

OVERVIEW

Blymyer Engineers, Inc. was retained by Diesel Recon Company to perform a Phase I Subsurface Investigation at the Northwest Motor Welding site located at 2100 Orchard Avenue in San Leandro, California. This report, documenting the investigation, is prepared for the Alameda County Health Care Services Agency and the San Francisco Bay Regional Water Quality Control Board.

The investigation was initiated by the discovery of petroleum-contaminated soil during the removal of one 600-gallon underground diesel storage tank on May 9, 1991. Several holes due to corrosion were observed in one end wall of the tank. Two soil samples collected from beneath the ends of the tank contained elevated levels of Total Petroleum Hydrocarbons (TPH) as diesel and toluene, ethylbenzene, and xylenes.

Five soil bores were installed around the tank excavation to determine the vertical and horizontal extent of petroleum contamination in the soil surrounding the tank excavation. Soil samples were collected at 5-, 10-, and 15-foot depths and were analyzed for TPH as diesel. The laboratory results showed that TPH as diesel was not detected above the reporting limits in any of the five soil bores.

Three additional soil bores were installed around the property, with one bore within 10 feet of the tank excavation in the inferred downgradient direction. The three soil bores were installed to a depth of 30 feet, with samples collected at 5-foot depths to the water table. The soil bores were converted to 2-inch diameter groundwater monitoring wells (MW-1, MW-2, and MW-3). The wells were sampled and the samples were analyzed for Total Extractable Hydrocarbons (TEH) and benzene, toluene, ethylbenzene, and xylenes (BTEX). The soil sample analytical results revealed only elevated levels of TEH in the diesel range at a depth of 5 feet in bore

MW-1. The groundwater sample analytical results indicated no concentrations of TEH in the diesel range or BTEX above the respective reporting limits.

Groundwater at the site is found at a depth of 19.5 feet below grade surface and flows to the southwest.

Due to the limited extent of petroleum-contamination around the tank excavation, as evidenced by the laboratory results of the soil samples collected from the five soil bores, Blymyer Engineers recommends that additional soil excavation be performed around the former tank location to remove the remaining petroleum-contaminated soil. Blymyer Engineers also recommends that monitoring well MW-1 be destroyed and excavation performed around the well to remove petroleum-contaminated soil that was detected at a depth of 5 feet. Verification samples should then be collected from the walls of the excavation to confirm the removal of petroleum contaminated soil around MW-1. MW-1 should then be reinstalled in the same general location after backfilling of the excavation. All petroleum-contaminated soil will be initially stockpiled at the site with heavy plastic placed over and underneath the stockpiled soil. The stockpiled soil will then be profiled and subsequently disposed of at an appropriate landfill.

Blymyer Engineers also recommends that a monitoring well be installed within 10 feet of the tank excavation in the downgradient direction in accordance with the Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites. This downgradient well will have to be installed inside the adjacent warehouse located on the property.

Laboratory results show that the groundwater underneath the site has not been impacted by the elevated levels of petroleum contamination discovered in the soil surrounding the tank excavation in May 1991. Therefore, Blymyer Engineers recommends that four periods (1 year) of quarterly monitoring be performed at the

site. Provided that the analyses continue to reveal no detectable levels of TPH as diesel or BTEX, Blymyer Engineers would recommend no further work be performed at this site.

1.0 INTRODUCTION

1.1 Background

Blymyer Engineers, Inc. was retained by Diesel Recon Company to perform a Phase I Subsurface Investigation at the Northwest Motor Welding office and warehouse located at 2100 Orchard Avenue in San Leandro, California. This report is prepared for submission to the Alameda County Health Care Services Agency (ACHCSA) and the San Francisco Bay Regional Water Quality Control Board (RWQCB).

The following background information is Blymyer Engineers' understanding of prior site work as based on laboratory reports from the tank removal and a prior preliminary subsurface investigation performed by Blymyer Engineers.

On May 9, 1991, Golden West Builders removed one 600-gallon underground diesel storage tank from the underneath the sidewalk on Estabrook Street that fronted the office and warehouse of Northwest Motor Welding in San Leandro, California. Available information revealed that the tank held only diesel, however, the tank was empty when removed and several corrosion holes were observed in one end wall of the tank. The age of the tank was not known.

