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KODIAK CONSULTING, LLC

660 4th Street, #288

San Francisco, California 94107

Tel: (415) 269-9515 Fax: (415) 840-0713

December 24, 2004

Ms. Wannetta Hall
4414 Fleming Avenue
Oakland, California 94619

Subject: **Subsurface Investigation Workplan
3600 MacArthur Blvd., Oakland, California**

Dear Ms. Hall:

Enclosed is a copy of the investigation workplan as requested by the Alameda County Health Care Services Agency (ACHCSA). A copy has been sent to Mr. Don Hwang of the ACHCSA.

If you have any questions regarding this project and/or claim, please call me at 415-269-9515.

Sincerely,



Ailsa Le May
Kodiak Consulting, LLC

cc. Mr. Don Hwang, ACHCSA, 1131 Harbor Parkway, Suite 250, Alameda, California 94502-6577



KODIAK CONSULTING, LLC

SUBSURFACE INVESTIGATION WORKPLAN

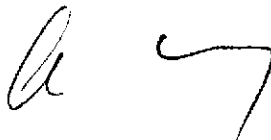
December 24, 2004

*Scooter's Auto Repair/Scooter Wilson
3600 MacArthur Boulevard
Oakland, California 94619*

Prepared for:

Ms. Wannetta Hall
4414 Fleming Avenue
Oakland, California 94619

By:



Ailsa S. Le May, R.G. # 6717
Registered Geologist



KODIAK CONSULTING, LLC
660 4th Street, #288
San Francisco, CA 941-7
Tel: (415) 269-9515 Fax: (415) 840-0713



KODIAK CONSULTING, LLC

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1.0 INTRODUCTION

The following is a workplan for an environmental investigation for the Scooter's Auto Repair facility located at 3600 MacArthur Boulevard in Oakland, California as was requested by the Alameda County Health Care Services Agency (ACHCSA). This workplan was originally requested in a letter from the ACHCSA dated October 8, 2003.

The purpose of this investigation is to further assess the plume directly downgradient of the former USTs, delineate the vertical and horizontal extent of the source area hydrocarbons in soil, identify any preferential pathways that may influence hydrocarbon migration, and provide details of any existing wells within ¼ mile radius of the site.

2.0 SITE DESCRIPTION

The site is in Oakland, California, on the southeastern corner of the intersection of MacArthur Boulevard and Magee Avenue. It lies approximately 0.2 mile northeast of Interstate 580 and 0.5 mile northwest of High Street. The site elevation is approximately 200 feet above mean sea level (NGVD, 1929). It is approximately 0.23 acre in area and currently owned by the Estate of Mr. Henry Hall (Alameda County Assessor's Parcel Number 30-1903-15-1). The property is currently used as an automobile repair facility. Mr. Hall operated the site as a service station from approximately 1973 to 1988. Prior to this, the site was a Phillips 66 service station. Underground storage tanks (USTs) used to store gasoline, diesel, and waste oil existed on site until March 1994. The site is zoned for commercial use. The surrounding parcels are zoned for commercial use (northwest and southwest) and residential use (northeast and southeast).

3.0 GEOLOGY AND HYDROGEOLOGY

The site is in the East Bay Plain Groundwater Basin (CRWQCB Basin Plan; 1995, Proposed Amendments, 1998, and the East Bay Plain Groundwater Basin Beneficial Use Report, (CRWQCB, 1999). The site is located at the eastern edge of the basin, approximately 2,000 feet southwest of the Hayward Fault. The East Bay Plain is regionally subdivided into two major basins, The San Pablo Basin and the San Francisco Basin. The site lies within the San Francisco Basin and is a part of the Oakland Sub-Area, defined by a series of alluvial fans ranging from 300 to 700 feet deep, all overlying a west sloping bedrock surface. There are no well-defined aquitards in this area. Soils beneath the site consist of silty clay with trace amounts of sand to 4.5 feet below grade (fbg), underlain by clays, silts, and sand with gravel to a maximum explored depth of approximately 15 fbg. A gravel-rich lense was logged at approximately 7 fbg in B1 and B3.

Groundwater in this basin is designated beneficial for municipal, industrial, and agricultural uses; although there is no historical evidence that groundwater supplies are sufficient for municipal use, primarily due to low recharge rates. There are no current or planned uses of groundwater as a drinking water source; however, groundwater may be used for backyard irrigation. Groundwater beneath the site flows to the southwest at 0.02 to 0.03 foot/foot. Depth to groundwater has been between 1.5 fbg and 8.4 fbg, and has fluctuated approximately two feet in each monitoring well from

November 1998 to June 2000.

The area has a Mediterranean climate, with an average rainfall of 24 inches, occurring predominantly between November and March. The watershed area for the East Bay Plain is over 100 square miles along the western slope of the Coast Ranges. The nearest surface water body is Peralta Creek, flowing in the southwesterly direction and located approximately 1,000 feet northwest of the site (Appendix A, Figure 1). San Francisco Bay lies approximately 2 miles to the west.

4.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

4.1 1994 Tank Removal

In March 1994, two 8,000-gallon gasoline USTs, one 6,000-gallon diesel UST, and one 100-gallon waste oil UST were removed. Soil samples collected at the approximate center of each sidewall of the former fuel tank cavity at approximately 7 fbg contained up to 5,000 milligrams per kilogram (mg/Kg) total petroleum hydrocarbons (TPH) as gasoline, 330 mg/Kg TPH as diesel (TPH-D), and 1.2 mg/Kg benzene. The groundwater sample collected in the former fuel tank cavity contained 2 milligrams per liter (mg/L) TPH-G, 75 mg/L TPH-D, and 0.016 mg/L benzene. The groundwater sample collected in the former waste oil tank cavity contained 0.6 mg/L TPH-G, 69 mg/L TPH-D, and 0.0006 mg/L benzene. The laboratory results of the soil and groundwater samples collected during the UST removal activities are summarized in Tables 1 and 2. The soil removed from the tank cavities was used as backfill following UST removal. Based on the December 1998 HK2/SEMCO *Site Characterization Report*, the product piping was not removed in 1994, but later grouted in place in 1999. A site plan is shown as Figure 1. A map showing the soil samples and respective concentrations with depth is presented in Figure 2.

4.2 1998 Soil and Groundwater Investigation

In November 1998, SEMCO drilled five soil borings (B1 to B5) up to approximately 15 fbg and converted three of the borings to 2-inch-diameter groundwater monitoring wells (MW-1 to MW-3). Soil samples collected in B1 through B4 between 4.5 and 12 fbg contained up to 930 mg/Kg TPH-G, 390 mg/Kg TPH-D, and 10 mg/Kg benzene. No methyl tertiary-butyl ether (MTBE) was detected.

4.3 Groundwater Sampling

The three onsite monitoring wells have been sampled four times from November 1998 through June 2000. The gradient was calculated to be toward the west and southwest between 0.025 and 0.031 foot/foot. A rose diagram showing the gradient directions and amplitudes is presented in Figures 1 through 4. This is consistent with interpretation of topographic maps and flow gradient directions from other UST sites (DWR Well Survey, 2001). Depth to water is very shallow beneath the site, ranging from just over one fbg to less than 5 fbg. The well screens were submerged during most of the sampling events. Concentrations of TPH-G, TPH-D, and BTEX have generally been detected only in MW-1, downgradient from the former USTs and in the vicinity of the former dispensers. TPH-G and low level benzene were detected in MW-2 in June 2000. The gasoline- and diesel-range hydrocarbon concentrations remained within the same orders of magnitude from November 1998 through June 2000 in MW-1. Dissolved-Phase hydrocarbons as detected in June and July 2000 are presented on Figure 3, and laboratory analytical results and depth to water measurements are



summarized in Table 2.

4.4 1999-2000 Subsurface Utility Survey

In June 1999 through January 2000, North State Environmental (NSE) performed a vicinity subsurface utility survey to evaluate the potential of off-site migration of dissolved-phase hydrocarbons via subsurface utility corridors. As groundwater beneath the site is very shallow, the subsurface utility trenches located on and adjacent to the site may act as preferential, off-site, migratory pathways for residual dissolved-phase hydrocarbons contaminants. A copy of the NSE's utilities map is presented in Appendix A. Figure 4 is a revised figure showing the utilities based on information from EBMUD, the City of Oakland, and field reconnaissance by Brent Wheeler of NSE. Two cross-sections (B-B' and C-C') are presented as Figure 5 and show shallow utilities and the variable groundwater elevations in both of the groundwater gradient directions.

4.5 2001 DWR Well Survey

In April 2001, a Department of Water Resources (DWR) well survey search was performed for the area within ¼ mile of the site. The DWR located 27 well drillers reports, of which 18 were identified as shallow groundwater monitoring wells (20 to 45 feet deep), one was a cathodic protection well, and six were abandoned. One well was likely an old supply well located at 2627 Minna Street, but is too far away from the subject site to be of concern. One irrigation well was identified at 3397 Arkansas Street in Oakland, approximately 1,500 feet west of the site. This well is described as an irrigation well, drilled in 1977 to 62 fbg. The 6-inch diameter well is screened from 20 to 24 fbg, with blank casing extending to 62 fbg. The well is sealed with cement from 20 fbg to surface. It is not known whether this well is still in use at this time. The well locations are shown on Figure 6 and well details summarized in Table 3. As part of the proposed work described in Sections 6.0, the well status will be evaluated.

5.0 CURRENT SITE CONDITIONS

The site is primarily paved, with the former UST excavation remaining gravel to grade. One building is present at the site, currently operating as an auto repair facility. It appears that hydrocarbons in soil originated primarily from the USTs and possibly from the dispenser island. More specifically, soil sample B at 7 fbg collected next to the southeastern gasoline UST contained 5,000 mg/Kg of TPH-G, 330 mg/Kg of TPH-D, and 1.2 mg/Kg of benzene. It must be noted that the laboratory has previously commented that the chromatograms of the diesel detected in soil and water samples did not match a typical diesel pattern. The diesel concentrations possibly represent degraded gasoline.

