# SITE CHARACTERIZATION
# 1461 PARK AVENUE
# EMERYVILLE, CALIFORNIA

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## 1.0 INTRODUCTION

Soil and ground water with elevated concentrations of petroleum hydrocarbons were detected at 1461 Park Avenue, in Emeryville, California following the removal of two underground storage tanks in 1989. Subsequent to review of the report of the removal of the tanks prepared by PCC, Incorporated, Remedial Action Corporation proposed that an additional investigation be performed to assess the petroleum hydrocarbon migration prior to site remediation. This report presents the results of the investigation, including assessment of soil and ground water left in drums on the site. The work performed is based on our proposal dated January 25, 1991 and a revision to the scope of work dated May 18, 1991.

The site is located on the southwest corner of the intersection of Park Avenue and Horton Street. The position of the site is shown relative to geographic, topographic and man-made features on portion of a United States Geological Survey topographical quadrangle in Figure 1.

## 2.0 OBJECTIVE

The objectives of the site investigation are as follows:

- Define the lateral extent of petroleum hydrocarbon migration in the soil.
- Devise a plan for soil remediation.
- Sample three existing ground water monitoring wells for petroleum hydrocarbons, solvents and metals.
- Assess the contents of five drums of soil and three drums of ground water left at the site by the previous consultant, and identify a method of disposal.

## 3.0 SCOPE OF WORK

The scope of work for site characterization included the following:

- Preparation of a Work Plan and Health and Safety Plan.

- Obtain work plan approvals from Alameda County Health Care Services Agency.

- Drill six hand auger borings in areas adjacent to the former underground storage tanks (USTs).

- Drill one hand auger boring in the center of the former UST area. Soil samples collected from this boring were submitted for laboratory analyses to determine a method of soil disposal.

- Purge and sample three existing monitoring wells. Analyze ground water samples from the wells for petroleum hydrocarbons, related to the former USTs. Ground water samples were also analyzed for CAM metals and solvents to assess migration of ground water contamination onto the site.

- Survey existing monitoring wells MW-1, MW-2 and MW-3 to assess the direction of ground water movement, as requested by the Alameda County Health Care Services Agency.

- Sample 6, 55 gallon drums of soil and 3, 55 gallon drums of water and analyze the samples as needed to obtain approval for off site disposal.

## 4.0 SITE SETTING

### 4.1 LAND USE

The property is situated, approximately a quarter of a mile east of the San Francisco Bay, in a commercial area of the city of Emeryville, California at about 122° 17' 30" west longitude and 37° 69' north latitude. The dominant industries in the area are warehousing and manufacturing.

The property was occupied from 1968 to 1973 by Pic-a-Tune, reportedly a music or record distributor. From 1973 to 1986 it was leased by Stuart Western, Stuart Radiator and Stuart Auto Parts. The Stuart companies were involved in rebuilding brakeshoes and/or warehousing and distributing auto parts. In 1986, Stuart Western was purchased by Modine Southwest Company. This company owns Western Brake Company, which is presently located on the site and warehouses and distributes vehicle brake parts and radiators.

## 4.2 PREVIOUS INVESTIGATION

In March 1990, two underground storage tanks (USTs) were removed by PCC, Incorporated. A tank closure report was filed with the Alameda County Health Care Agency (ACHCA) in July 1990. A 3000-gallon tank containing gasoline was found in good condition. A 500-gallon tank, thought to contain diesel, showed evidence of leakage due to failure at the welds. The required reports of contamination were filed with the RWQCB and with the ACHCA.

During the excavation of the tanks, three soil samples and two water samples were obtained from the tank excavations, as ground water occurs at a depth of about 6.5 feet. The two tanks were located adjacent to each other at the location indicated as the approximate extent of former UST excavation on Figure 2. The tanks were excavated separately creating separate pits in the area shown in Figure 2. The gasoline tank pit was located in about the northern 17 feet and the diesel tank pit in about the southern 13 feet of the former UST excavation area. Soil samples were taken at a depth of four feet from the north and south walls of the gasoline tank excavation and one soil sample was obtained of water standing in the pit. A soil sample was taken at a depth of five feet from the south wall of the diesel tank excavation and one water sample was taken from the ground water in the pit. After removal of the USTs, the contaminated soil was returned to the excavation.

Analysis for total petroleum hydrocarbons (TPH) detected 62.3 mg/kg and 460 mg/kg TPH in the north and south walls of the gasoline tank excavation, respectively, and 1580 mg/kg TPH was detected in the south wall of the diesel tank excavation. Analysis for TPH as diesel was also performed, but none was detected. Benzene, toluene, xylenes and ethylbenzene (BTXE) were detected in the three samples. In the north wall of the gasoline tank excavation, BTXE was detected at concentrations of 9.8, 207, 947 and 32.9 $\mu$g/kg, respectively. In the south wall of the gasoline tank excavation, BTXE was found at concentrations of 1,600, 9,140, 32,300 and 5,080 $\mu$g/kg, respectively. In the south wall of the diesel tank excavation, BTXE was detected at concentrations of 17.3, 2,600, 100,400 and 481 $\mu$g/kg, respectively.

Laboratory testing for TPH as gasoline detected 38.1 mg/l in the water from the gasoline tank excavation. BTXE concentrations were 2,750, 2,840, 5,890 and 1,160 $\mu$g/l, respectively. In the water from the diesel tank excavation, TPH as gasoline was detected at a concentration of 110 mg/l and BTXE at concentrations of 5,240, 7,040, 15,000 and 2,420 $\mu$g/l, respectively.

The results of chemical analysis suggest that the 500-gallon "diesel" tank may have contained gasoline during the period of leakage. The tank may have been used for diesel and gasoline storage, but appears to have leaked gasoline.

Elevated concentrations of TPH and BTXE occur in the north and south walls of the gasoline tank excavation and in the south wall of the diesel tank excavation (the soil was not tested from the north wall of the diesel tank excavation). It is probable that all walls of the tank excavations had elevated concentrations of petroleum hydrocarbons. As the ground water is reported to occur at a depth of 6½ feet, it is likely that ground water has elevated levels of petroleum hydrocarbons. The concentrations of the hydrocarbons in the ground water, however, should be much lower than those obtained from the ground water within the open excavation, which at 110 mg/kg is at about the saturation limit for gasoline in ground water. In general saturation of ground water with petroleum hydrocarbons is encountered when there is mixing of free product with water, such as that which can occur in some wells or in excavation below the ground water table.

In September 1990, three borings (MW1, MW2 and MW3) were drilled to a depth of 20 feet on the site (Figure 2). Soil samples were obtained at depths of 5 and 10 feet and analyzed for TPH as gasoline and for BTXE. The concentrations of TPH ranged from less than 2.5 to 150 mg/kg. Concentrations of benzene were from less than 5 to 5,000 µg/kg, toluene from less than 5 to 2,200 µg/kg, ethylbenzene from less than 5 to 3,100 µg/kg and xylenes from less than 5 to 4,900 µg/kg. Upon completion of drilling and soil sampling, monitoring wells were installed in the boreholes.

Two weeks after installation, the wells were purged and sampled by Alpha Chemical and Biomedical Laboratories. The samples were analyzed for TPH as gasoline and for BTXE. TPH and BTXE were detected in one well only. The concentration of TPH was 1.2 mg/l. BTXE concentrations were 209, 33.7, 128 and 5.4 µg/l, respectively.

## 4.3 SURFACE CONDITIONS

The former underground storage tanks were is located immediately adjacent to the northeastern corner of the building, in what would be a sidewalk, at the intersection of Park Avenue and Horton Street, as shown in Figure 2. Several truck doors are located on the side of the building where the tanks were formerly located, and in this area there is loading and unloading of materials. The land surface covering the area of the former USTs, which is approximately 30 feet by 15 feet in plan dimensions, is unpaved and covered with

vegetation. The surrounding land surfaces not occupied by buildings are paved streets and sidewalks. The site gently slopes toward the west with surface drainage being mostly in the form of sheetwash.

## 4.4 GEOLOGY AND HYDROLOGY

The site is situated approximately 12 feet above mean sea level about a quarter of a mile east of the San Francisco Bay. The property lies on recent Alluvial Bay Muds that are the youngest geological unit in the San Francisco Bay area. These deposits are underlain by sandstones of the Merrit Formation that in turn overlie the Alameda Formation that primarily consists of silty clays and associated layers of sand and fine gravels (Kaldveer and Associates, 1980).

The Alluvial Bay Muds contain a series of confined aquifers separated by relatively impermeable clay layers. Machine auger borings, conducted on the property as part of a previous investigation, detected ground water at a depth of between 6.5 and 8 feet below the ground surface.

Relatively permeable, thin, interbedded layers of sands, silts and clays are reportedly dominant from ground surface to an approximate depth of 25 feet. At a depth of 25 feet a relatively impermeable unit of silty clay restricts the downward migration of ground water. Above this aquiclude, ground water is reportedly moving toward San Francisco Bay, in a west to southwesterly direction, at a rate of 0.2 - 2.0 feet/day (Kleinfelder & Associates, 1983). However, this investigation determined ground water to be flowing beneath the site in a northwesterly direction, Figure 2.

Ground water pumping wells in the area reportedly utilize water from a depth of 250 feet below ground surface. (RWQCB, 1991)

## 4.5 LOCAL GROUND WATER CONTAMINATION

During the tank removal and subsequent monitoring well sampling, the local ground water was observed to be greenish-yellow in color. It is reported that the source of this contamination was a leaking chromium storage tank located on property leased to Electro-Coatings, Inc. (RWQCB, 1981). Electro-Coatings, Inc. is located at 1421 Park Avenue, just to the east of the site on the south side of Park Avenue. Electro Coatings, Inc property line begins about 50 feet east of Horton Street and extends east to Holden Street. Preliminary

site assessment was preformed and additional site assessment and remediation will be necessary (RWQCB, 1991). The reported estimated clean up cost is $2,540,000 from a Chapter 11 filing No. 4-66-02302-W in the United States Bankruptcy Court for the Northern District of California. It is our understanding that Electro Coatings Inc. is under regulatory order to remediate the ground water plume which extends underneath the site (Kleinfelder and Associates, 1983).

A number of monitoring wells have been drilled on and adjacent to the Electro-Coatings, Inc., property. One of those wells is noted as existing Monitory Well on Figure 2. Laboratory analyses of ground water samples indicate hexavalent chromium and total chromium concentrations in the ground water at 1461 Park Avenue of about 100 mg/l. The direction of ground water movement is reportedly toward the site in a westerly direction (Kleinfelder, 1983). In addition, the RWQCB indicated that laboratory analysis of ground water samples collected on Electro-Coatings, Inc. property have detected the chlorinated solvents 1,1,1-trichloroethane (TCA) and trichloroethene (TCE).

## 5.0 FIELD INVESTIGATION

### 5.1 HAND AUGER BORINGS

On May 15 and 16, 1991, 7 hand auger borings were drilled to a depth of from 4.5 to 9.5 feet below the ground surface. One boring, boring B107 was drilled in the backfilled excavation of the former tanks and the other 6 borings around the perimeter of the excavation. The locations of the borings are shown on the site sketch, Figure 2. Samples were generally collected at two, four and six feet below the surface. In boring B107 samples were collected at depths of 2, 4, 6, 8 and 9 feet below ground surface. The methods used to hand auger the borings, obtain soil samples and manage the samples are described in Appendix A.

A portable organic vapor analyzer (OVA) was used in the field to record the volatile organic chemicals (VOCs) in the headspace of plastic bags. The headspace is present above the soil samples sealed in the bags. The method of sampling the headspace is described in Appendix A. The results of the headspace analysis with a Photoionization Detector (PID) and a description of the soil stratigraphy are shown on the boring logs in Appendix B. A description of the symbols used on the boring logs and the unified soil classification system used to log the borings is described in a fold out on the last page in Appendix B.

## 5.2 MONITORING WELL SAMPLING

During a previous site investigation conducted by PCC, Inc., 3 ground water monitoring wells, MW1, MW2 and MW3, were installed adjacent to the property in September 1990. Two wells were installed in Horton Street, east and southeast of the former USTs and one was installed in an alley west of the building, as shown on Figure 2.

Each well was installed to a depth of 20 feet with 2" schedule 40 PVC. The lower 15 feet of each well was screened with 0.01" slotted screen.

On May 15, 1991, water level measurements were made, the top of monitoring wells surveyed for elevation, and ground water samples obtained from each of the wells.

The well locations were surveyed by Nolte and Associates and the elevations at the top of the well casing and the ground water elevation in each well are as follows:

| Monitoring Well | Top of Casing (feet - MSL) | Water Level (feet - MSL) |
|---|---|---|
| MW-1 | 11.78 | 7.48 |
| MW-2 | 12.08 | 7.78 |
| MW-3 | 10.88 | 6.72 |

Subsequent to measuring the depth to ground water, each monitoring well was purged of approximately four casing volumes and ground water samples were collected for laboratory analysis. The procedures for well purging and ground water sampling are described in Appendix A. Monitoring Well Sampling Forms are presented in Appendix C.

The monitoring wells were observed to recover to at least 80% of their original well volume within one hour of purging. Each well was sealed with a locking cap and lock to prevent unauthorized opening of the wells.

## 5.3 INVESTIGATION OF DRUMS ON PROPERTY

Six, 55 gallon drums of soil and 3, 55 gallon drums of ground water were located in the area of the former USTs. All drums were upright and appeared to be in relatively good condition with no evidence of leaking. The drums had reportedly been left at the site from a previous

site investigation conducted by PCC, Inc., (PCC, 1991). The soil was reported to have been generated from drilling monitoring wells MW-1, MW-2 and MW-3, and the ground water had been purged from the monitoring wells during well development. The drums were observed to have the following approximate contents:

| PCC Markings | RAC Markings | Contents |
|---|---|---|
| MW-2 | 1Z | 48 gallons soil |
| MW-3 | 2Y | 45 gallons soil |
| MW-3 | 3X | 40 gallons soil |
| MW-1 | 4W | 33 gallons soil |
| MW-1 | 5V | 48 gallons soil |
| Unmarked | 6U | 31 gallons soil |
| MW-3 | 7T | 12 gallons water |
| MW-2 | 8S | 12 gallons water |
| MW-1 | 9R | 19 gallons water |

A soil sample was obtained from the unmarked drum for laboratory analysis.

## 6.0 LABORATORY ANALYSIS

### 6.1 SOIL SAMPLES FROM BORINGS

Laboratory analysis was conducted on soil samples from the hand auger borings B101 - B106 to determine the lateral extent of petroleum hydrocarbon contamination. Two soil samples from each boring were analyzed for the following:

- Total Petroleum Hydrocarbons (TPH) as gasoline EPA Method 8015 Modified
- Benzene, Toluene, Xylene, Ethylbenzene (BTXE) EPA Method 8020

In addition to analyzing the samples, to define the extent of petroleum hydrocarbon in the unsaturated zone, soil samples were analyzed to assess the possible migration of total chromium and hexavalent chromium from the adjacent site. Samples from a depth of 6 feet in hand auger borings B101, B102 and B103 were analyzed for total chromium and hexavalent chromium.

Soil samples collected from depths of 2, 4, 6 and 8 feet in boring B107 were composited by the laboratory into Composite Sample A and B, respectively. Laboratory analysis was conducted on the composite samples to assess whether the backfill within the former UST areas are non hazardous materials:

- TPH by Method 8015 Modified
- Volatiles by EPA Method 8240
- CAM Metals by EPA Method 3050
- Hexavalent chromium by EPA Method 7196
- Cyanide and Sulfide by EPA Methods 9010 and 9030
- pH by EPA Method 9040
- Ignitability by EPA Method 1010B
- Aquatic Toxicity

A summary of the results of laboratory analyses performed on samples from the soil borings is presented in Tables 1 and 2. On the boring logs, in Appendix B, results of the laboratory analysis for TPH are presented together with the results of the field PID analyses. It can be seen on the boring log for boring B107 that elevated TPH concentrations identified in the field at a depth below 2 feet were not detected in the laboratory. This could be either due to water entering the PID in the field resulting in erroneous detection of VOCs (personel communication with NET personnel, 1991), to samples being left to aerate during the laboratory compositing procedure, or to "enhanced biodegration" occurring during transport and storage of the samples. It is likely that elevated concentrations of TPH and VOCs are present in the samples below a depth of 2 feet in boring B107.

TPH in the soil samples varied from less then 1 to 97 mg/kg. Benzene varied from less than 50 µg/kg to 1,540 µg/kg. Toluene, xylene and ethylbenzene varied from the detection level of less than about 70 µg/kg to 6,320, 23, 370 and 3,990 µg/kg, respectively. Hexavalent chromium was not detected at a concentration of 2.5 mg/kg in boring B101 and B102. In boring B103 however, hexavalent chromium was 17.3 mg/kg. Concentrations of metals in boring B107 did not appear to be elevated above typical concentrations of metals in the soil.



