A Report Prepared for

Texaco Refining and Marketing Inc.
100 Cutting Boulevard
Richmond, California 94804

GROUND-WATER REMEDIATION PLAN
FORMER TEXACO STATION NO. 62488000195
2225 TELEGRAPH AVENUE
OAKLAND, CALIFORNIA

HLA Job No. 2251,111.03

Nov 89

by

Michael A Sides

Michael A. Sides
Project Engineer

Randolph Stone

Randolph Stone
Associate Hydrogeologist

REGISTERED GEOLOGIST
RANDOLPH STONE
NO. 1214
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, California 94520
415/687-9660

November 30, 1989

TABLE OF CONTENTS

LIST OF TABLES iv

LIST OF ILLUSTRATIONS iv

I INTRODUCTION 1

II OBJECTIVES OF REMEDIATION 2

- A. Previous Investigation 2
- B. Summary of Findings and Need for Remediation 2
- C. Objective of Proposed Work 3

III SCOPE OF WORK 5

- A. Task 1 - Drill and Install Recovery Well 5
- B. Task 2 - Construct Ground-water Collection System 6
- C. Task 3 - Install Pumps 7
- D. Task 4 - Install Water Treatment System 7
- E. Task 5 - Start-up and Monitor Water Treatment System 8
- F. Schedule 9

IV SITE CONDITIONS 11

- A. Location and Topography 11
- B. Geographic Constraints 11
- C. Vadose Zone Soil Condition 11
- D. Ground-water Gradient 12
- E. Ground-water Condition 12
- F. Underground Fuel Tank Integrity 13
- G. Source of Hydrocarbons in Ground Water 13

V GROUND-WATER TREATMENT SYSTEM 14

- A. Design 14
- B. Feasibility 15

VI HYDROGEOLOGY 17

- A. Near-surface Geologic Profile 17
- B. Aquifer Testing 17
- C. Flow Rates 18
- D. Capture Zone 18
- E. Feasibility 18

VII ILLUSTRATIONS 19

TABLE OF CONTENTS
(continued)

APPENDICES

A CALIFORNIA DEPARTMENT OF HEALTH SERVICES REVISED ACTION LIST FOR CHEMICAL CONTAMINANTS OF DRINKING WATER (APRIL 19, 1989)

B TANK SYSTEM TIGHTNESS TEST

DISTRIBUTION

LIST OF TABLES

Table 1 Water Treatment System Design Parameters.......... 14
Table 2 Slug Test Results................................ 17

LIST OF ILLUSTRATIONS

Plate 1 Site Location Map
Plate 2 Distribution of Hydrocarbons in Ground Water
Plate 3 Ground-water Collection System
Plate 4 Proposed Well Construction Detail
Plate 5 Conceptual Ground-water Extraction System
Plate 6 Conceptual Ground-water Treatment System
Plate 7 Anticipated Remediation Schedule
Plate 8 Vicinity Plan
Plate 9 Ground-water Surface Map
Plate 10 Shallow Subsurface Cross Section A-A′
Plate 11 Capture Zone

I INTRODUCTION

This report describes a plan developed by Harding Lawson Associates (HLA), for treatment of ground water containing gasoline constituents at a service station site formerly owned by Texaco Refining and Marketing Inc. As shown on Plate 1, the site is at 2225 Telegraph Avenue in Oakland, California. The service station is currently owned and operated by Exxon Company U.S.A.

HLA previously conducted an investigation at this site that defined a dissolved gasoline plume in the ground water with concentrations of chemical compounds exceeding action levels established by the California Department of Health Services (DOHS). The purpose of this work plan is to outline a remediation program that will remediate the dissolved gasoline plume on-site while maintaining hydraulic control of the ground water in the site vicinity. Specifically, HLA proposes to: extract ground water using three on-site recovery wells, treat the extracted water through contact with granular-activated carbon (GAC), and discharge the clean, treated water into the Oakland sanitary sewer system.

II OBJECTIVES OF REMEDIATION

A. Previous Investigation

In May 1988, Texaco Refining and Marketing Inc. retained HLA to conduct a site investigation of a service station at 2225 Telegraph Avenue in Oakland, California. To date, the investigation has been performed in three sequential phases, results of which were presented in reports issued on the following dates:

1.	Sensitive Receptor Study	May 24, 1988
2.	Subsurface Investigation	July 20, 1988
3.	Environmental Assessment	June 22, 1989

To update project status, HLA issues quarterly technical reports to Texaco Refining and Marketing Inc. that describe continuing activities and present findings.

B. Summary of Findings and Need for Remediation

The results of HLA's investigation indicate that remedial actions are necessary to address the following conditions at this site:

1. Shallow ground water beneath the site contains dissolved benzene, toluene, ethylbenzene, and xylenes (BTEX) in excess of Drinking Water Action Levels (DWALs) and Maximum Contaminant Levels (MCLs).* The lateral extent of BTEX in the ground water is not known at this time because of restricted access on Telegraph and West Grand Avenues imposed by the City of Oakland.

---

* The DOHS issued a revised action list for chemical contaminants of drinking water in a letter dated April 19, 1989 (Appendix A). MCLs are drinking water standards enforced by law under California Code of Regulations, Title 22. DWALs are recommended levels but are not enforced by law.

Subsurface exploration north of the site, on West Grand Avenue, was also restricted because of the existing Bay Area Rapid Transit (BART) tunnel. Distribution of total petroleum hydrocarbons (TPH) as gasoline in the ground water is presented on Plate 2.

2. BTEX and TPH (as gasoline) concentrations in excess of 100 parts per million (ppm) have been detected exclusively in soils at 12 to 13.5 feet below the ground surface. This interval is within the zone of fluctuation of the ground-water table.

A more detailed discussion on site conditions is presented in a subsequent section of this report.

C. Objective of Proposed Work

HLA proposes to remediate the ground water on site by extracting from three on-site wells, treating the water by passing it through granulated carbon and discharging to the sanitary sewer. The clean-up goals for this remediation will be to continue ground water remediation until ground water samples from monitoring wells have concentrations of BTEX at or less than the existing DWALs or MCLs. We believe these levels to be adequate because the primary exposure pathway of these chemicals is through ingestion of ground water. As explained in our Sensitive Receptor Study, there are no registered drinking water wells within 1/4 mile of the site, and therefore HLA believes that human health is protected. We also believe that the DWAL and MCL are reasonable clean-up levels that can be achieved with available technologies.

Because significant concentrations of BTEX and TPH have only been detected in the soils below 12 feet and the water table is

12 to 14 feet deep, we believe that no remediation of the vadose-zone soil is needed.

If an off-site upgradient source of petroleum hydrocarbons is identified during the remediation, changes in the clean-up goals for individual monitoring wells may be requested.

III SCOPE OF WORK

The work will be approached as five tasks:

Task 1 - Drill and install one 25-foot-deep, 4-inch-diameter recovery well and modify well heads of MW-6C and MW-6D

Task 2 - Construct a ground-water collection system from three recovery wells to the treatment facility

Task 3 - Install pumps in three recovery wells

Task 4 - Install water treatment system

Task 5 - Start-up and monitor the water treatment system.

A. Task 1 - Drill and Install Recovery Well

A recovery well (RW-6A) will be installed, as shown on Plate 3. Existing monitoring wells MW-6C and MW-6D will also be converted into recovery wells.

The well will be drilled with 10-1/2-inch augers to a depth of 25 feet, and constructed of 4-inch-diameter PVC casing (see Well Construction Details, Plate 4). The well screen (0.02-inch slot size) will extend from approximately 10 to 25 feet below grade. The annular space between the casing and the borehole wall will be filled with No. 3 Monterey sand to approximately one foot above the top of the screened interval. A 2-foot-thick bentonite seal will be placed above the sand pack, and the remainder of the annulus will be filled with a cement-bentonite grout to just below the ground surface.

The top of RW-6A will be slightly below the ground surface and equipped to attach to the collection system piping. A locking, 2-foot by 3-foot traffic box will be installed over the well to house well-head attachments. The existing traffic boxes protecting MW-6C and MW-6D will be replaced with 2-foot by 3-foot rectangular traffic boxes below grade to accommodate well head equipment associated with pneumatic pumping systems.

B. Task 2 - Construct Ground-water Collection System

A ground-water collection system, in the configuration shown on Plate 3, will be constructed in a 2-foot-deep trench to connect the recovery wells with the treatment compound. A 4-inch-diameter, flush-threaded, PVC pipe will extend from the recovery wells to the treatment system compound. The pipe will contain two pneumatic control lines (a 1/2-inch inside diameter [ID] air source line and a 1/4-inch-ID pilot line), and a 1/2-inch-ID line to transport extracted ground water from the recovery wells to the treatment system.

The bottom 2 inches of the trench, which will contain the pipe, will be backfilled with sand. Then the pipe will be laid in the trench and sand will be placed to 6 inches above the 4-inch pipe and compacted by tamping with vibratory equipment. The trench will then be backfilled with Class II aggregate baserock and compacted to a minimum of 95 percent relative compaction* to within 2 inches of final grade. A 2-inch asphalt

---

* Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil determined by ASTM D1557-78 laboratory test procedure. Optimum moisture is the water content that corresponds to the maximum dry density.

layer will than be placed and compacted in the trench to match the existing grade.

C. Task 3 - Install Pumps

Pneumatic injector pumps will be installed inside the three recovery wells (RW-6A, MW-6C, and MW-6D) to facilitate ground-water extraction. Schematic representation of the ground-water extraction system is presented on Plate 5. An air compressor and control panel will be installed in the treatment system compound.

Each well will be equipped with a pneumatic control device that will stop the flow of compressed air to the pump when the water level in the well drops below the pump inlet. The water discharge line at each well head will have a block valve (ball type) and sampling port.

D. Task 4 - Install Water Treatment System

Extracted ground water will be processed through a water treatment system consisting of a retention tank, charge pump, and GAC canisters as shown in the schematic representation presented on Plate 6. The ground-water collection system will be connected to a retention tank. A centrifugal pump will be used to move water collected in the retention tank through GAC canisters for treatment prior to discharge to the sanitary sewer. The operation of the pump will be controlled by a high and low level switch in the retention tank; high level will start the charge pump, low level will stop the charge pump, and high-high level (to prevent overflow) will stop the well extraction pumps. Three

GAC canisters will be connected in series with a 1-inch-diameter PVC manifold to redistribute flow. Sampling ports will be installed in the influent line, effluent line, and between each canister. A flow meter totalizer will be installed on the effluent line at a point before the line discharges to the sanitary sewer.

The above treatment system will be installed on an 8-foot by 16-foot reinforced concrete pad enclosed by a fence at the location shown on Plate 3. A low retainer wall will be installed around the perimeter of the pad to provide secondary containment for liquids.

A licensed contractor will install flush-threaded cast iron pipe, which will discharge treated ground water from the treatment system to an on-site sanitary sewer connection after we receive the East Bay Municipal Utilities District (EBMUD) discharge permit. Electrical work will be performed by a licensed contractor. HLA will provide construction management of the installation.

E. Task 5 - Start-up and Monitor Water Treatment System

We expect that the construction operations described above will take approximately 2 to 3 weeks; a 2- to 3-day full or partial closure of the station services will be necessary to install trench and piping between wells RW-6A and MW-6D. The balance of the work can be done without any station closure. After the ground-water extraction and treatment systems are installed, HLA will provide testing of the remediation system over a three-week period. During this period, discharge water will be retained in a storage tank on site. After the test, it will be pumped to the sanitary sewer.

Water samples will be collected, as required by an EBMUD ground-water discharge permit, to assess treatment efficiency. We propose to sample treated effluent on the following schedule: daily for one week, weekly for the remainder of the month, monthly for the remainder of the quarter, and quarterly thereafter.

subject to EBMUD permit requirements!

Midstream samples will be obtained weekly to monitor hydrocarbon breakthrough of the first and second canister. The first canister will be removed once breakthrough of the second canister occurs; manifold valves will be manipulated to allow a clean GAC canister to be installed in series, following the remaining two canisters. Monitoring of the second canister in the series will continue on the basis of initial breakthrough times and EBMUD requirements.

We will evaluate the effectiveness of site ground-water remediation quarterly, by sampling and analyzing water from eight on-site and one off-site monitoring wells. Status reports will be submitted quarterly.

