CERTIFIED
ENVIRONMENTAL
CORPORATION

July 20, 1993

REF: 92-221-1088.201

Ms. Susan L. Hugo
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 350
Oakland, CA 94621
(510) 271-4530
(510) 579-4757 FAX

SUBJECT: GROUNDWATER MONITORING WELL INSTALLATION AND SPOILS PILE REPORT FOR QUIK STOP MARKET #47, 6001 MACARTHUR BOULEVARD, OAKLAND, CA 94605

Dear Ms. Hugo:

Certified Environmental Consulting, Inc. (CEC) is pleased to submit our first Quarterly Groundwater Monitoring report for the above site. Groundwater monitoring wells were installed in three locations on May 25 and 26, 1993. The wells were developed and sampled on June 8, 1993. Analytical results were returned to this office on June 12, 1993. The groundwater extraction sump was abandoned on May 26 according to Zone 7 requirements.

Also included in this report are the most recent analytical results for the spoils stockpile located at 991 Vasco Road in Livermore. The soil was tilled again following the most recent sampling event. We believe the soil will be free of detectable hydrocarbons by the end of September.

Sincerely,

for David W. Janney
Project Geologist

Stanley L. Klemetson, Ph.D., P.E.
Exec. Vice President

Enclosure

cc: Mr. Michael Karvelot, Quik Stop Markets, Inc.
Mr. Richard Hiett, San Francisco Bay Regional Water Quality Control Board

3160 Crow Canyon Road
Suite 350
San Ramon, California 94583

Ofc (510) 867-0322
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(800) 447-0171

EXECUTIVE SUMMARY

Certified Environmental Corporation (CEC) supervised the installation of three, four-inch groundwater monitoring wells at the former Quick Stop Market #47 located at 6001 MacArthur Boulevard in Oakland, California. The twelve-inch groundwater extraction sump installed during the site excavation process was also abandoned according to Zone 7 requirements. Total Petroleum Hydrocarbons as Gasoline (TPH-G) and Diesel (TPH-D) were detected in the water samples collected from two of the wells. No Petroleum Hydrocarbons as Total Oil and Grease (TOG) were detected in the samples. Groundwater was calculated to be flowing to the south-southeast at a rate of 0.03 ft/day.

During site remediation in 1992, approximately 7,800 cubic yards of soil was transported from 6001 MacArthur Blvd. in Oakland to 991 Vasco Road, Livermore, California. Due to natural settling and compaction, this volume has been reduced to approximately 6,400 cubic yards. The spoils pile was randomly sampled for the presence of TPH-G, benzene, toluene, ethyl benzene, and xylenes (BTEX). Very low levels of these constituents were detected in 25 of the 32 samples collected.

INTRODUCTION

Site Location. The project site is located at 6001 MacArthur Boulevard, Oakland, California (Figure 1). The site is approximately 45 feet above mean sea level (MSL) and consists of approximately 10,000 square feet (Figure 2).

Statement of Work. The installation, development, and sampling of three groundwater monitoring wells is the most recent phase of the site investigation/cleanup activities. Prior site activities have included the excavation and transport of approximately 7,839 cubic yards of gasoline contaminated soil to a Quik Stop facility located at 991 Vasco Road in Livermore (Figure 3). The soil has been tilled periodically to allow the volatilization of contaminants.

Background. The site was a Richfield Oil Company gasoline station from approximately 1950 through 1970. The former Richfield station operator indicated the station had two 4,000-gallon, leaded gasoline underground storage tanks (USTs) and one 100-gallon waste oil UST. Quik Stop Markets, Inc. apparently removed the Richfield gasoline tanks and installed two 10,000-gallon, single wall, steel, asphalt wrapped USTs in approximately 1972.

The Quik Stop tanks were removed by SEMCO on April 14, 1992. They were observed to be in very good condition and free of holes and corrosion. The asphalt tank wrap was dissolved on the fillport ends of the tanks. Soil samples collected from the bottom of the excavation and from the spoils pile of excavated soil contained detectable hydrocarbons. Samples collected from the south end of the excavation contained significantly higher concentrations of TPH-G than samples collected from the north end (fillport end). High levels on the south end may have been related to the former Richfield tanks.

Contamination delineation drilling was performed on April 29 and May 21, 1992 by Bay Area Exploration of Cordelia, California. CEC supervised the drilling of ten holes to a maximum depth of 27 feet using a CME 55 drilling rig equipped with hollow stem augers and a modified California split spoon sampler.

Excavation of contaminated soil began on July 14, 1992 and continued until August 28, 1992. Approximately 7,839 cubic yards of soil were excavated. The soil was screened and determined to contain less than 1000 ppm TPH-G/BTEX, therefore it was classified as non-hazardous. Soil was transported to a Quik Stop property located at 991 Vasco Road, Livermore, California. It has been tilled periodically. The spoils pile has settled since it was deposited and it now contains approximately 6,400 cubic yards.

GENERAL VICINITY MAP

QUIK STOP MARKET #47

6001 MacArthur Blvd.

Oakland, CA

Oakland

LEGEND

FREEWAYS — INTERSTATE HWY. NUMBERS

MAIN HIGHWAYS — STATE HIGHWAY NUMBERS

UNDER CONSTR'N — OFFICIAL SCENIC HWY.