## 6.2 SAMPLES FROM DRUMS

### 6.2.1 Soil in Drums

Drums 4W and 5V were labeled by the previous consultant as containing soil generated from the drilling of MW-1 closest to the former UST area. One soil sample was collected from each of these drums and analyzed in the laboratory for the following:

- TPH by EPA Method 8015 Modified
- VOCs by EPA Method 8240
- Cyanide and Sulfide by EPA Methods 9010 and 9030
- CAM Metals by EPA Method 8050
- Hexavalent chromium by EPA Method 7196
- pH by EPA Method 9040

Drum 6U was unmarked by the previous consultant however, the soil within the drum was probably generated from drilling MW-2. A soil sample from the drum was analyzed in the laboratory for the following:

- TPH by EPA Method 8015 Modified
- Volatiles by EPA Method 8240
- Total Chromium by EPA Method 6010
- Hexavalent chromium by EPA Method 7196
- Lead by EPA Method 7420

The results of laboratory analyses are summarized in Tables 2 and 3, and the laboratory reports are presented in Appendix D.

Soil in drums 4W, 5V and 6U had TPH concentrations of less than 1 mg/kg, a pH of between 7.8 and 8.5 and non detectable concentrations of cyanide and sulfide. Volatile concentrations were below the laboratory detection levels for all chemicals except for toluene. A toluene concentration of 64 mg/kg was recorded in soil from drum 4W. Analysis of CAM metals on soil from drums 4W and 5V detected concentrations of metals that did not appear to be above typical concentrations of metals in soil, however, soil in drum 6U, was found to contain concentrations of hexavalent chromium in excess of 10 times the Soluble Threshold Limit Concentration (STLC). Following extraction by the Toxic

Characteristic Leaching Procedure (TCLP) and a separate sample by the WET procedure the soluble analysis was performed for hexavalent chromium.

Soluble hexavalent chromium concentrations using the TCLP and WET extraction method are 2.88 mg/l and 0.14 mg/l, respectively.

### 6.2.2 Ground Water in Drums

Ground water generated from the development of MW-1 during a previous site investigation was stored on the site in drum 9R.

Ground water from drum 9R was analyzed in the laboratory for the following:

- VOCs by EPA Method 8240
- pH by EPA Method 9040
- Total chromium by EPA Method 2007
- Hexavalent chromium by EPA Method 7196

The laboratory results are summarized in Tables 3 and 4 and the laboratory reports are presented in Appendix D.

Volatile concentrations were all below the laboratory detection limits, the pH was 7.6, total chromium was 342 mg/l and hexavalent chromium was 0.09 mg/l, respectively.

## 6.3 GROUND WATER SAMPLES

Ground water samples were collected from MW-1, MW-2 and MW-3 and were analyzed for the following:

- TPH as gasoline by EPA Method 8015 Modified
- BTXE by EPA Method 8020
- Halocarbons by EPA Method 8010
- pH by EPA Method 9040
- CAM Metals
- Hexavalent chromium by EPA Method 7196



The results of laboratory analyses are summarized in Tables 3 and 4, and the laboratory reports are presented in Appendix D.

MW-1 had a TPH concentration as gasoline of 3,418 µg/l (3.418 mg/l) and BTXE concentrations of 1,454, 9.4, 273 and 599 µg/l, respectively. The pH was 6.9 and CAM metals concentrations were all below the laboratory detection levels except for antimony at 1.66, barium at 0.12, total chromium at 349, nickel at 0.06 and zinc at 0.03 mg/l. VOCs for MW-1 were below the laboratory detection levels except for TCA at 64.3 mg/l and TCE at 1.29 µg/l.

MW-2 had TPH concentrations as gasoline of 110 µg/l (0.110 mg/l) and BTXE concentrations of 11.2, <0.5, 1.2 and 1.0 µg/l, respectively. The pH of ground water from this well was 7.0 and CAM metals concentrations were all below the laboratory detection limits except for arsenic at 1.51 mg/l, barium at 0.03 mg/l and total chromium at 353 mg/l. VOCs for MW-2 were all below the laboratory detection limits except for TCE at 401 µg/l.

MW-3 had TPH concentrations as gasoline of less than the detection level of 10 µg/l (0.010 mg/l) and BTXE concentrations of 2.7, <0.5, <0.5, <0.5 µg/l, respectively. The pH of ground water from this well was 6.9 and CAM metals concentrations were all below the laboratory detection limits except for the antimony at 0.06 mg/l, barium at 0.03 mg/l and total chromium at 47.6 mg/l. VOCs for MW-3 were all below the laboratory detection limits except for TCE at 262 µg/l.

## 7.0 DISCUSSION

### 7.1 SUBSURFACE CONDITIONS

The site is situated approximately 12 feet above MSL a quarter of a mile east of the San Francisco Bay. Directly beneath the property are Alluvial Bay Mud deposits consisting of stiff black, relatively impermeable, clay deposits. Hand auger borings conducted during this investigation and machine auger boring drilled during a previous site investigation determined that these sediments continue to a depth of at least 20 feet beneath the site.

Ground water was encountered at depths of between six and eight feet below ground surface and was observed to rise within the borings to a depth of about four feet below ground surface. Ground water is confined, possibly within a more permeable section of the clay or within undetected sand or silt stringers within the bay muds. However, at soil boring B107,

within the former UST area, ground water was detected at 3 feet below ground surface. At this location the clay confining layer had been removed during the tank excavation. The excavation was then backfilled with excavated soils without recreating a relatively impermeable cap over the aquifer.

The ground water gradient and direction of ground water movement beneath the site were assessed from ground water elevations obtained from the existing monitoring wells. These elevations are 6.72 to 7.78 feet MSL. The ground water gradient based on these elevations is about 2.2 feet vertical per 1000 feet horizontal and is towards the northwest.

## 7.2 DISTRIBUTION OF CHEMICALS IN THE SOIL

At all soil borings a relative thin layer of unsaturated soil is present from the ground surface to a depth of about three to eight feet as shown on the boring logs. Laboratory analysis of soil samples detected elevated concentrations of VOCs. Concentrations of TPH and BTXE are depicted at each soil boring on the site sketch, Figure 2.

Elevated TPH concentrations in excess of 10 mg/kg were detected in all the borings except B104, B105 and B107. In the previously drilled monitoring wells, MW2 and MW3 concentrations of TPH were not detectable while in MW1, TPH was 150 mg/kg.

The lateral extent of TPH in excess of 10 mg/kg has not been defined by this investigation. Considering the information from the monitoring wells particularly MW2, the lateral extent should not be more than about 35 feet from the edge of the former excavation and is anticipated to vary from about 10 to 20 feet from the edge of the former excavation. As previously indicated, the results of the laboratory tests on the composite samples from B107 are suspicious. Higher concentrations of VOCs should have been detected based on the results of the field screening with the PID and our understanding of the excavation and backfill method.

BTXE were detected in all the samples analyzed from above the ground water level. The approximate location of the 0.5 mg/kg isoconcentration contour for benzene is shown in Figure 2. The concentrations of BTXE's are shown for each boring on the site sketch, Figure 2.

The 2 composite soil samples in boring B107 are mostly composited with saturated soils. The results of the analysis detected very low concentrations of toluene and xylene in one sample. Based on the field screening with the PID, higher concentrations of VOCs were anticipated in the samples from boring B107.

On the basis of the ground water information obtained from the Bay Area Regional Water Quality Control Board (RWQCB), selected soil samples were analyzed for total chromium and hexavalent chromium. Elevated concentrations of total chromium and hexavalent chromium were detected, however, the concentrations were below the TTLC criteria for hazardous waste.

## 7.3 DISTRIBUTION OF CHEMICALS IN THE GROUND WATER

Dissolved phase petroleum hydrocarbons were detected in monitoring wells MW1, MW2 and MW3. The highest concentrations of petroleum hydrocarbons were detected in MW1 immediately adjacent to the former tanks. In MW2, which is slightly upgradient of the former tanks, TPH and BTXE were much lower then in MW1. In MW3, which is generally downgradient of the former tanks, benzene only, was detected at a concentration of 2.7 µg/kg. A dissolved phase hydrocarbon plume is present in the ground water and appears to have the highest concentrations of hydrocarbons near the former underground storage tanks. No free phase petroleum hydrocarbons were detected in the wells.

Elevated concentrations, in excess of the EPA and State of California Drinking Water Standards, of chlorinated solvents TCE and TCA and total chromium, hexavalent chromium and antimony were detected in ground water samples collected from monitoring wells MW1, MW2 and MW3. The highest concentrations of these chemicals were detected in ground water from MW1 adjacent to the former USTs and MW2 which is slightly upgradient of the former USTs. These chemicals are not associated with underground gasoline or diesel storage tanks. Based on information from the RWQCB, these chemicals are believed to have migrated to beneath the property from the adjacent, upgradient site.

In 1981 a waste chromium storage tank leak at the nearby property, leased to Electro-Coatings Inc., was reported to the RWQCB. Considering that the Electro-Coatings Inc., facility is nearby to and immediately upgradient of the facility, and that preliminary information from reports prepared for Electro-Coatings, Inc. shows a plume with relatively high concentrations of chromium beneath the site, the source of the chromium has been determined to be Electro-Coatings, Inc. Chlorinated solvents were also reported by the

RWQCB to have been detected in the chromium plume and it is likely that Electro-Coatings Inc., is also the source of the chlorinated solvents in the ground water. (Personal Communication RWQCB, 1991)

## 7.4 CRITERIA FOR SITE REMEDIATION

The work plan included additional site investigation and remediation of soil with petroleum hydrocarbons. The criteria for soil remediation identified in the work plan are TPH at 10 mg/kg and BTXE at 10, 50, 50, and 50 $\mu$g/kg, respectively.

Although elevated concentrations of total and hexavalent chromium and chlorinated solvents were detected in the soil and ground water no criteria have been established for site remediation due to the presence of these chemicals. The chromium and solvents have migrated onto the site from an adjacent property. The RWQCB has requested that Electro-Coatings Inc., complete the site characterization and remediate the site. "Site" would include the Electro-Coatings, Inc. site and all adjacent and nearby facilities contaminated by migration of the chemical plume from the Electro-Coatings, Inc. site. The site (1461 Park Avenue) would be included in the "Site" (area) which Electro-Coatings, Inc. is responsible for cleanup.

The clean up criteria for ground water could be set at the drinking water criteria for BTXE which are 1, 1,000, 1.750 and 680 $\mu$g/l, respectively. It is suggested that RWQCB set clean up criteria for the chemicals in the ground water emanating from Electro-Coatings, Inc. at the detection levels but no higher than the drinking water standards.

# 8.0 CONCLUSIONS AND RECOMMENDATIONS

Petroleum hydrocarbons have been detected in the soil and ground water adjacent to the former USTs at concentrations in excess of the remediation criteria. The lateral extent of the petroleum hydrocarbon plume in the soil extends beyond the limits of all the borings for this investigation and beneath the building. It is anticipated however, that the plume would extend no more than about 20 to 30 feet from the former UST excavation.

Remediation of the contaminated soil outside the building could proceed at this time using a mobile laboratory in the field to control the horizontal limits of the excavation. The vertical extent would be to a depth of about six feet or just above the confined ground water aquifer.

It is our recommendation, however, that the limits of petroleum hydrocarbon migration in the unsaturated zone be defined prior to commencing excavation. For this purpose six to eight shallow hand auger borings to a depth of between 6 to 8 feet would be drilled at a distance about 10 to 15 feet radially away from the recent borings and the former USTs. If VOCs are detected in any of these borings in the field then step out borings would be drilled 10 to 15 feet radially away from the boring and the former USTs.

Without additional investigation the volume of contaminated soil could only be estimated and therefore the cost would need to be provided as a wide range of estimated costs. This wide range of costs may be difficult to manage where funds are limited and a large contingency fund is not available to pay for the difference between the estimated cost of remediation, upon which projects are usually contracted for, and the maximum cost. In proceeding with additional site investigation there is also a need to balance the cost of investigation verses the cost of remediation. An additional investigation of 6 to 8 borings may cost about $5,000 to $8,000. This cost would be equivalent to the remediation cost for about 12 to 19 cubic yards of soil or about 54 to 86 square feet of plan area. Although this is not an insignificant cost compared to the original estimated cost of remediation of about $46,000, it is probably not large enough to begin remediation without a reasonably well defined volume and therefore, a relatively firm final cost for remediation.

Petroleum hydrocarbons have been detected in the ground water monitoring wells with benzene, only, detected at 2.7 $\mu$g/l in downgradient well MW3. Elevated petroleum hydrocarbons in the ground water are likely to be from the former USTs on the site. To define the ground water plume and assess whether petroleum hydrocarbons may be migrating onto the site, it is recommended that one well be installed immediately downgradient of the former USTs on the north side of Park Avenue and one well installed on the east side of Horton Street. In lieu of the well on Horton Street, information on possible onsite migration of petroleum hydrocarbons could be obtained from existing information from Electro-Coatings, Inc., studies or by obtaining samples from Electro-Coatings, Inc. wells and analyzing the samples for TPH and BTXE.

The chlorinated solvents and chromium in the ground water are a result of the activities on adjacent sites. Electro-Coatings, Inc. has been requested to characterize the plume and remediate the ground water contamination. Ground water remediation of the petroleum hydrocarbons cannot be performed without consequent remediation of the chlorinated solvents and chromium. Since the chlorinated solvent and chromium plumes extend downgradient to MW3 it is anticipated that remediation of these plumes would also result

in remediation of the petroleum hydrocarbon plume. The most cost effective approach to ground water remediation therefore, is to have a single ground water remediation system with separate unit processes to treat inorganic, chlorinated solvents and petroleum waste streams.

## 9.0 REMEDIAL ALTERNATIVES

### 9.1 SOIL

Remedial alternative for soil with elevated concentrations of petroleum hydrocarbons include excavation and disposal, excavation and on site aeration, excavation and on site bioremediation, or "do nothing". Due to limited space on site, aeration and on site bioremediation are not feasible alternatives. Concentrations of petroleum hydrocarbons in the soil exceed the site remediation criteria and therefore "doing nothing" is not feasible. As proposed in the work plan excavation and disposal of the soil is the most feasible alternative.

Based on the laboratory analysis, the soil is non hazardous. Disposal of the soil in local landfills is not feasible due to concentrations of benzene. Gibson Oil and Refining Inc., in Bakersfield however, will treat and recycle the soil. Ogden, Inc. has a thermal treatment facility in Stockton, California which may also be an alternative for treatment of the waste. Currently, however, the facility is closed awaiting permits.

### 9.2 GROUND WATER

Petroleum hydrocarbons in ground water may be remediated by pumping the ground water and air stripping direct to the atmosphere, air stripping with carbon adsorption, direct or wet carbon adsorption, UV ozonation or peroxidation, biological, treatment or "no action". None of the above processes is feasible without further studies and/or pre-treatment or subsequent treatment for removal of chromium and/or the chlorinated solvents. The no action alternative is not feasible since the petroleum hydrocarbons exceed the site remediation criteria.

## 9.3 DISPOSAL OF DRUMS

About 3 tons of soil, contained in 7, 55 gallon drums stored on the site can be managed as non hazardous waste and sent for recycling to Gibson Oil and Refining Inc., in Bakersfield, California. This facility will not handle soil in drums and the soil will have to be removed from the drums and placed into a bin or haul truck for transportation to the facility. The drums can be reused, if needed, or sold to a drum recycler.

Ground water in 3, 55 gallon drums from previous monitoring well sampling and 1, 55 gallon drum from the recent monitoring well sampling, stored on the site, has elevated concentrations of total chromium. This water can be disposed of at Solvent Services, Inc. in San Jose, California. The facility requires a sample of the ground water to verify that chemicals in the water is below their acceptance criteria. It is anticipated that these criteria will be satisfied and that the ground water can be disposed of on the same day that laboratory analysis is completed.

Respectfully submitted,

**REMEDIAL ACTION CORPORATION**

James Farrow
Staff Geologist

Edward B. Sirota
Project Manager




RAC

## REFERENCES

Kaldveer and Associates, 1980. Geotechnical Consultants "Geotechnical Engineering Services for Gasoline Location Study Berths 4 & 5 Container Yard Outer Harbor Terminal Port of Oakland, Oakland, California.