F. Schedule

We anticipate that the proposed ground-water remediation system will be operational within three months after approval is obtained from the appropriate regulatory agency to proceed with the work outlined in this work plan (see Anticipated Remediation Schedule, Plate 7). HLA will submit an application to EBMUD for discharging treated ground water to the sanitary sewer; we expect that the permit will require one to two months for processing. During this time, HLA will prepare design drawings and specifications and solicit licensed contractors to install the ground-water collection system, construct components of the water treatment system and compound, install electrical wiring, and connect plumbing.

IV SITE CONDITIONS

A. Location and Topography

The former Texaco service station is located approximately 3.0 miles east of San Francisco Bay near the main business district of Oakland, California (Plate 1). The surrounding area consists of commercial/retail business, including a Chevron service station immediately across Telegraph Avenue, and a Beacon service station northeast (upgradient) of the site (Plate 8).

Surface elevation at the site is approximately 20 feet above mean sea level. The land surface slopes gently southeast, toward Lake Merritt and the Oakland/Alameda Inner Harbor. This area has been extensively developed, and surface-water runoff is mainly controlled by the municipal storm sewer system.

B. Geographic Constraints

The City of Oakland and BART have restricted off-site subsurface access in sidewalks and streets to the north, east, and south of the site; a church occupies the entire adjacent property to the southwest.

C. Vadose Zone Soil Condition

Because petroleum hydrocarbon concentrations in excess of 100 ppm have not been detected in the vadose zone soils (above fluctuation in the ground-water level), no soil remediation is necessary.

D. Ground-water Gradient

Ground water is encountered at approximately 13 feet. The estimated ground-water flow direction is predominantly southwest, with a gradient of 0.005 foot per foot. As shown on the ground-water surface map (Plate 9), in the northern part of the site, the ground-water flow direction is more toward the west.

E. Ground-water Condition

No free product has been observed in any of the monitoring wells. Hydrocarbons dissolved in the ground water are generally limited to the vicinity of the tanks and pump islands, extending southwest. The distribution of these hydrocarbons is presented on Plate 2.

Water from five on-site wells near the tanks and pump islands contains detectable levels of TPH. As of September 1989, the lateral limits of the plume are delineated by wells MW-6G, MW-6A, MW-6F, and MW-6I, which yield samples with non-detectable hydrocarbons (<50 parts per billion [ppb] TPH). Upgradient plume definition is incomplete because of restricted subsurface access.

Hydrocarbons may be migrating to the site from an upgradient source. In water from upgradient well MW-6B, combined concentrations of BTEX have increased from 6.6 ppb to 160 ppb (samplings of October 20, 1988, and July 11, 1989, respectively). Except for downgradient well MW-6E, water from every other monitoring well has exhibited a reduction in BTEX over the same time period.

F. Underground Fuel Tank Integrity

Three steel underground fuel tanks, installed in 1964, have cathodic protection and contain both leaded and unleaded gasoline (no diesel service). In November 1986, a fiberglass waste oil tank was installed in place of the previously existing waste oil tank. All four tanks and associated transfer lines were certified as "tight"* on June 30, 1988, by Paradiso Construction Company of Oakland, California (see Appendix B).

G. Source of Hydrocarbons in Ground Water

Given the positive results in recent tank and line integrity tests, and the limited extent of hydrocarbons in ground water, the most likely source of hydrocarbons is from past tank overfill.

---

* Tank systems certified as "tight" meet the criteria established by the National Fire Protection Association Pamphlet 329.

V GROUND-WATER TREATMENT SYSTEM

A. Design

Design parameters for the water treatment system are presented in Table 1. Influent concentrations are derived from an average of results from chemical analyses of ground water from the three wells that had the greatest concentration of dissolved hydrocarbon constituents (MW-6C, MW-6D, and MW-6H). Effluent concentrations are established by EBMUD, using the average concentrations in water processed during 1988. Flow rate is estimated from hydraulic calculations discussed in a subsequent section of this report.

Table 1. Water Treatment System Design Parameters

Influent Concentrations (ug/l)

	TPH (as gasoline)	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead
MW-6C	18,000	7,900	430	350	1,100	<0.3
MW-6D	2,200	600	26	58	31	4
MW-6H	660	480	<10	16	<10	<1
Average	7,000	3,000	160	140	380	<2

Effluent Concentrations (ug/l)

	Benzene	Toluene	Ethylbenzene	Xylenes	Lead
EBMUD Specifications	3	31	5	42	2

Flow Rates

Unconfined Aquifer
Conductivity 5.0 feet/day
Average Saturated Thickness = 4.0 feet

Transmissivity = 187 gpd/ft
Storativity (specific yield) 0.04
Q (per well) = 0.3 gpm

Expected Total Flow Rate = 0.9 gpm
Design Flow Rate = 0 to 5 gpm

The proposed treatment system consists of a retention tank, a charge pump, and three GAC canisters connected in series to maximize carbon utilization efficiency (see Plate 6). A 1-inch-diameter PVC manifold will be installed to redistribute flow between the GAC canisters as they are replaced.

The retention tank will serve three purposes:

1. Provide a constant head source for the charge pump to draw from, thus maintaining steady operation
2. Prevent air in the ground-water collection system from entering the GAC media
3. Retain any free product that enters the collection system, which would be skimmed from the tank to prevent fouling of GAC media.

A triple function fluid level control switch will be installed in the retention tank. At high level, the switch will start the charge pump to move water from the retention tank through the GAC media; at low level, the switch will stop the charge pump; and at its overflow level, the switch will shut off the extraction pumps in the recovery wells to prevent tank overflow in the event of a system failure.

B. Feasibility

Treatment with GAC media was decided upon after considering air stripping as a remediation technique for this site. Several factors make air stripping less cost effective than the proposed system: low flow rates, mechanical maintenance costs, permitting requirements imposed by the Bay Area Air Quality Management

District, and anticipated monitoring requirements of effluent air.

VI HYDROGEOLOGY

A. Near-surface Geologic Profile

Seven soil borings (B-1 through B-7) and nine monitoring wells have been drilled on and off site in the vicinity of the subject station. Subsurface materials generally consist of stiff, silty clay (10 to 15 feet thick), underlain by a dense silty sand layer (3 to 8 feet thick). The sand layer is underlain by more silty clay or silt. A shallow subsurface cross-section is presented on Plate 10.

B. Aquifer Testing

Hydraulic conductivity was estimated from the results of three single-well slug tests, using monitoring wells MW-6H, MW-6D, and MW-6E, which are generally downgradient of the underground fuel tanks. Water levels were compared with stratigraphic logs of the wells to classify the most permeable stratum adjacent to the screen in the saturated zone as hydraulically confined or unconfined. Table 2 lists the hydraulic conductivity estimates derived from the tests.

Table 2. Slug Test Results

Well Number	Lithology of Most Permeable Stratum	Classification of Stratum	Thickness of Stratum (feet)	Estimated Hydraulic Conductivity of Stratum (feet/day)
MW-6D	sand	confined	2	5.9
MW-6E	sand, fine-grained	confined	2.5	1.2
MW-6H	sand, medium-grained	unconfined	6	4.8

C. Flow Rates

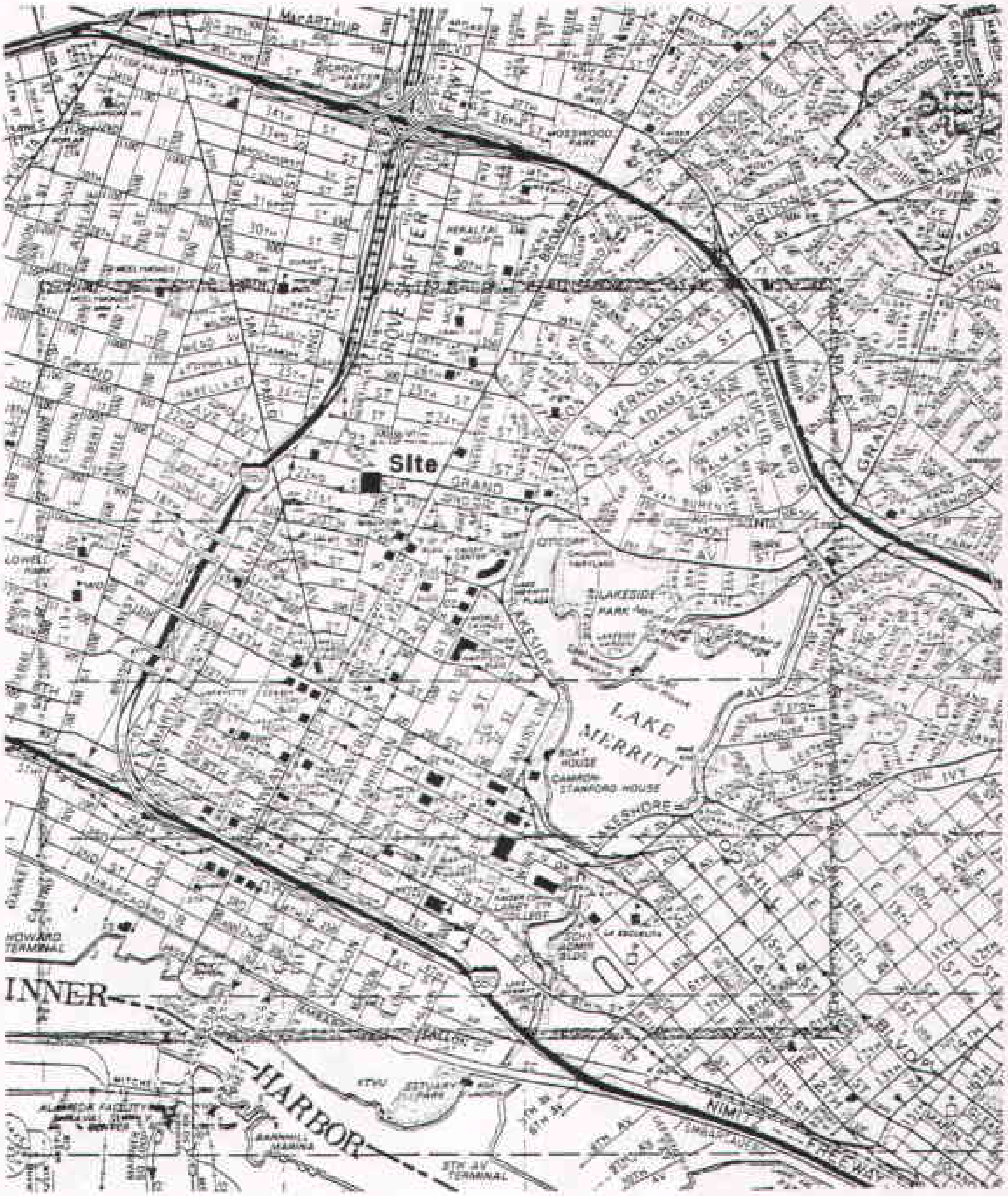
Initially, the expected flow rate from the three recovery wells is 0.3 gallons per minute (gpm) per well, using the parameters presented in Table 1. As ground-water extraction continues, flow rates are expected to decrease.

D. Capture Zone

As shown on Plate 11, cones of depression about each well, with radii of approximately 50 feet, are expected to develop after two months of operation. These cones will provide an imposed gradient toward the wells of about 0.05 foot per foot, which is 10 times greater than the natural hydraulic gradient across the site. In these calculations, we used the flow rate parameters presented in Table 1. The combined cones of depression (capture zone) of RW-6A, MW-6C, and MW-6D should provide hydraulic control over the site to recover the dissolved hydrocarbon plume as it is currently defined.

E. Feasibility

Three recovery wells were compared with the installation of a recovery trench. Capture zone calculations indicate that the proposed recovery wells will eventually dewater the low conductivity aquifer at this site; the additional expense to install a recovery trench would not provide increased hydraulic control.