Blymyer Engineers, Inc. collected two soil samples from the bottom of the excavation beneath the tank that was removed. The two soil samples, S-1 and S-2, were collected from beneath the two ends of the tank at the interface of the backfill and natural surrounding soil. Samples S-1 and S-2 were collected at approximate depths of 8 and 7 feet below grade surface, respectively. No groundwater was encountered in the excavation.

Samples S-1 and S-2 were analyzed for Total Petroleum Hydrocarbons (TPH) as diesel using modified EPA Method 8015, and benzene, toluene, ethylbenzene, and

xylene (BTEX) using EPA Method 8020. The May 14, 1991 laboratory report, included in Blymyer Engineers' letter to Mr. Michael Bakaldin of the City of San Leandro Fire Department, dated May 21, 1991 (**Appendix A**), showed TPH as diesel levels of 1,800 milligrams per kilogram (mg/Kg) in sample S-1 and 10,000 mg/Kg in sample S-2. Ethylbenzene levels were 4,200 micrograms per kilogram ($\mu\text{g}/\text{Kg}$) in sample S-1 and 3,500 $\mu\text{g}/\text{Kg}$ in sample S-2. Xylenes levels were 17,000 $\mu\text{g}/\text{Kg}$ in sample S-1 and 15,000 $\mu\text{g}/\text{Kg}$ in sample S-2. Toluene was only detected in sample S-2 at a concentration of 1,100 $\mu\text{g}/\text{Kg}$, while benzene was not detected above the reporting limit in either sample.

Due to the documented presence of petroleum-contaminated soil remaining in the ground at the site and the time constraint imposed by the potential purchase of the property, Blymyer Engineers, with the approval of the property owner, performed a Phase I Subsurface Investigation in anticipation of requirements of the ACHCSA. The Phase I Subsurface Investigation was performed to assess the extent of petroleum contamination in soil and groundwater beneath the site due to the leaking underground storage tank.

1.2 Site Conditions

The site is located in a residential and light industrial area in the northwest section of the city of San Leandro, California (**Figure 1**), approximately $\frac{1}{2}$ -mile northeast of the Marina Boulevard exit on Interstate Highway 880 and 200 feet north of Marina Boulevard. Site topography is generally flat, grading gently downward to the west. The property is 11,400 square feet in size and contains three steel-framed buildings with corrugated sheet metal siding that are constructed slab-on-grade. The buildings contain offices, a shop, and numerous storage areas that at one time housed welding equipment. The entire property is surfaced with concrete, except for a small strip of soil on the eastern edge of the property. At the time this work was performed, the site was unoccupied.

2.0 ENVIRONMENTAL SETTING

2.1 Regional Geology

The subject site is located in Alameda County, California at the southeast corner of the intersection of Orchard Avenue and Estabrook Street in San Leandro. Alameda County is one of the Central Coast Range counties lying on the eastern shore of the San Francisco Bay. An alluvial plain of Quaternary age, 3 to 8 miles in width and trending northwestward, constitutes the west border of the county. This plain rises from the tidal waters of the Bay to an elevation of about 100 feet at its eastern margin. Here, the Hayward fault, a persistent zone of structural weakness, separates the plain from the uplifted Berkeley Hills on the east. The Berkeley Hills are the dominant range in the uplifted block between the Bay and Mt. Diablo in Contra Costa County. Along the southwest flank of the Berkeley Hills, the Franciscan formation of Jurassic age, composed of sandstones, shales, cherts, schists and associated ultra-basic intrusives of peridotite (altered to serpentine), is exposed. These rocks are overlain conformably by Cretaceous sandstone and shales which extend over the summit of the range to the east (Radbruch, 1957).

The general dip of the Cretaceous units is northeast. The Cretaceous units are flanked by strips of Upper and Middle Miocene marine sediments forming the west limb of a syncline. The Miocene units are covered in places by Pliocene sediments of continental origin which are interbedded with volcanic flows.

