spill**

On January 18, 1973, "oil" was released from an above ground storage tank (AST) situated in the area of the former Port Petroleum leasehold. Reportedly, during decommissioning of Port Petroleum's bulk fuel handling facility, a valve on an AST was opened. The AST still contained an oil product. Reportedly, about 125,000 gallons flowed through a break in a concrete containment dike and overland into a catch basin. Evidence of the release was observed within the estuary. Records of the ensuing cleanup are not comprehensive. However, it appears that oil at the ground surface was collected and the area was regraded.

2. **Midland Ross Corporation Site Closure**

In 1987, the Midland Ross Corporation closed a plating business which was located within Building H-232 at 845 Embarcadero. Reportedly, plating waste water was treated and discharged to the sanitary sewer. Chemicals stored in above ground tanks, as shown on a site plan dated 1983 in the Alameda County file, included ferrous sulfate, chrome rinse, chromate acid, copper cyanide, caustic cyanide, sulfuric acid, electro clean, caustic soda, zinc cyanide, and chlorine. Chemicals listed as previously stored on-site in sumps, as reported to Alameda County

in 1985, included sulfuric and nitric acids, sodium hydroxide, sodium hypochlorite, sodium metabisulfite, ferrous sulfate, cyanide salts, zinc, hexavalent and trivalent chrome, and waste oil. A closure report prepared by Cummings Environmental indicated that additional compounds were removed from the site in 1987, including chromate acid, electro cleaner, Poly Chem solvents, methyl methacrylate, and unknown solvents. A complete copy of the closure report, with analytical test reports and manifests, was not available for review.

3. 1992 Estuary Releases

On October 21 and 27, 1992 the United States Coast Guard (Coast Guard) was notified that diesel fuel was observed within Clinton Basin. The Coast Guard immediately instigated various tasks to mitigate impacts to the basin and estuary, as well as to identify the source. On November 2, 1992 the Coast Guard was notified of another, yet more significant, diesel release to the estuary near Clinton Basin. Due to tides, wind and currents, the diesel spread to the north and central basin marinas. The Coast Guard stepped up their investigation when diesel fuel was identified within the main storm drain line, extending along Eighth Avenue. The PORT retained Uribe & Associates (Uribe) to investigate the source of the diesel and Riedel Environmental Services to immediately remediate the diesel product. Uribe's study included the following:

- Conducting a utility survey
- Dye tracer testing of the Eighth Avenue storm drain
- Drilling and sampling test borings
- Observing conditions in several storm drain manholes in the area

- Observing conditions within several test pits excavated adjacent to storm drain lines
- Rodding and cleaning some storm drain lines
- Obtaining water samples from some of the manholes
- Analytically testing numerous soil, groundwater and grab water samples for petroleum hydrocarbons and metals.

Based on the continuing Coast Guard and Uribe studies, the diesel fuel was traced to a single storm drain system at the Ninth Avenue Terminal which runs along Eighth Avenue. The storm drain system reportedly drains the Eighth Avenue area and a portion of the Embarcadero. Following a dye tracer test, the diesel fuel was traced back to an AST operated by Keep-on-Trucking (KOT) in the former building H-213. A leak in a below ground distribution pipe attached to the AST was identified as the source of the diesel fuel release. The source area is as shown on Plates 2 and 7. The Coast Guard issued a Notice of Designation dated January 8, 1993 identifying Mr. Paul Bokanower, as the owner of the source of diesel found in the Oakland Inner Harbor and Keep-On-Trucking as the source of the diesel. The AST system was subsequently dismantled and removed along with locally impacted soil. During decommissioning of the system, an abandoned underground storage tank (UST) was identified in the area of the pipeline leak. This tank was also removed during remedial activities. Further details regarding the 1992 releases and their impacts may be provided by interviewing percipient witnesses and through further review of contemporaneous files and field notes.

Analytical data from soil samples obtained during Uribe studies and subsequent remedial activities are summarized in the attached Tables.