Being that the groundwater is very shallow beneath the site and most soil beneath the site is likely saturated, the soil sample could represent the bottom of the tank (area most likely to leak) or a leak when the groundwater table was at approximately 7 fbg. The soil contamination appears to be highest at 7 fbg as seen in Borings B1 through B3, and diminishes with depth to approximately 10 fbg. A gravel-rich lense was logged at approximately 7 fbg in B1 and B3. The highest concentration of TPH-G was detected in B2 at 7 fbg; however, the soil in this boring was logged as a silty clay. It is possible then that the residual hydrocarbons have traveled along the gravel lense and have adhered

to the less permeable silty clay in B2. There are no further borings in the downgradient direction of B2. Also, no borings were advanced west of the former USTs in the other calculated groundwater gradient direction. The well screens have generally been submerged during the sampling, as groundwater has been less than two feet below ground surface.

Concentrations of TPH-G, TPH-D, and BTEX have generally been detected only in MW-1, downgradient from the former USTs and in the vicinity of the former dispensers. Groundwater was impacted within the former tank cavity as shown by the grab groundwater sample collected in 1994. The groundwater plume is not defined further downgradient of MW-1 or in the other calculated downgradient direction to the west-northwest.

Shallow utilities onsite are limited to a water line and a sewer line. The sewer line's exact location will be identified prior to field activities. Two other possible water lines were identified by EBMUD. Their records show possible lines from Magee to the tank area of the site. There are several shallow (1.5 to 4 feet deep) utilities beneath MacArthur Boulevard and Magee Street, which may act as preferential pathways for dissolved-phase hydrocarbons.

6.0 PROPOSED INVESTIGATION ACTIVITIES

In order to determine if significant hydrocarbons are present downgradient of MW-1 and west-northwest of the former USTs, additional soil sampling and grab groundwater sampling is proposed. Grab groundwater sampling is also recommended around shallow utilities downgradient of the site to determine if dissolved-phase hydrocarbons have preferentially migrated via underground utility lines. If grab groundwater sampling indicates that the plume extends offsite, additional monitoring wells may be required, and will be proposed following this phase of work. Purge groundwater samples will be collected from the three wells during the investigation to evaluate current conditions. And finally, the supply well identified in the DWR records search located at Arkansas Street will be investigated.

6.1 Permits

Prior to commencing field activities, Kodiak will obtain drilling and street encroachment permits from the Alameda County Public Works Agency.

6.2 Underground Service Alert

Underground Service Alert (USA) will be notified at least 48 hours prior to field activities. If required by any parties notified by USA, Kodiak will perform an onsite meeting in order to discuss possible hazardous subsurface utilities. In addition, Kodiak may employ a private underground utility locating service to more accurately locate the subsurface utilities.

6.3 Site Health and Safety Plan

A site health and safety will be prepared to protect site workers and the public. The plan will be kept onsite during the proposed activities and signed by all site workers.



6.4 Soil Borings

Kodiak plans to advance several soil borings to groundwater (expected to be less than six fbg). The proposed onsite borings are shown on Figure 7 and the offsite borings included on Figure 8.

In order to fully characterize hydrocarbons next to tank sample B and downgradient and west of the former USTs, soil borings will be advanced using a direct-push hydraulic rig at the approximate locations shown on Figure 7. The borings will be advanced to up to 20 fbg, (10 fbg is the limit of the vertical extent of soil contamination in the other borings at the site). The borings will be logged continuously and soil samples will be collected from each boring for soil description. Soil samples will be field screened using an organic vapor analyzer. Select soil samples may be collected for laboratory analysis for chemical analytes and physical parameters. Temporary PVC casing will be installed in the borings and grab groundwater samples collected to evaluate the extent of the dissolved-phase hydrocarbons. Based on file conditions, additional borings may be advanced by "stepping out" from the proposed locations.

As groundwater beneath the site has been measured to be less than 2 fbg, it is assumed that the subsurface utilities and their respective surrounding fill materials have been submerged by the groundwater table. The utilities beneath the site, MacArthur Boulevard and Magee Street range between 1.5 and 4 feet deep according to local agency records. In order to evaluate whether the dissolved-phase hydrocarbons may be preferentially migrating through shallow subsurface utilities, it is proposed that several borings be advanced into the fill material surrounding shallow utilities using an air knife. If the respective utility purveyors approve of the proposed action, air knifing will be used to bore a hole into the fill material surrounding the utilities without risk of damaging the piping. Grab groundwater samples will be collected where possible. Pavement coring will be performed as necessary prior to the air knifing and sampling activities. The proposed utility sampling locations are shown on Figures 7 and 8. A copy of Kodiak's Standard Field Procedures for Soil Boring Investigations and Groundwater Sampling is presented in Appendix B.

7.0 LABORATORY ANALYSIS

Select soil and groundwater samples will be analyzed for the following:

- TPH-G and TPH-D (with silica gel clean up) using modified EPA Method 8015,
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8021B,
- Fuel oxygenates using EPA Method 8260, and
- Lead scavengers ethylene dibromide (EDB) and ethylene dichloride (EDC).

In order to improve the evaluation of any future risk assessment, Kodiak proposes to analyze at least one soil sample for the following soil physical parameters:

- Porosity and bulk density by API-RP Method 40,
- Moisture Content by ASTM Method D2216, and
- Fraction Organic Carbon Content by the Walkley-Black Method.

All laboratory analyses will be performed by a State-certified laboratory. Chain of custody protocol will be followed for all samples selected for analysis, providing a continuous record of sample possession prior to actual analysis.

8.0 GROUNDWATER MONITORING WELL INSTALLATION

If grab groundwater sampling indicates that the dissolved-phase plume extends offsite, additional monitoring well(s) may be installed. If additional well(s) are warranted, the exact locations and well construction details will be proposed in another document.

9.0 SOIL AND WASTEWATER DISPOSAL

Any soil, purged groundwater or rinsate water generated during drilling activities will be stored onsite in Department of Transportation (DOT) approved drums pending transport and disposal/recycling at approved facilities. Waste manifests will be prepared for proper transport and disposal.

10.0 SUBSURFACE INVESTIGATION REPORT

After the analytical results are received, Kodiak will prepare a report that at minimum will contain:

- A summary of site background and history,
- A description of the field activities,
- Copies of all permits,
- Soil boring logs,
- Analytical reports and chain-of-custody documents,
- A discussion of soil and hydrocarbon distribution,
- Updated figures including dissolved-phase iso-concentration maps for TPH and benzene, and
- Conclusions and recommendations.

All data and reports will be uploaded to the State GeoTracker database as required. If new monitoring well(s) are installed, a new well survey to GeoTracker standards will be performed after the installations(s) and the data uploaded.

11.0 LIMITATIONS

This report has been prepared in accordance with generally accepted environmental practices exercised by professional geologists, scientists, and engineers. No warranty, either expressed or implied, is made as to the methods, results, conclusions, or professional advice presented herein. Kodiak's liability is limited to the dollar amount of the work performed. The findings and recommendations contained in this report are based upon information contained in previous reports of assessment activities performed at the subject property and based upon site conditions as they existed at the time of the evaluation, and are subject to change. Changes in the information or data

gained from any of these sources could result in changes in our conclusions or recommendations. If such changes do occur, we should be advised so that we can review our report in light of those changes.

12.0 REFERENCES

California Regional Water Quality Control Board, San Francisco Bay Region, 2003. "Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater, Volume 1: Summary Tier 1 Lookup Tables, Interim Final – July 2003 (Updated September 4, 2003)."

Department of Water Resources, 2001. Well Survey Information, Letter from DWR to Brent Wheeler of SEMCO, April 19, 2001.

East Bay Municipal District, EBMUD Distribution Maps, Letter from EBMUD to Brent Wheeler of CEC, February 2, 2000.

Kodiak Consulting, LLC, 2002. Risk Assessment Report, Scooter's Auto Repair, 3600 MacArthur Boulevard, Oakland, California. November 20, 2002.

