9/25/89

Converse Environmental Consultants California

CONVERSE ENVIRONMENTAL WEST
new name for
CONVERSE ENVIROMENTAL CONSULTANTS CALIFORNIA

55 Hawthorne Street, Suite 500
San Francisco, California 94105

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

September 21, 1989
88-44-359-01-168

Ms. Dyan Whyte
Water Resource Control Engineer
San Francisco Bay Regional Water Quality Control Board
1111 Jackson Street, Sixth Floor
Oakland, California 94607

Subject: Shell Oil Company - Quarterly Report
285 Hegenberger Road
Oakland, California

Dear Ms. Whyte:

Enclosed please find one copy of the Shell Oil Company Quarterly Report of Activities for Quarter 3, 1989 prepared by Converse Environmental West (CEW) - San Francisco.

Please call if you have any questions.

Very truly yours,

Converse Environmental West

Robin M. Breuer

Robin M. Breuer
Project Manager
DWC:fs
enclosure

cc: Ms. Diane Lundquist - Shell Oil Company - (w/encl.)
Ms. Wendy Howell - Shell Oil Company (w/encl.)
Mr. Rafat Shahid - Alameda County Health - (w/encl.)
Mr. Douglas W. Charlton - CEW - (w/o encl.)

HEGENBERGER\WHYTE.168

DOUGLAS W. CHARLTON
Principal Geologist

ACTIVE GASOLINE STATION

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

September 21, 1989

CEW Project No. 88-44-359-01

This report has been prepared by the staff of **Converse Environmental West (CEW)** 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 express or implied.

Converse Environmental West

REPORT OF ACTIVITIES

SHELL OIL COMPANY FACILITY
285 Hegenberger Road
Oakland, California

For Quarter 3, 1989
Submitted: September 21, 1989

RWQCB Representative:	Dyan Whyte Water Resource Control Engineer
LIA Representative:	Mr. Rafat Shahid Alameda County Health Care Services Agency
Shell Engineer:	Ms. Diane Lundquist Environmental Engineer
Converse Project Manager:	Ms. Robin Breuer, Project Manager 55 Hawthorne Street, Suite 500 San Francisco, California 94105 (415) 543-4200
Registered Geologist in Charge:	Douglas W. Charlton, Principal Geologist 55 Hawthorne Street, Suite 500 San Francisco, California 94105 (415) 543-4200
Site Owner:	Shell Oil Company

1. SITE DESCRIPTION

1.1 Maps

Vicinity Map: See Drawing 1
Plot Plan: See Drawing 2

1.2 Neighborhood Topography

Relatively flat. Most of neighborhood appears to be comprised of reclaimed marshlands.

1.3 Primary Surface Waters Nearby

San Leandro Creek, approximately 500 feet northwest, and San Francisco Bay, approximately one mile northwest of site.

1.4 Water Table Information

Q1/89: Water table elevation ranged between 2.80 and 2.34 feet MSL, with a gradient of 0.007 ft/ft. Highest high water by redox boundary in soil is ~4 feet MSL.

Q2/89: Water table elevation was approximately 2 feet MSL, with a gradient of .008 ft/ft. to the south.

2. INVESTIGATION HISTORY

2.1 Soil Borings Drilled to Period Start

SB-3, SB-4 and SB-5.

2.2 Soil Borings Abandoned to Period Start

SB-1 and SB-2.

2.3 Groundwater Wells Drilled to Period Start

MW-4, MW-5, MW-6, MW-7 and MW-8.

2.4 Groundwater Wells Abandoned to Period Start

None.

2.5 Investigative History Summary

TABLE 1: Chronological Summary

Date	Description of Activity
1984	Underground storage tanks replaced with single-wall fiberglass tanks
01/1989	Shell transferred this case to CEW (formely CECC).
02/15/89	CEW drilled and sampled three wells and two borings.
04/01/89	CEW reported results of Quarter 1, 1989 activities to agencies of jurisdiction.
04/28/89	CEW installed MW-4 through MW-8.
05/26/89	CEW drilled and sampled SB-3, SB-4 and SB-5.
07/13/89	**CEW drilled, sampled, and abandoned SB-6, SB-7, SB-8, SB-9, SB-10 and SB-11.**
07/13/89	**CEW installed MW-9.**

3. WORK COMPLETED THIS PERIOD

3.1 Introduction

Work initiated and completed during the quarter followed the task descriptions and modifications of the site Work Plan dated February 10, 1989. The relative timing and schedule of these activities is shown in summary in the Revised Critical Path (May 24, 1989) for the project (Drawing 3).

3.2 Soil Boring Drilling/Sampling

In accordance with Task (Attachment 4) **six** soil borings were drilled, sampled, and abandoned following the protocols described in Appendices A and B. Soil cuttings were handled by CEW and Shell Oil Company, following task procedures described in Appendix G. Boring logs are enclosed as Attachment 1. A summary of CEW soil boring activities is presented in Table 2.

TABLE 2: Summary of Soil Borings Drilled

Boring No.	Date	Diameter (inches)	T.D. (ft. bgs)	Unsaturated Soil Samples	Saturated Soil Samples
SB-1	02/89	4	6.5	4 ft.	None
SB-2	02/89	4	6.0	5 ft.	None
SB-3	5/24/89	4	5.0	2,4 ft.	None
SB-4	5/24/89	4	4.0	2,4 ft.	None
SB-5	5/24/89	4	5.0	2 ft.	None
SB-6	**7/13/89**	**4**	**7.0**	**None***	**None**
SB-7	**7/13/89**	**4**	**6.0**	**None***	**None**
SB-8	**7/13/89**	**4**	**6.5**	**4 ft.**	**None**
SB-9	**7/13/89**	**4**	**7.0**	**4 ft.**	**None**
SB-10	**7/13/89**	**4**	**6.5**	**4 ft.**	**None**
SB-11	**7/13/89**	**4**	**6.5**	**4 ft.**	**None**

* Sample not taken, in UST gravel backfill

3.3 Well Installations

In accordance with Task (Attachment 4), **one** groundwater monitoring well was installed, developed and sampled following the protocols in Appendices C, D and E. All wells were installed as 4-inch diameter filter-packed PVC wells through hollow-stem auger drilling equipment. Boring logs and as-built well construction diagrams of these and prior CEW wells are included as Attachment 1. A summary of CEW well installations is provided in Table 3.

TABLE 3: Summary of Groundwater Monitoring Well Installation

Well No.	Date Inst.	Diameter Well (in.)	Initial Water Table (ft. bgs)	Static Water Table (ft. bgs)	T.D. ft. bgs)	Screen (ft. bgs)	Bentonite Seal (ft. bgs)	Grout Seal (ft. bgs)
MW-1	2/14/89	4	~6.0	3.83	16.5	10-5.5	4.0-3.0	3.0-0
MW-2	2/15/89	4	~5.0	5.33	16.5	10-5.0	4.0-3.0	3.0-0
MW-3	2/15/89	4	~6.0	6.0	16.5	10-5.0	4.0-3.0	3.0-0
MW-4	4/28/89	4	7.5	9.60	14.0	10-5.0	5.0-4.0	4.0-0
MW-5	4/27/89	4	~7.0	5.47	14.0	10-4.5	4.5-3.5	3.5-0
MW-6	4/28/89	4	~6.0	6.47	12.0	11.0-5.0	5.0-4.0	4.0-0
MW-7	4/27/89	4	~6.0	5.48	14.0	10.0-5.0	5.0-4.0	4.0-0
MW-8	4/28/89	4	~7.0	8.62	12.0	10.0-5.0	5.0-4.0	4.0-0
MW-9	7/13/89	4	~6.0	5.33	10.5	10.0-5.0	4.5-3.5	3.5-0

3.4 Soil Analysis/Results

Soil samples were properly packaged and transferred to a California State-certified analytical laboratory under proper chain-of-custody and preservation (see Appendix E). The samples were analyzed for TPH (as gasoline and diesel) and BTEX using EPA Methods 3550, 5030, 8015 and 8020, and for Pb using EPA Methods 3050 and 7421. Analytical results are summarized in Table 4, and certified sheets from all analyses are enclosed as Attachment 2.

TABLE 4: Soil Analytical Results (ppm)

Boring No.	Depth (ft. bgs)	Moisture	TPH-g	TPH-d	Total Oil & Grease*	Benzene	Toluene	Ethyl-benzene	Xylene	Total Lead
SB-1	4.0	Damp	140	NA	NA	0.3	0.8	1.4	0.6	14.7
SB-2	5.0	Moist	3700	NA	NA	<8	120	110	530	9.17
SB-3	4.0	Wet	1300	180	89	0.54	8.4	18	24	0.2
SB-3	2,4**	Wet	250	100	67	<0.25	1.1	1.9	3.2	<0.2
SB-4	2,4**	Moist	1300	12	<10	0.54	0.4	18	24	
SB-4	4.0	V.Moist	50	20	13	0.12	0.43	0.45	0.18	<0.2
SB-5	2.0	Moist	31000	370	26	4.7	18	66	150	<0.2
SB-8	**6.5**	**Wet**	**1900**	**360**	**<10**	**<0.025**	**<0.025**	**25**	**82**	**6.2**
SB-9	**5.0**	**Moist**	**<10**	**<10**	**<10**	**<0.025**	**<0.025**	**<0.075**	**<0.075**	**3.9**
SB-10	**4.5**	**Wet**	**550**	**75**	**<10**	**2.3**	**11**	**13**	**71**	**5.8**
SB-11	**5.0**	**Wet**	**190**	**440**	**<10**	**3.8**	**16**	**5.7**	**28**	**17**
MW-1	5.5	Wet	1100	NA	NA	12	36	27	120	12.7
MW-2	6.0	Wet	2	NA	NA	0.1	<0.1	<0.1	<0.1	3.31
MW-3	5.0	Moist	3	NA	<30	<0.1	<0.1	<0.1	<0.1	1.42
MW-4	5.0	Moist	<10	<10	<10	<0.025	0.056	<0.075	<0.075	34
MW-4	10.0	Wet	<10	<10	<10	<0.025	0.052	<0.075	<0.075	2.3
MW-5	5.0	Damp	<10	<10	<10	<0.025	<0.025	<0.075	<0.075	5.3
MW-5	10.0	Moist	<10	<10	<10	<0.025	0.037	<0.075	<0.075	4.3
MW-6	5.0	Moist	<10	<10	<10	0.033	0.079	<0.075	<0.075	8.2
MW-6	10.0	Wet	<10	<10	<10	<0.025	0.12	<0.075	<0.075	7.0
MW-7	5.0	Moist	4100	84	<10	14	92	14	190	14
MW-7	10.0	Wet	<10	18	<10	0.11	0.045	<0.075	<0.075	14
MW-8	5.0	Moist	<10	<10	<10	<0.025	0.089	<0.075	<0.075	3.4
MW-8	10.0	Wet	<10	160	460	<0.025	0.087	<0.075	<0.075	22
MW-9	**5.0**	**Moist**	**120**	**<10**	**<10**	**1.1**	**0.64**	**3.7**	**0.46**	**4.1**

NOTE: SB-6 and SB-7 were located in UST gravel backfill and not sampled.
* Extractable as motor oil.
** Composite soil sample from two depths (equal weight basis).

3.5 Groundwater Analysis and Results

Groundwater samples were properly packaged and transferred to a California State-certified analytical laboratory under proper chain-of-custody and preservation (see Appendix E). The samples were analyzed for TPH (as gasoline and diesel) and BTEX using EPA Methods 5030, 3510, 8015 and 602. Analytical results are summarized in Table 5, and certified sheets from all analyses are enclosed as Attachment 3.

3.6 Physical Monitoring Results

Nine wells were physically monitored for depth to water table, and measurement of floating product, if any, once during the quarter. A summary of these results is presented in Table 6.

TABLE 5: Groundwater Analytical Results (ppm)

Well No.	Date Sampled	TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylene
MW-1	02/16/89	99	NA	20	23	5.7	23
MW-1	05/23/89	48	11	4.2	5.2	1.2	7.7
MW-1	**08/04/89**	**63**	**11**	**5.5**	**5.5**	**3.2**	**9.5**
MW-2	02/16/89	20	NA	0.2	0.9	2.7	9.6
MW-2	05/23/89	1.5	1.6	0.0043	0.0029	0.011	0.15
MW-2	**08/04/89**	**15**	**7.4**	**0.075**	**0.12**	**0.85**	**2.2**
MW-3	02/16/89	60	NA	5.5	0.2	3.2	5.2
MW-3	05/23/89	<0.05	1.5	<0.0005	<0.0005	<0.0015	<0.0015
MW-3	**08/04/89**	**2.0**	**1.2**	**0.12**	**0.012**	**<0.0015**	**0.086**
MW-4	05/23/89	<0.05	NA	<0.0005	<0.0005	<0.0015	<0.0015
MW-4*	**08/04/89**	**<0.05**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0015**	**<0.0015**
MW-5	05/23/89	26	7.0	1.5	0.28	<0.0015	8.1
MW-5	**08/04/89**	**12**	**8.7**	**0.86**	**0.094**	**<0.0015**	**2.6**
MW-6	05/23/89	22	7.0	0.016	0.0065	0.0066	3.4
MW-6	**08/04/89**	**28**	**8.8**	**1.2**	**0.13**	**2.1**	**2.8**
MW-7	05/23/89	47	11	3.5	5.0	1.5	7.8
MW-7	**08/04/89**	**68**	**22**	**6.2**	**6.6**	**3.6**	**8.8**
MW-8	05/23/89	<0.05	0.10	<0.0005	<0.0005	<0.0015	<0.0015
MW-8	**08/04/89**	**<0.05**	**0.075**	**<0.0005**	**<0.0005**	**<0.0015**	**<0.0015**
MW-9	**08/04/89**	**47**	**12**	**5.6**	**6.6**	**1.5**	**8.5**

*MW-4 Analysis 601 was ND for all compounds.
Note: Oil and grease (as motor oil) was <5 ppm for all samples taken 5/23/89.

