A Report Prepared for

DRAFT

City of Oakland
Redevelopment Agency
One City Hall Plaza
Oakland, California 94612

SUBSURFACE CONTAMINATION INVESTIGATION
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA

HLA Job No. 9382,008.01

by

Linda M. Poksay
Environmental Scientist

Michael L. Siembieda
Geologist - 4007

Harding Lawson Associates
7655 Redwood Boulevard, P.O. Box 578
Novato, California 94948
415/892-0821

December 28, 1987

12/28/87

INTRODUCTION

This report has been prepared for the City of Oakland (City) by Harding Lawson Associates (HLA). It presents the results of the third phase of the subsurface investigation conducted by HLA in the vicinity of a former underground storage tank site near 11th and Webster streets in the Chinatown Redevelopment Project Area of Oakland, California (Plate 1). The objective of this investigation was to provide additional information on the extent of subsurface contamination detected in the soil and ground water during Phases I and II. To meet this objective, HLA performed the following tasks:

Task I

- Resample Monitoring Well MW-1 and analyze ground water for total petroleum hydrocarbons (TPH) as gasoline, for benzene, ethylbenzene, toluene, and xylenes (BETX), and for other purgeable organics to verify chemical laboratory results reported for Phase II
- Perform a soil gas survey to evaluate the extent of the plume of ground water containing hydrocarbons

Task II:

- Drill a large-diameter test boring to evaluate the feasibility of removing soil in the vicinity of the former tank site by augering
- Drill and sample six soil borings near the former tank area and analyze soil and ground-water samples for TPH (as gasoline) and BETX
- Prepare this report

HLA received authorization from the City to proceed with Task I on August 27, 1987 in the third amendment to our contract with the City. Task II, with the exception of drilling the test boring, was authorized in a letter from Mr. Diego Garcia, City, dated September 30, 1987. The test boring was authorized verbally by the City.

12/27/87

SITE BACKGROUND

Four underground storage tanks were located under the sidewalk along the northeastern edge of a presently vacant lot bounded by 10th, 11th, Webster, and Franklin streets. The lot is within the Chinatown Redevelopment Project Area; an underground parking facility and high-rise office complex will be constructed on a portion of the lot. Construction is scheduled to begin in early 1988.

The tanks were removed in April 1987. HLA collected soil samples during tank removal and observed the excavation activities. Concentrations of TPH measured in soil samples collected below the tanks ranged from 3,200 to 11,000 parts per million (ppm). On the basis of the observations and test results, HLA concluded that significant leakage or spillage of hydrocarbons into the surrounding soils had occurred (HLA, 1987a). We recommended that 1) a ground-water monitoring well be installed to evaluate the impact of the leakage on water quality and 2) a test boring be drilled in the tank excavation to evaluate the vertical distribution of hydrocarbons in the soil beneath the removed tanks.

The second phase of the site investigation was conducted by HLA in late May 1987. Two borings, B1 and B2, were drilled and sampled (Plate 2). Boring B1, located south of the former tank location, was completed as a ground-water monitoring well, MW-1. Boring B2, drilled to ground water, was located within the tank excavation area. Soil samples were collected from both borings and analyzed for TPH (as gasoline) and BETX to evaluate the

vertical extent of soil contamination in these areas. One ground-water sample was collected from MW-1 and analyzed for TPH as gasoline, BETX, and purgeable halocarbons (EPA Test Method 601). Elevated concentrations of TPH and BETX were detected in the ground-water sample and in the soil samples from Boring B2. These results again indicated that significant leakage had occurred from one or more of the former tanks at this site (HLA 1987b). HLA recommended that 1) a leak report be filed with the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), and 2) further ground-water investigations be conducted.

FIELD INVESTIGATION AND LABORATORY RESULTS

Task 1

Monitoring Well Resampling

On August 28, 1987, HLA resampled Monitoring Well MW-1 to confirm the original analytical results and to assess whether soil gas and soil samples to be collected during Phase III should be analyzed for additional constituents.

The ground-water sample was collected in accordance with procedures outlined in "Guidelines for Addressing Fuel Leaks" (RWQCB, 1985). No sheen, discoloration, or floating product was observed during sampling, although a gasoline odor was noted. The sample was delivered to Analytical Science Associates, Inc. (ASA), Danville, California, under chain-of-custody and analyzed for TPH (as gasoline) and purgeable priority pollutants (EPA Test Method 624).

Results of the analyses of the ground-water sample from MW-1 showed 72,000 parts per billion (ppb) TPH (as gasoline), 11,000 ppb benzene, 6100 ppb toluene, and 6,000 ppb xylenes. Concentrations of other purgeable priority pollutants were below their detection limits. A copy of the laboratory report is included in the Appendix. Reported concentrations of the above chemicals exceed their respective action levels. State Action Levels are limits at or above which regulatory agencies typically require remedial action.

Soil Gas Survey

On September 9, 1987 Anatec Laboratories, Inc., Santa Rosa, California performed a soil gas survey in the area of the former tank site under the observation of an HLA geologist. Soil gas mapping was used as a reconnaissance tool to aid in identifying the chemical bearing ground water and in siting the scheduled borings.

Soil gas samples were extracted at the 10 locations shown on Plate 2. Sample depths ranged from 11.5 to 18.0 feet. Soil gas samples were analyzed by Anatec immediately after collection for volatile petroleum hydrocarbons (as gasoline) and BETX using a portable gas chromatograph (GC). A copy of the original laboratory report is included in the Appendix.

The results of the soil gas survey were inconclusive; although areas of known contamination were sampled, the constituents for which the soil gas samples were analyzed were not detected. The cause of the negative responses is not known; however, the presence of fine-grained constituents

(e.g., clay particles) in the sand matrix is commonly a cause for such negative responses.

Task II

Test Boring

Because of the high concentrations of petroleum hydrocarbons detected at the former tank location, removal of the soil has been proposed by HLA as a source remediation alternative. On September 25, 1987, a 30-inch diameter test boring, Boring T1, was drilled to evaluate the feasibility of removing affected soil using a large-diameter auger.

Malcolm Drilling Company of South San Francisco, California, drilled Test Boring T1 at the locations shown on Plate 2 to a depth of 30 feet using a 30-inch-diameter flight auger mounted on a Texoma 700 drill rig. An HLA geologist observed drilling activities and subsurface soil conditions. The boring was logged in accordance with the Unified Soil Classification System; any odors were noted, and the depth to water was measured. The boring log is presented on Plate 3.

Sand and clayey sand of medium density were encountered throughout the boring. Ground water was originally encountered during drilling at 29.0 feet below grade. The water level in the boring was rising and had not stabilized at the time of backfilling. A moderate "solvent-like" odor, characteristic of decomposed gasoline, was detected at 24.0 feet and a strong petroleum hydrocarbon odor was observed at 27.0 feet. The boring

wall remained stable during drilling. The boring was backfilled to grade with drill cuttings.

Soil Borings

On October 8 and 9, 1987 six borings (B3 through B8) were drilled adjacent to and near the former tank location to evaluate the extent of chemicals in the soil and ground water and to aid in estimating the limits of soil to be removed in the area of the former tanks. Aqua Science Engineers of San Ramon, California drilled the borings using a truck-mounted Geospace 1200 drill rig equipped with 8-inch outside diameter hollow-stem augers. Borings were completed to depths ranging from 30.8 feet to 36.5 feet. Drilling was observed by an HLA geotechnical engineer, who also logged the borings according to the United Soil Classification System and collected soil samples for chemical analyses. All drilling and sampling equipment was thoroughly decontaminated prior to use to minimize the potential for cross contamination. Conditions encountered during field activities, e.g., the level of contamination observed in relation to the distance from the former tanks, and physical restraints such as underground utility lines, were considered when determining boring placement.

Soil samples were collected at varying depths below grade. Samples were collected with a modified California sampler lined with stainless steel sample tubes. Each sample was screened for volatile hydrocarbons using an organic vapor meter to indicate the magnitude of hydrocarbon concentrations and thereby aid in selecting samples for laboratory analyses. After

screening, the ends of each sample tube were promptly sealed with aluminum foil-lined plastic caps. Samples were placed in a refrigerated environment until delivery to WESCO Laboratories, Novato, California.

A ground-water sample was collected from each boring. Once a boring reached its total depth, the inner plug of the auger was removed and the ground water was allowed to fill the inner annulus of the auger. A ground-water sample was collected using a clean stainless steel bailer. The sample was tranferred into clean 40 ml glass volatile organic analysis bottles (VOAs) and placed in a refrigerated environment for delivery to the analytical laboratory. After the ground-water sample was collected, the augers were removed from the borehole. Boreholes in areas designated to be excavated during future construction at the site were backfilled with drill cuttings. All other borings were backfilled with cement. Excess cuttings were stockpiled within the fenced area of the site.

The materials encountered during drilling consist of clayey and silty sands to the depths explored. Although the water levels did not fully stabilize in the borings during the drilling activities, the depth to ground water ranged from 22 to 28 feet.