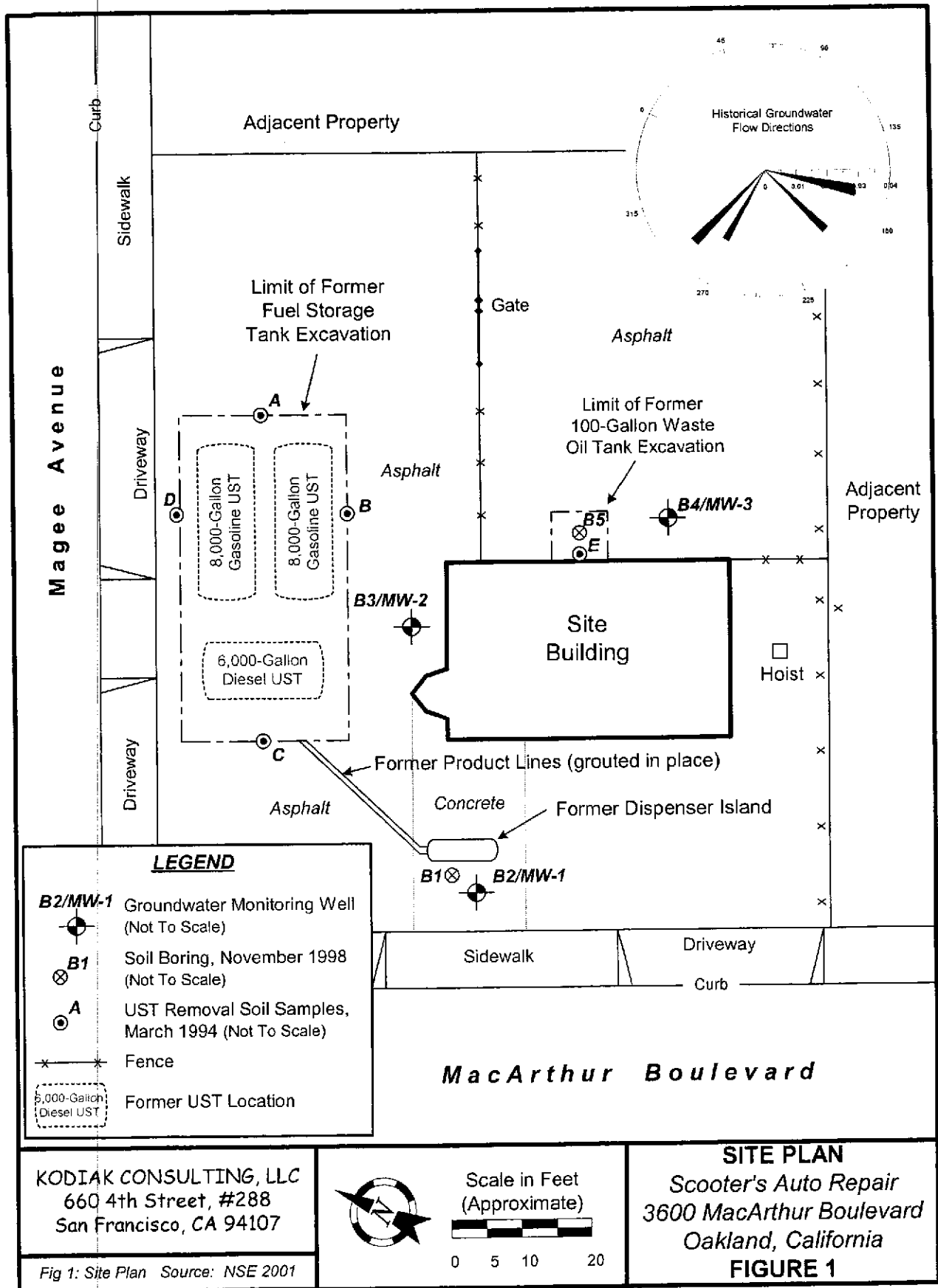
North State Environmental, 1999. Second Quarter 1999 Groundwater Sampling and Offsite Underground Utility Survey Activities at Scooter's Auto Repair, 3600 MacArthur Boulevard, Oakland, California. September 5, 2000.

North State Environmental, 2001. Second Quarter 2000 Groundwater Sampling Activities – Scooter's Auto Repair, 3600 MacArthur Boulevard, Oakland, California. January 23, 1001.

Pacific Gas and Electric, Underground Facilities Location Request, MacArthur and Magee Ave., Oakland. June 17, 1999.

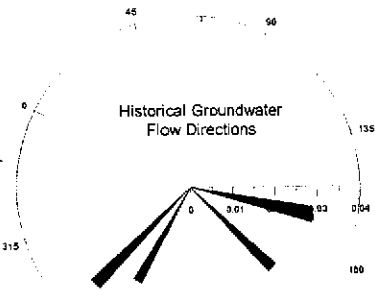
WP 9-04.doc



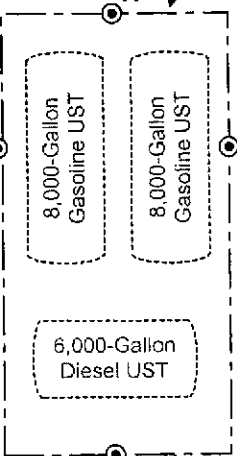


Magee Avenue

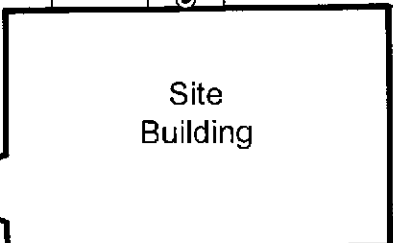
Adjacent Property



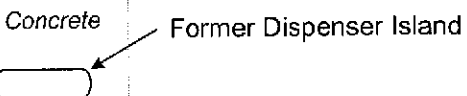
Limit of Former Fuel Storage Tank Excavation



Limit of Former 100-Gallon Waste Oil Tank Excavation



Former Product Lines (grouted in place)



- B2/MW-1** Groundwater Monitoring Well (Not To Scale)
- B1** Soil Boring, November 1998 (Not To Scale)
- A** UST Removal Soil Samples, March 1994 (Not To Scale)
- Fence
- 6,000-Gallon Diesel UST Former UST Location

MacArthur Boulevard

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 660 4th Street, #288
 San Francisco, CA 94107



Scale in Feet (Approximate)

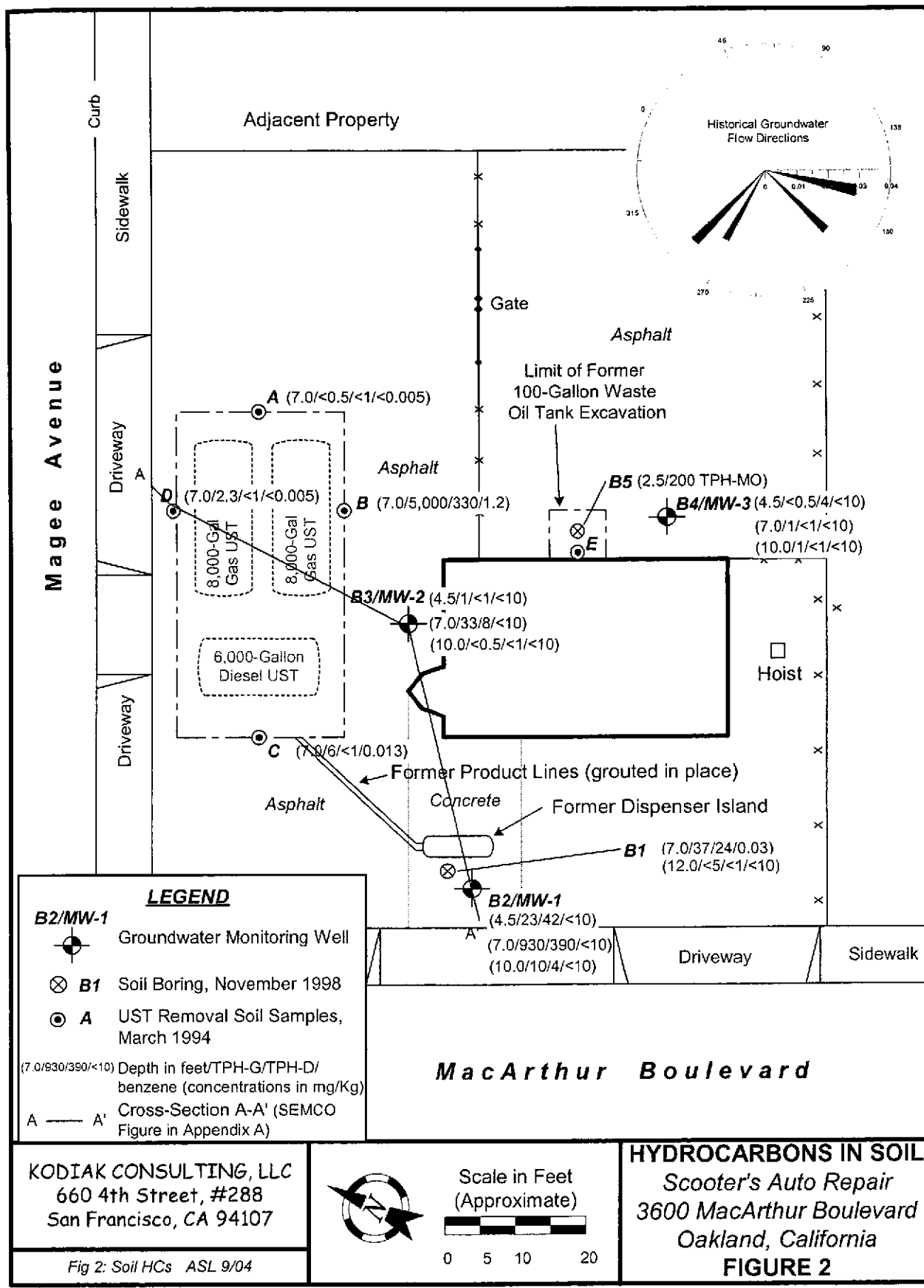


0 5 10 20

SITE PLAN
 Scooter's Auto Repair
 3600 MacArthur Boulevard
 Oakland, California

FIGURE 1

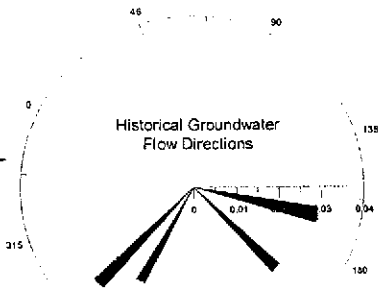
Fig 1: Site Plan Source: NSE 2001



Magee Avenue

Curb
Sidewalk
Driveway
Driveway

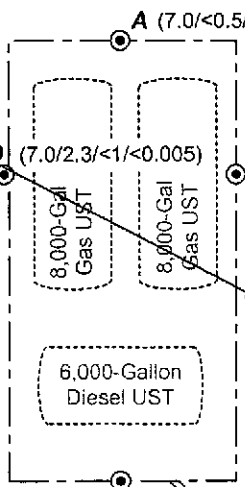
Adjacent Property



Gate

Asphalt

Limit of Former 100-Gallon Waste Oil Tank Excavation



A (7.0/<0.5/<1/<0.005)

D (7.0/2.3/<1/<0.005)

B (7.0/5,000/330/1.2)

B5 (2.5/200 TPH-MO)

B4/MW-3 (4.5/<0.5/4/<10)

(7.0/1/<1/<10)

(10.0/1/<1/<10)

