Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results: OMW-10 #1 (-40432)	OMW-10 #3 (-40433)
WET Soluble, Lead (EPA 7421)	0.002	0.046	0.031

CONVERSE ENVIRONMENTAL WEST

55 Hawthorne Street, Suite 500
San Francisco, California 94105-3906

Telephone **415 543-4200**
FAX 415 777-3157

90 MAR 33 AM 10: 37

March 30, 1990
88-44-361-20-502

Ms. Dyan Whyte
Water Resources Control Engineer
Regional Water Quality Control Board
1800 Harrison, Room 700
Oakland, California 94612

Subject: Transmittal of Quarter 1, 1990 Progress Report
Shell Retail Service Station
500 40th Street
Oakland, California

Dear Ms. Whyte:

Attached is a progress report describing the activities and findings for the Shell Oil Company site (Shell) located at 500 40th Street in Oakland, California, during Q1/90.

Please call if you have any questions.

Very truly yours,

Converse Environmental West

Bojan Gustincic
Project Geologist

BG:mb

cc: Ms. Diane Lundquist - Shell Oil Company (w/ encl.)
Mr. Rafat Shahid - Alameda County Health Department (w/ encl.)
Mr. Douglas Charlton - Converse Environmental West (w/o encl.)

500 40TH ST. 2\WHYTE.502

REPORT OF ACTIVITIES
QUARTER 1, 1990

SHELL OIL COMPANY FACILITY
500 40th STREET
OAKLAND, CALIFORNIA

Prepared for:

Shell Oil Company
1390 Willow Pass Road, Suite 900
Concord, California 94520

Prepared by:

Converse Environmental West
55 Hawthorne, Suite 500
San Francisco, California 94105

March 30, 1990

CEW Project No. 88-44-361-20

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SECTION 1

INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

This report presents the results of investigative activities conducted by Converse Environmental West (CEW) during Quarter 1, 1990 (Q1/90) for the former Shell Oil Company (Shell) station (site) located at 500 40th Street in Oakland, California (Drawing 1). This report is prepared to fulfill the monthly (March 30, 1990) and quarterly reporting requirements as specified in the Work Plan prepared by CEW (April, 1989) for achievement of environmental closure of the site. The Work Plan is on file with the regulatory agencies of jurisdiction.

The site is located on the northwest corner of 40th Street and Telegraph Avenue in Oakland, California (Drawing 2). The site location and setting are presented in Appendix A. The site was formerly operated as a retail motor vehicle fuel sales and automobile repair station. Presently, it is occupied by several non-industrial retail sales stores and services. The site is approximately 145 feet long by 130 feet wide.

The purpose of the investigative activities is to provide additional data on subsurface conditions at the site in order to characterize the present lateral and vertical extent, and distribution, of existing petroleum hydrocarbon contamination resulting from the operation of underground automobile fuel storage tanks at the site, and to assess the feasibility of applicable remedial technologies.

1.2 SCOPE OF ACTIVITIES

The work initiated and completed by CEW during Q1/90 consisted of the following activities:

- Sampling each well and analyzing the water for petroleum hydrocarbons,
- Surveying underground utilities location in the west alley behind the building,
- Evaluating the findings from the field activities and preparing monthly reports and this Quarterly Report.

The installation of two offsite groundwater monitoring wells has been delayed due to the recent changes in the city of Oakland policy for the groundwater monitoring well installation. The proposed onsite extraction well installation has been postponed because of delay in receiving the right-of-entry agreement from the property owners at 518 40th Street. The agreement was received on March 22, 1990.

As a consultant to Shell on this project, CEW is contracted to perform specific activities related to acquiring data and information which will lead to the ultimate successful closure of the facility under investigation. CEW's primary obligation is to collect information within proper standard of care and practice, and in accordance with protocols which have been created by CEW and which are on file with the regulatory agencies of jurisdiction. From time to time, because of site-specific conditions or limitations, CEW may find it necessary to deviate from these protocols. Under these conditions, CEW will describe in appropriate reports the rationale and necessities for the deviations which occurred, along with a statement of the possible impact these deviations may have on the database generated.

In compilation of its findings, CEW will follow the scientific method and develop multiple working hypotheses which explain site conditions and findings. CEW will not report and justify these multiple working hypotheses to the regulatory agencies for two principal reasons:

(1) The numerous assumptions and limitations that are part of the process would require substantial discussion and justification, and

(2) The multiple working hypothesis process is iterative to the time of closure, at which point a final, best hypothesis will be provided and fully explained to the regulatory agencies in closure documentation.

SECTION 2

WORK COMPLETED THIS QUARTER

Work initiated and completed during Q1/90 followed the task descriptions of the CEW Work Plan (April, 1989) and the CEW protocols on file with the regulatory agencies of jurisdiction. The site activity summary is presented in Table 1.

2.1 UNDERGROUND UTILITIES SURVEY

The underground utilities location survey in the west alley behind the building was initiated and completed during month of February, 1990. The purpose of this survey was to provide more information for the proposed groundwater extraction wells location selection.

2.2 GROUNDWATER SAMPLING AND ANALYSES

Following CEW QA/QC protocols (Appendix E), groundwater samples were collected on January 5 and March 2 - 4, 1990 from 4 onsite and 3 offsite wells, and were submitted to NET Pacific, Inc., a California-certified laboratory in Santa Rosa, California. Following the recommended analytical methods listed in Table 2, the samples were analyzed for TPH-g, TPH-d, and BTEX. Analytical data for the water samples collected from the monitoring wells are summarized in Table 3. Laboratory reports and chain-of-custody forms from this quarterly round of monitoring are provided in Appendix C.

2.3 FIELD GROUNDWATER MONITORING

During Q1/90, all wells were physically monitored twice for depth-to-water and observed for floating product and its thickness and odor, if any. A summary of these results is presented in Table 4.

SECTION 3

FINDINGS AND DISCUSSION

3.1 UNDERGROUND UTILITIES SURVEY

The underground utilities location survey in the west alley behind the building was started on February 15, 1990. During the survey, which lasted several days, two trenches were dug across the alley, each 2 feet wide and approximately 10 feet long. The top concrete layer was removed using a pneumatic hammer and utilities were exposed to the depth of 5 feet below surface. Two traffic rated steel plates were kept onsite continually to cover both trenches and provide the access for emergency vehicles, should a need occur. Survey indicated that a limited space is available for well installation. For that reason it appears that even a small SIMCO rig may not be able to access the proposed locations for three groundwater extraction wells without demolishing fence along the west site boundary.

Upon the survey completion, trenches were backfilled and temporarily covered. The concrete cover will be placed upon the extraction wells installation completion.

3.2 GROUNDWATER

3.2.1 Physical Parameters

During Q1/90 no floating product was detected in any of the wells. Petroleum odor was detected in two onsite and two offsite wells (MW-2, MW-3 and OMW-6, OMW-9, respectively).

3.2.2 Elevation and Gradient

Groundwater level measurements taken during Q1/90 indicate an upward trend in the groundwater elevation, as compared to Q4/89. An average increase is 0.43 feet. The trend is probably a result of the increased seasonal recharge due to the rainfall. The groundwater gradient is non-linear with an apparent change in direction from southwest to west. The potentiometric surface is presented on Drawing 3.

3.2.3 Results of Chemical Analyses

Groundwater analytical results made available during Q1/90 indicate no significant changes in the onsite groundwater quality. Onsite upgradient monitoring well, MW-4 continued to show non-detectable chemical concentrations. Groundwater analytical results gathered during Q1/90 have confirmed the upgradient northeastern contaminant plume boundary, established in Q4/89.

In the offsite area, all monitoring wells showed the chemical concentrations above detection levels. Water quality data from offsite wells OMW-9 and OMW-10 indicate that the contaminant plume is extended in the cross-gradient direction to the south. The highest concentration was detected in offsite well OMW-6, located approximately 30 feet offsite in the downgradient direction indicating that the contaminant plume extends considerably across the 40th Street in the downgradient direction. Based on the offsite soil and groundwater quality data, the possibility of offsite contamination source cannot be excluded. The chemical concentration contours for TPH-g, TPH-d and BTEX are presented in Drawings 4 through 6.

SECTION 4

NEXT QUARTER ACTIVITIES

4.1 PROPOSED ACTIVITIES

During Q2/90, Shell plans to continue the downgradient offsite groundwater investigation to the west, along 40th Street. The offsite groundwater monitoring wells will be installed across 40th Street. Three onsite extraction wells will be installed in the west alley behind the building. The onsite and offsite wells will be installed in accordance with CEW QA/QC protocols and revised Work Plan dated April 7, 1989.

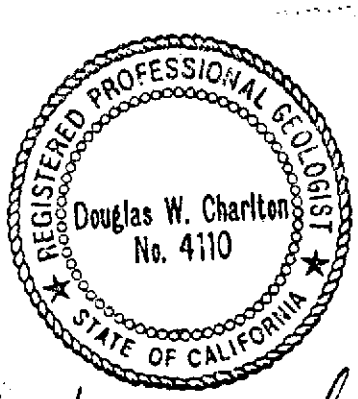
Wells planned to be installed during Q2/ 90 will be sampled and analyzed during the scheduled regularly Quarterly groundwater monitoring. The analytical results will be presented in Quarter 2, 1990 progress report.

CERTIFICATION

This report of activities for the Shell Oil Company facility at 500 40th Street, Oakland, California has been prepared by the staff of **Converse Environmental West** under the professional supervision of the Engineer and/or Geologist whose seal(s) and signature(s) appear hereon.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the Client, after being prepared in accordance with generally accepted professional engineering and geologic practice. We make no other warranty, either expressed or implied.

Respectfully submitted,



DOUGLAS W. CHARLTON, Ph.D.
Principal Geologist

PRIMARY CONTACTS

Shell Oil Company Facility
500 40th Street
Oakland, California

Quarter 1, 1990

Regional Water Quality Control Board Representative:	Ms. Dyan Whyte San Francisco Bay Regional Water Quality Control Board 1800 Harrison Street, Room 700 Oakland, California 94612
LIA Representative:	Mr. Rafat Shahid Alameda County Department of Health Services 80 Swan Way Oakland, California 94621
Shell Engineer:	Ms. Diane Lundquist Shell Oil Company 1390 Willow Pass Road, Suite 900 Concord, California 94520
Converse Project Manager:	Mr. Bojan Gustincic Converse Environmental West 55 Hawthorne, Suite 500 San Francisco, California 94105
Registered Geologist in Charge:	Mr. Douglas W. Charlton Converse Environmental West 55 Hawthorne Street, Suite 500 San Francisco, California 94105
Site Owner:	Shell Oil Company

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BIBLIOGRAPHY

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TABLE 1. ACTIVITY SUMMARY - QUARTER 1, 1990

Shell Oil Company Facility
500 40th Street
Oakland, California

	PERCENT COMPLETE			
	Quarter 1, 1990		Total to Date	
Activity	Onsite	Offsite	Onsite	Offsite
Soil Characterization	30	-----	30	5
Groundwater Characterization (Dissolved Product)	25	-----	25	10
Groundwater Characterization (Floating Product)	NA	NA	NA	NA
Soil Remediation	0	-----	0	-----
Groundwater Remediation (Dissolved Product)	0	-----	0	-----
Groundwater Remediation (Floating Product)	NA	NA	NA	NA

NOTES:

NA Not Applicable

TABLE 2. RECOMMENDED MIMIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

From: RWQCB Guidelines for Additional Fuel Tank Leaks (Revised May 18, 1989)

HYDROCARBON LEAK	SOIL ANALYSIS				WATER ANALYSIS			
		Prep	Analysis	D.L. (mg/kg)		Prep	Analysis	D.L. (µg/l)
Unknown Fuel	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	TPH-d	3550	GCFID	1.0	TPH-d	3510	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
Leaded Gas	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
	TEL*	---	DHS-LUFT		TEL	---	DHS-LUFT	
	EDB*	---	DHS-AB1803		EDB	---	DHS-AB1803	
Unleaded Gas	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
Diesel	TPH-d	3550	GCFID	1.0	TPH-d	3510	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
Waste Oil or Unknown	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	TPH-d	3550	GCFID	1.0	TPH-d	3510	GCFID	50.0
	O&G	---	503D&E	50.0	O&G	---	503A&E	5000.0
	BTEX	5030	8020/8240	1.0	BTEX	5030	602/624	0.50
	CL HC	5030	8010/8240	1.0	CL HC	5030	601/624	0.50
	ICAP or AA for soil or water to detect metals: Cadmium, Chromium, Lead, Zinc							
	Method 8270 for soil or water to detect: PCB, PCP, PNA, Creosote							