0 2200 4400
SCALE IN FEET

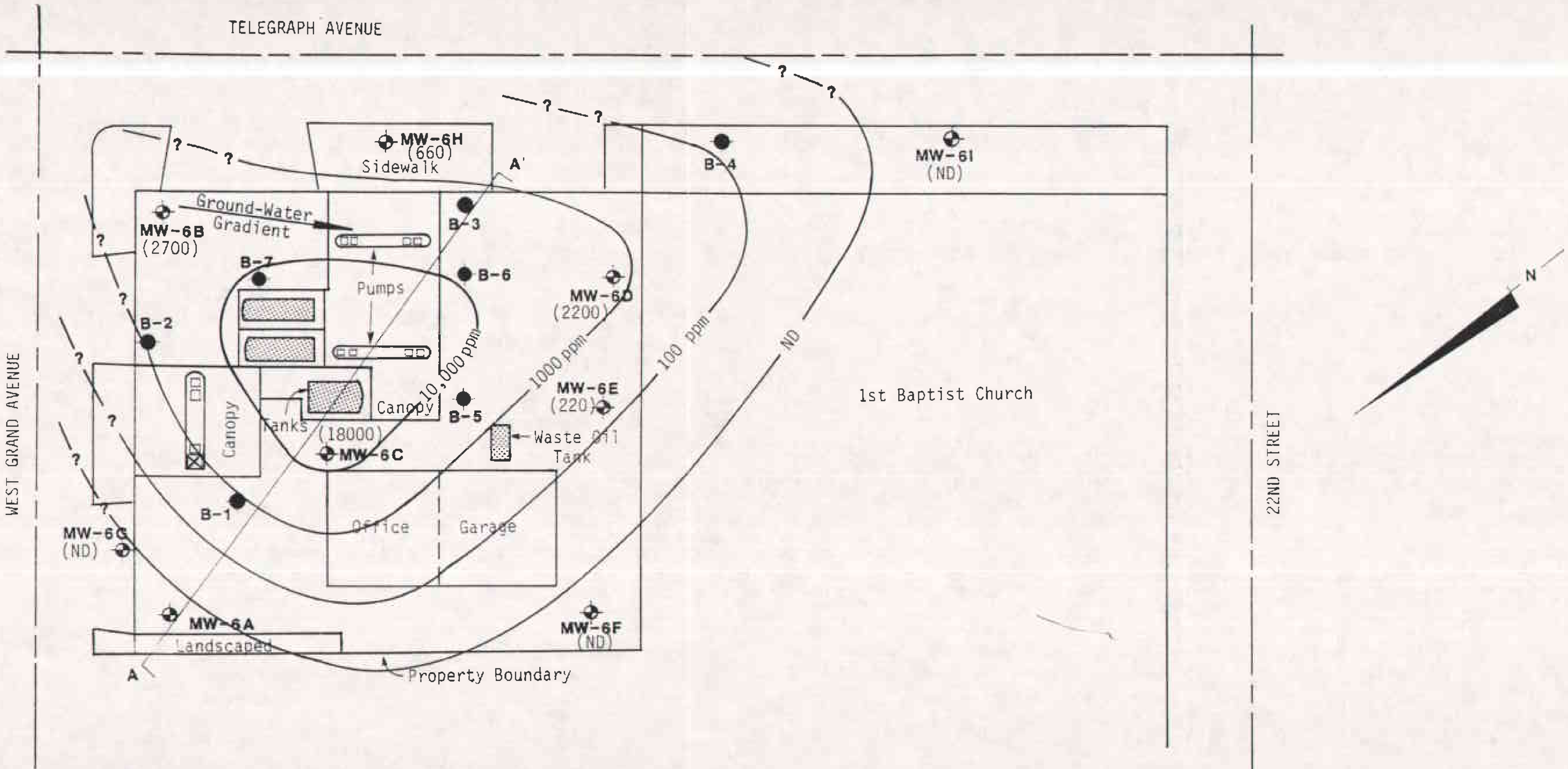
Leonard K. George
Mechanical Engineer - M25998

Harding Lawson Associates
Engineers and Geoscientists

Site Location Map
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,111.03		2/89		



Explanation

B-1 ●	Boring Location
MW-6J ⊕	Monitoring Well Location
☒	Bench Mark (HLA Datum El.= 100 feet)
(2700) benzene	Total Petroleum Hydrocarbon (TPH) Concentration
———	Contour of Constant TPH Concentration

ND = Not Detectable (< 50 ppm)

0 30 60
SCALE IN FEET

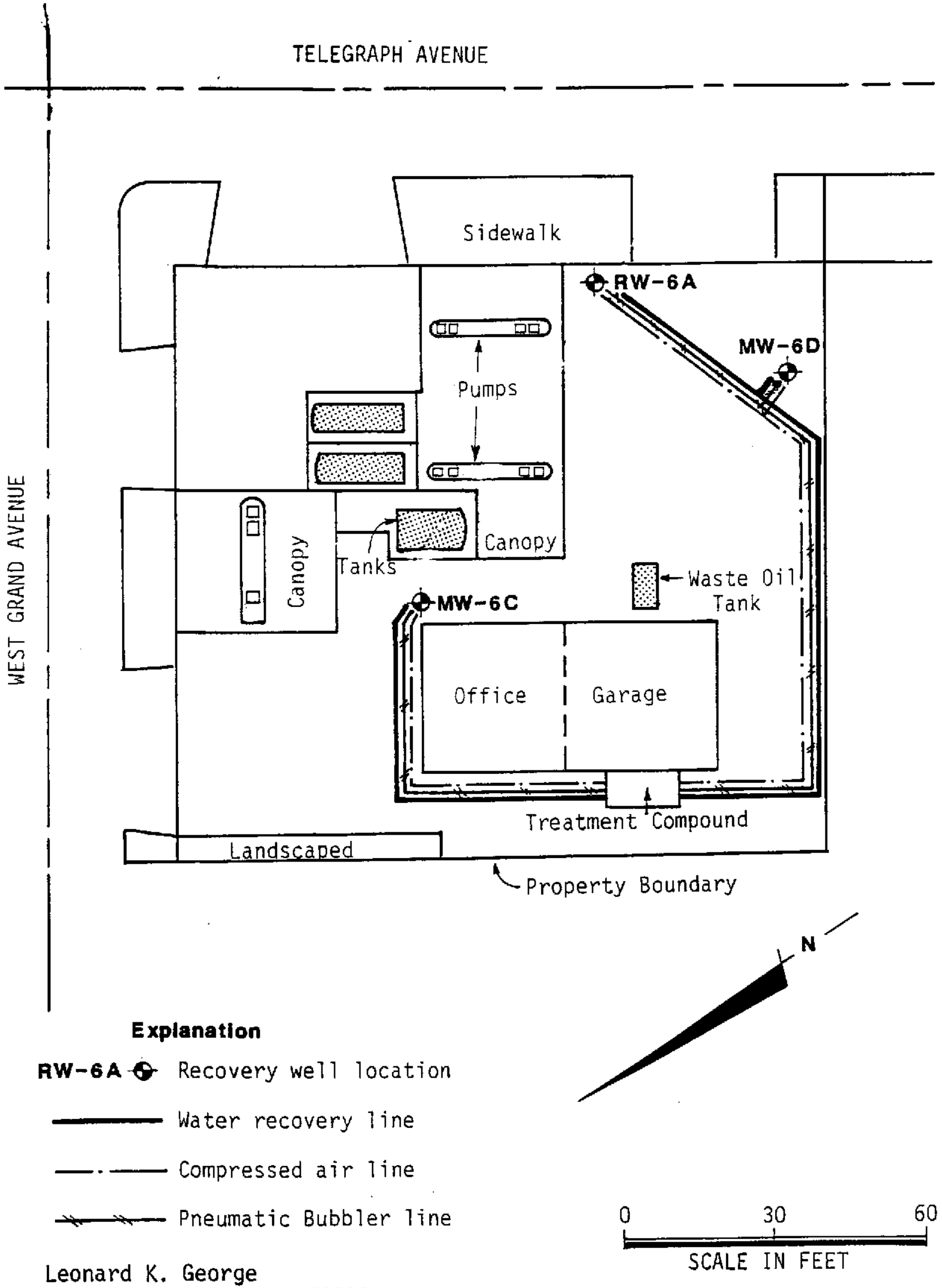
Harding Lawson Associates
Engineers and Geoscientists

Distribution of Hydrocarbons in Ground Water
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
KH	2251,111.03		9/89		

109463



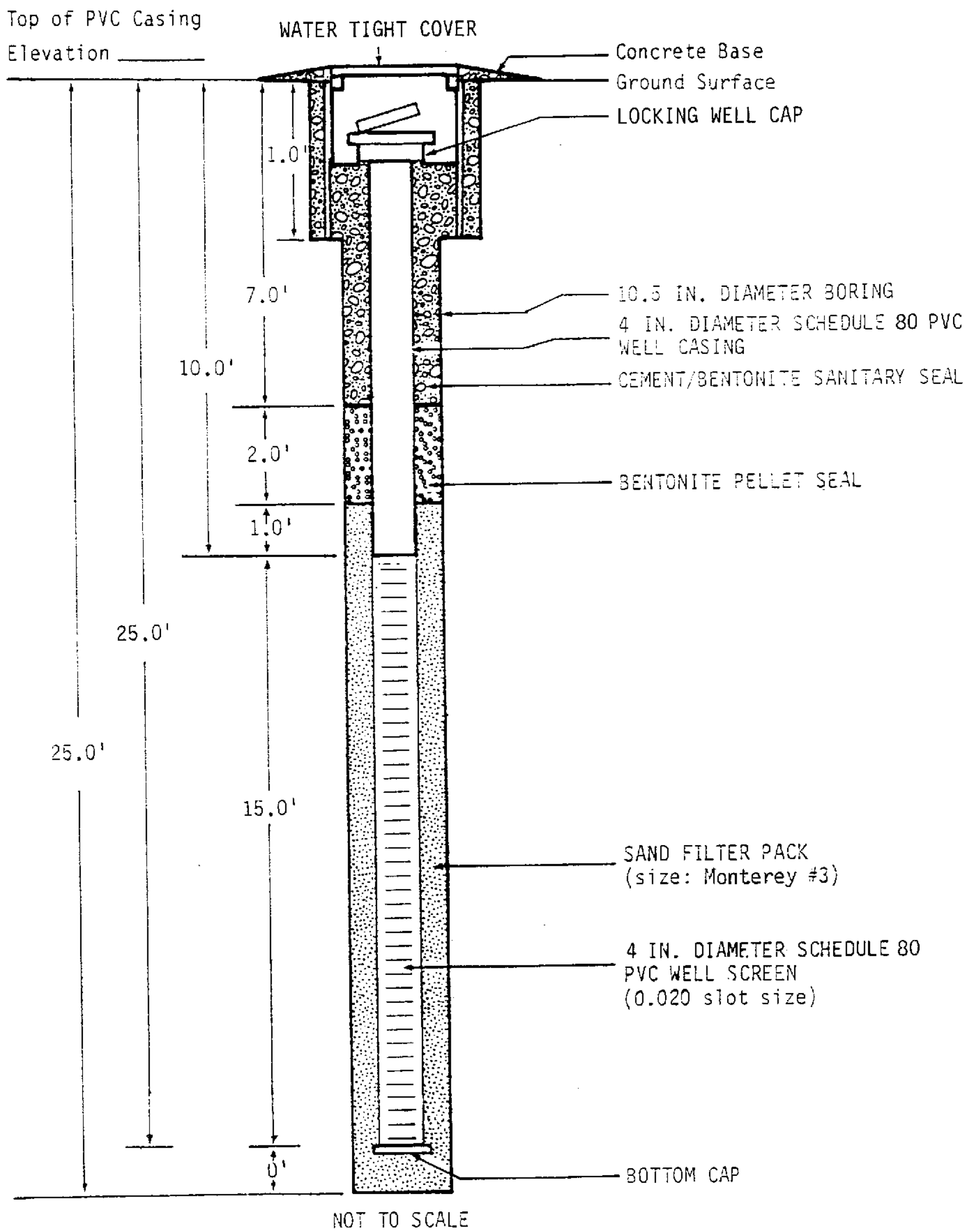
Leonard K. George
Mechanical Engineer - M25998

Harding Lawson Associates
Engineering and
Environmental Services

Ground-Water Collection System
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
YC	2251,111.03	mal	9/89	

