Harding Lawson Associates

November 3, 1987

18106,002.04

Alameda County Environmental
Health Service
470 27th Street, Room 322
Oakland, California 94612

Attention: Mr. Storm Goranson, P. E.

Dear Mr. Goranson:

Enclosed is one (1) copy of our final ground-water investigation report dated November 3, 1987 for the City Blue Production Facility on 17th and Jefferson streets in Oakland, California. If you have any questions, please call.

Yours very truly,

HARDING LAWSON ASSOCIATES

Daniel A. Louis
Civil Engineer

DAL/sjp

NOV - 6 1987
HAZARDOUS MATERIALS/

Engineers and Geoscientists
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Harding Lawson Associates

A Report Prepared for

Blue Print Service Company
149 Second Street
San Francisco, California 94105

FINAL REPORT
GROUND-WATER INVESTIGATION
CITY BLUE PRODUCTION FACILITY
17TH AND JEFFERSON STREETS
OAKLAND, CALIFORNIA

HLA Job No. 18106,002.04

REGISTERED PROFESSIONAL ENGINEER
DANIEL A. LOUIS
No. 42495
Exp. 3-31-88
CIVIL
STATE OF CALIFORNIA

by

Daniel A. Louis
Civil Engineer

Norman T. Shopay
Senior Environmental Specialist

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666 Howard Street
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415/543-8422

November 3, 1987

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

I INTRODUCTION

This report presents the results of our ground-water investigation at the City Blue Production Facility site at 1700 Jefferson Street in Oakland, California. We provided professional services during tank removal in accordance with the "Guidelines for Addressing Fuel Leaks" by the California Regional Water Quality Board (RWQCB), San Francisco Bay Region. We presented the results of our services in a report entitled "Professional Services during Tank Removal" dated August 25, 1987. We previously performed a soil investigation and preliminary hazardous waste assessment for the proposed facility and submitted the results in reports dated May 4, 1987 and June 3, 1987, respectively.

The three underground gasoline tanks at the site were removed on June 16, 1987. Structures and pavements on the property were demolished during tank removal, and the site is now unpaved and unoccupied. Our services during tank removal and our preliminary hazardous waste assessment indicated that the soil and ground water in the immediate tank area were contaminated. We undertook this more detailed investigation to determine the lateral extent of soil and ground water contamination. In addition, we provided professional services during aeration of the soil excavated during tank removal and subsequent backfilling of the tank excavation. These services are summarized in a separate, forthcoming report.

The scope of our ground-water monitoring was defined in our proposal dated June 11, 1987. It included the following:

1. Installing three 4-inch-diameter PVC monitoring wells in accordance with RWQCB guidelines (with permits from the Alameda County Flood Control District)

2. Obtaining soil samples approximately every 5 feet during monitoring well drilling

3. Developing the wells and obtaining ground-water samples

4. Performing accurate water-level measurements to determine the hydraulic gradient and direction at the site

5. Testing selected soil samples and all ground-water samples at an approved chemical analysis laboratory for total petroleum hydrocarbons (TPH) and/or benzene, toluene, and xylenes (BTX) in accordance with regulatory agency guidelines

6. Presenting the results in a final report.

Drilling of an additional boring was verbally approved by Blue Print Service Company as part of our ongoing site investigation. Permeability testing is being performed on samples obtained from this boring. These test results will be presented in a future report; however, information obtained from Boring 6 was useful in our ground-water investigation and is included in this report.

II FIELD INVESTIGATION

We investigated the lateral extent of soil and ground-water contamination at the site by installing three 4-inch-diameter PVC ground-water monitoring wells and by drilling one boring at the locations shown on the Site Plan, Plate 1.

The three monitoring wells were drilled between 32 and 35 feet below the ground surface on June 24 and 25, 1987, using truck-mounted, hollow-stem auger equipment. Drilling was directed by our field engineer, who logged the soils encountered and obtained undisturbed samples for field classification and potential chemical analysis.

Boring 6 was drilled to a depth of 32-1/2 feet below the ground surface on August 12, 1987, using truck-mounted, continuous-flight auger equipment. Our field engineer directed the drilling, logged the soils encountered, and obtained undisturbed samples for field classification and laboratory testing.