NOTES:

*	Optional Analysis
RWQCB	Regional Water Quality Control Board
µg/l	microgram per liter
mg/kg	milligram per kilogram
D.L.	Detection Limit
TPH-g	Total Petroleum Hydrocarbons as Gasoline
TPH-d	Total Petroleum Hydrocarbons as Diesel
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
O & G	Oil and Grease
CL HC	Chlorinated Hydrocarbons
TEL	Tetra Ethyl Lead
EDB	Ethylene Dibromide

TABLE 3. RESULTS OF GROUNDWATER CHEMICAL ANALYSES

Shell Oil Company Facility
500 40th Street
Oakland, California

Well No.	Sample Date	Concentration (ppm) TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead
MW-2	6/20/89	0.8	<0.01	0.046	0.0068	0.0027	0.056	NA
MW-2	7/18/89	1.4	0.4	0.033	0.0056	0.024	0.073	0.003
MW-2	8/08/89	0.23	0.50	0.0045	<0.0005	<0.0015	0.011	NA
MW-2	9/11/89	0.50	0.31	0.019	0.0023	<0.0015	0.010	NA
MW-2	10/10/89	2.0	0.81	0.077	0.0084	0.024	0.15	NA
MW-2	**1/05/90**	**2.0**	**0.56**	**0.038**	**0.0056**	**0.030**	**0.059**	**NA**
MW-2	**3/02/90**	**1.9**	**0.58**	**0.095**	**0.0005**	**0.083**	**0.2**	**NA**
MW-3	6/20/89	2.3	<0.1	0.18	0.15	0.054	0.80	NA
MW-3	7/18/89	1.5	9.1	0.085	0.034	0.010	0.12	0.002
MW-3	8/08/89	2.5	0.71	0.13	0.073	0.0035	0.33	NA
MW-3	9/11/89	1.9	0.23	0.18	0.074	0.0037	0.11	NA
MW-3	10/10/89	2.6	1.2	0.069	0.055	0.0063	0.30	NA
MW-3	**1/05/90**	**2.7**	**0.76**	**0.051**	**0.041**	**0.028**	**0.070**	**NA**
MW-3	**3/02/90**	**2.3**	**0.57**	**0.23**	**0.8**	**0.055**	**0.23**	**NA**
MW-3[1]	**3/02/90**	**2.3**	**0.56**	**0.22**	**0.8**	**0.53**	**0.23**	**NA**
MW-4	6/20/89	<0.05	<0.01	<0.0005	<0.0015	<0.0015	<0.0015	NA
MW-4	7/18/89	<0.05	<0.05	<0.0005	<0.0015	<0.0015	<0.0015	0.003
MW-4	8/08/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-4	9/11/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-4	10/10/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-4	**1/05/90**	**<0.05**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-4	**3/02/90**	**<0.05**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-5	10/10/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-5	**1/05/90**	**<0.05**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-5	**3/02/90**	**<0.05**	**0.11**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-6	**1/05/90**	**22**	**6.5**	**1.4**	**1.8**	**0.56**	**1.5**	**NA**
MW-6	**3/04/90**	**27**	**4.6**	**1.3**	**1.4**	**0.63**	**2.4**	**NA**
MW-6[1]	**3/04/90**	**25**	**4.8**	**1.2**	**1.3**	**0.55**	**2.3**	**NA**
MW-9	**1/05/90**	**4.3**	**1.6**	**0.097**	**0.12**	**0.091**	**0.29**	**NA**
MW-9	**3/04/90**	**2.6**	**1.0**	**0.058**	**0.024**	**0.0081**	**0.075**	**NA**
MW-10	**1/05/90**	**<0.05**	**0.20**	**0.034**	**0.0011**	**0.0043**	**0.013**	**NA**
MW-10	**3/04/90**	**0.29**	**0.39**	**0.053**	**0.0015**	**0.0043**	**0.015**	**NA**

NOTES:
[1] Duplicate sample
ppm part per million
TPH-g total petroleum hydrocarbons as gasoline (GCFID)
TPH-d total petroleum hydrocarbons as diesel (GCFID)
TPH-mo total petroleum hydrocarbons as motor oil (GCFID)
NA not analyzed

Bold Boldface indicates work completed this quarter.

TABLE 4. GROUNDWATER MONITORING INFORMATION

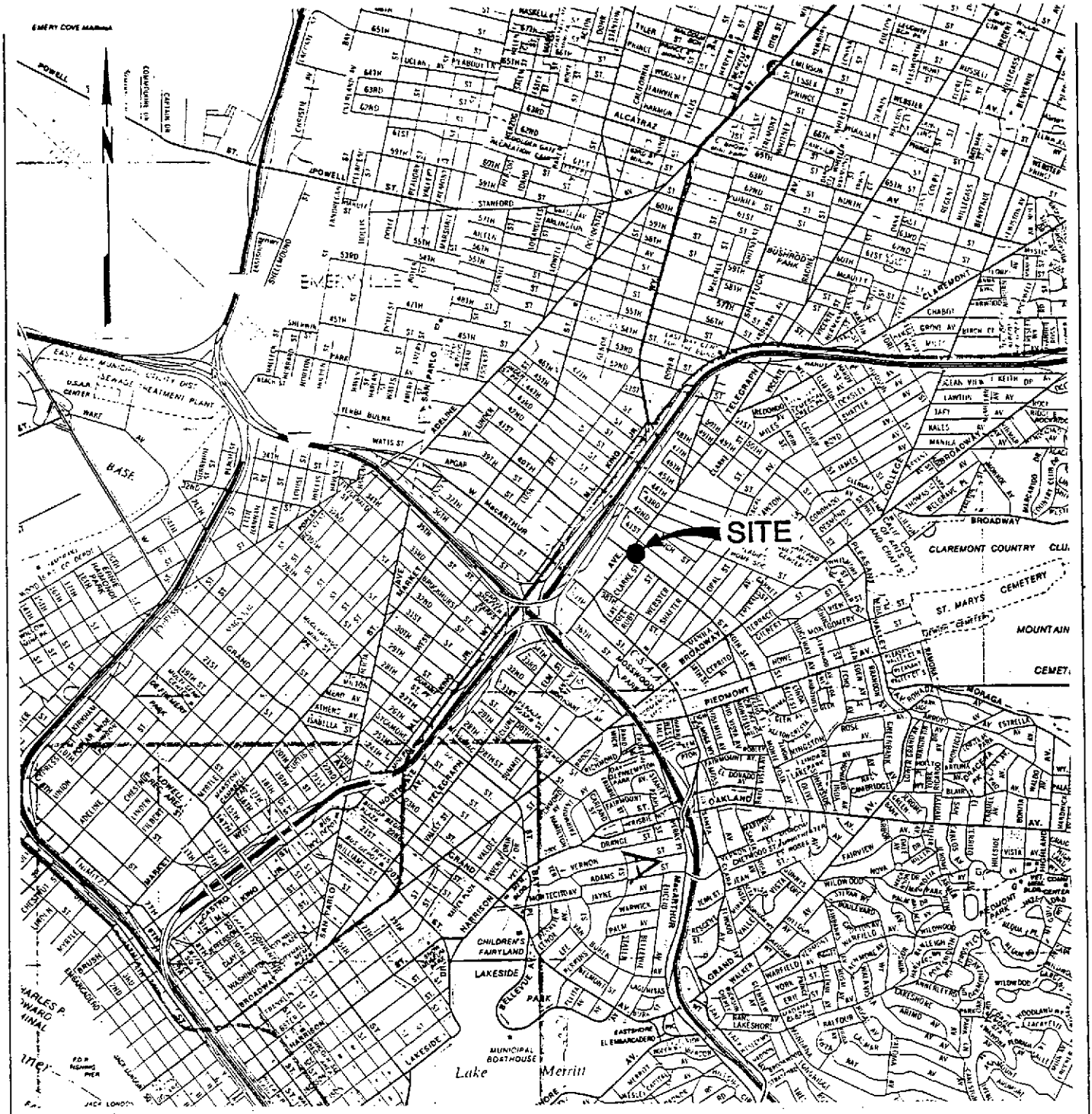
Shell Oil Company Facility
500 40th Street
Oakland, California

Well No.	Date Monitored	Well Elevation (ft msl)	Depth to Water (ft bgs)	Water Table Elevation (ft msl)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-2	6/19/89	80.8	11.91	68.89	No	0.0	
MW-2	7/18/89	80.8	11.98	68.82	No	0.0	
MW-2	8/08/89	80.8	12.00	68.80	Yes	0.0	
MW-2	9/11/89	80.8	12.00	68.80	No	0.0	
MW-2	10/10/89	80.8	12.05	68.75	Yes	0.0	
MW-2	**1/05/90**	**80.8**	**10.95**	**69.85**	**No**	**0.0**	
MW-2	**3/02/90**	**80.8**	**11.54**	**59.26**	**Yes**	**0.0**	
MW-3	6/19/89	79.6	10.99	68.61	No	0.0	
MW-3	7/18/89	79.6	11.05	68.55	Yes	0.0	
MW-3	8/08/89	79.6	11.07	68.53	Yes	0.0	
MW-3	9/11/89	79.6	11.02	68.58	Yes	0.0	
MW-3	10/10/89	79.6	11.08	68.52	Yes	0.0	
MW-3	**1/05/90**	**79.6**	**10.97**	**68.63**	**No**	**0.0**	
MW-3	**3/02/90**	**79.6**	**10.91**	**68.69**	**Yes**	**0.0**	
MW-4	6/19/89	81.0	12.18	68.82	No	0.0	
MW-4	7/18/89	81.0	12.21	68.79	No	0.0	
MW-4	8/08/89	81.0	12.23	68.77	No	0.0	
MW-4	9/11/89	81.0	12.26	68.74	No	0.0	
MW-4	10/10/89	81.0	12.28	68.72	No	0.0	
MW-4	**1/05/90**	**81.0**	**12.25**	**68.50**	**No**	**0.0**	
MW-4	**3/02/90**	**81.0**	**11.63**	**69.37**	**No**	**0.0**	
MW-5	10/10/89	81.5	11.08	70.42	No	0.0	
MW-5	**1/05/90**	**81.5**	**12.96**	**68.54**	**No**	**0.0**	
MW-5	**3/02/90**	**81.5**	**12.66**	**68.84**	**No**	**0.0**	
OMW-6	1/05/90	77.90	10.23	67.67	No	0.0	
OMW-6	3/02/90	77.90	9.40	68.50	No	0.0	
OMW-9	1/05/90	77.71	9.90	67.81	No	0.0	
OMW-9	3/04/90	77.71	9.20	68.51	Yes	0.0	
OMW-10	1/05/90	77.91	9.92	67.99	No	0.0	
OMW-10	3/04/90	77.91	9.20	68.71	No	0.0	

NOTES:

ft bgs feet below ground surface
NS none observed
Bold Boldface indicates work completed this quarter