BART SYSTEM AND STATION — ONE WAY STREET — BLOCK NUMBERS

SCALE

FEET 0 1000 2000 3000 4000 5280 FEET

MILES 0 0.2 0.4 0.6 0.8 1.0 MILES

METERS 0 200 400 600 800 1000 METERS

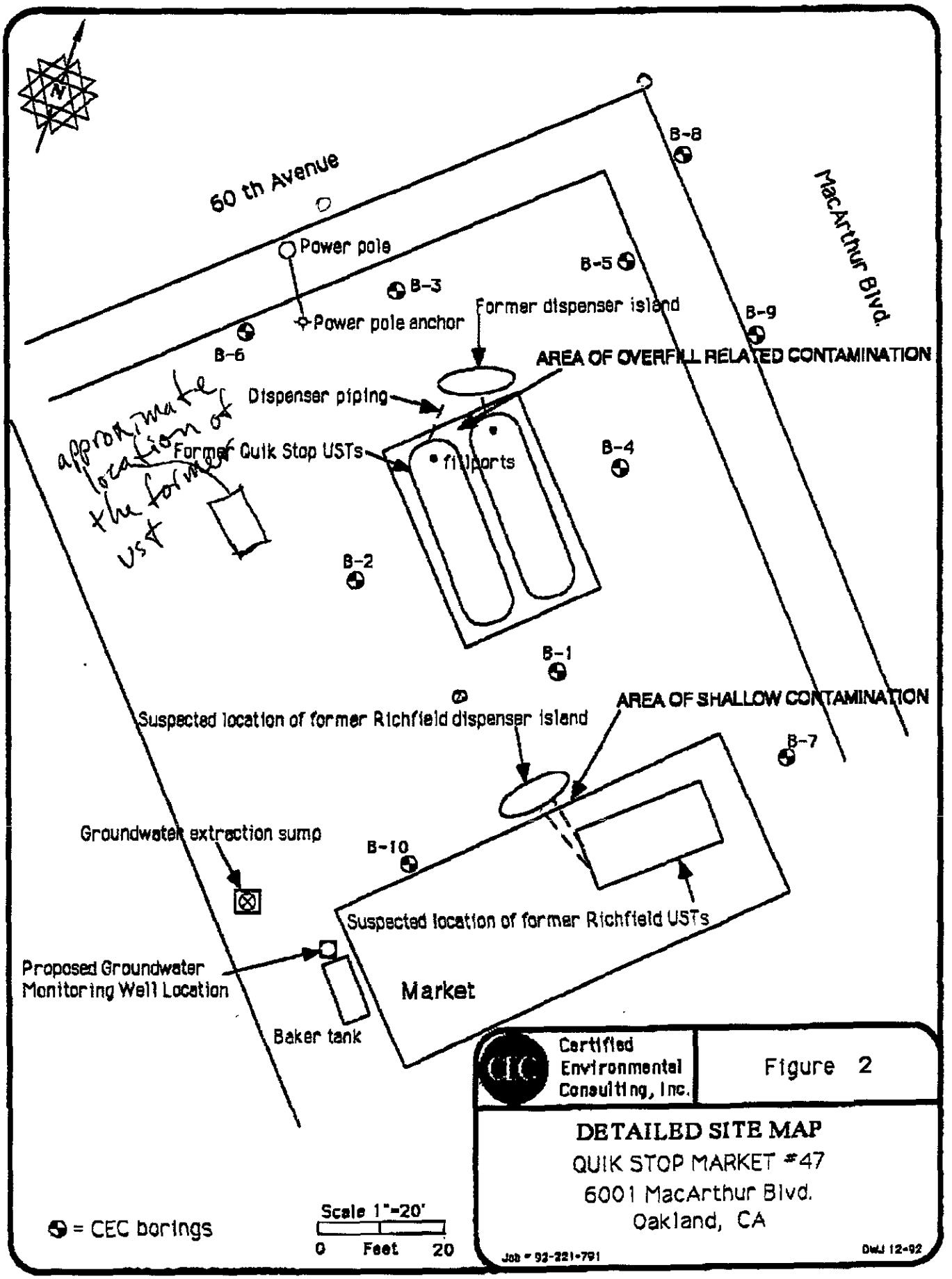
ONE KILOMETER = ⅝ MILE

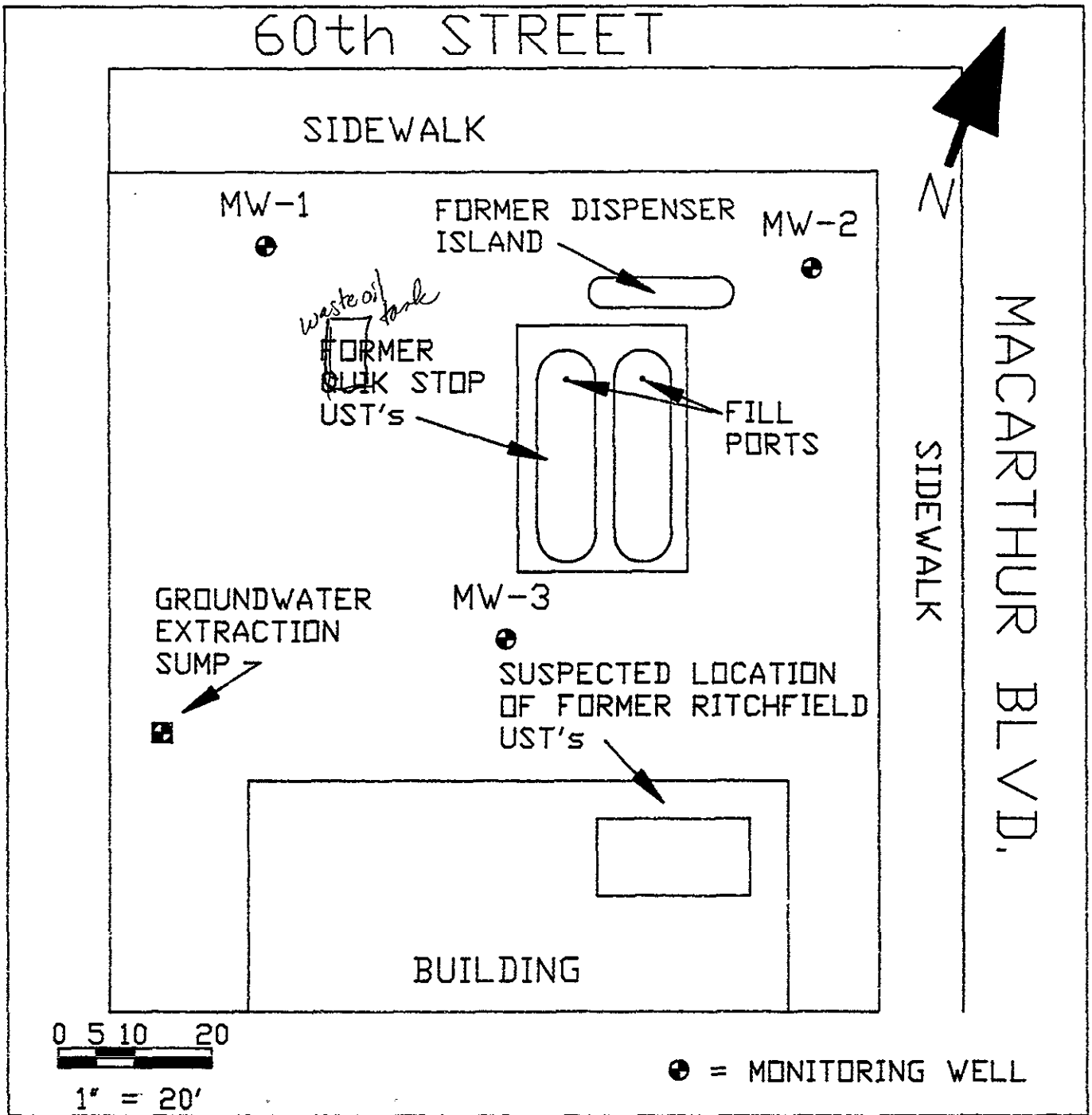
FIGURE 1

CERTIFIED ENVIRONMENTAL CONSULTING

356 STONE ROAD, SUITE J, BENICIA, CA 94510

(707) 745-0171 / (800) 228-0171 / (707) 745-0163 FAX


N
60 th Avenue
MacArthur Blvd.
Power pole
Power pole anchor
B-3
B-5
B-6
B-8
B-9
Former dispenser island
AREA OF OVERFILL RELATED CONTAMINATION
Dispenser piping
approximate location of the former UST
Former Quik Stop USTs
fillports
B-4
B-2
B-1
AREA OF SHALLOW CONTAMINATION
Suspected location of former Richfield dispenser island
B-7
Groundwater extraction sump
B-10
Suspected location of former Richfield USTs
Proposed Groundwater Monitoring Well Location
Market
Baker tank
= CEC borings
Scale 1"=20'
0 Feet 20
Certified Environmental Consulting, Inc.
Figure 2
DETAILED SITE MAP
QUIK STOP MARKET #47
6001 MacArthur Blvd.
Oakland, CA
Job # 93-221-791
DWG 12-93



QUIK STOP # 47
6001 MACARTHUR BLVD.
OAKLAND, CA
WELL LOCATIONS AND FORMER UST LOCATIONS

CERTIFIED ENVIRONMENTAL CONSULTING
356 STONE ROAD, SUITE J, BENICIA, CA 94510
(707) 745-0171 / (800) 228-0171 / (707) 745-0163 FAX

FIGURE 2

TABLE 1

Monitoring Well Installation Soil Analytical Results for Quick Stop Market #47 6001 MacArthur Boulevard, Oakland, CA

Well Number/ Depth Collected	TPH-G mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl Benzene mg/Kg	Xylenes mg/Kg
MW-1-22'	ND	ND	ND	ND	ND
MW-1-26'	ND	ND	ND	ND	ND
MW-2-21.5'	ND	ND	ND	ND	ND
MW-2-27.5	ND	ND	ND	ND	ND
MW-3-22.5	ND	ND	ND	ND	ND
MW-3-28.5	ND	ND	ND	ND	ND
Detection Limits	1.0	0.005	0.005	0.005	0.005

ND = Not Detected

TABLE 2

Groundwater Monitoring Well Analytical Results for Quik Stop Market #47 6001 MacArthur Boulevard, Oakland, CA

