Environmental Restoration Services

Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Second Floor
Alameda, CA 94502

June 26, 1995

Attn: Mr. Barney Chan; Haz Mat. Specialist for : DiSalvo Trucking
4919 Tidewater Ave., Oakland

Re: Investestigative Workplan

Dear Mr. Chan,

This workplan has been prepared by Environmental Restoration Services, (ERS) to address requirements by the Alameda County Department of Environmental Health (ACDEH) for the performance of a groundwater investigation at a Underground Storage Tank (UST) site, 4919 Tidewater Ave., Oakland, California.

The purpose of this investigation is to further determine the hydraulic groundwater gradient and the horizontal extent of hydrocarbons in soil and groundwater. This report first reviews the known site history, describes the site vicinity, and presents existing chemical data. Then, recommendation for further investigation are given including on-site soil sampling and the construction of an additional monitor well with associated soil sampling, monitor well development, sampling and gradient determination.

1.2 Site Location

The site is located in a light industrial district of Oakland, California on property at 4919 Tidewater Ave.(Figure 1).

1.3 Previous Subsurface Work at Site

Previous subsurface work at the site includes soil excavation and bio remediation, groundwater disposal, soil borings and sampling, monitor well construction and sampling. Description and chemical results from all work conducted to date are given in reports by Geo Environmental Technology (GTE) of San Jose dated April, 1989, June 1989 and February 1991 and in reports by Gen-Tech Environmental, Inc., (GTE) dated May 1994 and November 1994.

2.0 SITE DESCRIPTION

2.1 Site Description and Hydrogeologic Setting

The site is located on the west side of Tidewater Ave.. A 8000 square foot metal building is located on the northwest portion of the approximate one acre parcel. The majority of the remaining property is paved with asphalt.

The site is located at the fringe of the San Francisco Bay on soil that appears to have been imported to fill the location to approximately four feet above the mean high tide elevation. The imported fill caps the entire site and contains sands, gravels, concrete and asphalt. Native silty clay, silt, clayey sand and peat underlie this fill.

2.2 Vicinity Map

A vicinity map is given in Figure 1 which includes the location of any known hydraulic influences. The San Francisco Bay lies approximately 100 feet southeast of the site. A site map is given in Figure 2 which includes information on adjacent streets, site building locations, locations of existing wells, past soil borings and former tanks.

2.3 Existing Analytical Results

In April of 1994, three monitoring wells were installed at the site at locations shown in Figure 4 and 6. Corresponding analytical results for TPH/g, TPH/d and BTEX are shown in the GTE Figure 6.

In April of 1994, eleven soil boring were advanced at the site by GTE at locations shown in the GTE Figure 4 and 6. Groundwater grab samples were recovered from each boring and tested for TPH/g, TPH/d and BTEX. Corresponding analytical results for TPH/g, TPH/d and BTEX are shown in the GTE Figure 6.

2.3.2 **Depth to Groundwater**

Depth to groundwater based on the monitor well sampling is approximately two feet below ground surface.

2.3.3 **Soil Profile**

The boring logs for the monitor wells show predominantly import sands and gravels underlain with peat.

2.3.4 **Location of Samples and Analytical Results**

The GTE April of 1994 soil and water sampling locations with corresponding analytical results are shown in Figure 4 and 6.

2.4 Waste Removal

Three fuel tanks, one waste oil tank and approximately 40,000 gallons of hydrocarbon impacted groundwater have been removed from the site. No documentation exists for the disposal of soils, wash water, or groundwater from monitor well construction. Groundwater and wash-water generated by the shallow soil borings was placed in 55-gallon drums. Soils generated by borings are presently stored on-site in a 55-gallon drums.

3.0 RECOMMENDATIONS FOR ADDITIONAL INVESTIGATION

Based on the hydrogeology of the site vicinity, ERS believes that the vertical distribution of groundwater containing hydrocarbons does not require investigation. The floating characteristics of the low density hydrocarbons, make the downward migration of hydrocarbons a low probability.

In addition, ERS believes that the extent of any soil contamination on the site is due to the migration of the hydrocarbon on the shallow groundwater as it moves through the imported sand and gravel fill material. Most of the impacted soil was adequately removed by the 1989 excavation.

Because the contaminates exist within the relatively shallow aquifer range (0.5 to 5 feet) at the site and this section of the subsurface contains sand and gravel fill materials, ERS believes that a groundwater extraction system, designed to extract from known " hot spot" locations, will work well to both remove the higher concentrations of hydrocarbon from the groundwater and help to draw back the relative slow migration (0.0016% gradient) of the plume.

The lateral extent of groundwater contamination at the site has been defined to the South, West and East during the April of 1994 GTE investigation by the existing monitor well MW1 and soil borings EB-5 through EB-10, (shown in Figure 6). The northeastern to northwestern portion of the site and neighboring property need to be further defined.

On the basis of the past investigative findings, the scope of this investigation will be limited to further determination of the hydraulic gradient and to further investigate the extent of hydrocarbons in the groundwater. At the request of the ACDEH two soil samples will be recovered ✓ along a former product line that runs from the former tank location to the northwest (Figure 3).