The logs for the three monitoring wells are presented on Plates 2 through 4, and the log for Boring 6 is presented on Plate 5.

Soil samples were obtained using a Sprague and Henwood (S&H) split-barrel sampler driven with a 140-pound hammer falling 30 inches (a 150-pound hammer falling 27 inches was used during sampling for Boring 6). The number of blows required to drive the sampler was converted to equivalent standard penetration test (SPT) resistance values, which are presented on the boring logs.

Soil samples obtained from the borings were retained in brass liners, the ends of which were covered with aluminum foil, then enclosed with rubber caps and sealed with tape to prevent air leakage. The samples were labeled and kept in an ice chest until each workday, when they were delivered, using chain-of-custody procedures and documentation, to Trace Analysis Laboratories (TAL) in Hayward, California.

After the desired depth was reached, the monitoring wells were installed by inserting 4-inch-diameter Schedule 40 PVC pipes from the ground surface to approximately 6 to 12 inches above the bottom of the boring. The lower 10 feet of each well consisted of slotted pipe (machine slot size 0.020 inch), while the upper portion consisted of solid pipe. The slotted pipe extended approximately 5 feet above and 5 feet below the ground-water level. The approximate dimensions of the installed length of slotted and solid pipe are presented on the boring logs.

The wells were completed by placing No. 3 Monterey sand filter material in the annular space between the 4-inch pipe and the 10-inch-diameter borehole. The sand was placed from the bottom of the hole to approximately 6 to 12 inches above the slotted pipe interval. A 12-inch layer of bentonite pellets charged with water was then placed above the sand to seal off the filter material. The remaining distance from the bentonite seal to the ground surface was backfilled with a cement-bentonite grout mixture to provide a sanitary seal. A steel well casing was grouted into place at the ground surface to protect the monitoring well head and to provide a locking cover. A typical monitoring well completion detail is presented on Plate 6.

Approximately 7 to 10 days after installation, the wells were developed so that fresh ground water could be drawn into the well and the sand filter material could be densified around the well casing, eliminating possible clogging of the slotted pipe. More than five well volumes of water were removed from each well during development. This water was discharged into 55-gallon drums on the site. After well development, ground-water samples were obtained using a stainless steel bailer. The ground water from the bailer was drawn into 40-milliliter VOA vials, which were labeled appropriately, kept cool in an ice chest, and delivered using chain-of-custody procedures to TAL.

Appropriate measures were taken to avoid cross-contamination during all soil and ground-water sampling. All sampling tools, including the split-barrel samplers, brass liners, and stainless steel bailers, were decontaminated between samples by thorough scrubbing in a water-detergent mixture, followed by a clean water rinse and, in some cases, a third distilled water rinse. Drilling augers were decontaminated between each boring using a high-pressure steam cleaner.

III ANALYTICAL TESTING

A. Soils

During drilling for the monitoring wells, each soil sample obtained was screened in the field for hydrocarbon vapors using a GasTech portable combustible gas indicator. Readings recorded by the GasTech were noted in the field and they are presented on the boring logs. On the basis of the GasTech readings, a "worst case" sample from each boring was selected for laboratory analysis. Each "worst case" sample was tested for volatile hydrocarbons using modified EPA method 8015 and for physical properties (moisture content and field density).

B. Water

Ground-water samples from the monitoring wells were tested for volatile hydrocarbons using modified EPA method 8015 and for BTX using modified EPA method 8020.

IV RESULTS OF INVESTIGATION

A. Site and Subsurface Conditions

The soil conditions encountered in this investigation were very similar to those encountered in the five previous borings drilled at the site by HLA, indicating that the overall subsurface conditions are uniform.

The site is blanketed by approximately 3 to 5 feet of loose to medium dense silty sand fill that occasionally contains gravels and/or brick fragments. The sand fill is underlain by an approximately 15- to 18-foot-thick layer of native, medium dense to dense silty or clayey sand. In some of the borings, the fill-to-native-soil boundary is nearly indistinguishable. The silty or clayey sand is underlain by approximately 10 to 15 feet of dense, fine-grained sand and the sand is underlain by a stiff to very stiff silty or sandy clay, which extends to the depths investigated (approximately 32 to 35 feet). Petroleum odors were noticed during drilling of the borings; these odors are reported on the boring logs.