Kleinfelder and Associates, 1983 "Progress Report Electro-Coatings, Inc.," Emeryville, California", November 1983

PCC, Inc., 1991, personal communication with Mr. Richmond of Property Contamination Control Inc., May, 8, 1991

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# TABLE 1
# SUMMARY OF LABORATORY ANALYSIS
# SOIL BORINGS

| LOCATION | | B101 | B101 | B102 | B102 | B103 | B103 | B104 | B104 | B105 | B105 | B106 | B106 | B107 | B107 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBER | | 101.4.1 | 101.6.1 | 102.2.1 | 102.6.1 | 103.2.1 | 103.6.1 | 104.1.1 | 104.3.1 | 105.2.1 | 105.4.1 | 106.1.1 | 106.3.1 | A | B |
| TPH EPA 8015 Modified (mg/kg) | | 2.5 | 41 | 6.6 | 83.9 | 3.5 | 97 | 7.4 | 4.2 | <1 | 9.1 | 6.9 | 46 | <1.0 | <1.0 |
| Benzene EPA 8020 (mg/kg) | | 0.26 | 0.46 | 0.83 | 1.58 | 0.68 | 0.35 | 1.01 | 0.52 | <0.05 | <0.05 | 1.43 | 1.54 | NA | NA |
| Ethylbenzene EPA 8020 (mg/kg) | | 0.26 | 1.83 | 0.51 | 3.99 | 0.18 | <0.07 | 0.62 | 0.42 | <0.07 | 0.27 | 0.34 | 2.12 | NA | NA |
| Toluene EPA 8020 (mg/kg) | | 0.08 | 1.81 | 0.71 | 5.25 | 0.72 | <0.07 | 0.89 | 0.16 | <0.07 | 0.08 | 2.44 | 6.32 | NA | NA |
| Xylene EPA 8020 (mg/kg) | | 0.47 | 8.39 | 3.17 | 18.3 | 1.20 | <0.14 | 3.18 | 23.37 | <0.14 | 2.19 | 2.26 | 12 | NA | NA |
| pH EPA 9040 | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 8.8 | 8.3 |
| Ignitability of EPA 1010 B (°F) | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | >200 | >200 |
| Cyanide EPA 9010 (mg/kg) | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.4 | <0.4 |
| Sulfide EPA 9030 (mg/kg) | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <2.0 | <2.0 |
| Aquatic Toxicity 96 hr $LC_{50}$ | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 100% | 95% |
| CAM Metals EPA 3050 & 7196 (mg/kg) | Antimony | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <2.5 | <2.5 |
| | Arsenic | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.5 | 4.3 |
| | Barium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 97.1 | 76.3 |
| | Beryllium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.0 | <1.0 |
| | Cadmium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.5 | <0.5 |
| | Chromium-Total | NA | 26 | NA | 106 | NA | 113 | NA | NA | NA | NA | NA | NA | 39.7 | 39.4 |
| | Chromium Hexavalent | NA | <2.5 | NA | <2.5 | NA | 17.3 | NA | NA | NA | NA | NA | NA | <2.5 | <2.5 |
| | Cobalt | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 7.4 | 5.8 |
| | Copper | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 14.0 | 10.7 |
| | Lead - Total | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 30.4 | 10.4 |
| | Mercury | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.005 | <0.005 |
| | Molybdenum | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <2.5 | <2.5 |
| | Nickel | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 53.8 | 34.1 |
| | Selenium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.5 | <0.5 |
| | Silver | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.0 | <1.0 |
| | Thallium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <2.0 | <2.0 |
| | Vanadium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 26.2 | 21.0 |
| | Zinc | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 39.8 | 31.4 |

**NOTE:** **NA = NO ANALYSIS**
**FOR SAMPLE LOCATIONS SEE FIGURE 2**

# TABLE 2
# RESULTS OF VOLATILE LABORATORY ANALYSIS
# CONDUCTED ON SOIL SAMPLES

| DESCRIPTION | SOIL BORING | | SOIL IN DRUMS | | |
|---|---|---|---|---|---|
| LOCATION | B-107 | B-107 | 4W | 5V | 6U |
| SAMPLE NO. AND DEPTH (FT) | Composite A 107.2-107.4 | Composite B 107.6-107.8 | 4W1 | 5V1 | 6U1 |
| Acetone | <50 | <50 | <50 | <50 | <50 |
| Benzene | <25 | <25 | <25 | <25 | <25 |
| Bromodichloromethane | <25 | <25 | <25 | <25 | <25 |
| Bromoform | <25 | <25 | <25 | <25 | <25 |
| Bromomethane | <25 | <25 | <25 | <25 | <25 |
| 2-Butanone (MEK) | <50 | <50 | <50 | <50 | <50 |
| Carbon Disulfide | <25 | <25 | <25 | <25 | <25 |
| Carbon Tetrachloride | <25 | <25 | <25 | <25 | <25 |
| Chlorobenzene | <25 | <25 | <25 | <25 | <25 |
| Chloroethane | <25 | <25 | <25 | <25 | <25 |
| 2-Chloroethylvinyl ether | <50 | <50 | <50 | <50 | <50 |
| Chloroform | <25 | <25 | <25 | <25 | <25 |
| Chloromethane | <25 | <25 | <25 | <25 | <25 |
| Dibromochloromethane | <25 | <25 | <25 | <25 | <25 |
| 1,2-Dichlorobenzene | <25 | <25 | <25 | <25 | <25 |
| 1,3-Dichlorobenzene | <25 | <25 | <25 | <25 | <25 |
| 1,4-Dichlorobenzene | <25 | <25 | <25 | <25 | <25 |
| 1,1-Dichloroethane | <25 | <25 | <25 | <25 | <25 |
| 1,2-Dichloroethane | <25 | <25 | <25 | <25 | <25 |
| 1,1-Dichloroethene | <25 | <25 | <25 | <25 | <25 |
| trans-1,2-Dichloroethene | <25 | <25 | <25 | <25 | <25 |
| 1,2-Dichloropropane | <25 | <25 | <25 | <25 | <25 |
| cis-1,3-Dichloropropene | <25 | <25 | <25 | <25 | <25 |
| trans-1,3-Dichloropropene | <25 | <25 | <25 | <25 | <25 |
| Ethylbenzene | <25 | 29 | <25 | <25 | <25 |
| 2-Hexanone | <50 | <50 | <50 | <50 | <50 |
| Methylene Chloride | <50 | <50 | <50 | <50 | <50 |
| 4-Methyl-2-pentanone | <50 | <50 | <50 | <50 | <50 |
| Styrene | <25 | <25 | <25 | <25 | <25 |
| 1,1,2,2-Tetrachloroethane | <25 | <25 | <25 | <25 | <25 |
| Tetrachloroethene | <25 | <25 | <25 | <25 | <25 |
| Toluene | <25 | <25 | 64 | <25 | <25 |
| 1,1,1-Trichloroethane | <25 | <25 | <25 | <25 | <25 |
| 1,1,2-Trichloroethane | <25 | <25 | <25 | <25 | <25 |
| Trichloroethene | <25 | <25 | <25 | <25 | <25 |
| Trichlorofluoromethane | <25 | <25 | <25 | <25 | <25 |
| Vinyl Acetate | <50 | <50 | <50 | <50 | <50 |
| Vinyl Chloride | <25 | <25 | <25 | <25 | <25 |
| Xylene (total) | <25 | 60 | <25 | <25 | <25 |

**NOTE:** **NA = NO ANALYSIS**
**FOR SOIL SAMPLE LOCATION SEE FIGURE 2**
**ALL RESULTS IN µg/kg FROM EPA METHOD 8240**

# TABLE 3
# RESULTS OF LABORATORY ANALYSES CONDUCTED ON GROUND WATER SAMPLES AND SOIL DRUM SAMPLES

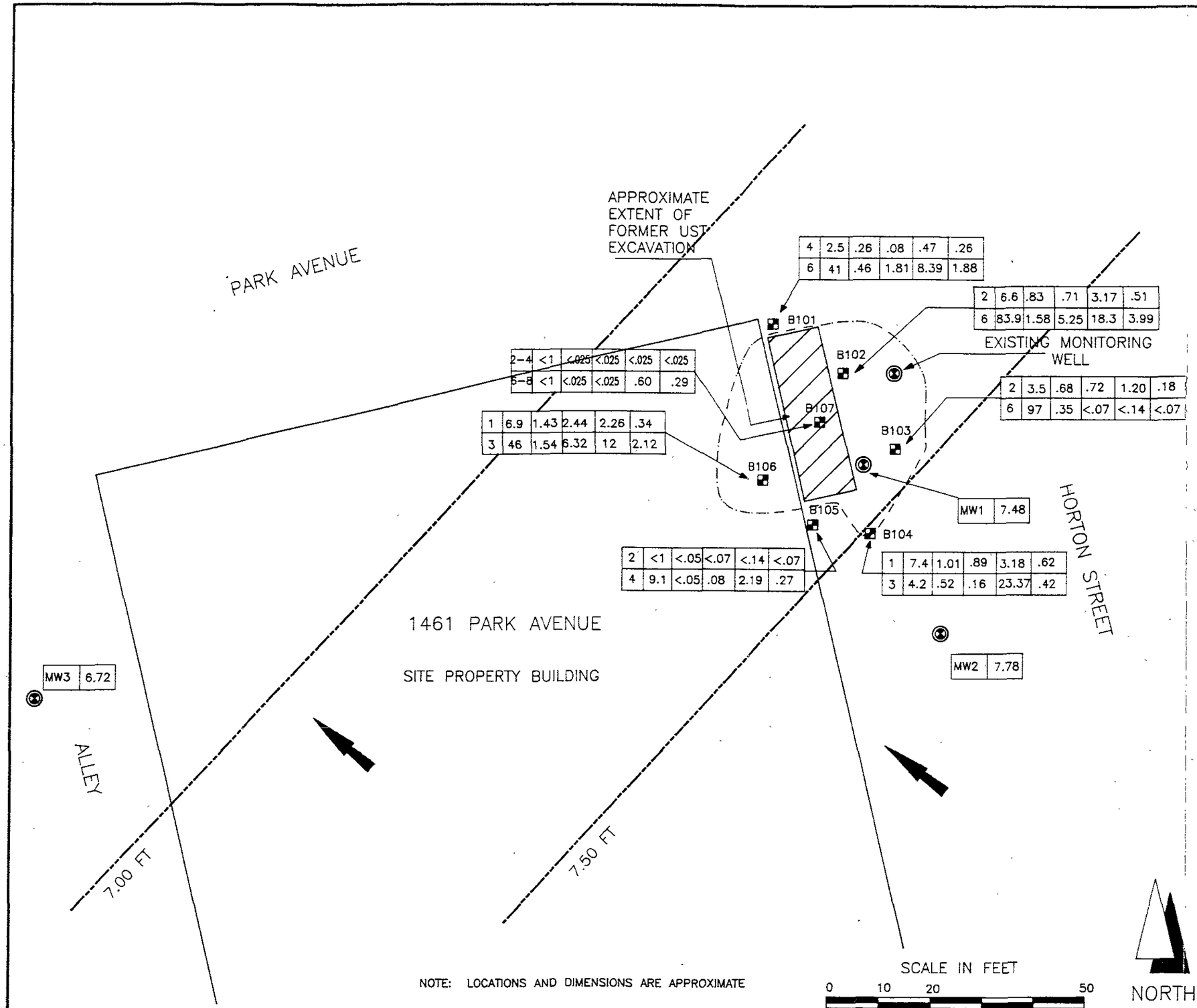
| DISCRIPTION | | GROUND WATER MONITORING WELL | | | | | | | | | GROUND WATER IN DRUM | | SOIL IN DRUMS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCATION | | MW-1 | MW-1 | MW-1 | MW-2 | MW-2 | MW-2 | MW-3 | MW-3 | MW-3 | 9R | 9R | 4W | 5V | 6U |
| SAMPLE NUMBER | | 1.O.1 | 1.C.1 | 1.M.1 | 2.O.1 | 2.C.1 | 2.M.1 | 3.O.1 | 3.C.1 | 3.M.1 | 9R.C.1 | 9R.M.1 | 4W1 | 5V1 | 6U1 |
| TPH EPA 8015 Modified µg/l | | 3418 | NA | NA | 110 | NA | NA | <10 | NA | NA | NA | NA | <1000 | <1000 | <1000 |
| Benzene EPA 8020 µg/l | | 1454 | NA | NA | 11.2 | NA | NA | 2.7 | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene EPA 8020 µg/l | | 9.4 | NA | NA | <0.5 | NA | NA | <0.5 | NA | NA | NA | NA | NA | NA | NA |
| Toluene EPA 8020 µg/l | | 273 | NA | NA | 1.2 | NA | NA | <0.5 | NA | NA | NA | NA | NA | NA | NA |
| Xylene EPA 8020 µg/l | | 599 | NA | NA | 1.0 | NA | NA | <0.5 | NA | NA | NA | NA | NA | NA | NA |
| pH EPA 9040 | | NA | 6.9 | NA | NA | 7.0 | NA | NA | NA | 6.9 | 7.6 | NA | 8.5 | 7.8 | NA |
| Cyanide 9030 µg/l | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.4 | <0.4 | NA |
| Sulfide EPA 9010 µg/l | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <2.0 | <2.0 | NA |
| Chromium Hexavalent TCLP/WET (mg/l) | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.88/0.14 |
| CAM Metals EPA 3050 & 7196 (mg/l) | Antimony | NA | NA | 1.66 | NA | NA | 1.51 | NA | NA | 0.06 | NA | NA | <2.5 | <2.5 | NA |
| | Arsenic | NA | NA | <0.003 | NA | NA | <0.003 | NA | NA | <0.003 | NA | NA | 4.10 | 6.45 | NA |
| | Barium | NA | NA | 0.12 | NA | NA | 0.03 | NA | NA | 0.03 | NA | NA | 157 | 161 | NA |
| | Beryllium | NA | NA | <0.02 | NA | NA | <0.02 | NA | NA | <0.02 | NA | NA | <1.0 | <1.0 | NA |
| | Cadmium | NA | NA | <0.01 | NA | NA | <0.01 | NA | NA | <0.01 | NA | NA | 0.7 | 0.9 | NA |
| | Chromium-Total | NA | NA | 349 | NA | NA | 353 | NA | NA | 47.6 | NA | 342 | 102 | 64.6 | 179 |
| | Chromium Hexavalent | NA | 0.11 | NA | NA | 0.26 | NA | NA | 0.17 | NA | 0.09 | NA | <2.5 | <2.5 | (1)55.9 |
| | Cobalt | NA | NA | <0.5 | NA | NA | <0.05 | NA | NA | <0.05 | NA | NA | 7.5 | 10.7 | NA |
| | Copper | NA | NA | <0.02 | NA | NA | <0.02 | NA | NA | <0.02 | NA | NA | 21.3 | 22.9 | NA |
| | Lead - Total | NA | NA | <0.05 | NA | NA | <0.05 | NA | NA | <0.05 | NA | NA | 21.2 | 6.1 | 9.8 |
| | Mercury | NA | NA | <0.0005 | NA | NA | <0.0005 | NA | NA | <0.0005 | NA | NA | <0.005 | <0.005 | NA |
| | Molybdenum | NA | NA | <0.05 | NA | NA | <0.05 | NA | NA | <0.05 | NA | NA | <2.5 | <2.5 | NA |
| | Nickel | NA | NA | 0.06 | NA | NA | <0.03 | NA | NA | <0.03 | NA | NA | 42.3 | 71.3 | NA |
| | Selenium | NA | NA | <0.01 | NA | NA | <0.01 | NA | NA | <0.01 | NA | NA | <0.5 | <0.5 | NA |
| | Silver | NA | NA | <0.02 | NA | NA | <0.02 | NA | NA | <0.02 | NA | NA | <1.0 | <1.0 | NA |
| | Thallium | NA | NA | <0.04 | NA | NA | <0.04 | NA | NA | <0.04 | NA | NA | <2.0 | <2.0 | NA |
| | Vanadium | NA | NA | <0.5 | NA | NA | <0.5 | NA | NA | <0.5 | NA | NA | 29.4 | 35.7 | NA |
| | Zinc | NA | NA | 0.03 | NA | NA | <0.02 | NA | NA | <0.04 | NA | NA | 52.3 | 44.1 | NA |

**NOTE:** **NA = NO ANALYSIS**
**FOR MONITORING WELL LOCATIONS SEE FIGURE 2**
**(1) SOLUBLE CHROM VI FROM THE TCLP AND WET PROCEDURES ARE**