The investigation will also include drilling and construction of one additional monitor well on the site, development and sampling of the new monitor well, hydraulic gradient determination, and quarterly monitoring of all existing wells and recovery sumps.

Investigation findings will help to determine the groundwater extraction system design and this design will be described in the quarterly report to be submitted before July 30, 1995.

3.1 On-site Soil Sampling

Approximately two borings will be constructed to determine the presence of higher concentrations of hydrocarbons in the soil below the former northwest product line. The locations of the borings are based on GTE drawings of the site. As such, the planned borings SB-I and SB-2 are located to the northwest of the former tanks at the locations shown in Figure 3.

Prior to mobilization of the drilling equipment on-site, and prior to leaving the site, all associated equipment and well installation equipment will be thoroughly cleaned to removed all soil, oil, grease, mud, tar, etc. The cleaning process will consist of TSP cleaning of the drilling equipment and a clean water final rinse. Before drilling each boring, all drill stems, bits, and other down-hole equipment will be cleaned.

3.1.1 **Soil Boring Procedure**

The borings will be advanced using a small diameter (maximum three-inch) hand auger to a depth of four feet. All of the soil recovered from the boring will be logged under the supervision of a registered civil engineer or geologist. Visual and olfactory observations of petroleum hydrocarbons well be made and recorded on the boring log.

3.1.2 **Soil Sampling Procedures**

Soil samples will be obtained from each boring at a depth 4 feet. Samples will be recovered in a two inch diameter by three inch brass sample container within a bullet sampler.

At the desired sample depth, the sleeved, bullet sampler will be driven into the undisturbed soil until the sample container has completely filled with soil. Upon removal of the sample container from the bullet sampler, the container ends will be sealed with Teflon sheet and plastic caps.

Sample containers will be obtained directly from the analytical laboratory.

Sample containers will be labeled with self-adhesive tags. Field personnel will label each tag, using waterproof ink, with the following information: Sampling location and number, Project name, Date and time samples were collected, Treatment (preservatives, filtered, etc.), Name of sampler.
- Should add name of analysis

Subsequent to collection, the samples will immediately be stored on ice in an appropriate ice chest. Samples will be transferred under Chain-of-Custody procedures to Hull Developmental Labs of San Jose. - DOHS certified ?

Care shall be taken to collect all excess water resulting from the sampling and cleaning procedures. The excess water will be contained in a pre-labeled 55-gallon drum on-site pending receipt of laboratory analyses.

The borings will be backfilled immediately after completion of the sampling with a cement grout mixture containing approximately 3% bentonite.

3.1.3 **Laboratory Analyses**

The following analyses will be performed by a State Certified Laboratory on groundwater samples obtained from the borings:

TPH-diesel (EPA Method 3550/8015); BTEX (EPA Method 8020)

3.2 Location of New Monitor Well

The three existing monitor wells are not showing consistent gradient determination and no plume defining wells exist to the northwest of the site. Therefore, construction of an additional monitor well (MW4) is proposed for use in further determination of the horizontal hydraulic gradient and to serve as a possible clean, plume defining monitor well with respect to water quality (Figure 3).

3.3 Monitor Well Drilling and Installation Methods

Prior to initiating drilling, a monitor well permit will be obtained from the ACFCWCD, Zone 7. ACDEH will be notified a minimum of 72 hours prior to drilling. + all other field work.

Prior to mobilization of the drill rig on-site, and prior to leaving the site, all associated equipment and well installation equipment will be thoroughly cleaned to removed all soil, oil, grease, mud, tar, etc. The cleaning process will consist of high pressure steam cleaning of the drilling equipment and a highpressure hot water final rinse. Before drilling the boring, all drilling equipment will be steam-cleaned.

A nominal 8-inch diameter boring will be advanced using a hollow stem auger. Soils will be visually logged and samples collected every five feet. In addition, olfactory and visual observations of petroleum hydrocarbons will be noted on the logs.

Based on the anticipated groundwater depth of approximately 2 feet in the vicinity of the site, it is expected that the boring will be terminated, and the monitor well constructed, at a depth of approximately 8 feet below ground surface. The final choice of screened interval will be selected by the site engineer on the basis of geologic field observations during drilling. The well casing and screens for the monitor well will be constructed with 2-inch diameter, Schedule 40, flush-joint threaded material. The PVC screens will consist of factory-milled 0.020 inch slots. The screens will be installed at the interval from approximately 3 to 8 feet below ground surface. A sand pack of clean washed Monterey 2/12 sand will be placed adjacent to the entire screened interval and will be extended a recommended minimum distance of two feet above the top of the screen. The sand pack will be placed by carefully pouring sand down the annulus between the hollow stem and the well casing. The auger will be raised periodically and an auger flight removed to allow the sand to fill the annulus between the casing and the borehole wall.

A one foot thick bentonite pellet seal will be placed above the sand pack. The seal will be placed in the same manner as the sand pack. The bentonite will be hydrated with clean water at the quantity of 1 gallon per pound of bentonite. The bentonite will be hydrated three times and allowed to swell for a minimum of 45 minutes.