This site is currently regulated by the Alameda County Health Care Services Agency's (ACHCSA) local oversight program. Six wells, MW-1 through MW-6, installed by Uribe and Clayton Environmental Services (Clayton) to assess the extent of groundwater impact. Free floating diesel has been observed on an ongoing basis in two of these wells (MW-4 and MW-6). The extent of the free product plume has not been delineated to date. It appears that the plume in this area is associated with the 1992 AST releases. This plume extends radially away from the AST release area, except where it was directly transported to the estuary, Clinton Basin and other currently unknown areas via preferential flow along and within utility corridors in the vicinity. The approximate radial extent of the plume is shown on Plate 7.

Groundwater monitoring has been ongoing in this area since 1993. Free floating diesel has been recovered from wells MW-4 and MW-6 through bailing and dedicated passive recovery equipment. To date, only 2 gallons of diesel have been recovered as the recovery system does not seem appropriate for the given site conditions. The data from the February 1996 event indicates that concentrations in the wells have not changed significantly since monitoring began in 1993. Monitoring data are summarized in the attached Tables.

4. 1994 H-107 Tank Removal

Keep-on-Trucking (KOT) has leased building H-107 since approximately 1982. Currently H-107 is the maintenance facility for KOT. An underground diesel tank was removed from the east side of the building in 1994. Both gasoline and diesel range hydrocarbons were detected in soil and groundwater samples obtained following tank removal. Clayton drilled two soil borings (BH-1 and BH-2) and installed one groundwater monitoring well (MW-7) at the site

in 1995 to evaluate impacts. Based on groundwater monitoring data, the area has been impacted by diesel range petroleum hydrocarbons. Monitoring data is summarized in the attached Tables.

IV FIELD INVESTIGATION

A. Purpose and Scope of Work

The purpose of this study was to preliminarily evaluate potential impacts to the study area resulting from the known KOT pipeline leak, as well as from other identified potential sources. A scope of services was developed to investigate the area in general accordance with the Work Plan. The rationale for the study is outlined herein. The rationale is based on our site history and various site reconnaissances.

Floating diesel has been observed in wells near the KOT pipeline leak which occurred outside former Building H-213. However, the free product plume is currently located upgradient of the release point and along a storm drain line. This suggests that the floating product associated with the diesel release(s) has migrated in unsuspected directions, and that preferential flow may be occurring through utility corridors and/or abandoned storm drain systems resulting in distribution of floating product to other areas of the Ninth Avenue Terminal. Accordingly, soil and groundwater samples were obtained and analyzed to evaluate the extent of impacts.

Numerous active subsurface utilities, such as storm drains and sanitary sewers, exist in the KOT pipeline leak area. Storm drains and sanitary sewers extend throughout the terminal area. Abandoned utility lines associated with the historical use of the terminal also exist.

Subsurface utilities and associated bedding materials may act as potential conduits for contaminant migration to the estuary and basin. Accordingly, a utility survey was performed to identify the location of storm drain and sanitary sewer alignments, and corresponding manholes and storm drain inlets. Soil and groundwater samples were collected from locations adjacent to storm drain and sanitary sewer pipelines, manholes and storm drain inlets to investigate whether utility lines act as potential migration pathways.

Based on our research of historical uses at the site, several other petroleum hydrocarbon sources may impact the terminal area. These potential sources are summarized below:

- Oil Tanks - West of Building H-232
- 10,000 gallon UST - North of Building H-227
- Suspected UST near former well, circa 1911 - Northeast of Building H-227
- Two USTs - Near former Building H-209/H-229
- UST/ASTs - East Bay Oil Company Area
- Diesel AST - Southwest of former Building H-213
- Suspected 1970's surface release of oil at the location of the former American Bitumuls and Port Petroleum facilities
- Storm drain and sanitary sewer lines and laterals that extend adjacent to former businesses with suspected petroleum hydrocarbon use
- Storm drain lines that discharge into Clinton Basin

Potential UST areas were screened for the presence of underground improvements by a utility locator. Soil and groundwater samples were collected and analyzed to evaluate chemical impacts at these potential source areas.

During a site reconnaissance, up to 17 inches of a petroleum based liquid and water were observed in a manhole south of the American Bitumuls/Port Petroleum area. PORT maps indicate that the manhole may be connected to a concrete storm drain which extends along Eighth Avenue, and parallel to the KOT Pipeline Leak area. The petroleum based liquid and water were removed to the extent possible. Samples of the liquid and water were analyzed to evaluate appropriate disposal alternatives.

