ETIC ENGINEERING

July 15, 2008

Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Ste. 250
Alameda, CA 94502

Subject: Revised Remedial Action Plan
4919 Tidewater Avenue, Oakland, California

Case No. RO0000107

Dear Mr. Wickham:

Attached for your review and comment is a copy of the Revised Remedial Action Plan for the above-referenced site. ETIC Engineering, Inc. of Pleasant Hill, California, is sending the report on behalf of the owner of the property.

The signed letter from the owner of the property will follow in the mail.

If you have any questions or require further information, please contact me at (925) 602-4710, ext. 41.

Sincerely,

Maura E. Dougherty

Maura E. Dougherty, P.E.
Project Manager

Attachment

cc: Bob Lawlor, R. W. L. Investments, Inc. (w/attachment)

ETIC ENGINEERING

Revised Remedial Action Plan

Former Disalvo Trucking
4919 Tidewater Avenue, Unit B
Oakland, California 94601

Fuel Leak Case Number: RO0000107

July 2008

Prepared For:

R.W.L. Investments, Inc.
4919 Tidewater Avenue, Unit B
Oakland, California 94601

Prepared By:

ETIC Engineering, Inc.
2285 Morello Avenue
Pleasant Hill, California 94523

Revised Remedial Action Plan

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Pleasant Hill, California 94523

Michael H. Garcia — **Date**
Project Geologist

Maura E. Dougherty, P.E. — **Date**
Project Manager

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GENERAL INFORMATION

Site Location

Former DiSalvo Trucking
4919 Tidewater Avenue, Unit B
Oakland, California 94601

Alameda County
Township 2 South, Range 3 West, Section 17 of the Mount Diablo Baseline and Meridian

Responsible Party

Bob Lawlor
R.W.L. Investments, Inc.
4919 Tidewater Avenue, Unit B
Oakland, California 94601

Environmental Consultant

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1.0 INTRODUCTION

On behalf of R.W.L. Investments, Inc., ETIC Engineering, Inc. (ETIC) has prepared this *Revised Remedial Action Plan* (RAP) for the former DiSalvo Trucking facility located at 4919 Tidewater Avenue in Oakland, California (the Site). This Revised RAP was prepared in accordance with the request by the Alameda County Health Care Services Agency (ACHCSA) in their letter dated May 1, 2008 (Appendix A).

2.0 SITE BACKGROUND

2.1 DESCRIPTION OF SITE

The Site is located east of the San Francisco Bay in southwest Oakland, approximately 500 feet southeast of the Tidewater Avenue and Lasser Street intersection, on the southwest side of Tidewater Avenue (Figure 1). The Site is located in Section 17 of Township 2 South, Range 3 West. The Site is currently owned by R.W.L. Investments, Inc. and leased to Heitz Trucking.

The 3.61 acre property contains an approximately 11,800 square-foot concrete warehouse and loading dock terminal along the north side of the Site, an office trailer, and an approximately 2,770 square-foot truck repair shop and maintenance building along the southern side of the Site (ART, 2007). An aboveground fuel storage tank is located north of the maintenance building and outside yard areas are located along the northwest side of the building and between the buildings.

The Site is listed as a fuel leak case and is overseen by ACHCSA.

2.2 LOCAL GEOLOGY AND HYDROGEOLOGY

Soil borings from previous onsite investigations indicate that the area beneath the Site was likely filled to create land and lift the surface roughly 5 feet above the high tide line (ART, 2007). The soil beneath the Site consists mostly of gravel and sand fill with concrete and asphalt debris (ART, 2007). The thickness of the fill material varies across the Site from about 1.5 feet thick near the southern corner and 4 to 5 feet along the northern property to greater than 9 feet thick along Tidewater Avenue (ART, 2007). The fill is underlain by organic clay with thin interbeds of peat material.

Groundwater flow direction in the area of the Site is toward the San Francisco Bay and has ranged from approximately west to south-southwest. Historically, depths to groundwater measured in monitoring wells at the Site have ranged from 1.14 to 3.88 feet below ground

surface (bgs). The hydraulic gradient has historically ranged from 0.0002 to 0.008 foot-per-foot.

Groundwater gauging data measured from observation wells in the vicinity of MW-2 was evaluated for the presence of a vertical hydraulic gradient. Well OB-5 is the only observation well screened within the native clay formation between 10 and 15 feet bgs. Wells OB-3, OB-4, and OB-6 are screened within the shallower fill material between 2 and 10 feet bgs. During the November 2007 groundwater monitoring event, observation well OB-5 had the deepest depth to groundwater measurement (11.78 feet bgs) while measurements in wells OB-3, OB-4, and OB-6 ranged from 2.93 to 3.03 feet bgs (ETIC, 2007a). Although groundwater elevations for the observation wells cannot be calculated until the top of well casing elevations are surveyed, well construction and gauging data support the possibility of a downward, vertical hydraulic gradient at the Site.

Groundwater elevations and contours for the November 2007 monitoring event and a rose diagram with historical groundwater flow direction and hydraulic gradient are presented on Figure 3. Monitoring well construction details are presented in Table 1. Historical groundwater elevation data are presented in Table 2.

2.3 TOPOGRAPHY AND SURFACE WATER

The land surface in the area of the Site generally slopes down to the west toward San Francisco Bay. The Site property is relatively flat with little topographic change. The elevation of the Site is approximately 5 feet above mean sea level (msl).

The San Leandro Bay is located approximately 350 feet to the south of the Site. Lake Merritt is a tidal lagoon located 5.7 miles northwest of the Site. The salt/freshwater lake covers an area of approximately 155 acres and the primary uses are recreation and aesthetics.

2.4 UST HISTORY

One 10,000-gallon diesel underground storage tank (UST), one 5,000-gallon diesel UST, and one 280-gallon used-oil UST were operated at the Site until their removal in March 1989 (GET,1989a). The USTs were reportedly installed in 1968 with a remote dispenser system (GET, 1989b). The remote dispenser system consisted of four remote hydrants in two separate lines, one on the north side and one on the south side of the trucking terminal building. Two pressurized single-wall 2-inch diameter galvanized steel lines were connected to a red jacket pump located on the 10,000-gallon diesel UST. One 2-inch diameter product line crossed underneath the trucking terminal building and connected to the first remote hydrant on the north side of the building and the second 2-inch product line connected to the first remote

hydrant on the south side of the building, adjacent to the USTs. A 1-½-inch diameter galvanized steel line connected the first hydrant to the second remote hydrant in each line. The hydrant lines were located approximately 2 feet bgs (GET, 1989b).

In March 1989, the three USTs, fill lines, and the southern remote hydrant dispenser lines were removed. Two areas of corrosion were visible when the hydrant line was removed (GET, 1989b). During removal activities a 550-gallon UST was discovered and also removed. Visual inspection identified two holes in the 550-gallon UST. In addition, a 10-inch diameter pipeline crossing the excavation was discovered. The pipe was broken during excavation activities and "diesel-like fuel" drained into the UST excavation (GTE, 1994a). The pipe was cut, the middle section was removed, and the ends were capped at the limits of the excavation (GTE, 1994a).

Petroleum hydrocarbons were detected at concentrations up to 240 milligrams per kilogram (mg/kg) in soil samples collected from the UST excavation. Diesel-impacted groundwater was observed flowing into the open UST excavation from the northeastern corner. The liquid-phase hydrocarbons (LPH) and contaminated groundwater were pumped from the excavation pit for disposal. In April 1989, a recovery well and recovery trench were installed from which an estimated 2,400 gallons of diesel fuel and 20,000 gallons of contaminated groundwater were recovered between April and August 1989 (GTE, 1991).

Approximately 3,000 cubic yards of excavated soil was stockpiled and treated onsite by enhanced biodegradation in 1990 (GTE, 1991). The stockpile was located adjacent to the excavation area. Soil was sampled and remediated under supervision of Ariu Levie of ACHCSA (GTE, 1994b). Confirmation soil sample results are included in the 1994 letter from Gen-Tech Environmental (GTE) to the ACHCSA (GTE, 1994b). Based on the results of confirmation samples collected on May 21, 1990, "some of the treated soil was used to fill pot holes and depressions onsite, and the remainder was moved to the front of the property (bordering Tidewater Avenue) and used for a planter berm" (GTE, 1994b). According to property owner Mr. Bob Lawlor, during a telephone conversation on July 2, 2008, the stockpiled material remains at the Site (Lawlor, 2008b). The stockpile was noted as the "debris pile" on the Murray Engineers report (Murray, 2006).

2.5 ENVIRONMENTAL INVESTIGATIONS (1989 THROUGH 2007)

Subsurface investigations were performed at the Site from 1989 to 2007. Historical groundwater monitoring well, soil, and grab groundwater sampling locations are presented on Figure 4; historical analytical data are presented in Tables 3, 4, and 5, respectively. These investigations confirmed the presence of diesel- and gasoline-impacted soil and groundwater beneath the Site and identified LPH at various locations including in monitoring wells MW-2 and MW-3. Total petroleum hydrocarbons in the diesel range (TPH-d), total petroleum hydrocarbons in the gasoline range (TPH-g), benzene, toluene, ethylbenzene, and xylenes

(BTEX), and fuel oxygenate methyl tertiary butyl ether (MTBE) have been detected in groundwater samples collected at the Site.

In May 1989, Geo-Environmental Technology (GET) performed a shallow soil investigation at the Site in which 11 soil samples and one groundwater sample were collected from 22 shallow soil borings (BH-1 through BH-22). Samples were not collected from borings with obvious petroleum impacts (GET, 1989b). Soil sampling confirmed the presence of diesel-impacted soil in the area of the former UST excavation and along the former fuel dispenser hydrant line extending from the former USTs to the northeast. The maximum TPH-d concentration (46,000 mg/kg) was detected in a soil sample collected at 5 feet bgs from boring BH-11, located approximately 10 feet west of the former UST excavation (GET, 1989b). Oil and grease was detected in this same sample at a concentration of 27,000 mg/kg.

In an April 1994 soil and groundwater investigation, GTE drilled 14 borings (EB-1 through EB-11 and MW-1 through MW-3), collected soil and groundwater samples, and installed three groundwater monitoring wells (MW-1 through MW-3) (GTE, 1994c). The maximum concentrations of TPH-d (29,000 mg/kg) and oil and grease (36,000 mg/kg) in soil were detected in samples from boring MW-2. The maximum concentrations of TPH-d detected during grab groundwater sampling were 64,000 micrograms per liter (µg/L) from boring EB-2 and 73,000 µg/L from boring EW-4. Groundwater monitoring well sampling conducted on April 14, 1994 indicated LPH in monitoring well MW-2 and elevated concentrations of TPH-d and TPH-g (7,700 µg/L and 250 µg/L, respectively) in well MW-3 (GTE, 1994c).

In July 1995, Environmental Restoration Services (Enrest) drilled two soil borings and installed monitoring well MW-4 (ART, 2007). MW-4 was installed on the northern side of the terminal building. TPH-g (250 µg/L) and low concentrations of BTEX were detected in the August 1995 groundwater sample from MW-4.

PIERS Environmental (PIERS) drilled 16 soil borings (SB-1 through SB-16) during a soil and groundwater investigation in December 2000. Eight soil samples between 6 and 7 feet bgs and 16 grab groundwater samples were collected and analyzed for TPH-d. The only TPH-d detection in soil was 14 mg/kg in a sample collected from SB-16 at 6.5 feet bgs. The maximum TPH-d concentration in groundwater was 670,000 µg/L (SB-10) (PIERS, 2000). PIERS identified two main areas of TPH-d impacted soil: 1) located in the area of the former UST excavation and 2) from the northeast end of the recovery trench to the area of MW-2. TPH-d concentrations in groundwater along the northwestern property boundary were 44,000 µg/L (SB-14) and 48,000 µg/L (SB-15) and PIERS concluded that the groundwater contamination plume extended offsite to the northwest (PIERS, 2000).

In February and April 2006, ERAS Environmental (ERAS) conducted additional subsurface investigations to further delineate vertical and lateral extents of diesel impacts in soil and groundwater at the Site (ERAS, 2006). In February 2006, ERAS collected soil and

groundwater samples from soil borings B-1 through B-9 for TPH-d analysis and Murray Engineers, Inc. (Murray) collected soil samples from borings B-6 through B-9 for geotechnical analysis (named B-1 through B-4 for the Murray report). In April 2006, an 8-inch dewatering well (EW-1) and four observation wells (OB-3 through OB-6) were installed and soil and groundwater samples were collected from borings B-10 through B-15. No LPH was encountered during these investigations. The maximum detection of TPH-d in soil was 5,400 mg/kg collected from B-9 at 4.5 feet bgs, located adjacent to the southwestern corner of the former UST excavation. The maximum concentration of TPH-d in groundwater was 2,500,000 µg/L collected from B-12 located northwest of the former UST excavation (ERAS, 2006).

Geotechnical results were reported by Murray in an April 2006 *Limited Geotechnical Evaluation Contaminated Soil Replacement Report.* The report summarized the subsurface geology and provided shoring design parameters for potential excavation activities at the Site.

Applied Remedial Technologies, Inc. (ART) conducted a groundwater aquifer test and construction dewatering analysis. ART performed both a step down drawdown pumping test and a constant-rate aquifer test at well EW-1. Pumping from EW-1 (screened across the fill material and approximately three feet into the clay unit underlying the fill material) resulted in drawdowns in all observation wells screened in fill material. No drawdown was observed in well OB-5, which was screened in the clay unit, located approximately seven feet from EW-1 (ART, 2006).

In February 2007, ART prepared a *Feasibility Study Report* to address the removal of petroleum hydrocarbons from the Site subsurface. Based on the feasibility evaluation of remedial alternatives, ART recommended groundwater extraction and treatment with limited source area remediation.

In their May 29, 2007 letter, the ACHCSA requested the preparation of a RAP for the Site. In accordance with this request, ETIC submitted the *Remedial Action Plan* dated September 14, 2007 (ETIC, 2007b). The RAP included a description of how the affected soil area would be precisely determined and how remedial alternatives other than excavation would be evaluated.

2.6 GROUNDWATER MONITORING (1994 THROUGH 2007)

Groundwater monitoring has been conducted at the Site intermittently since April 1994. Two monitoring wells, MW-2 and MW-3, historically have had LPH, which was removed by bailing. Groundwater flow direction has generally flowed from approximately west to south-southwest with a shallow gradient. The second semi-annual 2007 groundwater sampling event took place in November 2007.