B3/MW-2 (4.5/1/<1/<10)

(7.0/33/8/<10)

(10.0/<0.5/<1/<10)

C (7.0/6/<1/0.013)

Former Product Lines (grouted in place)

Concrete

Former Dispenser Island

B1 (7.0/37/24/0.03)

(12.0/<5/<1/<10)

B2/MW-1 (4.5/23/42/<10)

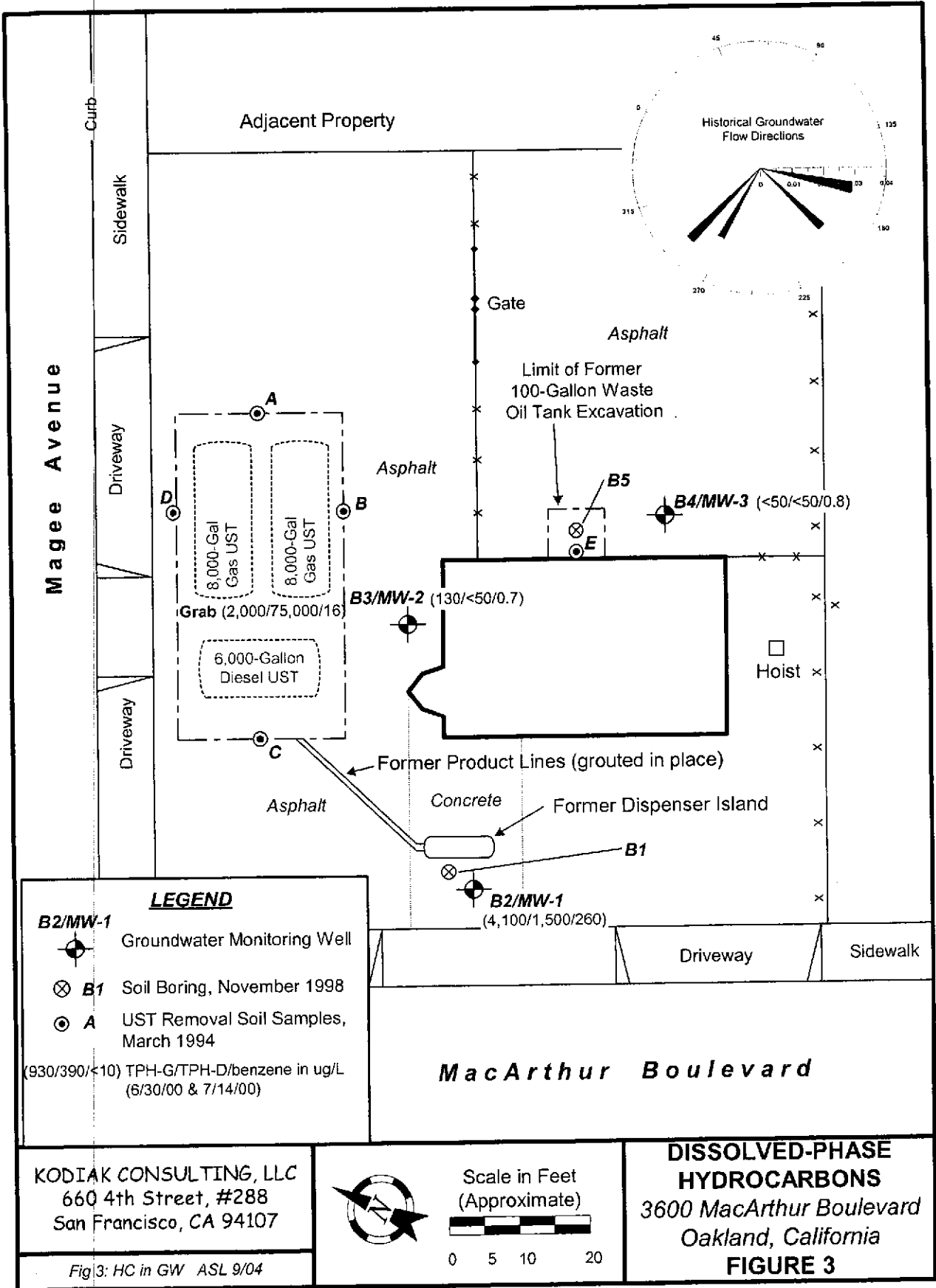
(7.0/930/390/<10)

(10.0/10/4/<10)

Driveway

Sidewalk

MacArthur Boulevard



Magee Avenue

Adjacent Property

Historical Groundwater Flow Directions

Sidewalk

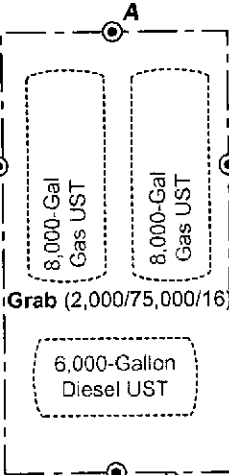
Gate

Asphalt

Limit of Former 100-Gallon Waste Oil Tank Excavation

Driveway

Asphalt



B3/MW-2 (130/<50/0.7)

B5

B4/MW-3 (<50/<50/0.8)

Hoist

Former Product Lines (grouted in place)

Asphalt

Concrete

Former Dispenser Island

B1

B2/MW-1 (4,100/1,500/260)

Driveway

Sidewalk

MacArthur Boulevard

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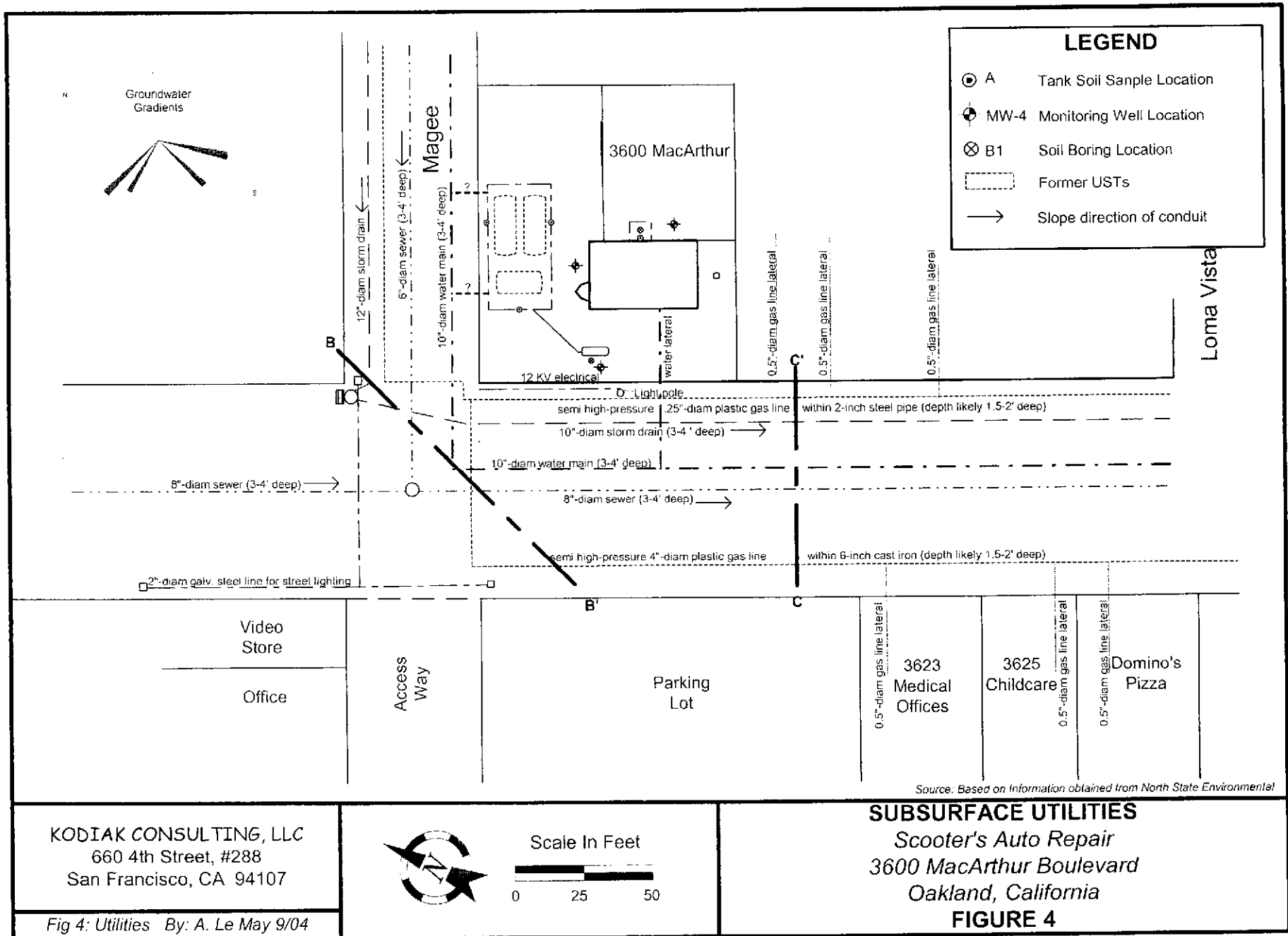
Scale in Feet (Approximate)



0 5 10 20

DISSOLVED-PHASE HYDROCARBONS
3600 MacArthur Boulevard
Oakland, California
FIGURE 3

Fig 3: HC in GW ASL 9/04

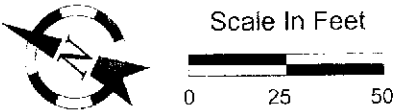


LEGEND

- ⊙ A Tank Soil Sample Location
- ⊕ MW-4 Monitoring Well Location
- ⊗ B1 Soil Boring Location
- ⊡ Former USTs
- Slope direction of conduit