A more detailed description of the services performed by SCI is outlined below.

B. Site Utility Survey

Accessible subsurface utilities within the study area were located using electronic and acoustic instrumentation by the California Utility Surveys (C.U. Surveys). Storm drains, sanitary sewers, wharf access manholes, water lines, gas lines, electric and fire alarm lines, and conduits were located to date.

C.U. Surveys began their utility survey by first locating all visible surface appurtenances such as catch basins, manholes, cleanouts, water and gas valves, etc. C.U. Surveys then opened all manholes and catch basins and inspected each vault for the following:

- Pipes leading into and out of the vault,
- Pipeline orientations,
- Pipe construction material and diameter,

- Pipe flowline depths, and
- Significant indications of petroleum based liquids.

Not all vaults were accessible due to site obstructions and some vaults could not be inspected due to the presence of water, silt or other media. A copy of C.U. Survey's report is presented in Appendix B.

C.U. Surveys also probed any storm drain or sanitary sewer pipeline where the alignment leading away from a vault was not readily apparent (i.e. did not obviously connect with an adjacent manhole or catch basin). A probe transmitting a specific radio frequency was inserted into the pipe as far as possible. The alignment of the pipeline was triangulated above ground by a radio frequency receiver. A similar technique was used for locating metal water and gas pipes, and electrical conduits. Other metallic pipes were located using a magnetometer and electromagnetic induction techniques. The location of identified subsurface pipelines and conduits were marked on the ground surface with spray paint.

The horizontal and vertical locations of all marked utilities, except for electric lines, were surveyed by A-N West, Inc., a licensed land surveyor. In addition to marked utilities, A-N West surveyed all existing monitoring wells including the new monitoring wells, borings installed during this study, and any visible above-ground utility appurtenances. All elevations were referenced to two City of Oakland monuments with known elevations located within the Embarcadero right-of-way. The maps presented in this report are based on the A-N West survey.

C. UST Locating

In addition to subsurface utility mapping, C.U. Surveys screened suspected UST areas using an electro-magnetic induction sweep accompanied by a magnetometer exploration. The suspected UST areas screened include:

- A gasoline UST located near an oil house (H-204) in the Bay Cities/East Bay Oil Company area,
- A gasoline engine operated by the Pacific Lumber Company, located northeast of former Building H-227, and
- A 10,000 gallon UST located northwest of former Building H-227.
- An unidentifiable metallic apparatus measuring approximately 27 feet long by 8 feet wide was identified northwest of former Building H-227. A-N West surveyed the horizontal and vertical extent of this anomaly.

USTs may also have existed west of former Building H-203 and south of Building H-229. Debris and steel stockpiles in the vicinity of these two building prevented C.U. Surveys from performing a sweep for potential USTs. The debris and steel stockpiles need to be relocated prior to screening for USTs at these areas.

D. Petroleum Based Liquid Removal From Manhole

During the utility locating phase of the investigation, up to 17 inches of petroleum-based liquid was observed inside a manhole located southwest of former Building H-227, as shown on the Site Plan. The manhole may be connected to an old concrete storm drain line that extends along Eighth Avenue. According to PORT maps, this line is referred to as the "Old Cannery

Line". In the area of the KOT pipeline leak, C.U. Surveys observed that the Cannery Line was blocked with bricks and concrete. This confirms Uribes' field notes which indicated that a storm drain line was blocked following the 1992 release.

C.U. Surveys observed two 4-inch steel pipes entering the manhole, near the top of the manhole collar. One pipe entered the manhole vault from the north and the other pipe entered from the southwest. The extent or use of these lines has not been determined

Dillard Environmental Services, a certified hazardous materials transporter, was retained by the PORT to remove the petroleum based liquids and water from the manhole. Dillard removed approximately 770 gallons of petroleum based liquid and water on May 13, 1996. During removal, the level of liquid within the manhole remained essentially unchanged suggesting inflow. An employee of Dillard probed and located two additional pipes entering and/or exiting the manhole below the liquid surface. The additional pipes appear to be oriented in directions similar to the orientation of the Cannery line as shown on PORT maps. These additional pipes cannot be probed or located until the manhole is purged of fluid below the level at which these additional pipes enter/exit the manhole. Preliminary estimates indicate that there may be at least 10,000 gallons of the liquid in the manhole and Cannery Line, if, in fact, they are connected. This estimate does not take into consideration additional lines which also may tie-in to the manhole.