TABLE 6: Physical Monitoring Results: Evidence of Contamination[1]

Well No.	Date	Depth to Water (ft.)	Petroleum Water Odor	Thickness Floating Product (inches)	Notes
MW-1	02/16/89	3.83	Slight	0	None
MW-1	05/23/89	3.59	Slight	0	No sheen
MW-1	**08/03/89**	**4.04**	**Slight**	**0**	**None**
MW-2	02/16/89	5.33	Slight	0	None
MW-2	05/23/89	5.23	Slight	0	None
MW-2	**08/03/89**	**6.03**	**Slight**	**0**	**None**
MW-3	02/16/89	5.17	None	0	None
MW-3	05/23/89	5.09	None	0	None
MW-3	**08/03/89**	**5.34**	**Slight**	**0**	**None**
MW-4	05/23/89	9.60	None	0	None
MW-4	**08/03/89**	**6.37**	**None**	**0**	**None**
MW-5	05/23/89	5.47	Moderate	0	No sheen
MW-5	**08/03/89**	**5.94**	**None**	**0**	**None**
MW-6	05/23/89	5.47	Strong	0	Sheen
MW-6	**08/03/89**	**5.91**	**None**	**0**	**None**
MW-7	05/23/89	5.48	Moderate	0	Slight sheen
MW-7	**08/03/89**	**4.22**	**None**	**0**	**None**
MW-8	05/23/89	8.62	None	0	None
MW-8	**08/03/89**	**6.62**	**None**	**0**	**None**
MW-9	**08/03/89**	**5.78**	**None**	**0**	**None**

[1] Sheen; odor; FID; color; PID (opened/odor trapped in casing)

3.7 Hydrologic Tests and Research

Certain public files and records were researched, and conversations were held with authorities on local water conditions to provide background on the location and thickness of saturated zone, soil stratigraphy, groundwater flow patterns, seasonal variation of water tables, beneficial uses, etc. This information is included in the interpretive diagrams presented in Section 4 of this report.

4. REVIEW OF DATA AND INTERPRETATIONS

4.1 Geologic Cross Section, Showing MVF Contamination in Soil (See Drawings 7 and 8)

- The site appears to be constructed approximately 10 feet of fill overlying Bay Mud.

4.2 Distribution of MVF Contamination in Soil (Drawings 5 and 6)

- At five feet bgs, contaminated soil adjacent to the current tank backfill exceeds 1,000 ppm TPH-g.
- Soil at (-5') bgs is contaminated with >100 ppm TPH-g (SB-10, SB-11 and MW-9) in the northeast portion of the property.
- Soil TPH-g contamination appears to extend offsite to the northeast of the Shell property.

4.3 Distribution of Dissolved MVF Contamination in Groundwater (Drawings 9, 10 and 11)

- TPH-g/TPH-d ratio ranges from 2:1 to 6:1.
- TPH-g and TPH-d concentrations are generally increasing despite the drop in the groundwater table. This increase may be seasonal and influenced by the lack of flushing action.
- TPH-g in groundwater at MW-9 may be from a possible offsite unknown source.
- TPH-d in groundwater mimics the TPH-g plume and extends offsite.

4.4 Distribution of Floating Product on Groundwater

None.

4.5 Groundwater Elevation and Gradient (See Drawing 4)

The groundwater elevations have all remained above mean sea-level, and has a few localized flow directions all of which are grading out from MW-7.

The groundwater table elevation has decreased irregularly over the site. Generally noted is a decrease of 5-8 inches but a one foot plus decrease in MW-7, a two foot decrease in MW-8 and a three foot plus decrease in MW-4. No explanation is available for these irregularities at this time. There may be possible draining and tidal influence in the fill, where high permeability likely.

5. STATUS OF SCHEDULE

Task time lines established on the Revised Critical Path were met (see Drawing 3).

6. TASKS PLANNED BUT NOT COMPLETED

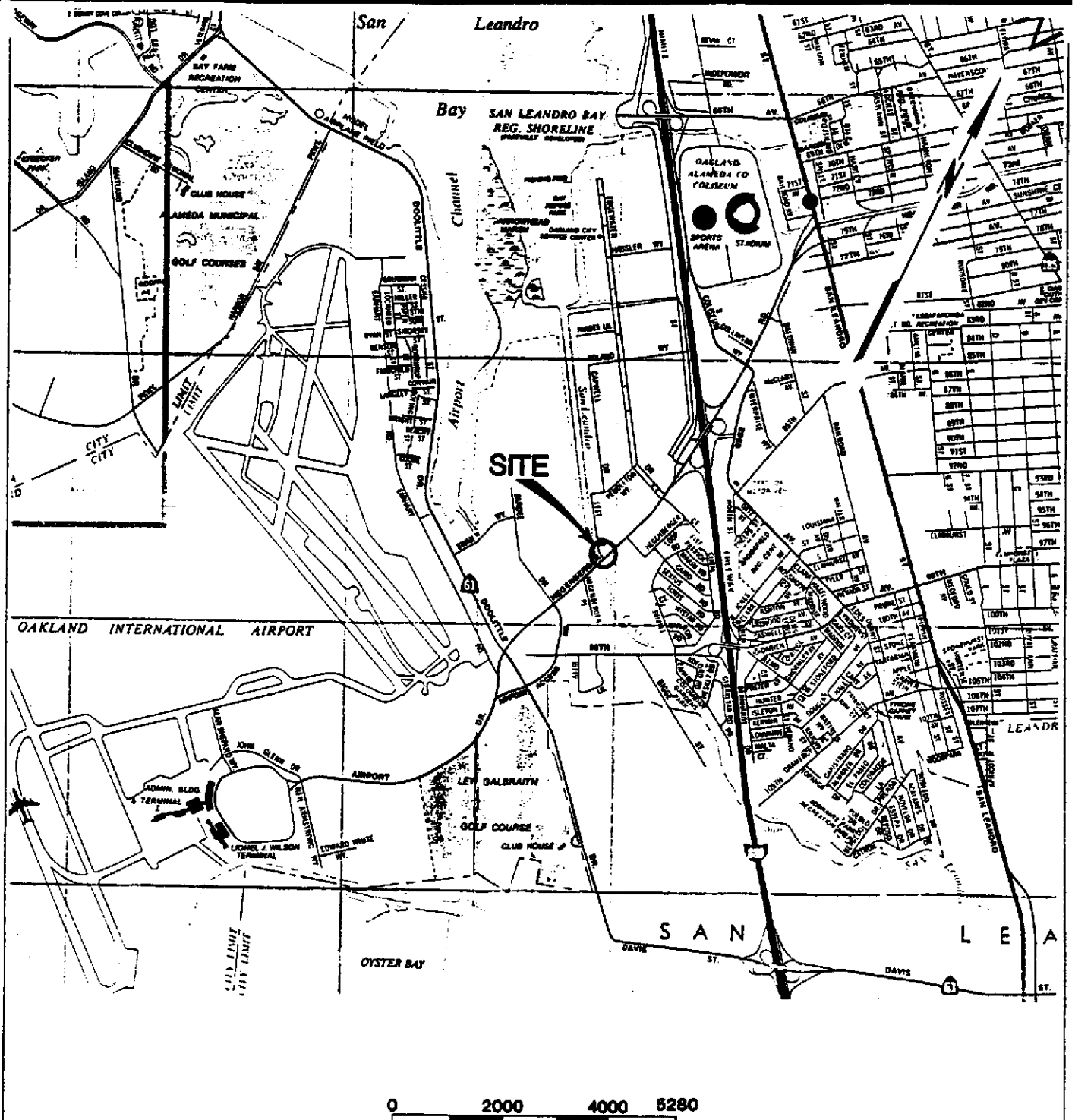
None.

7. PLANNED WORK

Tasks 1 through 13 will be continued next quarter, with the installation onsite of soil borings **SB-12** and **SB-13**, and one well, **MW-10**. These installations will supply soil and groundwater samples that will indicate whether soil and groundwater contamination are centered on the tank complex (Drawing 12), and work will be performed per CEW standard operating procedures (attached).

Task 1 - Drill and Sample Soil Borings
Task 7 - Install and Develop Groundwater Monitoring Wells
Task 8 - Sample/Analyze Groundwater
Task 13 - Prepare Offsite Groundwater Investigation Plan
Task 15 - Remediation Planning - Prepare Interim Remediation Plan

Groundwater monitoring will be continued for all wells. No offsite wells or borings are planned. However, permission for rights of entry to drill borings or install offsite, downgradient wells will be initiated and an offsite plan will be prepared.



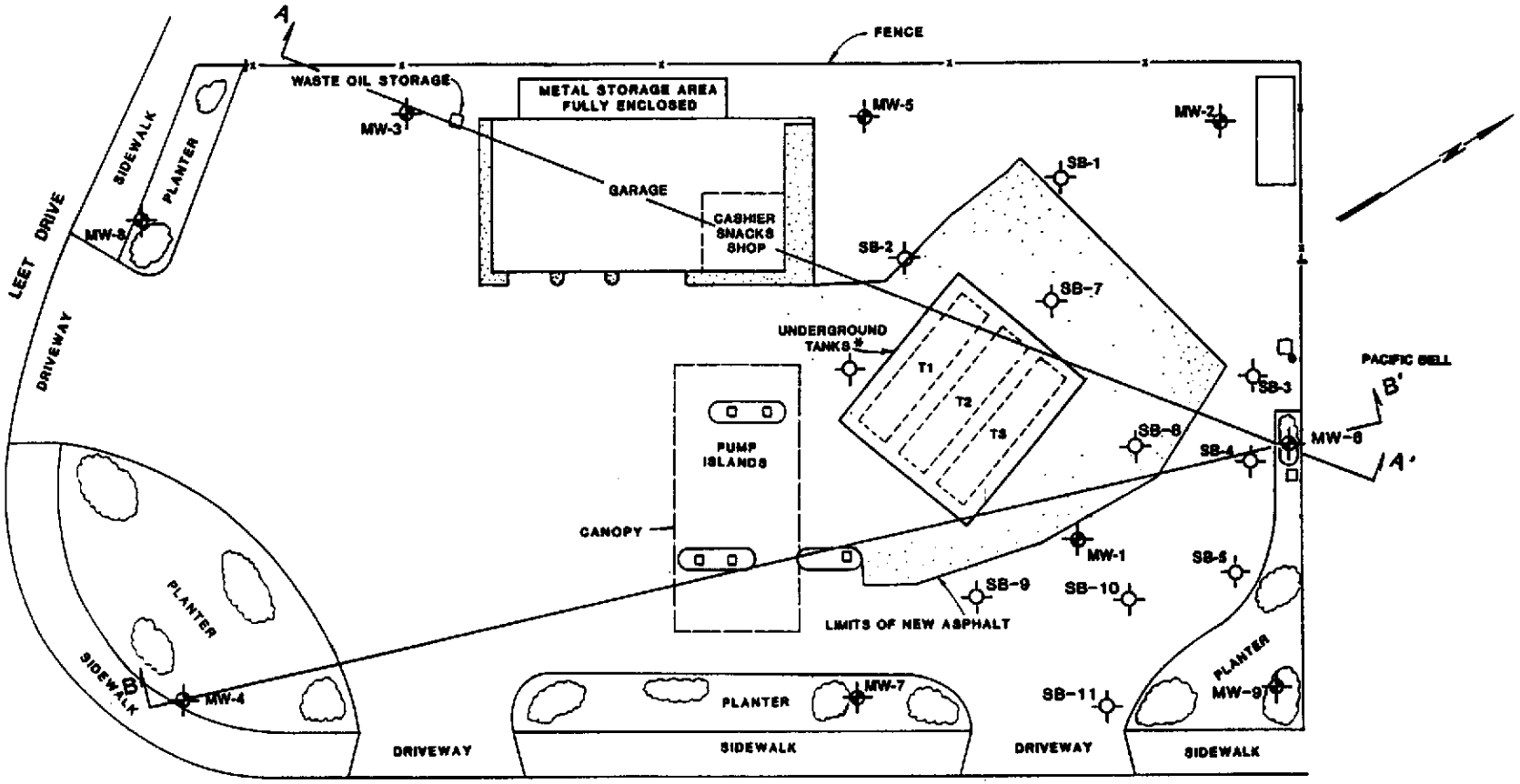
SOURCE: California State Automobile Association

SITE LOCATION

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale: AS SHOWN	Project No.: 88-44-359-01
Prepared by: KGC	Date: 3/21/89
Checked by: RMB	Drawing No.: 1
Approved by: DWC	