Source: Based on Information obtained from North State Environmental

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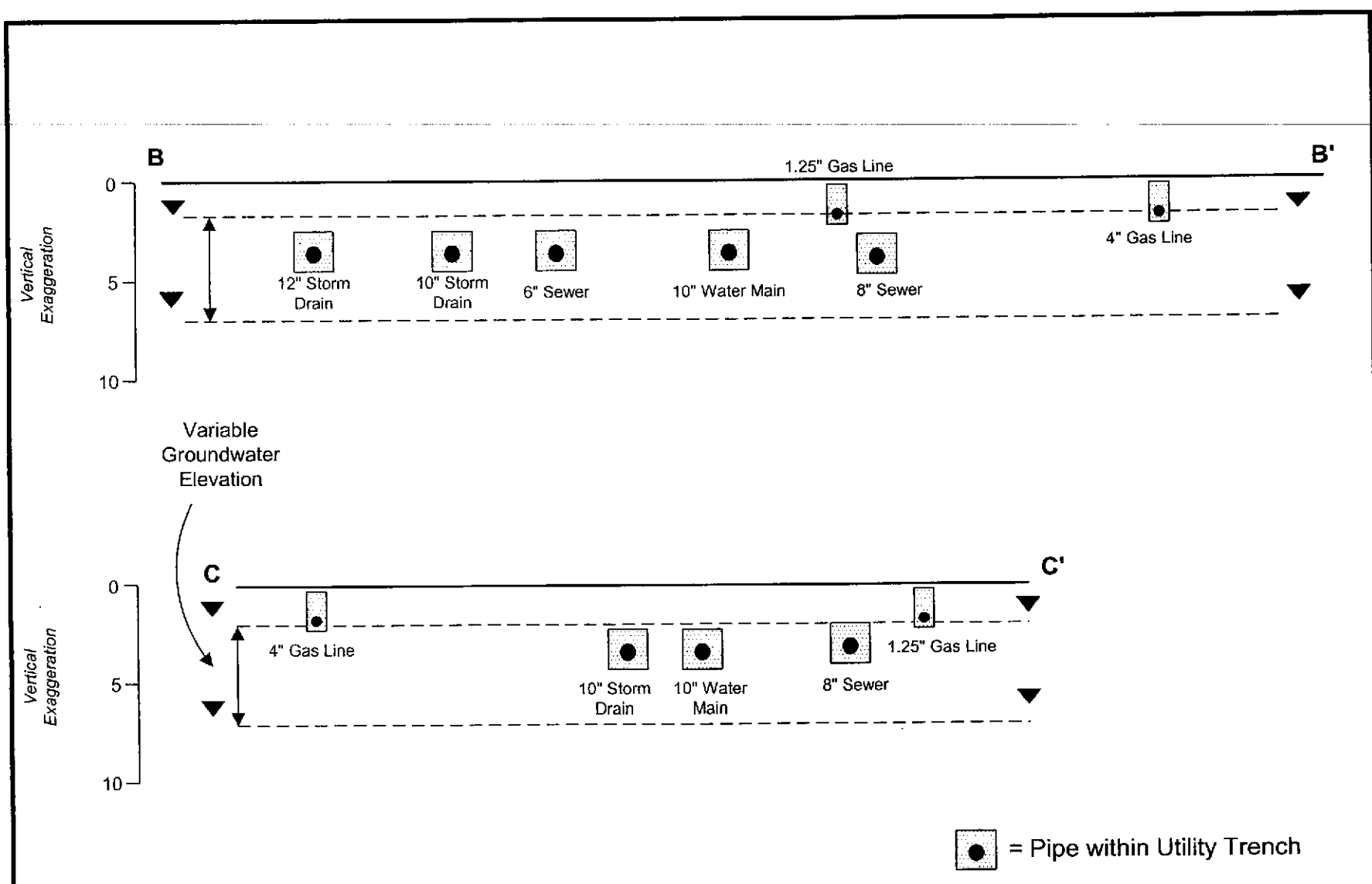


SUBSURFACE UTILITIES

Scooter's Auto Repair
 3600 MacArthur Boulevard
 Oakland, California

FIGURE 4

Fig 4: Utilities By: A. Le May 9/04



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Fig 5: X-Sections By: A. Le May 12/04

Utilities Trenches
 and Pipes Not To
 Scale

Horizontal Scale in Feet
 (Approximate)



0 15

CROSS SECTION B-B' AND C-C'

Scooter's Auto Repair
 3600 MacArthur Boulevard
 Oakland, California

FIGURE 5

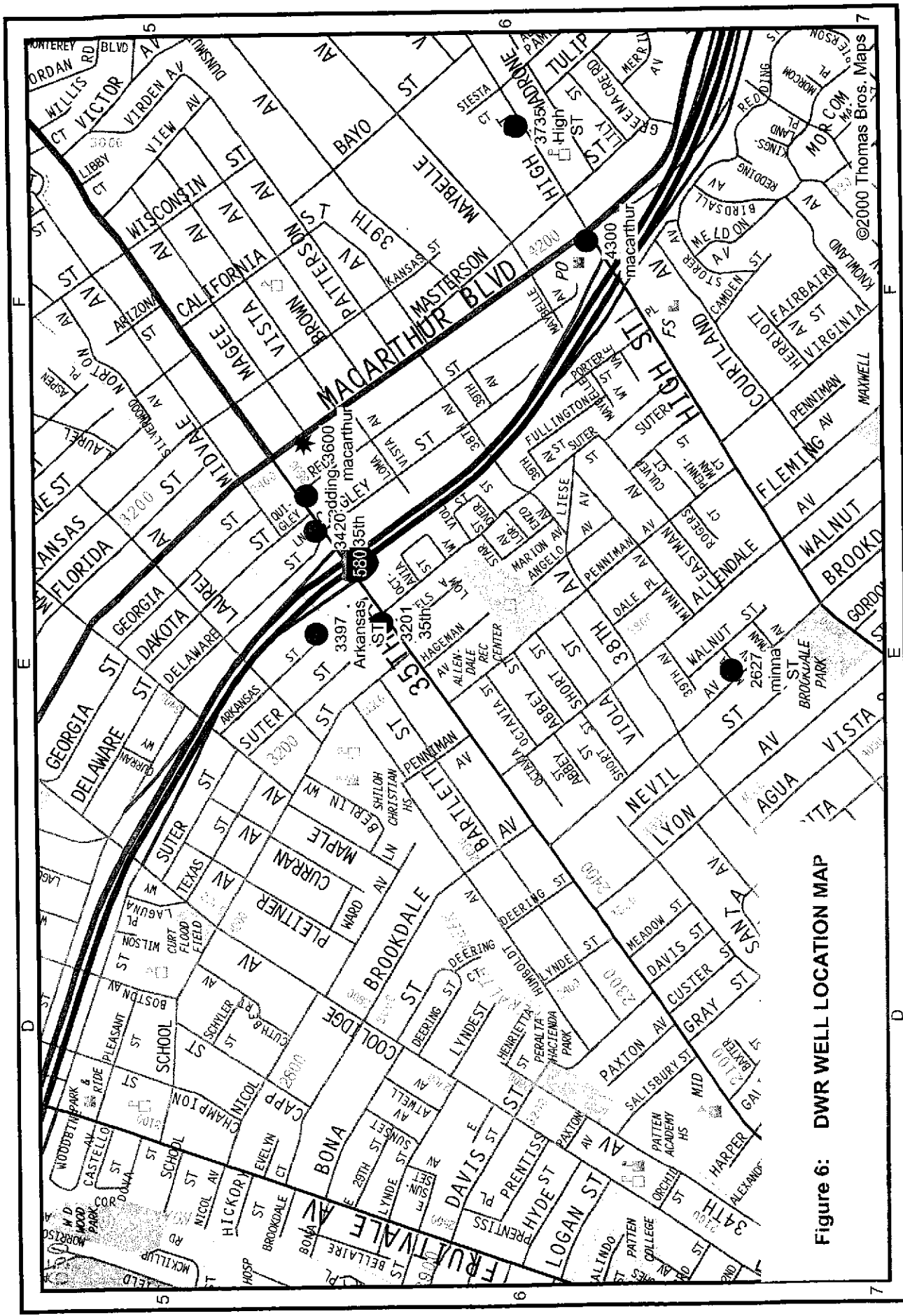
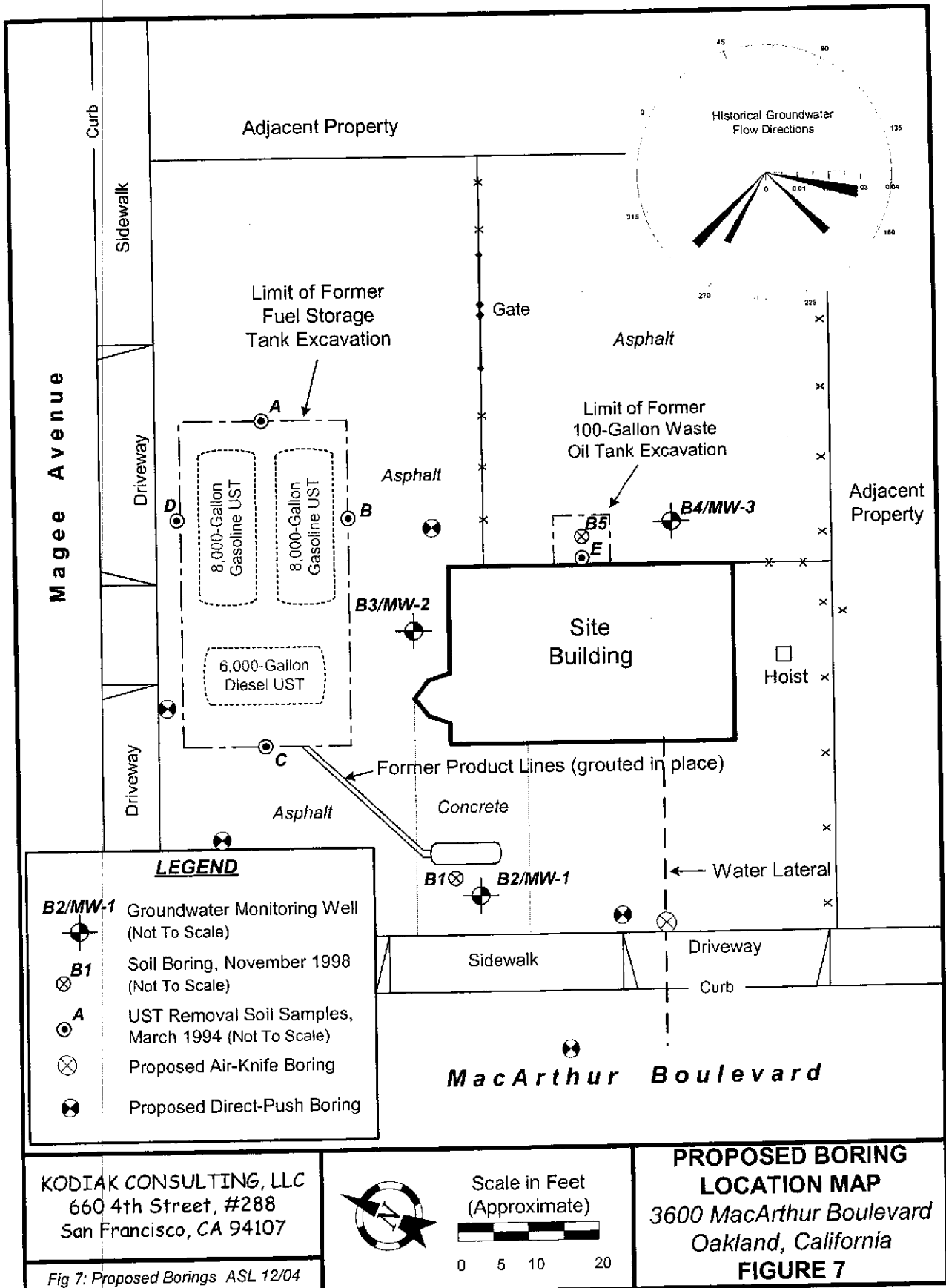