The petroleum based liquid and water removed from the manhole was pumped into drums which are being stored on site, pending the results of analytical testing. To evaluate appropriate disposal options, samples of the free floating petroleum based liquid and underlying

water were obtained and analyzed for total volatile hydrocarbons (TVH), total extractable hydrocarbons (TEH), heavy metals, volatile organics, semi-volatile organics, PCBs, bottom sediment and water, and boiling point. The sample chromatographs appear to match the standard laboratory chromatograph for diesel. The analytical test reports are presented in Appendix C. Analytical test results are presented in Tables 2 through 5.

E. Monitoring Well Installation

Monitoring wells were installed previously by others in the area of the 1992 KOT pipeline and in the area of the former KOT maintenance UST. To supplement groundwater elevation data and hence, further evaluate the groundwater flow direction, three additional monitoring wells (SCIMW-1 through SCIMW-3) were installed by SCI within the study area. Well locations are shown on Plate 2. Prior to well installation, a drilling application permit was submitted to and approved by the Alameda County Flood Control and Water Conservation District, Zone 7. A copy of the permit and field protocols for drilling, sampling, and well installation are presented in Appendix E. SCI's field engineer observed drilling operations, prepared detailed logs of the test borings and obtained undisturbed samples of the soils encountered. The test boring logs and well completion details are presented on Plates 8 through 26. Soils are classified in accordance with the Unified Soil Classification System described on Plate 27.

Following well installation and development, groundwater elevations were measured in the new wells and existing wells MW-1 through MW-7. Initially, the wells were checked for free floating product using a steel tape coated with petroleum product sensitive paste. The depth to water below the top of casing (TOC) was then measured in the wells using an electric well sounder.

A summary of groundwater elevation data is presented in Table 6. Well development and groundwater measurement forms are presented in Appendix E.

F. Soil and Groundwater Sampling/Analytical Testing

Subsurface conditions were explored by drilling 31 test borings at the locations shown on the Site Plan. The locations were selected to provide preliminary coverage of potential areas of impact and to supplement existing data. Drilling and sampling protocol are described in Appendix D.

Our field engineer observed drilling operations, prepared detailed logs of the test borings, and obtained undisturbed samples of the soils encountered. Groundwater samples were obtained through temporary wells placed into the test borings. The temporary wells were removed following collection of groundwater samples and the resulting boreholes were backfilled with cement grout.

Selected soil and grab groundwater samples collected from the temporary borings and groundwater samples collected from the 10 existing monitoring wells (MW-1 through MW-7 and SCIMW-1 through SCIMW-3). These samples were transported under Chain-of-Custody to Curtis & Tompkins, Ltd., an analytical laboratory certified by the California Department of Toxic Substances Control (DTSC). All samples were analyzed for petroleum hydrocarbons. Selected samples were further analyzed for other potential contaminants of concern. The testing program is presented on Table 1. Chain-of-Custody forms and analytical test reports are presented in Appendix F. Analytical data is presented in Tables 2 through 6. Analytical data is summarized on Plates 3 through 6.

V SUBSURFACE CONDITIONS

The study area is blanketed by miscellaneous, non-homogeneous fill. The fill is typically 5 feet thick, but measured more than 8 feet thick in areas toward the Clinton Basin and concrete marginal wharf to the south. The fill consists of a mixture of silty and sandy clays, clayey and sandy silts, sandy and clayey gravels, and miscellaneous debris including brick, wood and rock fragments.

Bay sediments underlie the miscellaneous fill. The bay sediments consist of soft, highly organic clayey silt, interlayered with thin lenses of sand. The sediments are soft and compressible and extend to the depth drilled, about 15 feet.

Groundwater was encountered in the temporary well casings at depths ranging from 0.6 to 10.3 feet below ground surface (bgs) up to 24 hours after drilling. Groundwater depths within the monitoring wells ranged from 5 to 7 feet bgs in May 1996. These depths correlate to 4 to 7.5 feet above the Port of Oakland Datum (MSL-3.2 feet).