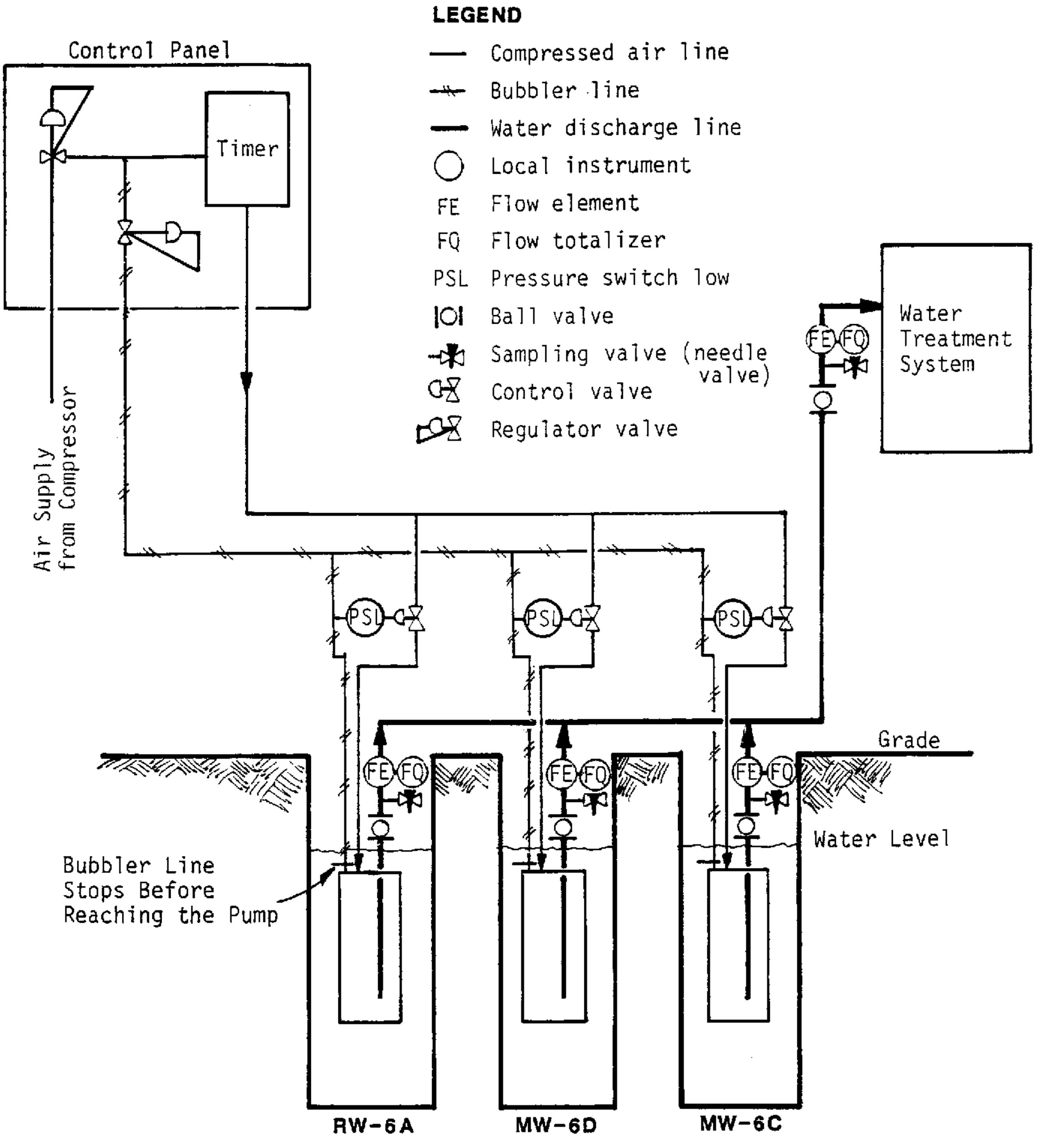


Harding Lawson Associates
Engineers and Geoscientists

Proposed Well Construction Detail
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,111.03		9/89		



Leonard K. George
Mechanical Engineer - M25998

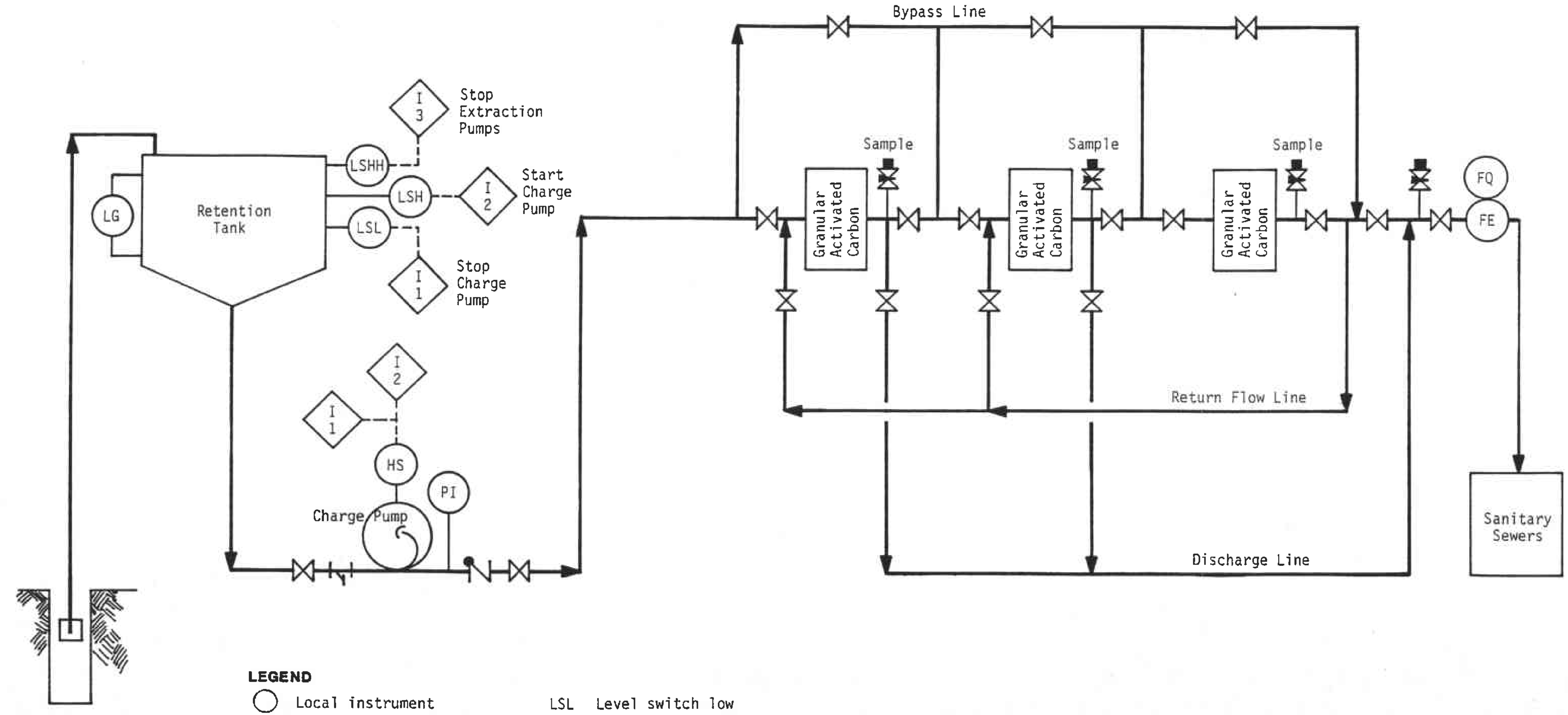
Harding Lawson Associates
Engineering and
Environmental Services

Conceptual Ground-Water Extraction System

Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
YC	2251,111.03		9/89	



LEGEND

○	Local instrument
FE	Flow element
FQ	Flow totalizer
HS	Hand switch (start/stop)
LSH	Level switch high
LSHH	Level switch high high
LSL	Level switch low
PI	Pressure indicator
◇ I	Logic interlock
⋈	Gate valve
N	Check valve
⧓	Sampling valve (needle valve)
⊣	Strainer

Leonard K. George
Mechanical Engineer - M25998

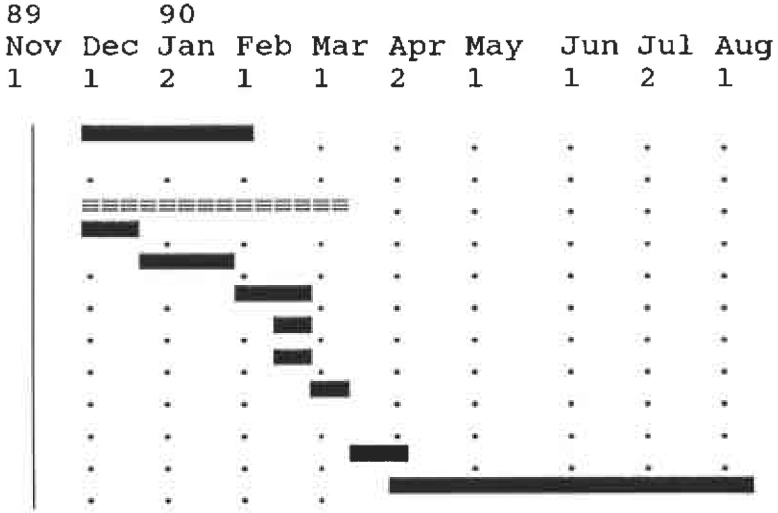
Harding Lawson Associates
Engineering and
Environmental Services

Conceptual Ground-Water Treatment System
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
YC	2251,111.03		10/89	

Task Name	Resources
EBMVP Permit Applictn	HLA
Engineering/Construction	HLA
Design Specs	HLA
Contract	HLA
Prefabricate	HLA/SUBCON
Install Fndtn.	HLA/SUBCON
Install Trench	HLA/SUBCON
Install Treat. Plant	HLA/SUBCON
Monitor System	HLA
Online	HLA



▬ Detail Task　　===== Summary Task　　▲ Milestone

..▬ (Started)　　==≡≡≡ (Started)　　►►► Conflict

▬— (Slack)　　≡≡≡— (Slack)　　..▬ Resource delay

Scale: 1 week per character

Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
YC

JOB NUMBER
2251,111.03

APPROVED

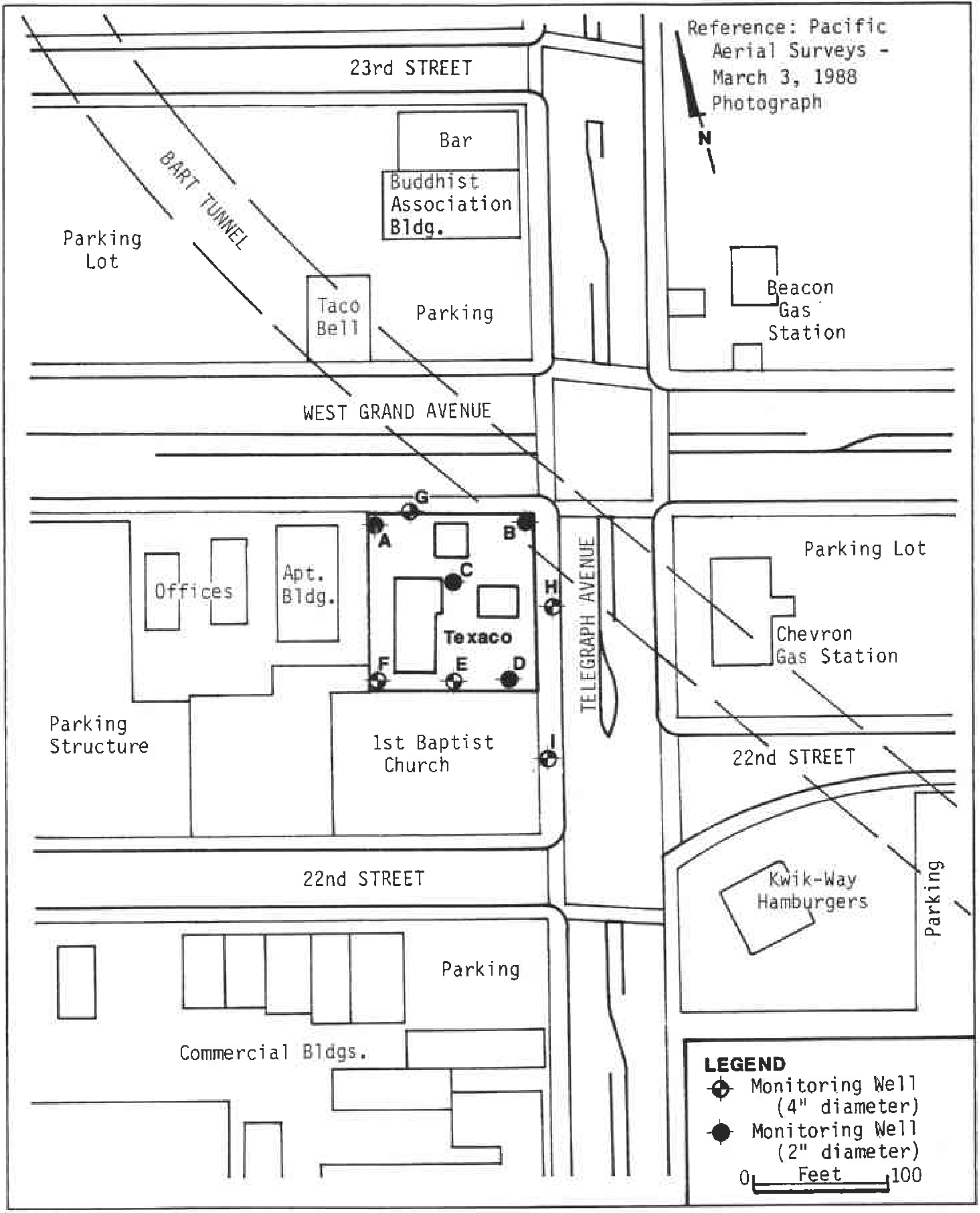
DATE
11/89

REVISED DATE

Anticipated Remediation Schedule
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
7