The water level encountered in our borings, and confirmed during subsequent ground-water monitoring well measurements, is approximately 26 feet below the ground surface, at an elevation of approximately 5.5 feet.*

---

* City of Oakland Datum

To accurately read ground-water levels for a study of the hydraulic gradient beneath the site, the three monitoring well casings were surveyed by a registered land surveyor and a steel water-level reading tape was used to measure the depth to ground water. In addition, a clear acrylic bailer was used to check for free product in each well and in Boring 6. Free product was not observed in Monitoring Wells 2 and 3 nor in the ground water in Boring 6. Ground water taken from Monitoring Well 1, however, had approximately 30 inches of free gasoline product on its surface. The ground-water monitoring data are presented in Table 1.

Table 1

Monitoring Point	Top of Well Casing Elevation (feet)*	Depth to Ground Water (feet)	Ground Water Surface Elevation (feet)*	Free Product Thickness Observed
MW-1	31.44	25.75**	5.69	30 inches
MW-2	31.17	25.27	5.90	None
MW-3	31.77	25.50	6.27	None
B-6	31.6***	25.38	6.2	None

* City of Oakland datum

** Depth to ground water corrected for differences in weight of free product observed (correction based on a specific gravity of gasoline product of 0.75)

*** Approximate measurement (elevation taken from a point at the ground surface next to the boring)

On the basis of the ground-water data summarized in Table 1, the direction of ground-water movement was calculated to be approximately north-northeast.

B. Analytical Results

The results of soil and ground-water analysis of samples taken during and after monitoring well installation are presented in the appendix and summarized in Table 2 below:

Table 2
Analytical Results

Test Method and Constituent Analyzed	MW-1	MW-2	MW-3	
Soil Analysis:				
Volatile Hydrocarbons (Modified EPA 8015)	4500 ppm[1] (0.8 ppm)	ND[2] (1 ppm)	ND (0.8 ppm)	
Moisture Content (by weight)	13 percent	11 percent	11 percent	
Field Density	109 pcf[3]	106 pcf	122 pcf	
Water Analysis:				
Volatile Hydrocarbons[4] (Modified EPA 8015)	190 ppm	8.2 ppm	6.2 ppm	
Benzene[5]	18 ppm	1.5 ppm	0.18 ppm	
Toluene	26 ppm	0.35 ppm	0.50 ppm	.1
Xylene	3.7 ppm	0.087 ppm	0.17 ppm	.62

---

1 ppm = Parts per million (ppm is equivalent to mg/kg); the detection limit is presented in parentheses below the result.

2 ND = Not detected at or above the detection limit

3 pcf = Pounds per cubic foot

4 Detection limit for this analysis was 0.002 ppm

5 Analysis for benzene, toluene, and xylene by modified EPA method 8020 with detection limit of 0.0005 ppm

V DISCUSSION AND CONCLUSIONS

On the basis of our soil and ground-water investigations at the site, we conclude that:

1. Hydrocarbon concentrations in the soil increase with depth to maximum values at 1 to 5 feet above the ground-water level and decrease below the ground-water level.