Radbruch and Case (1967) describe the general site geology on the geologic map published by the United States Geological Survey that covers the site area. The alluvial deposits mapped by Radbruch and Case are considered to be undifferentiated Quaternary deposits of Pleistocene and/or Pliocene age. These deposits consist of dark alluvium, irregularly bedded clays, sands, silts and gravels with organic matter,

and admixtures of these materials. In most instances, the alluvial deposits are poorly consolidated.

Hickenbottom and Muir (1988) classifies geologic units in the "East Bay Plain area" into two groups, consolidated and unconsolidated deposits. Bulletin No. 81, California Department of Water Resources, describes the alluvial sediments underlying the Bay Plain area of southern Alameda County as containing groundwater in permeable sand and gravel layers that are interbedded between clay layers. The consolidated bedrock units consist of marine sedimentary and volcanic rocks in a geosyncline which developed during Jurassic, Cretaceous, and Tertiary times in northern California. The unconsolidated sediments, reported to be 1,000 feet thick, underlying the East Bay Plain make up the groundwater reservoir in the region.

2.2 Climate

The East Bay Plain exhibits a Mediterranean-type climate with cool, wet winters and warmer, dry summers. Mean annual precipitation in the Oakland - San Leandro area is 17.74 inches, with a mean monthly rainfall of 3.30 inches in January and 0.02 inches in August. At the time of this writing, the entire Bay Area has experienced below-normal precipitation for the past five years. The mean monthly temperature at the nearby Oakland Airport is 47.2 degrees Fahrenheit in January and 62.9 degrees Fahrenheit in August (Soil Conservation Service, 1981).

5.0 SUMMARY AND CONCLUSIONS

- The site is located in a residential and light industrial area of San Leandro in Alameda County.
- Two soil samples collected from beneath the former 600-gallon diesel tank contained elevated levels of petroleum hydrocarbons (1,800 and 10,000 mg/Kg of TPH as diesel).
- Groundwater at the site is found at an approximate depth of 19.5 feet below grade surface.
- Soil samples collected during the installation of five soil bores around the tank excavation in June 1991 did not contain detectable levels of TPH as diesel.
- Only one soil sample, MW-1-1, collected at a depth of 5 feet during the installation of the three monitoring wells at the site in July 1991 contained a diesel range extractable petroleum hydrocarbon concentration of 7,500 mg/Kg.
- Groundwater samples collected from the monitoring wells in July 1991 did not contain detectable levels of extractable petroleum hydrocarbons or BTEX.
- Petroleum hydrocarbon contamination of the soil around the tank excavation appears to be limited to the area around the tank excavation that is bounded by the five soil bores installed in June 1991.
- At the time of this report, the extent of petroleum hydrocarbon of the soil surrounding monitoring well MW-1 is presently undefined, but will be addressed in a future report.

6.0 RECOMMENDATIONS

- This report should be submitted to:

Mr. Lowell Miller
Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621

Mr. Richard Hiatt
California Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, 5th Floor
Oakland, California 94612

- There is a limited areal extent of soil with elevated levels of TPH as diesel in the former tank location as shown by the laboratory results from the soil samples collected from the five soil bores installed around the tank excavation. Blymyer Engineers recommends excavation of the petroleum-contaminated soil and stockpiling of the soil at the site. Verification samples should be collected from each face of the excavation and analyzed for TPH as diesel and BTEX to confirm the removal of petroleum-contaminated soil that resulted from the leaking underground storage tank. The stockpiled soil should be profiled and properly disposed of at an appropriate facility. The excavated soil should be replaced with clean, imported fill and properly compacted and resurfaced.
- Blymyer also recommends that monitoring well MW-1 be destroyed and the petroleum-contaminated surrounding soil excavated and properly disposed of at an appropriate facility. Verification samples should be collected from each face of the excavation and analyzed for TPH as diesel to confirm that

petroleum hydrocarbon contamination has been removed from the area of concern. Monitoring well MW-1 should then be reinstalled in the same general location after backfilling of the excavation is completed.

- Blymyer Engineers recommends that an additional groundwater monitoring well be installed within 10 feet of the tank excavation in the downgradient direction as required by the Tri-Regional Board Recommendations. This well will need to be installed inside the adjacent warehouse located on the property.
- Blymyer Engineers recommends that four periods (1 year) of quarterly groundwater monitoring be performed at the site. If no detectable levels of diesel range extractable petroleum hydrocarbons or BTEX are detected in samples from the monitoring wells, Blymyer Engineers would recommend that no further work be performed at this site.

