9-6414

JMR.

October 8, 1985

Mr. Roger B. James
Executive Officer
Calif. Reg. Water Quality Control Board
1111 Jackson St., Rm. 6040
Oakland, California 94607
Attn: Mr. Dale Boyer

Re: Leak in U.G. Tank
Service Station
7th & Cypress Streets
Oakland, CA

Dear Mr. Boyer:

Enclosed is a copy of our Hydrogeologists Report on subject site. It appears the amount leaked was small and occurred possibly during the tank testing. Recent monitoring indicates no free product and very low levels of soil contamination.

The tank has been repaired by internal lining and all tanks and lines have tested tight. It appears no further action is required at this time. If you have any questions or comments please contact John Randall or myself.

Very truly yours,

D. MOLLER

By _____
J. G. McTague
Environmental Specialist

JGM/cag:XX2-207
Enclosure

bcc: Mr. J. M. Randall
Mr. J. H. Ough
Mr. R. A. Wulffraat, Chevron Park

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists
A Division of Oil Recovery Systems, Inc.
5047 CLAYTON ROAD • CONCORD, CA 94521 • (415) 671-2387

MONITORING WELL INSTALLATION
CHEVRON SERVICE STATION
CYPRESS AND 7TH STREETS
OAKLAND, CALIFORNIA

September 10, 1985

Prepared for:

John Randall
Chevron U.S.A, Inc.
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San Ramon, Ca. 95827

Prepared by:

Robert Juncal
Geologist

Gary B. Taggart
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Geologist No. 1061

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Vice President
Western Regional
Manager

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INTRODUCTION

On April 11, 1985 Groundwater Technology was authorized by Chevron U.S.A., Inc., San Ramon to investigate a potential leak from the subsurface storage tanks and product lines at the abandoned Chevron Service Station at the corner of Cypress and 7th Streets in Oakland, California (Figure 1). The loss was suspected as a result of positive leak indicators of recent tank and line intergrity testing. The purpose of the investigation was to determine the extent of soil and groundwater contamination resulting from the potential inadvertant discharge of petroleum product at the site. This investigation was conducted by the installation of three monitoring wells in conjunction with field analysis of soil samples.

INVESTIGATION PROCEDURE

On April 19, 1985 Groundwater Technology arrived on site to assess the extent of product contamination by the installation of three monitoring wells. Due to the project sites proximity to San Francisco Bay the groundwater was assumed to be at a shallow depth (less than 10 feet) and flowing in a westerly direction (towards the bay), possibly under fluctuating tidal influence. Two of the three wells were located in the assumed downgraded direction from the tank pit.

An 8 inch hollow stem auger was used to drill the boreholes. Grab samples were taken at random intervals and sealed in plastic bags to be field analyzed for hydrocarbon vapors. The soil samples were field anaylzed using a photoionizer (detection limit 1 ppm total volatile organics) which enabled relative qualification of hydrocarbon concentration in vapors released from the samples.