Well Number	Date Collected	Water Elevation**	TPH-D ug/L	TPH-G ug/L	Benzene ug/L	Toluene ug/L	Ethyl Benzene ug/L	Xylenes ug/L	Total Oil and Grease mg/L
MW-1	6/08/93	91.22'	240	ND	ND	ND	ND	ND	ND
MW-2	6/08/93	90.62'	300	73	ND	ND	0.62	0.94	ND
MW-3	6/08/93	89.68'	ND	ND	ND	ND	ND	ND	ND
Detection Limits			50	50	0.5	0.5	0.5	0.5	5
*California MCL's Primary			None	None	1.0	None	680	1750	None
California MCL's Secondary			None	None	None	40	30	20	None

* Marshack, J., B., 1991, A Compilation of Water Quality Goals, Staff Report, California Regional Water Quality Control Board, Central Valley Region

** On-site reference elevation, not surveyed to Mean Sea Level at this time

ND = Not Detected

GEOLOGY AND HYDROLOGY

Local Geology and Hydrology. In general, the local area is underlain by Late Quaternary age fine to coarse grained stream deposits. The deposits consist of weakly to strongly consolidated, poorly sorted, irregularly interbedded clay, silt, sand, and gravel (Helley and Lajoie, 1979). Locally, depth to groundwater ranges between 7 and 15 feet. Local groundwater flow direction varies from west to southeast and is strongly influenced by the steep topographic gradients east of the site.

Site Geology and Hydrology. Prior to performing the site remediation process, moist, dark yellow-brown, medium dense to stiff, lean clay (CL) with no plasticity to low plasticity was present from surface to approximately 12 feet bgs. In general, dark gray to dark brown, medium dense, silty to clayey gravel (GM-GC) was present below the lean clay to approximately 25 feet bgs. Between 12 and 25 feet bgs, clay generally comprises less than 15% of total soil volume. Groundwater was encountered between 12 and 16 feet bgs.

During our initial site investigation, groundwater was encountered at approximately 16 feet bgs. During the course of site excavation, standing water level in the excavation stabilized at approximately 18 feet bgs. During well installation, drilling water was encountered between 12 and 16 feet bgs and stabilized in the wells at between 8 and 12 feet bgs.

Monitoring wells were surveyed to a common site datum of 100' (MW-1). Our data indicates groundwater is flowing to the south-southeast with a gradient of 0.03 feet per foot. Groundwater flow calculations are presented in Appendix C.

SOIL REMEDIATION

Soil excavated from 6001 MacArthur was transported to a Quik Stop property located at 991 Vasco Road in Livermore. Soil was stockpiled on 10 mil plastic sheeting and spread to a uniform thickness of approximately four feet. The stockpile was temporarily covered by plastic sheeting. A four foot high straw bale retaining wall was erected around the perimeter of the plastic sheeting. Plastic sheeting was placed over the straw bale wall to prevent the escape of rainwater which might accumulate on the stockpile. An eight foot high chain-link fence was erected around the perimeter of the stockpile.

Approximately 20 cubic yards of contaminated soil was excavated below the waste-oil tank at Quik Stop #47. This soil was transported to 991 Vasco Road and stockpiled separately in the northwest corner of the lot (Figure 5). On April 1,1993, a four tube composite sample of the stockpile was collected, labeled and transported under chain of custody to McCampbell Analytical Laboratory of Pacheco, California. The sample was analyzed for TPH-G, TPH-D, BTEX and TOG. Analytical results are summarized in Table 3. Laboratory analytical sheets and the chain of custody appear in Appendix D.

During site remediation in 1992, approximately 7,800 cubic yards of soil were transported from 6001 MacArthur Blvd. in Oakland to 991 Vasco Road, Livermore, California. Due to natural settling and compaction during the past 10 months, this volume has been reduced to approximately 6,400 cubic yards. On May 21 and 22, 1993, the stockpile was divided into 32 equal segments containing approximately 200 cubic yards each (Figure 5). Soil samples were collected in brass tubes with a tube sampler/slide hammer from hand auger holes at depths ranging between one and three feet below the top of the pile. Following recovery, the ends of the sample tubes were covered with Teflon tape and plastic caps to prevent the loss of volatile constituents. The tubes were labeled and refrigerated on ice for transport under chain of custody to McCampbell Analytical Laboratory of Pacheco, California. The samples were analyzed for TPH-G and BTEX. Analytical results are summarized in Table 4. Laboratory analytical sheets and the chain of custody appear in Appendix D.

The aeration and sampling process will be repeated until no hydrocarbons are detected in the samples. We estimate the soil will be free of detectable hydrocarbons by August 1993. When free of hydrocarbons, the soil will be transported to a permanent disposal site, preferable within Alameda County.

TABLE 3

Analytical Results for Soil Sample from Waste Oil Tank
Spoils Pile (991 Vasco Rd., Livermore)
Quik Stop Market #47
6001 MacArthur Boulevard, Oakland, CA

Sample Number	Date Collected	Sample Location	TPH-G mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl Benzene mg/Kg	Xylenes mg/Kg	TPH-D mg/Kg	Total Oil and Grease mg/Kg
4193C	4/19/93	spoils	1.3	ND	ND	ND	ND	ND	110
Detection Limits			1.0	0.5	0.5	0.5	0.5	10	5

ND = Not Detected

CONCLUSIONS

A low concentration of gasoline (73 ppb) was detected in Monitoring Well MW-2. TPH-G/ BTEX in groundwater is limited to the northeast corner of the site. This may be residual and it is possible it can be removed by pumping the well. The source of the diesel detected in MW-1 and MW-2 has not been identified. The average concentration of diesel in groundwater is approximately 260 ppb along the 60th Avenue side of the site. Chromatograms for soil samples collected in the north wall of the remediation excavation did not indicate the presence of diesel. The Quik Stop tanks were never used for diesel storage. The former Richfield station operator was not aware of diesel storage in the Richfield tanks subsequent to 1968.

Diesel detected in groundwater may be migrating from an upgradient source. There were two service stations along MacArthur Boulevard (5885 and 5901 MacArthur) as early as 1950. Both are currently listed as leaking underground storage tank sites with the SFBRWQCB. Waste-oil has been detected in soil samples from both sites. Perchloroethylene (PCE) has been detected in soil samples from 5885 MacArthur. The former stations are approximately 325 feet from the Quik Stop site in the general upgradient direction. It is possible one of these stations stored diesel fuel in their underground tanks. Tanks may be present at these locations.

Oil and grease were not detected in any of the well water samples. This indicates groundwater was not impacted by the former waste-oil tank. Also, at the time of discovery/removal, there was no evidence of soil staining more than two feet below the bottom of the former waste-oil tank (five feet bgs).

Groundwater flow direction appears to be influenced by two Alameda County Flood Control storm drain lines. The lines have apparently created a shallow groundwater recharge mound northwest of the site. The I Line runs parallel to MacArthur Boulevard, within Mills College property, immediately northwest of the intersection of Camden and MacArthur. The I Line is uncontained, open to the surface and apparently flows year round. The J Line runs approximately parallel to Seminary Avenue within the Mills College property and exits the college at Mauritania Avenue. Within the college, this line is also uncontained and open to the surface. Leona Creek flows year round and enters the J line within college property. The J line enters an underground, concrete containment culvert near Mauritania Avenue and passes approximately 325 feet northwest of Quik Stop. This line runs beneath the service station formerly located at 5885 MacArthur Avenue. The J Line was uncontained and open to the surface along the backside of 5885 MacArthur as recently as 1969.