DRAWINGS



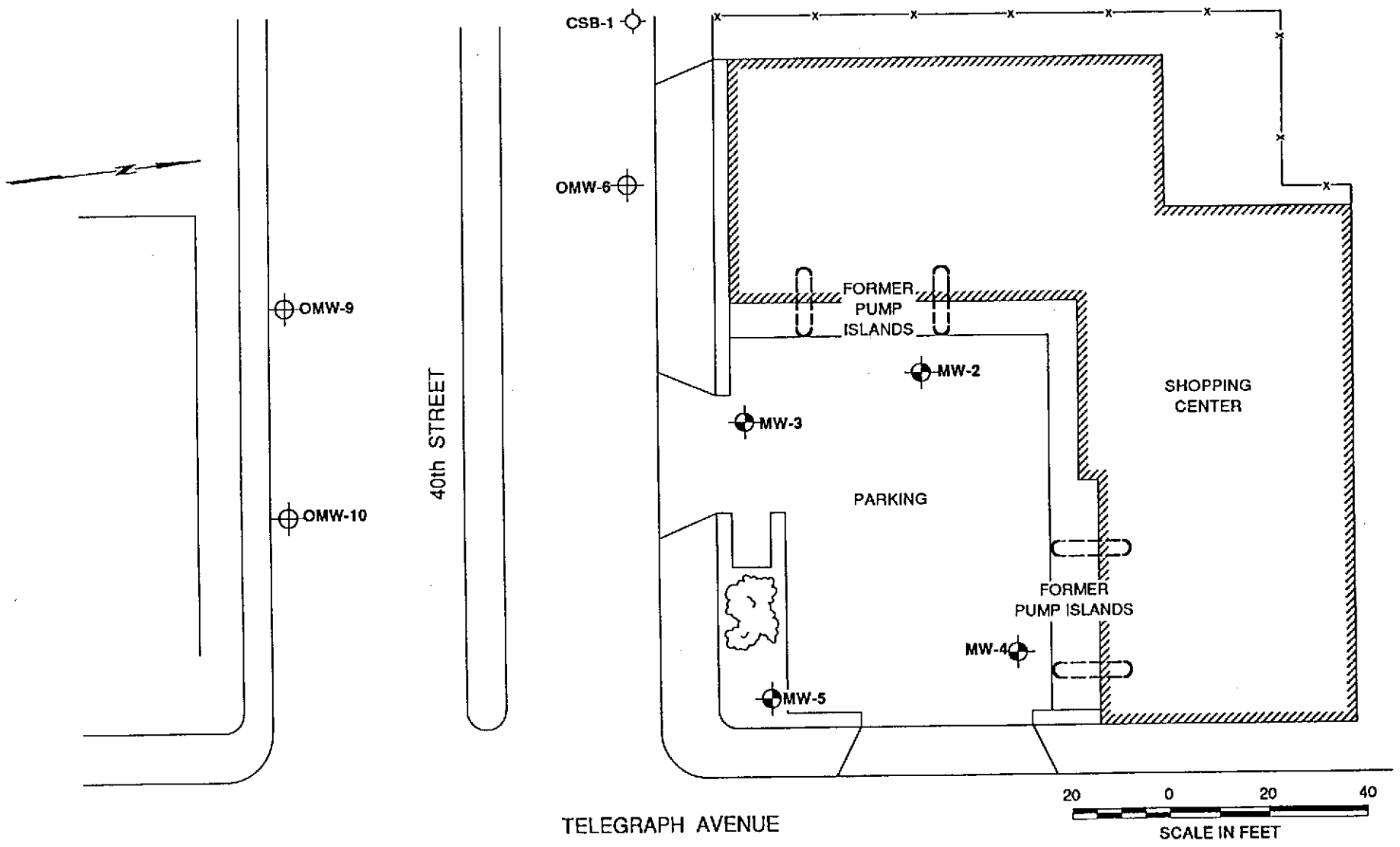
SOURCE: California State Automobile Association.

SITE LOCATION MAP

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental
Consultants California

Scale: AS SHOWN	Project No.: 88-44-361-01
Prepared by: KGC	Date: 4/4/89
Checked by: RMB/MIY	Drawing No.: 1
Approved by: DWC	



Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

LEGEND:

SB-1 ⊕ SOIL BORING

MW-1 ⊕ GROUNDWATER MONITORING WELL

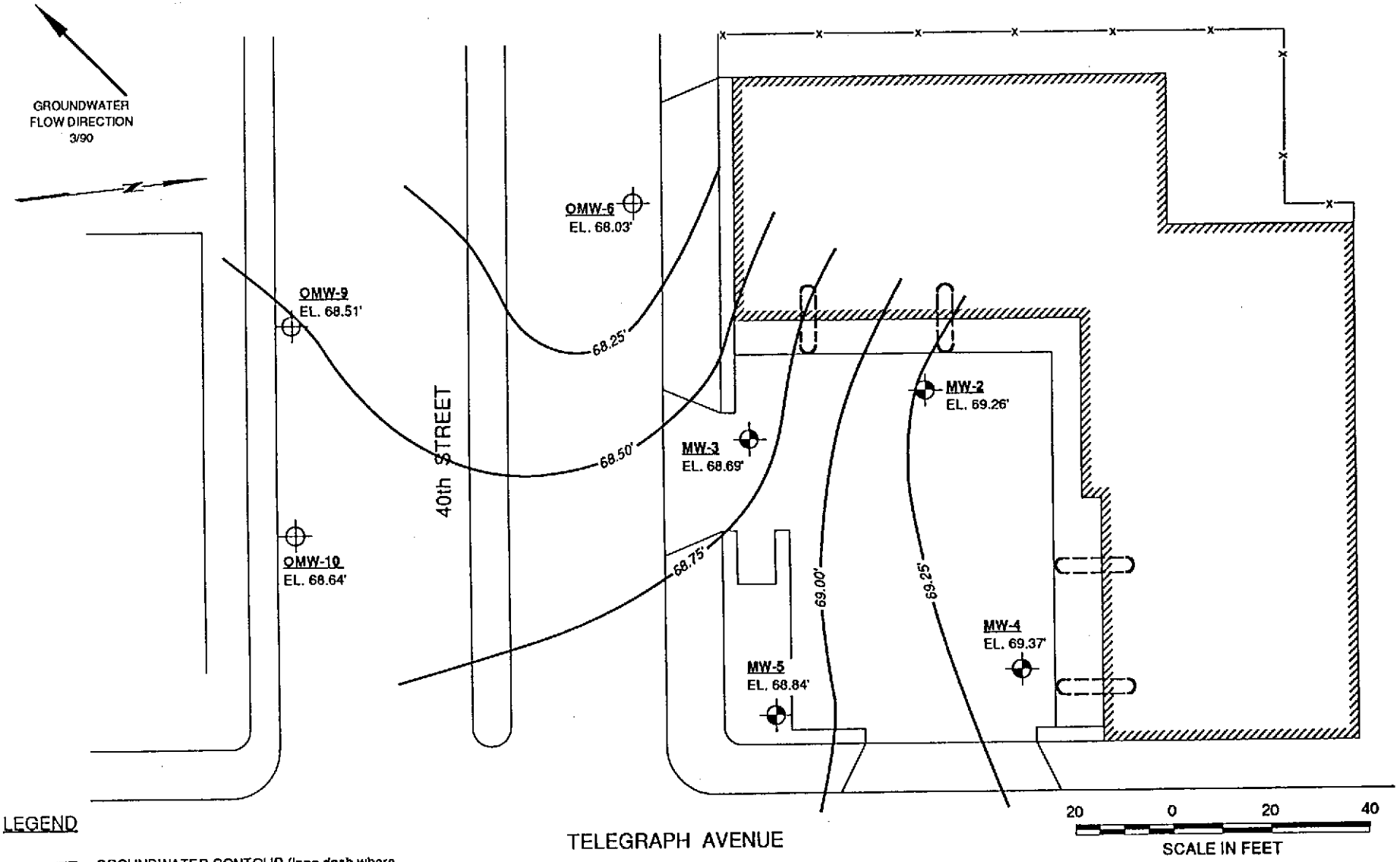
OMW-1 ⊕ OFFSITE GROUNDWATER MONITORING WELL

PLOT PLAN

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Prepared by	LQL
Checked by	JAA
Approved by	BG
Project No.	88-44-361-20
Date	12/29/89
Drawing No.	2



Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

LEGEND

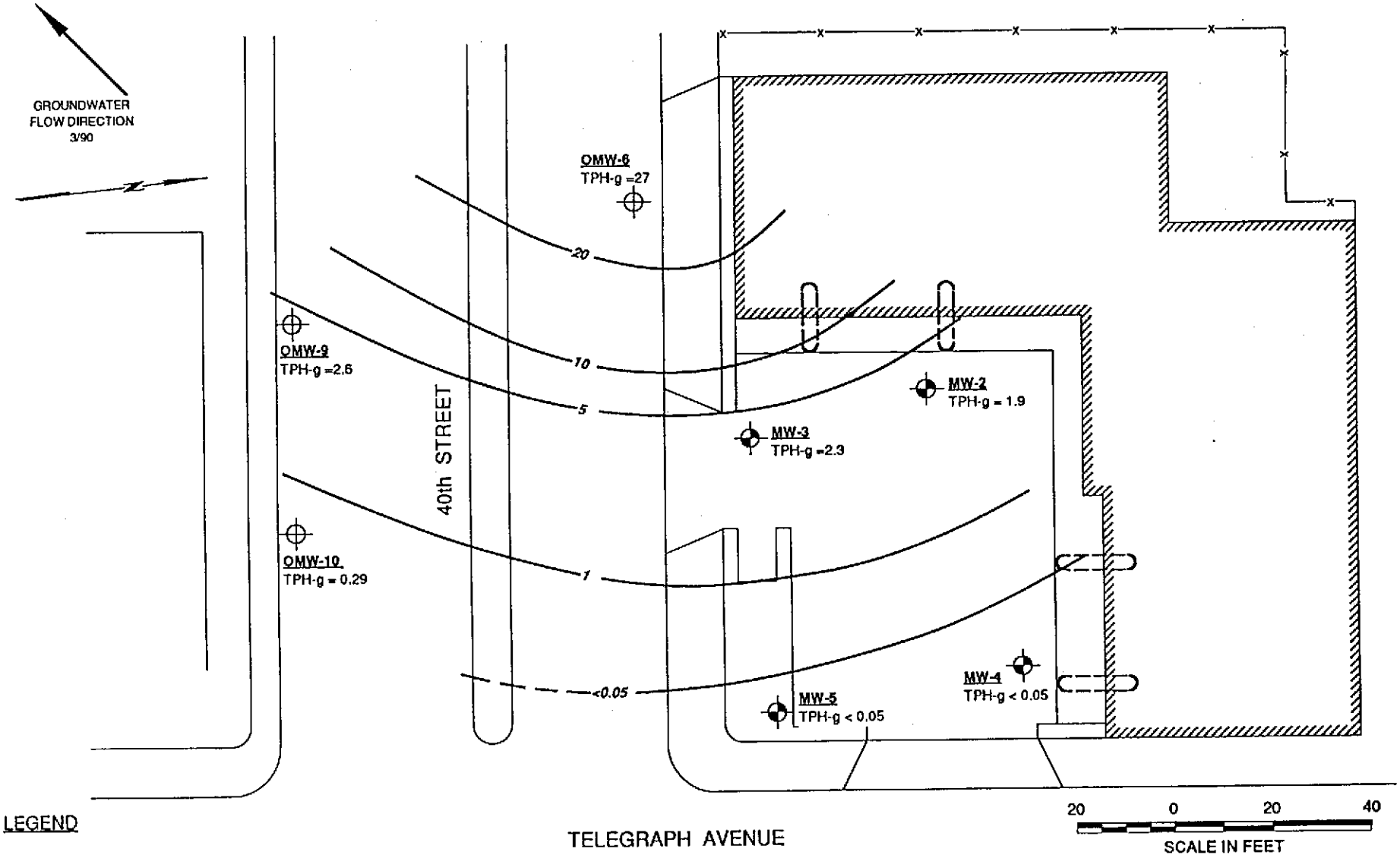
- GROUNDWATER CONTOUR (long dash where approximate, short dash where Inferred)
- MW-1 — GROUNDWATER MONITORING WELL SHOWING GROUNDWATER ELEVATION
- OMW-6 — OFFSITE GROUNDWATER MONITORING WELL
- NOTE: GROUNDWATER ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL

POTENTIOMETRIC MAP, MARCH 1990

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Prepared by	LQL
Checked by	JAA
Approved by	BG
Project No.	88-44-361-20
Date	3/22/90
Drawing No.	3



Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

LEGEND

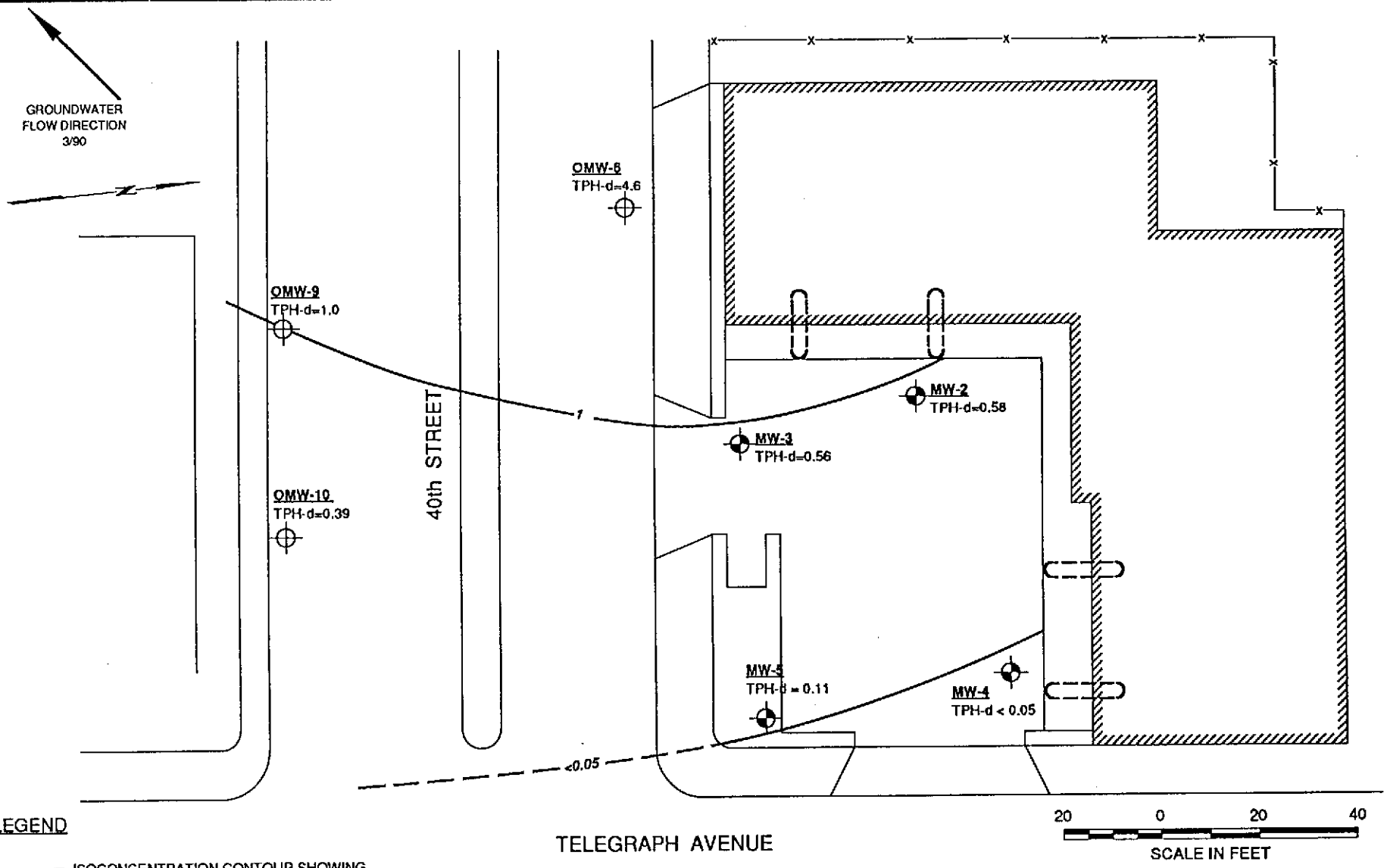
- ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)
- MW-1 — GROUNDWATER MONITORING WELL
- OMW-6 — OFFSITE GROUNDWATER MONITORING WELL
- TPH-g = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (in milligrams per liter)

PLAN: TPH-g IN GROUNDWATER, MARCH 1990

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Prepared by	LQL
Checked by	JAA
Approved by	BG
Project No.	88-44-361-20
Date	3/22/90
Drawing No.	4



Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

LEGEND

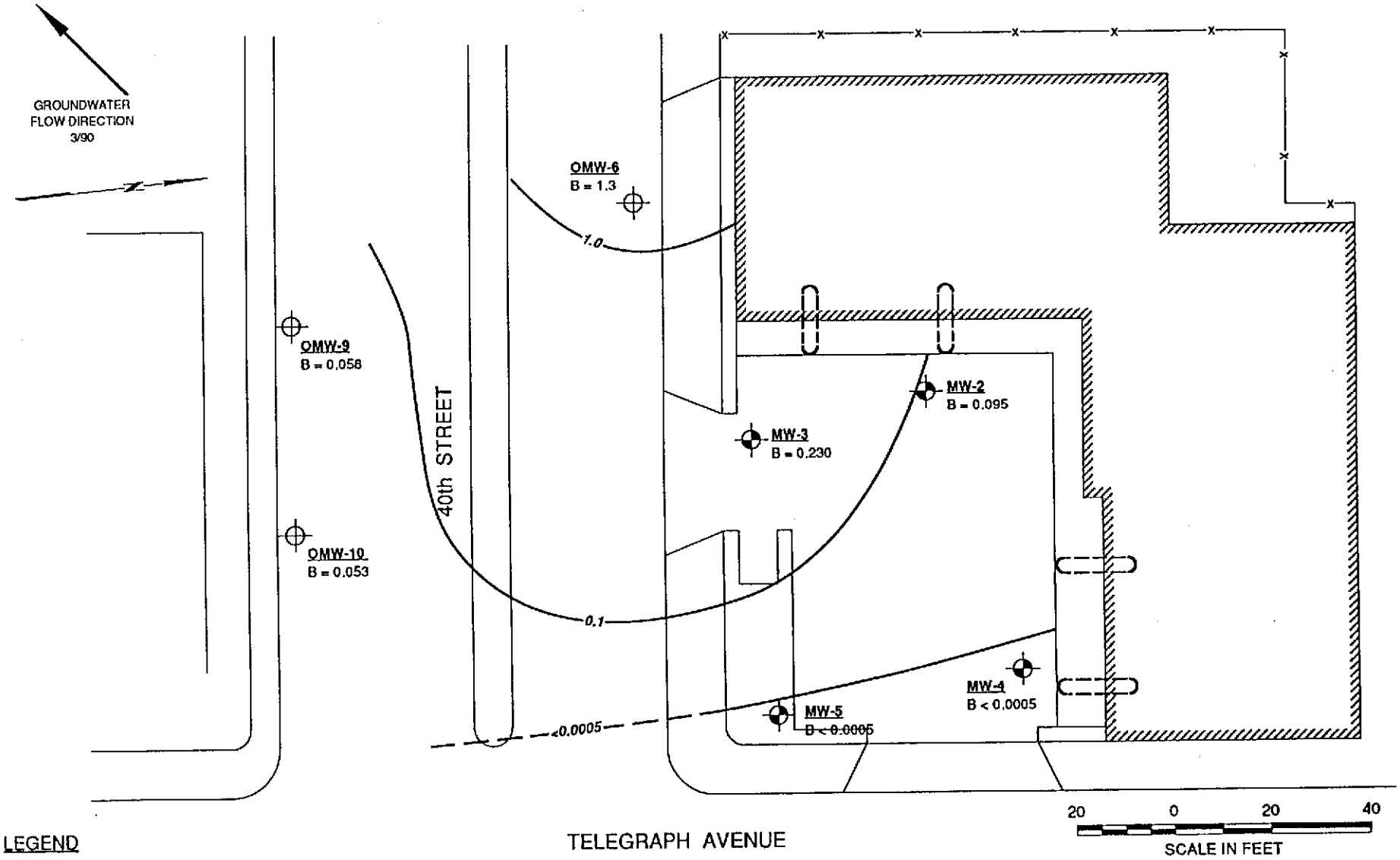
- ISOCONCENTRATION CONTOUR SHOWING DIESEL (long dash where approximate, short dash where inferred)
- MW-1 GROUNDWATER MONITORING WELL
- OMW-6 OFFSITE GROUNDWATER MONITORING WELL
- TPH-d = TOTAL PETROLEUM HYDROCARBONS AS DIESEL (in milligrams per liter)

PLAN: TPH-d IN GROUNDWATER, MARCH 1990

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Prepared by	LQL
Checked by	JAA
Approved by	BG
Project No.	88-44-361-20
Date	1/25/90
Drawing No.	5



LEGEND

- ISOCONCENTRATION CONTOUR SHOWING BENZENE (long dash where approximate, short dash where inferred)
- MW-1 — GROUNDWATER MONITORING WELL
- OMW-6 — OFFSITE GROUNDWATER MONITORING WELL
- B = BENZENE (milligrams per liter)

Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

PLAN: BENZENE IN GROUNDWATER, MARCH 1990

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Prepared by	LQL
Checked by	JAA
Approved by	BG
Project No.	88-44-361-20
Date	3/22/90
Drawing No.	6

APPENDIX A

SITE DESCRIPTION

APPENDIX A

SITE DESCRIPTION

LOCATION

The Shell Oil Company (Shell) site is located at 500 40th Street in Oakland, California. The site is approximately 145 feet long by approximately 130 feet wide. The site was formerly operated as a retail motor vehicle fuel sales and automobile repair station. Presently, it is occupied by several non-industrial retail sales stores and services.

SETTING

The facility is located on the gently sloped alluvial fan between the base of the Oakland Hills to the east and the San Francisco Bay to the west. The major natural soils underlying the site consist of alluvial-fan deposits comprising interfingering lenses of clayey gravel, sandy silty clay and sand-clay-silt mixtures of Pleistocene Age, commonly known as the Temescal formation. A layer of gravel with cobbles is at the base of the formation. The gravel often grades upward into sand and then into clay. In general, the formation is thin near the Bay and thicker close to the Oakland Hills.

Underlying the Temescal Formation is the oldest of the post-Knoxville quaternary unconsolidated deposits, known as the Alameda Formation, formed during the Pleistocene Age. In its upper part it consists mainly of yellowish-gray to yellowish-brown sandy, silty clay containing a few pebbles. The lower part, consisting of clay, silt, sand and gravel, does not crop out. The upper clay crops out at the several locations within the area.

Bedrock below the Alameda formation is the Franciscan Complex, of Jurassic and Cretaceous Age. It consists of fine to very coarse-grained sandstone with some shale beds.

APPENDIX B

CHRONOLOGICAL SUMMARY

CHRONOLOGICAL SUMMARY

The following chronological summary is based on information provided to Converse Environmental West (CEW) by Shell Oil Company (Shell). CEW was not provided with certain information related to the construction, operational, and environmental history of the facility. According to Shell, the following information is not available in Shell files: volume of contaminated soil removed at the time of tank removal, geometry of the excavation created during tank removal, if any, and date and volume of any possible releases at the facility.

Date	Description of Activity
7/82	IT installed 8 six inch diameter groundwater monitoring wells to 30 feet below ground surface (bgs) onsite. The wells were screened from 5 to 30 feet bgs. Combustible vapors were detected in the storm sewer system in the BART Station across the street.
7/82	IT Progress Report 1: Well installations and constructions were reported, and free product was noted in wells B-7 and B-8. Groundwater gradient was shown to be westward, towards the BART Station.
11/82	IT Progress Report 6: Groundwater gradient still towards well B-3. From September 1 to November 19, 1982, IT removed 35 pints of product from B-4. Well tops of casings (TOCs) were re-surveyed and groundwater gradient was confirmed toward B-3. Maximum product thickness was in B-4, at several inches.
12/82	IT Progress Report 7: Product thickness increased in B-3 in apparent response to rising water table. Product in B-4 remained at several inches.
1/83	IT Progress Report 8: Product in B-4 had diminished to film thickness.
2/83	IT Progress Report 9: Rainfall records were researched, and the relationship between rainfall, water table and product removed was charted by graph. Amount of product in B-4 appeared to vary inversely with water table; as water table rose with winter rains, the amount product in B-4 dropped. IT proposed that product was displaced downgradient as water table rose.
3/83	IT Progress Report 10: Vapor concentrations of TPH (expressed as percent lower explosive limit) were rising in wells B-1, B-2, B-3 and B-7. No product was measurable in B-4.
6/83	Rapid reappearance of product in well B-4, from negligible in May to 4+ feet by June 30 and 6.34 feet on July 15. Increase was also measured B-3, to a thickness of 0.66 feet in July. IT concluded that a reservoir of product existed in the tank backfill, and that as water table dropped in summer time this reservoir was allowed to escape by way of gravel lenses which were saturated at high water table seasons.
7/83	IT installed 8 inch diameter monitoring wells B-9 and B-10 to 20 feet bgs in native soils next to the tank backfill.
8/83	IT Progress Report 11: IT repeated the concept that product was released in surges through gravel lenses exposed to the water table during summer.