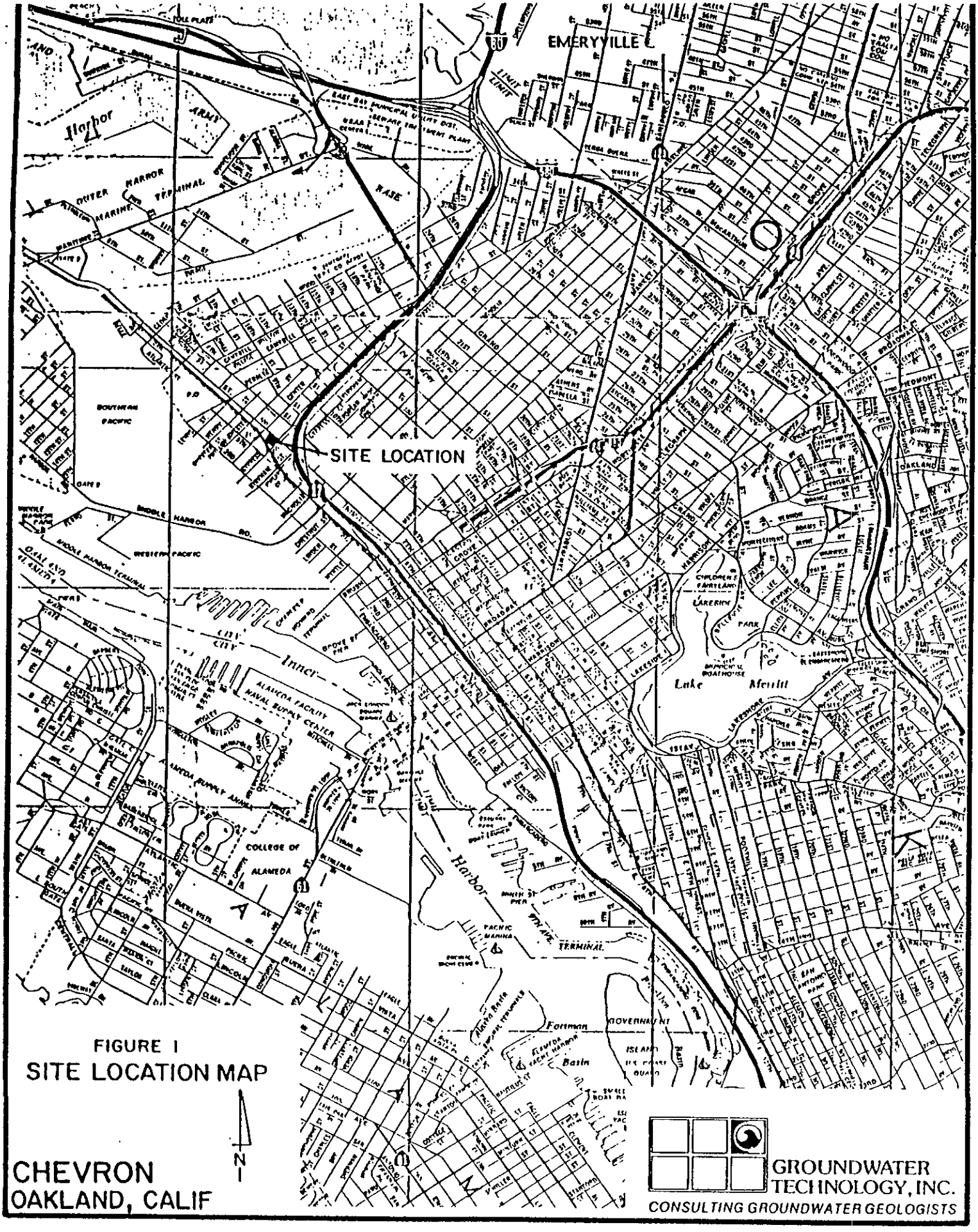

FIGURE 1
SITE LOCATION MAP

GROUNDWATER TECHNOLOGY, INC.
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The three wells were properly constructed, including allowance for seasonal/tidal fluctuations, appropriate screening, sand packing and sealing at the top portions of the wells (figure 2). Permitting for the monitoring well installation was conducted through the Alameda Flood Control and Water Conservation District.

MONITORING WELL INSTALLATION

The monitoring wells were installed using available data including water table gradient and depth; stratigraphy of soils; and locations of the potential product loss points. Well #1 was installed within the tank pit backfill and Wells #2 and #3 were located in the assumed down groundwater gradient direction (west) from the tanks to determine if product migration had ocurred. The site map marks the locations of the newly installed wells (Figure 3). Please refer to the Appendix for drill logs, well design schematics and soil descriptions.

The wells were constructed of two-inch and four-inch PVC, .020 inch machine slotted screen and blank casing. The sand pack used was #3 aquarium sand to inhibit silt building up around the well casing. The annular seal above the sand pack consisted of bentonite pellets overlain by neat cement to the surface. A street box was installed to protect the exposed portion of the wells.