Organic vapor meter readings detected vapors in all borings. Readings ranged in intensity from very slight to strong, and generally increased with depth. Soil conditions encountered in each boring, including a lithological description and organic vapor meter readings, are shown on the boring logs (Plates 4 through 9). A petroleum hydrocarbon sheen was observed on the water surface during ground-water sample collection at Borings B5 and B6.

Soil and ground-water samples were transported under chain-of-custody to WESCO Laboratories, Novato, California for the analyses requested. WESCO is a state-certified hazardous waste analytical laboratory. Six ground-water samples (one per boring) and nineteen soil samples were analyzed for TPH (as gasoline) and BETX.

Laboratory results for soil sample analyses are presented in the Appendix and summarized in Table 1. The highest concentrations of contaminants in the soil occur within the upper portions of the saturated zone. The laboratory reports TPH concentrations in soil as high as 2,800,000 ppb. The RWQCB guidelines indicate that TPH levels in excess of 1,000,000 ppb require soil removal.

The results for the ground-water analyses are presented in Table 2 and on Plate 10. A copy of the laboratory report is included in Appendix A. Analytical results indicate TPH (as gasoline) and BETX are present in significant concentrations in the soil and ground water at the site. The highest concentrations of ground-water contamination are found near the former tank locations and in the assumed immediate downgradient direction near Boring B6, although benzene concentrations exceeding the DOHS State Action Level of 0.7 ppb were detected at the furthest boring, B8. However, because of the methodology used in sampling ground water, laboratory results can only be used for order of magnitude estimates of chemical constituents present.

CONCLUSIONS AND RECOMMENDATIONS

Although the underground tanks have been removed, petroleum hydrocarbons are still present in the soil and ground water. The contaminated soil in the former tank area is probably acting as a continuing source of gasoline constituents to the surrounding soil and ground water. The RWQCB requires soil removal for TPH concentrations greater than 1,000,000 ppb. Therefore, soil removal is recommended.

Details of a soil removal remediation plan are included in our November 13, 1987 report titled "Work Plan, Gasoline Leak Investigation, Chinatown Redevelopment Project Area, Oakland, California" (HLA, 1987c).

Use of a large-diameter auger to remove affected soil appears feasible; the boring wall of Test Boring T-1 remained stable during drilling. A discussion of this soil removal alternative has been previously submitted to the City (HLA, 1987E).

In the area of the planned underground parking structure, most of the reported TPH concentrations are below 100,000 ppb (the RWQCB upper TPH limit for disposal at a Class III landfill). One exception to this is the soil in the immediate (assumed) downgradient direction of the former tanks, which exceeds this guideline level. Appropriate mitigation measures can be implemented during construction of the planned parking area. Possible alternatives include the disposal of contaminated soil at a Class II landfill, or aeration of the soil to reduce contaminant levels for subsequent disposal at a Class III landfill.

The significantly high levels of ground-water contamination detected in the former tank area and in the adjacent property needs to be investigated further to evaluate the magnitude of contamination. Details of a proposed scope of work are described in our Work Plan and our cost estimate letter dated November 13, 1987 (HLA, 1987c, HLA, 1987d).

REFERENCES

California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). 1985. Guidelines for Addressing Fuel Leaks. September.

Harding Lawson Associates. 1987a. Report, Services Following Tank Removal, Chinatown Redevelopment Project No. 97110, Oakland, California. May 8.

_____. 1987b. Initial Gasoline Leak Investigation, Chinatown Redevelopment Project Area, Oakland, California. June 19.

_____. 1987c. Work Plan, Gasoline Investigation, Chinatown Redevelopment Project Area, Oakland, California. November 13.

_____. 1987d. Detailed Cost Estimate Breakdown, Ground-Water Investigation, Chinatown Redevelopment Area, Oakland, California. November 20.

_____. 1987e. Cost Estimate, Remediation of Gasoline-Contaminated Soil, Chinatown Redevelopment Project, Oakland, California. November 13.

TABLES

12/87

Table 1. Laboratory Results of Chemical Analyses of Soil Samples[1]

Boring No.	Sample Depth (feet)	Date Sampled	Total Petroleum Hydrocarbons (as gasoline)	Benzene	Ethyl-Benzene	Toluene	Xylenes
B3	15.5 - 16.0	10/9/87	ND[2]	0.5	ND	0.6	ND
B3	20.5 - 21.0	10/9/87	ND	0.5	ND	ND	ND
B3	25.5 - 26.0	10/9/87	2,000,000	5,800	14,600	13,400	50,000
B3	30.0 - 30.5	10/9/87	2,500,000	14,000	21,000	10,000	47,100
B3	35.5 - 36.0	10/9/87	31,000	350	350	450	850
B4	15.5 - 16.0	10/9/87	ND	ND	ND	ND	ND
B4	20.5 - 21.0	10/9/87	ND	ND	ND	3.0	ND
B4	25.5 - 26.0	10/9/87	120.0	11.7	1.0	ND	24.3
B4	30.0 - 30.5	10/9/87	1,400.0	740.0	556.0	61.8	606.0
B4	35.5 - 36.0	10/9/87	860.0	525.0	29.5	14.0	198.0
B5	20.5 - 21.0	10/9/87	ND	ND	ND	0.5	ND
B5	25.5 - 26.0	10/9/87	2,800,000	8,300	28,000	10,000	197,000
B5	30.0 - 30.5	10/9/87	29,000	21	270	100	880
B5	35.5 - 36.0	10/9/87	470,000	13,047	1,232	492	6,594
B6	21.0 - 21.5	10/8/87	ND	ND	ND	ND	ND
B6	30.0 - 30.5	10/8/87	870,000	4,800	5,600	6,000	24,900
B7	25.5 - 26.0	10/8/87	1,100	4.9	1.9	0.7	3.4
B8	20.5 - 21.0	10/8/87	ND	ND	ND	ND	ND
B8	35.5 - 36.0	10/8/87	330.0	1.4	1.0	18.7	4.5

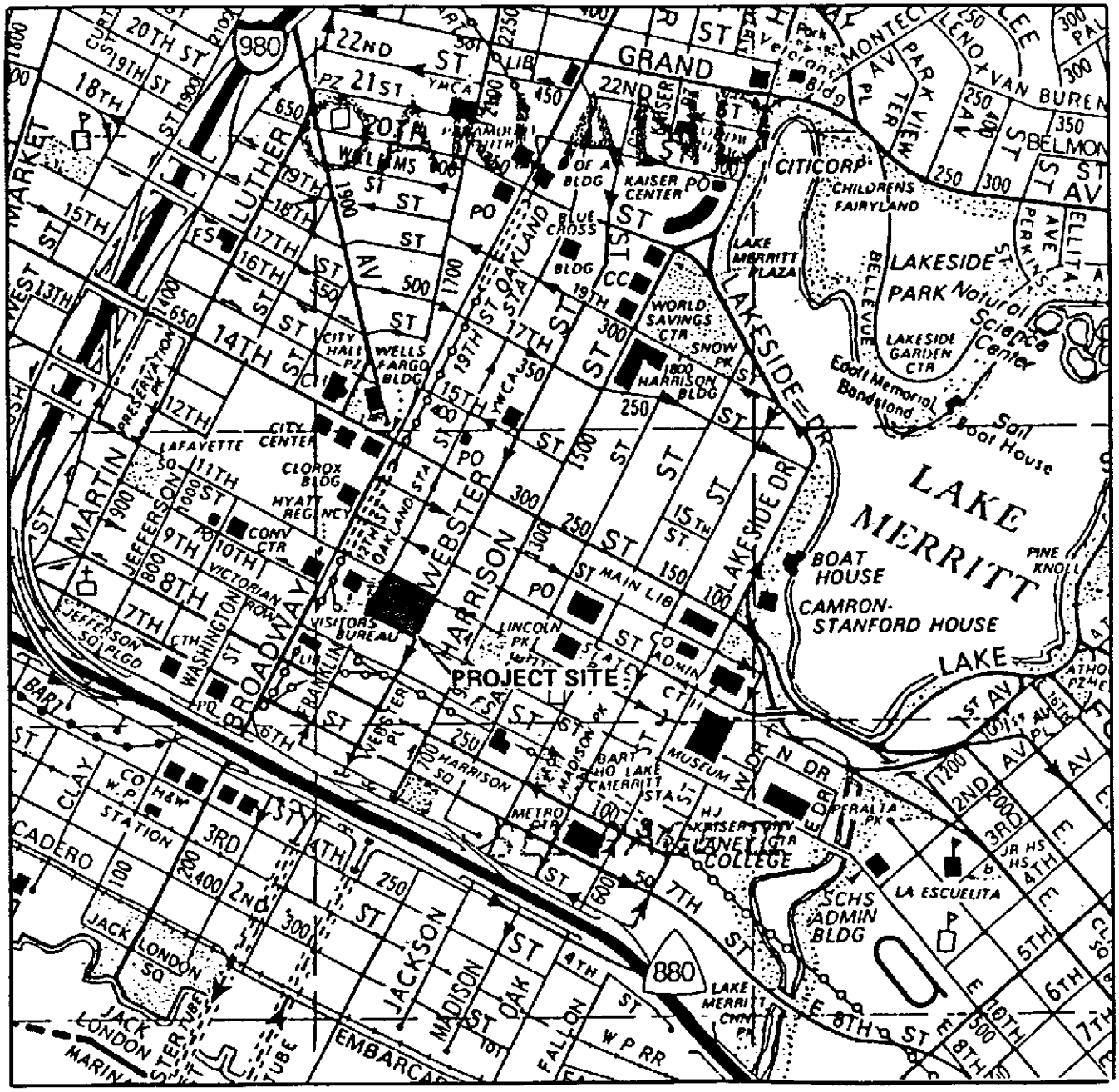
1 Concentrations in parts per billion
2 Not detected