Groundwater elevations were found approximately 2 to 3 feet higher near the center of the site as compared to those measured closer to Clinton Basin and the estuary. Hence, groundwater appears to be flowing toward the estuary, near the southern portion of the site and toward Clinton Basin along the west of the site.

The approximate groundwater elevation contours for May 1996 are presented on Plate 5. The elevated interior groundwater levels suggest that groundwater recharge, may occur. This may be due to surface infiltration at unpaved areas and/or exfiltration from storm and sanitary sewers in

the area. Additional groundwater monitoring wells need to be installed along the east side of the site to complete the evaluation of groundwater flow directions.

VI FINDINGS AND CONCLUSIONS

On a preliminary basis it appears that soil and groundwater in all areas investigated during this study have been impacted by petroleum hydrocarbons, as well as other chemicals of concern. Our conclusions regarding the significance of the investigation findings to date are as follows.

A. General Site Observations

- The predominant petroleum hydrocarbons identified at the site are within the diesel and motor oil range. Petroleum hydrocarbons were found in shallow soils and groundwater in all suspected areas of concern.
- Groundwater samples from selectively tested, temporary well points and monitoring wells also contain several heavy metals and 2-Butanone (aka MEK).
- Numerous subsurface utilities exist throughout impacted soil and groundwater areas. The utility pipelines extend both above as well as below groundwater levels rendering them potential conduits for contaminant migration. The reason for, and in some cases the extent of utility, pipelines are currently unknown.
- During site activities other areas of concern were identified due to oil stained soils near Lakeside Metals (H-314) and Harbor Forklift (H-318). Impacts to soil and groundwater in these areas have not been investigated to date.

B. Area of Former KOT Maintenance Facilities (H-213)

- Floating petroleum product and/or sheen were observed in the wells and temporary well points in the vicinity of the documented source/release area adjacent to the former building H-213. Floating product and water samples contain diesel, gasoline and motor oil range petroleum hydrocarbons, benzene, several heavy metals, MEK, naphthalene, 2-methylnaphthalene and phenanthrene.
- The extent of the floating product plume and impacts to groundwater have not been defined. However, the extent of contamination is believed to be far greater than an area radially bounding the source/release area due to migration along preferential pathways (utilities) as demonstrated by previous investigations. Hence, substantial impacts are likely exist to a significant, yet currently undefined, portion of the Ninth Avenue Terminal area.
- The main storm drain and the old "cannery" outfall pipelines extend adjacent to the source/release area. Storm drain and other utility laterals extend through impacted groundwater and the floating product plume. The full extent of utilities in this area has not been defined.

C. Area of the Former American Bitumuls and Port Petroleum Bulk Fuel Facilities

- Floating petroleum product and/or sheen were observed in well points and monitoring well MW-3 in the previous AST areas. The floating product and water samples contain diesel and motor oil range petroleum hydrocarbons, several heavy metals, MEK, 1,1-dichlorobenzene, pentachlorophenol, 2-methylnaphthalene, phenanthrene, and Aroclor 1260.
- A suspected storm drain manhole, located immediately south of the former bulk fuel facilities, contains several inches of floating petroleum product and water. The floating product and water contain diesel, gasoline and motor oil range hydrocarbons, ethylbenzene, xylenes, several heavy metals, 1,1-dichloroethane, 1,1-dichloroethene, 1,1,1-trichloroethane, trichloroethene, 2 methylnaphthalene and Aroclor 1260.
- The extent of the floating product plume and impacts to groundwater have not been defined.
- The full extent of utilities in this area have not been defined.

D. Former East Bay Oil/Bay City Oil Company Area

- Gasoline, diesel and motor oil range hydrocarbons, benzene, ethylbenzene, toluene and xylenes, were detected in groundwater, from a temporary well point, situated near the former location of a UST in this area. Diesel and motor oil range hydrocarbons, and heavy metals were detected in groundwater from well MW-2 situated near the former AST area and along the current Clinton Basin shoreline.
- The extent of impacts to groundwater have not been defined in either of these areas.