The annulus above the bentonite seal will be grouted with a cement/bentonite grout. The grout will consist of clean water mixed with Portland cement and powdered bentonite. The grout will be placed in the same manner as the sand pack, or after the auger flights are entirely withdrawn from the borehole.

Well completion will consist of a locking PVC cap and subsurface traffic-rated utility box set at or slightly above grade in concrete.

3.4 Monitor Well Development and Sampling

3.4.1 Monitor Well Development

After the concrete and cement/bentonite grout have set for a minimum of 24 hours, the new wells will be developed by swabbing, surging, and/or bailing with clean equipment in order to prepare the well for collection of a representative groundwater sample. A minimum of five casing volumes will be purged from the well, or until the water is relatively clear. Electrical conductivity (EC), pH, and temperature will be measured periodically to ensure that these parameters stabilize during the course of development. Water generated during development will be stored separately, on-site, in labeled 55gallon drums pending analytical results.

3.4.2 Sampling Procedure

Groundwater samples will be obtained from monitoring wells MW1 through MW4.

The new monitor well will be sampled after the water level has re-equilibrated from development. Groundwater samples will be collected as follows:

The well will be bailed until the volume of water withdrawn is equal to at least three casing volumes. To assure that a representative groundwater sample is collected periodic measurements of the temperature, pH and specific conductance will be made. The sample will be collected only when the temperature, pH, and/or specific conductance reach relatively constant values.

A hand operated bailer or a surface pump will be used for evacuating the well casing (purging) of the monitor well. Water samples will be collected using a new disposable bailer. An effort will be made to minimize exposure of the sample to air.

Sample containers will be labeled with self-adhesive tags. Field personnel will label each tag, using waterproof ink, with the following information: Sampling location and number, Project name, Date and time samples were collected, Treatment (preservatives, filtered, etc.), Name of sampler.

Subsequent to collection, the samples will immediately be stored on ice in an appropriate ice chest. Samples will be transported under Chain-of-Custody procedures to HDL.

Sample bottles, bottle caps and septa will be cleaned by the analytical laboratory subcontractor using standard EPA-approved protocols. Sample bottles, bottle caps, and septa will be protected from solvent contact or other contamination.

Sampling equipment will be cleaned after its use at each sampling location. Thermometers, pH electrodes, and conductivity probes will also be cleaned after sampling of each well. Cleaning procedures shall be accomplished as follows:

Scrub with a detergent-potable water solution; Rinse with potable water;

Care shall be taken to collect all excess water resulting from the sampling and cleaning procedures. The excess water will be contained in a pre-labeled 55-gallon drum on-site pending receipt of laboratory analyses.

3.4.3 **Laboratory Analyses**

The following analyses will be performed by State Certified Laboratory on groundwater samples obtained from the monitor well: TPH-diesel (EPA Method 8015M); BTEX (EPA Method 602)

3.5 Determination of Horizontal Groundwater Gradient

In order to obtain accurate groundwater elevations, monitor well head elevation of MW4 will be surveyed by a California Registered Civil Engineer to an accuracy of 0.01 feet. Elevations will be determined relative to MSL and the existing well heads will be used as benchmarks.
Water levels in each of the monitor wells will be measured within a one hour period. The water surface elevations in the wells will be calculated using the survey data. Then, the horizontal hydraulic gradient will be calculated based on accurately determined well locations. The gradient calculated will include a magnitude and direction.

3.6 Reporting

A report will be prepared which documents the investigation including boring logs, well development and sampling field notes, chains of custody, and laboratory reports. The report will include recommendations on interim remedial actions including a groundwater extraction system design. The report will be submitted to the client.