Table 2. Laboratory Results of Chemical Analyses of Ground-Water Samples[1]

Monitoring Well No. or Boring No.	Date Sampled	Total Petroleum Hydrocarbons (as gasoline)	Benzene	Ethyl-Benzene	Toluene	Xylenes	Other Purgeable Priority Pollutants
MW-1	8/28/87	72,000	11,000	ND[2]	6,100	6,000	ND
B3	10/9/87	77,100	9,725	1,350	5,375	6,050	NA[3]
B4	10/9/87	28,500	6,935	580	188	663	NA
B5	10/9/87	57,800	3,465	1,315	2,655	4,480	NA
B6	10/8/87	138,040	11,025	1,675	6,275	12,150	NA
B7	10/8/87	29,440	3,365	418	108	623	NA
B8	10/8/87	3,900	34.5	35.0	41.5	219	NA

1 Concentrations in parts per billion
2 Not detected
3 Not analyzed

PLATES



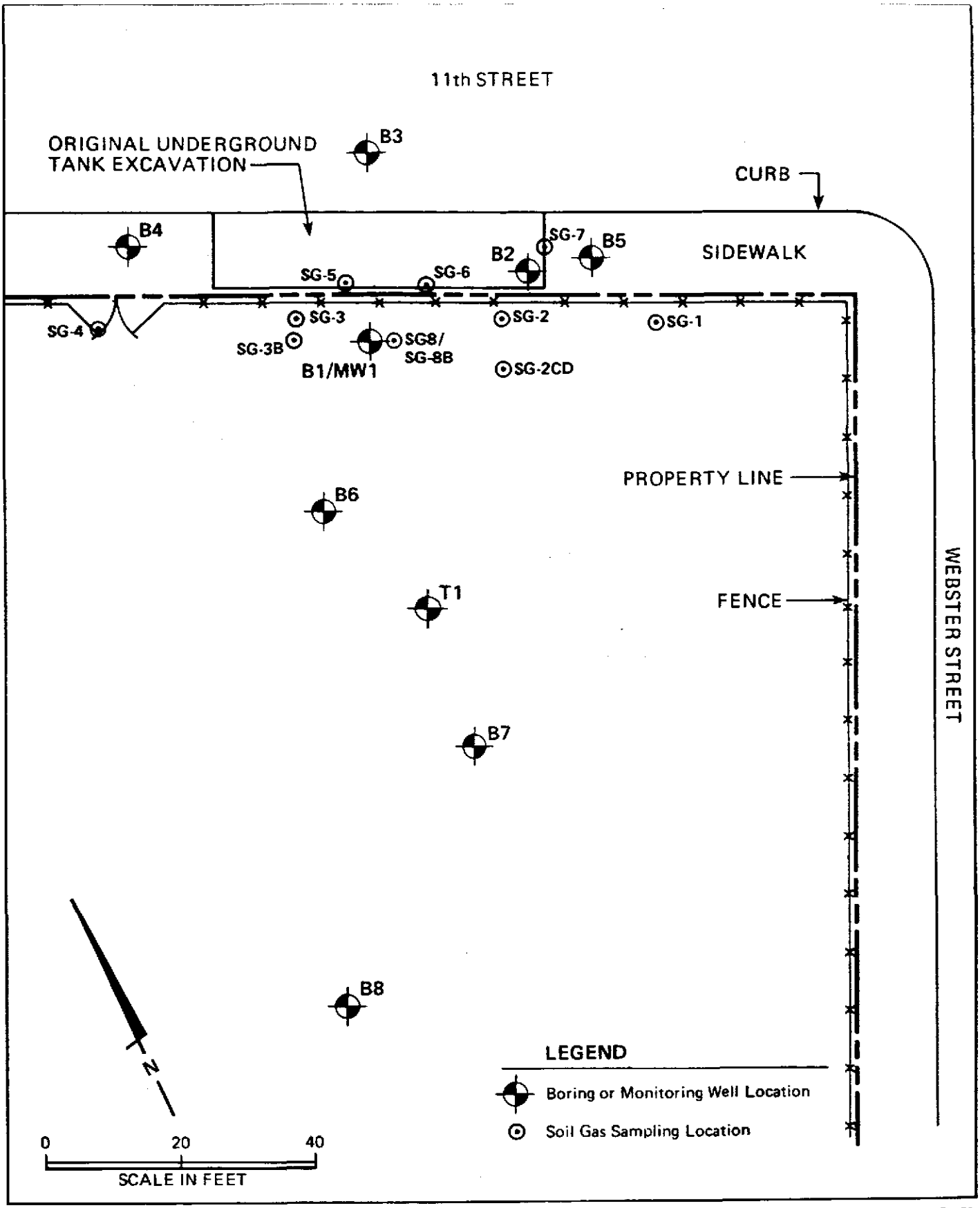
Harding Lawson Associates
Engineers and Geoscientists

Site Location Map
Oakland Chinatown
Oakland, California

PLATE

DRAFT 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CSN	9382,008.01		11/87		



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Engineers and Geoscientists

Site Plan
Oakland Chinatown Tanks
Oakland, California

DRAFT

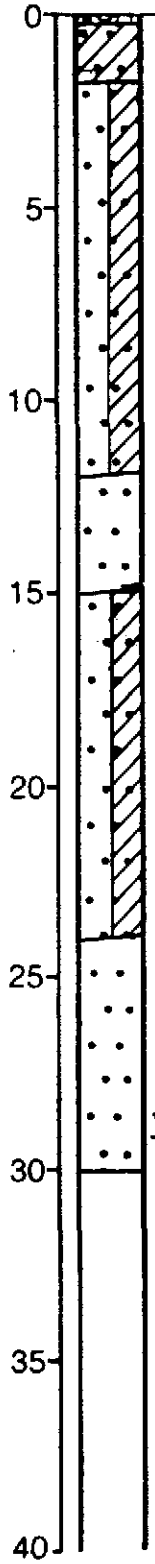
PLATE 2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		

Depth (ft)
Sample

Equipment: Texoma 700 30" Continuous Flight Auger

Elevation: — Date: 9/25/87



CONCRETE

BROWN CLAYEY SAND (SC) medium dense, moist, brick fragments, wood fragments, fill

GRAY CLAYEY SAND WITH GRAVEL (SC) medium dense, medium gravel, wood fragments, fill

RED-BROWN POORLY GRADED SAND WITH CLAY (SP-SC) medium dense, medium sand

RED-BROWN POORLY GRADED SAND WITH CLAY (SP-SC) medium dense, moist, no odor

GRAY POORLY GRADED SAND (SP) medium dense, moist, solvent-like odor

strong petroleum odor at 27.0 ft

▽ water level at 1030, and rising

▽ water level at 0950, and rising

bottom of boring at 30.0 ft

boring backfilled with cuttings

Harding Lawson Associates
Engineers and Geoscientists

Log of Boring T-1
Oakland Chinatown Tanks
Oakland, California

DRAFT 3

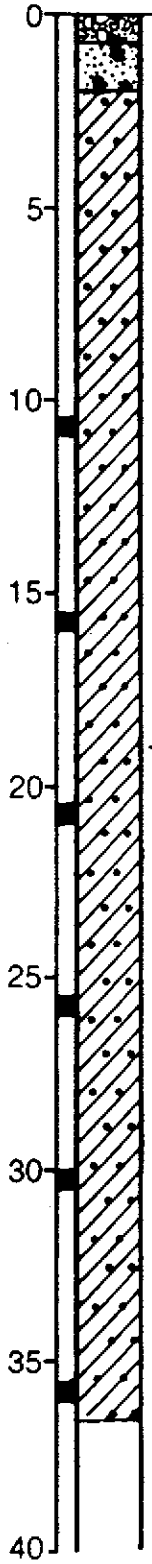
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		

TPH as gasoline (ppb)	Vapor Reading (ppm)
ND	75
ND	80
2,000,000	> 500
2,500,000	> 500
31,000	200

Depth (ft) Sample

Equipment 8" Hollow Stem Auger

Elevation — Date 10/9/87



ASPHALT CONCRETE

BROWN GRAVEL WITH SAND (GP) baserock

BROWN CLAYEY SAND (SC)
medium dense to dense

▽ water level at 1400, 10/9/87

bottom of boring at 36.5 ft

HLA **Harding Lawson Associates**
Engineers and Geoscientists

Log of Boring B-3
Oakland Chinatown Tanks
Oakland, California

DRAFT

PLATE 4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		

TPH as gasoline (ppb)	Vapor Reading (ppm)
ND	90
ND	90
120	125
1,400	
860	

Depth (ft) Sample

Equipment 8" Hollow Stem Auger

Elevation — Date 10/9/87

0 CONCRETE

DARK BROWN SILTY SAND (SM)