TABLE I, SUMMARY OF SOIL BORE SAMPLE ANALYTICAL RESULTS
BEI Job No. 91106, Diesel Recon Company,
2100 Orchard Avenue, San Leandro, California

Sample Identification	Modified EPA Method 8015 (mg/Kg)
	Extractable Petroleum Hydrocarbons (Diesel Range)
TB-1 5 feet bgs	<5
TB-1 10 feet bgs	<5
TB-1 15 feet bgs	<5
TB-2 5 feet bgs	<5
TB-2 10 feet bgs	<5
TB-2 15 feet bgs	<5
TB-3 5 feet bgs	<5
TB-3 10 feet bgs	<5
TB-3 15 feet bgs	<5
TB-4 5 feet bgs	<5
TB-4 10 feet bgs	<5
TB-4 15 feet bgs	<5
TB-5 5 feet bgs	<5
TB-5 10 feet bgs	<5
TB-5 15 feet bgs	<5

mg/Kg milligrams per kilogram
bgs below grade surface

For results presented as <x, x represents the reporting limit.

**TABLE II, SUMMARY OF MONITORING WELL INSTALLATION
SOIL SAMPLE ANALYTICAL RESULTS
BEI Job No. 91106, Diesel Recon Company,
2100 Orchard Avenue, San Leandro, California**

Sample Identification	Modified EPA Method 8015 (mg/Kg)	EPA Method 8020 (µg/Kg)			
	Extractable Petroleum Hydrocarbons (Diesel Range)	Benzene	Ethylbenzene	Toluene	Xylenes
MW-1-1 5.0-5.5 feet bgs	7,500	<100	<100	<100	<100
MW-1-2 9.0-9.5 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-1-3 14.5-15.0 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-1-4 19.5-20.0 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-2-1 4.0-5.5 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-2-2 9.0-10.5 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-2-3 16.0-16.5 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-2-4 19.5-20.0 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-3-1 4.5-5.0 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-3-2 9.5-10.0 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-3-3 15.0-15.5 feet bgs	<1	<5.0	<5.0	<5.0	<5.0
MW-3-4 19.5-20.0 feet bgs	<1	<5.0	<5.0	<5.0	<5.0

mg/Kg milligrams per kilogram
µg/Kg micrograms per kilogram
bgs below grade surface

For results presented as <x, x represents the reporting limit.

**TABLE III, SUMMARY OF GROUNDWATER SAMPLE
ANALYTICAL RESULTS
BEI Job No. 91106, Diesel Recon Company
2100 Orchard Avenue, San Leandro, California**

Sample Identification	Modified EPA Method 8015 (µg/L)	EPA Method 8020 (µg/L)			
	Extractable Petroleum Hydrocarbons (Diesel Range)	Benzene	Ethylbenzene	Toluene	Xylenes
MW-1	<50	<0.5	<0.5	<0.5	<0.5
MW-2	<50	<0.5	<0.5	<0.5	<0.5
MW-3	<50	<0.5	<0.5	<0.5	<0.5