CHRONOLOGICAL SUMMARY (continued)

Date	Description of Activity
8/83	IT installed groundwater monitoring well B-11 and sand backfill in the southwest corner of the tank bed. No free-flowing product was encountered in this well.
9/83	IT drilled two 18 inch diameter borings to 30 feet bgs and completed same as 12 inch diameter recovery wells with screen intervals from 5 to 30 feet bgs. These wells, R-1 and R-2, were located near wells B-3 and B-4, directly west of the tank backfill.
10/83	IT purged and developed wells R-1 and R-2, holding a strong depression on the water table for 2 hours.
11/83	According to IT reference, the tanks were removed and, as part of this excavation wells R-1 and R-2 were also removed. No information was provided on tank excavation or associated soils/groundwater testing and reporting to regulatory agencies.
1/84	IT Progress Report 13: Wells B-3 and B-4 continued to contain measurable product, to thicknesses of 2 feet. In general, product thicknesses decreased during December and January. Product thicknesses also decreased after tank removal. Groundwater piezometric map showed a westward-trending, low area encompassing wells R-1, R-2, B-3 and B-4. This extended offsite, suggesting a paleodrainage which controlled product collection and migration offsite.
5/84	IT Report: The thicknesses of product in B-3 and B-4 measured from several inches to one foot during the period January to May 1984.
7/84	IT Report: Product thicknesses increased starting in mid-May in response to lowering water tables. This pattern was similar to the pattern observed in 1983.
8/84	IT Report: The thickness of product in B-3 remained one foot, while the amount of product in B-4 decreased. IT recommended looking for possible upgradient offsite sources.
9/84	IT Report: The thickness of product in B-4 started to increase (still at less than one inch) while the thickness of product in B-3 decreased (still on the order of one foot).
10/84	IT Report: New construction was noted.
1/85	IT Report: The thickness of product of B-3 had decreased to several inches and B-4 contained negligible measurable product. This pattern of decreasing product in the winter (high water table) months was consistent with that observed in the winters of 1982-83, and 1983-84.
2/85	IT Report: Significant measurable gasoline (1.64 feet) was discovered in B-8. The gasoline appeared degraded and "old". IT concluded that this gasoline could be from the same source as that contributing to observed in wells B-3 and B-4.
6/85	IT Report: Product thicknesses in B-3, B-4 and B-8 decreased from January to mid-May, with a dramatic decrease in B-8. IT repeated its interpretation that product thickness decreased as water tables rose and increased as water tables fell. IT further proposed that the product was trapped in permeable lenses, and migrated to different geographic areas as the water tables rose and fell.

CHRONOLOGICAL SUMMARY (continued)

Date	Description of Activity
12/85	IT Report: The thickness of product in B-3 increased to approximately 2 feet during the summer, showing the seasonal increase of prior years period. Simultaneously, no product was measured in B-8 after June 3, and product reappeared in B-2 in September and October. Product thickness in B-4 fluctuated at less than one foot thick during this period. IT recommended installing a recovery extraction trench along the west boundary of the property.
5/86	IT Quarterly Report: Product thickness decreased in wells B-3 and B-4 in response to seasonal rise in the water table.
6/86	IT requested permission to abandon B-6.
7/86	IT stated that Shell planned to remove the underground storage tanks in the near future.
8/86	IT Quarterly Report: IT noted seasonal decline in water table and negligible measurable product in wells B-2 and B-4, with approximately 2 feet of floating product in B-3.
9/86	A groundwater sample from B-3 contained volatile organics: 0.90 ppm; benzene: 0.32 ppm; toluene: 0.23 ppm; xylene: 0.16 ppm.
1/04/87(?)	A commercial shopping center building was erected on the property, covering wells B-2, B-6, B-7, B-9 and B-10. Wells B-1, B-3, B-4, B-5 and B-8 were covered by site parking and a rear driveway.
1/89	Shell transfers project to CEW.
4/07/89	Revised Work Plan submitted to RWQCB.
5/23/89	Monitoring wells MW-2, MW-3 and MW-4 installed, soil sampled.
6/20/89	Groundwater sampled, wells MW-2 through MW-4.
7/07/89	CEW issued Quarterly Report.
7/19/89	Groundwater sampled, wells MW-2 through MW-4.
8/01/89	Right-of-Entry Agreement sent to property owners of 518 40th Street.
8/08/89	Groundwater was sampled, wells MW-2 through MW-4.
9/11/89	Groundwater was sampled, wells MW-2 through MW-4.
9/19/89	CEW installed well MW-5; soils were sampled and analyzed.
10/10/89	Groundwater was sampled MW-2 through MW-5.
10/16/89	CEW installed well OMW-6; soils were sampled and analyzed.
10/17/89	CEW installed boring CSB-1; soils sampled and analyzed; and bored OMW-9. During well drilling, Loma Prieta Earthquake struck. Oakland municipal services were severely disrupted.

CHRONOLOGICAL SUMMARY (continued)

Date	Description of Activity
10/21/89	OMW-9 pilot boring was sealed.
11/13/89	OMW-9 boring was reamed and the well installed. OMW-10 installed; soils sampled and analyzed. Proposed well OMW-8 boring attempted and abandoned; location was in sewer main backfill.
11/17/89	Discharge permit application for interim groundwater treatment system submitted to EBMUD.
12/01/89	OMW-6 was developed.
12/10/89	OMW-10 and OMW-9 were developed.
1/5/90	CEW sampled groundwater wells MW-2, MW-3, MW-4, MW-5, OMW-6, OMW-9 and OMW-10.
8/89-3/90	Ongoing unsuccessful attempts to gain right-of-entry for installation of extraction wells EW-11 and EW-12, as the commencement of onsite groundwater remediation. This process has continued without resolution since August, 1989.
2/15-20/90	**Conducted underground utilities location survey in the west alley behind the building; survey was needed for the proposed groundwater monitoring well location selection.**
3/2-3/4/90	**CEW sampled groundwater wells MW-2, MW-3, MW-4, MW-5, OMW-6, OMW-9 and OMW-10.**
3/22/90	**Shell obtained the right-of-entry agreement from the owners of 518 40th Street.**

Note:

Bold indicates work completed this quarter.

APPENDIX C

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

RECEIVED

JAN 1 5 1990

CONVERSE ENVIRONMENTAL

Marc Yalom
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 01-15-90
NET Client Acct. No: 18.02
NET Pacific Log No: 9206
Received: 01-06-90 1035

Client Reference Information

SHELL, 500 40th St., Oakland; Project # 88-44-361-01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

Enclosure(s)

SAMPLE DESCRIPTION: MW-10 01-05-90 1130
LAB Job No: (-43131)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		01-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	ppm
METHOD 602		--	
Benzene	0.0005	0.034	ppm
Ethylbenzene	0.0005	0.0043	ppm
Toluene	0.0005	0.0011	ppm
Xylenes, total	0.0005	0.013	ppm
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		01-09-90	
DATE ANALYZED		01-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.20	ppm
as Motor Oil	0.05	ND	ppm

SAMPLE DESCRIPTION: MW-9 01-05-90 1300
LAB Job No: (-43132)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		5	
DATE ANALYZED		01-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	4.3	ppm
METHOD 602		--	
Benzene	0.0005	0.097	ppm
Ethylbenzene	0.0005	0.091	ppm
Toluene	0.0005	0.12	ppm
Xylenes, total	0.0005	0.29	ppm
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		01-09-90	
DATE ANALYZED		01-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	1.6	ppm
as Motor Oil	0.05	ND	ppm

SAMPLE DESCRIPTION: MW-3 01-05-90 1315
LAB Job No: (-43133)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		01-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	2.7	ppm
METHOD 602		--	
Benzene	0.0005	0.051	ppm
Ethylbenzene	0.0005	0.028	ppm
Toluene	0.0005	0.041	ppm
Xylenes, total	0.0005	0.070	ppm
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		01-09-90	
DATE ANALYZED		01-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.76	ppm
as Motor Oil	0.05	ND	ppm

NET Pacific, Inc.

Client: 18.02
NET Log No: 9206

Date: 01-15-90

SAMPLE DESCRIPTION: MW-6 01-05-90 1330
LAB Job No: (-43134)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		5	
DATE ANALYZED		01-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	22	ppm
METHOD 602		--	
Benzene	0.0005	1.4	ppm
Ethylbenzene	0.0005	0.56	ppm
Toluene	0.0005	1.8	ppm
Xylenes, total	0.0005	1.5	ppm
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		01-09-90	
DATE ANALYZED		01-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	6.5	ppm
as Motor Oil	0.05	ND	ppm

SAMPLE DESCRIPTION: MW-4 01-05-90 1515
LAB Job No: (-43135)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		01-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	ppm
METHOD 602		--	
Benzene	0.0005	ND	ppm
Ethylbenzene	0.0005	ND	ppm
Toluene	0.0005	ND	ppm
Xylenes, total	0.0005	ND	ppm
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		01-09-90	
DATE ANALYZED		01-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	ppm
as Motor Oil	0.05	ND	ppm

SAMPLE DESCRIPTION: MW-2 01-05-90 1530
LAB Job No: (-43136)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		01-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	2.0	ppm
METHOD 602		--	
Benzene	0.0005	0.038	ppm
Ethylbenzene	0.0005	0.030	ppm
Toluene	0.0005	0.0056	ppm
Xylenes, total	0.0005	0.059	ppm
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		01-09-90	
DATE ANALYZED		01-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.56	ppm
as Motor Oil	0.05	ND	ppm

SAMPLE DESCRIPTION: MW-5 01-05-90 1630
LAB Job No: (-43137)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		01-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	ppm
METHOD 602		--	
Benzene	0.0005	ND	ppm
Ethylbenzene	0.0005	ND	ppm
Toluene	0.0005	ND	ppm
Xylenes, total	0.0005	ND	ppm
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		01-09-90	
DATE ANALYZED		01-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	ppm
as Motor Oil	0.05	ND	ppm

NET Pacific, Inc.

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following, which supercedes the listed reporting limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

Converse Consultants

WIC No.# 204-5508-4903
AFE No.# 986611
EXP CODE # 5440

9206

CHAIN OF CUSTODY RECORD

Project No.	Project Name
88-44-361-01	500 40th ST. - OAKLAND

Samplers: (signature) Kelly Shutes

15 - 1 LITRE BOTTLES
28 - 40 ML VOA'S

P.M. MARK YALOM
SHELL

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers (43 TOTAL)	TPH-GAS (WATER)	TPH-DIESEL (WATER)	BTEX (WATER)	Remarks
MW-10	1/5/90	11:30		✓	500 40th ST. - OAK.	7	✓	✓	✓	STANDARD TURN AROUND TIME
MW-9	1/5/90	1:00		✓	500 40th ST. - OAK.	6	✓	✓	✓	" " "
MW-3	1/5/90	1:15		✓	500 40th ST. - OAK.	6	✓	✓	✓	" " "
MW-6	1/5/90	1:30		✓	500 40th ST. - OAK.	6	✓	✓	✓	" " "
MW-4	1/5/90	3:15		✓	500 40th ST. - OAK.	6	✓	✓	✓	" " "
MW-2	1/5/90	3:30		✓	500 40th ST. - OAK.	6	✓	✓	✓	" " "
MW-5	1/5/90	4:30		✓	500 40th ST. - OAK.	6	✓	✓	✓	" " "

NOTE:
MUST HAVE ANALYSIS IN HAND
BY 1-12-90

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Kelly Shutes					
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time 1-6-90 | 10:50 am

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

~~Marc Yalom~~ Bo
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 03-15-90
NET Client Acct. No: 18.02
NET Pacific Log No: 9985
Received: 03-02-90 2300

Client Reference Information

SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Judy Ridley for
Jules Skamarack
Laboratory Manager

Enclosure(s)

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

SAMPLE DESCRIPTION: MW-3 03-02-90 1025
LAB Job No: (-47892)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		25	
DATE ANALYZED		03-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	2.3	mg/L
METHOD 602		--	
Benzene	0.5	230	ug/L
Ethylbenzene	0.5	55	ug/L
Toluene	0.5	80	ug/L
Xylenes, total	0.5	230	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		03-08-90	
DATE ANALYZED		03-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.57	mg/L
as Motor Oil	0.05	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 9985

Date: 03-15-90
Page: 3

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

SAMPLE DESCRIPTION: MW-3 dup 03-02-90 1025
LAB Job No: (-47893)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		25	
DATE ANALYZED		03-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	2.3	mg/L
METHOD 602		--	
Benzene	0.5	220	ug/L
Ethylbenzene	0.5	53	ug/L
Toluene	0.5	80	ug/L
Xylenes, total	0.5	230	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		03-08-90	
DATE ANALYZED		03-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.56	mg/L
as Motor Oil	0.05	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 9985