LEGEND

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

LINE OF GEOLOGIC CROSS SECTION

* T1 = REGULAR UNLEADED, 10,000 GALLONS

T2 = REGULAR LEADED, 10,000 GALLONS

T3 = SUPER UNLEADED, 100,000 GALLONS

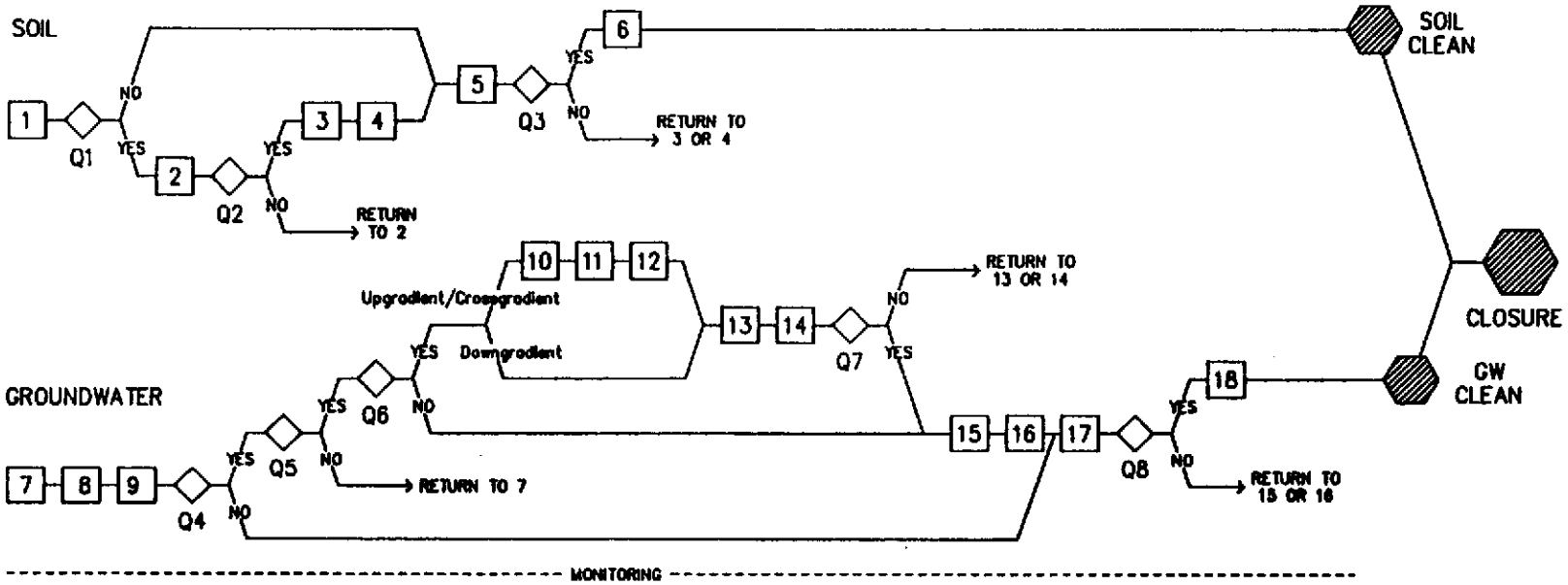
Base Map: Surveyed with EDM, Converse 1989.

PLOT PLAN

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/14/89
Prepared By	MLL
Checked By	RMB
Approved By	DWC
Project No.	98-44-388-02
Drawing No.	2



TASKS

Program 1: Onsite Soil Investigation/Remediation

Task 1 Drill and Sample Soil Borings
Task 2 Drill Step-Out Borings
Task 3 Prepare Soil Remedial Action Plan (if needed)
Task 4 Remediate Soil (if needed)
Task 5 Establish Clean Standards - Soil
Task 6 Confirm Remediated Soil

Program 2: Onsite Groundwater Investigation

Task 7 Install/Develop Groundwater Monitoring Wells
Task 8 Sample/Analyze Groundwater
Task 9 Conduct Hydrology Tests and Research

Program 3: Offsite Groundwater Investigation (if needed)

Task 10 Perform Neighborhood Assessment
Task 11 Refer to Legal Counsel
Task 12 Inform RWQCB
Task 13 Prepare Offsite Groundwater Investigation Plan
Task 14 Install Offsite Wells, Sample/Analyze

Program 4: Groundwater Remediation (if needed)

Task 15 Prepare Groundwater Remedial Action Plan
Task 16 Implement Remedial Action Plan
Task 17 Establish Cleanup Standards - Groundwater
Task 18 Confirm Groundwater Remediation

QUESTIONS

Q1: Are there concentrations of TPH greater than 100 ppm in any soil?

Q2: Is soil characterized?

Q3: Is the leaching potential acceptably low for contaminants proposed to be left in place?

Q4: Is groundwater actionable?

Q5: Is groundwater characterized onsite?

Q6: Does groundwater pollution extend offsite?

Q7: Is groundwater characterized offsite?

Q8: Is the environmental risk acceptably low for contaminants proposed to be left in groundwater?

SUMMARY OF PROGRESS - QUARTER 3, 1989

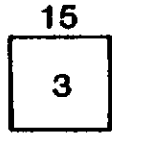
SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

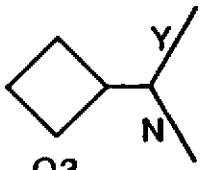
Scale	N/A
Date	5-24-89
Prepared By	LQL
Checked By	RMB
Approved By	DWC
Project No	88-44-359-01
Drawing No	3

KEY TO CRITICAL PATH DIAGRAMS

Time proceeds from left to right, with Tasks shown in relative order of succession.

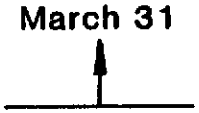


Task, showing Task number (inside) and anticipated number of days to completion (above), including preparatory activities, report preparation and review, and other related actions.



Question to be answered based on information from prior tasks.

Solid symbols indicate Letter Reports or formal Completion Reports coincident with question response.



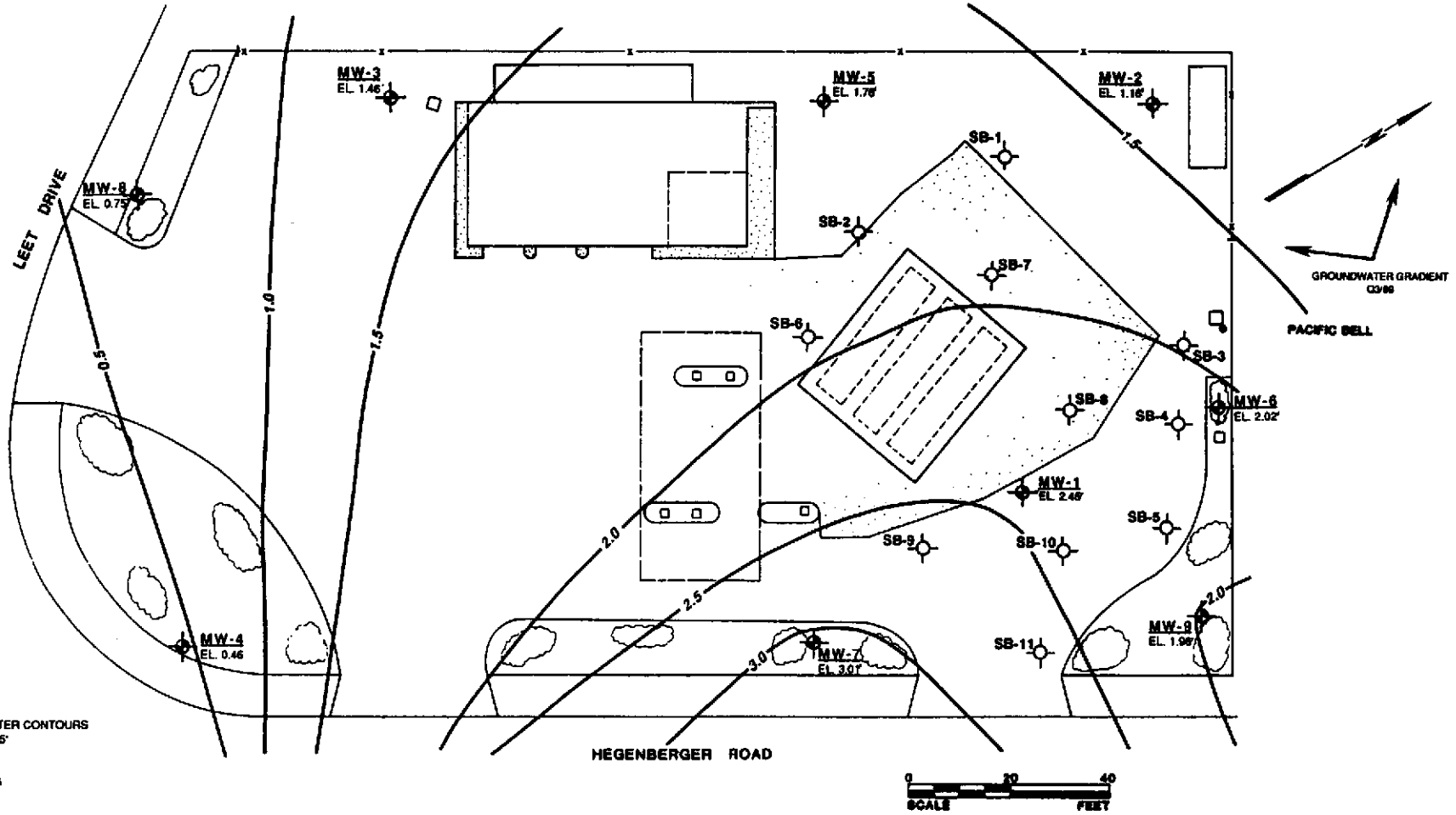
Relative calendar dates and dates of quarterly program reports to regulatory agencies.

KEY TO CRITICAL PATH DIAGRAM

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	N/A
Date	2/9/89
Prepared By	LQL
Checked By	RMB
Approved By	DWC
Project No	88-44-359-01
Drawing No	3a



LEGEND

GROUNDWATER CONTOURS
INTERVAL 0.5'

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

NOTES: WATER TABLE ELEVATIONS ARE IN FEET ABOVE MSL.

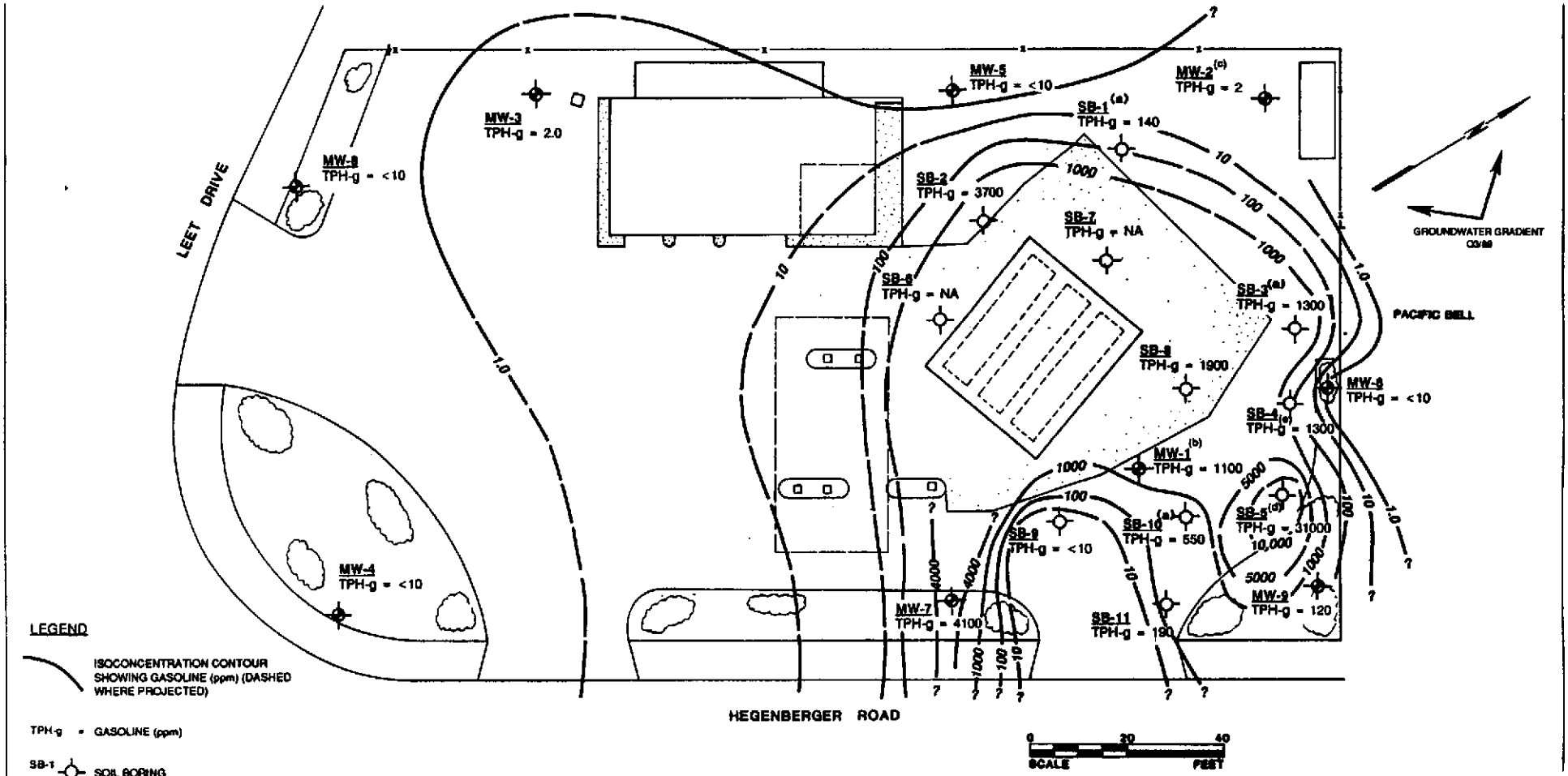
Base Map: Surveyed with EDM, Converse 1989.