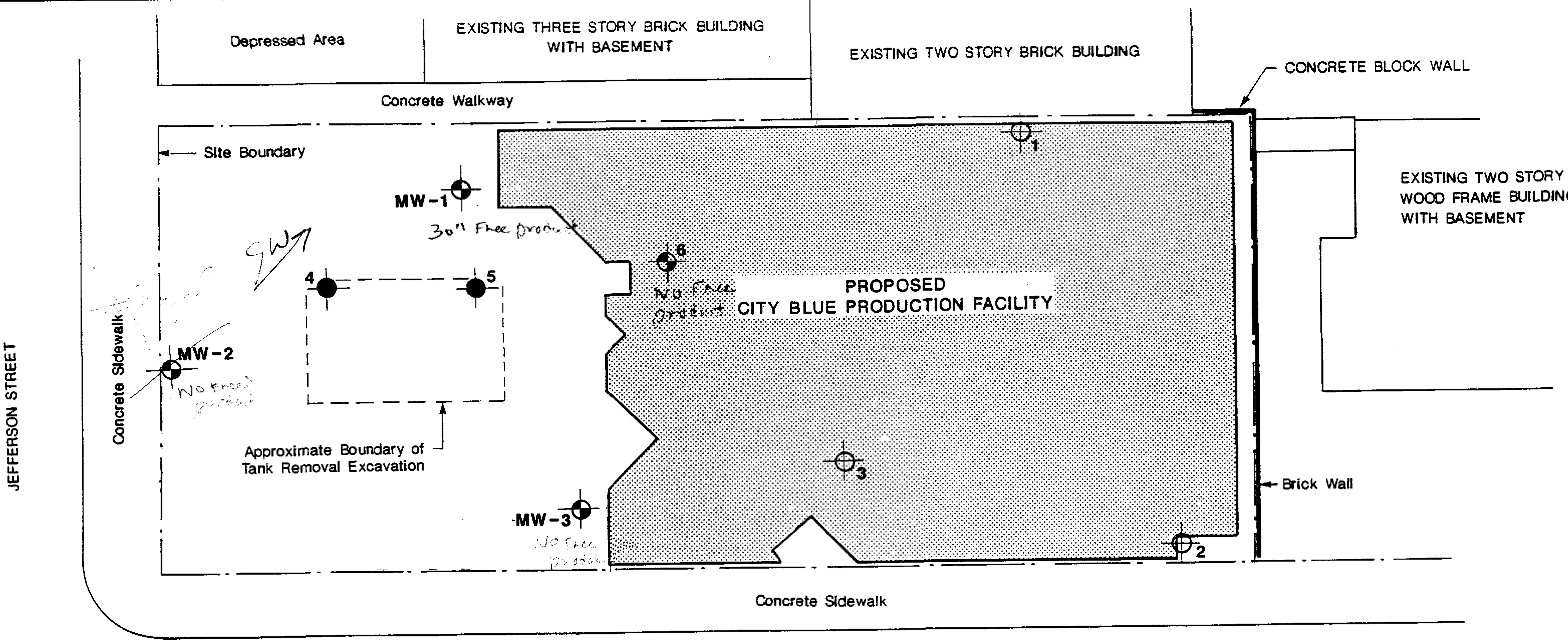
2. The lateral extent of the soil contamination decreases with distance from the former area of underground tanks. The highest concentrations of soil contamination follow the hydraulic gradient, which is north-northeast, in the approximate area outlined on Plate 1.

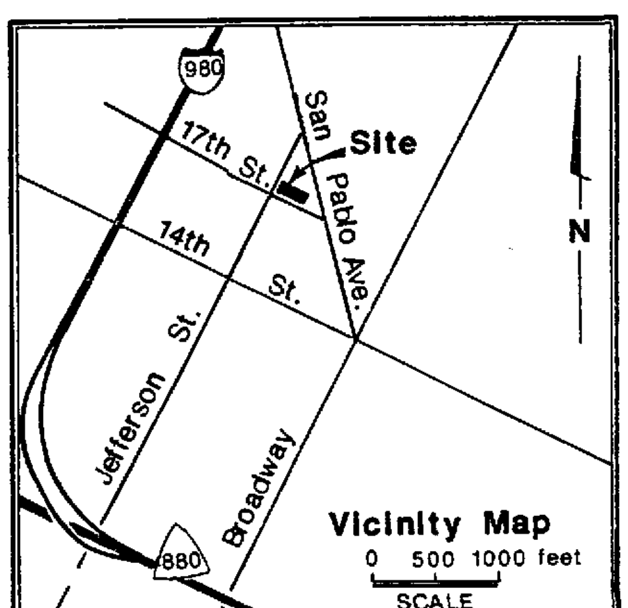
3. Although evidence of ground-water contamination was found in all wells, free product was found only in Monitoring Well 1. This indicates that gasoline product has migrated to the ground water, but that its lateral extent is limited, except possibly in the direction of the ground-water flow.