2.7 CURRENT SITE STATUS

In their May 1, 2008 letter, ACHCSA requested a Revised RAP to address several ACHCSA comments. This document was prepared in accordance with this request. The technical comments by ACHCSA have been addressed in Sections 2.0 through 5.0 of this document.

In their May 1, 2008 letter, ACHCSA concurred with ETIC's proposal to perform a geophysical survey at the Site with the purpose of locating existing utilities, utility trenches that may act as preferential pathways, and abandoned, underground piping. Section 3.0 includes a description of activities and results associated with the geophysical survey performed on June 3, 2008.

A site conceptual model is presented in Section 4.0 to detail the current understanding of the chemicals of concern and the affected media at the Site. Section 5.0 proposes remedial activities including a soil and groundwater investigation and monitoring well installation. Additional soil and groundwater sampling is proposed to delineate the vertical and lateral extent of TPH-d contamination at the Site. Sampling locations were chosen based on results of the geophysical survey to include locations adjacent to any identified piping. An additional monitoring well is proposed to further delineate the upgradient extent of petroleum hydrocarbons in groundwater toward the northern corner of the Site.

Potential remedial actions which may be utilized to address the contamination at the Site, including pipe removal, soil excavation, and groundwater extraction, are outlined in Section 6.0.

3.0 GEOPHYSICAL SURVEY

3.1 SURVEY ACTIVITIES

A geophysical survey was performed at the Site on June 3, 2008 by NORCAL Geophysical Consultants, Inc. (NORCAL) (California Professional Geophysicists) and was observed by an ETIC geologist. The purpose of the survey was to investigate subsurface conditions including the location of potential fuel hydrant dispenser lines left in-place on the north and south sides of the trucking terminal building, and to identify utilities and utility trenches that may act as preferential pathways.

Geophysical surveys use non-invasive methods to identify the presence of subterranean objects or anomalies. The geophysical survey methods included metal detection (MD), electromagnetic line locating (EMLL), and ground penetrating radar (GPR) (NORCAL, 2008). The MD survey was used to identify shallow, metal objects. The EMLL survey was used to

locate detectable utility alignments. The GPR survey continuously radiates an electromagnetic pulse into the subsurface and detects variations in electrical properties of the subsurface. These variations provide information on the location and dimensions of buried objects and fill boundaries. Combinations of survey methods were used to better define the extents of objects or anomalies identified during the electromagnetic survey.

The survey was conducted over an approximate 5-foot by 5-foot grid throughout the unobstructed areas of the property. A large part of the area north of the trucking terminal could not be investigated due to unhitched trailers and campers that could not be moved. The area south of the trucking terminal, however, was generally free from aboveground structures or objects.

3.2 SURVEY RESULTS

A site map showing results of the geophysical survey is presented on Figure 5. The report and figure presenting survey results prepared by NORCAL is included in Appendix B.

The surveyed area north of the trucking terminal building measured approximately 300 feet by 65 feet and extended to the northern property fence. As previously mentioned, obstructions in this portion of the property prevented the entire area from being investigated. One unidentified, metallic anomaly measuring approximately 23 feet by 5 feet was detected in the northeastern corner of the property, adjacent to the property fence. The survey identified six utility lines located on the north side of the building. One natural gas pipeline was identified in the northeastern corner of the property, parallel to and beneath the property fence. Five undifferentiated utility lines were detected from approximately 13 feet to 50 feet from and parallel to the terminal building. The undifferentiated lines are believed to be metallic in nature due to the MD and EMLL responses, but the specific types of utility or burial depths could not be determined. Historical documents indicate and according to property owner Mr. Bob Lawlor during a site visit on June 26, 2008, one of those undifferentiated utility lines is likely the remains of the fuel hydrant dispenser line left in-place (Lawlor, 2008a). Mr. Lawlor also identified a line located perpendicular to the building approximately 247 feet southwest of the entrance gate as a sanitary sewer pipeline. The line extends beneath the terminal building and reemerges to service the portable office on the south side of the terminal building.

The surveyed area south of the trucking terminal building measured approximately 260 feet by 180 feet. Three metallic anomalies were detected in this area measuring approximately 25 feet by 2 feet, 30 feet by 1 foot, and 4 feet by 4 feet, from northeast to southwest, respectively. Approximately 20 utility lines were identified on the south side of the building. One line is perpendicular to the building and parallel to the former fuel hydrant line located between the former UST excavation and the building. The line was identified as a telephone/electric line by Murray Engineers (Murray, 2006). The line identified as the sanitary sewer pipeline by Bob

Lawlor is located approximately 250 feet southwest of the entrance gate, perpendicular to and between the terminal building and the truck repair shop. A second line was located parallel to the sewer line (Murray, 2006). An approximately 45 foot-long utility was detected at the western edge of the former UST excavation extending perpendicularly to the west. It was detected in the same general area in which a 10-inch diameter, diesel fuel pipeline was broken, capped, and abandoned during excavation activities in 1989 (GTE, 1994a). An approximately 105 foot-long utility line was identified in the area of the recovery trench. This line is likely part of the recovery trench system. Two additional unidentified utilities were identified in the area of the trench. Several more undifferentiated and suspect utility lines were detected in the southeastern portion of the survey area. Suspect utility lines are likely non-metallic in nature because they were only detected by GPR survey method. They are considered 'suspect' because they may also represent other linear, buried objects such as concrete foundations associated with a former structure (NORCAL, 2008).

4.0 SITE CONCEPTUAL MODEL

4.1 CHEMICALS-OF-CONCERN AND AFFECTED MEDIA

Analytical data from historical and current soil and groundwater sampling (Tables 3, 4, and 5) indicate the subsurface beneath the Site has been impacted by the presence of petroleum hydrocarbons. TPH-d, total oil and grease (O&G), TPH-g, and BTEX have been detected in soil samples collected on the Site. Historical soil samples collected from the vadose zone indicate concentrations up to 29,000 mg/kg TPH-d and 36,000 mg/kg O&G (MW-2 at 2 feet bgs). In Section 5.0, additional sampling is proposed to evaluate the extent of petroleum hydrocarbons in soil on the Site.

Petroleum hydrocarbons have also been detected in groundwater samples collected at the Site. Concentrations of TPH-d up to 2,500,000 µg/L (B-12) have been detected in grab groundwater samples collected at the Site. Concentrations of MTBE up to 47 µg/L (MW-3) have been detected in groundwater well samples collected at the Site. In Section 5.0, additional sampling is proposed to evaluate the downgradient extent of petroleum hydrocarbons in the subsurface.

Due to the volatility of petroleum hydrocarbon compounds, soil vapor beneath the Site may also be impacted.

4.2 SOURCES OF CONTAMINATION

The former fuel USTs and the diesel remote hydrant piping system at the property are sources of contamination, as indicated by historical data.

4.3 LOCAL GEOLOGY AND GEOLOGIC CROSS-SECTIONS

Figure 6 illustrates the traces of two geologic cross-sections prepared from the logs of borings drilled at the Site. Figures 7 and 8 present the two cross-sections, illustrating the lithology and stratigraphy beneath the Site. Cross-section A-A' has a northwest to southeast orientation through the truck terminal building and is generally perpendicular to the direction of groundwater flow. Cross-section B-B' has a northeast to southwest orientation through the former UST excavation area and is generally parallel to groundwater flow.

Clay fill material and dense clay were encountered within the UST excavation pit (GET, 1989a). The clay fill material consisted of "wood, sawdust, debris, and rubble" from ground surface to approximately 6 to 8 feet bgs. Dense gray clay was encountered at approximately 8 feet bgs, coinciding with the approximate depth to the top of younger bay mud in that part of the Site, and extended through to the bottom of the excavation at approximately 12 feet bgs. The excavation was later backfilled with clean imported pea gravel and soil fill.

In borings drilled throughout the Site, thicknesses of the fill material vary from approximately 1.5-feet thick in the northwestern part of the property near well MW-4, to approximately 4- to 5-feet thick along the northern property line near boring EB-3. The *Limited Geotechnical Evaluation Contaminated Soil Replacement Report* published by Murray reports fill thicknesses greater than 9 feet at the northeastern part of the property (Murray, 2006). Silty sand, sandy silt, or clayey sand are generally encountered at approximately 8 feet bgs, underlain by organic clay with thin interbeds of peat material.

4.4 TRANSPORT MECHANISMS

Historically, petroleum hydrocarbon contamination has been detected in soil and groundwater samples. The primary transport mechanisms for the petroleum hydrocarbons are advection, adsorption, desorption, and volatilization. Petroleum hydrocarbons in the vicinity of the former UST excavation and remote fuel dispenser system can migrate downgradient primarily through advection. The potential movement of impacted groundwater offsite to surface water will be further assessed through downgradient soil borings proposed in the soil and groundwater investigation described in Section 5.1.

Historical soil and groundwater data indicate that both media are affected in the shallow aquifer, and consequently adsorption and desorption between the two phases may be occurring. Petroleum hydrocarbons (particularly TPH-g and BTEX) may volatilize from soil and/or groundwater into soil vapor. Volatilization of petroleum hydrocarbons from soil and groundwater into the vapor pore space may result in the subsequent migration to the ground surface.

4.5 POTENTIAL EXPOSURE PATHWAYS AND RECEPTORS

Potential exposure pathways and receptors at the Site and neighboring properties were evaluated based on current and potential future usage. The Site is currently used for commercial/industrial purposes, with nearby land used for commercial and industrial purposes. The property is largely paved.

Potentially-complete exposure pathways and receptors have been identified for the Site, with the following criteria:

- A source and mechanism of chemical release;
- One or more retention or transport media (e.g., soil, groundwater, soil vapor, air, or surface water);
- A point of potential contact with the impacted medium (referred to as the exposure point); and
- An exposure route at the point of contact (e.g., inhalation, ingestion, or dermal contact).

Figure 9 illustrates a schematic diagram of the site conceptual model, and Figure 10 shows the exposure pathway flow chart. Site-specific, potentially-complete exposure pathways and potential receptors are depicted on the figures, and are summarized as follows:

- Inhalation of chemicals volatilizing from soil or groundwater to indoor or outdoor air (onsite or offsite residential, commercial, or industrial receptors);
- Inhalation of volatiles, dermal contact, or incidental ingestion of contaminated soil or groundwater through excavation (onsite or offsite construction workers);
- Ingestion of or dermal contact with contaminated groundwater from a potential current or future water supply well (onsite or offsite residential, commercial, or industrial receptors); and
- Dermal contact with or incidental ingestion of contaminated surface water (offsite residential, commercial, or industrial receptors or construction workers).

Based on historical analytical data of residual petroleum hydrocarbon impacts at depths less than 5 feet bgs, occupants could be subject to direct exposure (ingestion or dermal contact) to residual petroleum hydrocarbons in soil. Construction workers could also have direct exposure to the residual contamination, if excavation occurs in the future.

Ingestion of or dermal contact with impacted groundwater at the Site is a potential human health risk for occupants. Installation of a shallow water-producing well within the contaminant plume could create a direct and complete exposure pathway. A survey of water-producing wells present in the site vicinity will demonstrate whether this exposure pathway is currently complete. A future sensitive receptor survey may be performed, which would include a well search, to determine whether there are any production wells in the vicinity of the Site. Construction workers may also have direct exposure to the residual contamination in groundwater if excavation and/or dewatering activities occur in the future.

The vapor intrusion pathway from impacted soil and/or groundwater to outdoor or indoor air is potentially complete. A future soil vapor investigation and intrusion study may be performed to evaluate the potential health risks associated with indirect exposure via inhalation of volatiles from the subsurface, depending on results of future soil and groundwater investigation and potential remediation.

Should contaminated groundwater discharge to surface water, there could be a potentially-complete exposure pathway for occupants or construction workers in the vicinity of the Site.

5.0 PROPOSED REMEDIAL ACTIVITIES

5.1 SOIL AND GROUNDWATER INVESTIGATION

The results of previous soil and groundwater investigations performed indicate that additional characterization of the extent of contamination is needed. Additional information is needed to delineate the vertical and lateral extent of TPH-d contamination in the area of the former UST excavation, the potential fuel hydrant lines on the northern and southern sides of the building, in the area of MW-2, and along the perimeter of the property. Soil and shallow groundwater samples will be collected from 16 borings to further characterize petroleum hydrocarbon contamination in the targeted areas.

5.1.1 Proposed Boring Locations

The proposed boring locations (C-1 through C-16) are shown on Figure 11. Boring locations C-1, C-2, C-3, and C-4 are located in the northeastern portion of the Site and were chosen to delineate the upgradient extent of the plume. Borings C-5, C-8, and C-9 are located in the area north of the trucking terminal building. C-5 and C-9 were placed adjacent to the suspected former fuel hydrant dispenser line identified during the geophysical survey. Analytical data from C-8 will help define the northern extent of the plume. Borings C-6, C-7, C-10, and C-11 are located within and near the central area of the Site, near the recovery trench. These locations were placed adjacent to utility lines detected in the geophysical survey. Boring C-13

was placed adjacent to the suspected 10-inch diameter fuel line, downgradient of the former UST excavation. Borings C-12, C-14, C-15, and C-16 are located along the downgradient limits of the Site and groundwater analytical data from these borings will help confirm whether or not petroleum hydrocarbon impacted groundwater is discharging offsite to surface water.

5.1.2 Drilling and Sampling

Drilling permits will be obtained from ACHCSA. A health and safety plan will be prepared and implemented during drilling and sampling activities. Prior to drilling activities, the proposed soil boring locations will be marked and checked for the presence of underground utilities by Underground Service Alert. A private utility-locating contractor will also be hired to check for the presence of underground utilities.

Drilling will be performed by a C57-licensed contractor, using a direct-push drilling rig equipped with a dual-tube sampling system. Drilling equipment and sampling tools will be decontaminated prior to beginning the field program. Reusable sampling equipment will be thoroughly washed with a Liqui-Nox solution, rinsed with tap water, and then rinsed with distilled water prior to each use.

Each boring location will be cleared with hand tools to an approximate depth of 2 feet bgs, where a slide hammer will be used to collect an initial soil sample. The boring will then be advanced until first groundwater is encountered, approximately 10 feet bgs, while continuously logging soil lithology. One groundwater sample will be collected from the shallow aquifer at each location. Borings C-1, C-7, C-13, and C-16 will be advanced to an approximate depth of 30 feet bgs and the remaining borings will be advanced to approximately 20 feet bgs, while continuously logging soil lithology. If groundwater is encountered below 10 feet bgs, a second groundwater sample will be collected by hydropunch from a new boring adjacent to the original boring.