GROUNDWATER GRADIENT Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/11/89
Prepared By	KGC/CRB
Checked By	RMB
Approved By	
Project No.	88-44-356-01
Drawing No.	4



LEGEND

ISOCONCENTRATION CONTOUR SHOWING GASOLINE (ppm) (DASHED WHERE PROJECTED)

TPH-g = GASOLINE (ppm)

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

NOTES:
(a) SAMPLE TAKEN AT -4' BGS
(b) SAMPLE TAKEN AT -5.5' BGS
(c) SAMPLE TAKEN AT -6' BGS
(d) SAMPLE TAKEN AT -2' BGS
(e) SAMPLE TAKEN AT -2', -4' BGS

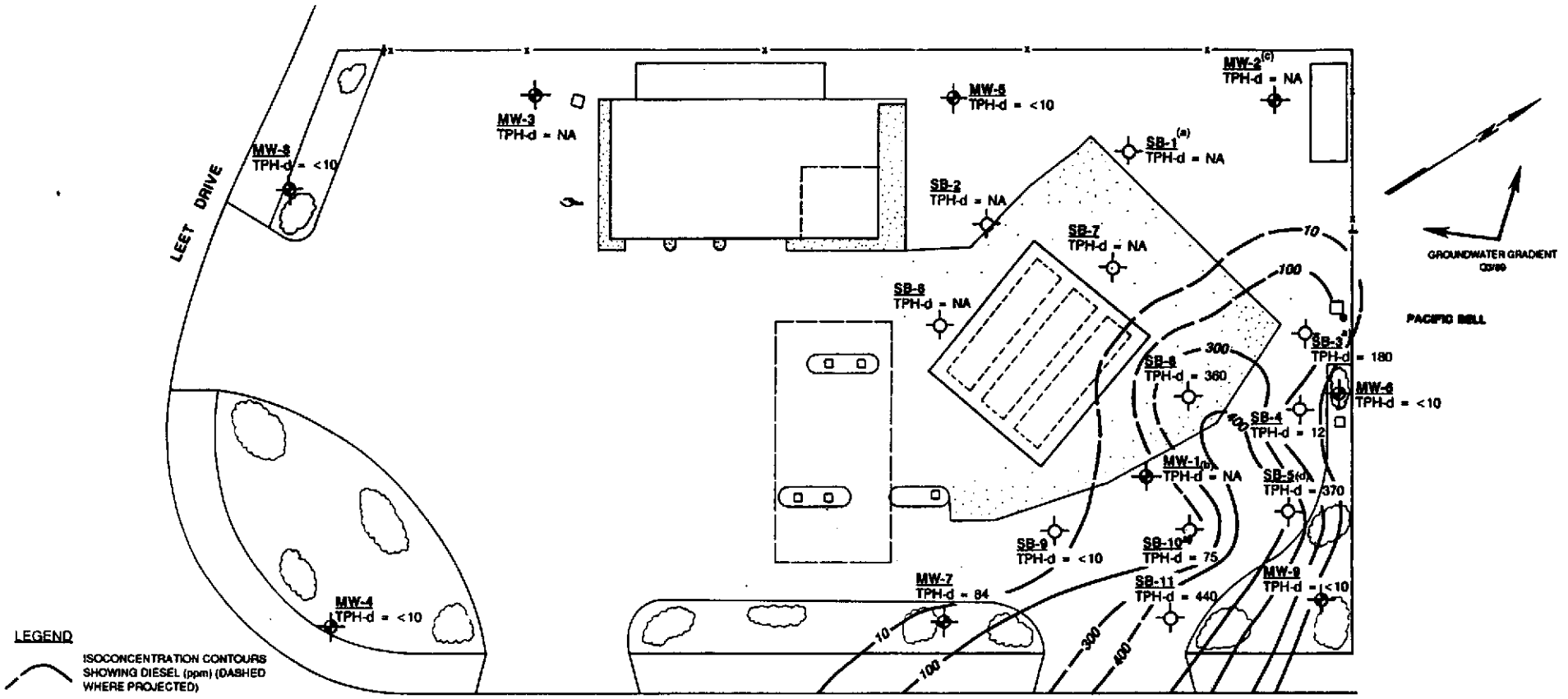
Base Map: Surveyed with EDM, Converse 1989.

PLAN: SOIL TPH-g (- 5') Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/14/89
Prepared By	MLL
Checked By	RMB
Approved By	
Project No.	88-44-309-01
Drawing No.	5



LEGEND

ISOCONCENTRATION CONTOURS SHOWING DIESEL (ppm) (DASHED WHERE PROJECTED)

TPH-d = DIESEL (ppm)

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

NOTES:
(a) SAMPLE TAKEN AT -4' BGS
(b) SAMPLE TAKEN AT -5.5' BGS
(c) SAMPLE TAKEN AT -6' BGS
(d) SAMPLE TAKEN AT -2' BGS
(e) SAMPLE TAKEN AT -2', -4' BGS

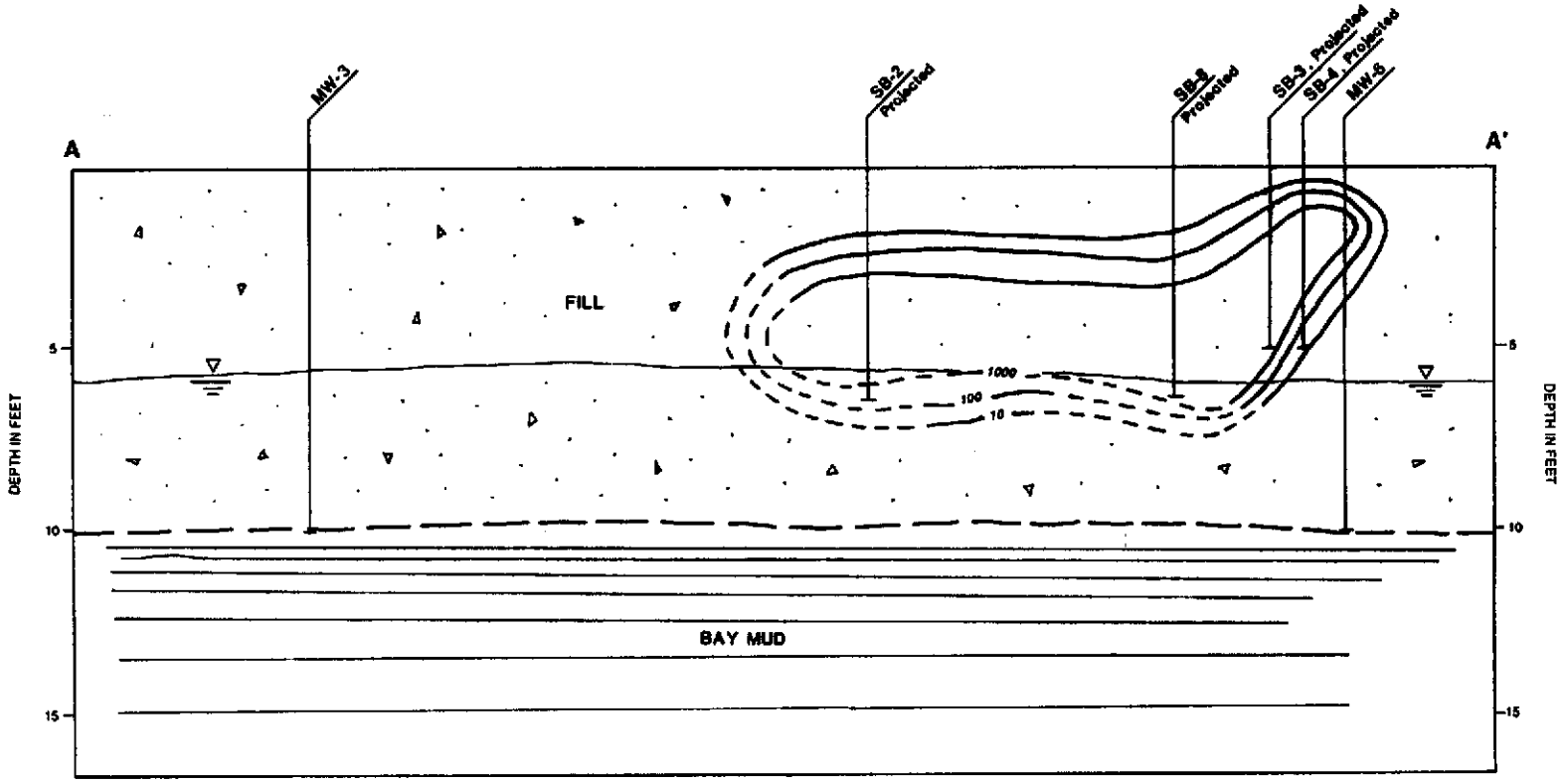
Base Map: Surveyed with EDM, Converse 1988.

PLAN: SOIL TPH-d AT (-5') Q/3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/14/89
Prepared By	MLL
Checked By	RMB
Approved By	DWC
Project No.	88-44-359-01
Drawing No.	6



0 20 40

SCALE

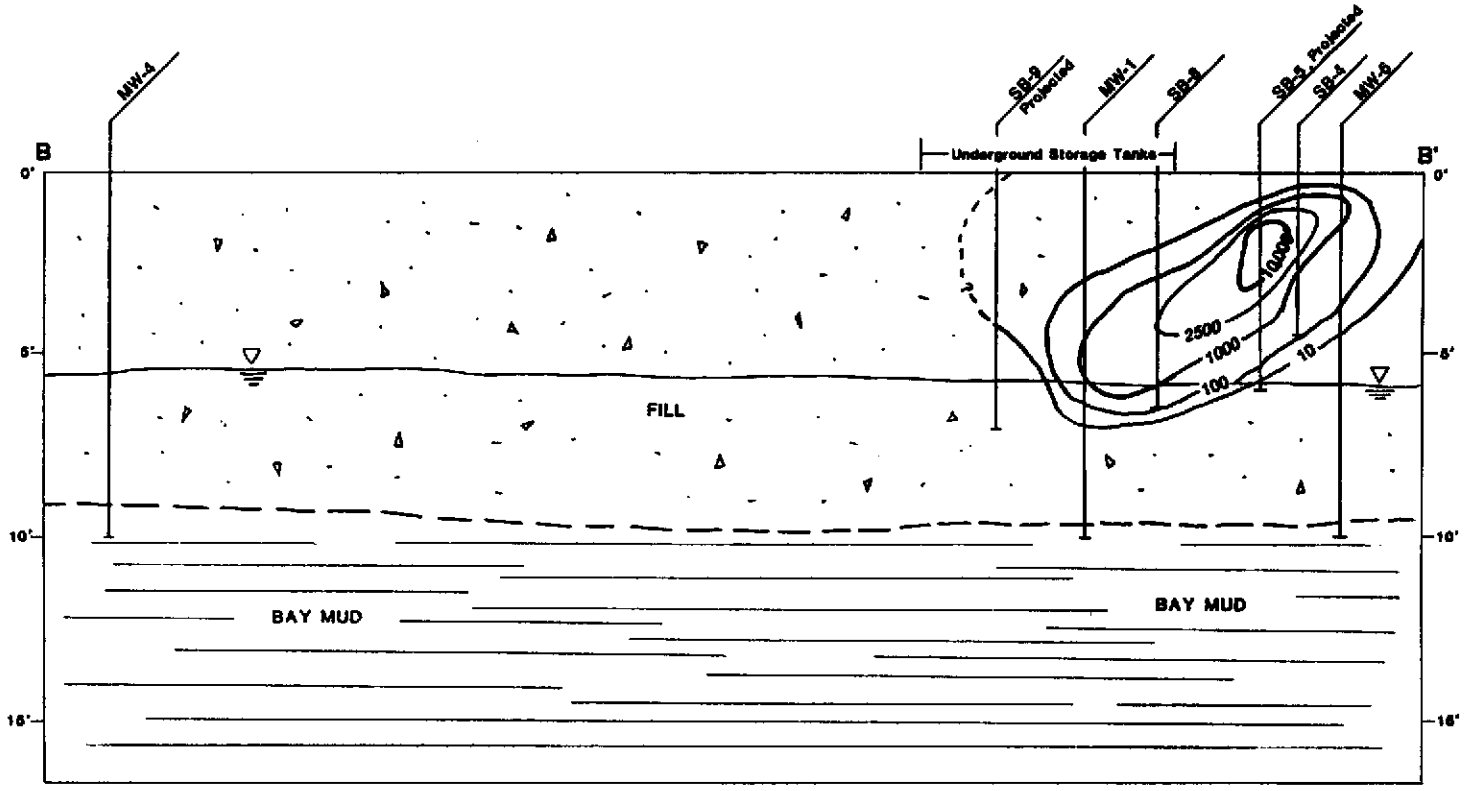
VERTICAL EXAGERATION X6

CROSS SECTION A-A' Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/11/89
Prepared By	ABC
Checked By	RMB
Approved By	DWC
Project No.	88-44-358-01
Drawing No.	7