To the greatest practical extent, contaminated soil was removed from the property during site excavation in 1992. Contaminated soil remains only beneath the market building, immediately around the power pole and power pole anchor along the north side, and adjacent to the property boundaries on the north, east and west sides. While concentrations of selected samples from the sidewalls of the excavation exceeded 10 ppm TPH-G, the median sample contained less than 10 ppm TPH-G. Therefore, on the basis of all of the sidewall samples collected, the samples with greater than 10 ppm TPH-G represented inaccessible, small volumes, areas

RECOMMENDATIONS

Groundwater impact from gasoline appears to be minor. Gasoline and diesel contamination may be removed if we extract water from the contaminated wells. We recommend up to 1,500 gallons of water be extracted from MW-1 and MW-2. Following water extraction, the wells will be resampled for TPH-G/BTEX and TPH-D. The extracted water will be disposed of properly.

We will continue to monitor groundwater quality and flow direction for three additional quarters. However, we do not believe it is necessary to continue analyzing water samples for TOG.

We also recommend final disposal of the spoils pile located at 991 Vasco Road in Livermore when no leachable hydrocarbons are detected in soil samples from the pile.

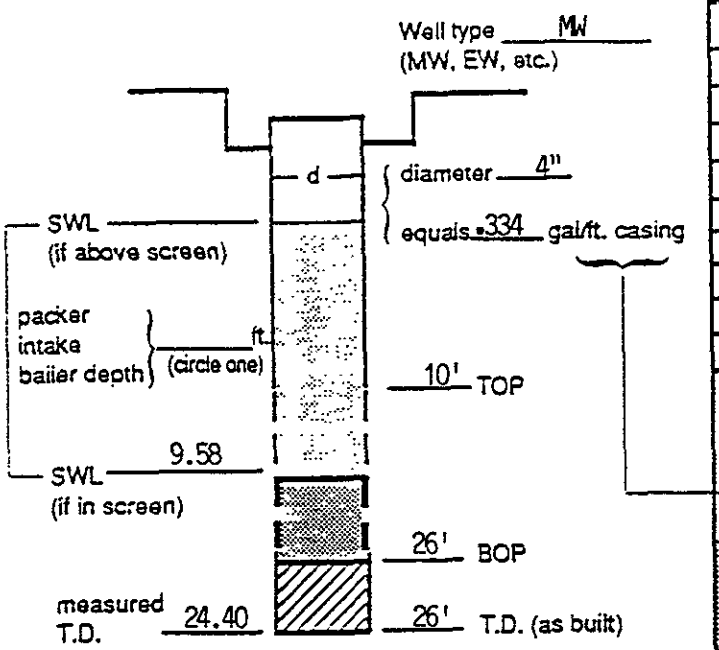
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-1

PROJECT Quik Stop #47 EVENT Well Development SAMPLER K. Bekker DATE 6-8-93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	3.07		
Surged 2nd Time	3.30		30 gallons
Re-started	3.45		
Stop	4.10		65 gallons
Sampled	4.45		
(Final IWL)	8.92		

Purge calculation

.334 gal/ft. • 14.82 ft. = 4.95 gals x 3 = 14.85 gals.

SWL to BOP or packer to BOP | one volume | purge volume-3 casings

Head purge calculation (Airlift only)

____ gal/ft. • ____ ft. = ____ gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

Two Stage Pump, Electric Water Level Sounder, Specific Conductance Meter/Ph Meter, Bailer, Gloves, 30' Teflon Sample Tubing, Pickup with tools, surger.

Actual gallons purged 65

Actual volumes purged 13

Well yield ⊕ ____
(see below)

COC # ____

Sample I.D.	Analysis	Lab

Additional comments:

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 0	79.3	17.24	10.49	> 200		
2. 15	75.3	14.10	7.10	> 200		
3. 25	74.1	14.23	7.77	58.6		
4. 40	73.9	13.9	9.46	84.8		
5. 60	73.8	13.32	7.97	24.1		

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

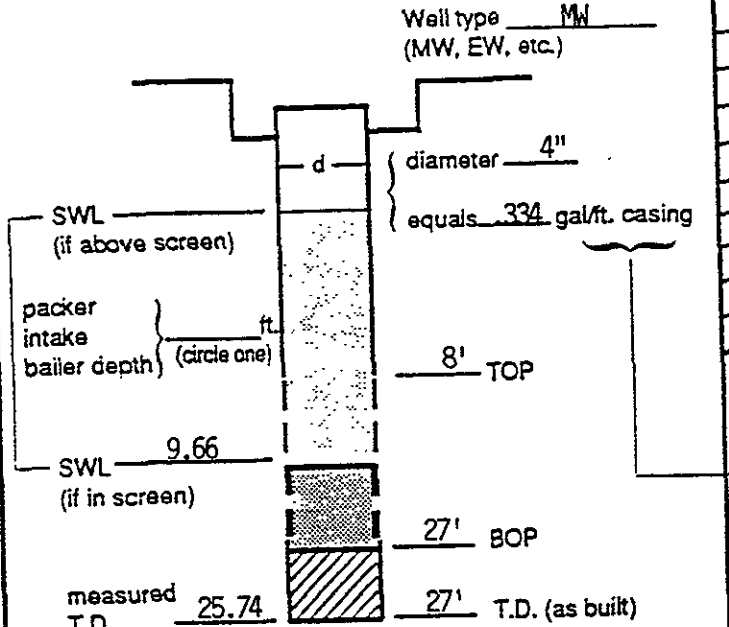
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-2

PROJECT Quik Stop #47 EVENT Well Development SAMPLER K. Bekker DATE 6-8-93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	6.30		
Surged 2nd Time	6.37		
	6.55		
	7.30		
Stop	7.58		
Sampled	8.10		
(Final IWL)	9.57		

Purge calculation

.334 gal/ft. (SWL to BOP or packer to BOP) • 16.08 ft. (one volume) = 5.37 gals x 3 = 16.11 gals. (purge volume- 3 casings)

Head purge calculation (Airlift only)

_____ gal/ft. (packer to SWL) • _____ ft. = _____ gals.

Equipment Used / Sampling Method / Description of Event:

Two Stage Pump, Electric Water Level Sounder, Specific Conductance Meter/Ph Meter, Bailer, Gloves, 30' Teflon Sample Tubing, Pickup with tools, surger.

Actual gallons purged 50

Actual volumes purged 9

Well yield ⊕ (see below) _____

COC # _____

Sample I.D.	Analysis	Lab

Additional comments:

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 0	74.6 °	9.97	7.94	-		
2. 10	71.7 °	8.90	7.58	-		
3. 25	68.4 °	7.25	8.14	-		
4. 40	67.2 °	6.93	8.05	-		
5. 50	67.4 °	6.93	7.94	-		

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

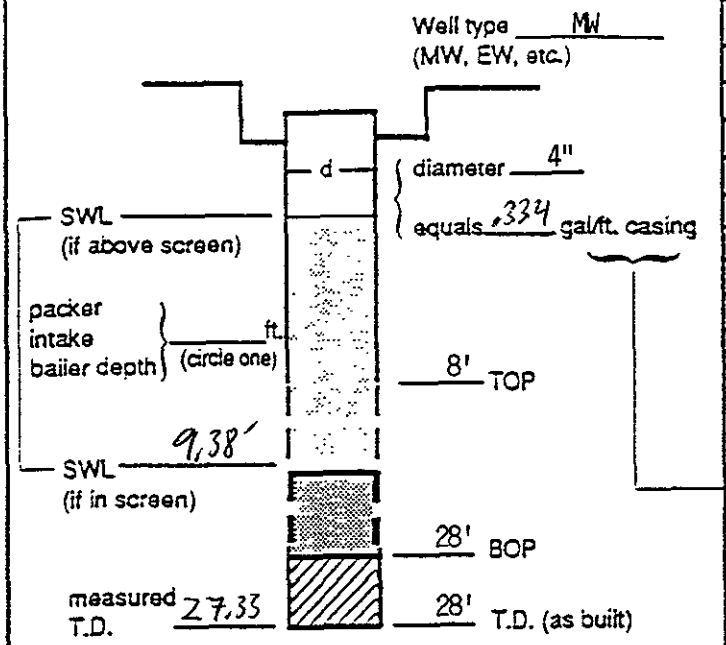
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-3

PROJECT Quik Stop #47 EVENT Well Development SAMPLER K. Bekker DATE 6-8-93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	4.45		
Surged 2nd Time	4.50		
	5.34		
	5.55		
Stop			
Sampled	6.25		
(Final IWL)	9.44		

Purge calculation

.334 gal/ft. • 17.95 ft. = 5.99 gals x 3 = 17.98 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. • ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

Two Stage Pump, Electric Water Level Sounder, Specific Conductance Meter/Ph Meter, Bailer, Gloves, 30' Teflon Sample Tubing, Pickup with tools, surger.