The three monitoring wells were drilled to a depth of twenty-five feet. The piezometric surface or the upper boundary of the water table was encountered at approximately nine feet. Due to the similarity of the soil stratigraphy encountered and the consistent depth to water, all three wells were constructed the same. Each well was screened from

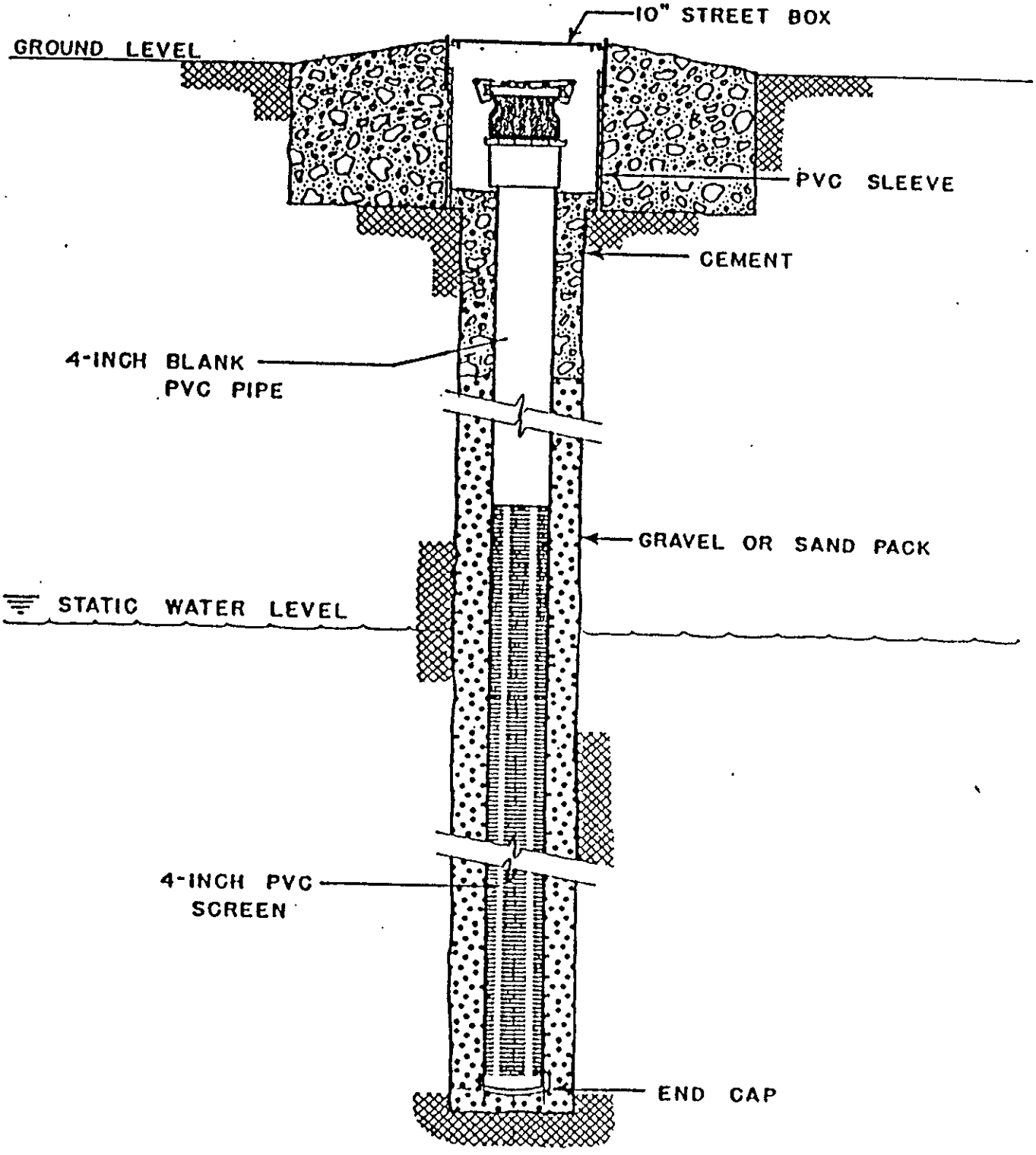
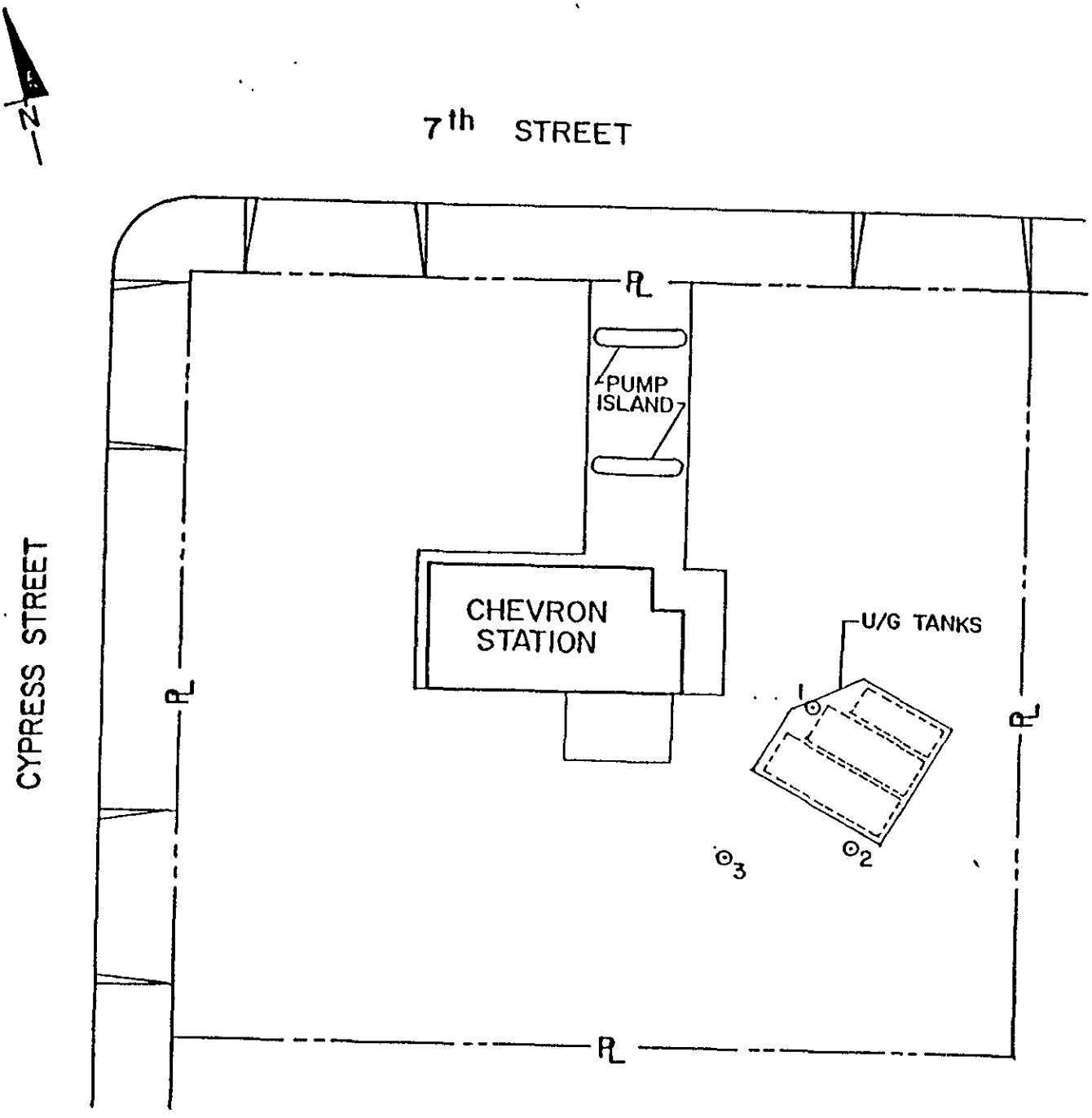