E. Other Fuel Tank Areas

- Diesel and motor oil range hydrocarbons were detected during this study and previous investigations in groundwater near the former UST at the current KOT maintenance area (H-107). The extent of impacts to groundwater has not been defined in either area.
- A possible UST was identified in the area where a UST was shown to exist on Port maps in the yard area northeast of former building H-227 and adjacent to the former Port Petroleum area. Groundwater from a temporary well point contains gasoline, diesel and motor oil range hydrocarbons and MEK. The extent of impacts to groundwater has not been defined.
- A possible UST was identified in the area where two USTs were shown to exist on Port maps adjacent to a former KOT maintenance facility (H-229). Groundwater from a temporary well point contains gasoline, diesel and motor oil range hydrocarbons, ethylbenzene and xylenes. The extent of impacts to groundwater has not been defined.
- A possible UST was identified in the area where two USTs were shown to exist on Port maps near the current KOT offices. It is currently unclear as to whether the tanks extend below the building. Groundwater from a temporary well point contains diesel and motor oil range hydrocarbons, heavy metals, and MEK. The extent of impacts to groundwater has not been defined.

VII RECOMMENDATIONS

This report should be submitted to the Alameda County Environmental Health Services. In addition, we recommend the following:

- The floating product within the suspected storm drain manhole should be removed to facilitate the investigation of utilities in the area.
- Additional research should be conducted of the areas of newly discovered contamination to 1) identify potentially responsible parties, 2) determine the extent of contamination and 3) determine impacts to other areas.
- Due to extensive and substantial soil and groundwater contamination, Port representatives and SCI should meet with the County to discuss the findings to date and to agree upon the scope of effective subsequent investigations.
- Work plans should be prepared which outline supplemental investigations, as necessary, pursuant to negotiations with the County to complete investigation of the site prior to preparation of a corrective action plan. To do otherwise could lead to unnecessary expenditures.

VIII LIMITATIONS

This study was intended to provide a preliminary means of evaluating soil and groundwater contamination that exists beneath the site, based on limited subsurface investigation and analytical testing. Contamination may exist in other areas not investigated by SCI. Environmental sampling studies, such as presented herein, are by nature non-comprehensive and subject to limitations including those presented herein.

SCI has performed this environmental assessment in accordance with generally accepted standards of care which exist in northern California at the time of this study. The definition and evaluation of environmental conditions are difficult and inexact. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the subsurface and/or historic conditions applicable to the site. In addition, the conclusions made herein reflect site conditions at the time of the investigation. These conditions may change with time, and as such, the conclusions may also change.

The conclusions and opinions presented herein may also be affected by rapid changes in the field of environmental engineering and the laws governing hazardous waste. The reader is advised to consult with SCI prior to relying upon the information provided.