Actual gallons purged 30

Actual volumes purged 5

Well yield ⊕ _____
(see below)

COC # _____

Sample I.D.	Analysis	Lab

Additional comments:

Gallons purged *		TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1.	0	75.7°	7.85	8.62	147		
2.	10	71.1°	5.57	8.15	130		
3.	15	71.4°	5.51	8.09	-		
4.	20	70.8°	5.10	8.05	-		
5.	30	70.7°	4.48	7.96	-		

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

DATE: 6-9-93

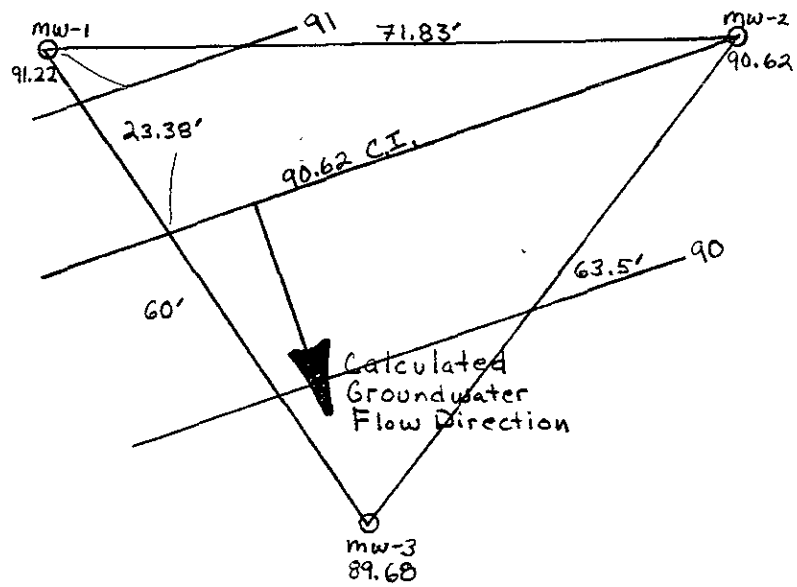
PAGE 1 OF 1

FIELD SURVEY RECORD

CLIENT Quik Stop Markets, Inc. LOCATION Quik Stop #47, 6001 MacArthur Blvd., Oakland, CA

SURVEYORS J. Robbins & K. Bekker WEATHER Sunny

STATION	BACK SIGHT	HI	FORE SIGHT	ELEVATION	WATER DEPTH	WATER ELEVATION
1	517	105.17		100.00	8.78	91.22
2			5.07	100.08	9.46	90.62
3			6.13	99.04	9.36	89.68



$\frac{91.22-90.62}{x} = \frac{91.22-89.68}{60\,ft}$

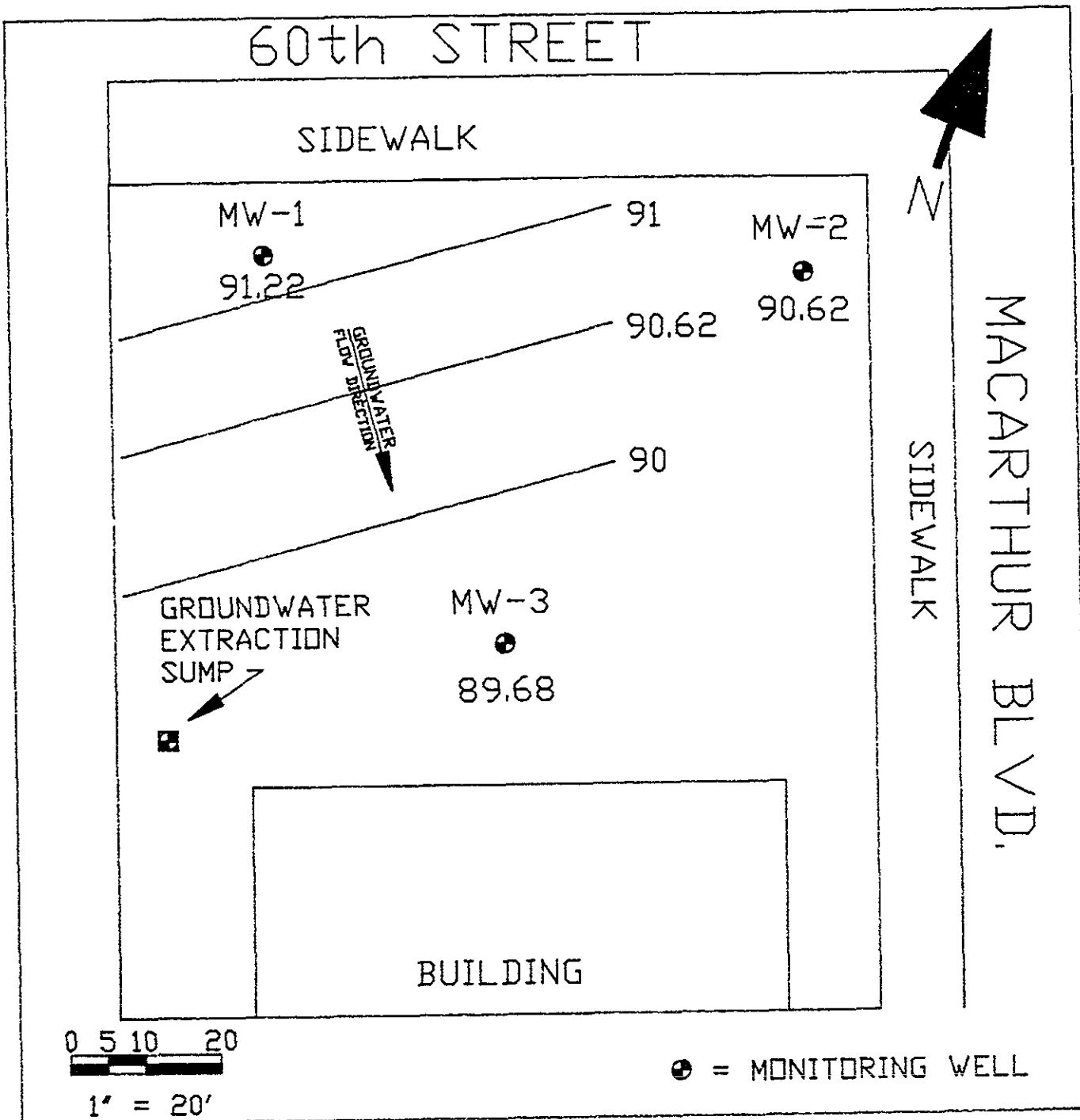
$x = 23.38\,ft$

$\frac{90.62-89.68}{35.5}$

$= \frac{0.03\,ft.}{ft.}$

0 FEET 20

Scale 1" = 20'



QUIK STOP # 47
6001 MACARTHUR BLVD.
OAKLAND, CA
WELL LOCATIONS, GROUNDWATER FLOW DIRECTION, AND RELATIVE GROUNDWATER CONTOUR INTERVALS

CERTIFIED ENVIRONMENTAL CONSULTING
356 STONE ROAD, SUITE J, BENICIA, CA 94510
(707) 745-0171 / (800) 228-0171 / (707) 745-0163 FAX