An ETIC geologist will supervise drilling and sampling activities. Soil will be examined for lithologic identification and visible signs of contamination in accordance with the Unified Soil Classification System and the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), American Society for Testing and Materials (ASTM) Designation D2488 (ASTM 2000), and the observations will be recorded in the field logs. Technical guidance for the program will be provided by a California Professional Geologist.

A photoionization detector or flame ionization detector will be used to monitor for organic vapors. Measurements of headspace vapors from soil samples will be recorded on the boring logs. If any unusual stains or odors are evident in the soil, additional samples will be collected for laboratory analyses.

Soil samples will be collected at 5-foot intervals, at changes in lithology, where petroleum hydrocarbon impacts are evident, and at the soil/groundwater interface. Additional soil samples may be collected and held for subsequent analysis, pending the results of the initial sample analyses. The samples will be cut directly from the acetate direct-push liners, sealed with Teflon tape and vinyl end caps, labeled, stored on ice in a thermally-insulated cooler, and then transported under chain-of-custody protocol to a state-certified analytical laboratory. Two groundwater samples will be collected from each proposed sample location using a new disposable bailer or tubing with check valve. The samples will be collected in clean 40-milliliter, hydrochloric-acid-preserved, volatile organic analysis (VOA) vials supplied by the analytical laboratory. The sample containers will be sealed, labeled, stored on ice in a thermally-insulated cooler, and then transported under chain-of-custody protocol to a state-certified analytical laboratory. Soil and groundwater samples will be analyzed for TPH-d by EPA Test Method 8015M with silica gel cleanup and BTEX by EPA Method 8260B.

The completed borings will be filled and sealed with a grout mixture consisting of neat cement, in accordance with ACHCSA and Department of Water Resources (DWR) requirements.

5.2 GROUNDWATER MONITORING WELL INSTALLATION

ETIC proposes to install one additional 2-inch diameter groundwater monitoring well upgradient of the former UST excavation in the northern corner of the subject property, to further delineate the lateral extent of groundwater contamination at the Site.

The proposed well will target the fill material in the northern corner of the Site. The well is expected to be constructed similarly to existing monitoring wells at the Site, with a 5-foot thick screen interval and a 5.5-foot thick filter pack. The well location will be based upon encountered field conditions but is expected to be installed near proposed boring C-1. Details summarizing well installation procedures are presented below.

5.2.1 Drilling and Soil Sampling

Drilling permits and variance permits to allow for a less than 10-foot grout seal in the well construction will be obtained from ACHCSA. A health and safety plan will be prepared and implemented during drilling and sampling activities. Prior to drilling activities, the proposed soil boring locations will be marked and checked for the presence of underground utilities by Underground Service Alert. A private utility-locating contractor will also be hired to check for the presence of underground utilities.

Drilling will be performed by a C57-licensed contractor using a truck-mounted rig equipped with 8-inch diameter hollow-stem continuous-flight augers. Drilling equipment and sampling tools will be decontaminated prior to beginning the field activities. Reusable sampling

equipment will be washed with a Liqui-Nox solution, rinsed with tap water, and rinsed with distilled water prior to each use. An ETIC geologist will supervise the drilling and sampling activities. Soil samples will be examined for lithologic identification in accordance with the procedures discussed in Section 5.1.2.

Soil cores will be continuously logged for lithologic identification and samples will be collected at 5-foot intervals for laboratory analysis. Additional soil samples may be collected and held for subsequent analysis, pending the results of the initial sample analyses. The samples will be collected in clean stainless steel liners and will be sealed, packaged, and transported in accordance with the procedures discussed in Section 5.1.2. At a minimum, the soil samples will be analyzed for TPH-d by EPA Test Method 8015M with silica gel cleanup and BTEX by EPA Method 8260B.

5.2.2 Groundwater Monitoring Well Construction

The groundwater monitoring well will be constructed using 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing. The total depth of the well and the slot size used in the screened portion of the well will be determined based on the results of the direct-push subsurface investigation proposed in this RAP. The screened interval will be selected based upon hydrogeologic data obtained during drilling but is expected to be similar to existing wells at the Site (between approximately 3 and 8 feet bgs). An appropriately-sized filter pack will be placed in the annular space of the borehole adjacent to the screened interval. The filter pack will be extended slightly above the top of the screened interval to allow for settlement during well development. A transitional seal, consisting of hydrated bentonite, will be placed above the filter pack in the annular space of the borehole. A grout slurry, consisting of neat cement, will be placed in the annular space above the bentonite seal to near ground surface. An inspector from ACHCSA will observe and approve the grouting procedures. A traffic-rated vault box, expandable locking cap, and padlock will be installed to secure the monitoring well. Following installation activities, a DWR 188 Well Completion Report will be prepared for each monitoring well and submitted to ACHCSA and DWR.

5.2.3 Well Development and Sampling

The monitoring well will be developed at least 72 hours after installation. The depth to water and product thickness (if present) will be measured to the nearest 0.01 foot, using an electronic oil/water interface probe. Development will consist of surging the screened interval of the monitoring well with a vented surge block of the same diameter as the casing for approximately 10 minutes. The monitoring well will be purged using one of the following methods:

- A vacuum truck equipped with a dedicated PVC stinger or disposable tubing;
- An inertial pump;

- A submersible electric pump;
- A centrifugal pump;
- An air-lift pump; or
- A bailer.

As part of the development, the monitoring well will be purged until at least 10 casing volumes of groundwater have been removed, the water is free of silt and apparent turbidity, and water quality parameters (including temperature, pH, specific conductance) have stabilized.

A record of the purging methods, water quality parameters, and volumes of water purged will be maintained. Purge water will be contained in properly labeled, Department of Transportation (DOT) approved, 55-gallon drums and transported to an appropriate treatment or disposal facility. Reusable sampling equipment will be washed with a Liqui-Nox solution, rinsed with tap water, and rinsed with distilled water.

Following at least 48 hours after development, the monitoring well will be purged and groundwater samples will be collected in clean bottles supplied by the analytical laboratory. Sample bottles will be sealed, labeled, placed in resealable plastic bags and immediately placed on ice in a thermally-insulated cooler, and transported to a state-certified analytical laboratory under chain-of-custody protocol. At a minimum, the groundwater samples will be analyzed for TPH-d by EPA Test Method 8015M with silica gel cleanup and BTEX by EPA Method 8260B. Following the initial sampling, sampling of the newly-installed well will be incorporated into the semi-annual groundwater monitoring schedule.

5.3 MONITORING WELL SURVEYING

In accordance with the State of California *GeoTracker* requirements, the locations and elevations of the monitoring well will be surveyed. The survey will be performed by a California-licensed Professional Land Surveyor and will include latitude, longitude, ground-surface elevation, and top of casing elevation at each monitoring well. Latitude and longitude will be referenced to the NAD83 datum and elevation will be referenced to the NAVD88 datum.

A survey data report will be uploaded into California *GeoTracker*, and will be used to prepare future groundwater elevation maps for the subject site.

5.4 DISPOSAL OF INVESTIGATIVE-DERIVED WASTE

Soil and water derived from the subsurface investigation will be contained in DOT approved drums stored temporarily at the property. A composite soil sample and a water sample will be collected and submitted for laboratory analyses to allow the waste to be profiled and delivered to an approved disposal facility.

6.0 POTENTIAL REMEDIATION ACTIVITIES

6.1 PIPELINE EXCAVATION AND REMOVAL

ETIC may propose to excavate and remove the remaining fuel pipelines to the extent practicable. Prior to removal, the contents of the pipelines will be drained and the lines will be pressure washed with a biodegradeable cleaning solution. The cleaning rinsate will be contained in DOT approved, 55-gallon drums, pending offsite disposal. The dimensions of the each component will be measured and recorded and the lines will be inspected for cracks, seams, holes, and evidence of leakage. The piping debris will then be excavated and placed on, and covered with, plastic sheeting, pending transportation to an appropriate recycling or disposal facility. If piping is located beneath the existing trucking terminal building, the line will be flushed, cut, filled with concrete or cement grout, and capped in-place. Impacted soil will be excavated as part of removal activities.

Confirmation soil samples will be collected at 20-foot intervals along the piping runs and at areas of visible contamination. The samples will be submitted for laboratory analyses.

6.2 SOIL EXCAVATION

Excavation may be proposed for areas of elevated levels of TPH-d. Potential areas of excavation may include the former UST excavation, remote hydrant fuel lines, and the area in the vicinity of well MW-2. If groundwater did not accumulate in the bottom of the excavations, soil samples will also be collected from the floor of each excavation. Soil generated during excavation may be directly loaded into trucks for offsite disposal or stockpiled on, and covered with, plastic sheeting and temporarily stored onsite until transported to an approved disposal facility. Upon completion of source removal activities, the remedial excavations will be backfilled, compacted, and resurfaced. Any water in the excavations will be extracted to allow proper backfilling of the excavations. The excavations will backfilled and the surface restored.

6.3 EXCAVATION DEWATERING

If excavation is conducted, each excavation will be dewatered to remediate affected groundwater, to provide stability for the excavations, and to allow for proper backfilling and compaction. Groundwater will be pumped into a holding tank, removed from the tank as necessary, and transported to a licensed treatment or disposal facility. If present, groundwater samples will be collected from the excavations and submitted for laboratory analyses.

6.4 GROUNDWATER EXTRACTION

An assessment of remediation options may indicate that groundwater extraction is an appropriate remedial alternative for the Site. If required, then this activity could include the installation of a network of 4-inch diameter extraction wells. The locations of any proposed extraction wells will be discussed with ACHCSA, prior to installation. Extraction well installation activities will be performed in accordance with the procedures described in Section 5.2. The extraction wells will be designed and constructed to target the zone of residual contamination for remediation.

6.5 POST-REMEDIATION SAMPLING PLAN

Once remedial options have been implemented, a sampling plan will be developed to monitor petroleum hydrocarbon concentrations at the Site. The plan may include confirmation soil sampling and some groundwater monitoring.

7.0 SCHEDULE

ETIC can implement proposed activities associated with the soil and groundwater investigation and monitoring well installation upon approval of the RAP from ACHCSA. The written report summarizing the results of the soil and groundwater investigation and monitoring well installation will be completed within eight weeks following the receipt of analytical data for soil and groundwater samples. The investigation report will include an assessment of the remedial options for the Site and a remedial plan.

8.0 REFERENCES

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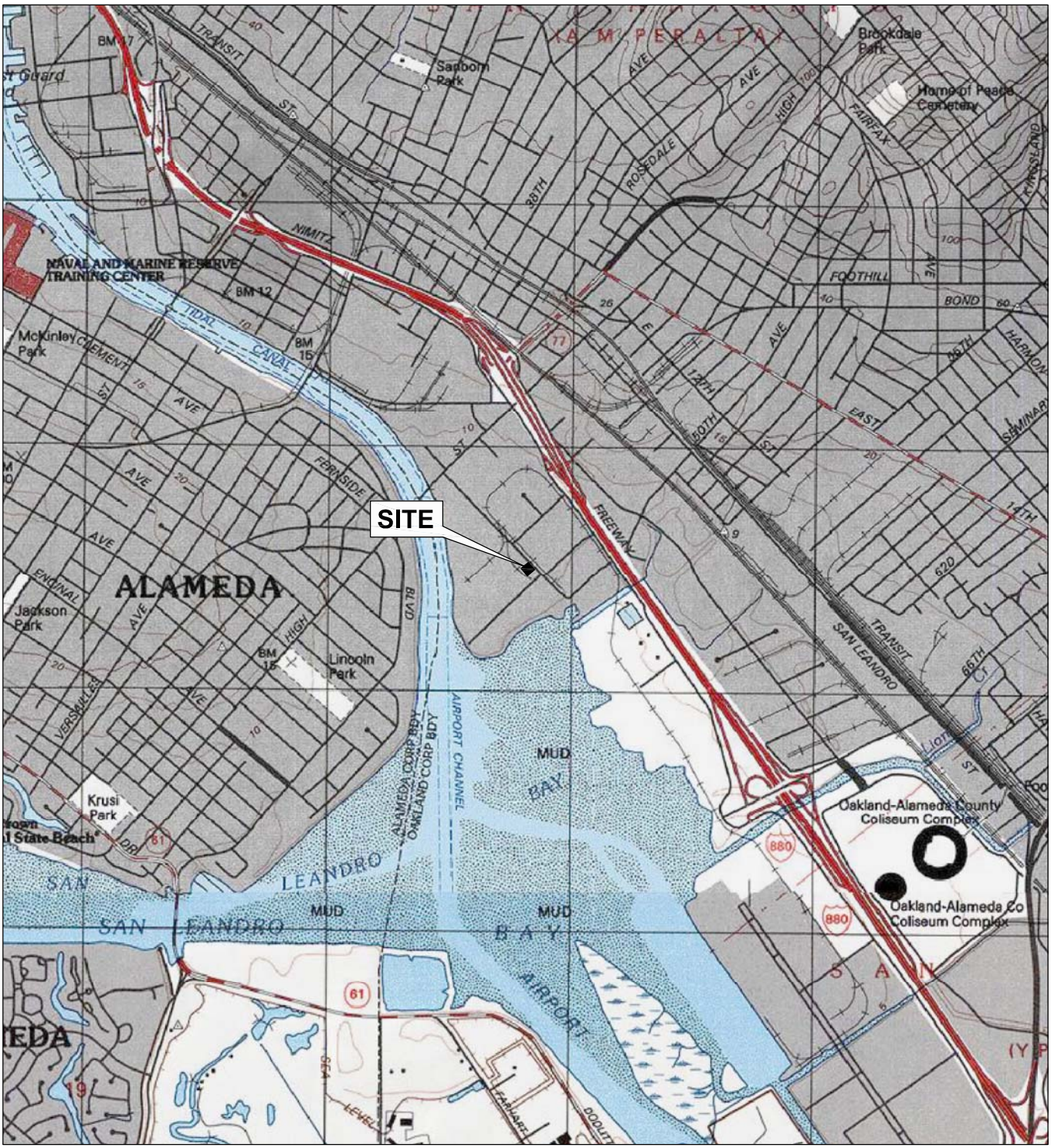
Figures