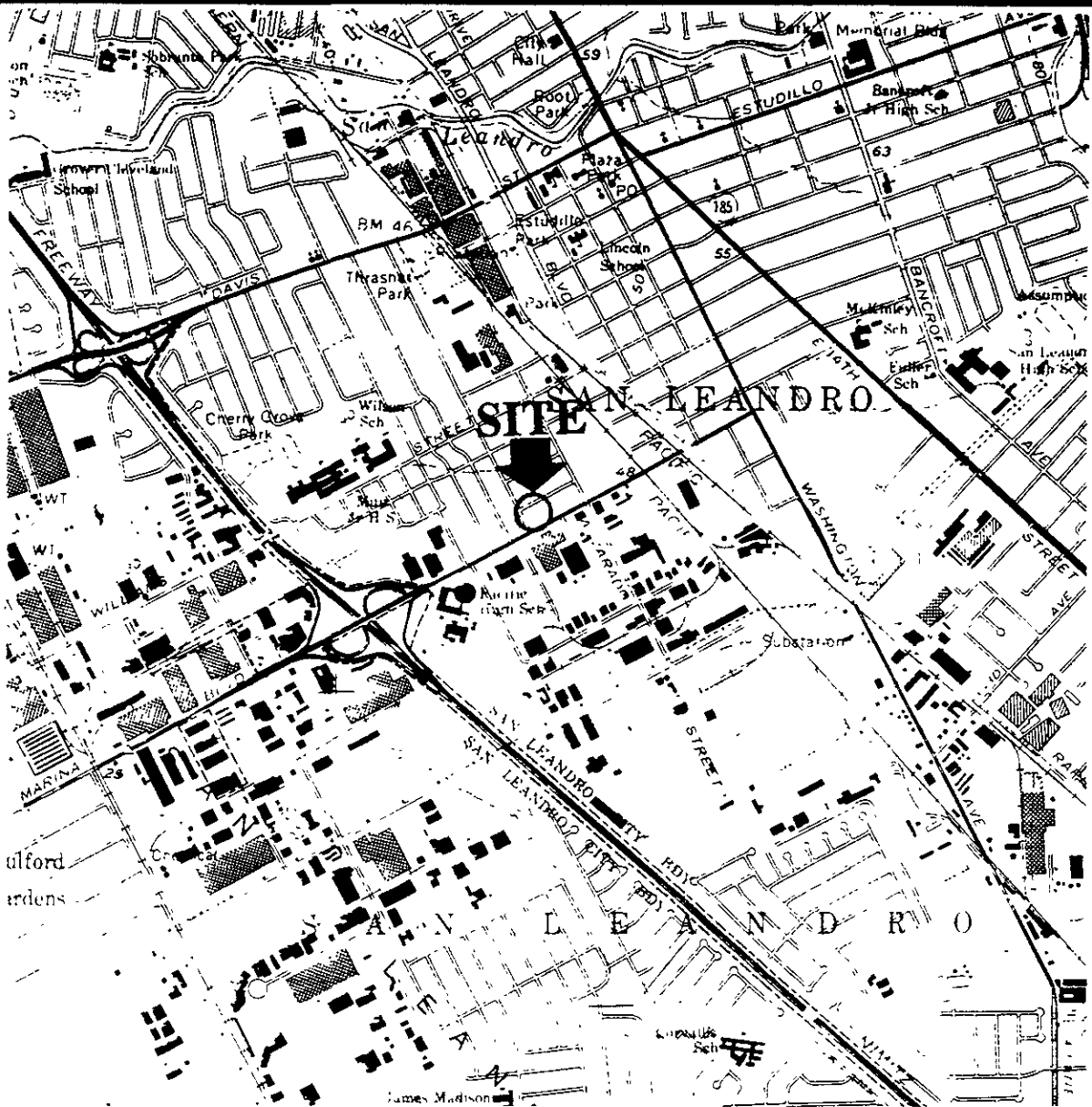
µg/L micrograms per liter

For results presented as <x, x represents the reporting limit.

TABLE IV, GROUNDWATER ELEVATION SURVEY DETAILS July 15, 1991 BEI Job No. 91106, Diesel Recon Company 2100 Orchard Avenue, San Leandro, California			
	TOC ELEVATION (feet)*	DEPTH TO WATER (feet from TOC)	WATER SURFACE ELEVATION (feet)*
MW-1	35.60	17.50	18.10
MW-2	35.99	17.88	18.11
MW-3	35.29	17.23	18.06