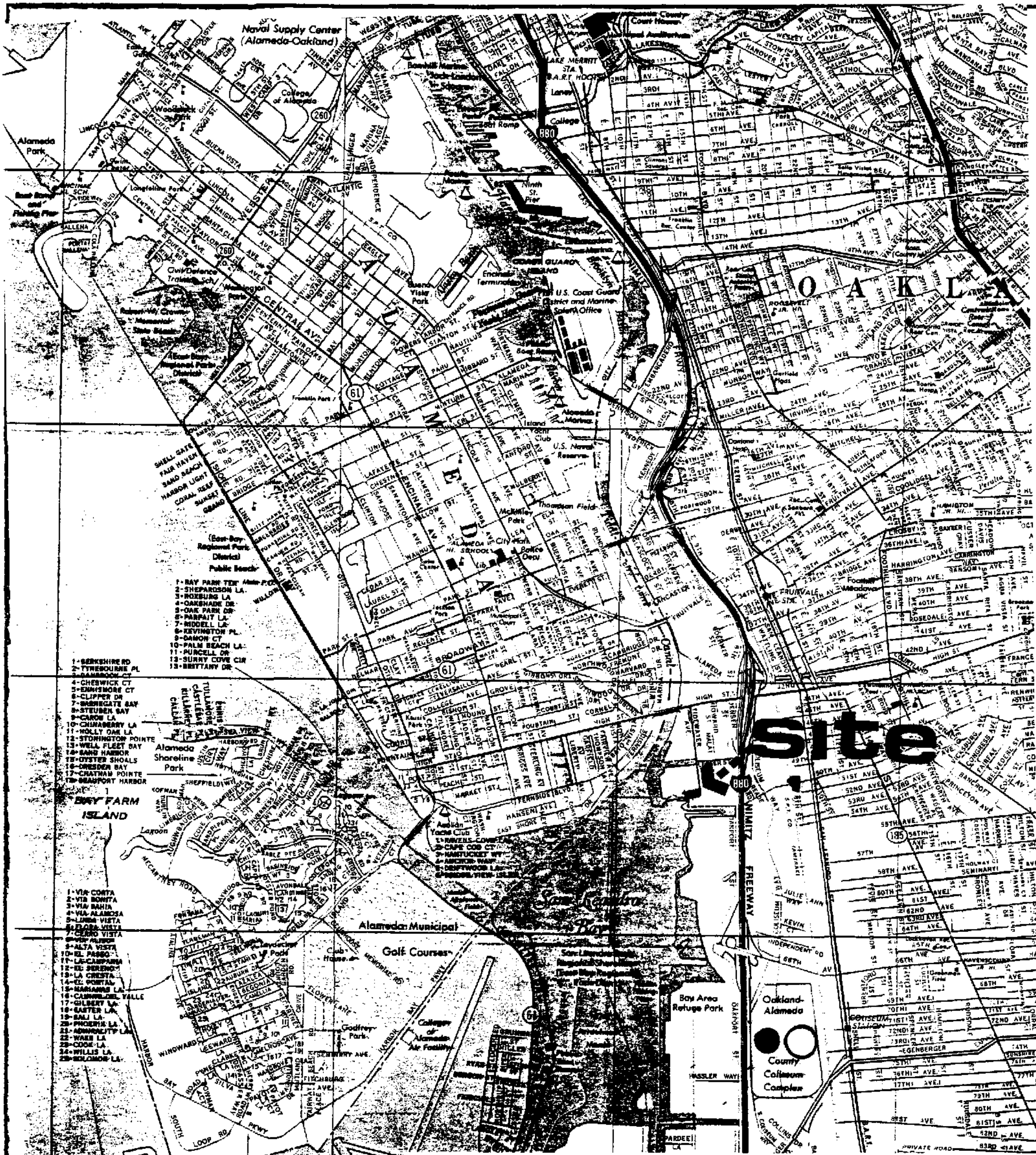
4.0 SITE SAFETY PLAN

A site safety plan will be prepared by the consultant prior to initiation of the field activities. The site safety plan will comply with all federal and state regulations for worker safety and hazardous material handling, transport, and disposal. The site safety plan will consider possible worker exposure during drilling and sampling operations in accordance with applicable OSHA standards.

If you have any questions regarding these comments or scope of work, or wish to add to or alter the scope of this investigation, please do not hesitate to call Ben Halsted at 415-325-3216 so I may resubmit any revisions.