BROWN CLAYEY SAND (SC)
medium dense to dense, moist to wet

5

10

15

20

25

30

35

40

water level at 1745, 10/9/87

bottom of boring at 36.5 ft

Harding Lawson Associates
Engineers and Geoscientists

Log of Boring B-4
Oakland Chinatown Tanks
Oakland, California

DRAFT

PLATE 5

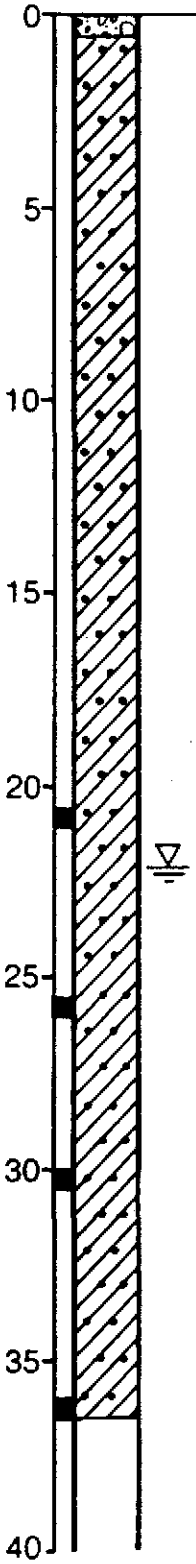
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		

TPH as gasoline (ppb)	Vapor Reading (ppm)
ND	60
2,800,000	>500
29,000	>500
470,000	

Depth (ft) / Sample

Equipment 8" Hollow Stem Auger

Elevation _____ Date 10/9/87



CONCRETE SIDEWALK

BROWN SAND WITH CLAY (SC)
dense to very dense

increase in clay content at 13.0 ft

decrease in clay content at 19.0 ft

water level at 1000, 10/9/87

bottom of boring at 36.5 ft

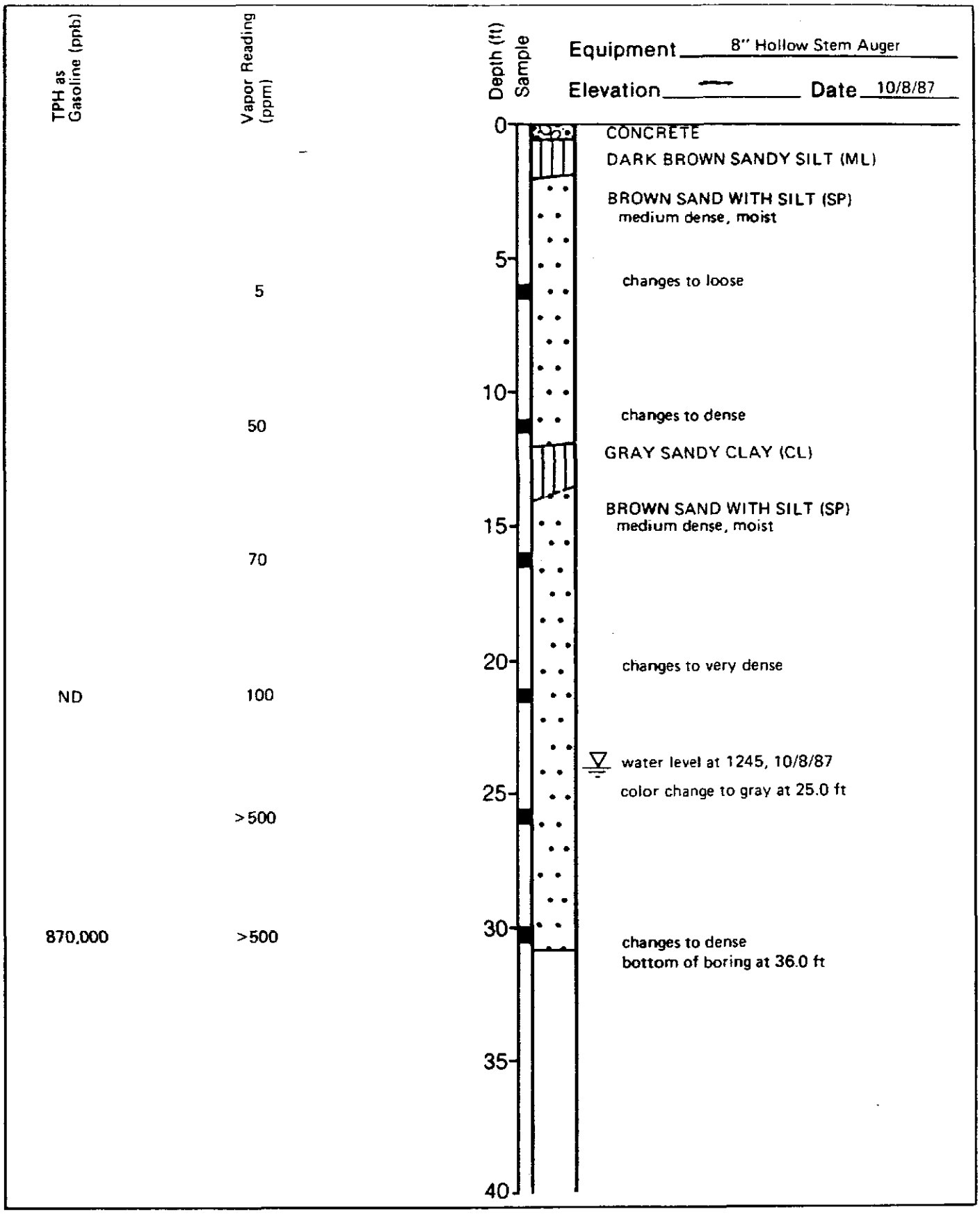
HLA **Harding Lawson Associates**
Engineers and Geoscientists

Log of Boring B-5
Oakland Chinatown Tanks
Oakland, California

DRAFT

PLATE **6**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		



HLA **Harding Lawson Associates**
Engineers and Geoscientists

Log of Boring B-6
Oakland Chinatown Tanks
Oakland, California

DRAFT

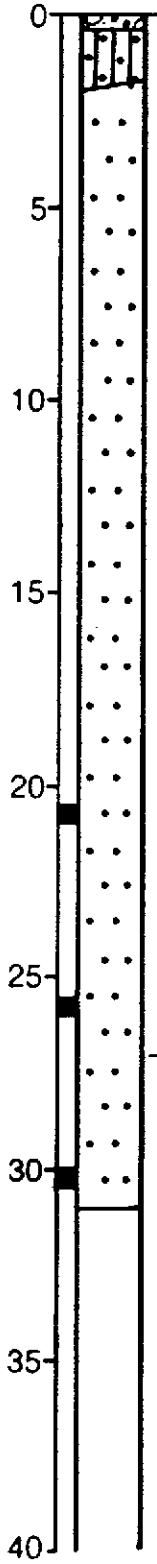
7

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		

TPH as Gasoline (ppb)	Vapor Reading (ppm)	Depth (ft)	Sample

Equipment 8" Hollow Stem Auger

Elevation — Date 10/8/87



CONCRETE

DARK BROWN SILTY SAND (SM)

BROWN SAND WITH CLAY (SP)
dense to very dense, moist to wet

50

1,100

slight odor

water level at 1900, 10/8/87

slight odor
saturated

bottom of boring at 31.0 ft

Harding Lawson Associates
Engineers and Geoscientists

Log of Boring B-7
Oakland Chinatown Tanks
Oakland, California

DRAFT

8

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		

TPH as Gasoline (ppb)	Vapor Reading (ppm)	Depth (ft) Sample	
		0	CONCRETE
			DARK BROWN SILTY SAND (SM)
			BROWN SAND WITH CLAY (SC)
		5	
		10	
		15	
		20	
ND	50		very dense
			changes to mottled gray-brown at 23.0 ft
		25	changes to medium dense
	90		▽ water level at 1615, 10/8/87
		30	changes to very dense
	60		
		35	
330			changes to dense, bottom of boring at 30.8 ft
		40	