105649



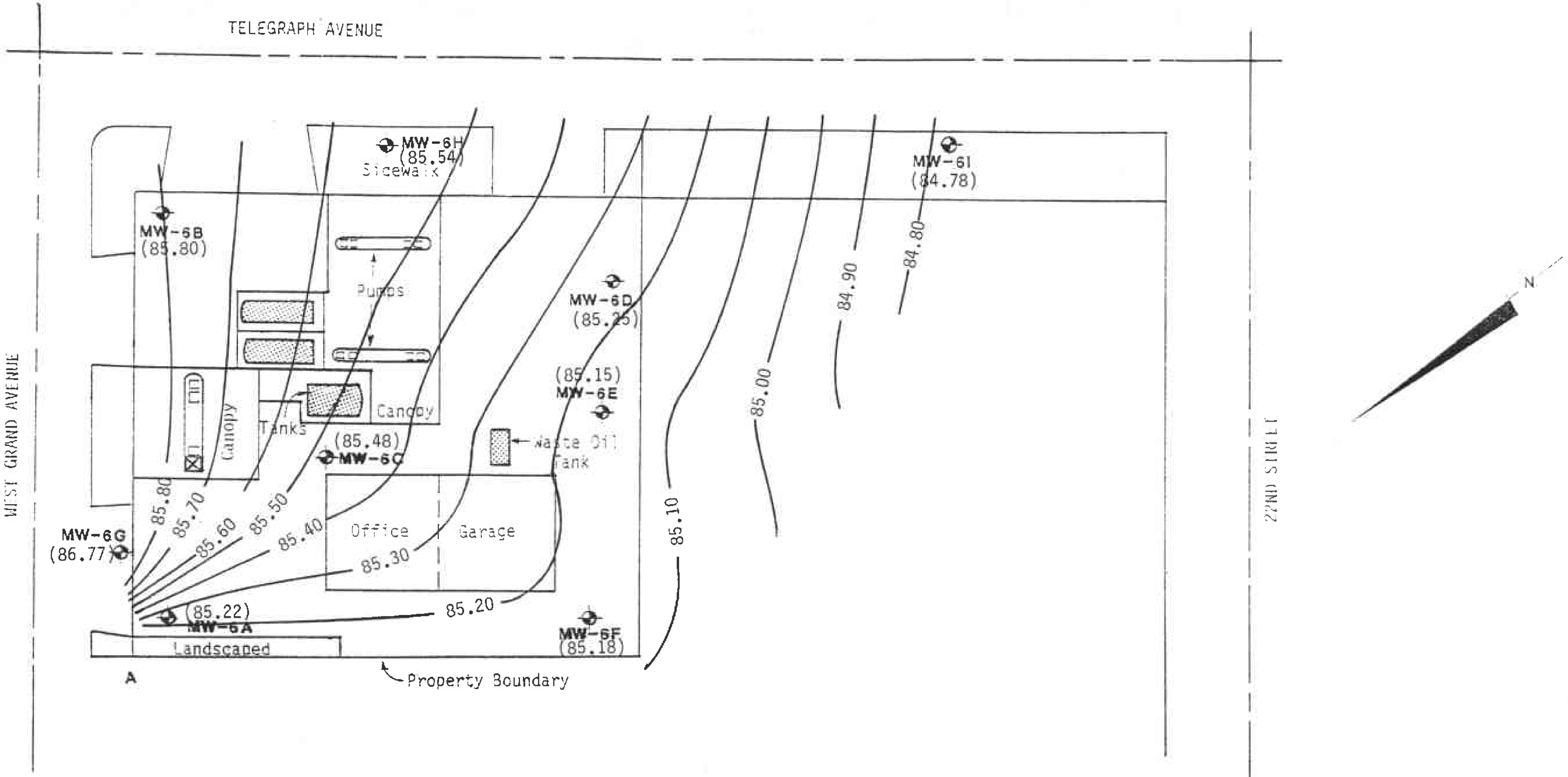
Harding Lawson Associates
Engineers and Geoscientists

Vicinity Plan

Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
8

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,111.03		12/88		



LEGEND

MW-6J (85.69) ⊕ Monitoring Well Location and Ground-water Surface Elevation on October 4, 1989

☒ Bench Mark (HLA Datum El.= 100 feet)

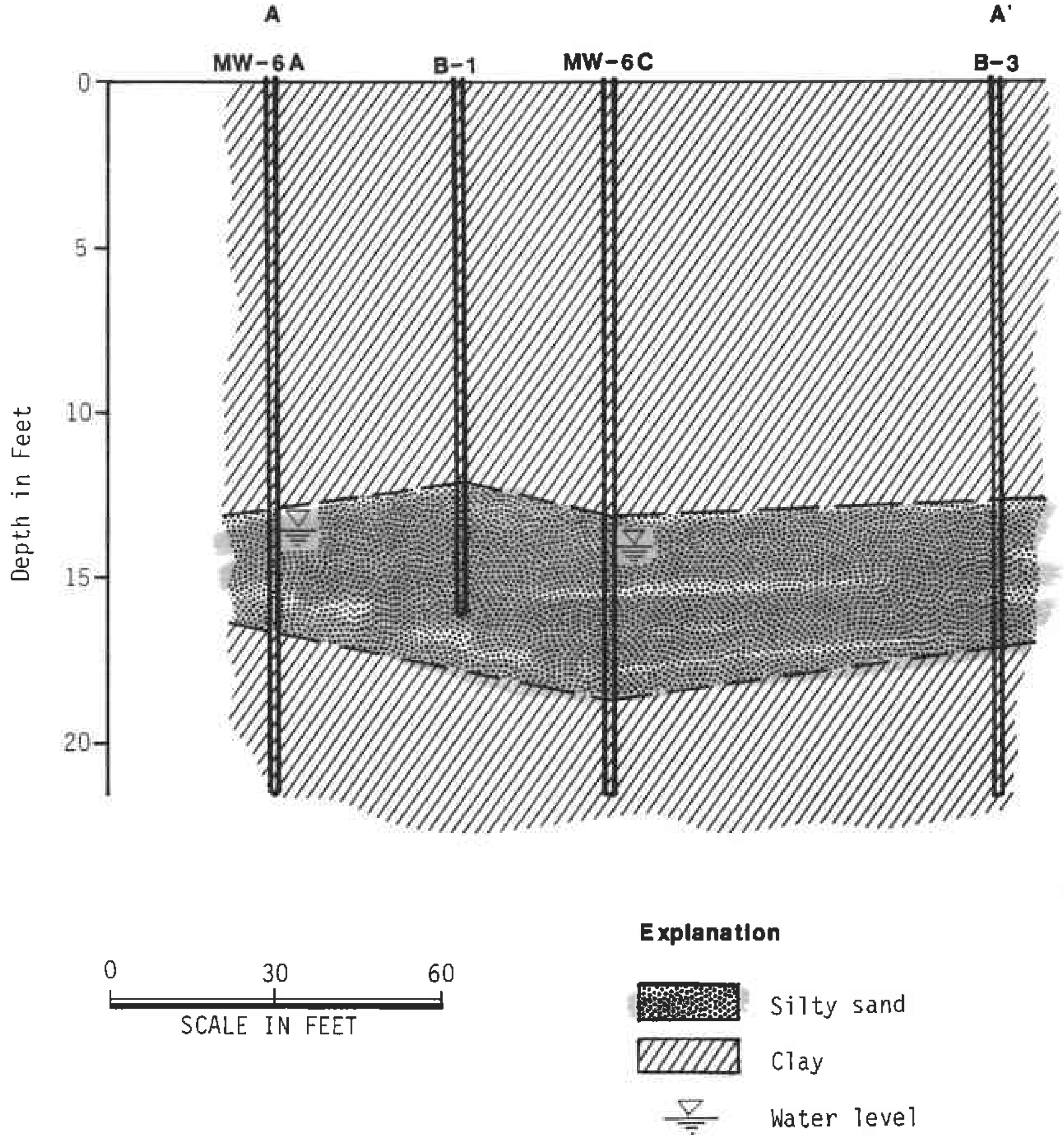
0 30 60
SCALE IN FEET

Harding Lawson Associates
Engineers and Geoscientists

Ground-Water Surface Map
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
KH	2251,111.03		9/89		

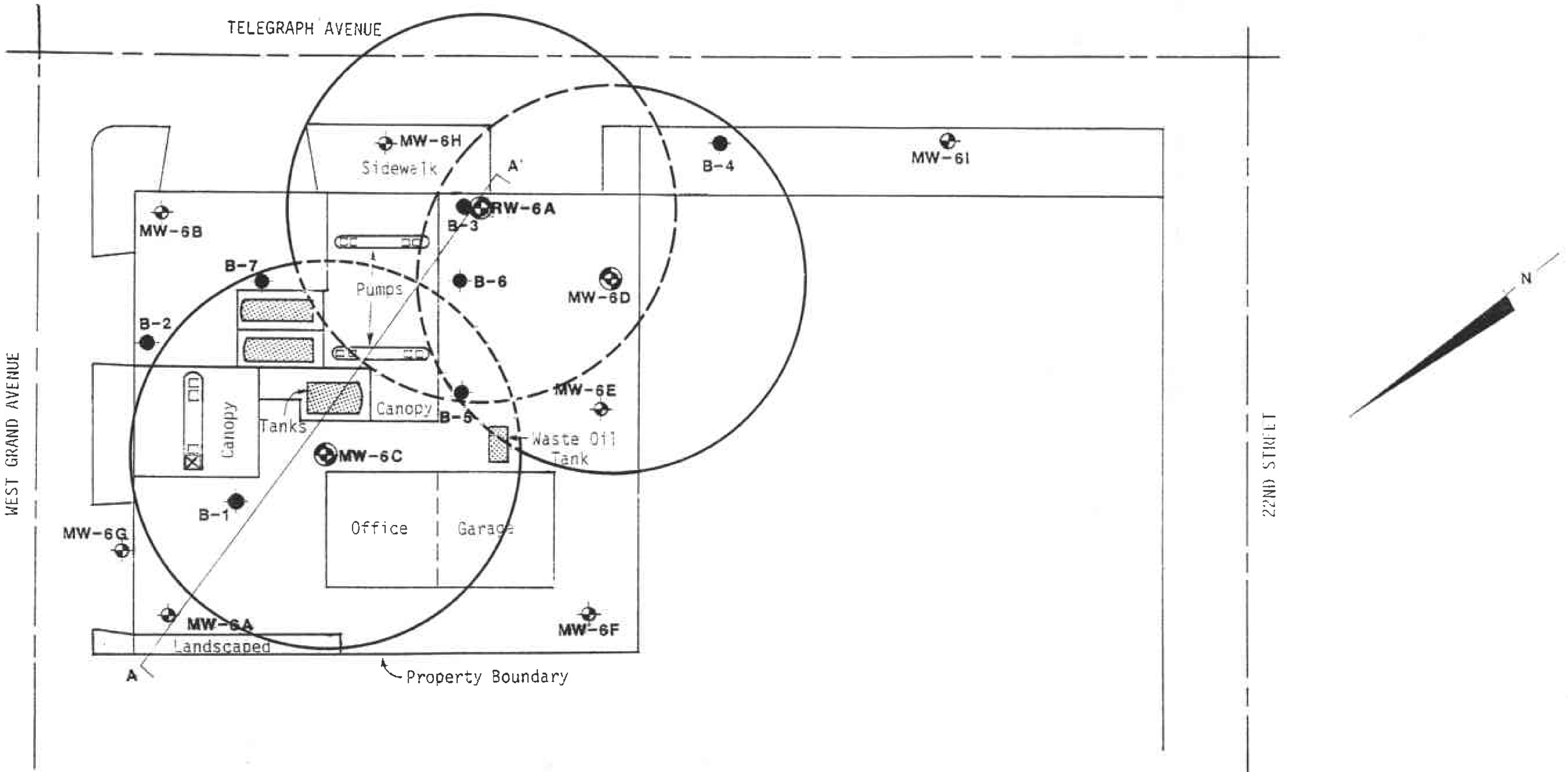


Harding Lawson Associates
Engineering and
Environmental Services

Shallow Subsurface Cross Section A-A'
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
10

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
KH	2251,111.03		9/89	



Explanation

B-1 ● Boring Location

MW-6J ⊕ Monitoring Well Location

☒ Bench Mark (HLA Datum El.= 100 feet)

⊗ Recovery Well Location

0 30 60
SCALE IN FEET

Harding Lawson Associates
Engineers and Geoscientists

Capture Zone
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE
11

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
KH	2251.111.03		9/89		

109463

APPENDIX A

DOHS REVISED ACTION LIST FOR CHEMICAL CONTAMINANTS OF DRINKING WATER

HARDING ASSOC.