Respectfully submitted this 26th day of June, 1995,

Bennett T Halsted	Samuel H Halsted P.E.
Project Manager	CE 14095



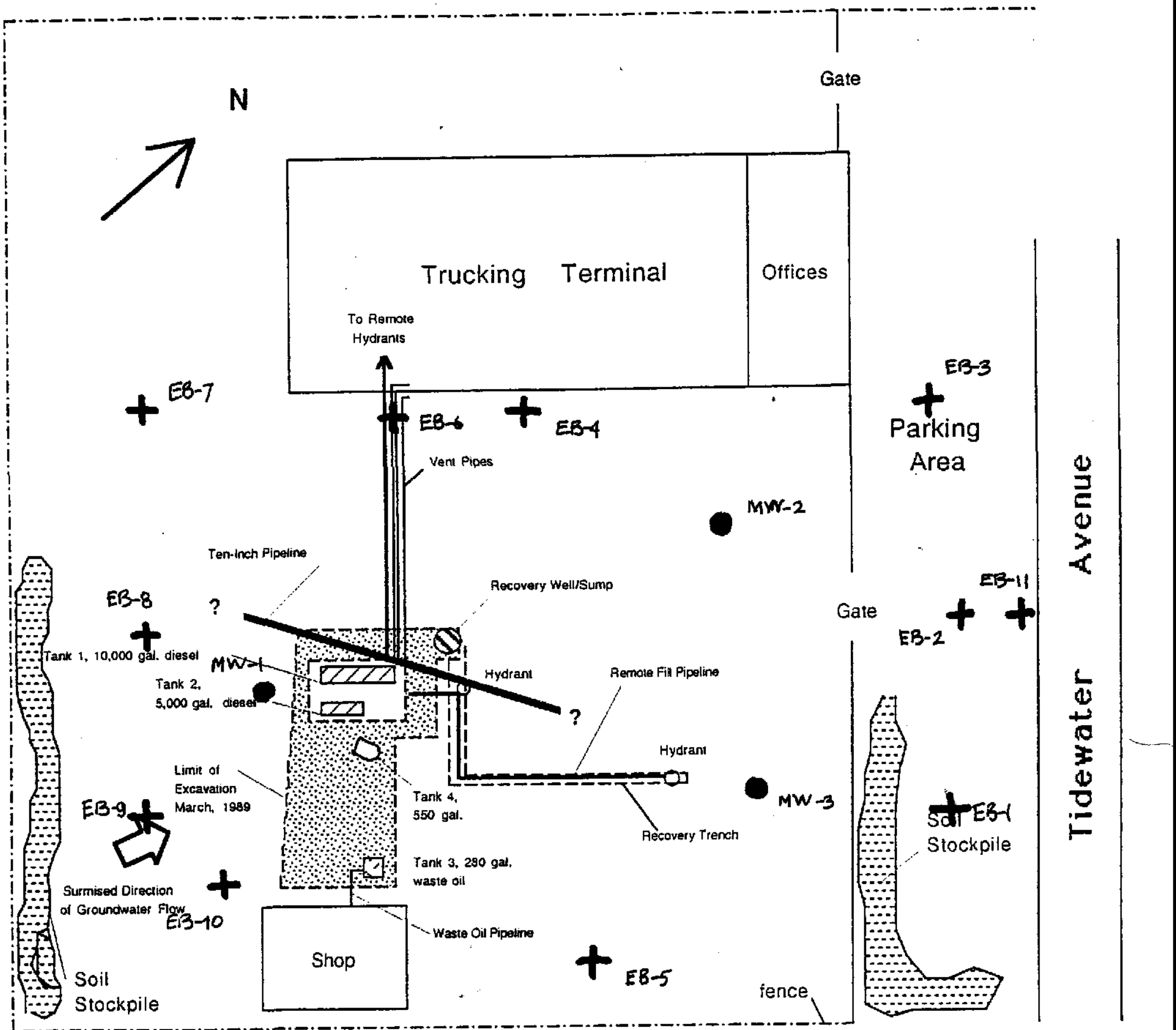
VICINITY MAP DI SALVO TRUCKING
4919 TIDEWATER AVE. OAKLAND FIGURE 1

SCALE:	APPROVED BY:	DRAWN BY
DATE:		REVISED

Environmental Restoration Services

1115 Merrill Street • Menlo Park, California 94025

DRAWING NUMBER



Notes: Information presented taken from Geo-Environmental Technology, Inc. June, 1989.
Tank No. 4 discovered during excavation, apparently used for petroleum storage. Ten-inch pipeline discovered during excavation, possible related to oil refinery use in area, original source unknown.

Site Plan Tank Location and Previous Excavation Map DiSalvo Trucking 4919 Tidewater Avenue Oakland, CA	Project No. 9344 Scale: 1" = 60' Date: Mar., 1994 **Figure 2**

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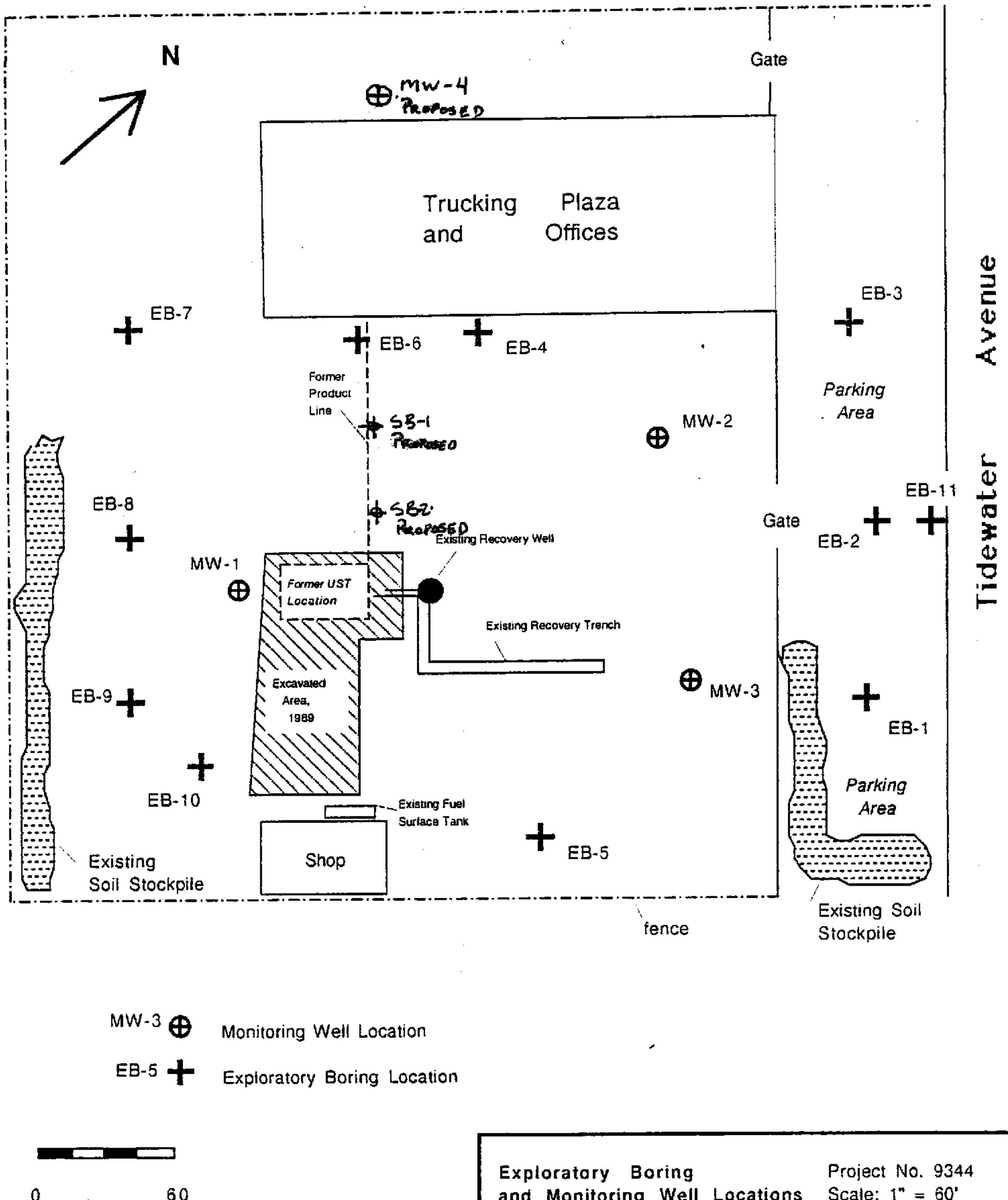