Equipment 8" Hollow Stem Auger

Elevation ____ Date 10/8/87

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Engineers and Geoscientists

Log of Boring B-8
Oakland Chinatown Tanks
Oakland, California

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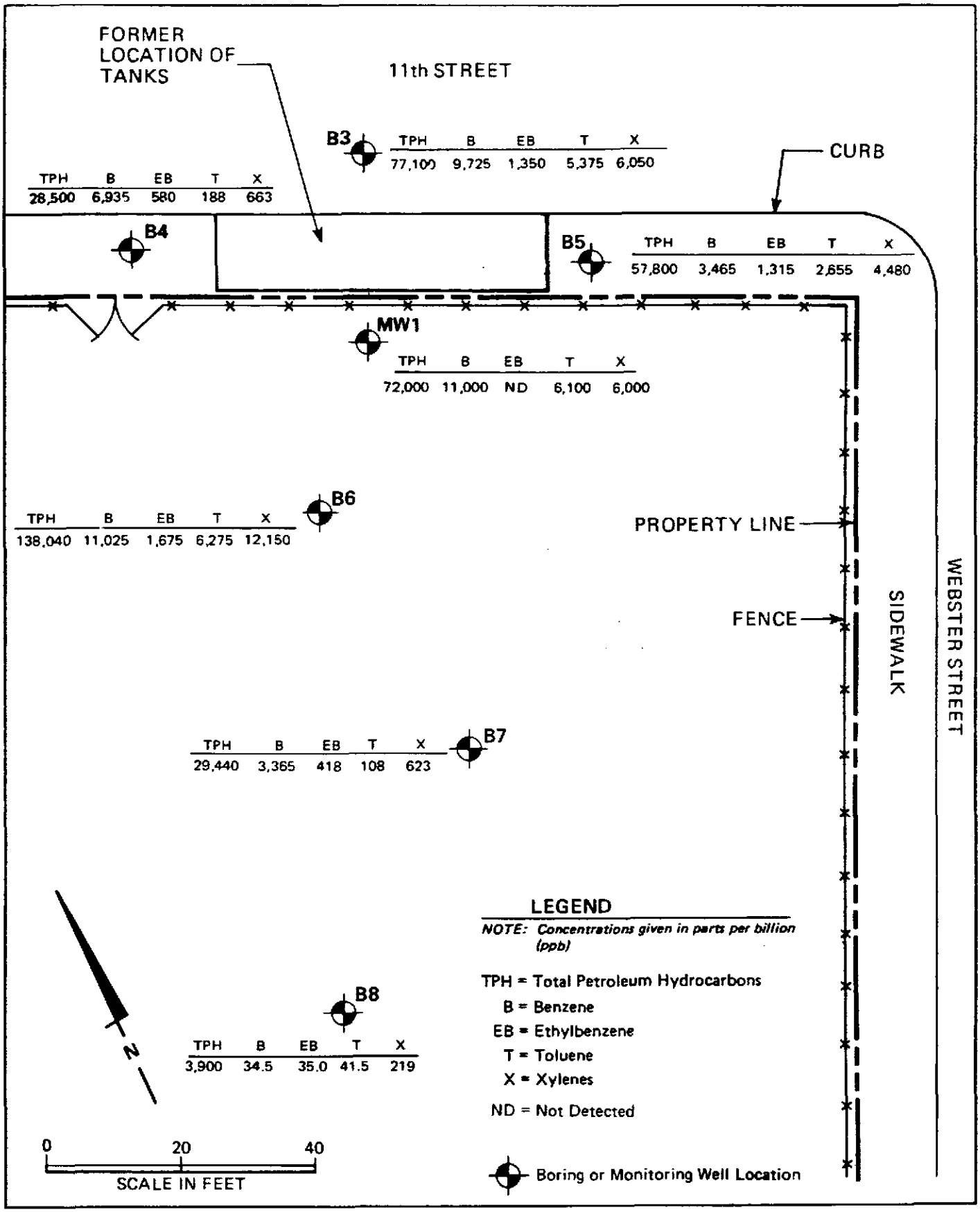
PLATE 9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		



Harding Lawson Associates
Engineers and Geoscientists

Groundwater Chemistry Distribution Map
Oakland Chinatown Tanks
Oakland, California

PLATE
DRAFT 0

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
JAS	09382,008.01		10/87		

Appendix

LABORATORY REPORTS

ANATEC
LABORATORIES
INC.

435 Tesconi Circle • Santa Rosa, California 95401 • 707-526-7200

Mr. Wayne Haydon
Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94947

September 22, 1987
ANATEC Log No: **1197** (1-12)
Series No: 281/068
Client Ref: (V) W. Haydon

Subject: ASAP Priority (On-site) Collection and Analysis of Soil Gas Samples at the Vacant Lot on 11th and Webster Streets, Oakland, CA on September 9, 1987.

Dear Mr. Haydon:

Analysis of the samples referenced above has been completed. This report is written in confirmation of results transmitted verbally on-site, September 9, 1987.

Collection and analysis of samples were performed by ANATEC field chemists. Samples of soil gas were obtained from eight stations established on the property by personnel of Harding Lawson Associates (HLA).

At each designated station, soil gas samples were obtained at depths ranging between 11.5 and 18 feet. Samples were collected via 1/2-inch I.D. galvanized probes which had been thoroughly cleaned with detergent and steam. Installation of the probes to the required depths was accomplished with a pneumatic driver.

Upon installation, a manually operated vacuum pump was used to draw gas from the soil through the probe. After purging the probe of several static volumes, samples were obtained in 300-mL glass sampling vessels, pre-evacuated to approximately 0.2 psia. A valve fitted to the sampling probe permitted sample collection to the exclusion of atmosphere. An in-line vacuum gauge served to indicate both the rate and the extent to which the gas vessels filled.

Shortly after collection, samples were analyzed in a mobile laboratory equipped with a Hewlett-Packard gas chromatograph with flame ionization, Hall electrolytic conductivity, and photoionization detectors. Two milliliters of sample volume were withdrawn from the sampling vessels by means of a gas-tight syringe, brought to atmospheric pressure, then injected directly into the chromatograph. Additionally, vessels were prepared in the same fashion to represent method blanks, probe blanks, high purity commercial standards, and sample replicates.

Analyte concentrations in soil gas samples were determined by comparing response (integrated peak area) of the chromatographic system to samples with response to standards.

Results of analyses are summarized in Table 1. Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

Lisa Hansard for
William G. Rotz, Manager
Field Chemistry

Approved by:

Greg Anderson, Director
Analytical Laboratories

/hs

TABLE 1. SUMMARIZED ANALYTICAL RESULTS FOR SOIL GAS SAMPLES COLLECTED AT 11TH AND WEBSTER STREETS, OAKLAND, CA ON SEPTEMBER 9, 1987

ANATEC Lab No.	Station & Soil Depth		Results (ppm_v)[a] Benzene	Toluene	Total Xylenes	Other Volatile Halocarbons	Volatile Petroleum Hydrocarbons, as Gasoline (mg/L)[b]
1197-1	1	11.5'	<0.025	<0.025	<0.025	<0.025	<10
1197-2	2	11.67'	<0.025	<0.025	<0.025	<0.025	<10
1197-3	2CD	17'	<0.025	<0.025	<0.025	<0.025	<10
1197-4	3	12'	<0.025	<0.025	<0.025	<0.025	<10
1197-5	3	18.5'	<0.025	<0.025	<0.025	<0.025	<10
1197-6	4	11.75'	<0.025	<0.025	<0.025	<0.025	<10
1197-7	5	18'	2,400	1,300	850	<0.025	170
1197-8	6	15.5'	5,100	2,200	1,600	<0.025	290
1197-9	7	12'	190	99	49	<0.025	11
1197-10	8	6'	140	46	21	<0.025	<10
1197-11	8B	17' 2nd Sample	270	59	7.0	<0.025	17
1197-12	8B	17'	<0.025	<0.025	<0.025	<0.025	<10

[a] ppm_v--Data are expressed in units of micromoles analyte per mole of soil gas, unless otherwise noted.

[b] mg/L--Data are expressed in units of milligrams analyte per liter-volume of sample.

WESCO Laboratories

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	16-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	16-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	8 days

LAB # 7-10200 MATRIX: Soil

CLIENT'S ID B3-15.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	0.5	0.2
Toluene	0.6	0.2
Ethylbenzene	N.D.	0.2
Xylene	N.D.	0.2
Gasoline	N.D.	50.0

N.D.: Not detected

Analytical Supervisor

14 Galli Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company, Inc

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	16-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	16-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	8 days

LAB # 7-10201 MATRIX: Soil

CLIENT'S ID B3-20.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	0.5	0.2
Toluene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Xylene	N.D.	0.2
Gasoline	N.D.	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge Date:	16-Oct-87
Preservatives:	none		
Analyst:	S.O'Keefe	Analysis Completion Date:	16-Oct-87
WESCO JOB #:	HLA 8757-L		
Analytical Method:	EPA 5030/8015/8020	Hold Time:	8 days

LAB # 7-10202 MATRIX: Soil

CLIENT'S ID B3-25.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	5800	0.20
Toluene	13400	0.20
Ethylbenzene	14600	0.20
Xylene	50000	0.20
Gasoline	2000000	50.00

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatovn
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	16-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	16-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	8 days

LAB # 7-10203 MATRIX: Soil

CLIENT'S ID B3-30.0

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	14000	0.2
Toluene	10000	0.2
Ethylbenzene	21000	0.2
Xylene	47100	0.2
Gasoline	2500000	50.0

N.D.: Not detected

Analytical Supervisor

Report Date: 05-Nov-87
Client: Harding Lawson Associates

Sampled by: L. Poksay
Submitted by: L. Poksay
Preservatives: none
Analyst: S.O'Keefe
WESCO JOB #: HLA 8757-L
Analytical Method: EPA 5030/8015/8020