SOURCE: USGS Topographic Map

N

0 2000

Scale (feet)

ETIC ENGINEERING

SITE LOCATION AND TOPOGRAPHIC MAP
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE: 1

FILENAME: TOPO0707.DWG 07/20/06

TIDEWATER AVENUE

B-6
B-1
EB-11
B-10
SB-4
SB-3
EB-2
EB-3
SB-16
EB-1
GATE
FENCE
BH-4
SB-12
BH-3
SB-2
BH-2
SB-5
BH-21
MW-3
SB-1
SB-15
OB-6
OB-4
BH-5
B-5
BH-19
MW-2
OB-5
BH-20
OB-3
BH-17
BH-6
BH-16
B-3
EW-1
SB-10
B-7
BH-14
EB-5
TRUCKING
TERMINAL
BUILDING
RECOVERY TRENCH
BH-1
BH-13
BH-12
BH-15
SB-11
BH-22
SB-6
FORMER REMOTE
HYDRANT FUEL
DISPENSER LINE
EB-4
APPROXIMATE LIMIT
OF 1989 EXCAVATION &
FORMER USTs
BH-9
FENCE
SB-14
MW-4
BH-8
BH-7
FORMER 280-GALLON WASTE
OIL UST
B-14
BH-18
B-11
DST-1A
B-2
?
EB-6
FORMER FUEL LINES
DS-2
DS-1
FORMER 10,000-GALLON
DIESEL UST
DST-1B
BH-10
SB-9
DST-3
TRUCK
REPAIR
SHOP
FORMER 5,000-GALLON
DIESEL UST
DS-6
DS-5
SB-13
DST-2
B-12
DS-3
DS-4
SB-7
BH-11
FORMER 550-GALLON
DIESEL UST
B-9
B-4
B-15
EB-10
SB-8
MW-1
EB-7
EB-9
EB-8
B-8
B-13
FENCE

LEGEND:

- Groundwater monitoring well
- Recovery well
- Extraction well
- Observation well

N

0 20 40

Scale (feet)

Source: Basemap from Applied Remedial Technologies, February. 2007

ETIC ENGINEERING

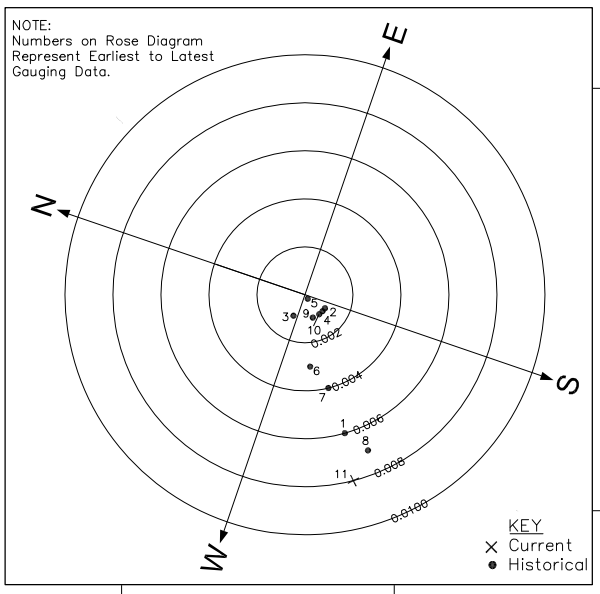
SITE MAP
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE: 2

FILENAME: PROP0907.DWG 09/14/07

TIDEWATER AVENUE

NOTE:
Numbers on Rose Diagram
Represent Earliest to Latest
Gauging Data.



GATE

FENCE

MW-3
(0.72)

OB-6
OB-4
OB-5
OB-3
(0.76)
MW-2
EW-1
0.75
0.75

0.50
0.50

0.25
0.25

0.00
0.00

RECOVERY TRENCH

FORMER REMOTE HYDRANT FUEL DISPENSER LINE

APPROXIMATE LIMIT OF 1989 EXCAVATION & FORMER USTs

FENCE

MW-4
(0.29)*

TRUCKING TERMINAL BUILDING

?

FORMER FUEL LINES

-0.25
-0.25

FORMER 280-GALLON WASTE OIL UST

FORMER 10,000-GALLON DIESEL UST

-0.50
-0.50

FORMER 5,000-GALLON DIESEL UST

TRUCK REPAIR SHOP

-0.75
-0.75

FORMER 550-GALLON DIESEL UST

-1.00
-1.00

MW-1
(-1.12)

FENCE

FENCE

LEGEND

- Groundwater monitoring well
- Recovery well
- Extraction well
- Observation well
- (0.76) Groundwater elevation (feet)
- Groundwater elevation contour (feet)
- * Not used in contouring

Note: Elevations referenced to Mean Sea Level

GW
Groundwater
Flow Direction
Gradient = 0.008

N
0 20 40
Scale (feet)

Source: Basemap from Applied Remedial Technologies, February 2007

ETIC ENGINEERING

GROUNDWATER ELEVATION CONTOUR MAP
NOVEMBER 26, 2007
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE, OAKLAND, CALIFORNIA

FIGURE: 3

FILENAME: 4Q2007.DWG 12/05/07

TIDEWATER AVENUE

B-6
B-1
EB-11
B-10
SB-4
SB-3
EB-2
EB-3
SB-16
EB-1
FENCE
GATE
BH-4
BH-3
SB-2
BH-2
SB-12
SB-5
BH-21
MW-3
SB-1
SB-15
OB-6
OB-4
BH-5
B-5
BH-19
MW-2
OB-5
BH-20
OB-3
BH-17
BH-6
BH-16
B-3
EW-1
SB-10
B-7
BH-14
EB-5
TRUCKING TERMINAL BUILDING
RECOVERY TRENCH
BH-1
BH-13
BH-12
BH-15
SB-11
BH-22
SB-6
EB-4
APPROXIMATE LIMIT OF 1989 EXCAVATION & FORMER USTs
FORMER REMOTE HYDRANT FUEL DISPENSER LINE
FENCE
SB-14
BH-9
MW-4
BH-8
BH-7
FORMER 280-GALLON WASTE OIL UST
BH-18
B-11
B-14
?
DST-1A
B-2
EB-6
FORMER FUEL LINES
DS-2
DS-1
FORMER 10,000-GALLON DIESEL UST
DST-1B
BH-10
SB-9
DST-3
TRUCK REPAIR SHOP
FORMER 5,000-GALLON DIESEL UST
DS-6
DS-5
SB-13
DST-2
B-12
DS-3
DS-4
SB-7
BH-11
FORMER 550-GALLON DIESEL UST
B-9
B-4
B-15
EB-10
SB-8
MW-1
EB-7
EB-9
EB-8
B-8
B-13
FENCE

LEGEND

- Groundwater monitoring well
- Recovery well
- Extraction well
- Observation well
- Excavation sampling location (GET, 1989)
- Soil sampling location (GET, 1989)
- Soil and groundwater sampling location (GEN-TECH, 1994)
- Soil and groundwater sampling location (PIERS, 2000)
- Soil and groundwater sampling location (ERAS, 2006)

N

0 20 40

Scale (feet)

Source: Basemap from Applied Remedial Technologies, February 2007

ETIC ENGINEERING

SITE MAP WITH HISTORICAL SAMPLING LOCATIONS
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE: 4

FILENAME: SAMPLE0807.DWG 08/17/07

TIDEWATER AVENUE

GATE

FENCE

GAS

Camper

Camper

Camper

Trailer

Scale

Truck Trailer

Truck Trailer

Ramp

Truck Trailer

Truck Trailer

Trailer

Trailer

Portable Building

Portable Office Building

TRUCKING TERMINAL BUILDING

FENCE

MW-4

MW-3

OB-6

OB-4

OB-5

MW-2

OB-3

EW-1

MW-1

RECOVERY TRENCH

FORMER REMOTE HYDRANT FUEL DISPENSER LINE

LOCATION OF FORMER FUEL LINES

?

FORMER 280-GALLON WASTE OIL UST

FORMER 10,000-GALLON DIESEL UST

FORMER 5,000-GALLON DIESEL UST

FORMER 550-GALLON DIESEL UST

Trailer

TRUCK REPAIR SHOP

APPROXIMATE LIMIT OF 1989 EXCAVATION & FORMER USTs

FENCE

FENCE

LEGEND

- Groundwater monitoring well
- Recovery well
- Extraction well
- Observation well
- Reinforced concrete
- Asphalt
- Buried concrete slab
- Metalic anomaly
- Natural gas line
- Undifferentiated utility line
- Suspect utility line
- Sanitary sewer pipeline[1]
- Telephone/Electric line[2]
- Limits of survey

Notes:

1. Utility line identified as sanitary sewer by Bob Lawlor, 2008.

2. Utility line identified as telephone/electric line by Murray Engineers, Inc., 2006.

N

0 20 40

Scale (feet)

Source: Geophysical survey results from NORCAL Geophysical Consultants, Inc., June 2008.

ETIC ENGINEERING

SITE MAP SHOWING RESULTS OF GEOPHYSICAL SURVEY
JUNE 3, 2008
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE, OAKLAND, CALIFORNIA

FIGURE: 5

FILENAME: Site0608.DWG 06/27/08

TIDEWATER AVENUE

B

A

A'

B'

B-6
B-1
B-10
EB-11
SB-4
SB-3
EB-2
EB-3
SB-16
EB-1
GATE
FENCE
BH-4
SB-5
BH-21
SB-12
BH-3
SB-2
BH-2
SB-15
B-5
OB-6
OB-4
BH-19
MW-2
OB-5
BH-20
OB-3
EW-1
BH-17
SB-10
BH-6
BH-16
B-3
B-7
BH-14
RECOVERY TRENCH
EB-5
TRUCKING
TERMINAL
BUILDING
BH-13
BH-12
BH-15
BH-1
SB-11
BH-22
SB-6
EB-4
APPROXIMATE LIMIT
OF 1989 EXCAVATION &
FORMER USTs
FORMER REMOTE
HYDRANT FUEL
DISPENSER LINE
FENCE
SB-14
BH-9
MW-4
BH-8
BH-7
BH-18
B-11
FORMER 280-GALLON WASTE
OIL UST
B-14
?
DST-1A
B-2
EB-6
FORMER FUEL LINES
DS-2
DS-1
FORMER 10,000-GALLON
DIESEL UST
DST-1B
BH-10
SB-9
DST-3
TRUCK
REPAIR
SHOP
FORMER 5,000-GALLON
DIESEL UST
DS-6
DS-5
SB-13
DST-2
B-12
DS-3
DS-4
SB-7
BH-11
FORMER 550-GALLON
DIESEL UST
B-9
B-4
B-15
EB-10
SB-8
MW-1
EB-7
EB-9
EB-8
B-8
B-13
MW-3
SB-1
BH-5

LEGEND

- Groundwater monitoring well
- Recovery well
- Extraction well
- Observation well
- Excavation sampling location (GET, 1989)
- Soil sampling location (GET, 1989)
- Soil and groundwater sampling location (Gentech, 1994)
- Soil and groundwater sampling location (PIERS, 2000)
- Soil and groundwater sampling location (ERAS, 2006)
- A⟷A' Traces of cross-section

N

0 20 40

Scale (feet)

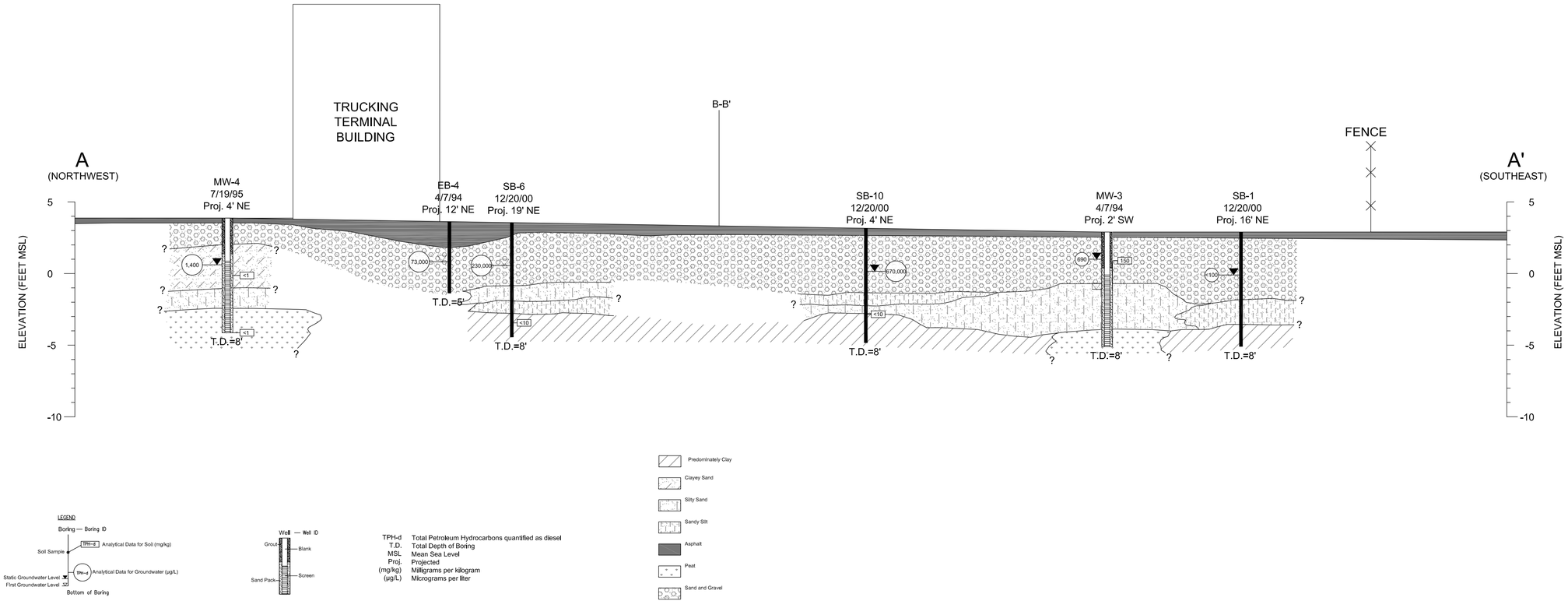
Source: Basemap from Applied Remedial Technologies, February 2007