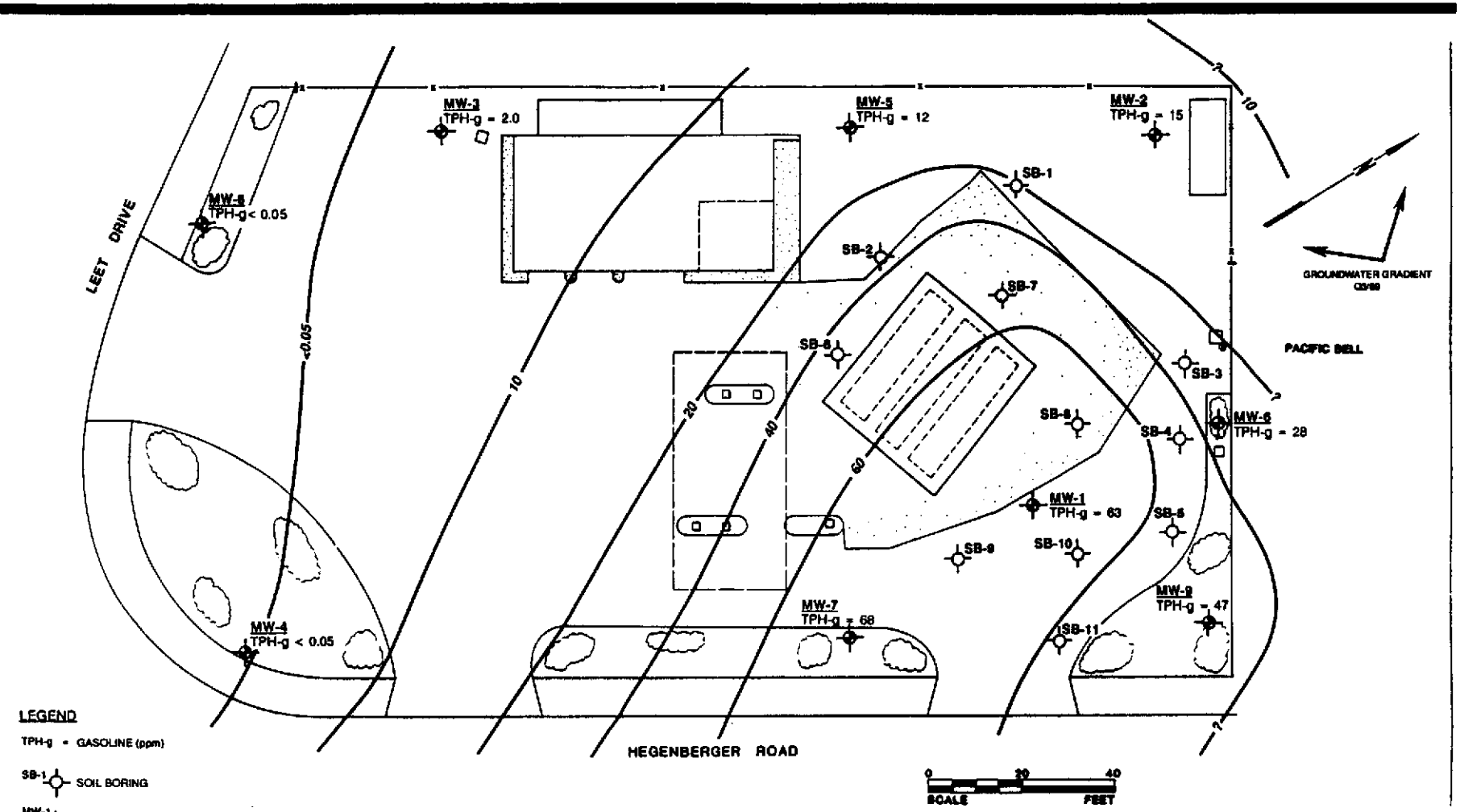
0 20 40
SCALE FEET

CROSS SECTION B-B' Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/11/89
Prepared By	ABC/CRB
Checked By	RMB
Approved By	
Project No.	88-44-359-01
Drawing No.	8



LEGEND

TPH-g = GASOLINE (ppm)

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

ISOCONCENTRATION CONTOURS SHOWING GASOLINE (ppm)

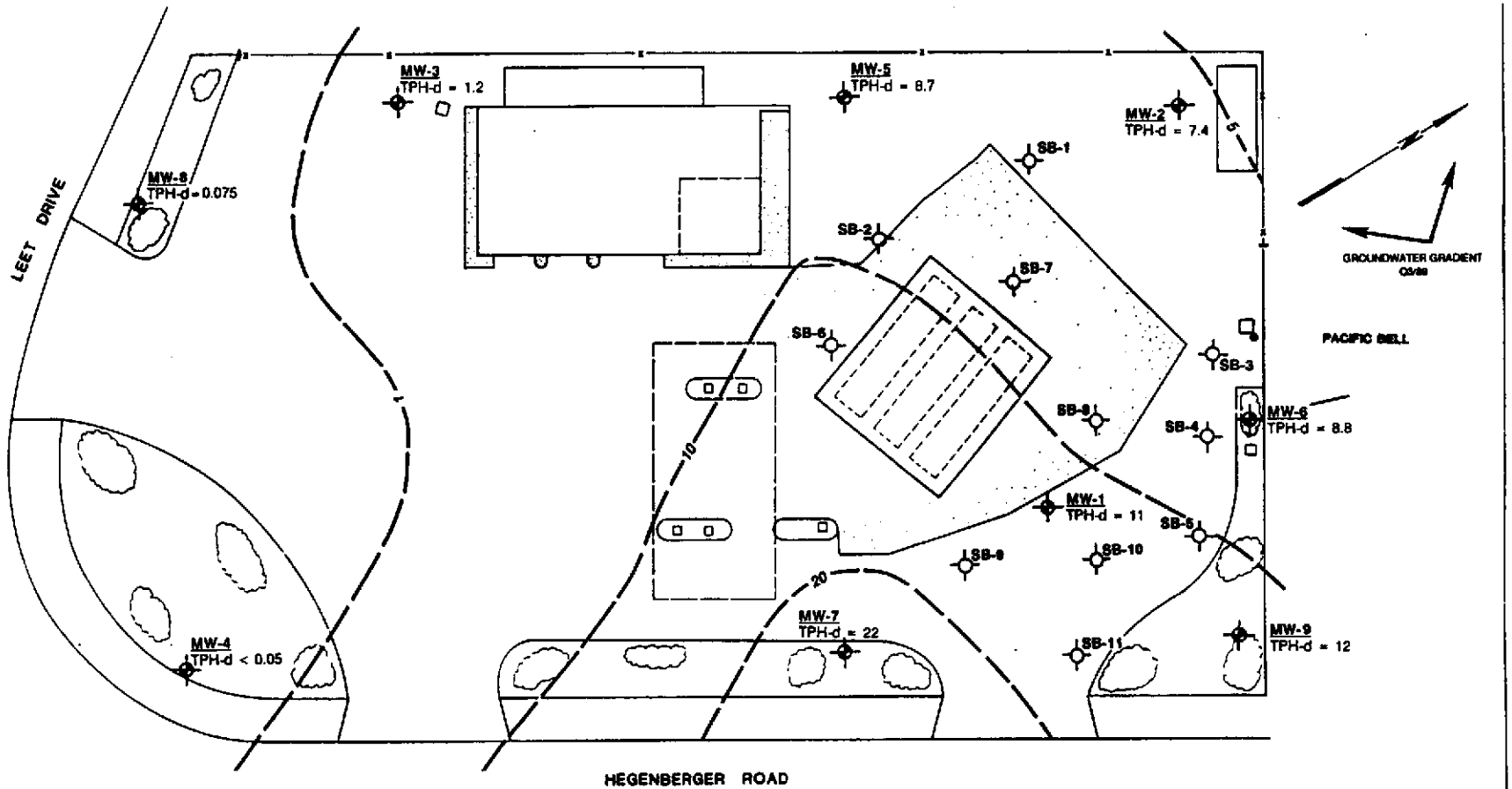
Base Map: Surveyed with EDM, Converse 1989.

PLAN: GROUNDWATER TPH-g Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/16/89
Prepared By	KGC/CRB
Checked By	RMB
Approved By	
Project No	88-44-368-01
Drawing No	9



LEGEND

TPH-d = DIESEL (ppm)

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

ISOCONCENTRATION CONTOURS SHOWING DIESEL (ppm)

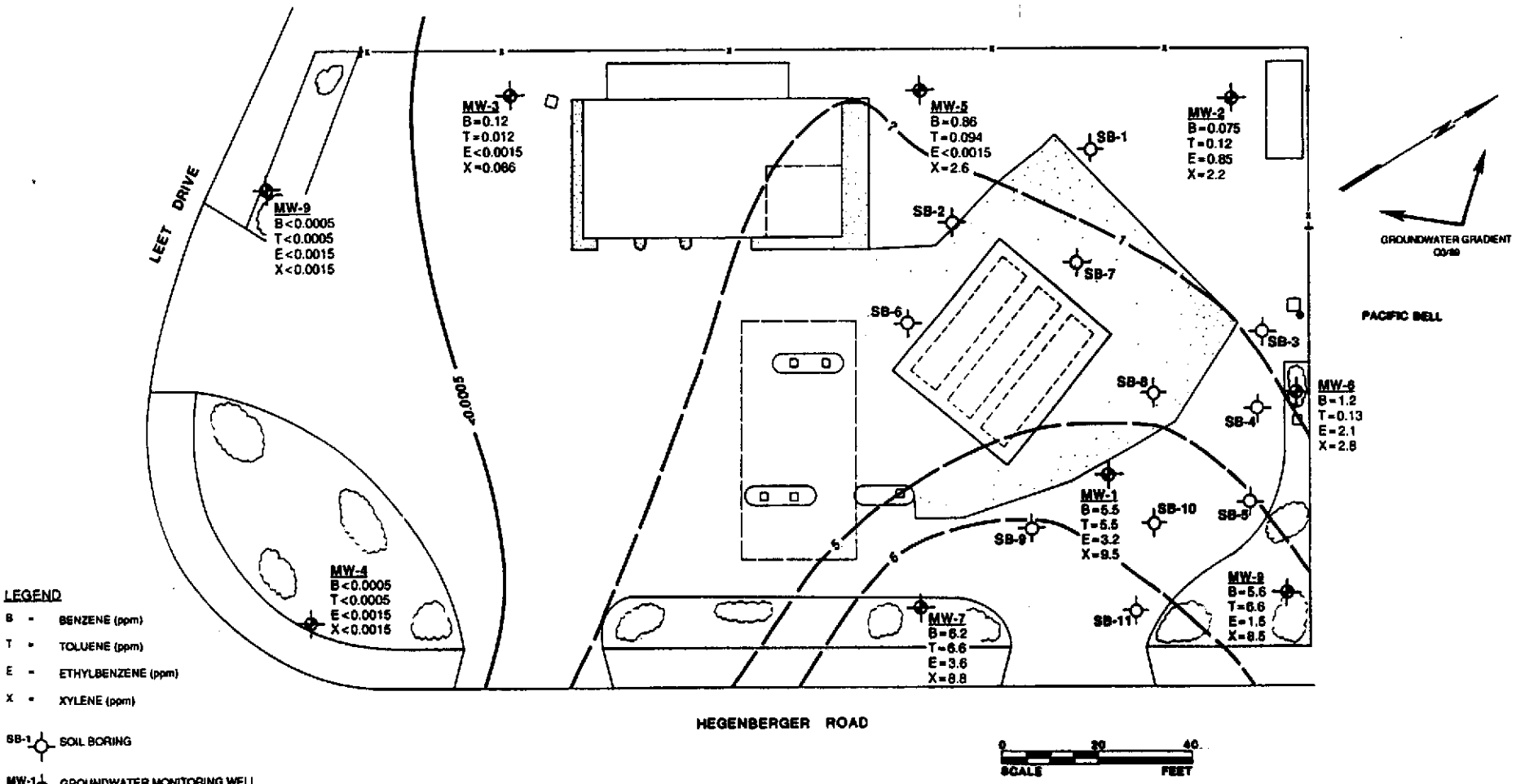
Base Map: Surveyed with EDM, Converse 1988.