Client Contract/PO: 09382,001.01
Date Sampled 08-Oct-87 09-Oct-87
Site: Oakland Chinatown
Date Received: 12-Oct-87
Extract/Digest/Purge Date: 16-Oct-87
Analysis Completion Date: 16-Oct-87
Hold Time: 8 days

LAB # 7-10204
CLIENT'S ID B3-35.5

MATRIX: Soil

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	350	0.2
Toluene	450	0.2
Ethylbenzene	350	0.2
Xylene	850	0.2
Gasoline	31000	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatovn
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	26-Oct-87
Analyst:	R. Moezzi	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	26-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	18 days

LAB # 7-10205 MATRIX: Soil

CLIENT'S ID B4-15.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	N.D.	0.2
Toluene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Xylene	N.D.	0.2
Gasoline	N.D.	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	**Client Contract/PO:**	09382,001.01
Client:	Harding Lawson Associates	**Date Sampled:**	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	**Date Received:**	12-Oct-87
Submitted by:	L. Poksay	**Extract/Digest/Purge Date:**	19-Oct-87
Preservatives:	none		
Analyst:	S.O'Keefe	**Analysis Completion Date:**	19-Oct-87
WESCO JOB #:	HLA 8757-L		
Analytical Method:	EPA 5030/8015/8020	**Hold Time:**	11 days

LAB # 7-10206 MATRIX: Soil

CLIENT'S ID B4-20.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	N.D.	0.2
Toluene	3.0	0.2
Ethylbenzene	N.D.	0.2
Xylene	N.D.	0.2
Gasoline	N.D.	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	19-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	19-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	11 days

LAB # 7-10207 MATRIX: Soil

CLIENT'S ID B4-25.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	11.7	0.2
Toluene	N.D.	0.2
Ethylbenzene	1.0	0.2
Xylene	24.3	0.2
Gasoline	120.0	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	19-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	19-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	11 days

LAB # 7-10208 MATRIX: Soil

CLIENT'S ID B4-30.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	740.0	0.2
Toluene	61.8	0.2
Ethylbenzene	556.0	0.2
Xylene	606.0	0.2
Gasoline	1,400.0	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	19-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	19-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	11 days

LAB # 7-10209 MATRIX: Soil

CLIENT'S ID B4-35.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	525.0	0.2
Toluene	14.0	0.2
Ethylbenzene	29.5	0.2
Xylene	198.0	0.2
Gasoline	860.0	50.0

N.D.: Not detected

Analytical Supervisor

Report Date: 05-Nov-87
Client: Harding Lawson Associates

Sampled by: L. Poksay
Submitted by: L. Poksay
Preservatives: none
Analyst: S.O'Keefe
WESCO JOB #: HLA 8757-L
Analytical Method: EPA 5030/8015/8020

Client Contract/PO: 09382,001.01
Date Sampled: 08-Oct-87 09-Oct-87
Site: Oakland Chinatown
Date Received: 12-Oct-87
Extract/Digest/Purge Date: 21-Oct-87
Analysis Completion Date: 21-Oct-87
Hold Time: 13 days

LAB # 7-10211
CLIENT'S ID BS-20.5

MATRIX: Soil

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	N.D.	0.2
Toluene	0.5	0.2
Ethylbenzene	N.D.	0.2
Xylene	N.D.	0.2
Gasoline	N.D.	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatovn
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	21-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	21-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	13 days

LAB # 7-10213 MATRIX: Soil

CLIENT'S ID B5-25.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	8,300	0.2
Toluene	10,000	0.2
Ethylbenzene	28,000	0.2
Xylene	197,000	0.2
Gasoline	2,800,000	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	21-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	21-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	13 days

LAB # 7-10210 MATRIX: Soil

CLIENT'S ID BS-30.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	21	0.2
Toluene	100	0.2
Ethylbenzene	270	0.2
Xylene	880	0.2
Gasoline	29,000	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge Date:	26-Oct-87
Preservatives:	none		
Analyst:	R. Moezzi	Analysis Completion Date:	26-Oct-87
WESCO JOB #:	HLA 8757-L		
Analytical Method:	EPA 5030/8015/8020	Hold Time:	18 days

LAB # 7-10212 MATRIX: Soil

CLIENT'S ID B5-35.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	13047	0.2
Toluene	942	0.2
Ethylbenzene	1232	0.2
Xylene	6594	0.2
Gasoline	470000	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge Date:	21-Oct-87
Preservatives:	none		
Analyst:	S.O'Keefe	Analysis Completion Date:	21-Oct-87
WESCO JOB #:	HLA 8757-L		
Analytical Method:	EPA 5030/8015/8020	Hold Time:	13 days

LAB # 7-10214 MATRIX: Soil

CLIENT'S ID B6-21.0

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	N.D.	0.2
Toluene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Xylene	N.D.	0.2
Gasoline	N.D.	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	21-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	21-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	13 days

LAB # 7-10216 MATRIX: Soil

CLIENT'S ID B6-30.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	4,800	0.2
Toluene	6,000	0.2
Ethylbenzene	5,600	0.2
Xylene	24,900	0.2
Gasoline	870,000	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	21-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	21-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	13 days

LAB # 7-10218 MATRIX: Soil

CLIENT'S ID B7-25.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	4.9	0.2
Toluene	0.7	0.2
Ethylbenzene	1.9	0.2
Xylene	3.4	0.2
Gasoline	1,100.0	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	21-Oct-87
Analyst:	S.O'Keefe	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	21-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	13 days

LAB # 7-10220 MATRIX: Soil

CLIENT'S ID B8-20.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	N.D.	0.2
Toluene	N.D.	0.2
Ethylbenzene	N.D.	0.2
Xylene	N.D.	0.2
Gasoline	N.D.	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	**Client Contract/PO:**	09382,001.01
Client:	Harding Lawson Associates	**Date Sampled:**	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	**Date Received:**	12-Oct-87
Submitted by:	L. Poksay	**Extract/Digest/Purge**	
Preservatives:	none	**Date:**	23-Oct-87
Analyst:	R. Moezzi	**Analysis Completion**	
WESCO JOB #:	HLA 8757-L	**Date:**	23-Oct-87
Analytical Method:	EPA 5030/8015/8020	**Hold Time:**	15 days

LAB # 7-10223 **MATRIX:** Soil

CLIENT'S ID B8-35.5

COMPOUND	RESULT (ug/kg)	Detection Limit (ug/kg)
Benzene	1.4	0.2
Toluene	18.7	0.2
Ethylbenzene	1.0	0.2
Xylene	4.5	0.2
Gasoline	330.0	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge Date:	22-Oct-87
Preservatives:	none		
Analyst:	D. Oram	Analysis Completion Date:	22-Oct-87
WESCO JOB #:	HLA 8757-L		
Analytical Method:	EPA 5030/8015/8020	Hold Time:	14 days

LAB # 7-10225 MATRIX: WATER

CLIENT'S ID 8710093

COMPOUND	RESULT (ug/L)	Detection Limit (ug/L)
Benzene	9725	0.2
Toluene	5375	0.2
Ethylbenzene	1350	0.2
Xylene	6050	0.2
Gasoline	77100	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge Date:	22-Oct-87
Preservatives:	none		
Analyst:	D. Oram	Analysis Completion Date:	22-Oct-87
WESCO JOB #:	HLA 8757-L		
Analytical Method:	EPA 5030/8015/8020	Hold Time:	14 days

LAB # 7-10228 MATRIX: WATER

CLIENT'S ID 8710094

COMPOUND	RESULT (ug/L)	Detection Limit (ug/L)
Benzene	6935	0.2
Toluene	188	0.2
Ethylbenzene	580	0.2
Xylene	663	0.2
Gasoline	28500	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge Date:	22-Oct-87
Preservatives:	none		
Analyst:	D. Oras	Analysis Completion Date:	22-Oct-87
WESCO JOB #:	HLA 8757-L		
Analytical Method:	EPA 5030/8015/8020	Hold Time:	14 days

LAB # 7-10231 MATRIX: WATER

CLIENT'S ID 8710095

COMPOUND	RESULT (ug/L)	Detection Limit (ug/L)
Benzene	3465	0.2
Toluene	2655	0.2
Ethylbenzene	1315	0.2
Xylene	4480	0.2
Gasoline	57800	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled:	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	22-Oct-87
Analyst:	D. Oram	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	22-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	14 days

LAB # 7-10234 MATRIX: WATER

CLIENT'S ID 8710086

COMPOUND	RESULT (ug/L)	Detection Limit (ug/L)
Benzene	11025	0.2
Toluene	6275	0.2
Ethylbenzene	1675	0.2
Xylene	12150	0.2
Gasoline	138040	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	**Client Contract/PO:**	09382,001.01
Client:	Harding Lawson Associates	**Date Sampled:**	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	**Date Received:**	12-Oct-87
Submitted by:	L. Poksay	**Extract/Digest/Purge**	
Preservatives:	none	**Date:**	22-Oct-87
Analyst:	D. Oram	**Analysis Completion**	
WESCO JOB #:	HLA 8757-L	**Date:**	22-Oct-87
Analytical Method:	EPA 5030/8015/8020	**Hold Time:**	14 days