FIGURE 2

TYPICAL DETAIL
MONITORING WELL CONSTRUCTION



LEGEND

⊙ MONITORING WELL

FIGURE 3
SITE PLAN

0 10 20 30 60FT

CHEVRON SERVICE STATION
OAKLAND, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
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twenty-five to six feet below ground surface. The upper six feet of the well was completed to the surface with blank casing. The sand pack was placed from twenty-five feet to one foot above the well screen. One foot of bentonite pellets overlain by four feet of neat cement completed the annular seal of these wells. The newly installed wells were developed by hand bailing a minimum of four well volumes.

SOIL SAMPLING AND ANALYSIS

just PID

The soil samples collected and analyzed on-site consisted of clays to fine sands. Field analysis of soils shows that all three wells have been exposed to at least some hydrocarbon contamination (See PID readings on the drill logs). The soil contamination is greatest in wells #1 and #2 which are located within and next to the tank pit respectfully. Well #3 located twenty feet southwest of the tank pit shows a significant decrease in soil contamination. The soil contamination was noted to continue to a depth below the nine foot depth of the perched water table.

GROUNDWATER MONITORING

no samples

The wells at the site have been periodically monitored since their installation. The purpose of the monitoring program was to detect any accumulation of free floating hydrocarbons and to determine fluctuations in groundwater elevations. Please see Appendix for the Monitoring Methodology and the Monitoring Well Data Sheets which outline the methods and results of the monitorings.

During the period from April 29 thru September 9, 1985 free floating product has been observed only in Well #1. The

product is characterized by being black in color with a high viscosity compared to fresh gasoline. Subsequent to monitoring, the free product has been removed during each site visit from this well in order to determine the amount of product recharge. The amount of free product within well #1 has varied over the six month period with a trend of increasing product accumulation (product thickness) with increasing depth to water. This trend is apparent even though fluctuations in depth to water were less than one foot over this time period.

SUMMARY

A total of three monitor wells were installed by Groundwater Technology on April 19, 1985. Field analysis of soil samples revealed that hydrocarbon contamination existed in the three wells with the greatest contamination occuring in well #1 and #2. The groundwater monitoring over a six month period revealed persistent free product accumulation in Well #1 only.

CONCLUSIONS

The presence of free product within Well #1, located within the tank pit backfill, indicates that an inadvertant loss of product has occurred at the site. The absence of free product in Wells #2 and 3 suggests that the extent of the product plume may be contained within the tank pit. The persistant recharge of product into Well #1 warrants continued monitoring/product recovery at the site and additional assessment of the product extent.

APPENDIX

TECHNOLOGY
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Drilling Log

Well Number 1

Project Chevron Oakland — Owner Chevron USA, Inc.

Location 7th Street, Oakland — Project Number 20-3235

Date Drilled 4/19/85 — Total Depth of Hole 25.0' — Diameter 8 inch

Surface Elevation _____ — Water Level, Initial 8.0' — 24-hrs. _____

Screen: Dia. 4 inch — Length 18 feet — Slot Size .020

Casing: Dia. 4 inch — Length 6 feet — Type PVC

Drilling Company Sierra Pacific — Drilling Method 8" H.S. Auger

Driller G. Taggart — Log by R. Juncal

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0		PID reading			Asphalt 0 - 4"
3					Gray fine sand (tank backfill), fuel odor
6					Gray fine micaceous sand, strong odor, moist
9		150 ppm			
		160 ppm			Gray fine sand, gas film, wet
12					
15		140 ppm			Light brown fine sand, moderate odor
18		145 ppm			Light brown silty sand, moderate odor
21					
24					Same to 25 feet

PVC Screen	24 to 6 ft.
PVC Blank	6 to 0 ft.
Sand Pack	24 to 5 ft.
Bentonite	5 to 4 ft.
Cement	4 to 0 ft.

PID reading - Field analysis of soil vapors (hydrocarbon concentration) using a photo-ionizer.

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TECHNOLOGY
Division of Oil Re ary Systems, Inc.

Drilling Log

Well Number 2

Project Chevron Oakland — Owner Chevron USA, Inc.