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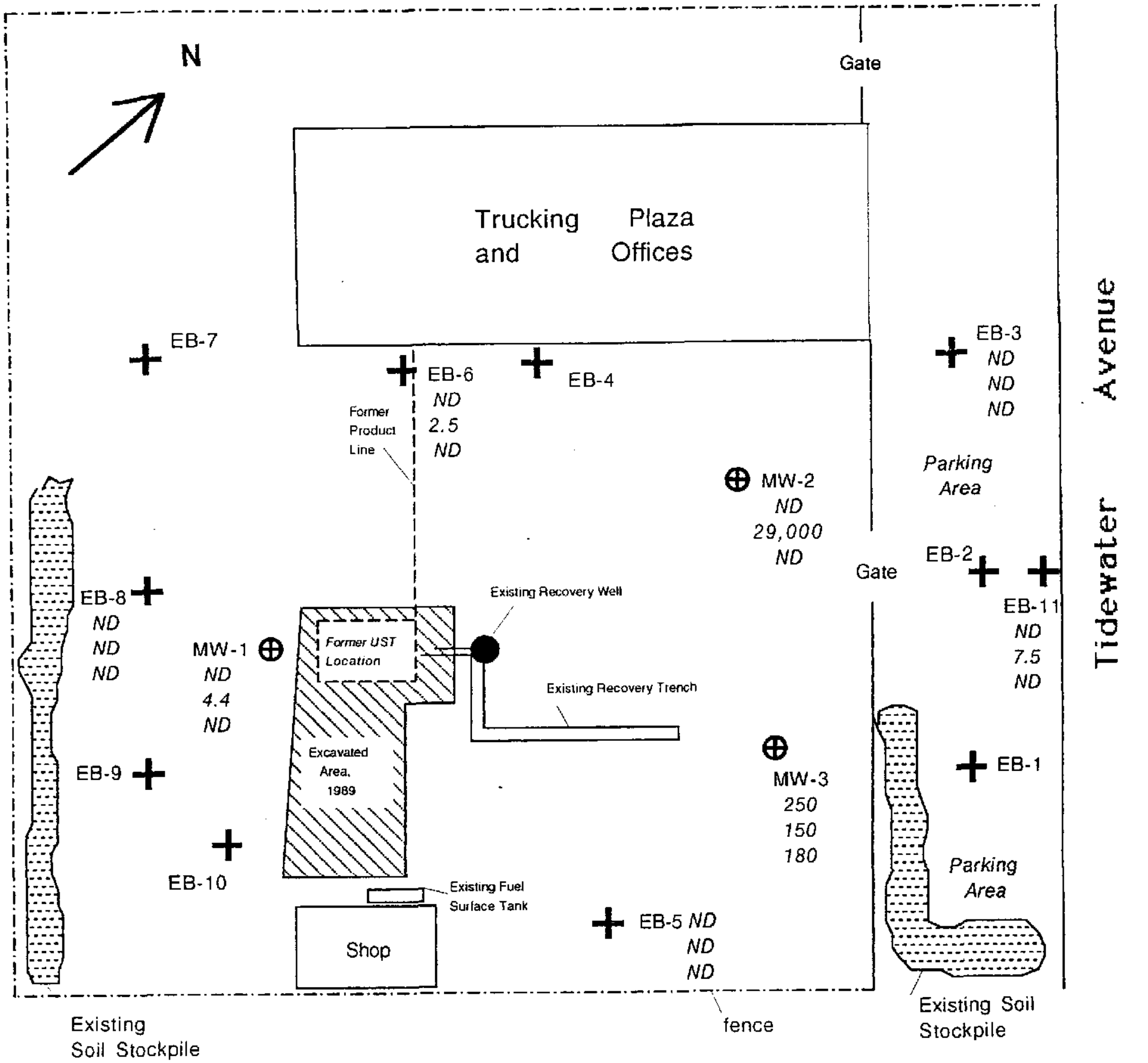
Exploratory Boring and Monitoring Well Locations
DiSalvo Trucking
4919 Tidewater Avenue
Oakland, CA