# TABLE 4
# RESULTS OF VOLATILE LABORATORY ANALYSIS
# CONDUCTED ON GROUND WATER

| DESCRIPTION | GROUND WATER MONITORING WELL | | | GROUND WATER IN DRUM |
|---|---|---|---|---|
| LOCATION | MW-1 | MW-2 | MW-3 | 9R |
| SAMPLE NO. | 1.0.1(1) | 2.0.1(1) | 3.0.1(1) | 9R.0.1(2) |
| Acetone | NA | NA | NA | <100 |
| Benzene | NA | NA | NA | <5 |
| Bromodichloromethane | <0.5 | <0.5 | <0.5 | <5 |
| Bromoform | <1.0 | <1.0 | <1.0 | <5 |
| Bromomethane | <1.0 | <1.0 | <1.0 | <5 |
| 2-Butanone (MEK) | NA | NA | NA | <10 |
| Carbon Disulfide | NA | NA | NA | <5 |
| Carbon Tetrachloride | <0.5 | <0.5 | <0.5 | <5 |
| Chlorobenzene | <0.5 | <0.5 | <0.5 | <5 |
| Chloroethane | <1.0 | <1.0 | <1.0 | <5 |
| 2-Chloroethylvinyl ether | <1.0 | <1.0 | <1.0 | <10 |
| Chloroform | <0.5 | <0.5 | <0.5 | <5 |
| Chloromethane | <1.0 | <1.0 | <1.0 | <5 |
| Dibromochloromethane | <0.5 | <0.5 | <0.5 | <5 |
| 1.2-Dichlorobenzene | <0.5 | <0.5 | <0.5 | <6 |
| 1,3-Dichlorobenzene | <0.5 | <0.5 | <0.5 | <6 |
| 1.4-Dichlorobenzene | <0.5 | <0.5 | <0.5 | <6 |
| 1,1-Dichloroethane | NA | NA | NA | <5 |
| 1,2-Dichloroethane | NA | NA | NA | <5 |
| 1.1-Dichloroethene | <0.5 | <0.5 | <0.5 | <5 |
| trans-1,2-Dichloroethene | <0.5 | <0.5 | <0.5 | <5 |
| 1.2-Dichloropropane | <0.5 | <0.5 | <0.5 | <5 |
| cis-1.3-Dichloropropene | <0.5 | <0.5 | <0.5 | <5 |
| trans-1.3-Dichloropropene | <0.5 | <0.5 | <0.5 | <5 |
| Ethylbenzene | NA | NA | NA | <5 |
| 2-Hexanone | NA | NA | NA | <10 |
| Methylene Chloride | <1.0 | <1.0 | <1.0 | <10 |
| 4-Methyl-2-pentanone | NA | NA | NA | <10 |
| Styrene | NA | NA | NA | <5 |
| 1.1.2.2-Tetrachloroethane | <0.5 | <0.5 | <0.5 | <5 |
| Tetrachloroethene | <0.5 | <0.5 | <0.5 | <5 |
| Toluene | NA | NA | NA | <5 |
| 1,1,1-Trichloroethane | 64.3 | <0.5 | <0.5 | <5 |
| 1,1,2-Trichloroethane | <0.5 | <0.5 | <0.5 | <5 |
| Trichloroethene | 1,285 | 401 | 262 | <5 |
| Trichlorofluoromethane | <1.0 | <1.0 | <1.0 | <5 |
| Vinyl Acetate | NA | NA | NA | <10 |
| Vinyl Chloride | <1.0 | <1.0 | <1.0 | <5 |
| Xylene (total) | NA | NA | NA | <5 |
| Dichlorodiflucromethane | <1.0 | <1.0 | <1.0 | NA |

**NOTE:** NA = NO ANALYSIS
FOR MONITORING WELL LOCATION SEE FIGURE 2
(1) = HALOGENATED VOLATILES, EPA METHOD 8010 µg/l
(2) = GC/MS VOLATILES, EPA METHOD 8240 µg/l



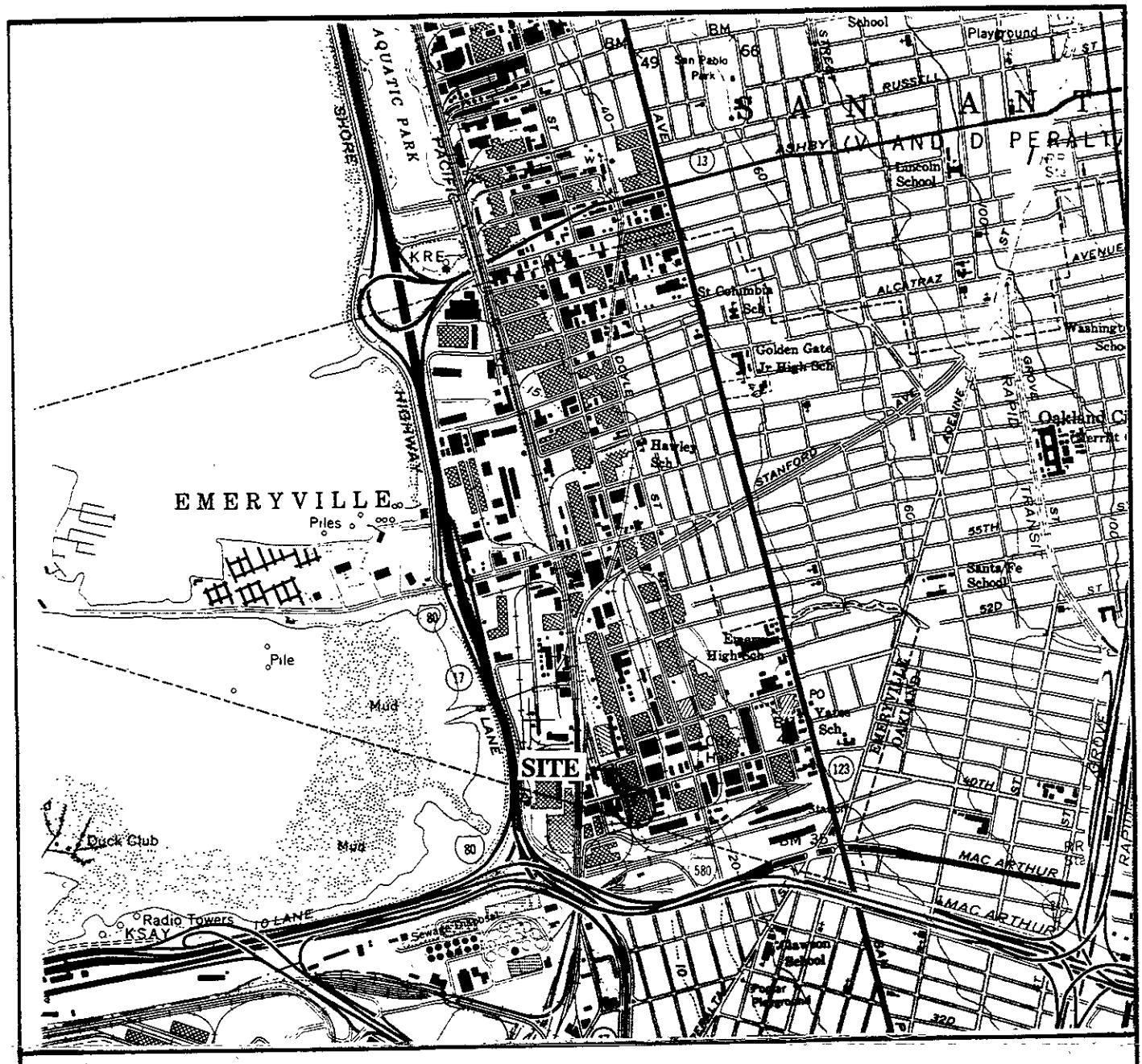

## LEGEND

- MONITORING WELL LOCATION
- MW1 | 7.48 — MONITORING WELL NUMBER; GROUND WATER ELEVATION (ft)
- 2 | 3.5 | .68 | .72 | 1.20 | .18 / 6 | 97 | .35 | <.07 | <.14 | <.07 — DEPTH IN FEET; TPH (mg/kg); BENZENE (mg/kg); TOLUENE (mg/kg); XYLENE (mg/kg); ETHYLBENZENE (mg/kg)
- POTENTIOMETRIC GROUND WATER ELEVATION ABOVE MEAN SEA LEVEL (ft)
- PROBABLE DIRECTION OF GROUND WATER MOVEMENT
- 0.5 APPROXIMATE BENZENE CONCENTRATION (mg/kg)

RAC
REMEDIAL ACTION CORPORATION

# SITE SKETCH
# UNION BANK,
# EMERYVILLE, CALIFORNIA

| | |
|---|---|
| CLIENT UNION BANK | PROJECT 050-03 |
| DRAWN BY AEP DATE 7/1/91 | DWG 050-03 |
| CHECKED BY JF DATE 7/1/91 | FIGURE 2 |
| APPROVED BY EBS DATE 7/1/91 | |




NOTE:
1. BASE MAP FROM U.S.G.S. 7.5 MINUTE OAKLAND WEST (1959, PHOTO REVISED 1980) CA. TOPOGRAPHICAL QUADRANGLE

NORTH

0 1/2 1

APPPROXIMATE SCALE IN MILES

RAC
REMEDIAL ACTION CORPORATION

# VICINITY MAP

| | | |
|---|---|---|
| CLIENT UNION BANK | | PROJ. NO:050-03B |
| DRAWN BY | DATE 11/22/91 | DWG. NO. |
| CHECKED BY | DATE 11/26/91 | FIGURE NO. 1 |
| APPROVED BY | DATE 11/26/91 | |

# APPENDIX A
# FIELD PROCEDURES

## A.1 HAND AUGER PROCEDURES

1. The hand auger borings will be drilled with a 3-inch diameter hand-held auger by a representative of Remedial Action Corporation.

2. The auger bit will be cleaned prior to drilling each hole using a brush and tap water, Alconox solution, a tap water rinse, and a deionized water rinse. The auger will be air-or paper towel dried before beginning each hole.

3. Soil descriptions, sample type and depth, and related information will be recorded on a boring log under the supervision of a State-Registered Geologist or Professional Engineer from Remedial Action Corporation.

4. Soil samples will be collected in 2-inch inside diameter and 1-and 4-inch long stainless steel tubes. Two 1-inch and 1 4-inch tubes are generally enclosed in the sampler. Prior to initial use, the sample tubes will be immersed in a three percent sulfuric acid solution and then cleaned, rinsed and dried using the procedures described in Item A.1.2.

5. The sampler will be driven into the soil approximately 8 inches using a slide hammer with an approximate weight of 5.5 pounds. The double acting hammer will be then pounded upwards to recover the sampler from the hole.

6. Following retrieval of the sampler the 4-inch tube will be removed from the sampler, the ends covered with aluminum foil, capped with tight fitting PVC end caps and the caps taped. The sample will be labeled with the sample number, sample depth, project name, date, and project number before being placed in a ziploc bag.

7. The soil in one 1-inch ring and observation during hand augering will be used to describe the soil and one 1-inch ring will be used for field head space analysis.

8. The samples will be placed in ziploc bags stored in an ice chest cooled to a temperature of approximately 40 degrees Fahrenheit using ice.

9. All samples will be delivered to the laboratory within 48 hours of collection. Sample

handling, transport, and delivery to the laboratory will be documented using Chain-of-Custody procedures, including the use of Chain-of-Custody forms.

## A.2 HEAD SPACE ANALYSIS

1. A 2-inch diameter by 1-inch long sample ring was cut from the sample and immediately extruded into a plastic bag. The soil was crumpled under finger pressure and left in the sunlight for a period of two to three hours.

2. A corner of the zip lock bag was opened and the sample tube from a portable organic vapor analyzing (OVA) photoionization detector (PID) was inserted to extract vapors from the air space directly above the sample.

3. Results were recorded on the boring logs in ppm above normal background.

## A.3 WATER SAMPLE COLLECTION PROCEDURES

1. The wells, were purged by removing four casing volumes with a bailer.

2. The bailer will be washed in a TSP solution followed by a tap water and a deionized water rinse.

3. The water level and depth to the bottom of the well will be measured using a conductance probe and a fiber measuring tape. The probes, bailers, and tapes will be rinsed in a solution of TSP followed by deionized water prior to use.

4. Free product will be measured in the well with a clear acrylic bailer.

5. A stainless steel bailer will be used for sampling the wells. The bailer will be washed in TSP solution followed by a tap water and a deionized water rinse. Dedicated nylon fishing line will be used with the bailer.

5A. Ground water samples were analyzed in the field for pH, temperature and conductivity.

6. Water samples will be collected from a valved spigot inserted in the bottom of the bailer which will discharge directly into 40 milliliter VOA vials. The spigot will be

cleaned and rinsed as above before each use.

7. All samples will be placed in an ice chest and cooled to a temperature of approximately 40 degrees Fahrenheit following collection.

8. Samples will be delivered to the laboratory within 48 hours of collection. Sample handling, transport, and delivery to the laboratory will be documented using Chain-of-Custody procedures and appropriate forms.

9. Items 3 and 4 were performed prior to purging the well.

## A.4 Drum Samples

1. Soil samples from drums were collected and managed in a manner similar to those discussed in A.1. The soil samples were collected form at least six inches below the surface.

2. Water samples from the drums were managed in a manner similar to that discussed in A.3. The sample was collected in a small diameter PVC and discharged from the tubing into the sample jars.

# APPENDIX B
# BORING LOGS

# LOG OF BORING

DATE DRILLED **May 16, 1991** SHEET **1 of 1**

SURFACE ELEVATION DATUM

| ELEVATION (feet) | DEPTH (feet) | LAB TESTS TPH (mg/kg) | FIELD TESTS HEADSPACE (ppm(vol)) | BOREHOLE COMPLETION GRAPHIC | BOREHOLE COMPLETION DETAILS | SAMPLE TYPE | BLOW COUNTS/FT | SAMPLE NUMBER | GRAPHIC LOG | U.S.C.S. CLASSIFICATION | SOIL DESCRIPTION | TYPE and/or REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | Concrete | | | | | GW | Asphalt - 6" | |
| | | | | | | | | | | CL | Light brown pea-gravel | |
| | | | 133 | | | | | 101-2 | | | Grey to olive grey clay with brown mottles, plastic, local coarse sand, moist, | Moderate hydrocarbon odor |
| | | 3 | 4140 | | Bentonite | | | 101-4 | | | | |
| | 5 | | | | | | | | | | | |
| | | 41 | NA | | | | | 101-6 | | | | |
| | | | | | | | | | | | Boring completed to a depth of 6.5 feet. | |

CLIENT **UNION BANK**

PROJECT NUMBER **050-03**

RAC

*REMEDIAL ACTION CORPORATION*

LOG OF BORING **B101**

FIGURE NO.

# LOG OF BORING

DATE DRILLED **May 16, 1991** SHEET **1 of 1**

SURFACE ELEVATION DATUM

| ELEVATION (feet) | DEPTH (feet) | LAB TESTS TPH (mg/kg) | FIELD TESTS HEADSPACE (ppm(vol)) | BOREHOLE COMPLETION GRAPHIC | BOREHOLE COMPLETION DETAILS | SAMPLE TYPE | BLOW COUNTS/FT | SAMPLE NUMBER | GRAPHIC LOG | U.S.C.S. CLASSIFICATION | SOIL DESCRIPTION | TYPE and/or REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | Concrete | | | | | GW | Asphalt - 6" | |
| | | | | | | | | | | CL | Light brown to grey pea-gravel | |
| | | 7 | 250 | | Bentonite | | | 102-2 | | | Dark grey to black, clay with local brown mottles, stiff, plastic, moist, | Moderate hydrocarbon odor |
| | 5 | | | | | | | | | | Olive grey, wet | Slight hydrocarbon odor |
| | | 84 | 550 | | | | | 102-6 | | | | |
| | | | | | | | | | | | Boring completed to a depth of 6.5 feet. | |

CLIENT **UNION BANK**

PROJECT NUMBER **050-03**

RAC

*REMEDIAL ACTION CORPORATION*

LOG OF BORING **B102**

FIGURE NO.

# LOG OF BORING

DATE DRILLED **May 16, 1991** SHEET **1 of 1**

SURFACE ELEVATION DATUM

| ELEVATION (feet) | DEPTH (feet) | LAB TESTS TPH (mg/kg) | FIELD TESTS HEADSPACE (ppm(vol)) | BOREHOLE COMPLETION GRAPHIC | BOREHOLE COMPLETION DETAILS | SAMPLE TYPE | BLOW COUNTS/FT | SAMPLE NUMBER | GRAPHIC LOG | U.S.C.S. CLASSIFICATION | SOIL DESCRIPTION | TYPE and/or REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | Concrete | | | | | | Asphalt - 6" | |
| | | | | | | | | | | GC | Grey to olive green pea-gravel, angular to sub angular, slightly moist | |
| | | 4 | 2540 | | | | | 103-2 | | CL | Olive grey to black clay, locally dusky yellow, occassional brown and green mottling, stiff, plastic, sand up to 0.25", moist, | Moderate hydrocarbon odor |
| | | | 260 | | | | | 103-4 | | | | |
| | 5 | | | | | | | | | | | |
| | | 97 | 5 | | Bentonite | | | 103-6 | | | | Saturated soil at 8.0 feet |
| | | | | | | | | | | | Boring completed at a depth of 8.3 feet. | |

CLIENT **UNION BANK**

PROJECT NUMBER **050-03**

RAC *REMEDIAL ACTION CORPORATION*

LOG OF BORING **B103**

FIGURE NO.