On the basis of our water level readings, we have determined that the hydraulic gradient is small, indicating that migration of free product on the ground water surface may be slow. In addition, since free product was not found in Monitoring Wells 2 and 3 nor in Boring 6, we believe the soil and ground water contamination on the site is limited to the area northeast of the former tank locations, as shown on Plate 1.

Our recommendations for additional site investigation and remediation design and implementation will be addressed in a separate letter following this report.

To ensure more efficient contact with the applicable regulatory agencies, and per your authorization, we are forwarding a copy of this document directly to the Alameda County Environmental Health Service.





EXPLANATION

4 ● Boring Location and Number, Preliminary Hazardous Waste Assessment

1 ⊕ Boring Location and Number, Soil Investigation

MW-1 Approximate Monitoring Well or Boring Location, this Investigation

REFERENCES:

1. "Preliminary Site Plan, City Blue Production Facility, 1700 Jefferson Street, Oakland, California," by Garcia/Wagner and Associates, dated Feb. 17, 1987.
2. Untitled Survey (partial print), Seventeenth Street and Jefferson Street, Surveyor unknown.

N

0 16
Scale in feet

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Site Plan

City Blue Production Facility
Oakland, California

PLATE 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AG	18106,002.04	DL	2/87		7/87

Equipment: 10-inch Diameter Hollow Stem Auger

Elevation: 31.6 feet*   Date: 6/24/87

Field and Laboratory Tests	Blows/foot
Field GasTech (GT) reading = 30 ppm	42
GT = 90 ppm	20
GT = 225 ppm	22
GT = 500+ ppm	56
GT = 500+ ppm Lab Moisure Content = 13% Lab Dry Density = 109 pcf Lab Volatile Hydrocarbons (TVH) = 4500 ppm	33/6"
GT = 500+ ppm	47
GT = 100 ppm	38

Well Completion Schematic: Solid; Slotted

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35, 40

Sample

BROWN AND GRAY SILTY SAND (SM)
medium dense, moist, some clay

BROWN CLAYEY SAND (SC)
dense, moist, with silt

mottled brown and gray with interbedded silty sand below 7 feet

medium dense below 9 feet

decreased clay and silt with slight orange-brown discoloration below 12 feet

GRAY SAND (SP)
dense, moist, uniform, fine-grained sand

water level measured on 6/25/87

water level measured during drilling, 6/24/87

GRAY SILTY CLAY (CH)
very stiff, saturated, with trace sand

*City of Oakland datum.

**Equivalent Standard Penetration Test (SPT) blow counts

Note: Strong petroleum hydrocarbon odors encountered between 18-30 feet

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Log of Boring MW-1
Underground Tank Investigation
City Blue Production Facility
Oakland, California

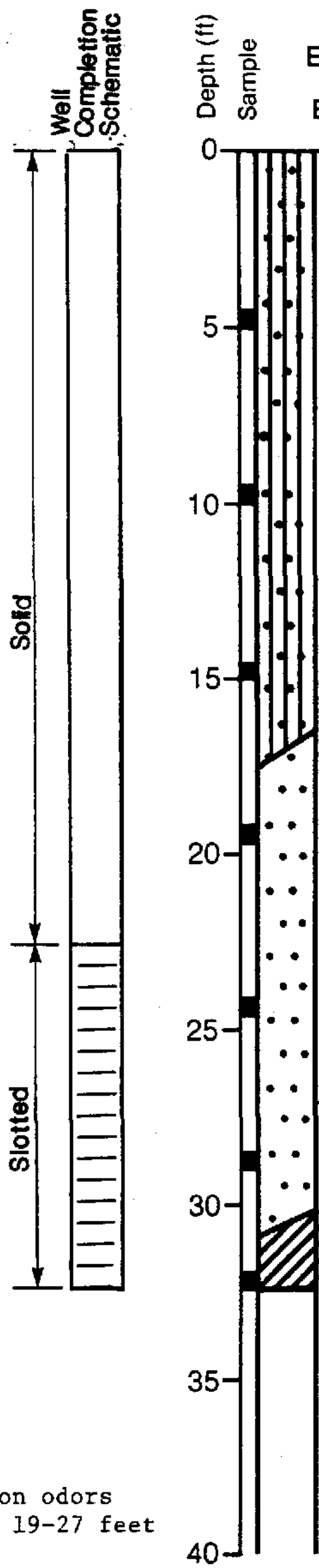
PLATE 2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AG	18106,002.04	DL	7/87		