Project No. 9344
Scale: 1" = 60'
Date: Apr., 1994

Figure 3



MW-3 ⊕ Monitoring Well Location

EB-5 + Exploratory Boring Location

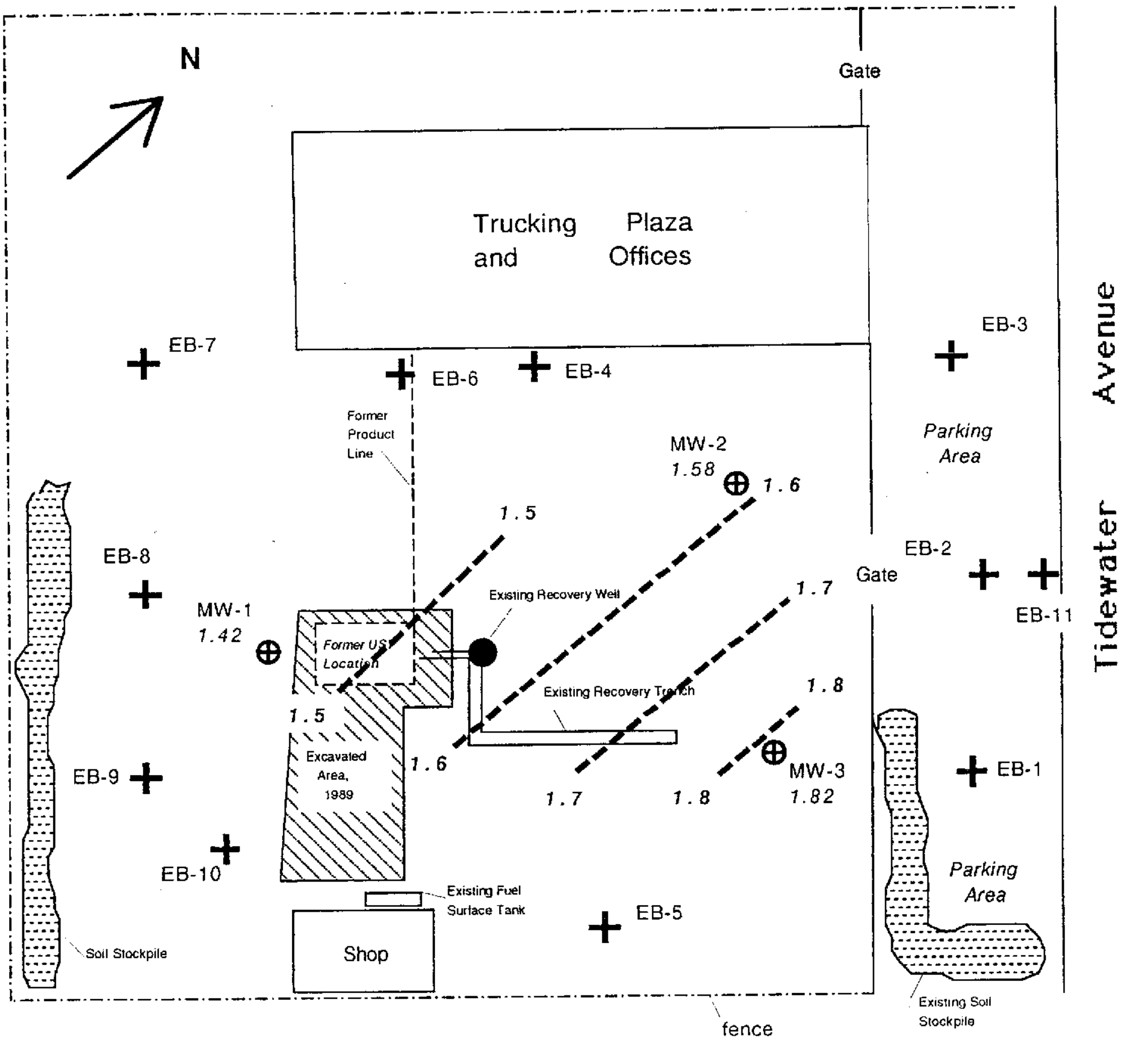
250 - *TPH, Gasoline mg/kg*
150 - *TPH, Diesel mg/kg*
180 - *Benzene, ug/kg*

Soil samples collected at the contact of the artifical fill and native soil which corresponds to the capillary fringe

0 feet 60

Gen Tech Environmental, Inc.
San Jose, CA

Soil Chemical Results	Project No. 9344
DiSalvo Trucking	Scale: 1" = 60'
4919 Tidewater Avenue	Date: Apr., 1994
Oakland, CA	**Figure 4**