# LOG OF BORING

DATE DRILLED **May 15, 1991** SHEET **1 of 1**

SURFACE ELEVATION DATUM

| ELEVATION (feet) | DEPTH (feet) | LAB TESTS TPH (mg/kg) | FIELD TESTS HEADSPACE (ppm(vol)) | BOREHOLE COMPLETION GRAPHIC | BOREHOLE COMPLETION DETAILS | SAMPLE TYPE | BLOW COUNTS/FT | SAMPLE NUMBER | GRAPHIC LOG | U.S.C.S. CLASSIFICATION | SOIL DESCRIPTION | TYPE and/or REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | Concrete | | | | | | Asphalt - 10" | |
| | | 7 | 350 | | | | | 104-1 | | GW CL | Dark olive grey clay, stiff, plastic, moist | Moderate hydrocarbon odor |
| | | 4 | NA | | Bentonite | | | 104-3 | | | | |
| | | | | | | | | | | | Boring completed to 3.5 feet. | |

CLIENT **UNION BANK**

PROJECT NUMBER **050-03**

RAC *REMEDIAL ACTION CORPORATION*

LOG OF BORING **B104**

FIGURE NO

# LOG OF BORING

DATE DRILLED **May 15, 1991** SHEET **1 of 1**

SURFACE ELEVATION DATUM

| ELEVATION (feet) | DEPTH (feet) | LAB TESTS TPH (mg/kg) | FIELD TESTS HEADSPACE (ppm(vol)) | BOREHOLE COMPLETION GRAPHIC | BOREHOLE COMPLETION DETAILS | SAMPLE TYPE | BLOW COUNTS/FT | SAMPLE NUMBER | GRAPHIC LOG | U.S.C.S. CLASSIFICATION | SOIL DESCRIPTION | TYPE and/or REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | Concrete | | | | | SM | Moderate yellow brown silty sand, well graded, fine to coarse grained, loose, dry | |
| | | | | | | | | | | CL | | |
| | | <1.0 | 1780 | | Bentonite | | | 105-2 | | | Dark grey to black clay, local brown mottles, stiff, plastic, moist to wet | Moderate hydrocarbon odor |
| | | 9 | 880 | | | | | 105-4 | | | | |
| | | | | | | | | | | | Boring completed to 4.5 feet. | |

CLIENT **UNION BANK**

PROJECT NUMBER **050-03**

RAC *REMEDIAL ACTION CORPORATION*

LOG OF BORING **B105**

FIGURE NO.

# LOG OF BORING

DATE DRILLED **May 15, 1991** SHEET **1 of 1**

SURFACE ELEVATION DATUM

| ELEVATION (feet) | DEPTH (feet) | LAB TESTS TPH (mg/kg) | FIELD TESTS HEADSPACE (ppm(vol)) | BOREHOLE COMPLETION GRAPHIC | BOREHOLE COMPLETION DETAILS | SAMPLE TYPE | BLOW COUNTS/FT | SAMPLE NUMBER | GRAPHIC LOG | U.S.C.S. CLASSIFICATION | SOIL DESCRIPTION | TYPE and/or REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | Concrete | | | | | GW | Asphalt - 4" | |
| | | 7 | NA | | | | | 106-1 | | | Light brown gravel, moist | |
| | | | | | | | | | | CL | Dark olive grey clay, stiff, plastic, moderately organic, moist | Slight to moderate hydrocarbon odor |
| | | 46 | 2100 | | Bentonite | | | 106-3 | | | | |
| | | | | | | | | | | | Boring completed to 4 feet. | |

CLIENT **UNION BANK**

PROJECT NUMBER **050-03**

RAC *REMEDIAL ACTION CORPORATION*

LOG OF BORING **B106**

FIGURE NO.

# LOG OF BORING

DATE DRILLED **May 16, 1991** SHEET **1 of 1**

SURFACE ELEVATION DATUM

| ELEVATION (feet) | DEPTH (feet) | LAB TESTS: TPH (mg/kg) | FIELD TESTS: HEADSPACE (ppm(vol)) | BOREHOLE COMPLETION: GRAPHIC | BOREHOLE COMPLETION: DETAILS | SAMPLE TYPE | BLOW COUNTS/FT | SAMPLE NUMBER | GRAPHIC LOG | U.S.C.S. CLASSIFICATION | SOIL DESCRIPTION | TYPE and/or REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | Concrete | | | | | CL | Brown to yellow brown clay, occassional ghravel of 2.0", occassionally sandy, locally plastic, frequently blocky, slightly moist | Man-made fill. |
| | | | 0 | | | | | 107-2 | | | | Saturated soil at 3 feet |
| | | A = <1 | 5400 | | | | | 107-4 | | | | |
| | 5 | | >10K | | Bentonite | | | 107-6 | | | | Moderate hydrocarbon odor |
| | | B = <1 | >10K | | | | | 107-8 | | SC | Dark olive brown sand, fine grained, subangular, blocky, wet | |
| | | | >10K | | | | | 107-9 | | CL | Dusky yellow green clay, occassional light olive brown mottling, stiff, plastic, Boring completed to 9.5 feet. | |

10K = Greated than 10,000 ppm.

A = Composite sample 2' and 4'.

B = Composite sample 6' and 8'.

CLIENT **UNION BANK**

PROJECT NUMBER **050-03**

RAC *REMEDIAL ACTION CORPORATION*

LOG OF BORING **B107**

FIGURE NO.

# APPENDIX C
# LABORATORY DATA

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
Burbank Division
700 South Flower Street
Burbank, CA 91502
Tel: (213) 849-6595
Fax: (818) 954-0232



DOHS Certificate Number: 1192
LACSD Lab I.D. Number: 10158

Formerly: Burmah Technical Services, Inc.

05-28-91

Dan Plazak
Remedial Action Corp.
505 N. Tustin Ave.,Ste 106
Santa Ana, CA 92705

Client Ref: 050-03 / Union Bank, Emeryville

Sample analysis for the project referred to above has been completed and results are located on attached pages.

Should you have questions regarding procedures or results, please feel welcome to contact our Client Services Representatives or the Laboratory Director.

Danny Wong
Laboratory Operations Manager

DW:rth
Attachments:
Analytical Reports
Chain of Custody Document

Client No: 81
NET Job No: 4453A-G

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453A
Lab Series : 26905-26925

Date Reported: 05-28-91
Date Received: 05-17-91 1430

Matrix : Soil

| | | | |
|---|---|---|---|
| Sample ID : | B-101 @ 4 | B-102 @ 2 | B-103 @ 2 |
| Lab No. : | 26905 | 26906 | 26907 |

| ANALYTES/METHOD | RESULTS | | | R.L. | UNITS |
|---|---|---|---|---|---|
| METHOD 8020/8015 COMB. | | | | | |
| Date Extracted | 05-22-91 | 05-22-91 | 05-22-91 | | |
| Date Analyzed | 05-23-91 | 05-23-91 | 05-23-91 | | |
| Reporting Limit Multiplier | 1 | 1 | 1 | | |
| AROMATIC VOLATILES | | | | | |
| Benzene | 0.26 | 0.83 | 0.68 | 0.05 | mg/Kg |
| Ethylbenzene | 0.26 | 0.51 | 0.18 | 0.07 | mg/Kg |
| Toluene | 0.08 | 0.71 | 0.72 | 0.07 | mg/Kg |
| Xylenes, total | 0.47 | 3.17 | 1.20 | 0.14 | mg/Kg |
| TOT. PET. HYDROCARBONS | -- | -- | -- | | |
| as Gasoline | 2.5 | 6.6 | 3.5 | 1.0 | mg/Kg |
| Surrogate Spike-8020/8015 | -- | -- | -- | | |
| Chlorobenzene | 98 | 94 | 98 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453A
Lab Series : 26905-26925

Date Reported: 05-28-91
Date Received: 05-17-91 1430

Matrix : Soil

| Sample ID : | B-104 @ 1 | B-104 @ 3 | B-105 @ 2 |
|---|---|---|---|
| Lab No. : | 26908 | 26909 | 26910 |

| ANALYTES/METHOD | RESULTS | | | R.L. | UNITS |
|---|---|---|---|---|---|
| METHOD 8020/8015 COMB. | | | | | |
| Date Extracted | 05-22-91 | 05-22-91 | 05-22-91 | | |
| Date Analyzed | 05-23-91 | 05-23-91 | 05-23-91 | | |
| Reporting Limit Multiplier | 1 | 1 | 1 | | |
| AROMATIC VOLATILES | | | | | |
| Benzene | 1.01 | 0.52 | ND | 0.05 | mg/Kg |
| Ethylbenzene | 0.62 | 0.42 | ND | 0.07 | mg/Kg |
| Toluene | 0.89 | 0.16 | ND | 0.07 | mg/Kg |
| Xylenes, total | 3.18 | 23.37 | ND | 0.14 | mg/Kg |
| TOT. PET. HYDROCARBONS | -- | -- | -- | | |
| as Gasoline | 7.4 | 4.2 | ND | 1.0 | mg/Kg |
| Surrogate Spike-8020/8015 | -- | -- | -- | | |
| Chlorobenzene | 95 | 91 | 96 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific Inc

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453A
Lab Series : 26905-26925

Date Reported: 05-28-91
Date Received: 05-17-91 1430

Matrix : Soil

| Sample ID : | B-105 @ 4 | B-106 @ 1 | B-106 @ 3 |
|---|---|---|---|
| Lab No. : | 26911 | 26912 | 26913 |

| ANALYTES/METHOD | RESULTS | | | R.L. | UNITS |
|---|---|---|---|---|---|
| METHOD 8020/8015 COMB. | | | | | |
| Date Extracted | 05-22-91 | 05-22-91 | 05-22-91 | | |
| Date Analyzed | 05-23-91 | 05-23-91 | 05-23-91 | | |
| Reporting Limit Multiplier | 1 | 1 | 1 | | |
| AROMATIC VOLATILES | | | | | |
| Benzene | ND | 1.43 | 1.54 | 0.05 | mg/Kg |
| Ethylbenzene | 0.27 | 0.34 | 2.12 | 0.07 | mg/Kg |
| Toluene | 0.08 | 2.44 | 6.32 | 0.07 | mg/Kg |
| Xylenes, total | 2.19 | 2.26 | 12.0 | 0.14 | mg/Kg |
| TOT. PET. HYDROCARBONS | -- | -- | -- | | |
| as Gasoline | 9.1 | 6.9 | 46 | 1.0 | mg/Kg |
| Surrogate Spike-8020/8015 | -- | -- | -- | | |
| Chlorobenzene | 95 | 93 | 95 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453B
Lab Series : 26905-26925

Date Reported: 06-04-91
Date Received: 05-17-91 1430

Matrix : Soil

| Sample ID : | | B-101 @ 6 | B-102 @ 6 | B-103 @ 6 | | |
|---|---|---|---|---|---|---|
| Lab No. : | | 26914 | 26915 | 26916 | | |
| **ANALYTES/METHOD** | | | **RESULTS** | | **R.L.** | **UNITS** |
| Acid Digestion | 3050 | 05-28-91 | 05-28-91 | 05-28-91 | | |
| METALS Total | | -- | -- | -- | | |
| Chromium(VI) | 7196 | ND | ND | 17.3 | 2.5 | mg/Kg |
| Chromium | 6010 | 26.1 | 109 | 113 | 0.5 | mg/Kg |
| METHOD 8020/8015 COMB. | | | | | | |
| Date Extracted | | 05-22-91 | 05-22-91 | 05-22-91 | | |
| Date Analyzed | | 05-23-91 | 05-23-91 | 05-24-91 | | |
| Reporting Limit Multiplier | | 1 | 1 | 1 | | |
| AROMATIC VOLATILES | | | | | | |
| Benzene | | 0.46 | 1.58 | 0.35 | 0.05 | mg/Kg |
| Ethylbenzene | | 1.83 | 3.99 | ND | 0.07 | mg/Kg |
| Toluene | | 1.81 | 5.25 | ND | 0.07 | mg/Kg |
| Xylenes, total | | 8.39 | 18.3 | ND | 0.14 | mg/Kg |
| TOT. PET. HYDROCARBONS | | -- | -- | -- | | |
| as Gasoline | | 41 | 83.9 | ND | 1.0 | mg/Kg |
| Surrogate Spike-8020/8015 | | -- | -- | -- | | |
| Chlorobenzene | | 97 | 92 | 97 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453C
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Soil

| Sample ID : | Composite: | Composite: |
|---|---|---|
| Lab No. : | 26917 | 26918 |

| ANALYTES/METHOD | | RESULTS | | R.L. | UNITS |
|---|---|---|---|---|---|
| FISH TOXICITY BIOASSAY - CAM Screening (96Hr. LC50) | | 100 | 95 | -- | % surv. |
| Soil pH | 9045 | 8.8 | 8.3 | | pH units |
| Reactive Sulfide | 9030 | ND | ND | 2.0 | mg/Kg |
| Reactive Cyanide | 9010 | ND | ND | 0.4 | mg/Kg |
| Flashpoint | 1010B | >200 | >200 | -- | deg F |
| Acid Digestion | 3050 | 05-28-91 | 05-28-91 | | |
| 17 CAM Metals, Total | | | | | |
| METALS Total | | -- | -- | | |
| Antimony | 6010 | ND | ND | 2.5 | mg/Kg |
| Arsenic | 7061 | 1.50 | 4.30 | 0.15 | mg/Kg |
| Barium | 6010 | 97.1 | 76.3 | 0.5 | mg/Kg |
| Beryllium | 6010 | ND | ND | 1.0 | mg/Kg |
| Cadmium | 7130 | ND | ND | 0.5 | mg/Kg |
| Chromium(VI) | 7196 | ND | ND | 2.5 | mg/Kg |
| Chromium | 6010 | 39.7 | 39.4 | 0.5 | mg/Kg |
| Cobalt | 7200 | 7.4 | 5.8 | 2.5 | mg/Kg |
| Copper | 7210 | 14.0 | 10.7 | 1.0 | mg/Kg |
| Lead | 7420 | 30.4 | 10.4 | 2.5 | mg/Kg |
| Mercury | 7470 | ND | ND | 0.05 | mg/Kg |
| Molybdenum | 6010 | ND | ND | 2.5 | mg/Kg |
| Nickel | 7520 | 53.8 | 34.1 | 1.5 | mg/Kg |
| Selenium | 7741 | ND | ND | 0.5 | mg/Kg |
| Silver | 7760 | ND | ND | 1.0 | mg/Kg |
| Thallium | 6010 | ND | ND | 5.0 | mg/Kg |
| Vanadium | 6010 | 26.2 | 21.0 | 2.5 | mg/Kg |
| Zinc | 7950 | 39.8 | 31.4 | 1.0 | mg/Kg |
| METHOD 8015 | | | | | |
| Date Extracted | | 05-22-91 | 05-22-91 | | |
| Date Analyzed | | 05-24-91 | 05-24-91 | | |
| Detection Limit Multiplier | | 1 | 1 | | |
| TOT. PET. HYDROCARBONS | | -- | -- | | |
| as Gasoline | | ND | ND | 1.0 | mg/Kg |
| Surrogate Spike-8020/8015 | | -- | -- | | |
| Chlorobenzene | | 87 | 92 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453C
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Soil

| Sample ID : | Composite: B-107 @ 2,4 | Composite: B-107 @ 6,8 |
|---|---|---|
| Lab No. : | 26917 | 26918 |