Equipment 10-inch Diameter Hollow Stem Auger

Elevation 30.7 feet Date 6/25/87

Field and Laboratory Tests	Blows/foot
GT = 25 ppm	43
GT = 50 ppm	15
GT = 25 ppm	22
GT = 150 ppm	33/6"
GT = 280 ppm Lab Moisture Content = 11% Lab Dry Density = 106 pcf Lab TVH < 1 ppm	33/6"
GT = 60 ppm	33/6"
GT = 25 ppm	25



MOTTLED BROWN AND GRAY SILTY SAND (SM)
dense, moist, with clay

medium dense, very moist below 9 feet

BROWN SAND (SP)
dense to very dense, moist to wet, fine-grained sand

brown-gray, silty below 22 feet

▽ water level measured during drilling, 6/25/87

saturated with increased silt below 27 feet

GRAY SILTY CLAY (CH)
stiff to very stiff, saturated, occasional thin lenses of mottled brown-gray silty sand

Note: Petroleum hydrocarbon odors encountered between 19-27 feet

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Log of Boring MW-2
Underground Tank Investigation
City Blue Production Facility
Oakland, California

PLATE **3**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AG	18106,002.04	DZ	7/87		

Equipment: 10-inch Diameter Hollow Stem Auger

Elevation: 31.2 feet Date: 6/24/87

Field and Laboratory Tests	Blows/foot	Well Completion Schematic	Depth (ft)	Description
		Solid	0	BROWN SILTY SAND (SM) dense, moist, with interbedded clayey sand layers
GT = 50 ppm	25/6"		5	
				MOTTLED BROWN AND GRAY CLAYEY SAND (SC) medium dense, moist, with silt
GT = 30 ppm	20		10	
				increased silt, moist to wet below 12 feet
GT = 75 ppm	20		15	
GT = 200 ppm	33/6"			dense below 19 feet
			20	GRAY SILTY SAND (SM) dense, moist
Labor Moisture Content = 11% Lab Dry Density = 122 pcf GT = 500 ppm Lab TVH < 0.8 ppm	32/6"	Slotted		
			25	∇ water level measured on 6/25/87
GT = 150 ppm	34/6"			saturated below 29 feet
			30	BROWNISH GRAY SILTY CLAY (CH) stiff to very stiff, moist, trace sand
GT = 100 ppm				
			35	
			40	

Note: Petroleum hydrocarbon odors encountered between 17-30 feet

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Engineers, Geologists & Geophysicists

Log of Boring MW-3

Underground Tank Investigation
City Blue Production Facility
Oakland, California

PLATE 4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AG	18106,002.04	DL	7/87		

Equipment 6-inch Diameter Soild Auger

Elevation 31.4 feet Date 8/12/87

Laboratory Tests	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Description
				0	BROWN SILTY SAND (SM) medium dense, moist, with some clay
					BROWN AND GRAYISH BROWN CLAYEY SAND (SC) medium dense to dense, moist, with silt
				5	
				10	dense below 11 feet
	38/9"				
				15	
	41				BROWNISH GRAY SAND (SP) dense, moist, very fine-grained, uniform, with silt
				20	
	47				
	40/10"			25	▽ water level observed 8/12/87 saturated below 26 feet
				30	BROWNISH GRAY SILTY CLAY (CH) stiff to very stiff, saturated, trace sand
				35	
				40	