APR 24 1989

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY
GEORGE DEUKMEJIAN, *Governor*

DEPARTMENT OF HEALTH SERVICES
2151 BERKELEY WAY
BERKELEY, CALIFORNIA 94704

April 19, 1989

TO: ALL INTERESTED PARTIES

LIST OF ACTION LEVELS FOR CONTAMINANTS OF DRINKING WATER

For your information and reference, I am forwarding a copy of this Department's most recently revised action level list for chemical contaminants of drinking water. The recently adopted maximum contaminant levels (MCLs) have been deleted. This list also reflects changes in the action levels of some of the contaminants.

A list of the recently adopted MCLs is also enclosed for your reference.

For further information concerning these lists, you may contact me at the technical staff office of the Public Water Supply Branch in Berkeley (415) 540-2172.

Sincerely,

Clarence Young

for David P. Spath, Ph.D., Chief
Chemical Standards and
Technology Unit
Public Water Supply Branch

Enclosures

State of California
Department of Health Services

Drinking Water Action Levels Recommended by the Department of Health Services

April 1989

Chemical	Action Level parts per billion (ppb)
Pesticides	
Chlorinated Hydrocarbon	
Aldrin	Limit of Quantification (0.05)
a-Benzene Hexachloride (a-BHC)	0.7
b-Benzene Hexachloride (b-BHC)	0.3
Chlordane	0.1
Dieldrin	Limit of Quantification (0.05)
Heptachlor	0.01
Heptachlor Epoxide	0.01
Pentachlorophenol	30.0
Organophosphate	
Dimethoate	140.0
Diazinon	14.0
Ethion	35.0
Malathion	160.0
Methyl Parathion	30.0
Parathion	30.0
Trithion	7.0
Carbamate	
Aldicarb	10.0
Baygon	90.0
Carbaryl	60.0
Phthalamide	
Captan	350.0
Amides	
Diphenamide	40.0
Fumigants	
Dibromochloropropane	1.0
1,2-Dichloropropane	5.0
Chloropicrin	50.0 (37.0)*
Miscellaneous	
Terrachlor (Pentachloronitrobenzene)	0.9

*Taste & Odor Threshold

Herbicides		
CIPC (isopropyl N (3-chlorophenyl) carbamate)	350.0	
Glyphosate	700.0	
Alachlor	Limit of Quantification (0.2)	
Purgeable Halocarbons		
Methylene Chloride	40.0	
Tetrachloroethylene	5.0	
1,1-Dichloroethane	5.0	
Trichlorofluoromethane (Freon 11)	150.0	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	1,200.0	
Cis-1,2-Dichloroethylene	6.0	
Trans-1,2-Dichloroethylene	10.0	
Purgeable Aromatics		
1,2-Dichlorobenzene	130.0	(10)*
1,3-Dichlorobenzene	130.0	(20)*

(Action Level for 1,2-Dichlorobenzene and 1,3-Dichlorobenzene is either for a single isomer or for the sum of the 2 isomers)

Toluene	100.0

(Action Level for Xylene is either for a single isomer or the sum of the 3 isomers)

Phenols	
2,4-dimethylphenol	(400.0)*
Phenol	(1.0)* (For Chlorinated Systems)
Aldehydes	
Formaldehyde	30.0

*Taste & Odor Threshold

Department of Health Services
Recently Adopted Maximum Contaminant Levels For Contaminants In Drinking Water

April 1989

California Code of Regulations
Title 22

Constituent	Maximum Contaminant Level
Inorganic (Section 64435)	mg/l
Aluminum	1.
Radioactivity (Section 64441)	pCi/l
Uranium	20
Organic (Section 64444.5)	mg/l
Atrazine	0.003
Bentazon	0.018
Benzene	0.001
Carbon Tetrachloride	0.0005
1,4-Dichlorobenzene	0.005
1,2-Dichloroethane	0.0005
1,1-Dichloroethylene	0.006
1,3-Dichloropropene	0.0005
Ethylbenzene	0.680
Ethylene Dibromide	0.00002
Molinate	0.02
Monochlorobenzene	0.030
Simazine	0.01
1,1,2,2-Tetrachloroethane	0.001

Thiobencarb	0.07
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.032
Trichloroethylene	0.005
Vinyl Chloride	0.0005
Xylenes	1.750*

---

*MCL is for either single isomer or the sum of the isomers.

APPENDIX B

TANK SYSTEM TIGHTNESS TEST

Data Chart for Tank System Tightness Test

PLEASE PRINT

1. OWNER Property ☒ Tank(s) ☒

TEXACO

Name | Address | Representative | Telephone

Name | Address | Representative | Telephone

2. OPERATOR

TEXACO 2225 TELEGRAPH/GRAND OAKLAND CALIFORNIA

Name | Address | Telephone

3. REASON FOR TEST (Explain Fully)

REQUIRED FOR SALE OF PROPERTY

4. WHO REQUESTED TEST AND WHEN

DON MCCUD

Name | Title | Company or Affiliation | Date

Address | Telephone

5. TANK INVOLVED

Use additional lines for manifolded tanks

Identify by Direction	Capacity	Brand/Supplier	Grade	Approx. Age	Steel/Fiberglass
#1 EAST	6K		REGULAR		STEEL
#2 CENTER	6K		SUPER UNLD.		"
#3 WEST	10K		UNLEADED		"
#4 NORTH	500 GAL.	WASTE OIL	WATER TEST		FIBERGLASS

6. INSTALLATION DATA

Location	Cover	Fills	Vents	Siphones	Pumps
—	CONCRETE	4" 2 & 3 YES	2"	N/A	REMOTE
North inside driveway, Rear of station, etc.	Concrete, Black Top, Earth, etc.	Size, Titefill make, Drop tubes, Remote Fills N/A	Size, Manifolded NO	Which tanks?	Suction, Remote, Make if known

7. UNDERGROUND WATER

Depth to the Water table ______________

Is the water over the tank? ☐ Yes ☒ No

8. FILL-UP ARRANGEMENTS

Tanks to be filled ______ hr. ______ Date Arranged by ______ Name Telephone

Extra product to "top off" and run tank tester. How and who to provide? Consider NO Lead.

Terminal or other contact for notice or inquiry ______ Company Name Telephone

9. CONTRACTOR, MECHANICS, any other contractor involved

Paradiso Construction Company

10. OTHER INFORMATION OR REMARKS

Additional information on any items above. Officials or others to be advised when testing is in progress or completed. Visitors or observers present during test, etc.

11. TEST RESULTS

Tests were made on the above tank systems in accordance with test procedures prescribed for as detailed on attached test charts with results as follows:

Tank Identification	Tight	Leakage Indicated	Date Tested
#1 EAST	YES	+.006 GPH	6-30-88
#2 CENTER	YES	+.031 GPH	6-30-88
#3 WEST	YES	+.023 GPH	6-30-88
#4 NORTH	YES	-.024 GPH	6-30-88

12. SENSOR CERTIFICATION

Date

Serial No. of Thermal Sensor

13. This is to certify that these tank systems were tested on the date(s) shown. Those indicated as "Tight" meet the criteria established by the National Fire Protection Association Pamphlet 329.

Technicians

1. PHILIP F. DELGADILLO

Certification # 122510940

2. N/A

Certification # N/A.

Paradiso Construction Co. Philip F. Delgadillo

Testing Contractor or Company. By: Signature

9220 G Street, Oakland, CA 94603

Address

PN6827

14. TEXACO 2225 TELEGRAPH/GRAND OAKLAND CALIFORNIA 6-30-88
Name of Supplier, Owner or Dealer | Address No. and Street(s) | City | State | Date of Test

15. TANK TO TEST

#1 EAST
Identity by position

REGULAR
Brand and Grade

15a. BRIEF DIAGRAM OF TANK FIELD

16. CAPACITY

Nominal Capacity 6,000 Gallons

By most accurate capacity chart available 6048 Gallons

From
☐ Station Chart
☐ Tank Manufacturer's Chart
☐ Company Engineering Data
☒ Charts supplied with PTT
☐ Other

17. FILL-UP FOR TEST

Stick Water Bottom before Fill-up 0 in. (to ⅛") 0 Gallons 96" Tank Diameter in.

		Gallons	Total Gallons ea. Reading
Inventory	96"		6048
	TOPOFF		+10
	WATER		-0
			6058

Transfer total to line 25a

18. SPECIAL CONDITIONS AND PROCEDURES TO TEST THIS TANK

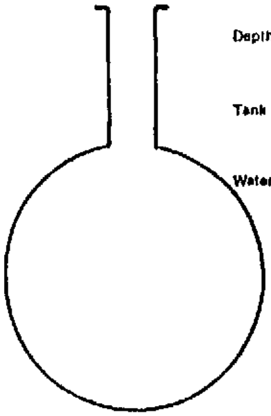
☐ Water in tank ☒ Line(s) being tested with LVLLT
☐ High water table in tank excavation

See manual sections applicable. Check below and record procedure in log (27).

Use maximum allowable test pressure for all tests.
Four pound rule does not apply to doublewalled tanks.

Complete section below:

1. Is four pound rule required? Yes ☒ No ☐
2. Height to 12" mark from bottom of tank ______ in.
3. Pressure at bottom of tank 5 P.S.I.
4. Pressure at top of tank 4 P.S.I.



Depth of burial 136 in.
Tank dia. 96 in.
Water table 0 in.

NOTES:

The above calculations are to be used for dry soil conditions to establish a positive pressure advantage, or when using the four pound rule to compensate for the presence of subsurface water in the tank area.

Refer to N.F.P.A. 30, Sections 2-3.2.4 and 2-7.2 and the tank manufacturer regarding allowable system test pressures.

19. TANK MEASUREMENTS FOR TSTT ASSEMBLY

Bottom of tank to grade* 136 in.
Add 30" for "T" probe assy. 30 in.
Total tubing to assemble — approximate 166 in.

20. EXTENSION HOSE SETTING

Tank top to grade* 40 in.
Extend hose on suction tube 6" or more below tank top 10 in.

*If Fill pipe extends above grade, use top of fill

21. VAPOR RECOVERY SYSTEM ☐ Stage I ☐ Stage II

22. Thermal-Sensor reading after circulation 15393 digits
69/70 °F Between

23. Digits per °F in range of expected change 326 digits

24b. COEFFICIENT OF EXPANSION RECIPROCAL METHOD

Type of Product GASOLINE
Hydrometer Employed ATSM5
Temperature in Tank After Circulation 69.8 °F
Temperature of Sample 72.0 °F
Difference (+/-) +2.2 °F (+2.
Observed A.P.I. Gravity 62.0
Reciprocal 1443 Page # 66

6058 ÷ 1443 = 4.1981981
Total quantity in full tank (16 or 17) | Reciprocal | Volume change in this tank per °F
Transfer to Line 26a.

COEFFICIENT OF EXPANSION (Complete after circulation)

24a. Corrected A.P.I. Gravity

Observed A.P.I. Gravity ______
Hydrometer employed ______ H
Observed Sample Temperature ______ °F
Corrected A.P.I. Gravity @ 60°F, From Table A ______
Coefficient of Expansion for Involved Product From Table B ______

Transfer COE to Line 25b.