Location 7th Street, Oakland — Project Number 20-3235

Date Drilled 4/19/85 — Total Depth of Hole 25.0' — Diameter 8 inch

Surface Elevation ____ — Water Level, Initial 9.0' — 24-hrs. ____

Screen: Dia. 2 inch — Length 19 feet — Slot Size .020

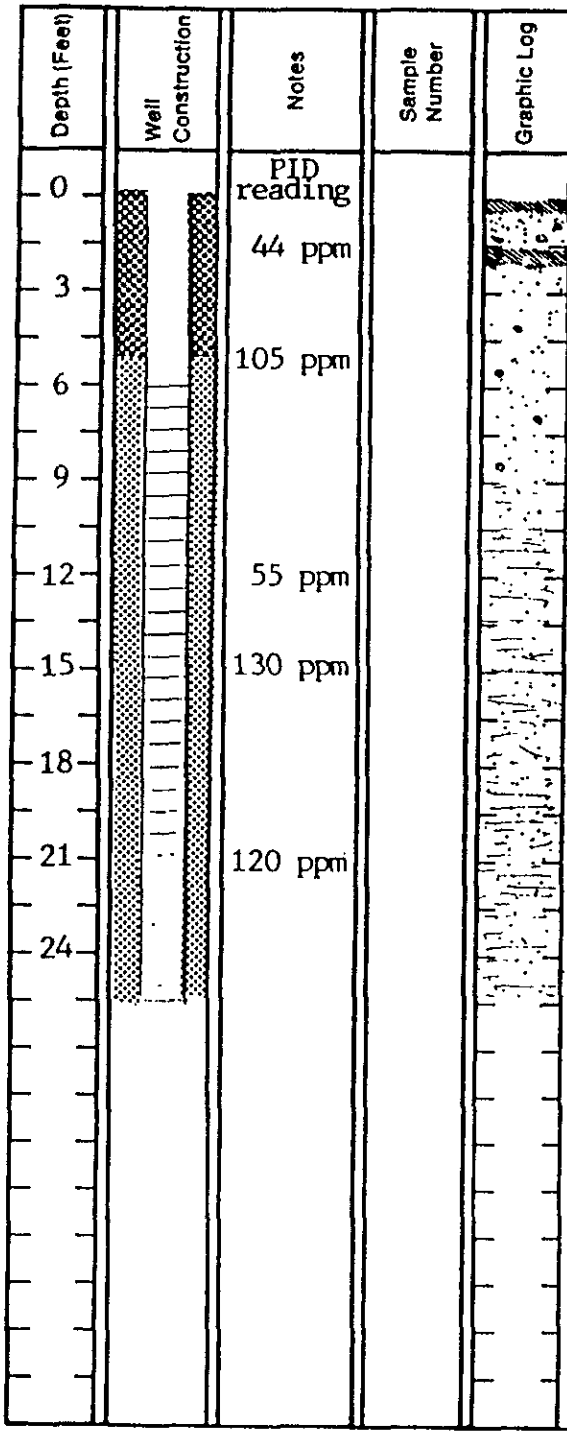
Casing: Dia. 2 inch — Length 6 feet — Type PVC

Drilling Company Sierra Pacific — Drilling Method 8" H.S. Auger

Driller G. Taggart — Log by R. Juncal

Sketch Map

Notes



Description/Soil Classification (Color, Texture, Structures)

Asphalt 0 - 4"
Road base: sand to gravel 4" to 1.5'
Cement slab 1.5' to 2'

Black silty sand, 5% subround pebbles, old gas odor

Same as above, fuel odor

Brown clay to fine sand

Brown clay to fine sand

Same to 25 feet

PVC Screen	25 to 6 ft.
PVC Blank	6 to 0 ft.
Sand pack	25 to 5 ft.
Bentonite	5 to 4 ft.
Cement	4 to 0 ft.

PID reading - Field analysis of soil vapors (hydrocarbon concentration) using a photo-ionizer.

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TECHNOLOGY
Division of Oil Recovery Systems, Inc.