FIGURE 4

F I E L D L O G SHEET 1 OF 1

LOCATION OF BORING: FROM NW CORNER OF PROPERTY LINE: 10' SOUTH 20' EAST	PROJECT NO. & PROJECT NAME: 93-221-1088 QUIK STOP #47	PROJECT LOCATION: 6001 MACARTHUR OAKLAND, CA
	CLIENT: QUIK STOP MARKETS, INC.	DRILL HOLE NO. MW-1
SURFACE CONDITIONS: ASPHALT	DRILLING CO./FOREMAN: SOILS EXPLORATION	DRILLING DATE/TIME START: 5/25/93
	DRILLING METHOD/RIG MODEL: 10" HS AUGERS/CME-55	
	SAMPLING METHOD(S): CA MODIFIED SPLIT SPOON	END: 5/25/93
	SEC - TOWNSHIP - RANGE	ELEVATION - DATUM -
WATER LEVEL 16.0' DATE 5/25/93 TIME	GEOLOGIST: HERB HIRSCHFELD	GEOPHYS. LOGS: NONE
		TOTAL DEPTH -

LABORATORY	SAMPLES	C-O-C NO.	C-O-C RELEASE DATE/TIME	OTHER

DEPTH FEET	SAMPLE TYPE & NUMBER	SPT	U.S. CLASS	NAME	DENSE	COLOR	MOIST	DESCRIPTION AND REMARKS
--			SC	clayey sand	slightly dense	yellowish brown (10 YR 4/6)	dry to saturated at 16'	0' - 21.5' clayey sand backfill material; fine to coarse sand; angular gravel to 1.5 inches in diameter.
-- 4								
--								
--								
-- 10								
--								
--								
--								
--								
-- 20								21.5' - 25.75' clayey gravel; subangular to subrounded gravel; approx. 35% gravel.
--	MW-1-22		GC	clayey gravel	loose	strong brown (7.5 YR 4/6)	saturated	
--								25.75' - 27.5' sandy clay
--	MW-1-26.5		CL	sandy clay	high plasticity	brown (10 YR 5/3)	moist	27.5' Total Depth
--								
-- 30								
--								

F I E L D L O G SHEET 1 OF 1

LOCATION OF BORING: FROM NE CORNER OF PROPERTY LINE: 12' SOUTH 9' WEST	PROJECT NO. & PROJECT NAME: 93-221-1088 QUIK STOP #47	PROJECT LOCATION: 6001 MACARTHUR OAKLAND, CA
	CLIENT: QUIK STOP MARKETS, INC.	DRILL HOLE NO. MW-2
SURFACE CONDITIONS: ASPHALT	DRILLING CO./FOREMAN: SOILS EXPLORATION	DRILLING DATE/TIME START: 5/25/93
	DRILLING METHOD/RIG MODEL: 10" HS AUGERS/CME-55	END: 5/25/93
	SAMPLING METHOD(S): CA MODIFIED SPLIT SPOON	
	SEC - TOWNSHIP - RANGE	ELEVATION - DATUM -
WATER LEVEL 12.0' DATE 5/25/93 TIME	GEOLOGIST: HERB HIRSCHFELD	GEOPHYS. LOGS: NONE TOTAL DEPTH -

LABORATORY	SAMPLES	C-O-C NO.	C-O-C RELEASE DATE/TIME	OTHER

DEPTH FEET	SAMPLE TYPE & NUMBER	SPT	U.S. CLASS	NAME	DENSE	COLOR	MOIST	DESCRIPTION AND REMARKS
–			SC	clayey sand	slightly dense	yellowish brown (10 YR 4/6)	dry to saturated at 12'	0' - 21.5' clayey sand backfill material; fine to coarse sand; angular gravel to 1.5 inches in diameter.
– 4								
– 10								
– 20								
–	MW-2-21.5		GC	clayey gravel	loose	strong brown (7.5 YR 4/6)	saturated	21.5' - 27.5' clayey gravel; subangular to subrounded gravel.
–	MW-2-27.5		CL	sandy clay	medium plasticity	brown (10 YR 5/3)	slightly moist	27.5' - 29' sandy clay.
– 30								29' Total Depth

F I E L D L O G SHEET 1 OF 1

LOCATION OF BORING: 33' EAST OF NW BUILDING CORNER 18' NORTH OF BUILDING	PROJECT NO. & PROJECT NAME: 93-221-1088 QUIK STOP #47	PROJECT LOCATION: 6001 MACARTHUR OAKLAND, CA
	CLIENT: QUIK STOP MARKETS, INC.	DRILL HOLE NO. MW-3
SURFACE CONDITIONS: ASPHALT	DRILLING CO./FOREMAN: SOILS EXPLORATION	DRILLING DATE/TIME START: 5/26/93
	DRILLING METHOD/RIG MODEL: 10" HS AUGERS/CME-55	END: 5/26/93
	SAMPLING METHOD(S): CA MODIFIED SPLIT SPOON	
	SEC - TOWNSHIP - RANGE	ELEVATION - DATUM - TOTAL DEPTH -
WATER LEVEL 12.0' DATE 5/26/93 TIME	GEOLOGIST: HERB HIRSCHFELD	GEOPHYS. LOGS: NONE

LABORATORY	SAMPLES	C-O-C NO.	C-O-C RELEASE DATE/TIME	OTHER

DEPTH FEET	SAMPLE TYPE & NUMBER	SPT	U.S. CLASS	NAME	DENSE	COLOR	MOIST	DESCRIPTION AND REMARKS
–			SC	clayey sand	slightly dense	yellowish brown (10 YR 4/6)	dry to saturated at 12'	0' - 21.5' clayey sand backfill material; fine to coarse sand; angular gravel to 1.5 inches in diameter.
– 4								
–								
–								
– 10								
–								
–								
–								
–								
– 20								
–	MW-3-22.5		GC	clayey gravel	loose	strong brown (7.5 YR 4/6)	saturated	21.5' - 24.5' clayey gravel; subangular to subrounded gravel.
–			GM	silty gravel	loose	brown & gray (10 YR 5/3) and (10 YR 5/1)	saturated	24.5' - 28.0' silty gravel; subangular to subrounded gravel to 3/4 inches in diameter.
–	MW-3-28.5		CL/CH	sandy clay	high plasticity	brown (10 YR 5/3)	moist	28.0' - 29' sandy clay.
– 30								29' Total Depth
–								

CERTIFIED ENVIRONMENTAL CORPORATION

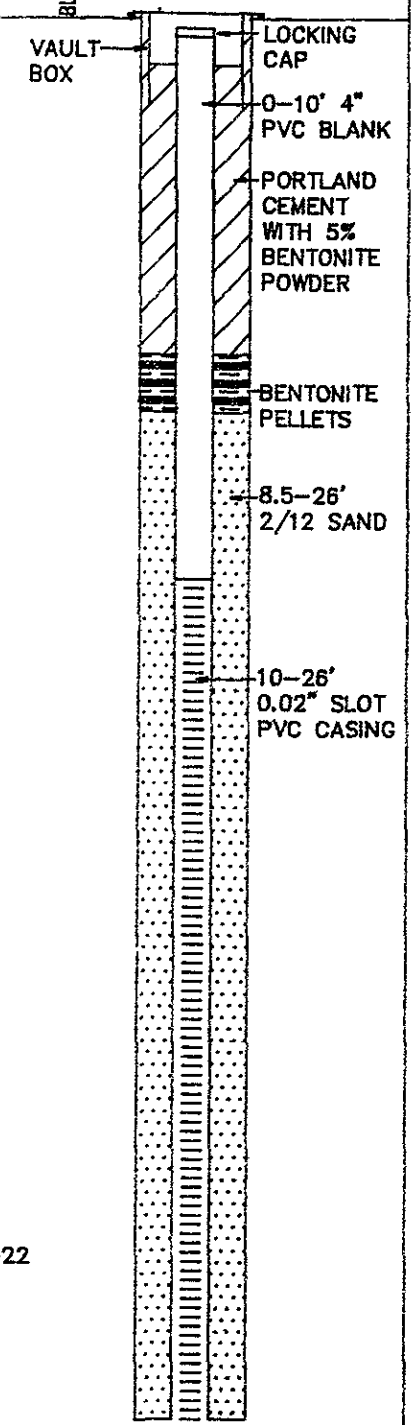
WELL/BORING NO. MW-1 PAGE 1

PROJECT QUIK STOP #47
PROJECT NO. 93-221-1088
LOCATION 6001 MACARTHUR, OAKLAND, CA
DATE/TIME DRILLED 5/25/93
SCREEN TYPE PVC INTERVAL 10-26'
FILTER PACK TYPE 2/12 SAND INTERVAL 8.5-26'
SURFACE SEAL TYPE BENT. CHIPS INTERVAL 7.5-8.5'