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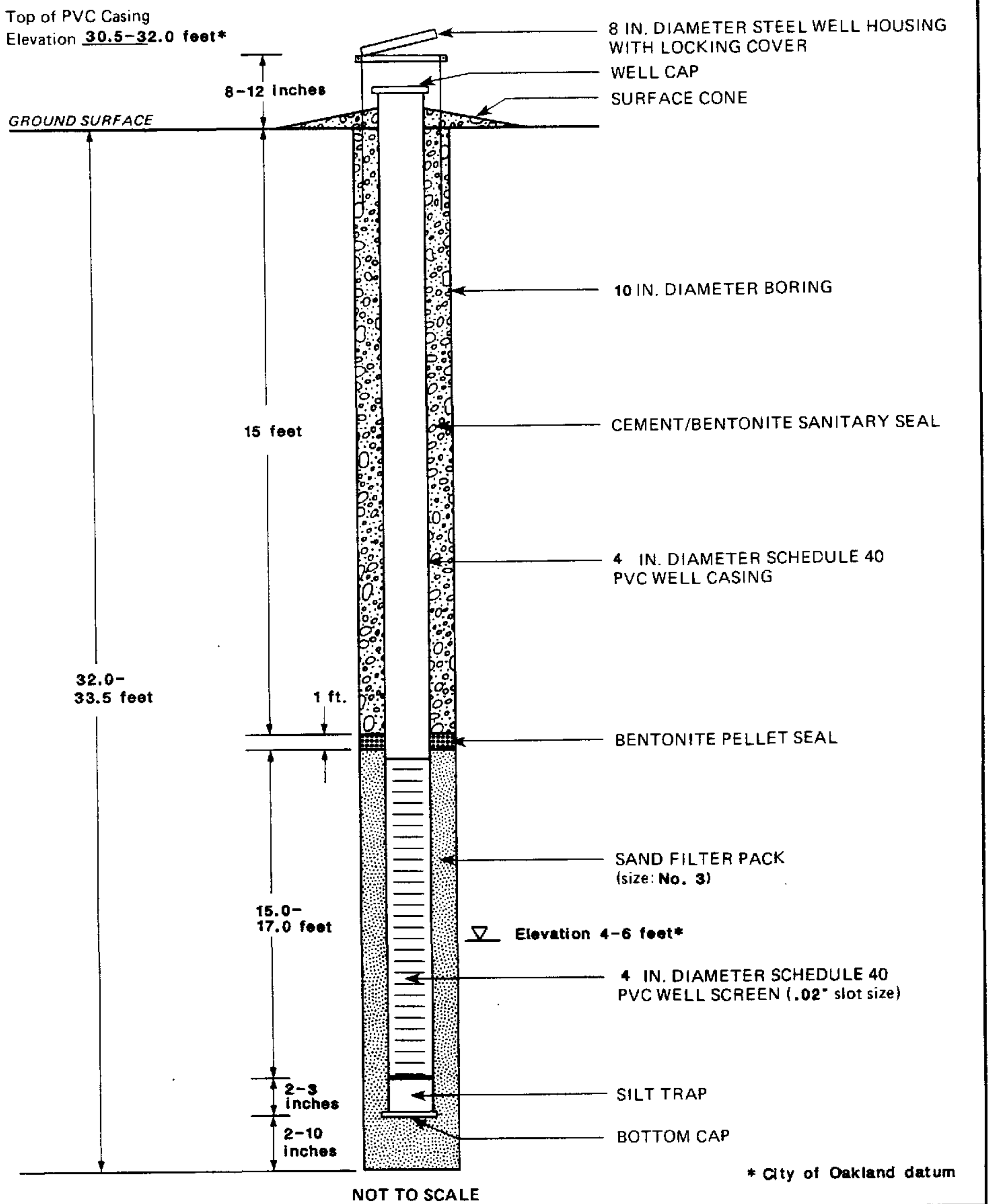
Engineers, Geologists
& Geophysicists

Log of Boring 6

City Blue Production Facility
Oakland, California

PLATE 5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
RS	18106,002.04	DL	10/87		



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Typical Well Completion Detail
City Blue Production Facility
Oakland, California

PLATE **6**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AG	18106,002.04	DL	7/87		

FORM GW1

MAJOR DIVISIONS				TYPICAL NAMES
COARSE - GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE - GRAINED SOILS MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM

Perm — Permeability
Consol — Consolidation
LL — Liquid Limit (%)
PI — Plastic Index (%)
G_s — Specific Gravity
MA — Particle Size Analysis
■ — "Undisturbed" Sample
☒ — Bulk or Classification Sample