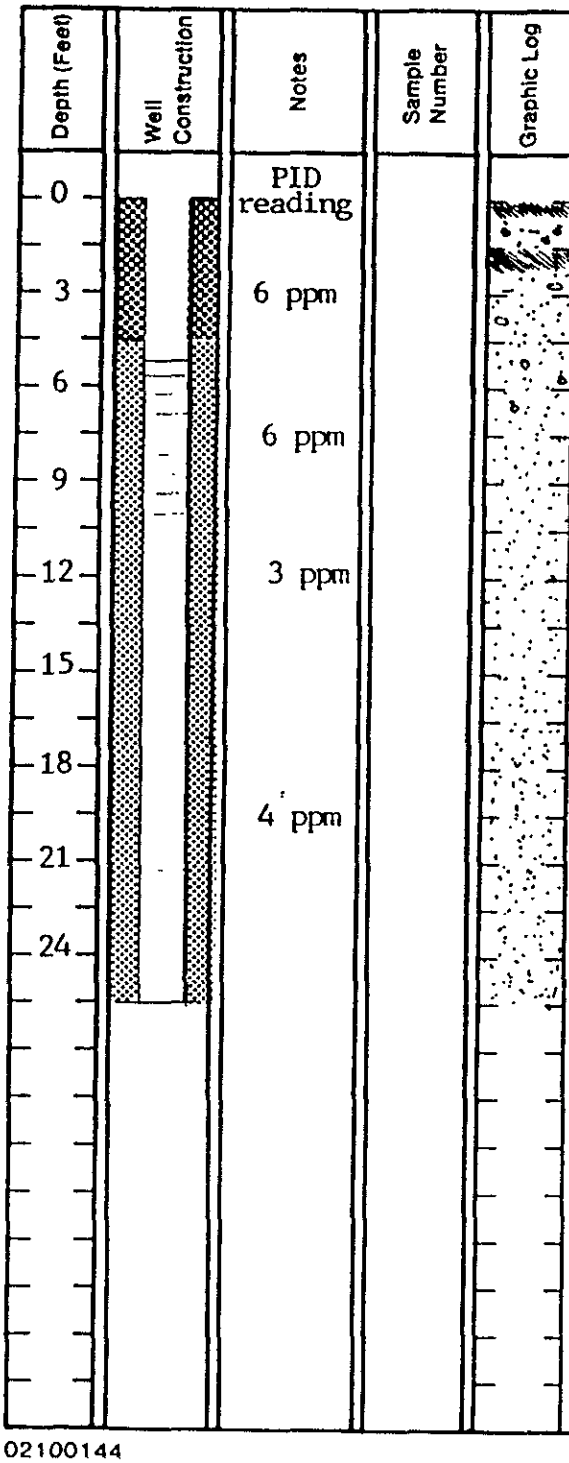
Drilling Log

Well Number 3

Project Chevron Oakland — Owner Chevron USA, Inc.
Location 7th Street, Oakland — Project Number 20-3235
Date Drilled 4/19/85 — Total Depth of Hole 25.0' — Diameter 8 inch
Surface Elevation ____ — Water Level, Initial 9.0' — 24-hrs. ____
Screen: Dia. 2 inch — Length 20 feet — Slot Size .020
Casing: Dia. 2 inch — Length 5 feet — Type PVC
Drilling Company Sierra Pacific — Drilling Method 8" H.S. Auger
Driller G. Taggart — Log by R. Juncal

Sketch Map

Notes



Description/Soil Classification (Color, Texture, Structures)

Asphalt 0 - 4"
Road base: sand and gravel 4" to 1'

Cement 1' - 1.5'

Gray silty sand to subangular cobbles, old gas odor

Black silty fine sand, no odor

Medium brown sandy silt, no odor

Medium brown sandy silt

Same to 25 feet

PVC Screen	25 to 5 ft.
PVC Blank	5 to 0 ft.
Sand pack	25 to 4 ft.
Bentonite	4 to 3 ft.
Cement	3 to 0 ft.

PID reading - Field analysis of soil vapors (hydrocarbon concentration) using a photo-ionizer.

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MONITORING METHODOLOGY

Monitoring of observation and recovery wells at the site was conducted using an ORS Interface Probe and Surface Sampler. The Interface Probe is a hand held, battery operated device for measuring depth to petroleum product and depth to water, as measured from an established datum (i.e., top of the well casing which has been surveyed). Product thickness is then calculated by subtracting the depth to product from the depth to water. In addition, water elevations are adjusted for the presence of fuel with the following calculation:

(Product Thickness)(.8)+(Water Elevation) = Corrected Water Elevation

Where .8 accounts for the density difference between water and the petroleum hydrocarbon.