Figure 6: DWR WELL LOCATION MAP

- 2627 Minna St: 2627 Minna Av, Oakland, CA 94619, 650 E7
- Redding: 3501 Redding St, Oakland, CA 94619, 650 E5
- 3450 35th: 3450 35th Av, Oakland, CA 94602, 650 E5
- 3735 High St: 3735 High St, Oakland, CA 94619, 650 F6
- 3600 MacArthur: 3600 MacArthur Blvd, Oakland, CA 94619, 650 F5
- 3420 35th: 3420 35th Av, Oakland, CA 94602, 650 E5
- 4300 MacArthur: 4300 MacArthur Blvd, Oakland, CA 94619, 650 F6
- 3201 35th: 3201 35th Av, Oakland, CA 94602, 650 E6
- 3397 Arkansas St: 3397 Arkansas St, Oakland, CA 94602, 650 E5

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LEGEND

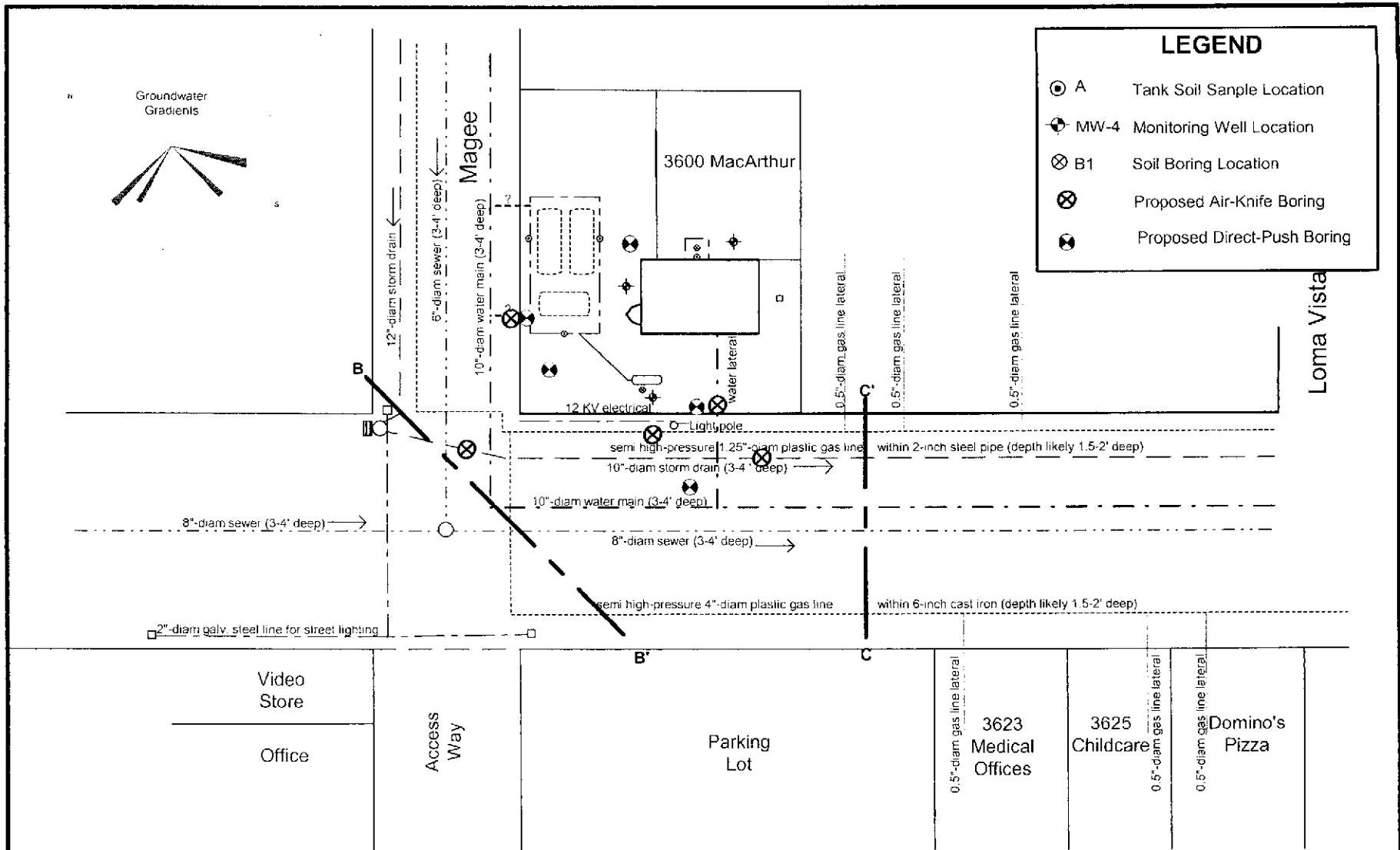
- B2/MW-1** Groundwater Monitoring Well (Not To Scale)
- B1** Soil Boring, November 1998 (Not To Scale)
- A** UST Removal Soil Samples, March 1994 (Not To Scale)
- Proposed Air-Knife Boring
- Proposed Direct-Push Boring

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 San Francisco, CA 94107

Scale in Feet (Approximate)

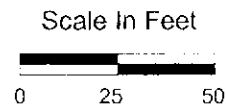
PROPOSED BORING LOCATION MAP
 3600 MacArthur Boulevard
 Oakland, California
FIGURE 7

Fig 7: Proposed Borings ASL 12/04



Source: Based on information obtained from North State Environmental

KODIAK CONSULTING, LLC
660 4th Street, #288
San Francisco, CA 94107



PROPOSED BORINGS LOCATION MAP 2

Scooter's Auto Repair
3600 MacArthur Boulevard
Oakland, California

FIGURE 8

Fig 8: Proposed Borings 2 ASL 12/04

Table 1.

**Soil Analytical Data
3600 MacArthur Boulevard, Oakland, California**

Sample No.	Date	Sample Depth (ft below grade)	TPH-G (mg/Kg)	TPH-D (mg/Kg)	TPH-MO (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl- benzene (mg/Kg)	Total Xylenes (mg/Kg)	MTBE (mg/Kg)	HVOCs (8010) (mg/Kg)	SVOCs (8270) (mg/Kg)
Tank A	3/31/1994	7.0	<0.5	<1	--	<0.005	<0.005	<0.005	<0.010	--	--	--
Tank B	3/31/1994	7.0	5,000	330	--	1.2	26	27	75	--	--	--
Tank C	3/31/1994	7.0	6	<1	--	0.013	0.047	0.035	0.18	--	--	--
Tank D	3/31/1994	7.0	2.3*	<1	--	<0.005	<0.005	<0.005	<0.010	--	--	--
Tank E	3/31/1994	5.0	1.4	<1	87(TEPH)	<0.005	0.012	0.038	0.081	--	<0.01	<1.7
B1	10/6/1998	7.0	37.0	24	<10	0.03	0.018	0.2	0.32	<0.005	--	--
	10/6/1998	12.0	<0.5	<1	<10	<0.005	<0.005	<0.005	<0.010	<0.005	--	--
B2	11/4/1998	4.5	23	42*	<10	0.054	0.065	1	2	<0.005	--	--
	11/4/1998	7.0	930	390*	<10	10	4	25	27	<0.125	--	--
	11/4/1998	10.0	10	4*	<10	0.11	<0.005	0.075	0.07	<0.005	--	--
B3	11/4/1998	4.5	1	<1	<10	<0.005	<0.005	0.075	<0.010	<0.005	--	--
	11/4/1998	7.0	33	8*	<10	0.32	0.03	<0.005	0.5	<0.005	--	--
	11/4/1998	10.0	<0.5	<1	<10	<0.005	<0.005	0.12	<0.010	<0.005	--	--
B4	11/4/1998	4.5	<0.5	4*	<10	<0.005	<0.005	<0.005	<0.010	<0.005	--	--
	11/4/1998	7.0	1	<1	<10	<0.005	<0.005	0.02	0.02	<0.005	--	--
	11/4/1998	10.0	1.0	<1	<10	<0.005	<0.005	<0.005	<0.010	<0.005	--	--
B5	11/4/1998	2.5	--	--	200	--	--	--	--	--	--	

Legend

mg/Kg: Milligrams per kilogram
 TPH-G: Total Petroleum Hydrocarbons as Gasoline
 TPH-D: Total Petroleum Hydrocarbons as Diesel
 TPH-MO: Total Petroleum Hydrocarbons as Motor Oil
 TPEH: Total Petroleum Extractable Hydrocarbons

MTBE (8020): Methyl Tertiary Butyl Ether analyzed using EPA Method 8020
 TOG = Total Oil and Grease
 *= Chromatogram did not match typical diesel pattern
 HVOCs: Halogenated volatile organic compounds by EPA Method 8010
 SVOCs: Semi-volatile organic compounds by EPA Method 8270

Table 2.