ETIC ENGINEERING

SITE MAP SHOWING TRACES OF GEOLOGIC CROSS-SECTIONS
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE: 6

FILENAME: SECTIONS0708.DWG 07/01/08



LEGEND

Boring — Boring ID

Soil Sample — TPH-d — Analytical Data for Soil (mg/kg)

Static Groundwater Level — TPH-d — Analytical Data for Groundwater (µg/L)

First Groundwater Level

Bottom of Boring

Well — Well ID

Grout — Blank

Sand Pack — Screen

TPH-d	Total Petroleum Hydrocarbons quantified as diesel
T.D.	Total Depth of Boring
MSL	Mean Sea Level
Proj.	Projected
(mg/kg)	Milligrams per kilogram
(µg/L)	Micrograms per liter

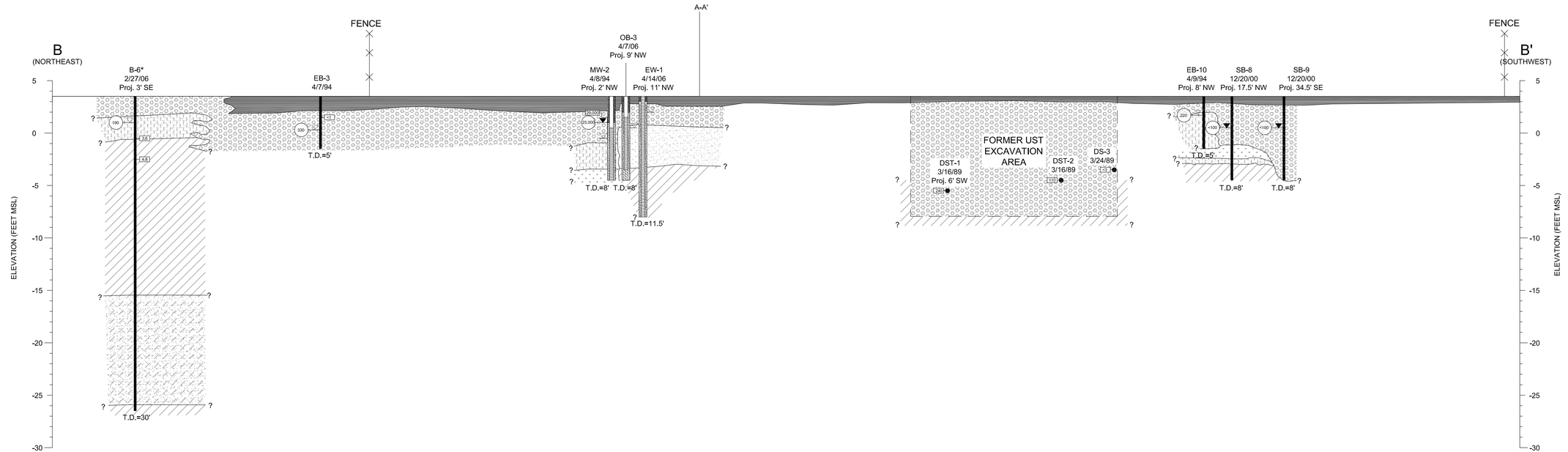
5
0
SCALE (feet) 20

FILENAME: SECTION070806.DWG 07/01/2008

ETIC ENGINEERING

CROSS-SECTION A-A'
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE:
7



LEGEND

Boring — Boring ID

Soil Sample — TPH-d — Analytical Data for Soil (mg/kg)

Static Groundwater Level
First Groundwater Level — TPH-d — Analytical Data for Groundwater (µg/L)

Bottom of Boring

Well — Well ID

Ground — Blank

Sand Pack — Screen

TPH-d Total Petroleum Hydrocarbons quantified as diesel
T.D. Total Depth of Boring
MSL Mean Sea Level
Proj. Projected
(mg/kg) Milligrams per kilogram
(µg/L) Micrograms per liter
* Boring sampled by ERAS Environmental, Inc. to 10 feet below ground surface; later advanced to 30 feet below ground surface by Murray Engineers, Inc. on the same day.

Predominately Clay

Clayey Sand

Predominantly Sand

Silty Sand

Sandy Silt

Asphalt

Peat

Sand Backfill

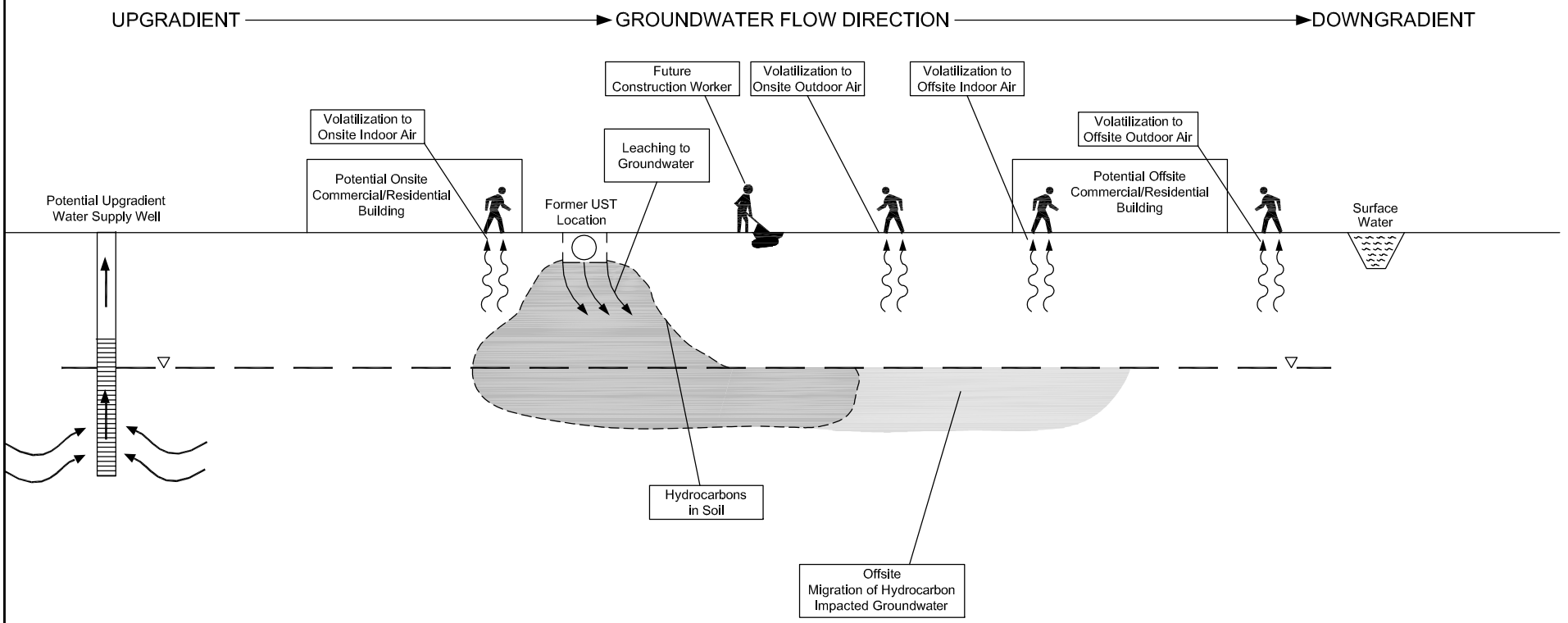
5
0
20
SCALE (feet)

ETIC ENGINEERING

CROSS-SECTION B-B'
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE:
8

FILENAME: SECTIONBB.IMG 07/31/2008



NEAREST SURFACE WATER BODY SAN LEANDRO BAY APPROXIMATELY 350 FEET SOUTH

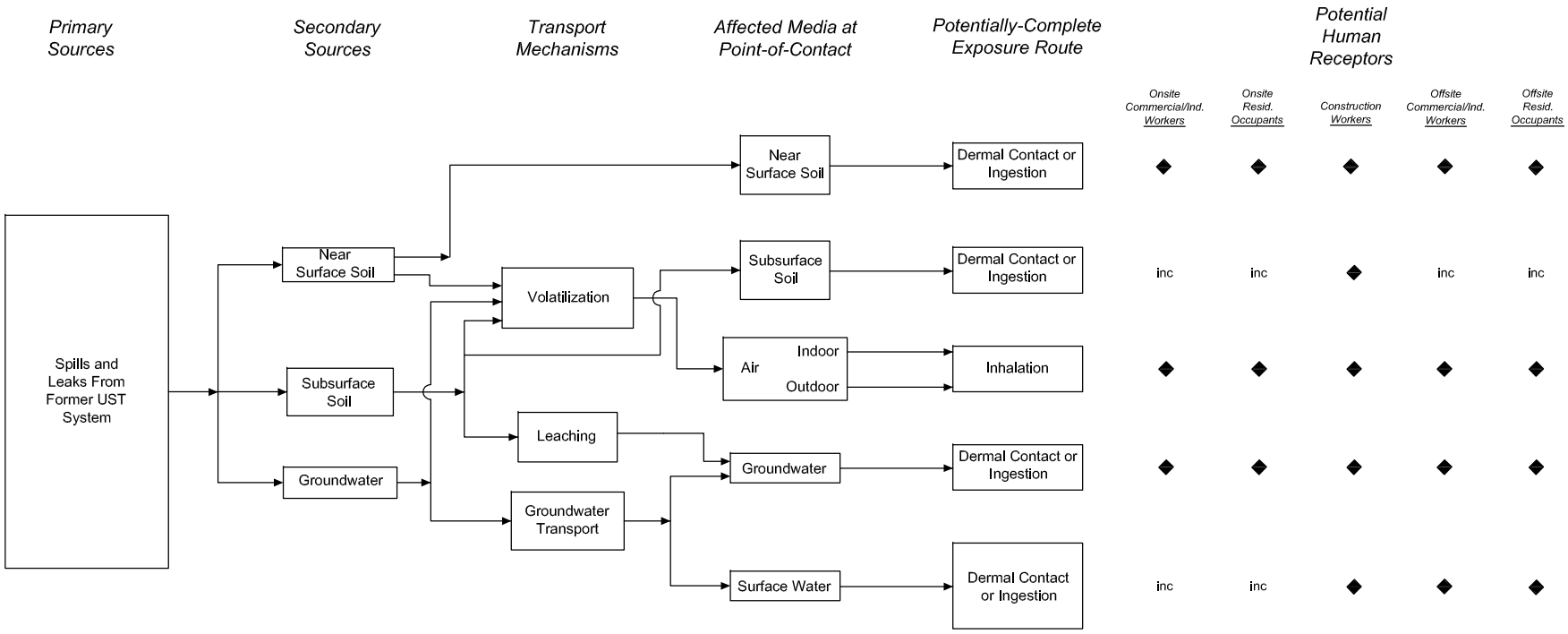
Note: Not to Scale.

ETIC ENGINEERING

SITE CONCEPTUAL MODEL SCHEMATIC DIAGRAM
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE: **9**

FILENAME: SCHEMATIC.DWG 03/29/07



LEGEND

◆ Potentially-Complete Exposure Pathway

inc Incomplete Exposure Pathway

ETIC ENGINEERING

EXPOSURE PATHWAY FLOW CHART
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE: **10**

FILENAME: exposure.DWG 03/29/07

TIDEWATER AVENUE

C-1 B-6 C-2 B-1 EB-11 C-3 B-10 SB-4 SB-3 EB-2 EB-3 SB-16 C-4 GATE FENCE EB-1 BH-4 BH-3 SB-2 BH-2 C-5 SB-5 BH-21 SB-12 SB-15 B-5 OB-6 OB-4 BH-19 MW-2 OB-5 BH-20 OB-3 EW-1 BH-17 SB-10 BH-6 BH-16 B-3 C-6 MW-3 SB-1 BH-5 B-7 C-7 BH-14 EB-5 TRUCKING TERMINAL BUILDING RECOVERY TRENCH BH-1 BH-13 BH-12 BH-15 C-12 SB-11 BH-22 C-8 SB-6 EB-4 C-9 APPROXIMATE LIMIT OF 1989 EXCAVATION & FORMER USTs FORMER REMOTE HYDRANT FUEL DISPENSER LINE FENCE SB-14 BH-9 C-11 MW-4 BH-8 BH-7 BH-18 B-11 FORMER 280-GALLON WASTE OIL UST B-14 C-10 DST-1A B-2 ? EB-6 FORMER FUEL LINES DS-2 DS-1 FORMER 10,000-GALLON DIESEL UST BH-10 SB-9 DST-1B DST-3 TRUCK REPAIR SHOP FORMER 5,000-GALLON DIESEL UST DS-6 DS-5 SB-13 DST-2 DS-3 DS-4 B-12 SB-7 BH-11 FORMER 550-GALLON DIESEL UST B-9 B-4 B-15 EB-10 SB-8 C-13 MW-1 EB-7 EB-9 EB-8 B-8 B-13 C-16 C-14 C-15 FENCE

LEGEND:

- Groundwater monitoring well
- Recovery well
- Extraction well
- Observation well
- Excavation sampling location (GET, 1989)
- Soil sampling location (GET, 1989)
- Soil and groundwater sampling location (Gentech, 1994)
- Soil and groundwater sampling location (PIERS, 2000)
- Soil and groundwater sampling location (ERAS, 2006)
- Proposed soil and groundwater sampling location

N

0 20 40

Scale (feet)

Source: Basemap from Applied Remedial Technologies, February. 2007

ETIC ENGINEERING

SITE MAP WITH PROPOSED SAMPLING LOCATIONS
FORMER DISALVO TRUCKING
4919 TIDEWATER AVENUE
OAKLAND, CALIFORNIA

FIGURE: 11

FILENAME: PROP0907.DWG 09/14/07

Tables

Table 1
Monitoring Well Construction Details
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Monitoring Well	Date Installed	Top of Casing Elevation (feet msl)	Casing Material	Boring Depth (feet)	Well Depth (feet)	Boring Diameter (inches)	Casing Diameter (inches)	Slot Size (inches)	Screened Interval (feet)	Filter Pack Interval (feet)	Filter Pack Material
MW-1	4/8/1994	2.68	Sch. 40 PVC	8	8	NDA	2	0.020	3-8	2.5-8	#2/12 Sand
MW-2	4/1994	3.50	Sch. 40 PVC	8	8	NDA	2	0.02	3-8	2.5-8	#2/12 Sand
MW-3	4/8/1994	2.90	Sch. 40 PVC	8	8	NDA	2	0.020	3-8	2.5-8	#2/12 Sand
MW-4	7/19/1995	3.87	Sch. 40 PVC	8	8	NDA	2	0.020	3-8	2.5-8	#2/12 Sand
OB-3	4/7/2006	NDA	Sch. 40 PVC	8	8	8	2	0.020	2-7	1.5-7	#2/12 Sand
OB-4	4/7/2006	NDA	Sch. 40 PVC	NDA	10	8	2	0.020	2.5-10	2-10	#2/12 Sand
OB-5	4/7/2006	NDA	Sch. 40 PVC	NDA	15	NDA	2	0.020	10-15	8.5-15	#2/12 Sand
OB-6	4/7/2006	NDA	Sch. 40 PVC	NDA	7.5	8	2	0.020	2-6.5	1-6.5	#2/12 Sand
EW-1	4/14/2006	NDA	Sch. 40 PVC	11.5	11.5	36	12	0.032	NDA	NDA	#2/12 Sand-1/4" gravel mix

Notes:
Sch. 40 PVC = Schedule 40 polyvinyl chloride.
msl = Mean sea level.
NDA = No data available.