LOGGED BY HERB HIRSCHFELD
DRILLING METHOD HOLLOW STEM CME-55
SAMPLING METHOD MOD. CALIFORNIA SPLIT SPOON
DRILLING CO./FOREMAN SOILS EXPLORATION SERVICE
CASING DIA. 4 IN. SLOT SIZE 0.02"
INITIAL WATER LEVEL FINAL WATER LEVEL
BOREHOLE DIA. 10 IN. TOTAL DEPTH 27.5'

DESCRIPTION	USGS	GRAPHIC LOG	SAMPLE	BLOWS/6"
0-21.5' CLAYEY SAND BACKFILL MATERIAL, FINE TO COARSE SAND, ANGULAR GRAVEL TO 1.5" DIAMETER	SC			
21.5-25.75' CLAYEY GRAVEL; SUBANGULAR TO SUBROUNDED GRAVEL; APPROX. 35% GRAVEL	GC		MW-1-22	

WELL DIAGRAM



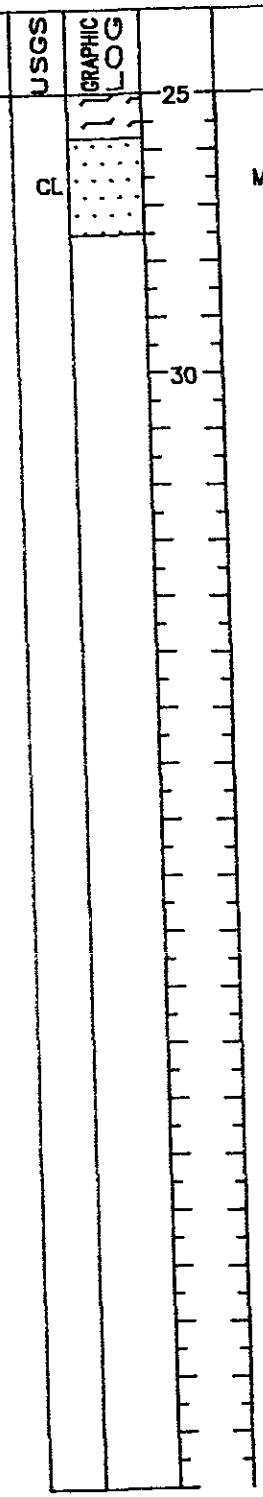
CERTIFIED ENVIRONMENTAL CORPORATION

WELL/BORING NO. MW-1 PAGE 2

PROJECT QUIK-STOP #47
PROJECT NO. 93-221-1088
LOCATION 6001 MACARTHER, OAKLAND, CA
DATE/TIME DRILLED 5/25/93
SCREEN TYPE PVC INTERVAL 10-26'
FILTER PACK TYPE 2/12 SAND INTERVAL 8.5-26'
SURFACE SEAL TYPE BENT. CHIPS INTERVAL 7.5-8.5'

LOGGED BY HERB HIRSCHFELD
DRILLING METHOD 10" HS AUGERS/CME-55
SAMPLING METHOD CA MODIFIED SPLIT SPOON
DRILLING CO./FOREMAN SOILS EXPLORATION
CASING DIA. 4" SLOT SIZE 0.02"
INITIAL WATER LEVEL ____ FINAL WATER LEVEL ____
BOREHOLE DIA. 10" TOTAL DEPTH 27.5'

DESCRIPTION	USGS	GRAPHIC LOG	SAMPLE	WELL DIAGRAM
25.75-27.5' SANDY CLAY	CL		MW-1-26.5	BENTONITE PELLETS
27.5' TOTAL DEPTH				



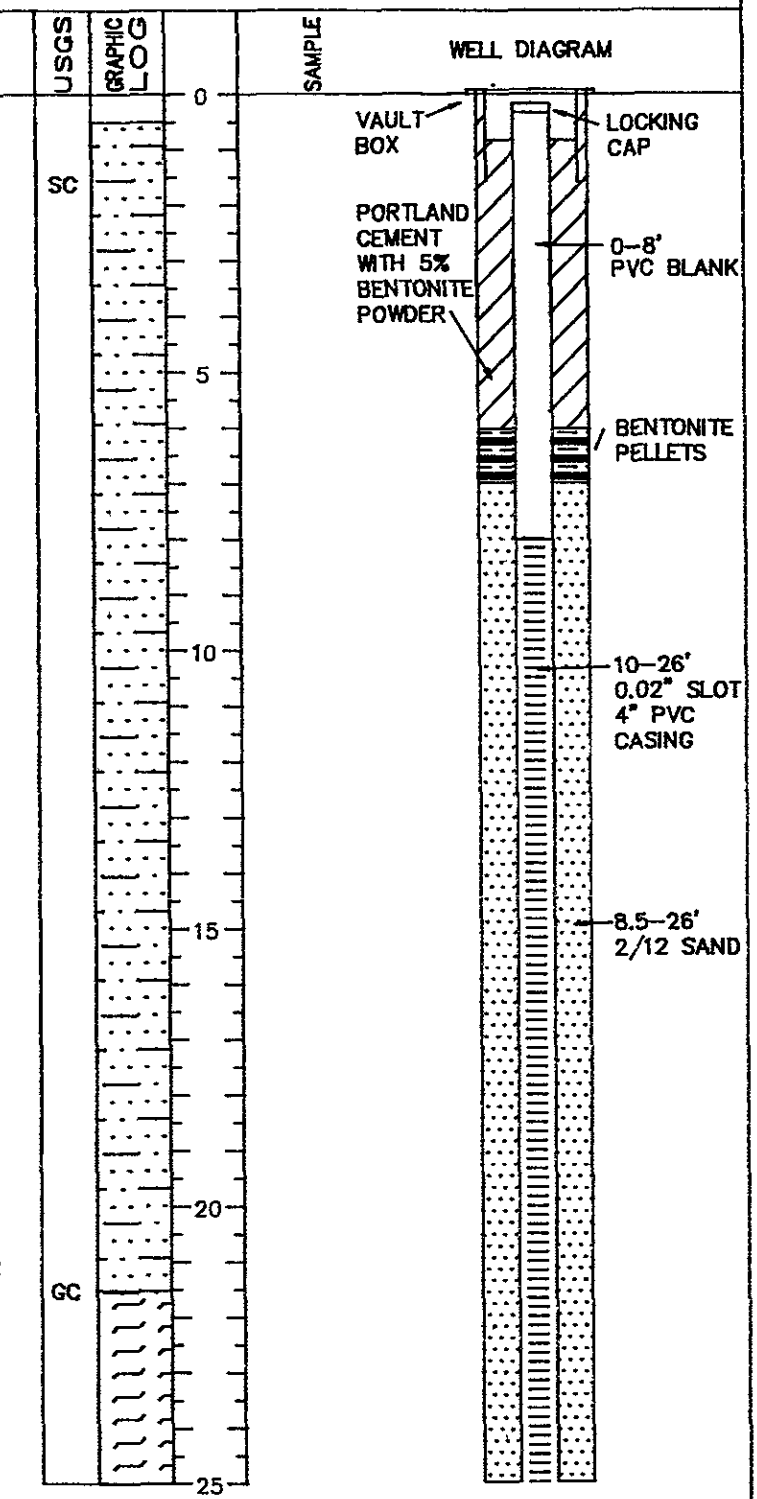
CERTIFIED ENVIRONMENTAL CORPORATION

WELL/BORING NO. MW-2 PAGE 1

PROJECT QUIK STOP #47
PROJECT NO. 93-221-1088
LOCATION 6001 MACARTHUR, OAKLAND, CA
DATE/TIME DRILLED 5/25/93
SCREEN TYPE PVC INTERVAL 8-27'
FILTER PACK TYPE 2/12 SAND INTERVAL 7-27'
SURFACE SEAL TYPE BENT. CHIPS INTERVAL 6-7'