Date: 03-15-90
Page: 4

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

SAMPLE DESCRIPTION: MW-4 03-02-90 1110
LAB Job No: (-47894)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		03-08-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
Benzene	0.5	ND	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	ND	ug/L
Xylenes, total	0.5	ND	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		03-08-90	
DATE ANALYZED		03-09-90	
METHOD GC FID/3510		--	
as Diesel	0:05	ND	mg/L
as Motor Oil	0.05	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 9985

Date: 03-15-90
Page: 5

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

SAMPLE DESCRIPTION: MW-2 03-02-90 1200
LAB Job No: (-47895)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		25	
DATE ANALYZED		03-09-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	1.9	mg/L
METHOD 602		--	
Benzene	0.5	95	ug/L
Ethylbenzene	0.5	83	ug/L
Toluene	0.5	ND	ug/L
Xylenes, total	0.5	200	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		03-08-90	
DATE ANALYZED		03-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.58	mg/L
as Motor Oil	0.05	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 9985

Date: 03-15-90
Page: 6

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

SAMPLE DESCRIPTION: MW-5 03-02-90 1245
LAB Job No: (-47896)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		03-08-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
Benzene	0.5	ND	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	ND	ug/L
Xylenes, total	0.5	ND	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		03-08-90	
DATE ANALYZED		03-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.11	mg/L
as Motor Oil	0.05	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 9985

Date: 03-15-90
Page: 7

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

SAMPLE DESCRIPTION: trip blank 03-02-90
LAB Job No: (-47897)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		03-08-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
Benzene	0.5	ND	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	ND	ug/L
Xylenes, total	0.5	ND	ug/L

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-47890S)	(-47890SR)	RPD
as Gasoline	0.05	mg/L	ND	95	99	4
Benzene	0.5	ug/L	ND	104	100	4
Toluene	0.5	ug/L	ND	105	102	3

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-47874S)	(-47874SR)	RPD
as Diesel	0.05	mg/L	ND	67	63	4.9

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

P.M. Marc Yalom
WIC# 204-5508-1903
AFE# 986611
Exp Code 5440
Shell Eng: Diane Luquist

PROJECT NO.:	PROJECT NAME / CROSS STREET :
68-44-3661-01	Shell Oil Company 500 40th St. Oakland, CA
SAMPLERS: (Signature) Thomas Smith	

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH-GAS	ANALYSES: TPH-Diesel	ANALYSES: BTEX	REMARKS
MW-3	3/1/90	10:25		✓	40 ml VOA	.4	X		X	(9985) All Samplee are STAT
MW-3	3/1/90	10:25		✓	Ambers Liter	.3		X		
MW-3	3/1/90	10:25		✓	40ml VOA	.4	X		X	Please call Marc Yalom about your findings.
MW-3	3/1/90	10:25		✓	Ambers Liter	.3		X		
MW-4	3/1/90	11:10		✓	40ml VOA	.4	X		X	
MW-4	3/1/90	11:10		✓	Ambers Liter	.2		X		
MW-2	3/1/90	12:00		✓	40ml VOA	.4	X		X	
MW-2	3/1/90	12:00		✓	Ambers Liter	.2		X		
MW-5	3/1/90	12:45		✓	40 ml VOA	.4	X		X	
MW-5	3/1/90	12:45		✓	Ambers Liter	.2		X		
Trip	3/1/90				40 ml VOA	.1	X		X	per MW 4 3/15 80 30
Trip	3/1/90				Ambers Liter	.1			→	hold custody seal intact 3/1
										custody seal 3/2/90 @ 21:00

RELINQUISHED BY : (Signature)	DATE : 3/2/90	RECEIVED BY : (Signartue)	RELINQUISHED BY : (Signature)	DATE :	RECEIVED BY : (Signature)
Thomas Smith	TIME : 19:30	Jeff Smith	Jeff Smith	TIME :	
RELINQUISHED BY : (Signature)	DATE :	RECEIVED BY : (Signartue)	RELINQUISHED BY : (Signature)	DATE :	RECEIVED BY : (Signature)
	TIME :			TIME :	
RELINQUISHED BY COURIER: (Sign.)	DATE :	RECEIVED BY MOBILE LAB : (Sign.)	RELINQ. BY MOBILE LAB : (Signature)	DATE :	RECEIVED BY COURIER : (Signature)
	TIME :			TIME :	
METHOD OF SHIPMENT: (VIA N(S)		SHIPPED BY : (Signatue)	RECEIVED FOR LAB : (Signature)	DATE : 3-2-90	COURIER FROM AIRPORT : (Signature)
				TIME : 2300	

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

RECEIVED
MAR 10 1990
CONVERSE ENVIRONMENT

~~Marc Yetom~~ Bo
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 03-15-90
NET Client Acct No: 18.02
NET Pacific Log No: 1000
Received: 03-06-90 0700

Client Reference Information

SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

Enclosure(s)

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

Parameter	Reporting Limit	Descriptor, Lab No. and Results OMW-6 03-04-90 1040 47955	 OMW-6 dup 03-04-90 1040 47956	 OMW-9 03-04-90 1300 47957	Units
PETROLEUM HYDROCARBONS		--	--	--	
VOLATILE (WATER)		--	--	--	
DILUTION FACTOR *		25	25	1	
DATE ANALYZED		03-12-90	03-12-90	03-09-90	
METHOD GC FID/5030		--	--	--	
as Gasoline	0.05	27	25	2.6	mg/L
METHOD 602		--	--	--	
Benzene	0.5	1,300	1,200	58	ug/L
Ethylbenzene	0.5	630	550	8.1	ug/L
Toluene	0.5	1,400	1,300	24	ug/L
Xylenes, total	0.5	2,400	2,300	75	ug/L
PETROLEUM HYDROCARBONS		--	--	--	
EXTRACTABLE (WATER)		--	--	--	
DILUTION FACTOR *		1	1	1	
DATE EXTRACTED		03-10-90	03-10-90	03-10-90	
DATE ANALYZED		03-10-90	03-10-90	03-10-90	
METHOD GC FID/3510		--	--	--	
as Diesel	0.05	4.6	4.8	1.0	mg/L
as Motor Oil	0.05	ND	ND	0.18	mg/L

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

		Descriptor, Lab No. and Results		
		OMW-10 03-04-90 1425	trip blank 03-04-90	
Parameter	Reporting Limit	47958	47959	Units
PETROLEUM HYDROCARBONS		--	--	
VOLATILE (WATER)		--	--	
DILUTION FACTOR *		1	1	
DATE ANALYZED		03-09-90	03-09-90	
METHOD GC FID/5030		--	--	
as Gasoline	0.05	0.29	ND	mg/L
METHOD 602		--	--	
Benzene	0.5	53	ND	ug/L
Ethylbenzene	0.5	4.3	ND	ug/L
Toluene	0.5	1.5	ND	ug/L
Xylenes, total	0.5	15	ND	ug/L
PETROLEUM HYDROCARBONS		--	--	
EXTRACTABLE (WATER)		--	--	
DILUTION FACTOR *		1	1	
DATE EXTRACTED		03-10-90	03-10-90	
DATE ANALYZED		03-10-90	03-10-90	
METHOD GC FID/3510		--	--	
as Diesel	0.05	0.39	ND	mg/L
as Motor Oil	0.05	2.7	ND	mg/L

Ref: SHELL, 500 40th Street, Oakland; Project: 88-44-361-01

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-47890S)	(-47890SR)	RPD
as Gasoline	0.05	mg/L	ND	95	99	4
Benzene	0.5	ug/L	ND	104	100	4
Toluene	0.5	ug/L	ND	105	102	3

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-48263S)	(-48263SR)	RPD
as Diesel	0.05	mg/L	ND	86	78	8.6

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following, which supercedes the listed reporting limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

P.M. Marc Yalom
Wic #204-5508-4903
AFE# 981611
EXP Code 5440

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

Shell Engineer - Diane L

PROJECT NO.: 88-44-361-9

PROJECT NAME / CROSS STREET: Shell Oil Company 580 40th St Oakland, CA

SAMPLERS: (Signature) Thomas Smith

1000

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	TPH-GAS	BTEX	TPH-Diesel			REMARKS
OMW-6	3/4/90	10:40		✓	40 ml VOA	4	X	X				All Samples are STAT
OMW-6	3/4/90	10:40		✓	Ambers Liter	3			X			
Dup OMW-6	3/4/90	10:40		✓	40 ml VOA	4	X	X				Please Call Marc Yalom
Dup OMW-6	3/4/90	10:40		✓	Ambers Liter	3			X			about your finding
OMW-9	3/4/90	1:00		✓	40 ml VOA	4	X	X				
OMW-9	3/4/90	1:00		✓	Ambers Liter	2			X			
OMW-10	3/4/90	2:25		✓	40 ml VOA	4	X	X				
OMW10	3/4/90	2:25		✓	Ambers Liter	2			X			
Trip	3/4/90				40 ml VOA	1	X	X				
Trip	3/4/90				Amber Liter	1			X			

custody seal intact on 3/6

custody seal 3/5/90 @ 19:00

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signartue)	RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)
Thomas Smith	DATE: 3/5/90 TIME: 17:30	Jeff Wickler	Jeff Wickler	DATE: TIME:	
RELINQUISHED BY: (Signature)	DATE: TIME:	RECEIVED BY: (Signartue)	RELINQUISHED BY: (Signature)	DATE: TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY COURIER: (Sign.)	DATE: TIME:	RECEIVED BY MOBILE LAB: (Sign.)	RELINQ. BY MOBILE LAB: (Signatue)	DATE: TIME:	RECEIVED BY COURIER: (Signature)
METHOD OF SHIPMENT: via NCCI		SHIPPED BY: (Signatue)	RECEIVED FOR LAB: (Signature) K Temple	DATE: 3-6-90 TIME: 0700	COURIER FROM AIRPORT: (Signature)

APPENDIX D

RAW DATA OF FIELD MEASUREMENTS

CONVERSE ENVIRONMENTAL WEST
WELL DEVELOPMENT LOG

Site: 540 TH ST.
Project #: 88-[illegible]-391-01
Pre-Development Depth to Water: 9.43

Well: MW-9
Date: 11/5/90
TD of Well: 17.50

Field Team: R.R. K.S. + J.C.
Total Volume Purged: 30 GAL.
Casing Volume: 14.92

Time	Gallons Purged	Method	pH	E.C. umhos	Temp °C or °F	Turbidity NTU	Sediment @ Mins	Notes
10:00	P.P.	HAND BAIL 2 GAL.						NO ODOR OR SHEEN CLEAR
10:10	5	4 GAL. BAIL	6.66	0080	18°C			SLIGHT PETROLEUM ODOR TAN COLOR
10:13	10	4 GAL. BAIL	6.70	0090	18°C			MUSTY ODOR BROWN COLOR.
10:20	15	4 GAL. BAIL	6.79	0090	18°C			SLIGHT ODOR MURKY BROWN COLOR.
10:45	20	4 GAL. BAIL	6.59	0070	18°C			TAN COLOR MURKY
11:00	25	4 GAL. BAIL	6.64	0060	18°C			TAN COLOR
11:15	30	4 GAL. BAIL	6.62	0060	18°C			CLOUDY TAN COLOR LT. SANDS.
								10:30 D.T.W AT 14.53
								11:10 D.T.W = 12.90
								11:00 D.T.W. = 14.25
								11:10 D.T.W = 12.80
								11:20 D.T.W = 14.45
								12:10 D.T.W = 10.27

CONVERSE ENVIRONMENTAL WEST

Well Sampling Summary

Project Name: 540TH ST.
Project Number: 92-44- -01
Date: 1/5/92
Inspector: R.R. & S.C.

Well Number	Time	Total Depth	Depth to Water	Comments
MW-3	09:27	19 FT.	10.97	0909 LOCK
MW-2	09:30	20 FT.	10.95	" "
MW-4	09:35	15.50 FT.	12.25	" "
MW-5	09:32	20 FT.	12.96	" "
MW-6	09:38	20.50 FT.	10.23	~~LOCK~~ P 812
MW-9	09:40	17.50 FT.	9.90	" "
MW-10	09:43	16.50 FT.	9.92	" "

ATER SAMPLING FIELD SURVEY FORM

Job # 38-44-361-01 Site 500 YOTH Sampling Team R.R. K.S.