LAB # 7-10237 **MATRIX: WATER**

CLIENT'S ID 8710087

COMPOUND	RESULT (ug/L)	Detection Limit (ug/L)
Benzene	3365	0.2
Toluene	108	0.2
Ethylbenzene	418	0.2
Xylene	623	0.2
Gasoline	29440	50.0

N.D.: Not detected

Analytical Supervisor

Report Date:	05-Nov-87	Client Contract/PO:	09382,001.01
Client:	Harding Lawson Associates	Date Sampled	08-Oct-87 09-Oct-87
		Site:	Oakland Chinatown
Sampled by:	L. Poksay	Date Received:	12-Oct-87
Submitted by:	L. Poksay	Extract/Digest/Purge	
Preservatives:	none	Date:	22-Oct-87
Analyst:	D. Oram	Analysis Completion	
WESCO JOB #:	HLA 8757-L	Date:	22-Oct-87
Analytical Method:	EPA 5030/8015/8020	Hold Time:	14 days

LAB # 7-10240 MATRIX: WATER

CLIENT'S ID 8710088

COMPOUND	RESULT (ug/L)	Detection Limit (ug/L)
Benzene	34.5	0.2
Toluene	41.5	0.2
Ethylbenzene	35.0	0.2
Xylene	219.0	0.2
Gasoline	3,900.0	50.0

N.D.: Not detected

Analytical Supervisor

BLANK, DUPLICATE AND SPIKE REPORT FOR JOB # HLA 8757-L
Lab #: 7-1200 7-10201 7-10202 7-10203 7-10204
METHOD: EPA 5030/8015/8020

COMPOUND	Blank ug/kg	Duplicate % deviation 7-10200	Spike % recovery 7-10200	Detection Limit (ug/kg)
Sample #				
Benzene	N.D.	0	89	0.2
Toluene	N.D.	16	88	0.2
Ethylbenzene	N.D.	1.4	88	0.2
Xylene	N.D.	0	88	0.2
Gasoline	N.D.	18	94	50.0

Remarks

N.S.: Not Spiked
N.S.: Not detected

Analytical Supervisor

BLANK, DUPLICATE AND SPIKE REPORT FOR JOB # HLA 8757-L
Lab #: 7-1206 7-10207 7-10208 7-10209
METHOD: EPA 5030/8015/8020

COMPOUND	Blank ug/kg	Duplicate % deviation	Spike % recovery	Detection Limit (ug/kg
Sample #		7-10206	7-10206	
Benzene	N.D.	0	107	0.2
Toluene	N.D.	62	49	0.2
Ethylbenzene	N.D.	0	52	0.2
Xylene	N.D.	0	89	0.2
Gasoline	N.D.	0	107	50.0
Remarks				

N.S.: Not Spiked
N.S.: Not detected

Analytical Supervisor

BLANK, DUPLICATE AND SPIKE REPORT FOR JOB # HLA 8757-L
Lab #: 7-1205 7-10212
METHOD: EPA 5030/8015/8020

COMPOUND	Blank ug/kg	Duplicate % deviation	Spike % recovery	Detection Limit (ug/kg
Sample #		7-10205	7-10205	
Benzene	N.D.	6.9	99	0.2
Toluene	N.D.	24.0	99	0.2
Ethylbenzene	N.D.	7.6	96	0.2
Xylene	N.D.	3.1	98	0.2
Gasoline	N.D.	4.4	100	50.0
Remarks				

N.S.: Not Spiked
N.S.: Not detected

Analytical Supervisor

BLANK, DUPLICATE AND SPIKE REPORT FOR JOB # HLA 8757-L
Lab #: 7-1210 7-10211 7-10213 7-10214 7-102216 7-10218 7-10220
METHOD: EPA 5030/8015/8020

COMPOUND	Blank ug/kg	Duplicate % deviation	Spike % recovery	Detection Limit (ug/kg
Sample #		7-10214	7-10220	
Benzene	N.D.	0	26	0.2
Toluene	N.D.	0	67	0.2
Ethylbenzene	N.D.	0	81	0.2
Xylene	N.D.	0	82	0.2
Gasoline	N.D.	0	103	50.0

Remarks

N.S.: Not Spiked
N.S.: Not detected

Analytical Supervisor

BLANK, DUPLICATE AND SPIKE REPORT FOR JOB # HLA 8757-L
Lab #: 7-10223
METHOD: EPA 5030/8015/8020

COMPOUND	Blank ug/kg	Duplicate % deviation	Spike % recovery	Detection Limit (ug/kg
Sample #		7-10206	7-10206	
Benzene	N.D.	0	98	0.2
Toluene	N.D.	60	54	0.2
Ethylbenzene	N.D.	20	81	0.2
Xylene	N.D.	19	82	0.2
Gasoline	N.D.	19	53	50.0
Remarks				

N.S.: Not Spiked
N.S.: Not detected

Analytical Supervisor

BLANK, DUPLICATE AND SPIKE REPORT FOR JOB # HLA 8757-L
Lab #: 7-10225 7-10228 7-10231 7-10234 7-10237 7-10240
METHOD: EPA 5030/8015/8020

COMPOUND	Blank ug/l	Duplicate % deviation	Spike % recovery	Detection Limit (ug/l)
Sample #		7-10240	7-10240	
Benzene	N.D.	4.8	79	0.2
Toluene	N.D.	10.9	78	0.2
Ethylbenzene	N.D.	10.4	90	0.2
Xylene	N.D.	8.7	95	0.2
Gasoline	N.D.	123	88	50.0
Remarks				

N.S.: Not Spiked
N.S.: Not detected

Analytical Supervisor

WESCO Laboratories

Chain of Custody Record

Client: HARDING LAWSON

Site: OAKLAND CHINATOWN

Phone#: 892-0821

Purchase order #:

Contact: Linda Poksay

Turnaround time: REGULAR

Job Number	Date/Time Sampled	Sampler(s) (signatures)	Sampler Affiliation
09382.00B01	10/8/87-10/9/87	Dave Montague	HLA-Sta. Rosa

Lab No.	Sample ID	Description	Remarks / Notes / Analyses Requested
10199	B3-10.5	SOIL	5030/8015/8020
10200	B3-15.5		" " 10ffo verbal per Linda
10201	B3-20.5		" " Poksay - change B2 to B3
202	B3-25.5		" "
203	B3-30.0		"
204	B3-35.5		"
205	B4-15.5		"
206	B4-20.5		" "
207	B4-25.5		" "
208	B4-30.5		" "
209	B4-35.5		" "
210	B5-20.5		" "
211	B5-25.5		" "

Relinquished by (print)	Date/Time/Location	Received by (print)
LINDA POKSAY	10/10/87 / NOVATO 8:30AM	Greg R. Zitney
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliationn**
Linda M. Poksay / HLA		Greg R. Zitney WESCO Labs
Relinquished by (print)	**Date/Time/Location**	**Received by (print)**
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliation**

FAX REPORT

Notes: Received in lab 10/12 by M. Casey

14 Galli Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company, Inc

WESCO Laboratories

Chain of Custody Record

Client: HLA — Site: OAK. CHINATOWN

Phone#: 892-0821 — Purchase order #:

Contact: LINDA POKSAY — Turnaround time: Reg.

Job Number	Date/Time Sampled	Sampler(s) (signatures)	Sampler Affiliation

Lab No.	Sample ID	Description	Remarks / Notes / Analyses Requested
210	B5-30.0	SOIL	" "
213	B5-35.5		" "
214	B6-21.0		" "
215	B6-25.5		hold
216	B6-30.5		5030/8015/8020
217	B7-20.5		hold
218	B7-25.5		5030/8015/8020
219	B7-30.0		hold
220	B8-20.5		5030/8015/8020
221	B8-25.5		hold
222	B8-30.0		hold
223	B8-35.5		5030/8015/8020
224			

Relinquished by (print)	Date/Time/Location	Received by (print)
LINDA POKSAY	10/10/87 / NOVATO	Greg R. Zitney
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliation**
Linda Poksay / HLA		Greg R Zitney
Relinquished by (print)	**Date/Time/Location**	**Received by (print)**
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliation**

Notes: Received in lab 10/12 by M. Casey

14 Galli Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company, Inc.

WESCO Laboratories

Chain of Custody Record

Client: HLA

Site: OAK. CHINATOWN

Phone#: 892-0821

Purchase order #:

Contact: LINDA POKSAY

Turnaround time: Reg.

Job Number	Date/Time Sampled	Sampler(s) (signatures)	Sampler Affiliation
	10/8/87 → 10/9/87	Dave Montague	HLA-Sta. Rosa

Lab No.	Sample ID	Description	Remarks / Notes / Analyses Requested
224	87100093	GROUNDWATER	5030/8015/8020
27	87100094		" "
230	87100095		" " Held
33	87100086		" "
36	87100087		" "
39-41	87100088		" "
Note: Will phone in on Mon., 10/12/87, samples to be analyzed for TPHx BTX-E.			