| ANALYTES/METHOD | RESULTS | | R.L. | UNITS |
|---|---|---|---|---|
| METHOD 8240 | | | | |
| Date Extracted | 05-22-91 | 05-22-91 | | |
| Date Analyzed | 05-28-91 | 05-29-91 | | |
| Reporting Limit Multiplier | 1 | 1 | | |
| GC/MS VOLATILES | -- | -- | | |
| Acetone | ND | ND | 50 | ug/Kg |
| Benzene | ND | ND | 25 | ug/Kg |
| Bromodichloromethane | ND | ND | 25 | ug/Kg |
| Bromoform | ND | ND | 25 | ug/Kg |
| Bromomethane | ND | ND | 25 | ug/Kg |
| 2-Butanone (MEK) | ND | ND | 50 | ug/Kg |
| Carbon Disulfide | ND | ND | 25 | ug/Kg |
| Carbon Tetrachloride | ND | ND | 25 | ug/Kg |
| Chlorobenzene | ND | ND | 25 | ug/Kg |
| Chloroethane | ND | ND | 25 | ug/Kg |
| 2-Chloroethylvinyl ether | ND | ND | 50 | ug/Kg |
| Chloroform | ND | ND | 25 | ug/Kg |
| Chloromethane | ND | ND | 25 | ug/Kg |
| Dibromochloromethane | ND | ND | 25 | ug/Kg |
| 1,2-Dichlorobenzene | ND | ND | 25 | ug/Kg |
| 1,3-Dichlorobenzene | ND | ND | 25 | ug/Kg |
| 1,4-Dichlorobenzene | ND | ND | 25 | ug/Kg |
| 1,1-Dichloroethane | ND | ND | 25 | ug/Kg |
| 1,2-Dichloroethane | ND | ND | 25 | ug/Kg |
| 1,1-Dichloroethene | ND | ND | 25 | ug/Kg |
| trans-1,2-Dichloroethene | ND | ND | 25 | ug/Kg |
| 1,2-Dichloropropane | ND | ND | 25 | ug/Kg |
| cis-1,3-Dichloropropene | ND | ND | 25 | ug/Kg |
| trans-1,3-Dichloropropene | ND | ND | 25 | ug/Kg |
| Ethylbenzene | ND | 29 | 25 | ug/Kg |
| 2-Hexanone | ND | ND | 50 | ug/Kg |
| Methylene chloride | ND | ND | 50 | ug/Kg |
| 4-Methyl-2-Pentanone | ND | ND | 50 | ug/Kg |
| Styrene | ND | ND | 25 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | ND | ND | 25 | ug/Kg |
| Tetrachloroethene | ND | ND | 25 | ug/Kg |
| Toluene | ND | ND | 25 | ug/Kg |
| 1,1,1-Trichloroethane | ND | ND | 25 | ug/Kg |
| 1,1,2-Trichloroethane | ND | ND | 25 | ug/Kg |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453C
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Soil

| | | |
|---|---|---|
| Sample ID : | Composite: B-107 @ 2,4 | Composite: B-107 @ 6,8 |
| Lab No. : | 26917 | 26918 |

| ANALYTES/METHOD | RESULTS | | R.L. | UNITS |
|---|---|---|---|---|
| Trichloroethene | ND | ND | 25 | ug/Kg |
| Trichlorofluoromethane | ND | ND | 25 | ug/Kg |
| Vinyl Acetate | ND | ND | 50 | ug/Kg |
| Vinyl chloride | ND | ND | 25 | ug/Kg |
| Xylenes, total | ND | 60 | 25 | ug/Kg |
| SURROGATE SPIKE | | | | |
| 1,2 Dichloroethane-d4 | 104 | 104 | | % Rec. |
| Toluene - d8 | 101 | 107 | | % Rec. |
| Bromofluorobenzene | 99 | 105 | | % Rec. |

ND - Not Detected at the Reporting Limit

NET Pacific Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453D
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Soil

| Sample ID : | Drum 4 W | Drum 5 V |
|---|---|---|
| Lab No. : | 26919 | 26920 |

| ANALYTES/METHOD | | RESULTS | | R.L. | UNITS |
|---|---|---|---|---|---|
| Soil pH | 9045 | 8.5 | 7.8 | | pH units |
| Reactive Sulfide | 9030 | ND | ND | 2.0 | mg/Kg |
| Reactive Cyanide | 9010 | ND | ND | 0.4 | mg/Kg |
| Acid Digestion | 3050 | 05-28-91 | 05-28-91 | | |
| 17 CAM Metals, Total | | | | | |
| METALS Total | | -- | -- | | |
| Antimony | 6010 | ND | ND | 2.5 | mg/Kg |
| Arsenic | 7061 | 4.10 | 6.45 | 0.15 | mg/Kg |
| Barium | 6010 | 157 | 161 | 0.5 | mg/Kg |
| Beryllium | 6010 | ND | ND | 1.0 | mg/Kg |
| Cadmium | 7130 | 0.7 | 0.9 | 0.5 | mg/Kg |
| Chromium(VI) | 7196 | ND | ND | 2.5 | mg/Kg |
| Chromium | 6010 | 102 | 64.6 | 0.5 | mg/Kg |
| Cobalt | 7200 | 7.5 | 10.7 | 2.5 | mg/Kg |
| Copper | 7210 | 21.3 | 22.9 | 1.0 | mg/Kg |
| Lead | 7420 | 21.2 | 6.1 | 2.5 | mg/Kg |
| Mercury | 7470 | ND | ND | 0.05 | mg/Kg |
| Molybdenum | 6010 | ND | ND | 2.5 | mg/Kg |
| Nickel | 7520 | 42.3 | 71.3 | 1.5 | mg/Kg |
| Selenium | 7741 | ND | ND | 0.5 | mg/Kg |
| Silver | 7760 | ND | ND | 1.0 | mg/Kg |
| Thallium | 6010 | ND | ND | 5.0 | mg/Kg |
| Vanadium | 6010 | 29.4 | 35.7 | 2.5 | mg/Kg |
| Zinc | 7950 | 52.2 | 44.1 | 1.0 | mg/Kg |
| METHOD 8015 | | | | | |
| Date Extracted | | 05-22-91 | 05-22-91 | | |
| Date Analyzed | | 05-24-91 | 05-24-91 | | |
| Detection Limit Multiplier | | 1 | 1 | | |
| TOT. PET. HYDROCARBONS | | -- | -- | | |
| as Gasoline | | ND | ND | 1.0 | mg/Kg |
| Surrogate Spike-8020/8015 | | -- | -- | | |
| Chlorobenzene | | 88 | 94 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453D
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Soil

| | | |
|---|---|---|
| Sample ID : | Drum 4 W | Drum 5 V |
| Lab No. : | 26919 | 26920 |

| ANALYTES/METHOD | RESULTS | | R.L. | UNITS |
|---|---|---|---|---|
| METHOD 8240 | | | | |
| Date Extracted | 05-22-91 | 05-22-91 | | |
| Date Analyzed | 05-28-91 | 05-28-91 | | |
| Reporting Limit Multiplier | 1 | 1 | | |
| GC/MS VOLATILES | -- | -- | | |
| Acetone | ND | ND | 50 | ug/Kg |
| Benzene | ND | ND | 25 | ug/Kg |
| Bromodichloromethane | ND | ND | 25 | ug/Kg |
| Bromoform | ND | ND | 25 | ug/Kg |
| Bromomethane | ND | ND | 25 | ug/Kg |
| 2-Butanone (MEK) | ND | ND | 50 | ug/Kg |
| Carbon Disulfide | ND | ND | 25 | ug/Kg |
| Carbon Tetrachloride | ND | ND | 25 | ug/Kg |
| Chlorobenzene | ND | ND | 25 | ug/Kg |
| Chloroethane | ND | ND | 25 | ug/Kg |
| 2-Chloroethylvinyl ether | ND | ND | 50 | ug/Kg |
| Chloroform | ND | ND | 25 | ug/Kg |
| Chloromethane | ND | ND | 25 | ug/Kg |
| Dibromochloromethane | ND | ND | 25 | ug/Kg |
| 1,2-Dichlorobenzene | ND | ND | 25 | ug/Kg |
| 1,3-Dichlorobenzene | ND | ND | 25 | ug/Kg |
| 1,4-Dichlorobenzene | ND | ND | 25 | ug/Kg |
| 1,1-Dichloroethane | ND | ND | 25 | ug/Kg |
| 1,2-Dichloroethane | ND | ND | 25 | ug/Kg |
| 1,1-Dichloroethene | ND | ND | 25 | ug/Kg |
| trans-1,2-Dichloroethene | ND | ND | 25 | ug/Kg |
| 1,2-Dichloropropane | ND | ND | 25 | ug/Kg |
| cis-1,3-Dichloropropene | ND | ND | 25 | ug/Kg |
| trans-1,3-Dichloropropene | ND | ND | 25 | ug/Kg |
| Ethylbenzene | ND | ND | 25 | ug/Kg |
| 2-Hexanone | ND | ND | 50 | ug/Kg |
| Methylene chloride | ND | ND | 50 | ug/Kg |
| 4-Methyl-2-Pentanone | ND | ND | 50 | ug/Kg |
| Styrene | ND | ND | 25 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | ND | ND | 25 | ug/Kg |
| Tetrachloroethene | ND | ND | 25 | ug/Kg |
| Toluene | 64 | ND | 25 | ug/Kg |
| 1,1,1-Trichloroethane | ND | ND | 25 | ug/Kg |
| 1,1,2-Trichloroethane | ND | ND | 25 | ug/Kg |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 44530 Date Reported: 06-05-91
Lab Series : 26905-26925 Date Received: 05-17-91 1430

Matrix : Soil

| Sample ID : | Drum 4 W | Drum 5 V |
|---|---|---|
| Lab No. : | 26919 | 26920 |

| ANALYTES/METHOD | RESULTS | | R.L. | UNITS |
|---|---|---|---|---|
| Trichloroethene | ND | ND | 25 | ug/Kg |
| Trichlorofluoromethane | ND | ND | 25 | ug/Kg |
| Vinyl Acetate | ND | ND | 50 | ug/Kg |
| Vinyl chloride | ND | ND | 25 | ug/Kg |
| Xylenes, total | ND | ND | 25 | ug/Kg |
| SURROGATE SPIKE | | | | |
| 1,2 Dichloroethane-d4 | 107 | 107 | | % Rec. |
| Toluene - d8 | 101 | 102 | | % Rec. |
| Bromofluorobenzene | 102 | 101 | | % Rec. |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453E
Lab Series : 26905-26925

Date Reported: 06-04-91
Date Received: 05-17-91 1430

Matrix : Soil

Sample ID : Drum 6 U
Lab No. : 26921

| ANALYTES/METHOD | | RESULTS | R.L. | UNITS |
|---|---|---|---|---|
| Acid Digestion | 3050 | 05-28-91 | | |
| METALS Total | | -- | | |
| Chromium(VI) | 7196 | 55.9 | 2.5 | mg/Kg |
| Chromium | 6010 | 179 | 0.5 | mg/Kg |
| Lead | 7420 | 9.8 | 2.5 | mg/Kg |
| METHOD 8015 | | | | |
| Date Extracted | | 05-22-91 | | |
| Date Analyzed | | 05-24-91 | | |
| Detection Limit Multiplier | | 1 | | |
| TOT. PET. HYDROCARBONS | | -- | | |
| as Gasoline | | ND | 1.0 | mg/Kg |
| Surrogate Spike-8020/8015 | | -- | | |
| Chlorobenzene | | 93 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453E
Lab Series : 26905-26925

Date Reported: 06-04-91
Date Received: 05-17-91 1430

Matrix : Soil

Sample ID : Drum 6 U
Lab No. : 26921

| ANALYTES/METHOD | RESULTS | R.L. | UNITS |
|---|---|---|---|
| Vinyl chloride | ND | 25 | ug/Kg |
| Xylenes, total | ND | 25 | ug/Kg |
| SURROGATE SPIKE | | | |
| 1,2 Dichloroethane-d4 | 108 | | % Rec. |
| Toluene - d8 | 101 | | % Rec. |
| Bromofluorobenzene | 100 | | % Rec. |

ND - Not Detected at the Reporting Limit

NET Pacific Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453F
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Water

| Sample ID : | MW-1 | MW-2 | MW-3 |
|---|---|---|---|
| Lab No. : | 26922 | 26923 | 26924 |

| ANALYTES/METHOD | | | RESULTS | | R.L. | UNITS |
|---|---|---|---|---|---|---|
| pH | 9040 | 6.9 | 7.0 | 6.9 | | pH units |
| 17 CAM Metals, Total | | | | | | |
| Antimony | 200.7 | 1.66 | 1.51 | 0.06 | 0.05 | mg/L |
| Arsenic | 206.3 | ND | ND | ND | 0.003 | mg/L |
| Barium | 200.7 | 0.12 | ND | ND | 0.05 | mg/L |
| Beryllium | 200.7 | ND | ND | ND | 0.02 | mg/L |
| Cadmium | 213.1 | ND | ND | ND | 0.01 | mg/L |
| Chromium(VI) | 7196 | 0.11 | 0.26 | 0.17 | 0.05 | mg/L |
| Chromium | 200.7 | 349 | 353 | 47.6 | 0.01 | mg/L |
| Cobalt | 219.1 | ND | ND | ND | 0.05 | mg/L |
| Copper | 220.1 | ND | ND | ND | 0.02 | mg/L |
| Lead | 239.1 | ND | ND | ND | 0.05 | mg/L |
| Mercury | 245.1 | ND | ND | ND | 0.0005 | mg/L |
| Molybdenum | 200.7 | ND | ND | ND | 0.05 | mg/L |
| Nickel | 249.1 | 0.06 | ND | ND | 0.03 | mg/L |
| Selenium | 270.3 | ND | ND | ND | 0.01 | mg/L |
| Silver | 272.1 | ND | ND | ND | 0.02 | mg/L |
| Thallium | 200.7 | ND | ND | ND | 0.04 | mg/L |
| Vanadium | 200.7 | ND | ND | ND | 0.5 | mg/L |
| Zinc | 289.1 | 0.03 | ND | 0.04 | 0.02 | mg/L |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453F
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Water

| Sample ID : | MW-1 | MW-2 | MW-3 |
|---|---|---|---|
| Lab No. : | 26922 | 26923 | 26924 |

| ANALYTES/METHOD | RESULTS | | | R.L. | UNITS |
|---|---|---|---|---|---|
| METHOD 8010/8020 COMB. | | | | | |
| Date Analyzed | 05-24-91 | 05-24-91 | 05-24-91 | | |
| Reporting Limit Multiplier | 100 | 100 | 100 | | |
| HALOGENATED VOLATILES | -- | -- | -- | | |
| Bromodichloromethane | ND | ND | ND | 0.5 | ug/L |
| Bromoform | ND | ND | ND | 1.0 | ug/L |
| Bromomethane | ND | ND | ND | 1.0 | ug/L |
| Carbon tetrachloride | ND | ND | ND | 0.5 | ug/L |
| Chlorobenzene | ND | 67.5 | ND | 0.5 | ug/L |
| Chloroethane | ND | ND | ND | 1.0 | ug/L |
| 2-Chloroethylvinyl ether | ND | ND | ND | 1.0 | ug/L |
| Chloroform | ND | ND | ND | 0.5 | ug/L |
| Chloromethane | ND | ND | ND | 1.0 | ug/L |
| Dibromochloromethane | ND | ND | ND | 0.5 | ug/L |
| 1,2-Dichlorobenzene | ND | ND | ND | 0.5 | ug/L |
| 1,3-Dichlorobenzene | ND | ND | ND | 0.5 | ug/L |
| 1,4-Dichlorobenzene | ND | ND | ND | 0.5 | ug/L |
| Dichlorodifluoromethane | ND | ND | ND | 1.0 | ug/L |
| 1,1-Dichloroethane | ND | ND | ND | 0.5 | ug/L |
| 1,2-Dichloroethane | ND | ND | ND | 0.5 | ug/L |
| 1,1-Dichloroethene | ND | ND | ND | 0.5 | ug/L |
| trans-1,2-Dichloroethene | ND | ND | ND | 0.5 | ug/L |
| 1,2-Dichloropropane | ND | ND | ND | 0.5 | ug/L |
| cis-1,3-Dichloropropene | ND | ND | ND | 0.5 | ug/L |
| trans-1,3-Dichloropropene | ND | ND | ND | 0.5 | ug/L |
| Methylene chloride | ND | ND | ND | 1.0 | ug/L |
| 1,1,2,2-Tetrachloroethane | ND | ND | ND | 0.5 | ug/L |
| Tetrachloroethene | ND | ND | ND | 0.5 | ug/L |
| 1,1,1-Trichloroethane | 64.3 | ND | ND | 0.5 | ug/L |
| 1,1,2-Trichloroethane | ND | ND | ND | 0.5 | ug/L |
| Trichloroethene | 1,290 | 401 | 262 | 0.5 | ug/L |
| Trichlorofluoromethane | ND | ND | ND | 1.0 | ug/L |
| Vinyl chloride | ND | ND | ND | 1.0 | ug/L |
| AROMATIC VOLATILES | | | | | |
| Benzene | 1,450 | 11.2 | 2.7 | 0.5 | ug/L |
| Ethylbenzene | 9.4 | ND | ND | 0.5 | ug/L |
| Toluene | 273 | 1.2 | ND | 0.5 | ug/L |
| Xylenes, total | 599 | 1.0 | ND | 0.5 | ug/L |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453F
Lab Series : 26905-26925