Date 1/5/90 Well # MW-9 Sampling Method HAND BAIL Filter Method ____

Field Conditions ____

Describe Equipment D-Con Before Sampling This Well ALCONOX WASH H2O RINSE D.I. FINAL

Total Depth of Well 17.50 Time 9:43

Depth to Water Before Pumping 9.92

Height of Water Column	Diameter: 2 inch * .16 / 4 inch .65	= Volume	* Purge Factor	= Volume to Purge
7.58	4 inch .65	4.92	X 10±	____

Depth Purging From 17.50

Time Purging Begins 9:55 Notes on Initial Discharge CLOUDY TO CLEAR NO ODOR OR SHEEN

Time	Volume Purged	pH	Conductivity	EC	Notes	Time	Volume Purged	pH	Conductivity	EC	Notes

Time Field Parameter Measurement Begins ____

	Rep #1	Rep #2	Rep #3	Rep #4
pH				
Conductivity				
T°C				

Pre-Sample Collection Volume Purged ____ Gal.

Time Sample Collection Begins 12:45 Time Sample Collection Ends 1:00

Total Volume Purged 30 Gal.

Comments:

DEVELOPED AND SAMPLED

WATER SAMPLING FIELD SURVEY FORM

Job # 88-44-261-01 Site 500 40TH ST Sampling Team R. R.

Date 1/5/90 Well # MW 10 Sampling Method Dim Pump (cent.) Filter Method

Field Conditions SHADY COOL

Describe Equipment D-Con Before Sampling This Well ALCONOX WASH D.I. FINAL

Total Depth of Well 16.50 Time 9:46

Depth to Water Before Pumping 9.92

Height of Water Column 6.58 Diameter 2 inch * .16 / (4 inch .65) = Volume 4.27 * Purge Factor X 3 = Volume to Purge 13 GAL.

Depth Purging From BOTTOM

Time Purging Begins 9:55 Notes on Initial Discharge

Time	Volume Purged	pH	Conductivity (x10)	EC	Notes	Time	Volume Purged	pH	Conductivity	EC	Notes
9:55	P.P.				NO ODOR / NO SHEEN	10:25	14	6.50	0040	17°C	
10:12	5	6.79	0030	17°C							
10:13	8	6.66	0040	17°C	Well is Dry - Below PVC						
10:20	12	6.63	0040	17°C	NO ODOR - sheen						
10:23	13	6.51	0040	17°C	NO ODOR - Sheen						

Time Field Parameter Measurement Begins

	Rep #1	Rep #2	Rep #3	Rep #4
pH				
Conductivity				
T°C				

DTW = 13.90' @ 10:12
DTW = 14.39' @ 10:27
DTW = 11.55' @ 10:40
DTW = 10.20' @ 10:59
DTW = 10.00 @ 11:15

Pre-Sample Collection Volume Purged ______ Gal.

Time Sample Collection Begins 11:15 Time Sample Collection Ends 11:30

Total Volume Purged 15 GAll ± Gal.

Comments:

NO ODOR OR sheen - Well [illegible] Down Below [illegible] @ APPROX. 10:13 [illegible]
6 GAll ± - HAS [illegible] [illegible] Recharge

WATER SAMPLING FIELD SURVEY FORM

Job # 88-44-1 -01 Site 500 40TH ST. Sampling Team A. S. J. C.

Date 11/90 Well # MW-6 Sampling Method CENT PUMP Filter Method

Field Conditions SUNNY, COOL

Describe Equipment D-Con Before Sampling This Well ALCONOX WASH H2O RINSE D. I. FINAL

Total Depth of Well 20.50 Time 9:38

Depth to Water Before Pumping 10.23

Height of Water Column 10.27 Diameter: 2 inch * .16 / (4 inch .65) = Volume 6.68 * Purge Factor X3 = Volume to Purge 20 GAL.

Depth Purging From Bottom

Time Purging Begins 12:00 Notes on Initial Discharge

Time	Volume Purged	pH	Conductivity X10	EC	Notes	Time	Volume Purged	pH	Conductivity	EC	Notes
12:01	PP	—	—	—	PETRO ODOR - clear	12:29	25	6.36	110	19°C	" " "
12:13	7	6.32	0090	18°C	" " "						
12:16	10	6.28	0090	19°C	" " "						
12:18	15	6.29	0090	19°C	" " "						
12:26	20	6.28	0080	19°C	" " "						

Time Field Parameter Measurement Begins

	Rep #1	Rep #2	Rep #3	Rep #4
pH				
Conductivity				
T°C				

DTW = 17.10' @ 12:32
DTW = 14.95' @ 12:38
DTW = 11.53' @ 12:57
DTW = 10:59 @ 1:18

Pre-Sample Collection Volume Purged Gal.

Time Sample Collection Begins 1:15 Time Sample Collection Ends 1:30

Total Volume Purged 25 GALL ± Gal.

Comments:

WATER SAMPLING FIELD SURVEY FORM

Job # 88-40- -01 Site 54th ST. Sampling Team P. R. + K. S.

Date 4-1-90 Well # MW-5 Sampling Method Cont. Pump Filter Method

Field Conditions

Describe Equipment D-Con Before Sampling This Well

Total Depth of Well 20.0'FT Time

Depth to Water Before Pumping 12.96'FT.

Height of Water Column 7.04'FT. Diameter: 2 inch * .16 / (4 inch .65) = Volume 4.58 * Purge Factor 3 = Volume to Purge 14.FA11

Depth Purging From Bottom

Time Purging Begins 3:55 Notes on Initial Discharge

Time	Volume Purged	pH	Conductivity	EC	Notes	Time	Volume Purged	pH	Conductivity	EC	Notes
3:55	PP	—	—	—	Clear - NO ODOR - Brown	4:10	30	6.02	0030	23C	
4:03	5	6.00	0020	20C	" "						
4:05	10	6.04	0030	22C	" "						
4:07	15	6.02	0030	21C	" "						
4:09	25	6.02	0030	23C	" "						

Time Field Parameter Measurement Begins

	Rep #1	Rep #2	Rep #3	Rep #4
pH				
Conductivity				
T°C				

DTW = 15.20'FT @ 4:1
DTW = 13.02'FT @ 4:2

Pre-Sample Collection Volume Purged Gal.

Time Sample Collection Begins 4:20 Time Sample Collection Ends 4:30

Total Volume Purged 30 GAL Gal.

Comments:

WELL IS VERY FAST ON RECHARGE.

WATER SAMPLING FIELD SURVEY FORM

Job # 93-40- -01 Site 540 2 ST. Sampling Team P.R + K.S.

Date 1/6/90 Well # MW-4 Sampling Method _____ Filter Method _____

Field Conditions SUNNY, COOL

Describe Equipment D-Con Before Sampling This Well ALCONOX WASH 1% RINSE, D.I. FINAL

Total Depth of Well 15.50 Time 9:35

Depth to Water Before Pumping 12.25

Height of Water Column 3.25 Diameter: 2 inch * .16 / (4 inch .65) = Volume 2.11 * Purge Factor X3 = Volume to Purge 7 GAL

Depth Purging From BOTTOM

Time Purging Begins 2:18 Notes on Initial Discharge CLEAR NO ODOR

Time	Volume Purged	pH	Conductivity	EC	Notes	Time	Volume Purged	pH	Conductivity	EC	Notes
2:18	P.P.	—	—	—	CLEAR NO ODOR OR SHEEN						
2:30	3	6.19	0030	18°C	CLOUDY TAN NO ODOR						
2:37	6	6.24	0030	18°C	CLOUDY TAN						
2:45	7	6.26	0030	18°C	CLOUDY TAN NO ODOR						
3:08	8	6.19	0030	18°C	CLOUDY TAN						

Time Field Parameter Measurement Begins _____

2.54 D.T.W = 12.38
3:04 D.T.W = 12.25
3:10 D.T.W = 12.28

	Rep #1	Rep #2	Rep #3	Rep #4
pH				
Conductivity				
T°C				

Pre-Sample Collection Volume Purged _____ Gal.

Time Sample Collection Begins 3:10 Time Sample Collection Ends 3:15

Total Volume Purged 8 Gal.

Comments:

Job # 93-44- -01 Site SC) 40TH ST Sampling Team P.R. + K.S.

Date 11/5/90 Well # MW-3 Sampling Method HANDRAIL Filter Method

Field Conditions SUNNY. COOL

Describe Equipment D-Con Before Sampling This Well ALCONOX WASH H²O RINSE D.I. FINAL

Total Depth of Well 20 FT. Time 9:27

Depth to Water Before Pumping 10.97

Height of Water Column 9.03 Diameter: 2 inch * .16 / (4 inch .65) = Volume 5.87 * Purge Factor X3 = Volume to Purge 18 GAL

Depth Purging From BOTTOM

Time Purging Begins 12:00 Notes on Initial Discharge NO ODOR, SHEEN, CLEAR

Time	Volume Purged	pH	Conductivity X10	EC	Notes	Time	Volume Purged	pH	Conductivity	EC	Notes
12:07	P.P.	—	—	—	NO ODOR CLEAR						
12:15	5	6.35	0050	18C	CLOUDY NO ODOR						
12:20	10	6.36	0040	20C	CLOUDY VERY SLIGHT PETRO ODOR						
12:25	15	6.40	0040	20C	CLOUDY SLIGHT PETRO ODOR						
12:30	18	6.38	0040	20C	CLOUDY SLIGHT PETRO ODOR.						

12:30 DTW = 11.73'

1:05 DTW = 11.10'

Time Field Parameter Measurement Begins

	Rep #1	Rep #2	Rep #3	Rep #4
pH				
Conductivity				
T°C				

Pre-Sample Collection Volume Purged Gal.

Time Sample Collection Begins 1:00 Time Sample Collection Ends 1:15

Total Volume Purged Gal.

Comments:

WATER SAMPLING FIELD SURVEY FORM

Job # 88-44- -01 Site S4. ST. Sampling Team R.K. - K.S.

Date 1/-/00 Well # Sampling Method Centr. Pump Filter Method

Field Conditions

Describe Equipment D-Con Before Sampling This Well

Total Depth of Well 20.0 FT. Time

Depth to Water Before Pumping 10.95'

Height of Water Column	Diameter 2 inch * .16 / 4 inch .65 (circled)	= Volume	* Purge Factor	= Volume to Purge
9.05	4 inch .65	[illegible]	3	20

Depth Purging From Bottom

Time Purging Begins 2:10 Notes on Initial Discharge

Time	Volume Purged	pH	Conductivity	EC	Notes	Time	Volume Purged	pH	Conductivity	EC	Notes
2:10	PP	—	x10 —	—	clear NO NO ODOR - sheen	2:33	25	6.11	0030		" " "
2:24	6	6.05	0030	20°C	" " "						
2:26	10	6.08	0030	20°	" " "						
2:28	15	6.12	0030	20°	" " "						
2:30	20	6.07	0030	20°	" " "						

Time Field Parameter Measurement Begins

	Rep #1	Rep #2	Rep #3	Rep #4
pH				
Conductivity				
T°C				

DTW = 16.0 FT @ 2:36
DTW = 13.20' FT @ 2:46
DTW = 12.15' @ 3:?8
DTW = 12.10' @ 3:15
DTW = 12.05' @ 3:25

Pre-Sample Collection Volume Purged Gal.

Time Sample Collection Begins 3:25 Time Sample Collection Ends 3:30

Total Volume Purged 25 GAll ± Gal.

Comments:

Has A good Recharge - NO ODOR or sheen - PVC Dedicated 1" cas NO foot valve
Still No Problem Discharge

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # [illegible] Site [illegible] Sampling Team T. T.

Date 3/2/92 Well # MW-2 Sampling Method Centrifugal pump/Disposable [illegible]

Field Conditions Raining, Cold

Describe Equipment D-Con Before Sampling This Well Alconox Wash

Describe Meter Calibration Buffer #7, Ph # 4&10

Total Depth of Well 19.54 FT Time 8.53 Am

Depth to Water Before Pumping 11.54 FT Product Present YES/NO (Circle) Thickness ____

Height of Water Column 8 × (2" .16, 3" .37, 4" .65 — circled) = Volume 5.2 × Purge Multiple 3 = Volume to Purge 15.6

Depth Purging From Bottom of well

Time Purging Begins 11:42 Notes on Initial Discharge Clear, [illegible] odor

Time	Volume Purged	pH	Conductivity	T	Notes	Time	Volume Purged	Conductivity	T	Notes
11:43	Prepurge	5.90	030	19°	No Sheen					
11:45	5gals	6.00	040	19°	Very Clear					
11:47	10gals	6.06	040	19°	Clear					
11:54	15gals	6.10	040	20°	No change					

Pre-Sample Collection Volume Purged ____ Gal.