PLAN: GROUNDWATER TPH-d Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/16/89
Prepared By	KGC/CRB
Checked By	RMS
Approved By	
Project No	88-44-358-01
Drawing No	10



LEGEND

B = BENZENE (ppm)

T = TOLUENE (ppm)

E = ETHYLBENZENE (ppm)

X = XYLENE (ppm)

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

ISOCONCENTRATION CONTOURS SHOWING BENZENE (ppm)

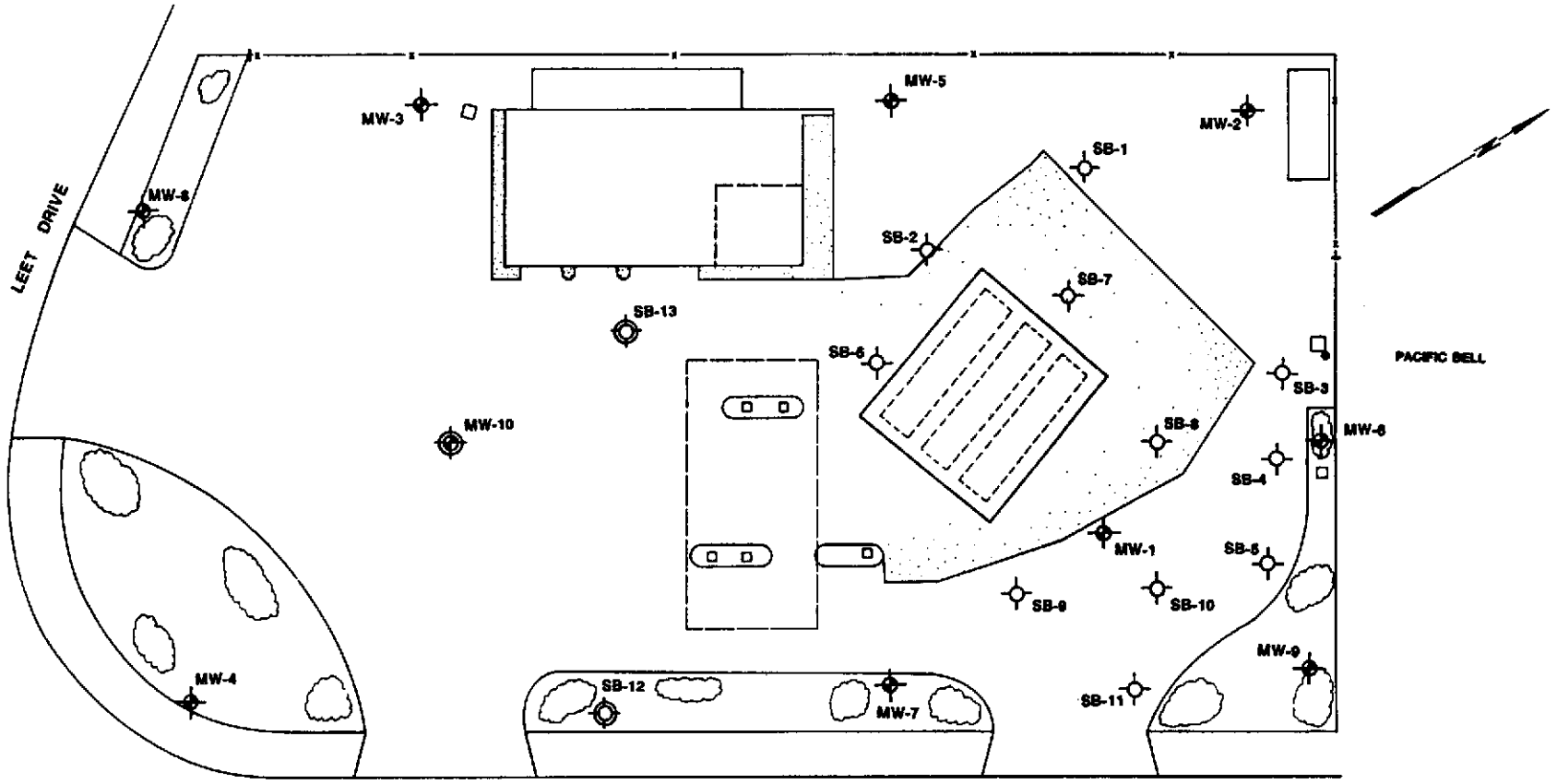
Base Map: Surveyed with EDM, Converse 1988.

PLAN: GROUNDWATER BTEX Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	9/11/89
Prepared By	CJD
Checked By	RMB
Approved By	
Project No	88-44-389-01
Drawing No	11



LEGEND

SB-14 PROPOSED SOIL BORING

SB-1 SOIL BORING

MW-1 GROUNDWATER MONITORING WELL

Base Map: Surveyed with EDM, Converse 1989.

PROPOSED GROUNDWATER MONITORING WELLS AND SOIL BORINGS Q3/89

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale: AS SHOWN
Date:
Prepared By: KGC
Checked By: RMB
Approved By:
Project No: 88-44-350-01
Drawing No: 12

LOG OF BORING NO. SB-6

DATE DRILLED: 7-13-89	ELEVATION:	WL TAKEN: 7-13-89	EQUIPMENT: 3-1/4"x 6" Hollow Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION	BLOWS/FT.	O.V.M. (ppm)	DRY DENSITY lb/ft³	TESTS
							ASPHALT 3" CONC. SLAB. 6"				
				dry	loose	gray	GRAVEL backfill				
5							Filter fabric				
	1			wet	medium	light gray	Lenses-layers SILT and fine SAND ML Odor	9			
							Bottom of Hole at 7 ft.				
10											
15											
20											

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Clarkson
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-1

LOG OF BORING NO. SB-7

DATE DRILLED: 7-13-89	ELEVATION:	WL TAKEN: 7-13-89	EQUIPMENT: 3-1/4"x 6" Hollow Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION	BLOWS/FT.	O.V.M. (ppm)	DRY DENSITY lb/ft³	TESTS
							ASPHALT 4" BASE 6"				
							GRAVEL backfill				
5				wet			No odor				
							Bottom of Hole at 7 ft.				
10											
15											
20											

REGISTERED PROFESSIONAL ENGINEER
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-2

LOG OF BORING NO. SB-8

DATE DRILLED: 7-13-89	ELEVATION:	ML TAKEN: 7-13-89	EQUIPMENT: 3-1/4"x 6" Hollow Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION	BLOWS/FT.	O.V.M. (ppm)	DRY DENSITY lb/ft3	TESTS
							ASPHALT 2" BASE 6"				
							Mix Bay Mud, SAND SP Odor				
5	1			moist v. moist	loose	gray	Silty fine SAND trace shells fragments SM Strong odor	5	260		
	2	▽		wet	loose			5	260		
							Bottom of Hole at 6.5 ft.				
10											
15											
20											

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-3

LOG OF BORING NO. SB-9

DATE DRILLED: 7-13-89	ELEVATION:	WL TAKEN: 7-13-89	EQUIPMENT: 3-1/4"x 6" Hollow Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION	BLOWS/FT.	O.V.M. (ppm)	DRY DENSITY lb/ft³	TESTS
					medium dense	black brown	ASPHALT 2" BASE 6"				
				moist	medium	dark gray	Silty CLAY CL Odor				
5	1			moist v. moist	loose	gray	Fine Sandy SILT ML Odor	6	280		
	2	▼		wet	firm to stiff		Silty CLAY Bay Mud CH Slight odor Clayey SILT rootlets	8	15		
10							Bottom of Hole at 7 ft.				
15											
20											

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-4

LOG OF BORING NO. SB-10

DATE DRILLED: 7-13-89	ELEVATION:	ML TAKEN: 7-13-89	EQUIPMENT: 3-1/4"x 6" Hollow Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION		BLOWS/FT.	O.V.M. (ppm)	DRY DENSITY lb/ft³	TESTS
							ASPHALT 2" BASE 6"					
						gray	Silty CLAY Odor	CL		50		
						light gray	Fine SAND trace SILT	SP/SM		80		
						dark gray	Silty CLAY and Clayey SILT. Strong odor	ML/CL		500		
				wet								
5	1						Coarse SAND and pea GRAVEL	SP/GP	7			
	2								11			
							Bottom of Hole at 6.5 ft.					
10												
15												
20												

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-5

LOG OF BORING NO. SB-11

DATE DRILLED: 7-13-89	ELEVATION:	WL TAKEN: 7-13-89	EQUIPMENT: 3-1/4"x 6" Hollow Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION	BLOWS/FT.	O.V.M. (ppm)	DRY DENSITY lb/ft³	TESTS
							ASPHALT 2" BASE 6" Pavement badly cracked in this area. Surface infiltration				
				moist	stiff	gray	Silty CLAY CL/CH		60		
							trace concrete rubble				
							Silty CLAY increase moisture		30		
	1			very moist	medium		Clayey SILT ML trace fine SAND Odor	6	280		
5	2	▽				black	Saturated fine SAND SP	9	30		
						gray	SILT trace fine SAND ML				
							Bottom of Hole at 7 ft.				
10											
15											
20											

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-6

LOG OF BORING NO. MW-9

DATE DRILLED: 7-13-89	ELEVATION:	WL TAKEN: 7-13-89	EQUIPMENT: 6-1/4"x 10" Hollow Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION	WELL CONSTRUCTION	BLOWS/FT.	O.V.M. (ppm)	T.P.H. (ppm)
							Crush ROCK 2" Plastic, (topsoil)				
				slightly moist to moist	medium	brown	Silty CLAY Clayey SILT ML/CL (topsoil)				
				moist	stiff	gray	Silty CLAY CL				
	1			s. moist	medium	light gray	Clayey SILT ML Strong odor		7	320	
5				moist							
	2			wet		gray	Fine Sandy SILT ML		8	460	
							Silty SAND				
	3			wet					6	112	
						mottled gray	Bay Mud (tidial zone) CH/OH				
10	4						Trace calcareous with depth		5	40	
							Bottom of Hole at 10.5 ft.				
15											
20											

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-7

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Formerly: ANATEC Labs, Inc.

Robin Breuer
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

07-27-89
NET Pacific Log No: 7120
Series No: 212
Client Ref: Proj#: 88-44-359

Subject: Analytical Results for "Shell 285 Hegenberger" Received 07-18-89.

Dear Ms. Breuer:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Susan Joy Griffin
Group Leader
Gas Chromatography

Approved by:

Sue J. Long
Group Leader
Classical Chemistry

/ma
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total 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, unless noted otherwise.
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.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
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.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

Parameter	Reporting Limit (ppm)	SB-8 #2@6.5' 07-13-89 (-31032)[a]	SB-9 #1@5' 07-13-89 (-31033)	SB-10#1@4.5' 07-13-89 (-31034)[b]	SB-11#1@5' 07-13-89 (-31035)	MW-9 #1@5' 07-13-89 (-31036)
		Descriptor, Lab No. and Results (ppm)				
Lead	0.2	6.2	3.9	5.8	17	4.1
METHOD 7421						
PETROLEUM HYDROCARBONS						
Volatile, as Gasoline	10	1,900	ND	550	190	120
DATE ANALYZED		07-21-89	07-21-89	07-24-89	07-21-89	07-21-89
METHOD GCFID/5030						
Extractable,						
as Motor Oil	10	ND	ND	ND	ND	ND
as Diesel Fuel	10	360[c]	ND	75[c]	440[c]	ND
DATE ANALYZED		07-20-89	07-20-89	07-20-89	07-20-89	07-20-89
DATE EXTRACTED		07-19-89	07-19-89	07-19-89	07-19-89	07-19-89
METHOD GCFID/3550						
PURGEABLE AROMATICS						
Benzene	0.025	ND	ND	2.3	3.8	1.1
Ethylbenzene	0.075	25	ND	13	5.7	3.7
Toluene	0.025	ND	ND	11	16	0.64
Xylenes, total	0.075	82	ND	71	28	0.46
METHOD 8020						

[a] Reporting limits are 50 times those listed for gasoline and purgeable aromatics.
[b] Reporting limits are ten times those listed for gasoline and purgeable aromatics.
[c] Sample contains lower boiling hydrocarbons not characteristic of diesel.

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
88-47-354	285 HEGENBERGER

Samplers: (signature) Charles Brown

ATTN: ROBB BACHER

7120

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-G	TPH-D	BTEX	PB	Remarks
BH-8	7/17/89				DRUM #1 @ 10	1	—	—	—	—	BELOW WATER. BELOW TANK BACKFILL HOLE
BH-8					2 @ 5	1	X	X	X	X	
9					1 @ 50	1	X	X	X	X	
10					1 @ 45	1	X	X	X	X	
11					1 @ 52	1	X	X	X	X	
MW-9					1 @ 52	1	X	X	X	X	
↓	↓				3 @ 9	1	—	—	—	—	BELOW CENTER HOLE

Relinquished by: (signature) Charles Brown	Date/Time 7/17/89 1000	Received by: (signature) Jeff Winkler 7/17/89 17:15	Relinquished by: (signature) Jeff Winkler	Date/Time 7-18 0200	Received by: (signature) SFC
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) CV IA NBO	Received for Laboratory: (signature) K Temple	Date/Time 7/18/89 0700

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Formerly: ANATEC Labs, Inc.

Robin Breuer
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

08-07-89
NET Pacific Log No: 7222
Series No: 212
Client Ref: Project # 88-44-359

Subject: Analytical Results for "285 Hegenberger-Shell" Received 07-26-89

Dear Ms. Breuer:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Brian Fies
Group Leader
Atomic Spectroscopy

Approved by:

Susan Joy Griffin
Group Leader
Gas Chromatography

/ml

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total 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, unless noted otherwise.
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.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
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.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

THE COVER LETTER AND KEY TO ABBREVIATIONS ARE AN INTEGRAL PART OF THIS REPORT

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results SB-8 #2 @ 6.5' 07-13-89 (-31521)	 SB-10 #1 @ 4.5' 07-13-89 (-31522)	 SB-11 #1 @ 5' 07-13-89 (-31523)
Bunsen Burner Flame Test		NEGATIVE	NR	NR
WET-Soluble Lead	0.002	0.25	0.13	0.38

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Formerly: ANATEC Labs, Inc.