24c. FOR TESTING WITH WATER see Table C & D

Water Temperature after Circulation Table C ______ °F
Coefficient of Water Table D ______

Added Surfactant? ☐ Yes ☐ No Transfer COE to Line 25b.

25. (a) ______ × (b) ______ = (c) ______ gallons
Total quantity in full tank (16 or 17) | Coefficient of expansion for involved product | Volume change in this tank per °F

26. (a) 4.1981981 ÷ 326 = .0128779 (.0128)

#1 EAST REGULAR

0730	Top off load being delivered on site at arrival										
0830	Pump Primed & Running									FACTOR	"Δ"	(.0129)
								15				
0900	1st Sensor Reading	1		42				593				
0915	Start high level test	2	42.8	42	.245	.300	+.055	608	+15	+.194	-.139	
0930	Con't high level test	3	43.2	42	.300	.380	+.080	636	+28	+.361	-.281	
0945	" "	4	44.0	42	.380	.520	+.140	646	+10	+.129	+.011	
1000	" "	5	44.2	42	.520	.670	+.150	666	+20	+.258	-.108	
1015	" "	6	44.3	42	.670	.825	+.155	675	+9	+.116	+.039	
1030	" "	7	44.2	42	.825	.975	+.150	690	+15	+.194	-.044	
1045	" "	8	44.3	42	.190	.345	+.155	703	+13	+.168	-.013	
1100	" "	9	44.4	42	.345	.505	+.160	718	+15	+.194	-.034	
	Drop to low level											
1115	1st low level Reading	10		12				731				
1130	Start low level test	11	15.3	12	.260	.465	+.205	746	+15	+.194	+.011	+.011
1145	Con't low level test	12	15.3	12	.465	.710	+.245	767	+21	+.271	-.026	-.015
1200	" "	13	15.1	12	.710	.910	+.200	780	+13	+.168	+.032	+.017
1215	" "	14	15.0	12	.380	.575	+.195	796	+16	+.206	-.011	+.006

P-T Tank Test Data Chart
Additional Info

1. Net Volume Change at Conclusion of Precision Test +.006 gph

Signature of Tester: Philip J. Delgadillo

Date: 6-30-88

Statement:

☒ Tank and product handling system has been tested tight according to the Precision Test Criteria as established by N.F.P.A. publication 329. This is not intended to indicate permission of a leak.

OR

☐ Tank and product handling system has failed the tank tightness test according to the Precision Test Criteria as established by N.F.P.A. publication 329.

It is the responsibility of the owner and/or operator of this system to immediately advise state and local authorities of any implied hazard and the possibility of any reportable pollution to the environment as a result of the indicated failure of this system. Heath Consultants Incorporated does not assume any responsibility or liability for any loss of product to the environment.

Tank Owner/Operator ____________

14. TEXACO 2225 TELEGRAPH/GRAND OAKLAND CALIFORNIA 6-30-88

Name of Supplier, Owner or Dealer / Address No. and Street(s) / City / State / Date of Test

15. TANK TO TEST

#2 CENTER
Identity by position

SUPER UNLEADED
Brand and Grade

15a. BRIEF DIAGRAM OF TANK FIELD

16. CAPACITY

Nominal Capacity 6000 Gallons

By most accurate capacity chart available 6048 Gallons

From
☐ Station Chart
☐ Tank Manufacturer's Chart
☐ Company Engineering Data
☒ Charts supplied with PTT
☐ Other

17. FILL-UP FOR TEST

Stick Water Bottom before Fill-up 0 in. to ⅛" 0 Gallons 96" in. Tank Diameter

	Gallons	Total Gallons ea. Reading
Inventory 96"		6048
TOP OFF		+10
WATER		-0
		6058

Transfer total to line 25a

18. SPECIAL CONDITIONS AND PROCEDURES TO TEST THIS TANK

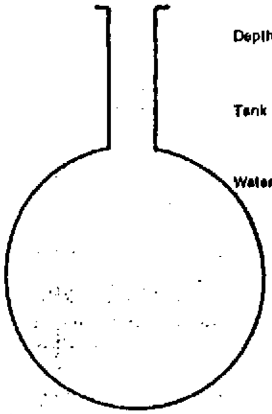
☐ Water in tank ☒ Line(s) being tested with LVLLT
☐ High water table in tank excavation

See manual sections applicable. Check below and record procedure in log (27).

Use maximum allowable test pressure for all tests.
Four pound rule does not apply to doublewalled tanks.

Complete section below:

1. Is four pound rule required? Yes ☒ No ☐
2. Height to 12" mark from bottom of tank 159 in.
3. Pressure at bottom of tank 5 P.S.I.
4. Pressure at top of tank 4 P.S.I.



Depth of burial 139 in.
Tank dia. 96 in.
Water table 0 in.

NOTES:

The above calculations are to be used for dry soil conditions to establish a positive pressure advantage, or when using the four pound rule to compensate for the presence of subsurface water in the tank area.

Refer to N.F.P.A. 30, Sections 2-3.2.4 and 2-7.2 and the tank manufacturer regarding allowable system test pressures.

19. TANK MEASUREMENTS FOR TSTT ASSEMBLY

Bottom of tank to grade* 139 in.
Add 30" for "T" probe assy. 30 in.
Total tubing to assemble — approximate 169 in.

20. EXTENSION HOSE SETTING

Tank top to grade* 43 in.
Extend hose on suction tube 6" or more below tank top 10 in.

*If Fill pipe extends above grade, use top of fill.

22. Thermal-Sensor reading after circulation 15452 digits
69/70 °F Between

23. Digits per °F in range of expected change 326 digits

COEFFICIENT OF EXPANSION (Complete after circulation)

24a. Corrected A.P.I. Gravity

Observed A.P.I. Gravity
Hydrometer employed H
Observed Sample Temperature °F
Corrected A.P.I. Gravity @ 60°F, From Table A
Coefficient of Expansion for Involved Product From Table B
Transfer COE to Line 25b.

21. VAPOR RECOVERY SYSTEM ☐ Stage I ☐ Stage II

24b. COEFFICIENT OF EXPANSION RECIPROCAL METHOD

Type of Product GASOLINE
Hydrometer Employed ATSM6 H
Temperature in Tank After Circulation 69.2 °F
Temperature of Sample 72.0 °F
Difference (+/-) +2.8 °F (+3.(
Observed A.P.I. Gravity 56.9
Reciprocal 1504 Page # 60

6058 , 1504 . 4.0279255
Total quantity in full tank (16 or 17) / Reciprocal / Volume change in this tank per °F
Transfer to Line 26a.

24c. FOR TESTING WITH WATER see Table C & D

Water Temperature after Circulation Table C °F
Coefficient of Water Table D
Added Surfactant? ☐ Yes ☐ No Transfer COE to Line 25b.

25. (a) ____ × (b) ____ = (c) ____ gallons
Total quantity in full tank (16 or 17) / Coefficient of expansion for involved product / Volume change in this tank per °F

26. (a) 4.0279255 , 326 = .0123555 This is (.0124)

#2 CENTER SUPER UNLEADED

0840	Pump Primed & Running									FACTOR	"A"	(.0124)
								15				
0910	1st Sensor Reading	1		42				452				
0925	Start high level test	2	44.0	42	.170	.315	+.115	459	+7	+.087	+.058	
0940	Cont. high level test	3	44.4	42	.315	.490	+.175	472	+13	+.161	+.014	
0955	" "	4	44.5	42	.490	.655	+.165	476	+4	+.050	+.115	
1010	" "	5	44.6	42	.655	.830	+.175	486	+10	+.124	+.051	
1025	" "	6	44.5	42	.450	.620	+.170	495	+9	+.112	+.058	
1040	" "	7	44.6	42	.620	.795	+.175	501	+6	+.074	+.101	
1055	" "	8	44.5	42	.200	.370	+.170	512	+11	+.136	+.034	
1110	" "	9	44.7	42	.370	.550	+.180	524	+12	+.149	+.031	
	Drop to low level											
1125	1st low level Reading	10		12				539				
1140	Start low level test	11	15.8	12	.265	.525	+.260	558	+19	+.236	+.024	+.024
1155	Cont. low level test	12	15.1	12	.525	.720	+.195	573	+15	+.186	+.009	+.033
1210	" "	13	14.9	12	.720	.908	+.180	590	+17	+.211	-.031	+.002
1225	" "	14	15.0	12	.305	.495	+.190	603	+13	+.161	+.029	+.031

P-T Tank Test Data Chart
Additional Info

1. Net Volume Change at Conclusion of Precision Test +.031 gph

Signature of Tester: Philip H. Delgado

Date: 6-30-88

2. Statement:

☒ Tank and product handling system has been tested tight according to the Precision Test Criteria as established by N.F.P.A. publication 329. This is not intended to indicate permission of a leak.

OR

☐ Tank and product handling system has failed the tank tightness test according to the Precision Test Criteria as established by N.F.P.A. publication 329.

It is the responsibility of the owner and/or operator of this system to immediately advise state and local authorities of any implied hazard and the possibility of any reportable pollution to the environment as a result of the indicated failure of this system. Heath Consultants Incorporated does not assume any responsibility or liability for any loss of product to the environment.

Tank Owner/Operator ____________________

14. TEXACO 2225 TELEGRAPH/GRAND OAKLAND CALIFORNIA 6-30-8
Name of Supplier, Owner or Dealer | Address No. and Street(s) | City | State | Date of Test

15. TANK TO TEST

#3 WEST
Identity by position

UNLEADED
Brand and Grade

15a. BRIEF DIAGRAM OF TANK FIELD

16. CAPACITY

Nominal Capacity 10,000 Gallons

By most accurate capacity chart available 10184 Gallons

From
☐ Station Chart
☐ Tank Manufacturer's Chart
☐ Company Engineering Data
☒ Charts supplied with PTT
☐ Other

17. FILL-UP FOR TEST

Stick Water Bottom before Fill-up 0 in. to ⅛" | 0 Gallons | 96" in. Tank Diameter

		Gallons	Total Gallons ea. Reading
Inventory	96"		10184
	TOP OFF		+10
	WATER		-0
			10194

Transfer total to line 25a

18. SPECIAL CONDITIONS AND PROCEDURES TO TEST THIS TANK

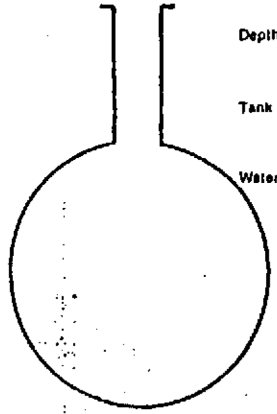
☐ Water in tank ☒ Line(s) being tested with LVLLT
☐ High water table in tank excavation

See manual sections applicable. Check below and record procedure in log (27).

Use maximum allowable test pressure for all tests.
Four pound rule does not apply to doublewalled tanks.

Complete section below:

1. Is four pound rule required? Yes ☒ No ☐
2. Height to 12" mark from bottom of tank 167 in.
3. Pressure at bottom of tank 5 P.S.I.
4. Pressure at top of tank 4 P.S.I.



Depth of burial 147 in.
Tank dia. 96 in.
Water table 0 in.

NOTES:

The above calculations are to be used for dry soil conditions to establish a positive pressure advantage, or when using the four pound rule to compensate for the presence of subsurface water in the tank area.

Refer to N.F.P.A. 30, Sections 2-3.2.4 and 2-7.2 and the tank manufacturer regarding allowable system test pressures.

19. TANK MEASUREMENTS FOR TSTT ASSEMBLY

Bottom of tank to grade* 147 in.
Add 30" for "T" probe assy. 30 in.
Total tubing to assemble — approximate 177 in.

20. EXTENSION HOSE SETTING

Tank top to grade* 51 in.
Extend hose on suction tube 6" or more below tank top 10 in.

*If Fill pipe extends above grade, use top of fill.

21. VAPOR RECOVERY SYSTEM

☐ Stage I ☐ Stage II

22. Thermal-Sensor reading after circulation 15050 digits
68/69 °F Between

23. Digits per °F in range of expected change 326 digits

COEFFICIENT OF EXPANSION (Complete after circulation)

24a. Corrected A.P.I. Gravity

Observed A.P.I. Gravity
Hydrometer employed H
Observed Sample Temperature °F
Corrected A.P.I. Gravity @ 60°F, From Table A
Coefficient of Expansion for Involved Product From Table B
Transfer COE to Line 25b.