**Groundwater Monitoring and Analytical Data
3600 MacArthur Boulevard, Oakland, California**

Sample No.	Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	HVOCs (8010)	Oxygenates (8260)
TOC (ft above MSL)		(ft)	(ft above MSL)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Fuel Tank Cavity	3/31/1994	--	--	2,000	75,000	--	16	47	8	290.0	--	--	--
WO Tank Cavity	3/31/1994	--	--	600	6,900	--	0.6	2	5	56.0	--	ND	--
MW-1	11/12/1998	3.24	198.14	6,200	540	<50	420	47	<0.5	210	<0.5	--	--
201.38	4/6/1999	1.76	199.62	--	--	--	--	--	--	--	--	--	--
Screened 4-14 ft	4/9/1999	--	--	4,400	<50	--	320	33	240	240	<0.5*	--	--
	10/1/1999	6.51	194.87	2,800	190	--	290	20	190	46	<0.5*	--	--
	1/31/2000	1.88	199.50	--	--	--	--	--	--	--	--	--	--
	6/30/2000	2.96	198.42	4,100	--	--	260	69	320	510	<0.5*	--	<100
	7/14/2000	--	--	--	1,500**	--	--	--	--	--	--	--	--
MW-2	11/12/1998	2.85	199.02	<50	<50	<50	<0.5	<0.5	<0.5	<1	<0.5	--	--
201.87	4/6/1999	1.43	200.44	--	--	--	--	--	--	--	--	--	--
Screened 4-14 ft	4/9/1999	--	--	<50	<50	--	<0.5	<0.5	<0.5	<1	<0.5	--	--
	10/1/1999	3.29	198.58	<50	110	--	<0.5	<0.5	<0.5	<1	<0.5	--	--
	1/31/2000	1.61	200.26	--	--	--	--	--	--	--	--	--	--
	6/30/2000	2.74	189.13	130	--	--	0.7	<0.5	1.0	2.0	<0.5	--	--
	7/14/2000	--	--	--	<50	--	--	--	--	--	--	--	--
MW-3	11/12/1998	3.43	198.68	<50	<50	<50	<0.5	<0.5	<0.5	<1	<0.5	<5	--
202.11	4/6/1999	2.91	199.20	--	--	--	--	--	--	--	--	--	--
Screened 4-14 ft	4/9/1999	--	--	<50	<50	--	<0.5	<0.5	<0.5	<1	<0.5	--	--
	10/1/1999	8.42	193.69	<50	80	--	<0.5	<0.5	<0.5	<1	<0.5	--	--
	1/31/2000	1.12	200.99	--	--	--	--	--	--	--	--	--	--
	6/30/2000	1.83	200.28	<50	--	--	0.8	0.5	0.9	3	<0.5*	--	--
	7/14/2000	--	--	--	<50	--	--	--	--	--	--	--	--

Legend

(µg/L): Micrograms per liter
 TPH-G: Total Petroleum Hydrocarbons as Gasoline
 TPH-D: Total Petroleum Hydrocarbons as Diesel
 TPH-MO: Total Petroleum Hydrocarbons as Motor Oil

TPEH: Total Petroleum Extractable Hydrocarbons
 MTBE (8020): Methyl Tertiary Butyl Ether analyzed using EPA Method 8020
 TOG = Total Oil and Grease
 * = Confirmed by EPA Method 8260

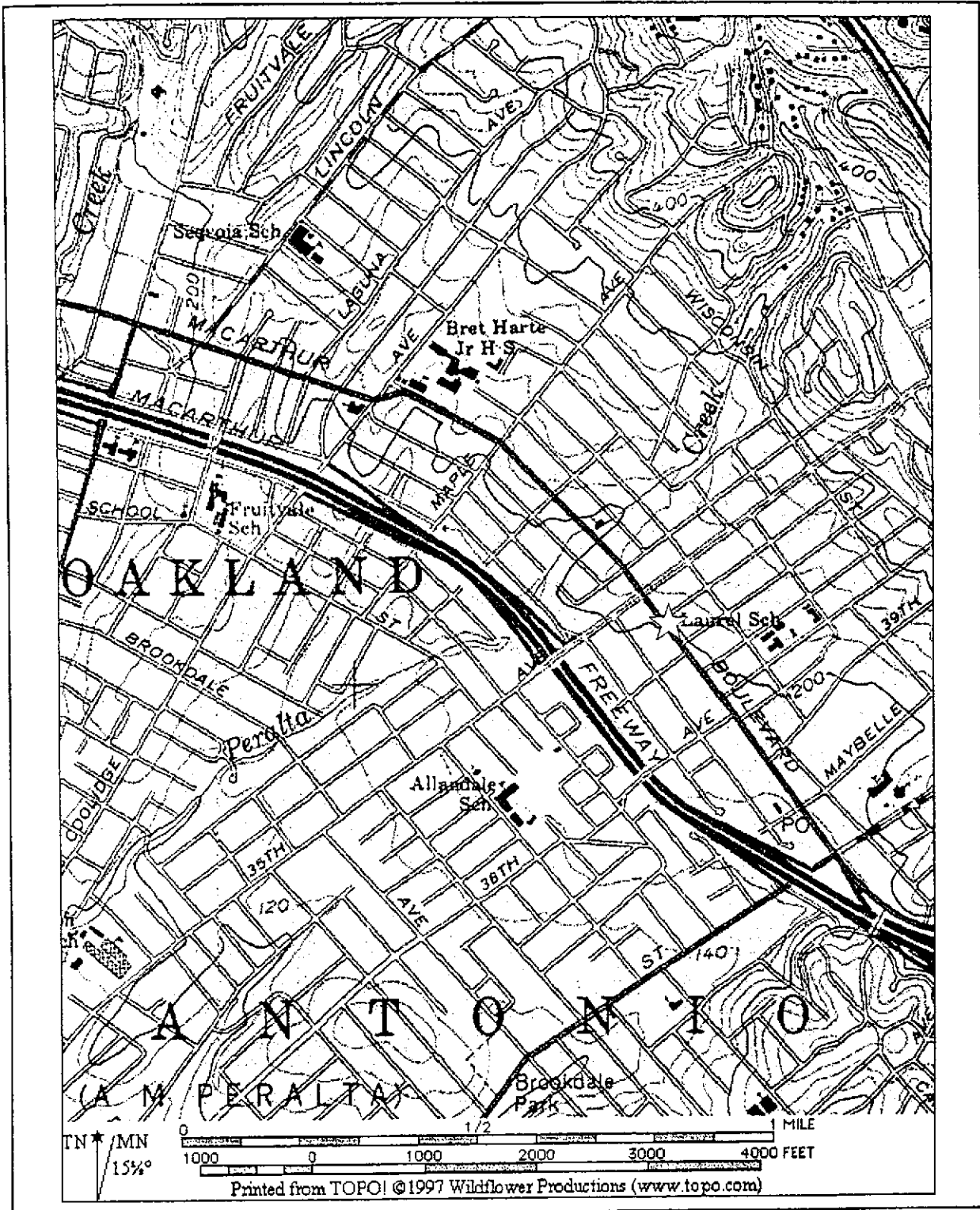
** = Chromatogram did not match typical diesel pattern
 HVOCs: Halogenated volatile organic compounds by EPA Method 8010
 SVOCs: Semi-volatile organic compounds by EPA Method 8270

Table 3.