TOC Top of Well Casing

* based on City of San Leandro Benchmark



Source: United States Geological Survey, "San Leandro, CA", photorevised 1980

Site Location Map

DIESEL RECON COMPANY
2100 ORCHARD AVE.
SAN LEANDRO, CA



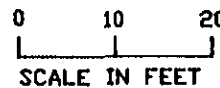
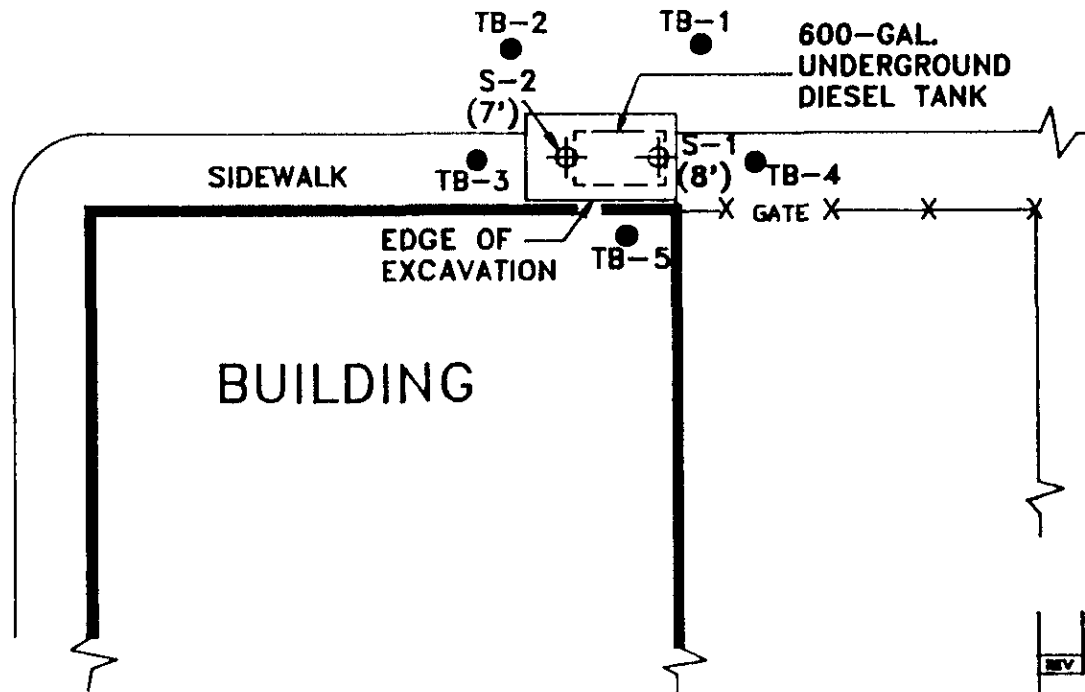
JOB #91106

FIGURE 1



ESTABROOK ST.

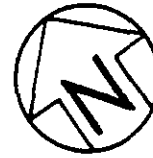
ORCHARD AVE.



LEGEND

- SOIL BORE LOCATION
- ⊕ SOIL SAMPLE LOCATION

REV	DESCRIPTION	DATE	BY
BLYMYER ENGINEERS, INC ALAMEDA, CALIFORNIA			
SCALE SHOWN	FOR	DIESEL RECON. CO. SAN LEANDRO, CA	
JOB NO.	LW 8/91		
APPROVED	TITLE SOIL BORE LOCATION MAP		
JOB NO.	91108	PAGE NO.	FIGURE 2



PROPERTY LINE

MW-2

MW-1

ESTABROOK ST.