Table 2
Groundwater Elevation Data
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Monitoring Well	Gauging Date	Top of Casing Elevation (feet msl)	Depth to Water (feet bgs)	Free Product Thickness (feet)	Groundwater Elevation (feet msl)
MW-1	4/14/1994	2.68	1.26	NDA	1.42
MW-1	11/17/1994	2.68	3.88	NDA	-1.20
MW-1	8/13/1995	2.68	3.09	NDA	-0.41
MW-1	8/23/1999	2.68	2.17	NDA	0.51
MW-1	5/26/1999	2.68	2.29	NDA	0.39
MW-1	4/26/2001	2.68	1.14	NDA	1.54
MW-1	9/5/2002	2.68	2.15	NDA	0.53
MW-1	8/18/2005	2.68	2.54	0	0.14
MW-1	8/19/2005	2.68	6.1	0	-3.42
MW-1	1/25/2006	2.68	2.02	0	0.66
MW-1	5/9/2006	2.68	0.30	0.00	2.38
MW-1	7/12/2006	2.68	1.81	0.00	0.87
MW-1	6/27/2007	2.68	1.82	0.00	0.86
MW-1	11/26/2007	2.68	3.80	0.00	-1.12
MW-2	4/14/1994	3.50	1.92	NDA	1.58
MW-2	11/18/1994	3.50	1.78	NDA	1.72
MW-2	8/13/1995	3.50	2.95	NDA	0.55
MW-2	8/23/1999	3.50	2.89	NDA	0.61
MW-2	5/26/1999	3.50	2.96	NDA	0.54
MW-2	4/26/2001	3.50	1.74	NDA	1.76
MW-2	9/5/2002	3.50	3.06	NDA	0.44
MW-2	8/18/2005	3.50	2.62	0	0.88
MW-2	8/19/2005	3.50	2.62	0	0.88
MW-2	1/25/2006	3.50	1.27	0	2.23
MW-2	7/12/2006	3.50	2.42	0.00	1.08
MW-2	6/27/2007	3.50	2.46	0.00	1.04
MW-2	11/26/2007	3.50	2.74	0.00	0.76

Table 2
Groundwater Elevation Data
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Monitoring Well	Gauging Date	Top of Casing Elevation (feet msl)	Depth to Water (feet bgs)	Free Product Thickness (feet)	Groundwater Elevation (feet msl)
MW-3	4/14/1994	2.90	1.33	NDA	1.57
MW-3	11/18/1994	2.90	1.23	NDA	1.67
MW-3	8/13/1995	2.90	2.18	NDA	0.72
MW-3	8/23/1999	2.90	2.18	NDA	0.72
MW-3	5/26/1999	2.90	2.50	NDA	0.40
MW-3	4/26/2001	2.90	1.29	NDA	1.61
MW-3	9/5/2002	2.90	2.34	NDA	0.56
MW-3	8/18/2005	2.90	2.08	0.04	0.85
MW-3	8/19/2005	2.90	2.10	0.03	0.82
MW-3	1/25/2006	2.90	0.97	0	1.93
MW-3	7/12/2006	2.90	1.82	0.00	1.08
MW-3	6/27/2007	2.90	1.90	0.00	1.00
MW-3	11/26/2007	2.90	2.18	0.00	0.72
MW-4	8/13/1995	3.87	3.33	NDA	0.54
MW-4	5/26/1999	3.87	3.31	NDA	0.56
MW-4	4/26/2001	3.87	1.69	NDA	2.18
MW-4	9/5/2002	3.87	3.31	NDA	0.56
MW-4	8/18/2005	3.87	3.37	0	0.50
MW-4	8/19/2005	3.87	3.46	0	0.41
MW-4	1/25/2006	3.87	2.50	0	1.37
MW-4	7/12/2006	3.87	3.09	0.00	0.78
MW-4	6/27/2007	3.87	3.26	0.00	0.61
MW-4	11/26/2007	3.87	3.58	0.00	0.29

Notes:
msl = Mean sea level.
bgs = Below ground surface.
NDA = No data available

Table 3
Analytical Data for Monitoring Well Groundwater Samples
TPH-d, TPH-g, BTEX, and MTBE
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Monitoring Well	Sampling Date	TPH-d (µg/L)	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-1	4/14/1994	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-1	11/17/1994	<50	<50	<0.3	<0.3	<0.3	<0.3	NA
MW-1	8/13/1995	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-1	5/26/1999	<50	60	0.6	<0.5	0.8	1.9	<0.50
MW-1	8/23/1999	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-1	10/16/2000	150	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-1	4/26/2001	1,300	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-1	9/5/2002	<50	NA	<0.5	<0.5	<0.5	<1	9.8
MW-1	8/18/2005	410[1]	<50	<1	<1	<1	<1	6.0
MW-1	1/25/2006	3,600[2]	<50	2.3	<0.5	<0.5	1.2	11.0
MW-1	7/12/2006	100	<50	<0.5	<0.5	<0.5	<1	6.2
MW-1	6/27/2007	<50	<50	<0.50	<0.50	<0.50	<0.50	4.4
MW-1	11/26/2007	<50	<50	<0.50	<0.50	<0.50	<0.50	5.0
MW-2	4/14/1994	Not sampled due to free product.						
MW-2	11/17/1994	28,000	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	8/13/1995	180	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	5/26/1999	120	<50	<0.5	<0.5	<0.5	<0.5	<50
MW-2	8/23/1999	61	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-2	10/16/2000	3,400	570	<0.5	<0.5	<0.5	<0.5	NA
MW-2	4/26/2001	57,000	2,400	<0.5	<0.5	<0.5	<0.5	NA
MW-2	9/5/2002	27,100	NA	<0.5	<0.5	<0.5	<1	5.1
MW-2	8/18/2005	13,300	<50	<10	<10	<10	<10	<30
MW-2	1/25/2006	110,000[2]	1,200	<10	<10	<10	<20	<10
MW-2	7/12/2006	5,900	330	<0.5	<0.5	<0.5	<1	3.6
MW-2	6/27/2007	10,000	200	<0.50	<0.50	<0.50	<0.50	1.8
MW-2	11/26/2007	25,000	330	<0.50	<0.50	<0.50	<0.50	2.4
MW-3	4/14/1994	7,700	250	<0.5	<0.5	<0.5	1.2	NA
MW-3	11/17/1994	160,000	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	8/13/1995	1,500	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	5/26/1999	1,100	160	1.6	1.1	16	54.00	<0.50
MW-3	8/23/1999	84	NA	<0.5	<0.5	<0.5	<0.5	NA

Table 3
Analytical Data for Monitoring Well Groundwater Samples
TPH-d, TPH-g, BTEX, and MTBE
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Monitoring Well	Sampling Date	TPH-d (µg/L)	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-3	10/16/2000	42,000	130	0.52	<0.5	<0.5	<0.5	NA
MW-3	4/26/2001	21,000	310	<0.5	<0.5	<0.5	<0.5	NA
MW-3	9/5/2002	1,990	NA	<0.5	<0.5	<0.5	<1	31.1
MW-3	8/18/2005	Not sampled due to free product.						
MW-3	1/25/2006	21,000[2]	440	<2.5	<2.5	<2.5	<5.0	29
MW-3	7/12/2006	16,000	280	<0.5	<0.5	<0.5	<1	47
MW-3	6/27/2007	2,600	140	<0.50	<0.50	<0.50	<0.50	25
MW-3	11/26/2007	690	160	<0.50	<0.50	<0.50	<0.50	27
MW-4	8/13/1995	<50	450	2.1	0.7	4.1	13	NA
MW-4	5/26/1999	100	600	0.7	<0.5	<0.5	5.8	<0.5
MW-4	8/23/1999	180	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-4	10/16/2000	75,000	890	<0.5	<0.5	<0.5	11	NA
MW-4	4/26/2001	24,000	2,100	<0.5	<0.5	<0.5	<0.5	NA
MW-4	9/5/2002	17,000	NA	<0.5	<0.5	<0.5	<1	1.2
MW-4	8/18/2005	6,200	<50	<1	<1	<1	<1	<3
MW-4	1/25/2006	8,200	110	2.0	0.87	<0.5	2.3	4.5
MW-4	7/12/2006	5,200	250	<0.5	<0.5	<0.5	<1	0.93
MW-4	6/27/2007	320	<50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-4	11/26/2007	1,400	<50	<0.50	<0.50	<0.50	<0.50	<0.50
Travel Blank	6/27/2007	NA	<50	<0.50	<0.50	<0.50	<0.50	<0.50
Travel Blank	11/26/2007	NA	<50	<0.50	<0.50	<0.50	<0.50	<0.50
Title 22 CCR MCLs		NE	NE	1	150	300	1,750	13

Notes:

TPH-d = Total petroleum hydrocarbons quantified as diesel.
TPH-g = Total petroleum hydrocarbons quantified as gasoline.
MTBE = Methyl tertiary butyl ether.
µg/L = Micrograms per liter.
NA = Not analyzed.
NE = Not established.
<50 = Analyte not detected above the laboratory method reporting limit indicated.
1. Chromatogram does not resemble the typical diesel pattern.
2. TPH-d sample collected on 2/2/2006.

Title 22 CCR MCLs = Title 22 California Code of Regulations Maximum Contaminant Levels (June 2004).

Table 4
Analytical Data for Soil Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and Waste Oil
Former Disalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sampling Location	Sample ID	Sampling Date	Depth (feet bgs)	TPH-d (mg/kg)	TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total O&G (mg/kg)	TPH-WO (mg/kg)
Excavation											
DST-1A	DST-1	3/16/1989	9.0	240	NA	<0.02	<0.02	<0.04	<0.05	NA	NA
DST-2	DST-2	3/16/1989	8.0	110	NA	<0.02	<0.02	<0.04	<0.05	NA	NA
DST-3	DST-3	3/16/1989	29 inches	110	NA	<0.07	<0.06	<0.08	<0.1	15	NA
DST-1B	DST-1	3/27/1989	Unknown	<3.0	<0.5	<0.03	<0.03	<0.05	<0.1	NA	NA
DS-1	DS-1	3/16/1989	6.0	<3	NA	<0.02	<0.02	<0.04	<0.1	29	NA
DS-2	DS-2	3/24/1989	6.0	<3	NA	<0.02	<0.02	<0.04	<0.1	59	NA
DS-3	DS-3	3/24/1989	7.0	<3	NA	<0.02	<0.02	<0.04	<0.1	NA	NA
DS-4	DS-4	3/24/1989	7.0	64	NA	<0.02	<0.02	<0.04	<0.1	NA	NA
DS-5	DS-5	3/24/1989	8.0	<3	NA	<0.02	<0.02	<0.04	<0.1	NA	NA
DS-6	DS-6	3/24/1989	8.0	<3	NA	<0.02	<0.02	<0.04	<0.1	NA	NA
Line samples											
SB1	Unknown	7/19/1995	4.0	34.0	NA	ND	ND	ND	ND	NA	NA
SB2	Unknown	7/19/1995	4.0	ND	NA	ND	ND	ND	ND	NA	NA
Borings											
BH-4	LS-1	5/1/1989	6.0	<3	NA	NA	NA	NA	NA	NA	NA
BH-3	LS-2	5/1/1989	6.0	<3	NA	NA	NA	NA	NA	NA	NA
BH-6	LS-4	5/1/1989	3.5	3,000	NA	NA	NA	NA	NA	NA	NA
BH-7	LS-6	5/2/1989	6.0	40	NA	NA	NA	NA	NA	NA	NA

Table 4
Analytical Data for Soil Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and Waste Oil
Former Disalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sampling Location	Sample ID	Sampling Date	Depth (feet bgs)	TPH-d (mg/kg)	TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total O&G (mg/kg)	TPH-WO (mg/kg)
BH-10	LS-9	5/3/1989	4.25	460	NA	NA	NA	NA	NA	NA	NA
BH-11	LS-10	5/3/1989	5.0	46,000	NA	NA	NA	NA	NA	27,000	NA
BH-13	LS-11	5/3/1989	4.0	420	NA	NA	NA	NA	NA	NA	NA
BH-14	LS-12	5/3/1989	4.5	260	NA	NA	NA	NA	NA	NA	NA
BH-16	LS-16	5/4/1989	3-3.25	<3	NA	NA	NA	NA	NA	NA	NA
BH-18	LS-18	5/4/1989	3.75-4	<3	NA	NA	NA	NA	NA	NA	NA
BH-21	LS-21	5/5/1989	4.3	<3	NA	NA	NA	NA	NA	NA	NA
BH-22	LS-22	5/5/1989	3.3	<3	NA	NA	NA	NA	NA	NA	NA
MW-1	MW#1@C/F	4/7/1994	3.0	4.4	ND	ND	ND	ND	ND	<50	NA
MW-2	MW#2@C/F	4/7/1994	2.0	29,000	ND	ND	ND	ND	ND	36,000	NA
MW-3	MW#3@C/F	4/7/1994	2.0	150	250	0.180	ND	2.1	2.0	<50	NA
EB-3	EB#3@C/F	4/7/1994	2.0	<1	ND	ND	ND	ND	ND	<50	NA
EB-5	EB#5@C/F	4/7/1994	2-2.5	<5	ND	ND	ND	ND	ND	180	NA
EB-6	EB#6@C/F	4/7/1994	2-2.5	2.5	ND	ND	ND	ND	ND	<50	NA
EB-8	EB#8@C/F	4/7/1994	3-3.5	<1	ND	ND	ND	ND	ND	<50	NA
EB-11*	EB#11@C/F	4/7/1994	2-2.5	7.5	ND	ND	ND	ND	ND	<50	NA
MW4	Unknown	7/19/1995	4.0	<1	NA	<0.005	<0.005	<0.005	<0.005	NA	NA
MW4	Unknown	7/19/1995	8.0	<1	NA	<0.005	<0.005	<0.005	<0.005	NA	NA
SB-2	SB2@6'	12/20/2000	6.0	<10	NA	NA	NA	NA	NA	NA	NA