The Interface Probe consists of a dual sensing probe utilizing an optical liquid sensor and electrical conductivity to distinguish between water and petroleum products. A coated steel measuring tape transmits the sensor's signals to the reel assembly, where an audible alarm sounds a continuous tone when the sensor is in petroleum product and an ascillating tone when in water. The Interface Probe is accurate to 1/16-inch.

The Surface Sampler is used for visual inspection of the groundwater to note sheens (undetectable with the Interface Probe), odors, microbial action, etc.

The Surface Sampler used consists of a 12-inch long cast acrylic tube with a Delrin ball which closes onto a conical surface creating a seal as the sampler is pulled up. The sampler is calibrated in inches and centimeters for visual inspection of product thickness.

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GROUNDWATER GRADIENT DATA

CLIENT: Chevron U.S.A. Inc.
LOCATION: Oakland, Ca.
DATE: April 29, 1985

OBSERVATION WELL

NO.	TOP WELL ELEV.	DTW	DTP	PT	PT x .8	ADJ. DTW	ELEV. WATER
1		8.35	7.93	.42			
2		8.07	---	0			
3		7.56	---	0			
* 1		8.79					

* After hand bailing well

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists

GROUNDWATER GRADIENT DATA

CLIENT: Chevron U.S.A. Inc.
LOCATION: Oakland, Ca.
DATE: May 1, 1985

OBSERVATION WELL

NO.	TOP WELL ELEV.	DTW	DTP	PT	PT x .8	ADJ. DTW	ELEV. WATER
1		8.06	8.02	.04			
2		8.06					
3		7.55					
* 1		8.46	---	0			

* After hand bailing well

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists

GROUNDWATER GRADIENT DATA

CLIENT: Chevron U.S.A. Inc.
LOCATION: Oakland, Ca.
DATE: May 14, 1985

OBSERVATION WELL

NO.	TOP WELL ELEV.	DTW	DTP	PT	PT x .8	ADJ. DTW	ELEV. WATER
1		7.78	7.73	.05			very dark/black product
2		7.90					clean well; no odor
3		7.28					clean well; no odor
* 1		8.33	8.32	.01			floating film

* After hand bailing well

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists

GROUNDWATER GRADIENT DATA

CLIENT: Chevron U.S.A. Inc.
LOCATION: Oakland, Ca.
DATE: June 18, 1985

OBSERVATION WELL

NO.	TOP WELL ELEV.	DTW	DTP	PT	PT x .8	ADJ. DTW	ELEV. WATER
1		8.23	8.20	.03			black, sticky
2		8.33					muddy, no odor
3		7.82					clean, no odor
* 1		8.63	---	0			

* After hand bailing well

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists

GROUNDWATER GRADIENT DATA

CLIENT: Chevron U.S.A. Inc.
LOCATION: Oakland, Ca.
DATE: July 17, 1985

OBSERVATION WELL

NO.	TOP WELL ELEV.	DTW	DTP	PT	PT x .8	ADJ. DTW	ELEV. WATER
1		8.71	8.23	.48			black product
2		8.41	---	0			no odor
3		7.91	---	0			no odor
* 1		9.07	---	0			

* After hand bailing well

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GROUNDWATER GRADIENT DATA

CLIENT: Chevron U.S.A., Inc.
LOCATION: Oakland, Ca.
DATE: July 31, 1985

MONITORING WELL

NO.	TOP WELL ELEV.	DTW	DTP	PT	PT x .8	ADJ. DTW	ELEV. WATER	COMMENTS
1		8.51	8.23	.28				Black and sticky
2		8.39	——	0				Clear, odor
3		7.92	——	0				Yellowish-clear, odor
1		8.92	——	0				

* After hand bailing well

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CONSULTING GROUNDWATER GEOLOGISTS

GROUNDWATER GRADIENT DATA

CLIENT: Chevron U.S.A., Inc.
LOCATION: Oakland, Ca.
DATE: September 9, 1985

MONITORING WELL

NO.	TOP WELL ELEV.	DTW	DTP	PT	PT x .8	ADJ. DTW	ELEV. WATER	COMMENTS
1		8.98	8.37	.61				Black, sticky
2		8.65	----	0				Muddy, slight odor
3		8.19	----	0				Muddy, slight odor

* Product was not bailed from well