Test	Shear Strength (psf)	Confining Pressure		Description
TxUU	3200	(2600)	—	Unconsolidated Undrained Triaxial Shear
(FM) or (S)				(field moisture or saturated)
TxCU	3200	(2600)	—	Consolidated Undrained Triaxial Shear
(P)				(with or without pore pressure measurement)
TxCD	3200	(2600)	—	Consolidated Drained Triaxial Shear
SSCU	3200	(2600)	—	Simple Shear Consolidated Undrained
(P)				(with or without pore pressure measurement)
SSCD	3200	(2600)	—	Simple Shear Consolidated Drained
DSCD	2700	(2000)	—	Consolidated Drained Direct Shear
UC	470		—	Unconfined Compression
LVS	700		—	Laboratory Vane Shear

KEY TO TEST DATA

Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Soil Classification Chart and Key to Test Data
City Blue Production Facility
Oakland, California

PLATE **7**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AG	18106,002.04	DZ	7/87		

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545 (415) 783-6960

TAL

DATE: 7/13/87
LOG NO.: 4902
DATE SAMPLED: 6/24/87
DATE RECEIVED: 6/24/87

CUSTOMER: Harding Lawson Associates
REQUESTER: Dan Louis
PROJECT: No. 18106,002.04, City Blue

			Sample Type: Soil	
			MW-1 at 23.5	MW-3 at 23.5
Method and Constituent	Units	Detection Limit	Concentration	Concentration
Modified EPA Method 8015:				
Volatile Hydrocarbons	mg/kg	0.8	4500	< 0.8
Moisture	Weight %		13	11
Field Density	g/ml		2.0	2.2

Ronald H. Ming Chew

Ronald H. Ming Chew
Supervisory Chemist

RHC:mln

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545 (415) 783-6960

TAL

DATE: 7/13/87
LOG NO.: 4912
DATE SAMPLED: 6/25/87
DATE RECEIVED: 6/25/87

CUSTOMER: Harding Lawson Associates
REQUESTER: Dan Louis
PROJECT: No. 18106,002.04, City Blue

		Sample Type: Soil	
			MW-2 at 24
Method and Constituent	Units	Detection Limit	Concentration
Modified EPA Method 8015:			
Volatile Hydrocarbons	mg/kg	1	< 1
Moisture	Weight %		11
Field Density	g/ml		1.9

Ronald H. Ming Chew

Ronald H. Ming Chew
Supervisory Chemist

RHC:mln

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545 (415) 783-6960

TAL

DATE: 7/22/87

LOG NO.: 4963

DATE SAMPLED: 7/8/87

DATE RECEIVED: 7/8/87

CUSTOMER: Harding Lawson Associates

REQUESTER: Dan Louis

PROJECT: No. 18106.002.04, City Blue

		Sample Type: Water		
			MW - 1	MW - 2
Method and Constituent	Units	Detection Limit	Concentration	Concentration
Modified EPA Method 8015:				
Volatile Hydrocarbons	mg/l	0.002	190	8.2
Modified EPA Method 8020:				
Benzene	mg/l	0.0005	18	1.5
Toluene	mg/l	0.0005	26	0.34
Xylene	mg/l	0.0005	3.7	0.087

DATE: 7/22/87
LOG NO.: 4963
DATE SAMPLED: 7/8/87
DATE RECEIVED: 7/8/87
PAGE: Two

Sample Type: Water

Method and Constituent	Units	Detection Limit	MW - 3 Concentration
Modified EPA Method 8015:			
Volatile Hydrocarbons	mg/l	0.002	6.2
Modified EPA Method 8020:			
Benzene	mg/l	0.0005	0.18
Toluene	mg/l	0.0005	0.50
Xylene	mg/l	0.0005	0.17

Ronald H. Ming Chew

Ronald H. Ming Chew
Supervisory Chemist

RHC:vls

DISTRIBUTION

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San Francisco, California 94105
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San Francisco, California 94102
Attention: Mr. Felix A. Rodriguez

1 copy: Alameda County Environmental Health Service
470 27th Street, Room 322
Oakland, California 94612
Attention: Mr. Storm Goranson, P.E.

DAL/NTS/sjp

QUALITY CONTROL REVIEWER

Donald E. Bruggers

Donald E. Bruggers
Civil Engineer