Relinquished by (print)	Date/Time/Location	Received by (print)
LINDA POKSAY	10/10/87/NOVATO	Greg R. Zitney
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliation**
Linda Poksay/HLA		Greg R Zitney
Relinquished by (print)	**Date/Time/Location**	**Received by (print)**
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliation**

Notes: Received in Lab 10/12 by M. Casey

14 Galli Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company, Inc.

ANALYTICAL SCIENCE ASSOCIATES, Inc.
475 EL ALAMO • DANVILLE, CA 94526 • (415) 820-9058 • (415) 547-6390

HLA PROJECT NO. 9382,006.01
CHINATOWN REDEVELOPMENT
SEPTEMBER 21, 1987
ATTENTION: M. SIEMBIEDA

DATE SAMPLED: 8/28/87
DATE ANALYZED: 9/2/87
MATRIX: WATER
PREFIX: MW-1

	MW-1
TPH (GASOLINE)	72,000

All values in ppb.

Signed: William Prater
William Prater
Senior Scientist

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-09-025

Received: 01 SEP 87
Reported: 16 SEP 87

Mr. Bill Prater
Analytical Science Associates, Inc.
475 El Alamo
Danville, California 94526

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, WASTEWATER SAMPLES	DATE SAMPLED
09-025-1	MW1 05382,006 RVB	28 AUG 87

PARAMETER	09-025-1
Purgeable Priority Pollutants	
Extraction	09.12.87
1,1,1-Trichloroethane, ug/L	<50
1,1,2,2-Tetrachloroethane, ug/L	<50
1,1,2-Trichloroethane, ug/L	<50
1,1-Dichloroethane, ug/L	<50
1,1-Dichloroethylene, ug/L	<50
1,2-Dichloroethane, ug/L	<50
1,2-Dichloropropane, ug/L	<50
1,3-Dichloropropene, ug/L	<50
2-Chloroethylvinylether, ug/L	<50
Acrolein, ug/L	<500
Acrylonitrile, ug/L	<500
Bromodichloromethane, ug/L	<50
Bromomethane, ug/L	<50
Benzene, ug/L	11000
Chlorobenzene, ug/L	<50
Carbon Tetrachloride, ug/L	<50
Chloroethane, ug/L	<50
Bromoform, ug/L	<50
Chloroform, ug/L	<50
Chloromethane, ug/L	<50
Dibromochloromethane, ug/L	<50
Ethylbenzene, ug/L	<50
Methylene chloride, ug/L	<50

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-09-025

Received: 01 SEP 87
Reported: 16 SEP 87

Mr. Bill Prater
Analytical Science Associates, Inc.
475 El Alamo
Danville, California 94526

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, WASTEWATER SAMPLES	DATE SAMPLED
09-025-1	MW1 05382,006 RVB	28 AUG 87

PARAMETER	09-025-1
Tetrachloroethylene, ug/L	<50
Trichloroethylene, ug/L	<50
Trichlorofluoromethane, ug/L	<50
Toluene, ug/L	6100
Vinyl chloride, ug/L	<50
trans-1,2-Dichloroethylene, ug/L	<50
trans-1,3-Dichloropropene, ug/L	<50
Semi-Quantified Results **	
C5H10 Hydrocarbon, ug/L	2000
C5H12 Hydrocarbon, ug/L	2000
C6H10O2 (Ether ketone), ug/L	1000
C6H12 Hydrocarbon, ug/L	2000
C7H14 Hydrocarbon, ug/L	2000
Total Xylene Isomers, ug/L	6000

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

Linda Brack for
D. A. McLean, Laboratory Director

WESCO Laboratories

OCT 15

Chain of Custody Record

Client: HARDING LAWSON | Site: OAKLAND CHINATOWN

Phone#: 892-0821 | Purchase order #:

Contact: Linda Poksay | Turnaround time: REGULAR

Job Number	Date/Time Sampled	Sampler(s) (signatures)	Sampler Affiliation
09382.08.01	10/8/87-10/9/87	Dave Montague	HLA-Sta. Rosa

Lab No.	Sample ID	Description	Remarks / Notes / Analyses Requested
10199	B3-10.5	Soil	~~5030/8015/8020~~ hold
10200	B3-15.5		5030/8015/8020
10201	B3-20.5		" "
202	B3-25.5		" "
203	B3-30.0		"
204	B3-35.5		"
205	B4-15.5		"
206	B4-20.5		" "
207	B4-25.5		" "
208	B4-30.0		" "
209	B4-35.5		" "
210	B5-20.5		" "
211	B5-25.5		" "

Relinquished by (print)	Date/Time/Location	Received by (print)
LINDA POKSAY	10/10/87/NOVATO 8:30AM	Greg R. Zitney
Relinquished by (sign)/Affiliation		Received by (sign)/Affiliation
Linda M. Poksay/HLA		Greg R. Zitney WESCO Labs
Relinquished by (print)	Date/Time/Location	Received by (print)
Relinquished by (sign)/Affiliation		Received by (sign)/Affiliation

Notes: Received in lab 10/12 by M. Casey

14 Galli Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company Inc

WESCO Laboratories

Chain of Custody Record

Client: HLA — Site: OAK. CHINATOWN

Phone#: 892-0821 — Purchase order #:

Contact: LINDA POKSAY — Turnaround time: Reg.

Job Number	Date/Time Sampled	Sampler(s) (signatures)	Sampler Affiliation

Lab No.	Sample ID	Description	Remarks / Notes / Analyses Requested
212	B5-30.5	Soil	" "
213	B5-35.5		" "
214	B6-21.0		" "
215	B6-25.5		hold
216	B6-30.5		5030/8015/8020
217	B7-20.5		hold
218	B7-25.5		5030/8015/8020
219	B7-30.0		hold
220	B8-20.5		5030/8015/8020
221	B8-25.5		hold
222	B8-30.0		hold
223	B8-35.5		5030/8015/8020
224			

Relinquished by (print)	Date/Time/Location	Received by (print)
LINDA POKSAY	10/10/87 / NOVATO	Greg R. Zitney
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliation**
Linda Poksay / HLA		Greg R. Zitney
Relinquished by (print)	**Date/Time/Location**	**Received by (print)**
Relinquished by (sign)/Affiliation		**Received by (sign)/Affiliation**

Notes: Received in lab 10/12 by M. Casey

14 Galli Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company, Inc

WESCO Laboratories

Chain of Custody Record

Client: HLA — Site: OAK. CHINATOWN

Phone#: 892-0821 — Purchase order #:

Contact: LINDA POKSAY — Turnaround time: Reg.

Job Number	Date/Time Sampled	Sampler(s) (signatures)	Sampler Affiliation
	10/8/87 → 10/9/87	Dave Montague	HLA-Sta. Rosa

Lab No.	Sample ID	Description	Remarks / Notes / Analyses Requested
224	8710093	GROUNDWATER	5030/8015/8020
227	8710094		" "
230	8710095		Hold " "
33	8710086		" "
36	8710087		" "
39-41	8710088		" "
Note: Well phone in on Mon., 10/12/87, samples to be analyzed for TPH+ BTX+E.			

Relinquished by (print)	Date/Time/Location	Received by (print)
LINDA POKSAY	10/10/87/NOVATO	Greg R. Zitney
Relinquished by (sign)/Affiliation		Received by (sign)/Affiliation
Linda Poksay/HLA		Greg R Zitney
Relinquished by (print)	Date/Time/Location	Received by (print)
Relinquished by (sign)/Affiliation		Received by (sign)/Affiliation

Notes: Received in lab 10/12 by M. Carey

14 Gall Drive, Suite A
Novato, California 94949 415 883-6425
A Division of Western Ecological Services Company, Inc.

CHAIN OF CUSTODY FORM

HLA
[illegible]
7655 Redwood Blvd.
P.O. Box 578
Novato, CA 94948
(415) 892-0821

Samplers: Rick Van Buggen

Job Number: 09382-006.01

Name/Location: Chevron Redevelopment

Project Manager: M. Sremac

Recorder: Rick Van Buggen (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	6-VOA's	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pllnt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	EDB
23	X							6	~~87~~	~~MW~~	1	87	08	23	1395	MW-1	X	X					X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

Samples dropped off in front of lab for refrigeration at front desk.

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) Rick Van Buggen	RECEIVED BY: (Signature)	DATE/TIME 8/28 3:15
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT		

Laboratory Copy Project Office Copy Field or Office Copy

DISTRIBUTION

SUBSURFACE CONTAMINATION INVESTIGATION
CHINATOWN REDEVELOPMENT PROJECT AREA
OAKLAND, CALIFORNIA
December 28, 1987

COPY NO. ____

		Copy No.
3 copies:	City of Oakland Redevelopment Agency One City Hall Plaza Oakland, California 94612	1-3
1 copy:	Job File	4
1 copy:	QC/Bound Report File	5

LMP/MLS/km

QUALITY CONTROL REVIEWER

Christopher R. Smith
Associate Hydrogeologist