LOGGED BY HERB HIRSCHFELD
DRILLING METHOD HOLLOW STEM CME-55
SAMPLING METHOD MOD. CALIFORNIA SPLIT SPOON
DRILLING CO./FOREMAN SOILS EXPLORATION
CASING DIA. 4 IN. SLOT SIZE 0.02"
INITIAL WATER LEVEL ____ FINAL WATER LEVEL ____
BOREHOLE DIA. 10 IN. TOTAL DEPTH 29'

DESCRIPTION	USGS	GRAPHIC LOG	SAMPLE
0-21.5' CLAYEY SAND BACKFILL MATERIAL, FINE TO COARSE SAND, ANGULAR GRAVEL TO 1.5" DIAMETER	SC		
21.5' - 27.5' CLAYEY GRAVEL; SUBANGULAR TO SUBROUNDED GRAVEL	GC		



WELL DIAGRAM

CERTIFIED ENVIRONMENTAL CORPORATION

WELL/BORING NO. MW-2 PAGE 2

PROJECT QUIK-STOP #47
PROJECT NO. 93-221-1088
LOCATION 6001 MACARTHER, OAKLAND, CA
DATE/TIME DRILLED 5/25/93
SCREEN TYPE PVC INTERVAL 8-27'
FILTER PACK TYPE 2/12 SAND INTERVAL 7-27.5'
SURFACE SEAL TYPE BENT. CHIPS INTERVAL 6-7'

LOGGED BY HERB HIRSCHFELD
DRILLING METHOD 10" HS AUGERS/CME-55
SAMPLING METHOD CA MODIFIED SPLIT SPOON
DRILLING CO./FOREMAN SOILS EXPLORATION
CASING DIA. 4" SLOT SIZE 0.02"
INITIAL WATER LEVEL ____ FINAL WATER LEVEL ____
BOREHOLE DIA. 10" TOTAL DEPTH 29'

DESCRIPTION	USGS	GRAPHIC LOG	SAMPLE	WELL DIAGRAM
27.5' – 29' SANDY CLAY	CL	25	MW-2-27.5	BENTONITE PELLETS
29' TOTAL DEPTH		30		

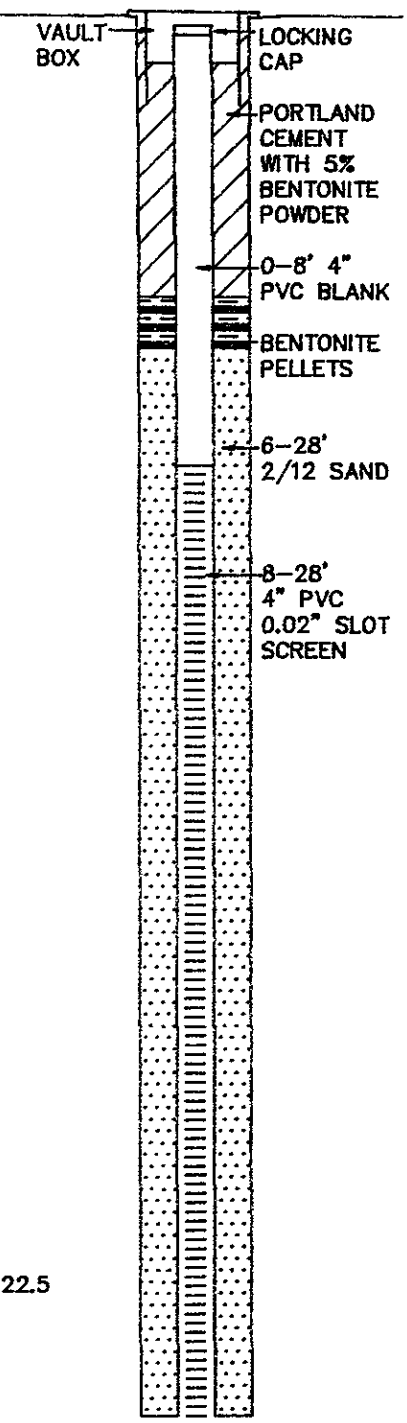
CERTIFIED ENVIRONMENTAL CORPORATION

WELL/BORING NO. MW-3 PAGE 1

PROJECT QUIK STOP #47
PROJECT NO. 93-221-1088
LOCATION 6001 MACARTHER, OAKLAND, CA
DATE/TIME DRILLED 5/26/93
SCREEN TYPE PVC INTERVAL 8-28'
FILTER PACK TYPE 2/12 SAND INTERVAL 6-28'
SURFACE SEAL TYPE BENT. CHIPS INTERVAL 5-6'

LOGGED BY HERB HIRSCHFELD
DRILLING METHOD 10" HS AUGERS/CME-55
SAMPLING METHOD MOD. CALIFORNIA SPLIT SPOON
DRILLING CO./FOREMAN SOILS EXPLORATION SERVICE
CASING DIA. 4 IN. SLOT SIZE 0.02"
INITIAL WATER LEVEL FINAL WATER LEVEL
BOREHOLE DIA. 10 IN. TOTAL DEPTH 29'

DESCRIPTION	USGS	GRAPHIC LOG	SAMPLE
0-21.5' CLAYEY SAND BACKFILL MATERIAL; FINE TO COARSE SAND; ANGULAR GRAVEL TO 1.5" IN DIAMETER	SC		
21.5-24.5' CLAYEY GRAVEL; SUBANGULAR TO SUBROUNDED GRAVEL	GC		MW-3-22.5
24.5-28.0' SILTY GRAVEL; SUBANGULAR TO SUBROUNDED GRAVEL TO 3/4" IN DIAMETER	GM		



WELL DIAGRAM

CERTIFIED ENVIRONMENTAL CORPORATION

WELL/BORING NO. MW-3 PAGE 2

PROJECT QUIK STOP #47
PROJECT NO. 93-221-1088
LOCATION 6001 MACARTHER, OAKLAND, CA
DATE/TIME DRILLED 5/26/93
SCREEN TYPE PVC INTERVAL 8-28'
FILTER PACK TYPE 2/12 SAND INTERVAL 6-28'
SURFACE SEAL TYPE BENT. CHIPS INTERVAL 5-6'

LOGGED BY HERB HIRSCHFELD
DRILLING METHOD 10" HS AUGERS/CME-55
SAMPLING METHOD MOD. CALIFORNIA SPLIT SPOON
DRILLING CO./FOREMAN SOILS EXPLORATION SERVICE
CASING DIA. 4 IN. SLOT SIZE 0.02"
INITIAL WATER LEVEL ____ FINAL WATER LEVEL ____
BOREHOLE DIA. 10 IN. TOTAL DEPTH 29'

DESCRIPTION	USGS	GRAPHIC LOG	SAMPLE	WELL DIAGRAM
28-29' SANDY CLAY	CL/CH	25, 30	MW-3-28.5	BENTONITE PELLETS