Date Reported: 06-05-91
Date Received: 05-17-91 1430

Matrix : Water

| Sample ID : | MW-1 | MW-2 | MW-3 | | |
|---|---|---|---|---|---|
| Lab No. : | 26922 | 26923 | 26924 | | |
| **ANALYTES/METHOD** | | **RESULTS** | | **R.L.** | **UNITS** |
| Surrogate Spike | -- | -- | -- | | |
| 2-Chlorotoluene | 102 | 95 | 87 | | % Rec |
| METHOD 8015 | | | | | |
| Detection Limit Multiplier | 1 | 1 | 1 | | |
| Date Analyzed | 05-24-91 | 05-24-91 | 05-24-91 | | |
| TOT. PET. HYDROCARBONS | -- | -- | -- | | |
| as Gasoline | 3,420 | 110 | ND | 10 | ug/L |
| Surrogate Spike-8020/8015 | -- | -- | -- | | |
| Chlorobenzene | 102 | 101 | 102 | | % Rec |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453G
Lab Series : 26905-26925

Date Reported: 06-04-91
Date Received: 05-17-91 1430

Matrix : Water

Sample ID : Drum 9 R
Lab No. : 26925

| ANALYTES/METHOD | | RESULTS | R.L. | UNITS |
|---|---|---|---|---|
| pH | 9040 | 7.6 | | pH units |
| METALS Total | | -- | | |
| Chromium(VI) | 7196 | 0.09 | 0.05 | mg/L |
| Chromium | 200.7 | 342 | 0.01 | mg/L |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453G
Lab Series : 26905-26925

Date Reported: 06-04-91
Date Received: 05-17-91 1430

Matrix : Water

Sample ID : Drum 9 R
Lab No. : 26925

| ANALYTES/METHOD | RESULTS | R.L. | UNITS |
|---|---|---|---|
| METHOD 8240 | | | |
| Date Analyzed | 05-24-91 | | |
| Reporting Limit Multiplier | 1 | | |
| GC/MS VOLATILES | -- | | |
| Acetone | ND | 100 | ug/L |
| Benzene | ND | 5 | ug/L |
| Bromodichloromethane | ND | 5 | ug/L |
| Bromoform | ND | 5 | ug/L |
| Bromomethane | ND | 5 | ug/L |
| 2-Butanone (MEK) | ND | 10 | ug/L |
| Carbon Disulfide | ND | 5 | ug/L |
| Carbon Tetrachloride | ND | 5 | ug/L |
| Chlorobenzene | ND | 5 | ug/L |
| Chloroethane | ND | 5 | ug/L |
| 2-Chloroethylvinyl ether | ND | 10 | ug/L |
| Chloroform | ND | 5 | ug/L |
| Chloromethane | ND | 5 | ug/L |
| Dibromochloromethane | ND | 5 | ug/L |
| 1,2-Dichlorobenzene | ND | 6 | ug/L |
| 1,3-Dichlorobenzene | ND | 6 | ug/L |
| 1,4-Dichlorobenzene | ND | 6 | ug/L |
| 1,1-Dichloroethane | ND | 5 | ug/L |
| 1,2-Dichloroethane | ND | 5 | ug/L |
| 1,1-Dichloroethene | ND | 5 | ug/L |
| trans-1,2-Dichloroethene | ND | 5 | ug/L |
| 1,2-Dichloropropane | ND | 5 | ug/L |
| cis-1,3-Dichloropropene | ND | 5 | ug/L |
| trans-1,3-Dichloropropene | ND | 5 | ug/L |
| Ethylbenzene | ND | 5 | ug/L |
| 2-Hexanone | ND | 10 | ug/L |
| Methylene chloride | ND | 10 | ug/L |
| 4-Methyl-2-Pentanone | ND | 10 | ug/L |
| Styrene | ND | 5 | ug/L |
| 1,1,2,2-Tetrachloroethane | ND | 5 | ug/L |
| Tetrachloroethene | ND | 5 | ug/L |
| Toluene | ND | 5 | ug/L |
| 1,1,1-Trichloroethane | ND | 5 | ug/L |
| 1,1,2-Trichloroethane | ND | 5 | ug/L |
| Trichloroethene | ND | 5 | ug/L |
| Trichlorofluoromethane | ND | 5 | ug/L |
| Vinyl Acetate | ND | 10 | ug/L |
| Vinyl chloride | ND | 5 | ug/L |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453G
Lab Series : 26905-26925

Date Reported: 06-04-91
Date Received: 05-17-91 1430

Matrix : Water

Sample ID : Drum 9 R
Lab No. : 26925

| ANALYTES/METHOD | RESULTS | R.L. | UNITS |
|---|---|---|---|
| Xylenes, Total | ND | 5 | ug/L |
| SURROGATE SPIKE | | | |
| 1,2 Dichloroethane-d4 | 105 | | % Rec. |
| Toluene - d8 | 99 | | % Rec. |
| Bromofluorobenzene | 105 | | % Rec. |

ND - Not Detected at the Reporting Limit

NET Pacific, Inc.

Client Name: Remedial Action Corp.
Client Ref.: 050-03 / Union Bank, Emeryville

NET Job No.: 4453E — Date Reported: 06-04-91
Lab Series : 26905-26925 — Date Received: 05-17-91 1430

Matrix : Soil

Sample ID : Drum 6 U
Lab No. : 26921

| ANALYTES/METHOD | RESULTS | R.L. | UNITS |
|---|---|---|---|
| METHOD 8240 | | | |
| Date Extracted | 05-24-91 | | |
| Date Analyzed | 05-28-91 | | |
| Reporting Limit Multiplier | 1 | | |
| GC/MS VOLATILES | -- | | |
| Acetone | ND | 50 | ug/Kg |
| Benzene | ND | 25 | ug/Kg |
| Bromodichloromethane | ND | 25 | ug/Kg |
| Bromoform | ND | 25 | ug/Kg |
| Bromomethane | ND | 25 | ug/Kg |
| 2-Butanone (MEK) | ND | 50 | ug/Kg |
| Carbon Disulfide | ND | 25 | ug/Kg |
| Carbon Tetrachloride | ND | 25 | ug/Kg |
| Chlorobenzene | ND | 25 | ug/Kg |
| Chloroethane | ND | 25 | ug/Kg |
| 2-Chloroethylvinyl ether | ND | 50 | ug/Kg |
| Chloroform | ND | 25 | ug/Kg |
| Chloromethane | ND | 25 | ug/Kg |
| Dibromochloromethane | ND | 25 | ug/Kg |
| 1,2-Dichlorobenzene | ND | 25 | ug/Kg |
| 1,3-Dichlorobenzene | ND | 25 | ug/Kg |
| 1,4-Dichlorobenzene | ND | 25 | ug/Kg |
| 1,1-Dichloroethane | ND | 25 | ug/Kg |
| 1,2-Dichloroethane | ND | 25 | ug/Kg |
| 1,1-Dichloroethene | ND | 25 | ug/Kg |
| trans-1,2-Dichloroethene | ND | 25 | ug/Kg |
| 1,2-Dichloropropane | ND | 25 | ug/Kg |
| cis-1,3-Dichloropropene | ND | 25 | ug/Kg |
| trans-1,3-Dichloropropene | ND | 25 | ug/Kg |
| Ethylbenzene | ND | 25 | ug/Kg |
| 2-Hexanone | ND | 50 | ug/Kg |
| Methylene chloride | ND | 50 | ug/Kg |
| 4-Methyl-2-Pentanone | ND | 50 | ug/Kg |
| Styrene | ND | 25 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | ND | 25 | ug/Kg |
| Tetrachloroethene | ND | 25 | ug/Kg |
| Toluene | ND | 25 | ug/Kg |
| 1,1,1-Trichloroethane | ND | 25 | ug/Kg |
| 1,1,2-Trichloroethane | ND | 25 | ug/Kg |
| Trichloroethene | ND | 25 | ug/Kg |
| Trichlorofluoromethane | ND | 25 | ug/Kg |
| Vinyl Acetate | ND | 50 | ug/Kg |

ND - Not Detected at the Reporting Limit

# CHAIN OF CUSTODY RECORD

Shipped By: RAC Remedial Action Corporation
505 N. Tustin Ave., Suite 140
Santa Ana, California 92705
714/541-9393

Delivered To: NET
Burbank CA

PROJECT NAME: Union Bank-Emeryville
PROJECT NO.: 050-03
DATE: May 16, 1991 | PAGE 1 OF 4
SAMPLED BY: Plazak | SIGNATURE: [signature]
DELIVERY METHOD:
TOTAL NO. OF SAMPLES: 68

| BORING or SAMP. ID. | SAMPLE NO. | DEPTH or CO-ORDIN. | DATE SAMPLED | TIME SAMPLED | SAMPLE Material | SAMPLE Method | CONTAINER | PRESERVATION Temp. | PRESERVATION Chem. | ANALYSIS REQUIRED |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 1.0.1 | | 5-15-91 | | Water | SS.Bailer | 40 ml VOA | 32°F | None | 8015 (Gasoline) 8020 |
| | 1.0.2 | | | | | | " | | | |
| | 1.C.1 | | | | | | Plastic Bottle | | | |
| | 1.C.2 | | | | | | | | | |
| | 1.M.1 | | | | | | | | $HNO_3$ | |
| | 1.M.2 | | | | | | | | " | |
| MW-2 | 2.0.1 | | | | | | 40 ml VOA | | None | 8015 (Gasoline) 8020 |
| | 2.0.2 | | | | | | " | | | |
| | 2.C.1 | | | | | | Plastic Bottle | | | |
| | 2.C.2 | | | | | | | | | |
| | 2.M.1 | | | | | | | | $HNO_3$ | |
| | 2.M.2 | | | | | | | | " | |
| MW-3 | 3.0.1 | | | | | | 40 ml VOA | | None | 8015 (Gasoline) 8020 |
| | 3.0.2 | | | | | | " | | | |
| | 3.C.1 | | | | | | Plastic Bottle | | | |
| | 3.C.2 | | | | | | | | | |
| | 3.M.1 | | | | | | | | $HNO_3$ | |
| | 3.M.2 | | | | | | | | " | |
| Drum 7T | 7T.0.1 | | | | | Grab | 40 ml VOA | | None | 8 |
| " | 7T.C.1 | | 5-16-91 | | | " | Plastic Bottle | | " | |

SPECIAL ANALYSIS OR HANDLING REQUIREMENTS:
NA = No Analysis

RELINQUISHED BY:
Signature [signature]
Name Dan Plazak
Company RAC
Reason

RECEIVED BY:
Signature [signature]
Name
Company NET PACIFIC
DATE: 5/16/91
TIME: 11:05

RELINQUISHED BY:
Signature [signature] 5/17/ 1:00 pm
Name
Company
Reason

RECEIVED BY:
Signature [signature]
Name SIGNED A MARTIN
Company NET
DATE: 5/17/91
TIME: 2:30

RELINQUISHED BY:
Signature
Name
Company
Reason

RECEIVED BY:
Signature
Name
Company
DATE:
TIME:

ADDITIONAL INFORMATION:
Hold Until Further Instructed

# CHAIN OF CUSTODY RECORD

Shipped By: RAC Remedial Action Corporation
505 N. Tustin Ave., Suite 160
Santa Ana, California 92705
714/541-9353

Delivered To: NET
Burbank CA

PROJECT NAME: Union Bank-Emeryville
PROJECT NO.: 050-03

DATE: May 16, 1991 | PAGE 2 OF 4
SAMPLED BY: Plazak | SIGNATURE:

DELIVERY METHOD:
TOTAL NO. OF SAMPLES: 68

| BORING or SAMP. ID. | SAMPLE NO. | DEPTH or CO-ORDIN. | DATE SAMPLED | TIME SAMPLED | SAMPLE Material | SAMPLE Method | CONTAINER | PRESERVATION Temp. | PRESERVATION Chem. | # ANALYSIS REQUIRED |
|---|---|---|---|---|---|---|---|---|---|---|
| Drum 7T | 7T.M.1 | | 5-16-91 | | Water | Grab | 500 ml Plastic | 32°F | $HNO_3$ | |
| Drum 8S | 8S.0.1 | | 5-15-91 | | | | 40 ml VOA | | None | |
| | 8S.0.2 | | 5-16-91 | | | | " | | | |
| | 8S.C.1 | | | | | | Plastic Bottle | | | |
| | 8S.C.2 | | | | | | | | | |
| | 8S.M.1 | | | | | | | | $HNO_3$ | |
| | 8S.M.2 | | | | | | | | " | |
| Drum 9R | 9R.0.1 | | 5-15-91 | | | | 40 ml VOA | | None | |
| | 9R.0.2 | | 5-16-91 | | | | " | | | |
| | 9R.C.1 | | | | | | Plastic Bottle | | | |
| | 9R.C.2 | | | | | | | | | |
| | 9R.M.1 | | | | | | | | $HNO_3$ | |
| | 9R.M.2 | | | | | | | | " | |
| B-101 | 101.2.1 | 2' | | | Soil | Driven | SS Tube | | None | |
| | 101.4.1 | 4' | | | | | | | | |
| | 101.6.1 | 6' | | | | | | | | |
| B-102 | 102.2.1 | 2' | | | | | | | | |
| " | 102.6.1 | 6' | | | | | | | | |
| B-103 | 103.2.1 | 2' | | | | | | | | |
| " | 103.4.1 | 4' | | | | | | | | |

SPECIAL ANALYSIS OR HANDLING REQUIREMENTS:

RELINQUISHED BY:
Signature
Name Dan Plazak
Company RAC
Reason

RECEIVED BY:
Signature
Name
Company NET PACIFIC
DATE: 5/17/91
TIME: 11:05

RELINQUISHED BY:
Signature
Name
Company
Reason

RECEIVED BY:
Signature Jeffrey A Martin
Name JEFFREY A MARTIN
Company NET
DATE: 5/17/91
TIME: 2:30

RELINQUISHED BY:
Signature
Name
Company
Reason

RECEIVED BY:
Signature
Name
Company
DATE:
TIME:

ADDITIONAL INFORMATION:

# CHAIN OF CUSTODY RECORD

Shipped By: RAC Remedial Action Corporation
505 N. Tustin Ave., Suite 160
Santa Ana, California 92705
714/541-9353

Delivered To: NET
Burbank CA

PROJECT NAME: Union Bank - Emeryville
PROJECT NO.: 050-03
DATE: May 16, 1991
PAGE 3 OF 4
SAMPLED BY: Plazak
SIGNATURE:
DELIVERY METHOD:
TOTAL NO. OF SAMPLES: 68

| BORING or SAMP. ID. | SAMPLE NO. | DEPTH or CO-ORDIN. | DATE SAMPLED | TIME SAMPLED | SAMPLE Material | SAMPLE Method | CONTAINER | PRESERVATION Temp. | PRESERVATION Chem. | ANALYSIS REQUIRED |
|---|---|---|---|---|---|---|---|---|---|---|
| B-103 | 103.6.1 | 6' | 5-16-91 | | Soil | Drive | | 32°F | None | |
| B-104 | 104.1.1 | 1' | 5-15-91 | | | | | | | |
| " | 104.3.1 | 3' | | | | | | | | |
| B-105 | 105.2.1 | 2' | | | | | | | | |
| | 105.2.2 | 2' | | | | | | | | |
| | 105.4.1 | 4' | | | | | | | | |
| | 105.4.2 | 4' | | | | | | | | |
| B-106 | 106.1.1 | 1' | | | | | | | | |
| | 106.1.2 | 1' | | | | | | | | |
| | 106.3.1 | 3' | | | | | | | | |
| | 106.3.2 | 3' | | | | | | | | |
| B-107 | 107.2.1 | 2' | 5-16-91 | | | | | | | |
| | 107.4.1 | 4' | | | | | | | | |
| | 107.6.1 | 6' | | | | | | | | |
| | 107.8.1 | 8' | | | | | | | | |
| | 107.9.1 | 9' | | | | | | | | |
| Drum 1Z | 1Z1 | | 5-15-91 | | | Grab | | | | |
| " | 1Z2 | | | | | | | | | |
| Drum 2Y | 2Y1 | | | | | | | | | |
| " | 2Y2 | | | | | | | | | |

SPECIAL ANALYSIS OR HANDLING REQUIREMENTS:

RELINQUISHED BY:
Signature
Name Dan Plazak
Company RAC
Reason

RECEIVED BY:
Signature
Name
Company NET PACIFIC
DATE: 5/16/91
TIME: 11:00

RELINQUISHED BY:
Signature
Name
Company
Reason

RECEIVED BY:
Signature
Name J. JEFFREY A. MARTIN
Company NET
DATE: 5/17/91
TIME: 2:30

RELINQUISHED BY:
Signature
Name
Company
Reason

RECEIVED BY:
Signature
Name
Company
DATE:
TIME:

ADDITIONAL INFORMATION:

# CHAIN OF CUSTODY RECORD

Shipped By: RAC Remedial Action Corporation
505 N. Tustin Ave., Suite 160
Santa Ana, California 92705
714/541-9153

Delivered To: NET
Burbank CA

PROJECT NAME: Union Bank - Emeryville
PROJECT NO.: 050-03

DATE: May 16, 1991
PAGE 4 OF 4
SAMPLED BY: Plazak
SIGNATURE:

DELIVERY METHOD:
TOTAL NO. OF SAMPLES: 68

| BORING or SAMP. ID. | SAMPLE NO. | DEPTH or CO-ORDIN. | DATE SAMPLED | TIME SAMPLED | SAMPLE Material | SAMPLE Method | CONTAINER | PRESERVATION Temp. | PRESERVATION Chem. | ANALYSIS REQUIRED |
|---|---|---|---|---|---|---|---|---|---|---|
| Drum 3X | 3X1 | | 5-15-91 | | Soil | Grab | 55 Tube | 32°F | None | |
| " | 3X2 | | | | | | | | | |
| Drum 4W | 4W1 | | | | | | | | | |
| | 4W2 | | | | | | | | | |
| Drum 5V | 5V1 | | | | | | | | | |
| " | 5V2 | | | | | | | | | |
| Drum 6U | 6U1 | | | | | | | | | |
| " | 6U2 | | | | | | | | | |

SPECIAL ANALYSIS OR HANDLING REQUIREMENTS:

RELINQUISHED BY:
Signature
Name: Dan Plazak
Company: RAC
Reason

RECEIVED BY:
Signature
Name
Company: DOT PACIFIC
DATE:
TIME: 11:05

RELINQUISHED BY:
Signature
Name
Company
Reason

RECEIVED BY:
Signature
Name: JEFFREY N MARTIN
Company: NET
DATE: 5/17/91
TIME: 2:30

RELINQUISHED BY:
Signature
Name
Company
Reason

RECEIVED BY:
Signature
Name
Company
DATE:
TIME:

ADDITIONAL INFORMATION:

# APPENDIX D
# MONITORING WELL SAMPLING FORMS

RAC Remedial Action Corporation

505 N. Tustin Ave., Suite 160
Santa Ana, California 92705
714/541-9353

# MONITORING WELL SAMPLING FORM

| PROJECT NAME | PROJECT NUMBER |
|---|---|
| UNION BANK-EMERYVILLE | 050 - 03 |

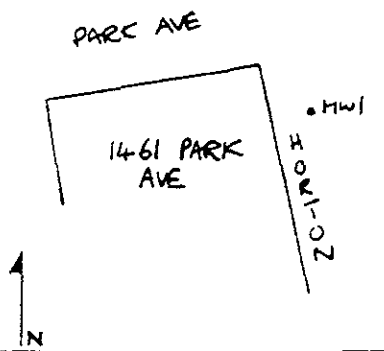
WELL NO.: MW-1 | DATE: 5.15.91 | TIME: PM | PAGE 1 OF 3 | WEATHER - SITE CONDITION: SUNNY

CONTRACTOR: — | RECORDED BY: J.F. | CHECKED BY: D.P.

**WELL CONSTRUCTION DETAILS:** FROM PCC., INC.

| | | | | | |
|---|---|---|---|---|---|
| Date Constructed: | SEPT 1990 | Casing Type: | 40 PVC | Screen Type: | 40 PVC |
| Date Developed: | SEPT 1990 | Diameter: | 2" | Diameter: | 2" |
| Date Last Sampled: | 9.26.90 | Length: | 5' | Length: | 15' |
| | | Well Depth: | 20' | Slot Size: | 0.01 |

LOCATION SKETCH




**WELL CONDITION:**

| | | | | | |
|---|---|---|---|---|---|
| G.S. Elvation: | 11.98' | Well Depth: | 20' | Product Thickness: | NA |
| T.C. Elevation: | 11.78' | Water Depth: | 4.30' | Water Odor: | NONE |
| W.L. Elevation: | 7.48' | Column Thickness: | 15.70' | Turbidity: | SLIGHT |

Well Water Volume: 2.5 GALLONS (2"=0.16gal/ft, 4"=0.65gal/ft, 6"=1.47gal/ft)

WELL PURGING METHOD: HAND Pump Type: 2" BAILER Pump Inlet Depth: NA

**WELL PURGING AND RECOVERY ANALYSIS**

| TIME | WATER LEVEL PUMP ON | PUMPING RATE | VOLUME PUMPED | TEMP. °C | pH | CONDUCT. µMHOS | D.O. | SAMPLE NO. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 12:13 | 4.30 | | 0 | | | | | | BEGAN BAILING |
| 12:27 | 4.90 | | 10 GAL | | | | | | STOP BAILING |
| | | | | | | | | | |
| 12:40 | 4.40 | | | | | | | | 80% RECOVERY |
| 17:05 | | | | 16.5 | 7.2 | 1,810 | | | COLLECT SAMPLES |

**SAMPLING INFORMATION:**

| SAMPLE NO. | TIME: | SAMPLING METHOD: | CONTAINER: | ANALYSIS REQUIRED |
|---|---|---|---|---|
| 1.G.1 | 17:05 | 2" SS BAILER | 40 ML VOA VIAL | 8010, 8020, 8015 |
| 1.C.1 | 17:05 | " " | 500 ML PLASTIC | $Cr^{+6}$, PH |
| 1.M.1 | 17:05 | " " | " " | CAM METALS |

ADDITIONAL INFORMATION:
WATER LEVEL MEASURED BELOW TOP CASING
SAMPLES ARE BRIGHT YELLOW, TRANSPARENT, FREE OF SUSPENDED SEDIMENT.

RAC Remedial Action Corporation

505 N. Tustin Ave., Suite 160
Santa Ana, California 92705
714/541-9353

# MONITORING WELL SAMPLING FORM

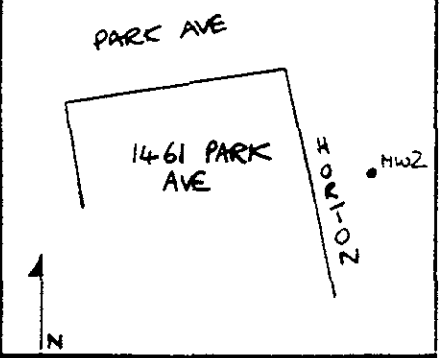
| PROJECT NAME | PROJECT NUMBER |
|---|---|
| UNION BANK-EMERYVILLE | 050 -03 |

| WELL NO.: MW2 | DATE: 5.15.91 | TIME: PM | PAGE 2 OF 3 | WEATHER - SITE CONDITION: SUNNY |
|---|---|---|---|---|
| CONTRACTOR: — | | RECORDED BY: J.F. | | CHECKED BY: D.P. |

**WELL CONSTRUCTION DETAILS:** FROM PCC, INC.

| | | | | | |
|---|---|---|---|---|---|
| Date Constructed: | SEPT 1990 | Casing Type: | 40 PVC | Screen Type: | 40 PVC |
| Date Developed: | SEPT 1990 | Diameter: | 2" | Diameter: | 2" |
| Date Last Sampled: | 9.26.90 | Length: | 5' | Length: | 15' |
| | | Well Depth: | 20' | Slot Size: | 0.01 |

LOCATION SKETCH




**WELL CONDITION:**

| | | | | | |
|---|---|---|---|---|---|
| G.S. Elvation: | 12.36' | Well Depth: | 20' | Product Thickness: | NA |
| T.C. Elevation: | 12.08' | Water Depth: | 4.58' | Water Odor: | NONE |
| W.L. Elevation: | 7.78' | Column Thickness: | 15.70' | Turbidity: | SLIGHT |

Well Water Volume: 2.5 GALLONS (2"=0.16gal/ft, 4"=0.65gal/ft, 6"=1.47gal/ft)

WELL PURGING METHOD: HAND Pump Type: 2" BAILER Pump Inlet Depth: NA

**WELL PURGING AND RECOVERY ANALYSIS**

| TIME | WATER LEVEL | PUMP ON | PUMPING RATE | VOLUME PUMPED | TEMP. °C | pH | CONDUCT. µMHOS | D.O. | SAMPLE NO. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 11:37 | 4.30 | | | 0 | | | | | | BEGIN BAILING |
| 11:57 | 5.22 | | | 10 GAL | | | | | | STOP BAILING |
| | | | | | | | | | | |
| 12:11 | 4.37 | | | | | | | | | 80% RECOVERY |
| 16:59 | | | | | 18 | 7.1 | 1,800 | | | COLLECT SAMPLES |

**SAMPLING INFORMATION:**

| SAMPLE NO. | TIME: | SAMPLING METHOD: | CONTAINER: | ANALYSIS REQUIRED |
|---|---|---|---|---|
| 2.O.1 | 16:59 | 2" SS BAILER | 40 ML. VOA VIAL | 8010, 8020, 8015 |
| 2.C.1 | 16:59 | " " | 500 ML. PLASTIC | Cr+6, PH |
| 2.M.1 | 16:59 | " " | " " | CAM METALS |
| | | | | |
| | | | | |

ADDITIONAL INFORMATION:
WATER LEVEL MEASURED BELOW TOP CASING
SAMPLES ARE BRIGHT YELLOW, TRANSPARENT, FREE OF SUSPENDED SEDIMENT.

RAC Remedial Action Corporation

505 N. Tustin Ave., Suite 160
Santa Ana, California 92705
714/541-9353

# MONITORING WELL SAMPLING FORM

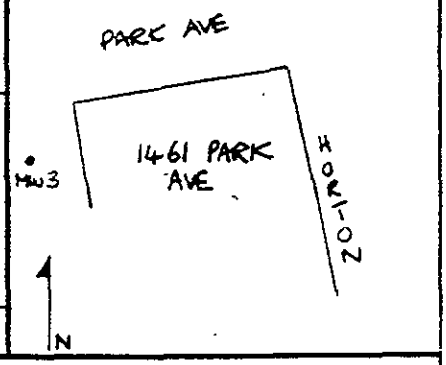
| PROJECT NAME | PROJECT NUMBER |
|---|---|
| UNION BANK-EMERYVILLE | 050 - 03 |

| WELL NO.: MW-3 | DATE: 5.15.91 | TIME: PM | PAGE 3 OF 3 | WEATHER - SITE CONDITION: SUNNY |
|---|---|---|---|---|
| CONTRACTOR: — | | RECORDED BY: J.F. | | CHECKED BY: D.P. |

**WELL CONSTRUCTION DETAILS:** FROM PCC, INC.

| | | | | | |
|---|---|---|---|---|---|
| Date Constructed: | SEPT 1990 | Casing Type: | 40 PVC | Screen Type: | 40 PVC |
| Date Developed: | SEPT 1990 | Diameter: | 2" | Diameter: | 2" |
| Date Last Sampled: | 9.26.90 | Length: | 5' | Length: | 15' |
| | | Well Depth: | 20' | Slot Size: | 0.01 |

LOCATION SKETCH




**WELL CONDITION:**

| | | | | | |
|---|---|---|---|---|---|
| G.S. Elvation: | 11.24' | Well Depth: | 20' | Product Thickness: | NA |
| T.C. Elevation: | 10.88' | Water Depth: | 4.52' | Water Odor: | NONE |
| W.L. Elevation: | 6.72' | Column Thickness: | 15.70' | Turbidity: | SLIGHT |

Well Water Volume: 2.5 GALLONS (2"=0.16gal/ft, 4"=0.65gal/ft, 6"=1.47gal/ft)

WELL PURGING METHOD: HAND Pump Type: 2" BAILER Pump Inlet Depth: NA

**WELL PURGING AND RECOVERY ANALYSIS**

| TIME | WATER LEVEL PUMP ON | PUMPING RATE | VOLUME PUMPED | TEMP. °C | pH | CONDUCT. µMHOS | D.O. | SAMPLE NO. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 12:44 | 4.16 | | 0 | | | | | | BEGIN BAILING |
| 12:57 | 9.20 | | 10 GAL | | | | | | STOP BAILING |
| | | | | | | | | | |
| 13:10 | 5.10 | | | | | | | | 80% RECOVERY |
| 17:20 | | | | 16.5 | 7.0 | 1,970 | | | COLLECT SAMPLES |

**SAMPLING INFORMATION:**

| SAMPLE NO. | TIME: | SAMPLING METHOD: | CONTAINER: | ANALYSIS REQUIRED |
|---|---|---|---|---|
| 3.G.1 | 17:20 | 2" SS BAILER | 40 ML VOA VIAL | 8010, 8020, 8015 |
| 3.C.1 | 17:20 | " | 500 ML PLASTIC | Cr+6, pH |
| 3.M.1 | 17:20 | " | " | CAM METALS |

ADDITIONAL INFORMATION:
WATER LEVEL MEASURED BELOW TOP CASING
SAMPLES ARE BRIGHT YELLOW, TRANSPARENT, FREE OF SUSPENDED SEDIMENT.

Walnut Creek

RECEIVED
MAY 23 1991

May 20, 1991
1014-91-00

Mr. James Farrow
**REMEDIAL ACTION CORPORATION**
505 N. Tustin Avenue, Suite 160
Santa Ana, CA 92705

Re: Your Purchase Order #0503
1461 Park Avenue
Emeryville, California

Dear James:

Enclosed please find a listing of the data points for the above referenced project along with a copy of our field notes.

All horizontal data is referenced to California Coordinate Systems. Zone 3 NAD27, Vertical datum is based on USC&GS Mean Sea Level.

Thank you for using Nolte for this project. We look forward to providing surveying services for any of your future Bay Area projects.

Should you have any questions regarding the data, please do not hesitate to call.

Sincerely,

**NOLTE and ASSOCIATES**

Frederick T. Seher
Licensed Land Surveyor

FTS:el
Enclosure

**NOLTE and ASSOCIATES**
Engineers / Planners / Surveyors

2950 Buskirk Avenue, Suite 225, Walnut Creek, CA 94596 Tel (415) 934-8060 FAX No (415) 939-5451

CL1035-X.FTS

JOB: 1014-91-00 Setup: 78BS77 Fri May 17 15:54:06 1991
WELL LOCATIONS,1461 PARK AVE. EMERYVILLE

| Point | | Coordinates | Elevation | Desc / Type |
|---|---|---|---|---|
| 1 | N | 489411.0046 | 11.12 | BLDG. CORNER |
| | E | 1483798.5167 | | SS |
| 2 | N | 489441.4232 | 12.28 | BLDG. CORNER |
| | E | 1483927.9079 | | SS |
| 3 | N | 489319.8591 | 12.83 | BLDG. CORNER |
| | E | 1483956.4466 | | SS |
| 4 | N | 489380.6693 | 12.36 | MONITORINGWELL |
| | E | 1483963.2648 | | SS |
| 5 | N | 489413.2681 | 11.98 | MONITORINGWELL |
| | E | 1483948.4248 | | SS |
| 6 | N | 489430.8915 | 12.20 | MONITORINGWELL |
| | E | 1483954.4347 | | SS |
| 7 | N | 489440.4634 | 12.26 | SOIL BORING |
| | E | 1483930.8964 | | SS |
| 8 | N | 489430.9704 | 11.90 | SOIL BORING |
| | E | 1483944.4703 | | SS |
| 9 | N | 489416.2888 | 12.18 | SOIL BORING |
| | E | 1483954.6014 | | SS |
| 10 | N | 489399.6963 | 12.04 | SOIL BORING |
| | E | 1483949.7789 | | SS |
| 11 | N | 489401.7348 | 12.18 | SOIL BORING |
| | E | 1483938.5993 | | SS |


JOB: 1014-91-00 Setup: 519BS78 Fri May 17 15:54:18 1991
WELL LOCATIONS,1461 PARK AVE. EMERYVILLE

| Point | | Coordinates | Elevation | Desc / Type |
|---|---|---|---|---|
| 12 | N | 489410.9895 | 11.14 | BLDG. CORNER |
| | E | 1483798.4535 | | SS |
| 13 | N | 489355.7081 | 11.44 | BLDG. LINE |
| | E | 1483811.4153 | | SS |
| 14 | N | 489367.7410 | 11.24 | MONITORINGWELL |
| | E | 1483786.8903 | | SS |