Time Sample Collection Begins 12:00 Time Sample Collection Ends 12:10

Total Volume Purged 15± Gal. Depth to Water After Sampling 12.21 FT

Comments: DTW after purging is 20.8FT @ 11:58 DTW 16.60 @ 11:56

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-01 Site Shell-5014 42th St Sampling Team T.J. / J.C

Date 3/2/90 Well # MW-3 Sampling Method Centrifugal pump / Disposable B

Field Conditions Rainy, Cold

Describe Equipment D-Con Before Sampling This Well Alconox Wash / H2O Rinse

Describe Meter Calibration Buffer = 7, pH = 10&4

Total Depth of Well 18.73 FT Time 8:30

Depth to Water Before Pumping 10.91 FT Product Present YES/NO (Circle) Thickness

Height of Water Column 7.82 2" 3" (4") * .16 .37 .65 = Volume 5.08 Purge Multiple * 3 Volume to Purge = 15.24

Depth Purging From Bottom of Well

Time Purging Begins 9:35 Notes on Initial Discharge Strong Petro odor

Time	Volume Purged	pH	Conductivity	T	Notes
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	10	[illegible]	[illegible]	[illegible]	[illegible]
10:15	5	.020	35	[illegible]	[illegible]

Time	Volume Purged	Conductivity	T	Notes

Pre-Sample Collection Volume Purged [illegible] Gal.

Time Sample Collection Begins [illegible] Time Sample Collection Ends [illegible]

Total Volume Purged [illegible] Gal. Depth to Water After Sampling [illegible]

Comments: [illegible]

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-01 Site Shell-500 40th St Sampling Team T. J

Date 3/2/90 Well # MW-4 Sampling Method Hand Bail 4 inch S.S., Disposable Bailer

Field Conditions Rainy, Cool

Describe Equipment D-Con Before Sampling This Well Alconox Wash / H2O Rinse / DI Rinse

Describe Meter Calibration Buffer = 7, pH = 4 & 10

Total Depth of Well 14.95 Time 9:49

Depth to Water Before Pumping 11.63 Product Present YES/NO (Circle) Thickness

Height of Water Column 3.32 2" 3" 4" * .16 .37 (.65) = Volume 2.15 Purge Multiple * 3 Volume to Purge = 6.47

Depth Purging From Bottom of the Well

Time Purging Begins 9:53 Notes on Initial Discharge Clear, No odor

Time	Volume Purged	pH	Conductivity	T	Notes	Time	Volume Purged	Conductivity	T	Notes
9:54	Prepurge	6.00	030	18C	Clear					
10:02	3 gals	6.10	030	18C	Murky					
10:15	6 gals	6.20	030	18C	Cloudy					

Pre-Sample Collection Volume Purged _____ Gal.

Time Sample Collection Begins 11:13 Time Sample Collection Ends 11:20

Total Volume Purged _____ Gal. Depth to Water After Sampling 11.85 FT @ 11:21

Comments: DTW after purging is 12.02 FT @ 12:14pm

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # [illegible] Site Shell-[illegible] Sampling Team T. J. / J. C.

Date 3/2/90 Well # MW-5 Sampling Method Centrifugal Pump

Field Conditions Raining, Cold

Describe Equipment D-Con Before Sampling This Well Alconox Wash / H2O Rinse / DI Final

Describe Meter Calibration Buffer 7, pH = 4 & 10

Total Depth of Well 20.22 Time 12:19

Depth to Water Before Pumping 12.66 FT Product Present YES/NO (Circle) Thickness _____

Height of Water Column 7.57 2" 3" 4" * .16 .37 (.65) = Volume 4.92 Purge Multiple * 3 Volume to Purge = 14.76

Depth Purging From _____

Time Purging Begins 12:34 Notes on Initial Discharge No odor, no sheen

Time	Volume Purged	pH	Conductivity	T	Notes	Time	Volume Purged	Conductivity	T	Notes
12:35	Prepurge	6.05	1030	12.6°	clear					
12:41	5 gals	6.00	0.37	12°	Sheen					
12:43	10 gals	6.00	0.40	12°	Sediment					
12:50	15 gals	6.10	0.40	12°	clear					

Pre-Sample Collection Volume Purged _____ Gal.

Time Sample Collection Begins 12:45 Time Sample Collection Ends 1:00

Total Volume Purged 15± Gal. Depth to Water After Sampling 12.75 FT 1:06

Comments: DTW when pumping is 12.66 FT @ 12:51

CONVERSE ENVIRONMENTAL WEST
Water Sampling Field Survey Form

Job # 88-44-361-01 Site Shell-500 40th St Sampling Team T. S.

Date 3/4/96 Well # OMW-1e Sampling Method Centrifical pump / Disposable Bailer

Field Conditions Rainy, Cool

Describe Equipment D-Con Before Sampling This Well Alconox Wash | H20 Rinse | DI final

Describe Meter Calibration Buffer #7, PH Solution #4, 10

Total Depth of Well 20.50 FT Time 9:36

Depth to Water Before Pumping 9.40 FT Product Present YES/NO (Circle) Thickness

Height of Water Column 11.1 2" .16 3" .37 (4" .65) = Volume 7.21 Purge Multiple * 3 Volume to Purge = 21.64

Depth Purging From Bottom of well

Time Purging Begins 9:44 Notes on Initial Discharge Clear Rust very Strong Petrol odor

Time	Volume Purged	pH	Conductivity X10	T	Notes
9:45	Prepurge	6.60	110	18°	Odor
9:51	5 gals	6.40	115	20°	Organic
9:53	10 gals	6.70	115	20°	Very Clear
9:56	16 gals	6.70	115	20°	White foam on water
9:59	20 gals	6.70	120	20°	

Time	Volume Purged	Conductivity	T	Notes
10:03	25 gals	115	20°	No change

Pre-Sample Collection Volume Purged _____ Gal.

Time Sample Collection Begins 10:40 AM Time Sample Collection Ends 11:00

Total Volume Purged 25± Gal. Depth to Water After Sampling 9:42 FT @ 11:02

Comments: DTW after purging is 18.14' DTW is 10.38 FT at 10:35 AM

CONVERSE ENVIRONMENTAL WEST
Water Sampling Field Survey Form

Job # 80-44-361-01 Site Shell-500 40th St. Sampling Team T. J.

Date 3/4/90 Well # OMW-9 Sampling Method Centrifical pump, Disposable Bailer

Field Conditions Rain, Cool

Describe Equipment D-Con Before Sampling This Well Alconox Wash / H2O Rinsh / DI Final

Describe Meter Calibration Buffer #7, Ph Solution # 4,10

Total Depth of Well 17.25 FT Time 11:50

Depth to Water Before Pumping 9.20 FT Product Present YES/NO (Circle) Thickness ______

Height of Water Column 8.05 * 2" .16 3" .37 (4" .65) = Volume 5.23 * Purge Multiple 3 = Volume to Purge 15.69

Depth Purging From Bottom of Well

Time Purging Begins 12:01 Notes on Initial Discharge Clear, Slight Petro odor

Time	Volume Purged	pH	Conductivity X10	T	Notes
12:02	Prepurge	6.40	050	18°c	No Sheen
12:15	5gals	6.80	050	19°c	Cloudy
12:21	10gals	6.80	0.50	19°c	Slow recharge
12:30	15gals	6.80	060	19°c	Cloudy

Time	Volume Purged	Conductivity	T	Notes

Pre-Sample Collection Volume Purged ______ Gal.

Time Sample Collection Begins 1:00 Time Sample Collection Ends 1:10

Total Volume Purged 15± Gal. Depth to Water After Sampling 10.21FT @ 1:13

Comments: DTW after purging is 14.54 FT @ 12:21 Pm, Heavy rain stopped working at 12:40 Pm

Converse Environmental West

MIY\WATER SAMPLING FORM

CONVERSE ENVIRONMENTAL WEST
Water Sampling Field Survey Form

Job # 88-44-361-01 Site Shell-500 40th St Sampling Team T.J. / M.S.

Date 3/14/90 Well # OMW-10 Sampling Method Centifical Pump, Disposable Bail

Field Conditions Rainy/Cool

Describe Equipment D-Con Before Sampling This Well Alconox Wash/H2O Rinse/ DI final

Describe Meter Calibration Buffer #7, PH #4, 10

Total Depth of Well 16.50 Time 1:30

Depth to Water Before Pumping 9.20 Product Present YES/NO (Circle) Thickness ____

Height of Water Column 7.3 2" 3" (4") * .16 .37 .65 = Volume 4.74 Purge Multiple * 3 Volume to Purge = 14.23

Depth Purging From Bottom of Well

Time Purging Begins 1:37 Notes on Initial Discharge NO FREE PRODUCT CLEAR, NO ODOR

Time	Volume Purged	pH	Conductivity x1	T	Notes	Time	Volume Purged	Conductivity	T	Notes
1:38	PREPERG	6.30	125	15°C	CLOUDY, NO SHEEN, NO ODOR					
1:49	5.0	6.40	140	17°C	TRACE OF SHEEN ORGANICS/WEEDY					
1:55	10.0	6.80	x10 0.20	15°C	CLOUDY, V. 2Y SLIGHT SHEEN, NO SAND OR SILTS					
2:09	16.0	6.80	x10 0.20	18°C	SLIGHT SHEEN, CLOUDY, VERY SLIGHT SILTS					

Pre-Sample Collection Volume Purged ____ Gal.

Time Sample Collection Begins 2:25 Time Sample Collection Ends 2:33

Total Volume Purged 16.0 ± Gal. Depth to Water After Sampling 9.31'

Comments: OMW-10 @ 2:00 STOPPED TO LET WELL RECHARGE AFTER DTW = 14.10' @ 2:08 WE BEGAN FINISHING THE FINAL PURGE OF OMW-10. DTW = 14.70 AFTER PURGEING 16.0 GALLONS. DTW = 10.70 BEFORE SAMPLEING. SAMPLEING BEGAN 2:25

APPENDIX E

QA/QC PROTOCOLS
SAMPLING FOR VOLATILE ORGANICS

SAMPLING FOR VOLATILE ORGANICS

In this sampling, it is especially important that the sample represent conditions existing in the aquifer, not in the well. Differences in water quality characteristics often exist between the water in the well and the surrounding aquifer, particularly in wells used intermittently or infrequently such as monitoring wells. To obtain a representative sample of the aquifer, the well is purged until selected water quality parameters stabilize. The parameters should include pH, electrical conductivity and temperature. Once consistent readings are obtained for the three parameters, the discharge should represent formation waters rather than potentially stagnant water in the well. The purge volume should amount to between three and five well volumes.

After the well is purged, the discharge shall be decreased to the slowest rate obtainable. The sampler shall be careful to not contaminate the sample. The following practices shall be followed:

1. Do not touch the lip of the bottles or insides of the septum.

2. Avoid touching the mouth of the discharge tap.

3. Do not splash or agitate the water while the bottle is being filled.

4. Do not smoke, eat or handle any objects not necessary for sampling.

5. Do not sample downwind of any potential volatile organic sources such as car exhausts, open fuel tanks, etc. Note any potential sources in the area if the are unavoidable.

6. Avoid handling the septum. If handling is necessary, use specially prepared and protected forceps or tweezers.

When taking the sample, first rinse the bottle two to three volumes with the well water. The bottle is then filled slowly to prevent entrapment of any air bubbles. The bottle is filled completely such that a meniscus form, essentially "piling up" the water into the bottle. Immediately place the cap on, turn the bottle upside down, tap it a few times and note whether there are any bubbles in the sample. If a bubble exists, discard the sample and repeat sampling including the triple rinse. If a bubble is found on the second attempt, do not repeat the procedure again, but note the bubbles existence on the sample label and also notify the laboratory when it is submitted.

Place the sample in a sealable plastic bag and then into a cooler/ refrigerator. The sample should be protected from any light sources as much as possible.

Deliver the sample to the laboratory as soon as possible. If it cannot be delivered to the lab the same day, store the sample in a refrigerator which maintains a constant

temperature of 4°C. It is important that the sample be delivered as soon as possible since the samples must be analyzed within two weeks for the results to be valid. Therefore, the sooner the sample is given to the lab, the more time the lab has to analyze it.