Ren Hodgson
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

08-16-89
NET Pacific Log No: 7335
Series No: 212
Client Ref: Proj # 88-44-359-02

Subject: Analytical Results for "SHELL-285 Hegenberger" Received 08-08-89

Dear Mr. Hodgson

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Susan Joy Griffin
Group Leader
Gas Chromatography

Approved by:

Brian Fies
Group Leader
Atomic Spectroscopy

/ml
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

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.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
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.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results MW-2 08-04-89 1338 (-32427)	MW-5 08-04-89 1318 (-32428)	MW-6 08-04-89 1256 (-32429)
PETROLEUM HYDROCARBONS				
Volatile, as Gasoline	0.05	15	12	28
DATE ANALYZED		08-09-89	08-09-89	08-10-89
METHOD 8015/5030				
Extractable,				
as Motor Oil	0.05	ND	ND	ND
as Diesel Fuel	0.05	7.4[a]	8.7[a]	8.8[a]
DATE ANALYZED		08-10-89	08-10-89	08-10-89
DATE EXTRACTED		08-09-89	08-09-89	08-09-89
METHOD GCFID/3550				
Benzene	0.0005	0.075	0.86	1.2
Ethylbenzene	0.0015	0.85	ND	2.1
Toluene	0.0005	0.12	0.094	0.13
Xylenes, total	0.0015	2.2	2.6	2.8
METHOD 602				

[a]Sample contains lower boiling hydrocarabons not characteristic of diesel.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results MW-1 08-04-89 1233 (-32430)	 MW-9 08-04-89 1207 (-32431)	 MW-7 08-04-89 1148 (-32432)
PETROLEUM HYDROCARBONS				
Volatile, as Gasoline	0.05	63	47	68
DATE ANALYZED		08-10-89	08-10-89	08-10-89
METHOD 8015/5030				
Extractable,				
as Motor Oil	0.05	ND[a]	ND[a]	ND[a]
as Diesel Fuel	0.05	11[a]	12[a]	22[a]
DATE ANALYZED		08-10-89	08-10-89	08-10-89
DATE EXTRACTED		08-09-89	08-09-89	08-09-89
METHOD GCFID/3550				
Benzene	0.0005	5.5	5.6	6.2
Ethylbenzene	0.0015	3.2	1.5	3.6
Toluene	0.0005	5.5	6.6	6.6
Xylenes, total	0.0015	9.5	8.5	8.8
METHOD 602				

[a]Sample contains lower boiling hydrocarabons not characteristic of diesel.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results MW-4 08-04-89 1107 (-32433)	MW-8 08-04-89 1042 (-32434)	MW-3 08-04-89 1025 (-32435)
PETROLEUM HYDROCARBONS				
Volatile, as Gasoline	0.05	ND	ND	2.0
DATE ANALYZED		08-09-89	08-09-89	08-09-89
METHOD 8015/5030				
Extractable,				
as Motor Oil	0.05	ND	ND	ND
as Diesel Fuel	0.05	ND	0.075[a]	1.2[a]
DATE ANALYZED		08-10-89	08-10-89	08-10-89
DATE EXTRACTED		08-09-89	08-09-89	08-09-89
METHOD GCFID/3550				
Benzene	0.0005	ND	ND	0.12
Ethylbenzene	0.0015	ND	ND	ND
Toluene	0.0005	ND	ND	0.012
Xylenes, total	0.0015	ND	ND	0.086
METHOD 602				

[a]Sample contains lower boiling hydrocarabons not characteristic of diesel.

PM - REN HODGSON

7335

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
98-44-359-02	SHELL

Samplers: (signature) Thomas Smith

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers (25 LITRE, 34 VOA / 59 total)	BTEX	TPH-GAS	TPH-DIESEL				Remarks
MW-2	8-4-99	1.38		X	285 HEGENBERGER	7	X	X	X				STANDARD T.A.T.
MW-5	"	1:18		X	" "	7	X	X	X				
MW-6	"	12:56		X	" "	7	X	X	X				
MW-1	"	12:53		X	" "	7	X	X	X				
MW-9	"	12:07		X	" "	7	X	X	X				
MW-7	"	11:48		X	" "	5	X	X	X				could only retrieve 1 (one) litre for diesel
MW-4	"	11:07		X	" "	7	X	X	X				
MW-8	"	10:42		X	" "	7	X	X	X				
MW-3	"	10:15		X	" "	7	X	X	X				

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Thomas Smith	8/7/99 16:40	Jeff Nicklin	Jeff Nicklin	8-8 0730	Fred Reed
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) (VIA NCS)	Received for Laboratory: (signature) K Temple	Date/Time 8/8/99 0720

TASK MODIFICATION I

285 Hegenberger Road
Shell Work Plan
April 26, 1989

This amendment to the Revised Critical Path (April 26, 1989) specifies the detailed scope and cost for completion of Tasks 1a, 6a, and 9a.

Task 1 a - Drill and Sample Soil Borings:

Explanation: According to information supplied by Blymyer engineers, consultants to PacBell, "significant" soil contamination exists at the PacBell property boundary with the Shell station. PacBell alleges this contamination is from releases by Shell. Wells installed to date do not refute this allegation.

Scope: Install and sample 3 soil borings to the water table, per the protocols described in Task 1 of the original Work Plan dated February 10, 1989.

Task 6a - Install Groundwater Monitoring Wells:

Explanation: The laterally extensive TPH (as gasoline) and BTEX contamination has not been defined by the initial installation of three wells on site. Additional wells are needed to complete this characterization.

Scope: Five additional monitoring wells, MW-4 through MW-8, will be installed at locations shown on (Drawing 1, Modification 1). The drilling, well installation development, sampling, and analytical protocols described in the initial Work Plan will be followed during installation and groundwater sampling of these new wells.

Task 9a - Locate Borings and Wells on Adjacent Property:

Explanation: According to information provided by Blymyer Engineers, six soil borings exist on the adjacent PacBell property at 295 Hegenberger. Certain soil information exists for these borings but only slight oil of grease contamination was indicated. The borings should be surveyed so that the existing analytical data can be added to the information for the site, to allow for a complete compilation of soil and water quality data for these properties.

Scope: An attempt will be made to find the soil borings on the PacBell property. If found the borings will be located by surveying using Electronic Distant Meter (EDM) equipment.

TASK MODIFICATION II

285 Hegenberger Road
Shell Work Plan
June 10, 1989

This amendment to the Revised Critical Path (April 26, 1989) specifies the detailed scope and cost for completion of work.

Task 1 b - Drill and Sample Soil Borings:

Explanation: Laboratory soils data shows elevated concentrations of TPH (as gasoline) contamination that has not been defined vertically or laterally near the underground tank farm. Additional borings are needed to complete this characterization.

Scope: Two additional borings are proposed for installation near SB-2 (SB-6 and SB-7); three borings are proposed for a triangle array around MW-1, and two borings (SB-11 and SB-12) are proposed for the southeast corner of the property.

The drilling, sampling and analytical protocols described in the initial Work Plan will be followed during advancement and sampling of the borings.

TABLE 1
REVISED 6 OCTOBER 1988

RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

HYDROCARBON LEAK	SOIL ANALYSIS			WATER ANALYSIS		
		Prep	Analysis		Prep	Analysis
Unknown Fuel	TPH G	5030	8015	TPH G	5030	8015
	TPH D	3550	8015	TPH D	3510	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
	LEAD	3050	7421	LEAD	3050	7421
Leaded Gas	TPH G	5030	8015	TPH G	5030	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
	LEAD	3050	7421	LEAD	3050	7421
Unleaded Gas	TPH G	5030	8015	TPH G	5030	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
Diesel	TPH D	3550	8015	TPH D	3510	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
Waste Oil or Unknown	TPH G	5030	8015	TPH G	5030	8015
	TPH D	3550	8015	TPH D	3510	8015
	O & G	503D	503E	O & G	503A	503E
	BTX&E	5030	8020/8240	BTX&E	5030	8020/8240
	CL HC	5030	8010/8240	CL HC	5030	601/624
	ICAP or AA to detect metals: Cd, Cr, Pb, Zn					

APPENDIX A

Hollow-Stem Auger Drilling and Soil Sampling

HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING

Borings shall be drilled with a hollow-stem auger and sampled with a modified California-type split-spoon sampler. Soil samples shall be of sufficient volume to perform the analyses which may be required, including replicate analyses. Aside from deionized water or distilled water, no fluids will be used in drilling.

Undisturbed (intact) soil samples shall be recovered from soil borings without introducing liquids into the borings. Soil samples as core or cuttings shall be taken continuously from ground surface to termination depth (TD), or through the aquifer zone of interest for lithologic logging.

Soils from all borings shall be described in detail using the Unified Soil Classification System and shall be logged by a professional geologist, civil engineer, or engineering geologist who is registered or certified by the State of California and who is experienced in the use of the Unified Soil Classification System. A technician trained and experienced in the use of the Unified Soil Classification System who is working under the direct supervision of one of the aforementioned professionals shall be qualified to log borings, provided the aforementioned professional reviews the logs and assumes responsibility for the accuracy and completeness of the logs.

All wet zones above the free water zone shall be noted and accurately logged.

If evidence of contamination is detected by sight, smell, or other field analytical methods, drilling shall be halted until the responsible professional determines if drilling deeper is advisable.

All drilling tools shall be thoroughly decontaminated with trisodium phosphate (TSP) or steam cleaner immediately before starting each boring.

Soil samples shall be taken in decontaminated brass sampling tubes in the split-spoon. The brass sleeves will be cut apart using a clean knife. The ends of the tubes will be covered tightly with teflon wrap, capped with tight-fitting plastic caps, wrapped with plastic electricians' tape, and properly labeled.

APPENDIX B

Standards for Backfilling Borings and Sealing Wells

STANDARDS FOR BACKFILLING BORINGS AND SEALING WELLS

INTRODUCTION

As standard practice, all borings and observation and monitoring wells shall be backfilled or sealed with "relatively impervious" grout to prevent surface contamination or cross-contamination between aquifers. Borings will be sealed from termination depth to the surface and observation and monitoring wells shall be backfilled and sealed above the water table. This practice will reduce liability if it is determined and proven that groundwater contamination occurred along a "vertical pathway" in an improperly sealed or filled boring or well.

In hazardous and potentially hazardous waste sites where deep borings or wells are installed, appropriate geologic information will be reviewed to determine if multiple aquifer system(s) exist(s). If such system(s) exist(s), drilling and sealing techniques will be used to prevent contamination of a lower aquifer by upper, potentially contaminated aquifer(s). Grout seals will be installed according to the following techniques through all thicknesses of impermeable zones which separate aquifer.

Borehole grouting shall consist of backfilling with bentonite pellets, cement/bentonite grout, or a thick bentonite slurry, depending upon the depth of the boring, depth to ground water, and type of drilling equipment used. Details of currently acceptable sealing methods are outlined below.

GENERAL SPECIFICATIONS

- All grouting and well construction and sealing and abandonment of borings shall be consistent with local ordinances.

- Cement/bentonite grout used to seal wells will be of a hard consistency that can resist traffic loads, but not installed to create a "concrete pile" that will obstruct further earthwork. Bentonite slurry, which does not support surface loads, will not be used for sealing wells.

GROUTING/SEALING TECHNIQUES

Dry Holes and Borings Containing Less Than 5 Feet of Water

Option 1: Backfill boring with bentonite pellets or granules in about 2-foot lifts. Add a gallon of water to hole after each lift.

Option 2: Pour in a mixture of cement/bentonite group (9 parts cement, 1 part bentonite powder plus water as needed to make mixture consistency of pancake batter).

Option 3: Pour in a thick mixture of bentonite and water. Soil cuttings can be used to bulk this mixture is soil is not contaminated and chunks are small and well-mixed in slurry.

Borings Containing More Than 5 Feet of Water

Option 1: Pump out water and use criteria for "dry hole."

Option 2: Pump cement/bentonite grout to bottom of hole or use tremie. Do not pour grout through water.

Option 3: Pump or tremie bentonite slurry. This alternative is particularly efficient if you are using rotary wash equipment since all you have to do is thicken the drilling mud and pump it through the drill rod.

Monitoring/Observation Well Sealing (Single Aquifer)

A. Place sand pack around well casing to about 2 feet above slotted interval. Anticipate fluctuation of water level so screened interval covers maximum water elevation.

B. Place 2-foot thick bentonite pellet seal above sand pack. Add a bucket of clean water to swell pellets.

C. Pour cement/bentonite grout or bentonite slurry above pellet seal to ground surface.

APPENDIX C

Groundwater Monitoring Well Construction

GROUNDWATER MONITORING WELL CONSTRUCTION

Groundwater monitoring wells shall be constructed according to the general specifications described in the EPA Technical Enforcement Guidance Document (TEGD, 1986) and shown on the attached well construction diagram.

Groundwater monitoring wells shall be installed through hollow stem augers in borings drilled and sampled per Appendix A. Groundwater monitoring wells shall extend to the base of the upper aquifer, as defined by the first consistent (>5-foot thick) clay layer below the upper aquifer, or at least 15 feet below the top of the upper aquifer, whichever is shallower. The wells shall not extend through the laterally extensive clay layer below the upper aquifer. The wells shall be terminated 1 to 2 feet into such a clay layer.

The groundwater monitoring wells shall be single-cased wells which extend to the bottom of the boring or into a bentonite plug, if one is used at the bottom of the boring as a hydraulic seal. The screens shall be factory-perforated from the bottom of the upper blank casing at least 5 feet above the top of the upper aquifer as defined by boring lithology and/or geophysics. The base of the screen shall be the bottom of the well, or above a 2-5 foot long silt trap in the bottom of the well.