Table 4
Analytical Data for Soil Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and Waste Oil
Former Disalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sampling Location	Sample ID	Sampling Date	Depth (feet bgs)	TPH-d (mg/kg)	TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total O&G (mg/kg)	TPH-WO (mg/kg)
SB-5	SB5@6.5'	12/20/2000	6.5	<10	NA	NA	NA	NA	NA	NA	NA
SB-6	SB6@7'	12/20/2000	7.0	<10	NA	NA	NA	NA	NA	NA	NA
SB-10	SB10@6'	12/20/2000	6.0	<10	NA	NA	NA	NA	NA	NA	NA
SB-12	SB12@6.5'	12/20/2000	6.5	<10	NA	NA	NA	NA	NA	NA	NA
SB-14	SB14@7'	12/20/2000	7.0	<10	NA	NA	NA	NA	NA	NA	NA
SB-15	SB15@6'	12/20/2000	6.0	<10	NA	NA	NA	NA	NA	NA	NA
SB-16	SB16@6.5'	12/20/2000	6.5	14	NA	NA	NA	NA	NA	NA	NA
B-1	B-1,2.75-3	2/24/2006	2.75	1.9	NA	NA	NA	NA	NA	NA	NA
B-2	B-2,3.5-3.75	2/24/2006	3.5	4,700	NA	NA	NA	NA	NA	NA	NA
B-2	B-2,7-7.25	2/24/2006	7.0	1,100	NA	NA	NA	NA	NA	NA	NA
B-3	B-3,2.75-3	2/24/2006	2.75	74	NA	NA	NA	NA	NA	NA	NA
B-3	B-3,7-7.25	2/24/2006	7.0	6.0	NA	NA	NA	NA	NA	NA	NA
B-4	B-4,5-5.25	2/24/2006	5.0	<0.99	NA	NA	NA	NA	NA	NA	NA
B-5	B-5,5-5.25	2/24/2006	5.0	<0.99	NA	NA	NA	NA	NA	NA	NA
B-5	B-5,6.75-7	2/24/2006	6.75	<0.99	NA	NA	NA	NA	NA	NA	NA
B-6	B-6,4-4.5	2/27/2006	4.0	3.6	NA	NA	NA	NA	NA	NA	NA
B-6	B-6,6-6.25	2/27/2006	6.0	4.8	NA	NA	NA	NA	NA	NA	NA
B-7	B-7,4-4.5	2/27/2006	4.0	<0.99	NA	NA	NA	NA	NA	NA	NA
B-7	B-7,6-6.25	2/27/2006	6.0	14	NA	NA	NA	NA	NA	NA	NA
B-8	B-8,3-3.5	2/27/2006	3.0	<1.0	NA	NA	NA	NA	NA	NA	NA
B-8	B-4.5-5	2/27/2006	4.5	1.6	NA	NA	NA	NA	NA	NA	NA

Table 4
Analytical Data for Soil Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and Waste Oil
Former Disalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sampling Location	Sample ID	Sampling Date	Depth (feet bgs)	TPH-d (mg/kg)	TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total O&G (mg/kg)	TPH-WO (mg/kg)
B-9	B-9,4.5-5	2/27/2006	4.5	5,400	NA	NA	NA	NA	NA	NA	NA
B-9	B-9,10-10.25	2/27/2006	10.0	4.7	NA	NA	NA	NA	NA	NA	NA
OB-5	OB-5,11-1.5	4/7/2006	11.0	1.9 (4.3)	NA	NA	NA	NA	NA	NA	NA
B-10	B-10,4.5-5	4/12/2006	4.5	<1.0 (<1.0)	NA	NA	NA	NA	NA	NA	NA
B-10	B-10,9.5-10	4/12/2006	9.5	<0.99 (<0.99)	NA	NA	NA	NA	NA	NA	NA
B-11	B-11,4.5-5	4/12/2006	4.5	2,900 (3,000)	NA	NA	NA	NA	NA	NA	NA
B-11	B-11,8.5-8.75	4/12/2006	8.5	1.2	NA	NA	NA	NA	NA	NA	NA
B-11	B-11	4/12/2006	8.5	0.69** (0.89)	NA	NA	NA	NA	NA	NA	NA
B-11	B-11,8.75-9	4/12/2006	8.75	<0.99 (<0.99)	NA	NA	NA	NA	NA	NA	NA
B-12	B-12,2.5-2.75	4/12/2006	2.5	990	NA	NA	NA	NA	NA	NA	NA
B-12	B-12	4/12/2006	2.5	5.1** (2.8)	NA	NA	NA	NA	NA	NA	NA
B-12	B-12,2.75-3	4/12/2006	2.75	1,100 (1,300)	NA	NA	NA	NA	NA	NA	NA
B-12	B-12,7.5-8	4/12/2006	7.5	<0.99 (<1.0)	NA	NA	NA	NA	NA	NA	NA
B-13	B-13,4-4.5	4/12/2006	4.0	<0.99 (<0.99)	NA	NA	NA	NA	NA	NA	NA
B-14	B-14,4-4.5	4/12/2006	4.0	92 (73)	NA	NA	NA	NA	NA	NA	NA
B-14	B-14,7.5-8	4/12/2006	7.5	2.5 (1.9)	NA	NA	NA	NA	NA	NA	NA
B-15	B-15,8-8.5	4/12/2006	8.0	<0.99 (<1.0)	NA	NA	NA	NA	NA	NA	NA
Location unknown											
Unknown	DS-1	6/20/1989	Unknown	<20	NA	0.092	<0.05	<0.05	1.456	NA	NA

Table 4
Analytical Data for Soil Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and Waste Oil
Former Disalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sampling Location	Sample ID	Sampling Date	Depth (feet bgs)	TPH-d (mg/kg)	TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total O&G (mg/kg)	TPH-WO (mg/kg)
Unknown	DS-2	6/20/1989	Unknown	4,310	NA	<0.05	<0.05	0.19	0.645	NA	NA
Unknown	DS-3	6/20/1989	Unknown	1,690	NA	<0.05	<0.05	<0.05	0.284	NA	NA
Unknown	DS-4	6/20/1989	Unknown	420	NA	0.197	<0.05	<0.05	<0.05	NA	NA
Unknown	WOP-1	3/24/1989	Unknown	<3,000	NA	<0.02	<0.02	<0.03	<0.02	NA	<10,000
Unknown	WOP-2	3/24/1989	Unknown	<3,000	NA	<0.02	<0.02	<0.03	<0.02	NA	<10,000
Unknown	TANK 4	3/27/1989	Unknown	<3	<500	<0.03	<0.03	<0.1	<0.05	NA	NA

Notes:

TPH-d = Total petroleum hydrocarbons quantified as diesel. Results with silica gell cleanup in parentheses.

TPH-g = Total petroleum hydrocarbons quantified as gasoline.

O & G = Oil and grease.

TPH-WO = Total petroleum hydrocarbons quantified as waste oil.

<50 = Analyte not detected above the laboratory method reporting limit indicated.

ND = Analyte not detected above the laboratory method reporting limit.

NA = Not analyzed.

Unknown = Data unknown.

* = Report as CB in oil and grease results by laboratory.

** = Soluble Threshold limit concentration results in milligrams per liter.

Table 5
Analytical Data for Grab Groundwater Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and VOC
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sample Location	Sample ID	Sampling Date	TPH-d (µg/L)	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	O & G (µg/L)	VOC (µg/L)
BH-2	WS-1	5/2-3/89	<80	NA	NA	NA	NA	NA	NA	NA
Unknown	WS-1	5/16/1989	NA	NA	110	41	1,000	120	NA	8,000
Unknown	WS-2	5/16/1989	690,000	NA	NA	NA	NA	NA	NA	NA
Unknown	WWOP-1	5/24/1989	<100	NA	<2	120	260	3,300	36,000	ND
EB-1	EB-1GWS	4/7/1994	240	ND	ND	ND	ND	ND	4,000	NA
EB-2	EB-2GWS	4/7/1994	64,000	2,500	ND	1.2	ND	ND	100,000	NA
EB-3	EB-3GWS	4/7/1994	330	ND	ND	ND	ND	ND	4,000	NA
EB-4	EB-4GWS	4/7/1994	73,000	200	200	ND	0.80	4.4	38,000	NA
EB-5	EB-5GWS	4/7/1994	<50	ND	ND	ND	ND	ND	4,000	NA
EB-6	EB-6GWS	4/7/1994	650	ND	ND	ND	ND	ND	4,000	NA
EB-7	EB-7GWS	4/7/1994	<50	ND	ND	ND	ND	ND	4,000	NA
EB-8	EB-8GWS	4/7/1994	<50	ND	ND	ND	ND	ND	4,000	NA
EB-9	EB-9GWS	4/7/1994	<50	ND	ND	ND	ND	ND	4,000	NA
EB-10	EB-10GWS	4/7/1994	220	ND	ND	ND	ND	ND	3,400	NA
EB-11	EB-11GWS	4/7/1994	290	ND	ND	ND	ND	ND	ND	NA
SB-1	SB1-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA
SB-2	SB2-GW	12/20/2000	26,000	NA	NA	NA	NA	NA	NA	NA
SB-3	SB3-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA
SB-4	SB4-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA
SB-5	SB5-GW	12/20/2000	110,000	NA	NA	NA	NA	NA	NA	NA
SB-6	SB6-GW	12/20/2000	230,000	NA	NA	NA	NA	NA	NA	NA
SB-7	SB7-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA

Table 5
Analytical Data for Grab Groundwater Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and VOC
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sample Location	Sample ID	Sampling Date	TPH-d (µg/L)	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	O & G (µg/L)	VOC (µg/L)
SB-8	SB8-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA
SB-9	SB9-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA
SB-10	SB10-GW	12/20/2000	670,000	NA	NA	NA	NA	NA	NA	NA
SB-11	SB11-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA
SB-12	SB12-GW	12/20/2000	190,000	NA	NA	NA	NA	NA	NA	NA
SB-13	SB13-GW	12/20/2000	<100	NA	NA	NA	NA	NA	NA	NA
SB-14	SB14-GW	12/20/2000	44,000	NA	NA	NA	NA	NA	NA	NA
SB-15	SB15-GW	12/20/2000	48,000	NA	NA	NA	NA	NA	NA	NA
SB-16	SB16-GW	12/20/2000	2,000	NA	NA	NA	NA	NA	NA	NA
B-1	B-1	2/24/2006	2,000	NA	NA	NA	NA	NA	NA	NA
B-2	B-2	2/24/2006	12,000	NA	NA	NA	NA	NA	NA	NA
B-3	B-3	2/24/2006	2,400	NA	NA	NA	NA	NA	NA	NA
B-4	B-4	2/24/2006	910	NA	NA	NA	NA	NA	NA	NA
B-5	B-5	2/24/2006	490	NA	NA	NA	NA	NA	NA	NA
B-6	B-6	2/27/2006	190	NA	NA	NA	NA	NA	NA	NA
B-7	B-7	2/27/2006	4,100	NA	NA	NA	NA	NA	NA	NA
B-8	B-8	2/27/2006	1,300	NA	NA	NA	NA	NA	NA	NA
B-9	B-9	2/27/2006	13,000	NA	NA	NA	NA	NA	NA	NA
B-10	B-10	4/12/2006	290 (<50)	NA	NA	NA	NA	NA	NA	NA
B-11	B-11	4/12/2006	1,800,000 (660,000)	NA	NA	NA	NA	NA	NA	NA
B-12	B-12	4/12/2006	32,000,000 (2,500,000)	NA	NA	NA	NA	NA	NA	NA

Table 5
Analytical Data for Grab Groundwater Samples
TPH-d, TPH-g, BTEX, Oil and Grease, and VOC
Former DiSalvo Trucking
4919 Tidewater Avenue
Oakland, California 94601

Sample Location	Sample ID	Sampling Date	TPH-d (µg/L)	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	O & G (µg/L)	VOC (µg/L)
B-13	B-13	4/12/2006	1,100 (130)	NA	NA	NA	NA	NA	NA	NA
B-14	B-14	4/12/2006	4,700 (560)	NA	NA	NA	NA	NA	NA	NA
B-15	B-15	4/12/2006	1,400 (320)	NA	NA	NA	NA	NA	NA	NA

Notes:

TPH-d = Total petroleum hydrocarbons quantified as diesel. Results with silica gell cleanup in parentheses.

TPH-g = Total petroleum hydrocarbons quantified as gasoline.

O & G = Oil and grease.

VOC = Volatile organic compounds, no more specific information available in GenTech 24 March 1994.

<50 = Analyte not detected above the laboratory method reporting limit indicated.

ND = Analyte not detected above the laboratory method reporting limit indicated.

NA = Not analyzed.

290 (<50) = Second value in parentheses was analyzed with silica gel clean-up.

Appendix A

Regulatory Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

May 1, 2008

Mr. Bob Lawlor
RWL Investments, Inc.
4919 Tidewater Avenue, Unit B
Oakland, CA 94601-4914

Subject: Fuel Leak Case No. RO0000107 and Geotracker Global ID T0600100451, Di Salvo Trucking, 4919 Tidewater Avenue, Oakland, CA 94601

Dear Mr. Lawlor:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above-referenced site, including the most recent document entitled, *"Remedial Action Plan, Heitz Trucking, 4919 Tidewater Avenue, Unit B, Oakland, California, 94601,"* (RAP) dated September 14, 2007 and prepared on your behalf by ETIC Engineering. The RAP proposes conducting a geophysical survey, sampling soil and groundwater in ten soil borings, and installation, development, and sampling of one monitoring well.