MW-3
1.82 ⊕ Monitoring Well Location, Groundwater Elevation in feet

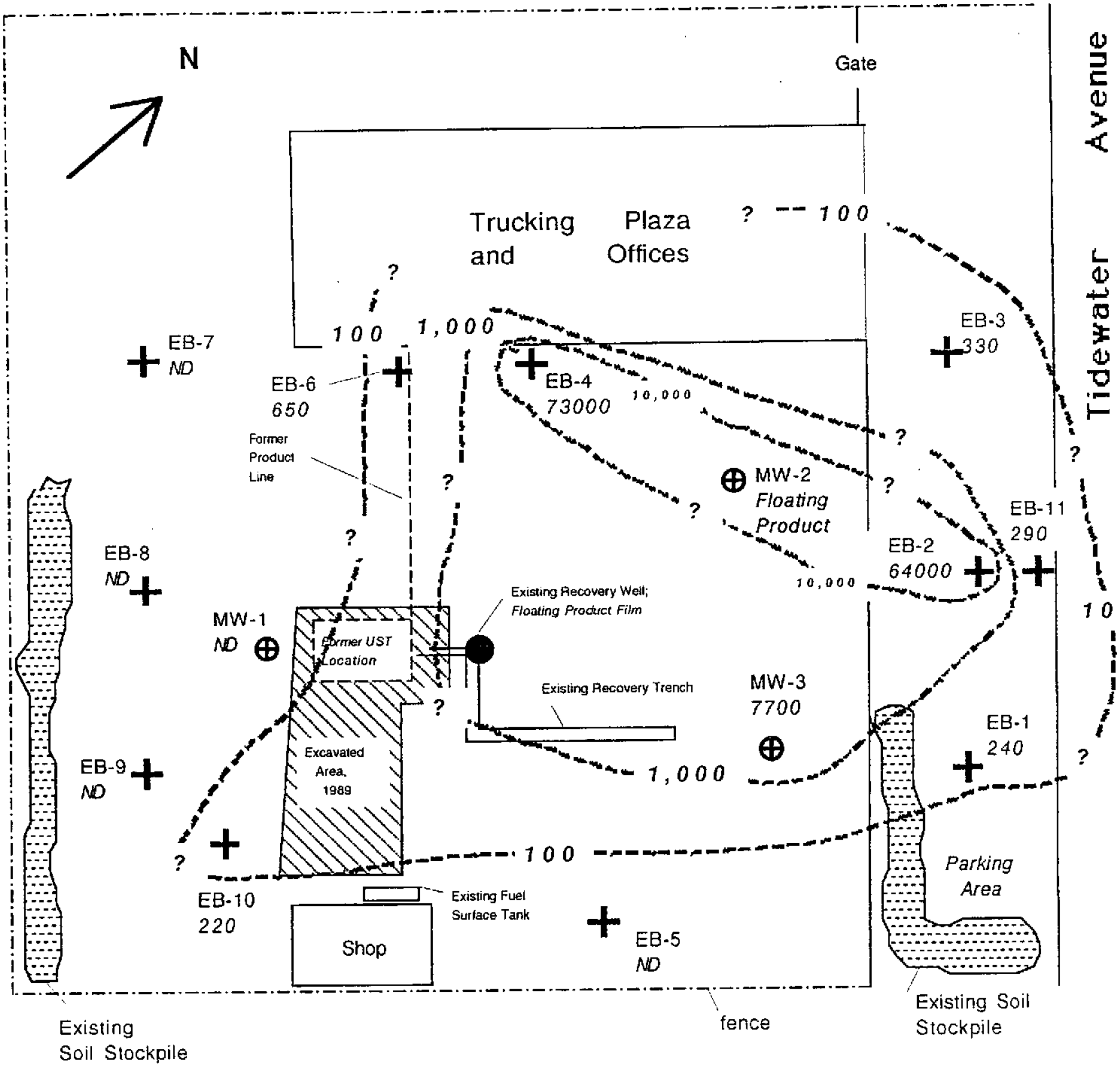
1.8 Groundwater Elevation, in feet, MSL; datum, City of Oakland catch basin.

+ Exploratory Boring Location

0 feet 60

Gen Tech Environmental, Inc.
San Jose, CA

Groundwater Elevation Contory Map, April 14, 1994 DiSalvo Trucking 4919 Tidewater Avenue Oakland, CA	Project No. 9344 Scale: 1" = 60' Date: Apr., 1994 **Figure 5**



MW-3 7700 — Monitoring Well Location, *TPHD in ug/l*

EB-5 ND — Exploratory Boring Location, *TPHD in ug/l*

1,000 — Interpreted TPHD concentration, ug/l, April 14-15, 1994. Contours include both "grab" groundwater sample and monitoring well sample data (see report text).

0 feet 60

Gen Tech Environmental, Inc.
San Jose, CA

TPH Diesel Concentration Contour Map, April, 1994

DiSalvo Trucking
4919 Tidewater Avenue
Oakland, CA

Project No. 9344
Scale: 1" = 60'
Date: Apr., 1994

Figure 6