Groundwater monitoring wells shall be constructed as filter-packed wells that will prevent the migration of the surrounding formation into the well. Wells shall have 4-inch diameter factory-perforated casing with slots which match formation grain size as determined by field grain-size distribution analysis. Well casings shall have a threaded bottom cap or plug, and may have a silt trap below the screened zone.

All casing and screen shall be flush threaded, and no adhesive shall be used. PVC casing screen shall be steam-cleaned prior to installation. Filter pack shall be washed, graded sand.

Filter packs shall extend at least 2 feet above the top of the perforated interval. A layer of bentonite pellets 1 to 2 feet thick shall be placed on top of the filter pack. Approximately 2 gallons of water shall be added to hydrate the bentonite pellets. The wells shall then be sealed from the top of the bentonite seal to the surface with neat cement. All sand, bentonite and cement shall be placed using a tremie pipe.

Wellheads shall be installed in flush-mounted watertight structures and provided with watertight caps. Wellheads shall be provided with locked security devices that protect the wells from the entry of surface water, accidental damage, unauthorized access, and vandalism.

Soil and water sampling equipment and materials used to construct the wells shall not donate, capture, mask, nor alter the chemical composition of the soils and ground water.

All well casings, casing fittings, screens, and all other components that are installed in the well shall be thoroughly decontaminated immediately before starting each well installation.

APPENDIX D

Well Development

WELL DEVELOPMENT

For all newly installed groundwater monitoring wells, the well casing, filter pack and adjacent formation shall be cleared of disturbed sediment and water before representative water samples are collected. A field geologist shall supervise such development work.

Before well development begins, the grout and bentonite seals shall set at least 24 hours and one pre-development water sample will be taken for each well. These water samples will be collected and analyzed for possible contaminants present according to CECC groundwater sampling protocol and QA/QC. These samples will be stored in the laboratory pending a decision to analyze, if required. If analyzed, standard laboratory procedures will be used. Samples not analyzed will be discarded.

All well development tools shall be thoroughly cleaned immediately before each well development. Well development shall begin with bailing using either a stainless steel or teflon bailer. This procedure will remove heavy sediments from within each well casing, reducing the possibility of the well screen abrasion and pump damage during subsequent pumping. Wells shall be bailed until water samples contain only trace amounts of fine to coarse sand, as measured in sampling jars after 15 minutes of settling.

The wells will be mechanically surged with a surge or flapper block for 15 strokes or 30 minutes, whichever is less. The block will be lowered to the well plug and then carefully drawn up to the top of the well screen or until it emerges from the water. For wells in moderate soils, the rate of surging will be progressively increased with each stroke. When working in areas of loose sediments, surging will be at a constant, slow stroke rate. Areas of dense or over-compacted sediments may require more vigorous surging. Between surging episodes, the wells will be bailed and/or pumped to remove the sediment-rich water generated.

After surging, wells under development will be pumped using stainless steel 3-inch positive displacement development pumps, 2-inch bladder pumps or other appropriate equipment. In this procedure, the pumps will operate at maximum rate which is less than the recharge rate of the pumped well. For complete development, the wells will be pumped until: (1) the discharge is clear or nearly clear; and (2) the turbidity has not noticeably changed with one-half hour.

All water and sediment generated by well development shall be collected in clean, 55-gallon steel drums unless only a small volume (less than 100 gallons) is produced. Drums of this development water will be temporarily contained onsite, pending sampling and laboratory analysis. Non-hazardous development waters shall be disposed of by surface dumping (small volumes) or sewerage. Potentially hazardous development water shall be properly disposed of at a suitable hazardous waste disposal site or properly treated for non-hazardous discharge. Small volumes of development water may be disposed of by surface dumping if, in the opinion of the onsite geologist, potential contamination to the environment is minimal.

APPENDIX E

Groundwater Sampling

GROUNDWATER SAMPLING

Groundwater samples shall be collected for laboratory analysis by the following procedures:

1. Before sampling or purging begins, all bailers, pumps, cables and lines will be steam-cleaned. An established and designated cleaning area will be kept clean by lining with visqueen or using a cleaning rack.

2. A pre-purge sample shall first be obtained with a bailer from as deep in the well as possible. Standard "Water Sampling Field Survey Forms" will be filled out for this and all future samples, to include the following information:

   - Depth to water and total depth of water column, measured and recorded before purging begins;
   - Conductivity, checked and recorded for every 5 gallons of purged water (for small volumes); and
   - Purged volume (as appropriate), with stabilized readings for pH, conductivity and temperature.

The well shall then be bailed or pumped to remove four to ten well volumes prior to sampling. The well will be purged until conductivity has been stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another. A casing volume will be based on actual measurements made on the day of sampling, i.e., the total depth minus depth to water on day of sampling, time the cross-sectioned area of the casing.

If the well is emptied before four to ten well volumes are removed, the sample shall be taken when the water level in the well recovers to 80% of its initial water level or better.

Whenever possible, samples will be collected within 24 hours after purging; ideally, samples will be collected immediately after purging.

Following the required volume of evacuation from the well, the sample shall be obtained with a teflon or stainless steel bailer on a 60-pound monofilament or polypropylene (washed) line. Care will be taken to properly clean cables with braided stainless steel cable or plastic coverings, if used. Air lift sampling and bladder pumps shall not be used.

Unless specifically waived or changed by the local, prevailing regulatory agency, water samples shall be handled and preserved according to the latest EPA methods as described in the Federal Register (Volume 44, No. 233, Monday, December 3, 1979, Page 69544, Table II) for the type of analysis to be performed.

Purge water will be properly disposed of or temporarily contained in steel barrels pending chemical analysis to designate proper disposal procedure.

APPENDIX F

Chain-of-Custody

CHAIN-OF-CUSTODY

SAMPLE COLLECTION, HANDLING AND IDENTIFICATION

Sample collection, handling, and identification will follow the guidelines set by the California Department of Health Services. Field records will be completed when the sample is collected and will be signed or initialed, including the date and time, by the sample collector(s). Field records will contain the following information:

1. Unique sample or log number;
2. Date and time;
3. Source of sample (including name, location and sample type);
4. Preservative used;
5. Analyses required;
6. Name of collector(s);
7. Pertinent field data (pH, DO, C1, residual, etc.); and
8. Serial number on seals and transportation cases.

Each sample will be identified by affixing a pressure sensitive, gummed label, or standardized tag on the container(s). This label will contain the sample identification number, date and time of sample collection, source of sample preservative used, and the collector(s) initial(s). Analysis required will be identified. Where a label is not available, the same information will be affixed to the sample contained with an indelible, waterproof, marking pen.

The sample container will be placed in a transportation case along with the chain-of-custody record form, pertinent field records, and analyses request form. The transportation case will then be sealed and labeled. Records will be filled out legibly in pen.

TRANSFER OF CUSTODY AND SHIPMENT

When transferring the possession of the samples, the transferee will sign and record the date and time on the chain-of-custody record. Custody transfer, if made to a sample custodian in the field, will account for each individual sample, although samples may be transferred as a group.

The field custodian or field inspector will be responsible for properly packaging and dispatching samples to the appropriate laboratory for analysis. This responsibility includes filling out, dating, and signing the appropriate portion of the chain-of-custody record.

All packages sent to the laboratory will be accompanied by the chain-of-custody record and other pertinent forms. A copy of these forms will be retained by the originating office.

Mailed packages can be registered with return receipt requested. If packages are sent by common carrier, receipts should be retained as part of the permanent chain-of-custody documentation.

Samples to be shipped will be sealed locked so evidence of tampering may be readily detected.

LABORATORY CUSTODY PROCEDURES

Chain-of-custody procedures will be followed in the laboratory from the time of sample receipt to the time the sample is discarded.

The sample control officer (SCO) will be the designated custodian, and an alternate is designated to act as custodian in the custodian's absence. All incoming samples are received by the SCO, who shall indicate receipt by signing the accompanying custody forms and who shall retain the signed forms as permanent records.

The SCO will maintain a permanent log book to record, for each sample, the person delivering the sample, the person receiving the sample, date and time received, source of sample, sample identification or log number, how transmitted to the laboratory, and condition received (sealed, unsealed, broken container, or other pertinent remarks). A standardized format will be established for log book entries.

A clean, dry, isolated room, building, and/or refrigerated space that can be securely locked from the outside, will be designated as a "sample storage security area."

The SCO will ensure that heat-sensitive, light-sensitive samples, radioactive, or other sample materials having unusual physical characteristics, or requiring special handling, are properly stored and maintained prior to analysis.

Only the custodian will distribute samples to the section leaders who are responsible for the laboratory performing the analysis.

The laboratory area will be maintained as a secured area, restricted to authorized personnel only.

Laboratory personnel will be responsible for the care and custody of the sample once it is received by them. These personnel shall be prepared to testify that the sample was in their possession and view, or secured in the laboratory at all times, from the moment it was received from the SCO, until the time that the analyses are completed.

Once the sample analyses are completed, the unused portion of the sample, together with all identifying labels, will be returned to the SCO. The returned tagged sample will be retained in the custody room until permission to destroy the sample is received by the SCO.

Samples will be destroyed only upon the order of the Laboratory Director, in consultation with previously-designated Project Manager, and/or client, or when it is certain that the information is no longer required or the samples have deteriorated. The same procedure will apply to tags and laboratory records.

APPENDIX G

Drum Handling Procedures

OUTLINE OF DRUM HANDLING PROCEDURES

1. Complete drummed worksheets onsite, forward a copy to Shell.

2. Test material per Shell's site-specific test requirements.

3. Classify Material as: Clean/Non-Hazardous/Hazardous

4. Labeling of Drums

   - Pending Label: Used to describe material pending final analytical testing. Labels must be immediately affixed to drum during field work.

   - Non-Hazardous Label: Required within 48 hours after analytical results are received.

   - Hazardous Label: Required within 48 hours after analytical results are received.

   - For Pick-Up Label: Must be affixed to drum prior to Shell Hazardous Waste Coordinator arranged pick-up date.

5. Remove within 14 days of date of generation. Empty drums, where material was disposed in bulk, must be removed the same day they are emptied.

6. Dispose of Material:

   - Clean: Any local landfill
   - Non-Hazardous: Class III landfill. If a Class III landfill will not accept, contact Shell Hazardous Waste Coordinator for assistance
   - Hazardous: Class I landfill arranged by Shell Hazardous Waste Coordinator.

   Mail or FAX completed Hazardous Waste Pick-Up Forms to the Shell Hazardous Waste Coordinator with a copy of the analytical results and worksheets.

7. If required, contact the Shell Hazardous Waste Coordinator:

   Shell Oil Company
   Hazardous Waste Coordinator
   Anna Sampson
   P.O. Box 6249
   Carson, California 90749
   Phone: (213) 816-2037
   FAX: (213) 816-2114

8. Manifests may be signed by the onsite contractor or consultant, station dealer, or other authorized Shell Oil representatives. The transporter CAN NOT sign the manifest.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR/CONSULTANT TO ARRANGE FOR A PERSON TO SIGN THE MANIFEST ON THE DAY OF PICK-UP.

9. Reporting

   All reports must be received by the Shell Hazardous Waste Coordinator within 7 working days of disposal. Reports shall include the following:

   - Completed drummed soil and water worksheets.
   - Attach a copy of the analytical results.
   - State how and where material was disposed.
   - If drums are emptied and material was disposed in bulk, state how empty drums were handled.
   - The signed blue and yellow copies of the hazardous waste manifest.

SOIL:

1. Test Requirements and Methods: Per Shell's site-specific test requirements

   - TPH: EPA Method 8015

   - BTEX: EPA Method 8020

   - Lead:

     -One composite sample from each boring
     -See attached decision tree
     -Total Lead - EPA Method 7421
     -Inorganic (soluble) Lead - DOS Title 22, Waste Extraction Test, §22-66700

   - Ignitable:

     -One composite sample from each boring
     -Bunsen Burner Test Flame Test

2. Classification:

   - Clean: TPH, BTEX, and Lead non-detectable

   - Non-Hazardous if any are true:

     -TPH less than 1000 ppm

-Lead -Inorganic (soluble) Lead less than 5 ppm (STLC)
or less than 100 ppm (TTLC)
-Organic Lead less than 13 ppm (TTLC)

-Ignitable - If TPH < 1000 ppm do not conduct test

- Hazardous if any are true:

-TPH greater than 1000 ppm

-Lead -Inorganic (soluble) Lead greater than 5 ppm (STLC)
or greater than 1000 ppm (TTLC)
-Organic Lead greater than 13 PPM (TTLC)

-Ignitable -If TPH >1000 ppm, then conduct Bunsen Burner Test
-If soil burns vigorously and persistently, soils are RCRA D001

3. Responsibility for Disposal:

- Clean: Consultant/Contractor
- Non-Hazardous: Consultant/Contractor or Shell Hazardous Waste Coordinator
- Hazardous: Shell Hazardous Waste Coordinator

4. Types of Drums: DOT-17H for a solid, solidified, or sludge material.

5. Disposal Facility:

- Clean: Any local landfill
- Non-Hazardous: Class III landfill. If a Class III landfill will not accept, contact Shell Hazardous Waste Coordinator for assistance
- Hazardous: Class I landfill arranged by Shell Hazardous Waste Coordinator

WATER:

1. Test Requirements and Methods: Per Shell's site-specific test requirements.

- TPH: EPA Method 8015
- BTEX: EPA Method 602

2. Classification:

- Clean Water: TPH and BTEX non-detectable