Implementation of the proposed geophysical survey is acceptable provided that technical comment 1 below is addressed during the geophysical survey. Prior to advancing the proposed soil borings and monitoring well, we request that you prepare a revised RAP in order to address the technical comments 2 through 9.

REQUEST FOR INFORMATION

Please submit copies of any reports you have documenting additional investigation activities or other work that are relevant to the fuel release or other unauthorized releases and not currently in ACEH case files. This includes Phase I environmental site assessment reports and site investigations conducted for potential real estate transactions. ACEH case files may be reviewed online using the ACEH website (http://ehgis.acgov.org/dehpublic/dehpublic.jsp).

TECHNICAL COMMENTS

1. **Geophysical Survey.** We concur with the proposal to conduct an electromagnetic and ground penetrating radar survey to locate the potential fuel hydrant dispenser lines remaining in place on the north side of the trucking terminal building. We request that you also utilize the geophysical survey to identity utilities and utility trenches that may act as preferential pathways.

2. **Vertical Delineation.** The RAP proposes advancing soil borings to a total depth of no more than 10 feet. We note that previous soil borings for environmental site investigations have generally extended to total depths of approximately 5 to 10 feet bgs. In April 2006, four soil borings were extended to depths of 30 feet bgs for geotechnical purposes. Based on encountered conditions in the borings, site stratigraphy consists of fill material overlying silty

clay (Younger Bay Mud) which in turn overlies stiff clays (Older Bay Mud) and/or alluvial fan deposits. No analyses for petroleum hydrocarbons appear to have been conducted on soil samples from the four geotechnical borings. We request that you extend several soil borings in order to assess the vertical extent of contamination. Specifically, we request that vertical delineation include collection of depth-discrete groundwater samples to evaluate whether groundwater in the alluvial fan deposits is contaminated. Please include plans to define the vertical extent of contamination and to sample groundwater within the alluvial fan deposits in the revised RAP requested below.

3. **Soil Sampling.** The proposed methods for soil sampling in the RAP appear to be adequate. We request that the field geologist continuously log recovered soil samples from each boring. Field screening is to be conducted using visual observations, odor, and measurements using a field photoionization detector (PID) fitted with an appropriate lamp and calibrated for the chemicals of concern. Soil samples are to be collected for laboratory analysis from any zones where visible staining, odor, or elevated PID readings are observed. If no visible staining, odor, or elevated PID readings are observed, the collection of soil samples at the proposed 5-foot interval is acceptable.

4. **Monitoring Well.** The RAP indicates that one monitoring well will be installed downgradient of the former UST excavation in the northern corner of the property with a location selected using results of soil and grab groundwater sampling. The depth of the well is to be based on encountered conditions. We have no objection to basing the depth of the well and screen interval on encountered conditions:" however, the revised RAP requested below must include a description of the targeted interval for the well (entire thickness of fill material, upper portion of Younger Bay Mud, alluvial fan deposits, etc.), and the maximum thickness of the filter pack and screen interval. In addition, please expand the discussion of the rationale for proposed monitoring well locations including a description of how the proposed soil and groundwater sampling results will affect well placement.

5. **Site Conceptual Model and Discharge to Surface Water.** We concur with the finding in the Site Conceptual Model (SCM) that a future soil vapor investigation and intrusion study may be needed to evaluate potential health risks. We also concur that discharge to surface water could be a potentially complete exposure pathway. In the revised RAP requested below, please present plans to assess whether contaminated groundwater within the fill material discharges to surface water near the site.

6. **Water Levels in Observation Well OB-5.** The reported depth to water in observation well OB-5 during the groundwater sampling event on November 26, 2008 was 11.78 feet. The depth to water in observation wells OB-3, OB-4, and OB-6, ranged from 2.92 to 3.03 feet. In the revised RAP requested below, please discuss the vertical hydraulic gradient between the fill material and lower native soil. Please incorporate your conclusions regarding vertical hydraulic gradients into the site conceptual model and plans to assess groundwater discharge to surface water.

7. **Tidal Influence.** The RAP indicates that groundwater flow direction has been difficult to determine due to tidal influence. Please explain the basis for this statement. We note that all monitoring wells with the exception of OB-5 are screened within the fill material. Observation

of diurnal tidal influence in wells within the fill material would indicate that there is a hydraulic connection between groundwater in the fill material and surface water. Please include this discussion of observed tidal influence in the revised RAP requested below.

8. **Off-Site Extent of Groundwater Contamination.** Total petroleum hydrocarbons as diesel have been detected in groundwater samples collected near the northern and eastern boundaries of the site at concentrations of 4,100 µg/L (B-7) and 2,000 µg/L (B-1), respectively. In the revised RAP requested below, please review these data along with hydraulic gradient, fill thickness, and potential preferential pathways and present recommendations regarding assessment of the off-site extent of groundwater contamination.

9. **"Raised Debris Area."** Site figures in previous reports have identified a mounded area near the northern corner of the site as a "raised debris area." Please identify the origin and nature of this site feature.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Jerry Wickham), according to the following schedule:

- **July 15, 2008** – Revised Remedial Action Plan

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) Geotracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the Geotracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in Geotracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at jerry.wickham@acgov.org.

Sincerely,

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032

Maura Dougherty, ETIC Engineering, 2285 Morello Avenue, Pleasant Hill, CA 94523

Donna Drogos, ACEH
Jerry Wickham, ACEH
File

Appendix B

Geophysical Survey Results
Norcal Geophysical Consultants, Inc.

NORCAL GEOPHYSICAL CONSULTANTS, INC.

June 20, 2008

Ms. Jamie Peters
ETIC Engineering Inc. (ETIC)
2285 Morello Avenue
Pleasant Hill, CA 94523

Subject: Geophysical Survey
Heitz Trucking Facility, Oakland, CA
NORCAL Job # 08-554.05

Dear Ms. Peters:

This letter presents the findings of a geophysical investigation performed by NORCAL Geophysical Consultants, Inc. on portions of the Heitz Trucking Facility located at 4919 Tidewater Avenue, Oakland, CA. The field survey was conducted on June 3, 2008 by NORCAL Professional Geophysicist Donald J. Kirker and geophysical technician Travis Black.

Field Investigation

The geophysical survey, as specified by ETIC, was performed south and north of the main facility building, as shown on Plate 1. The survey area to the south measures 260 by 180 feet and is generally free from above ground structures and objects. The survey area to the north measures 300 by 65 feet and includes truck and camper trailers that could not be moved. Therefore, a large portion of this area could not be investigated. The purpose of the geophysical investigation is to define the location of all detectable utilities and other subsurface features within the designated survey limits.

Our approach to this investigation included using the metal detection (MD), electromagnetic line locating (EMLL), and ground penetrating radar (GPR) methods. The MD method was used to detect possible shallow subsurface metal objects. The EMLL was used to locate detectable utility alignments. The GPR method was used to image variations in the electrical properties of the shallow subsurface. These variations can provide information on the location and dimensions of buried objects and fill boundaries, as well as to locate utilities and other potential subsurface objects. Since GPR depth of detection is based on site specific soil conditions, not all subsurface features are detectable.

Results

The results of the geophysical investigation are presented on the Geophysical Survey Map, Plate 1. This map shows the limits of the designated survey areas, structures or above ground cultural features that are in close proximity to the site, and the locations of detected subsurface objects and utility alignments.

The results of the EMLL and MD surveys defined the location of several buried metal objects and numerous subsurface utilities. The buried metal objects vary in size from approximately 4 by 6 feet to over 17 by 32 feet and are located throughout the survey area. Some of the larger objects produced an MD and GPR response typical of buried reinforced concrete slabs, and are therefore labeled as such on Plate 1. The smaller objects produced an MD response typical of buried reinforced concrete footings, utility vaults, and/or near surface metal debris.

Utility alignments were detected throughout the survey area, as shown on Plate 1. They are referred to as either 'undifferentiated utilities' or 'suspected utilities based on the GPR survey'. The undifferentiated utilities were detected with the MD and EMLL methods and are therefore metallic in nature. They are considered undifferentiated because the specific type of utility (i.e. water, gas, etc.) could not be determined. The suspected utilities could only be defined by the GPR method. Therefore, we believe that they are nonmetallic in nature. They are considered suspect because they may also represent other linear buried objects such as concrete foundations associated with a former structure. The locations of all detected features were marked on the ground surface with spray paint.

Limitations

The detection of underground utilities is dependent upon the composition and construction of the line of interest, as well as depth. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless they carry a passive current, these utilities must be exposed at the surface or accessible in utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that may not be detectable using standard electromagnetic line location techniques include certain abandoned utilities, utilities not exposed at the ground surface, or those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and metal pipes with insulating joints. Pipes generally deeper than about five to seven feet may not be detected.

The ability to detect subsurface targets with the GPR method is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Under ideal conditions, the GPR can generally detect objects buried to approximately six feet. However, as the clay content in the subsurface increases, the GPR depth of detection decreases. Therefore, it is possible that on-site soil conditions and target features may limit the depth of detection to the upper one to two feet below ground surface.

STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to characterize the subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the standard of care ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

We appreciate having the opportunity to provide you with this information.

Respectfully,

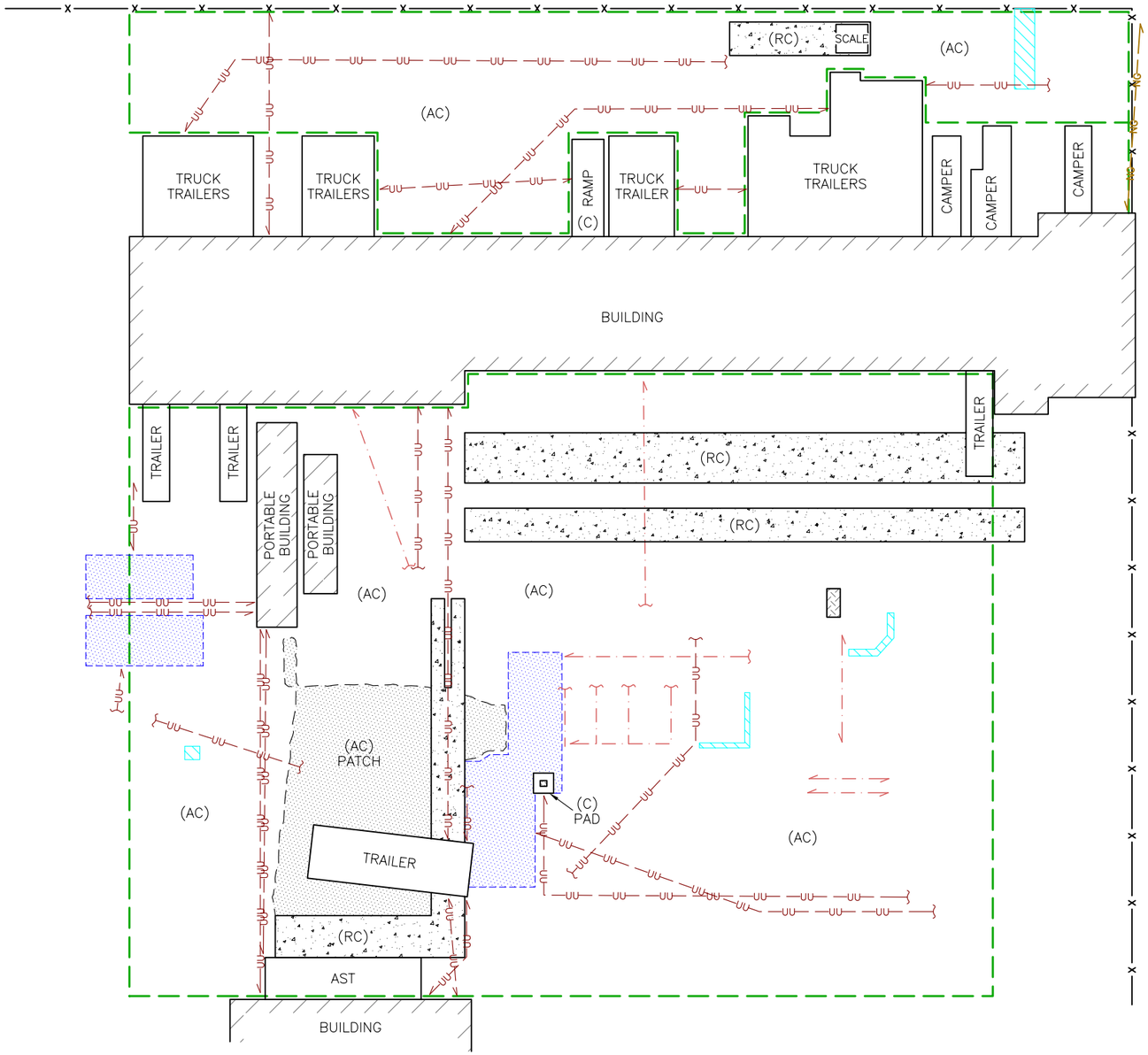
NORCAL Geophysical Consultants, Inc.

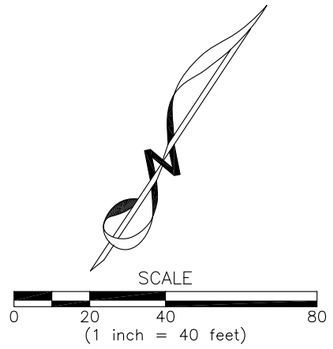
Donald J. Kirker

Donald J. Kirker
Geophysicist, GP-997

DJK/tt

Enclosure: Plate 1





LEGEND

— — —	LIMITS OF GEOPHYSICAL SURVEY
	METAL DETECTOR ANOMALY
	INTERPRETED BURIED CONCRETE SLAB
—NG—	NATURAL GAS LINE
—UU—	UNDIFFERENTIATED UTILTY LINE
	SUSPECTED UTILITY LINE BASED ON GPR SURVEY
—x—	CHAIN–LINK FENCE
	VAULT LID
(C)	CONCRETE
(AC)	ASPHALT
(RC)$_1$	REINFORCED CONCRETE

NORCAL

GEOPHYSICAL SURVEY MAP
HEITZ TRUCKING
4919 TIDEWATER AVENUE

LOCATION: OAKLAND, CALIFORNIA

CLIENT: ETIC ENGINEERS

NORCAL GEOPHYSICAL CONSULTANTS INC.

JOB #: 08–554.05

DATE: JUN. 2008

DRAWN BY: G.RANDALL

APPROVED BY: DJK

PLATE 1