LOCATION OF FORMER UNDERGROUND DIESEL TANK

BUILDING

MW-3

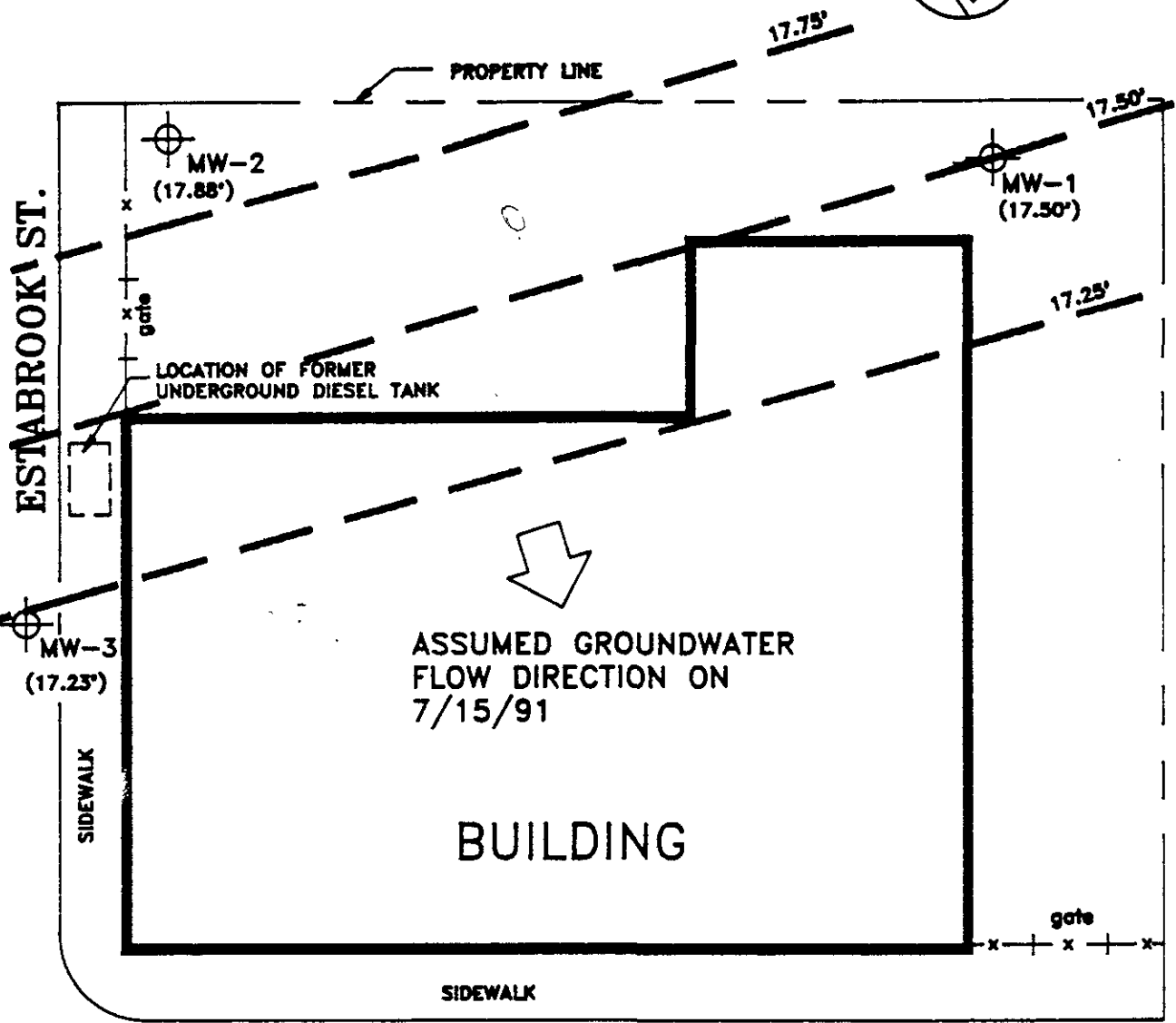
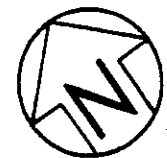
SIDEWALK

SIDEWALK

ORCHARD AVE.

0 20
SCALE IN FEET

REV	DESCRIPTION	DATE BY
BLYMYER ENGINEERS, INC ALAMEDA, CALIFORNIA		
SCALE SHOWN	DATE	TITLE
DATE LW 7/81	DIESEL RECON. COMPANY SAN LEANDRO, CA	MONITORING WELL LOCATION
APPROVED		
NO 91108	PAGE NO.	FIGURE 3



ESTABROOK ST.

ORCHARD AVE.

LEGEND

(17.23') GROUNDWATER ELEVATION ON 7/15/91

Note: Bench mark City of San Leandro cinch nail on curb at storm water inlet, south side of intersection Marina and Orchard.



REV	DESCRIPTION	DATE BY
BLYMYER ENGINEERS, INC ALAMEDA, CALIFORNIA		
SCALE SHOWN	DATE	TITLE
LW 8/91		DIESEL RECON. COMPANY SAN LEANDRO, CA
APPROVED		TITLE
		GROUNDWATER GRADIENT MAP
JOB 91108	PAGE NO.	FIGURE 4