24b. COEFFICIENT OF EXPANSION RECIPROCAL METHOD

Type of Product GASOLINE
Hydrometer Employed ATSM H
Temperature in Tank After Circulation 68.0 °F
Temperature of Sample 78.0 °F
Difference (+/-) +10.0 °F
Observed A.P.I. Gravity 57.9
Reciprocal 1503 Page # 61

10194 ÷ 1503 = 6.7824351
Total quantity in full tank (16 or 17) | Reciprocal | Volume change in this tank per °F

Transfer to Line 26a.

24c. FOR TESTING WITH WATER see Table C & D

Water Temperature after Circulation Table C °F
Coefficient of Water Table D
Added Surfactant? ☐ Yes ☐ No Transfer COE to Line 25b.

25. (a) ______ × (b) ______ = (c) ______ gallons
Total quantity in full tank (16 or 17) | Coefficient of expansion for involved product | Volume change in this tank per °F

26. (a) 6.7824351 326 .020805 (.02[illegible])

#3 WEST UNLEADED

1300	Pump Primed & Running									FACTOR	"A"	.0208
								15				
1400	1st Sensor Reading	1		42				050				
1415	Start high level test	2	42.8	42	,385	,440	+,055	053	+3	+,062	-,007	
1430	Con't high level test	3	42.8	42	,440	,490	+,050	056	+3	+,062	-,012	
1445	" "	4	42.8	42	,490	,545	+,055	056	+0	+,000	-,055	
1500	" "	5	43.1	42	,545	,630	+,085	058	+2	+,042	+,043	
1515	" "	6	43.0	42	,630	,705	+,075	061	+3	+,062	+,013	
1530	" "	7	43,0	42	,705	,775	+,070	065	+4	+,083	-,013	
1545	" "	8	43,1	42	,775	,855	+,080	068	+3	+,062	+,018	
1600	" "	9	43.1	42	,855	.910	+,085	072	+4	+,083	+,002	
	Drop to low level											
1615	1st low level Reading	10		12				075				
1630	Start low level test	11	13.4	12	,260	,360	+,100	080	+5	+,104	-,004	-,004
1645	Con't low level test	12	13.2	12	,360	,450	+,090	084	+4	+,083	+,001	+,003
1700	" "	13	13,1	12	,450	,535	+,085	088	+4	+,083	+,002	+,005
1715	" "	14	13.1	12	,535	,615	+,080	091	+3	+,062	+,018	+,023

P-T Tank Test Data Chart
Additional Info

1. Net Volume Change at Conclusion of Precision Test +,023 gph

Signature of Tester

Date: 6-30-88

☒ Statement:
Tank and product handling system has been tested tight according to the Precision Test Criteria as established by N.F.P.A. publication 329. This is not intended to indicate permission of a leak.

OR

☐ Tank and product handling system has failed the tank tightness test according to the Precision Test Criteria as established by N.F.P.A. publication 329.

It is the responsibility of the owner and/or operator of this system to immediately advise state and local authorities of any implied hazard and the possibility of any reportable pollution to the environment as a result of the indicated failure of this system. Health Consultants Incorporated does not assume any responsibility or liability for any loss of product to the environment.

Tank Owner/Operator ____________________

14. TEXACO 2225 TELEGRAPH/GRAND OAKLAND CALIFORNIA 6-30-88

Name of Supplier, Owner or Dealer — Address No. and Street(s) — City — State — Date of Test

15. TANK TO TEST

#4 NORTH

Identity by position

WASTE OIL/WATER TEST

Brand and Grade

15a. BRIEF DIAGRAM OF TANK FIELD

16. CAPACITY

Nominal Capacity 550 Gallons

By most accurate capacity chart available 550 Gallons

From

☐ Station Chart

☐ Tank Manufacturer's Chart

☐ Company Engineering Data

☒ Charts supplied with PTT

☐ Other

17. FILL-UP FOR TEST

Stick Water Bottom before Fill-up — in. to ¼" — Gallons 48 in. Tank Diameter

	Gallons	Total Gallons ea. Reading
Inventory 48"		550
TOP OFF		10
		560

Transfer total to line 25a

18. SPECIAL CONDITIONS AND PROCEDURES TO TEST THIS TANK

☐ Water in tank ☐ Line(s) being tested with LVLLT

☐ High water table in tank excavation

See manual sections applicable. Check below and record procedure in log (27).

Use maximum allowable test pressure for all tests.
Four pound rule does not apply to doublewalled tanks.

Complete section below:

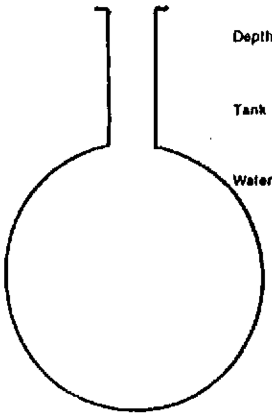
1. Is four pound rule required? Yes ☐ No ☒

DOUBLE WALLED TANK

2. Height to 12" mark from bottom of tank 114 in.

3. Pressure at bottom of tank 5 P.S.I.

4. Pressure at top of tank 4 P.S.I.



Depth of burial 94 in.

Tank dia. 48 in.

Water table 0 in.

NOTES:

The above calculations are to be used for dry soil conditions to establish a positive pressure advantage, or when using the four pound rule to compensate for the presence of subsurface water in the tank area.

Refer to N.F.P.A. 30, Sections 2-3.2.4 and 2-7.2 and the tank manufacturer regarding allowable system test pressures.

19. TANK MEASUREMENTS FOR TSTT ASSEMBLY

Bottom of tank to grade* 94 in.

Add 30" for "T" probe assy. 30 in.

Total tubing to assemble — approximate 124 in.

20. EXTENSION HOSE SETTING

Tank top to grade* 46 in.

Extend hose on suction tube 6" or more below tank top 10 in.

*If Fill pipe extends above grade, use top of fill.

22. Thermal-Sensor reading after circulation 15576 digits 69/70 °F Between

23. Digits per °F in range of expected change 326 digits

COEFFICIENT OF EXPANSION (Complete after circulation)

24a. Corrected A.P.I. Gravity

Observed A.P.I. Gravity

Hydrometer employed H

Observed Sample Temperature °F

Corrected A.P.I. Gravity @ 60°F, From Table A

Coefficient of Expansion for Involved Product From Table B

Transfer COE to Line 25b.

21. VAPOR RECOVERY SYSTEM ☐ Stage I ☐ Stage II

24b. COEFFICIENT OF EXPANSION RECIPROCAL METHOD

Type of Product

Hydrometer Employed H

Temperature in Tank After Circulation °F

Temperature of Sample °F

Difference (+/-) °F

Observed A.P.I. Gravity

Reciprocal Page #

Total quantity in full tank (16 or 17) ÷ Reciprocal = Volume change in this tank per °F

Transfer to Line 26a.

24c. FOR TESTING WITH WATER see Table C & D

Water Temperature after Circulation Table C 69.6 °F

Coefficient of Water Table D .00012006

Added Surfactant? ☐ Yes ☐ No Transfer COE to Line 25b.

25. (a) 560 Total quantity in full tank (16 or 17) × (b) .00012006 Coefficient of expansion for involved product = (c) .0672336 gallons Volume change in this tank per °F

26. (a) .0672336 326 = .0002062 (.0002)

#4 NORTH WASTE OIL

1305	Pump Primed & Running									FACTOR	"A"	(.0002)
								15				
1315	1st Sensor Reading	1		42				576				
1330	Start high level test	2	42.1	42	.260	.270	+.010	610	+34	+.007	+.003	
1345	Cont high level test	3	42.0	42	.270	.270	+.000	644	+34	+.007	-.007	
1400	" "	4	42.0	42	.270	.270	+.000	682	+38	+.008	-.008	
1415	" "	5	42.0	42	.270	.270	+.000	714	+32	+.006	-.006	
	Drop to low level											
1430	1st low level Reading	6		12				732				
1445	Start low level test	7	12.0	12	.320	.320	+.000	776	+44	+.009	-.009	-.009
1500	Cont. low-level test	8	12.1	12	.320	.325	+.005	811	+35	+.007	-.002	-.011
1515	" "	9	12.0	12	.325	.325	+.000	844	+33	+.007	-.007	-.018
1530	" "	10	12.0	12	.325	.325	+.000	875	+31	+.006	-.006	-.024

P-T Tank Test Data Chart
Additional Info

1. Net Volume Change at Conclusion of Precision Test -.024 gph

Signature of Tester: Philip A. Delgadillo

Date: 12-30-88

2. Statement:

☒ Tank and product handling system has been tested tight according to the Precision Test Criteria as established by N.F.P.A. publication 329. This is not intended to indicate permission of a leak.

OR

☐ Tank and product handling system has failed the tank tightness test according to the Precision Test Criteria as established by N.F.P.A. publication 329.

It is the responsibility of the owner and/or operator of this system to immediately advise state and local authorities of any implied hazard and the possibility of any reportable pollution to the environment as a result of the indicated failure of this system. Health Consultants Incorporated does not assume any responsibility or liability for any loss of product to the environment.

Tank Owner/Operator ______________________

DATA CHART
For Use With
petro tite

Year 88 CALIFORNIA State TEXACO Name OWNER
Mo. 6 OAKLAND City
Day 30 2225 TELEGRAPH State LOCATION
DATE OF TEST

1 LOCATION: 2225 TELEGRAPH/GRAND OAKLAND CALIFORNIA
Street No. and/or Corner City State Telephone

2 OWNER: TEXACO
Name Address Representative Position Telephone

3 OPERATOR: TEXACO
Name Dealer, Mgr. or Other Address (If different than Location) Telephone

4 REASON FOR TEST REQUIRED FOR SALE OF PROPERTY

5 TEST REQUESTED BY: DON MAGUD
Name Position Order No. Billing Address

6 SPECIAL INSTRUCTIONS: TEST TANKS & LINES.

7 CONTRACTOR OR COMPANY MAKING TEST MECHANIC(S) NAME PHILIP F. DELGADILLO / PARADISO CONST. Co OAKLAN

8 IS A PET TANK TEST TO BE MADE WITH THIS LINE TEST? ☒ YES ☐ NO

9 MAKE AND TYPE OF PUMP OR DISPENSERS REMOTE

10 WEATHER ______ TEMPERATURE IN TANKS ____ °F ____ °C COVER OVER LINES CONCRETE
Concrete, Black Top, etc
APPROXIMATE BURIAL DEPTH ______

11 IDENTIFY EACH LINE AS TESTED	12 TIME (MILITARY)	13 LOG OF TEST PROCEDURES, AMBIENT TEMPERATURE, WEATHER, ETC.	14 PRESSURE psi OR kPa		15 VOLUME READING			16 TEST RESULTS
			BEFORE	AFTER	BEFORE	AFTER	NET CHANGE	CONCLUSIONS, REPAIRS AND COMMENTS
		INSERT LINE TEST ADAPTERS						
#3 WEST	0935	START LINE TEST		50				
UNLEADED	0950	CONT. LINE TEST	49	50	.035	.034	-.001	-.001 GPH LINES TITE
	1005	" "	49	50	.034	.034	+.000	
	1020	" "	50	50	.034	.034	+.000	
	1035	" "	50	50	.034	.034	+.000	
	1040	BLEED BACK	50	0	.034	.060	+.026	

#2 CENTER	1115	START LINE TEST		50			
SUPER	1130	CONT. LINE TEST	49	50	.030	.029	-.001
UNLEADED	1145	" "	48	50	.029	.028	-.001
	1200	" "	49	50	.028	.028	+.000
	1215	" "	50	50	.028	.028	+.000
	1220	BLEED BACK	50	0	.028	.048	+.020

-.002 GPH
LINES TITE

#1 EAST	1240	START LINE TEST		50			
REGULAR	1255	CONT. LINE TEST	49	50	.033	.032	-.001
	1310	" "	49	50	.032	.031	-.001
	1325	" "	50	50	.031	.031	+.000
	1340	" "	50	50	.031	.031	+.000
	1345	BLEED BACK	50	0	.031	.054	+.023

DISTRIBUTION

3 copies: Texaco Refining and Marketing Inc.
100 Cutting Boulevard
Richmond, California 94804

Attention: Mr. R. R. Zielinski

MAS/RS/ly 031060P/R24

QUALITY CONTROL REVIEWER

Leonard K. George
Senior Engineer