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PORT Card File for H213

1968

Tank adjacent to H213 installed for Western
Tube & Conduit

Map 124-15

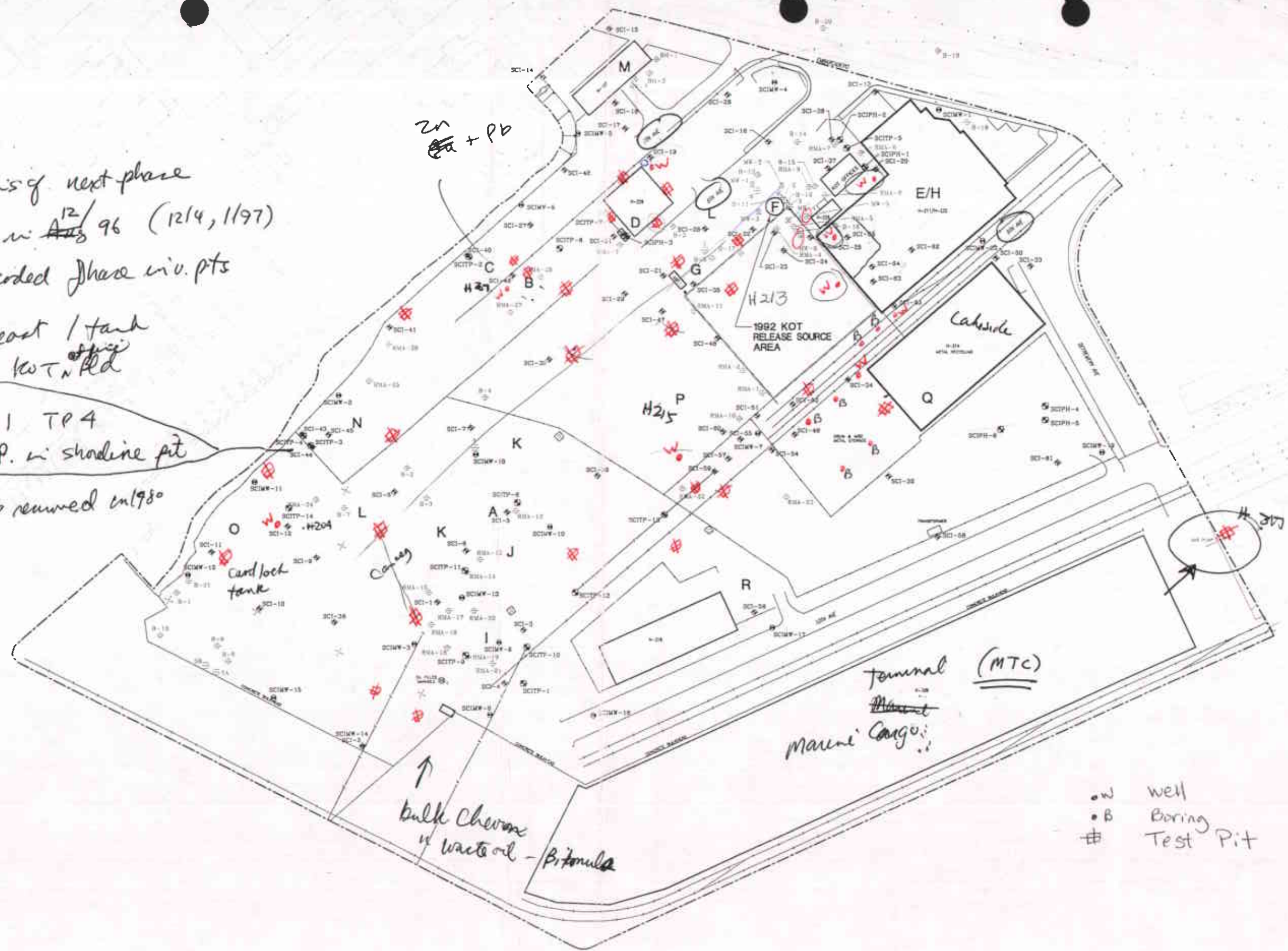
Proposed locations of next phase
 last monitoring in ~~Aug~~ ^{12/} 96 (12/4, 1/97)
 requested color coded phase in v. pts
 identified at least 1 tank
 + piping beneath KOT ^{spec} ~~and~~
 SCI TP 4
 EP. in shoreline pit
 Caherside tank was removed in 1980

LEGEND:

- ◆ SOIL BORING LOCATION (SCI)
- ⊕ SOIL BORING LOCATION (BY OTHERS)
- ⊙ MONITORING WELL LOCATION (SC)
- ⊗ MONITORING WELL LOCATION (BY OTHERS)
- ⊕ TEST PIT/POT HOLE LOCATION
- ≡ TRENCH LOCATION (BY OTHERS)
- ▭ EXISTING BUILDING
- ▭ EXISTING BUILDING FOUNDATION
- ▭ EXISTING BUILDING FOUNDATION
- FENCE LINE
- RAILROAD
- OVERHEAD LIGHT STANDARD
- - - STUDY AREA BOUNDARY
- ⊙ EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- A SITE REFERENCE AREA

NOTES:
 1. UTILITY SURVEY WAS PREPARED BY
 AN WEST 5-22-96

REFERENCE DRAWINGS
 BASE MAP BY
 PORT OF OAKLAND
 DATED 2-22-96



•w well
 •B Boring
 ⊕ Test Pit

DESIGNED BY
 DRAWN BY RDP/DJP
 CHECKED BY JD
 APPROVED BY JL
 DATE 3-13-97

NINTH AVENUE TERMINAL
 PORT OF OAKLAND
SITE PLAN

SCALE
 AS SHOWN
 PROJECT NO
 133.005
 SHEET NO. OF