**DWR Well Location Map
3600 MacArthur Boulevard, Oakland, California**

Well Location	Type of Well	Diameter (Inches)	Screen Interval (feet)	Depth to Water (feet)	Notes
3450 35th Street	Monitoring	4	25-45	31	
	Monitoring	4	25-45	31	
	Monitoring	4	25-45	31	
3201 35th Street	Monitoring	6	20-40	28	
	Monitoring	2	10-40	27	
	Monitoring	2.0	10-35	25	
	Monitoring	2	15-35	25	
	Monitoring	2	17-35	27	
	Monitoring	2.0	20-40	25	
	Monitoring	2	15-35	25	
	Monitoring	2	20-35	27	
3397 Arkansas Street	Irrigation	6	20-42	23	
4300 MacArthur Boulevard	Abandoned Monitoring	4	10-30	15	
	Abandoned Monitoring	4	6-30	21	
	Abandoned Monitoring	4	6.5-30.5	21	
	Abandoned Monitoring	4	6-30	17	
	Abandoned Monitoring	4	6-25	10	
	Monitoring	4	10-30	15	
	Monitoring	4	6-25	10	
	Monitoring	2	13-21	8	
	Monitoring	2	12-20	16	
Redding Street @ 35th	Cathodic Protection	NA	NA	NA	
3735 High Street	Abandoned Dug Well	?	7 feet deep?	?	According to notes it was a dig well that was cleared of bricks and debris and infilled with a concrete plug from 7 to 5 feet and topped to surface with debris and sand and then paved over
2627 Minna Street	Unknown Use	?	155 deep with 40 feet of screen	?	
3420 35th Street	Monitoring	2	20-43	35	
	Monitoring	2	20-44	35	
	Monitoring	2	20-44	35	

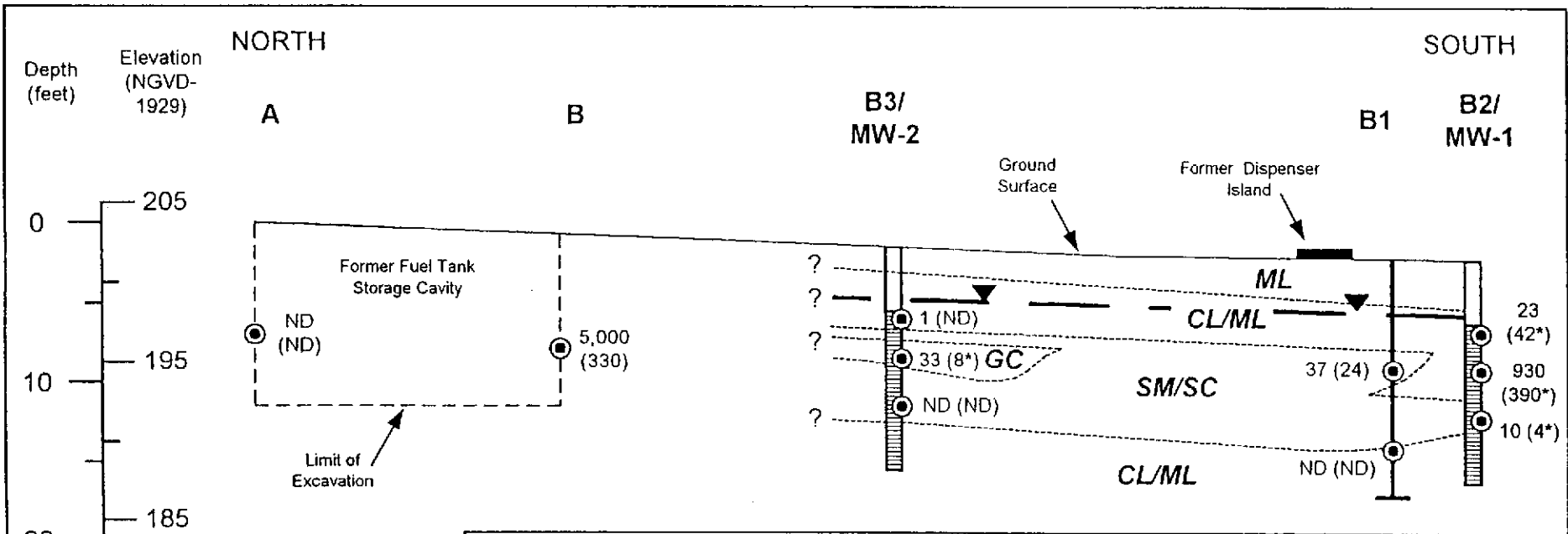
APPENDIX A
ADDITIONAL FIGURES



HK2, Inc./SEMCO
 70 Chemical Way
 Redwood City, CA 94063
 Project 97-0187.1
 FN: 97-0187.1.SC.F1 DRWG: BAW/7.98






★ SITE LOCATION


SITE LOCATION
 Scooter's Auto Repair
 3600 MacArthur Boulevard
 Oakland, California
FIGURE 1



NOTE: TPH-G = total petroleum hydrocarbons as gasoline; TPH-D = total petroleum hydrocarbons as diesel. ND = below lab reporting limits. * = chromatogram does not match typical diesel pattern. Refer to Tables 1 and 2 for additional soil sample laboratory results.

LEGEND

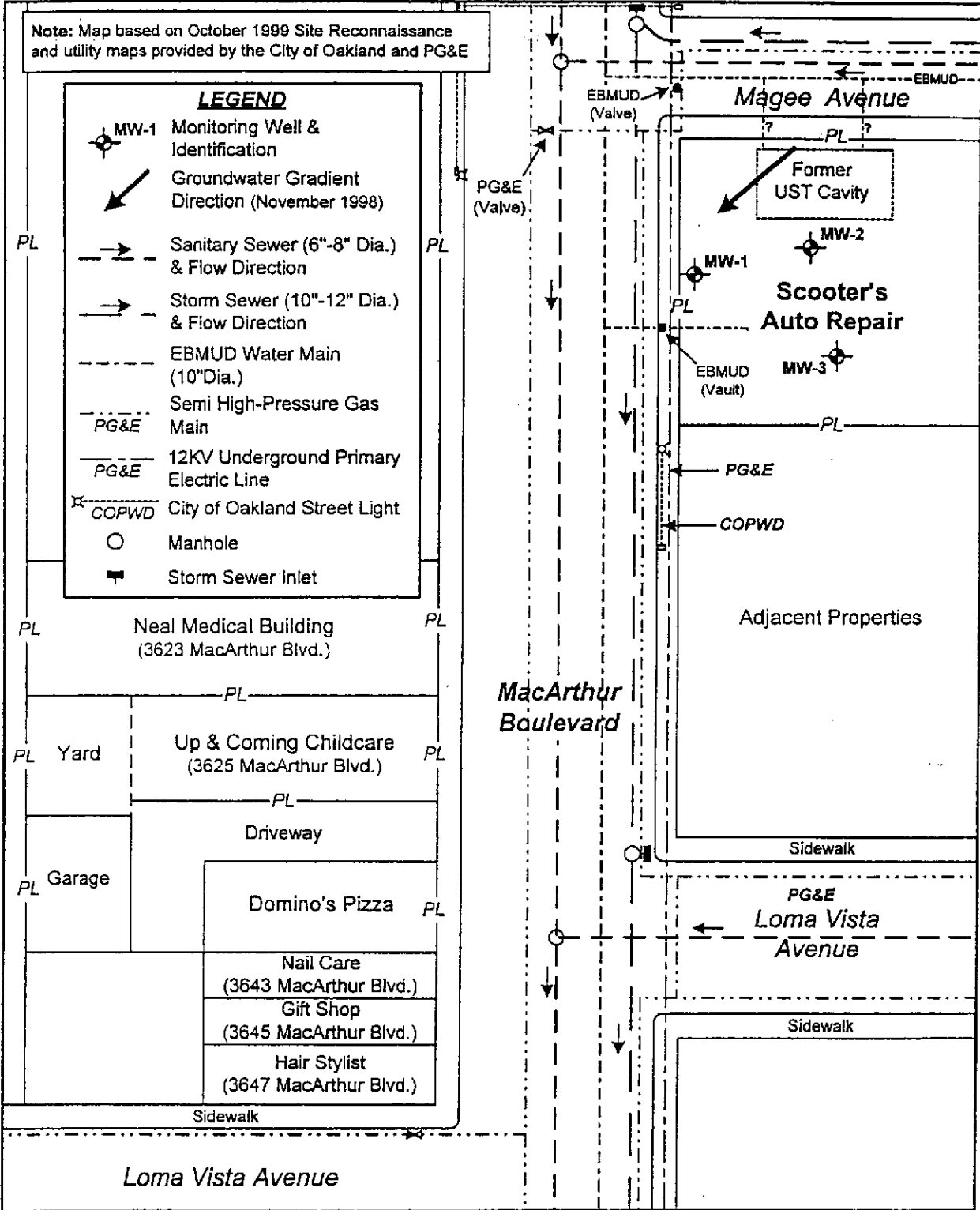
	Groundwater monitoring well showing slotted interval		Estimated depth to groundwater on November 12, 1998
	Boring		Soil sample showing TPH-G and (TPH-D) concentration in milligrams per kilogram
	Lithologic contact	ML	Clayey silt or sandy, clayey silt
ML	Clayey silt or sandy, clayey silt	SM/SC	Clayey, silty sand with gravel
CL/ML	Sandy, silty clay/clayey silt with sporadic fine gravel	GC	Silty, clayey gravel with sand

HK2, Inc./SEMCO 70 Chemical Way Redwood City, California Project 97-0131.1sc.F3	Horizontal and Vertical Scale (Feet)  0 2 5 10	CROSS-SECTION Scooter's Auto Repair 3600 MacArthur Boulevard Oakland, California FIGURE 3
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Note: Map based on October 1999 Site Reconnaissance and utility maps provided by the City of Oakland and PG&E

LEGEND

- MW-1 Monitoring Well & Identification
- Groundwater Gradient Direction (November 1998)
- Sanitary Sewer (6"-8" Dia.) & Flow Direction
- Storm Sewer (10"-12" Dia.) & Flow Direction
- EBMUD Water Main (10" Dia.)
- Semi High-Pressure Gas Main
- PG&E Main
- 12KV Underground Primary Electric Line
- City of Oakland Street Light
- Manhole
- Storm Sewer Inlet



North State Environmental
 90 So. Spruce Avenue, Ste. V
 So. San Francisco, CA 94080
 Fn:0022C.2q99.ss.F3 Dwg:baw 08/00

Scale in Feet (Approximate)

Underground Utility Map
 Scooter's Auto Repair
 3600 MacArthur Boulevard
 Oakland, California
Figure 3

APPENDIX B

STANDARD FIELD PROCEDURES FOR SOIL BORING INVESTIGATIONS AND GROUNDWATER SAMPLING

This document presents standard field methods for drilling and sampling soil borings and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. All soil borings will be drilled under supervision of a C-57 drilling contractor licensed by the State of California. Soil samples are collected at least every five feet to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4° C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile

hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves as required, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with bentonite-cement grout poured or pumped through a tremie pipe.

MONITORING WELL SAMPLING

Objectives

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two feet above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature, have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.