COMPLETION REPORT

PHASE II INVESTIGATION E-Z SERVE MOBIL STATION NO. 1235

PREPARED FOR

E-Z SERVE OF CALIFORNIA

BY

CONVERSE ENVIRONMENTAL
CONSULTANTS CALIFORNIA

JUNE 30, 1988

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1. INTRODUCTION

1.1 SITE DESCRIPTION

E-Z Serve Mobil Station No. 1235 ("site") is located at 525 West A Street in Hayward, California (see Drawing 1). The station occupies a 16,000 square-foot area measuring approximately 110 feet by 145 feet. The site is bounded on the south by A Street, and on the east by Garden Avenue. There is a mobile home park on the north boundary of the site and a commercial establishment on the west boundary.

The site is an active fuel dispensing operation. Four underground storage tanks are located in the northwest quadrant of the site (see Drawing 2 and Table 1).

TABLE 1

TANKS AND CONTENTS

TANK NO.	CONTENTS	CAPACITY (GALLONS)
T-1	DIESEL FUEL	10,000
T-2	UNLEADED GASOLINE	10,000
T-3	REGULAR GASOLINE	10,000
T-4	PREMIUM UNLEADED GASOLINE	10,000

1.2 SITE CONDITIONS

A fuel system leak was discovered by E-Z Serve personnel in November 1986, as a result of a discrepancy in inventory reconciliation (CECC, 1987) (see Drawing 2). The product line

was subsequently repaired, with E-Z Serve personnel coordinating repair services. The duration and volume of the leak are unknown.

1.3 REGULATORY STATUS

In accordance with the Guidelines of the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region (1985), the detection of soil contamination levels exceeding 1000 ppm Total Petroleum Hydrocarbons (TPH) categorizes the site as a confirmed "Fuel Case". As such, the RWQCB will require by precedent: (1) abatement of the release; (2) definition of the extent of free product, if found; (3) analysis of ground water for dissolved constituents; and (4) remediation of contaminated soil.

1.4 PREVIOUS INVESTIGATIONS

In December 1986, Converse Environmental Consultants California (CECC) conducted Phase I of a site assessment as a initial step in assessing the extent of gasoline contamination at the site. At that time, soil borings were drilled on the station property to 30± feet below ground surface (bgs). Static water in these borings was 10-15 feet bgs at the time of drilling. The borings were then converted to monitoring wells, designated MW-1 through MW-3 on the Site Plan (see Drawing 2).

Representative soil samples were recovered from each boring and well. These samples were analyzed for TPH as gasoline (TPH-g) by Kennedy/Jenks/Chilton, a State-certified laboratory, using gas chromatography with flame ionization detection. The Phase I soil samples from near the inferred leak contained >1200 ppm TPH-g. For confirmed release cases, The San Francisco Regional Water Quality Objective Guidelines (1985) requires excavation of polluted soils to less than 1000 ppm total hydrocarbons.

After thorough development, ground water from each well was sampled and analyzed for TPH-g, and dissolved constituents benzene, toluene, and xylene (BTX) by EPA Method 602. Groundwater samples from the wells indicated concentrations of TPH-g and BTX well above detection limits (see Table 3). The ground water in MW-2, the well nearest the leak source, contained the highest concentrations of contaminants. Based upon this concentration of dissolved constituents in ground water, this condition is classifiable as a Confirmed Release case by the San Francisco Regional Water Quality Objective Guidelines (1985).

The results of Phase I inferred that gasoline had leaked from underground storage tank piping, contaminating approximately the upper twenty feet of soil near the leak. Subsurface information implied that the leaked gasoline migrated vertically downward through near-surface clay, leading to contamination of underlying saturated clayey sand and ground water. Maximum concentrations

of TPH-g in soil exceeded 1200 ppm at 11 feet bgs approximately 15 feet from the inferred leak. The only significant soil contamination in the other borings occurred within the capillary-fringe at the soil/water interface.

No measurable free product was encountered in the groundwater samples from the onsite wells, but a faint sheen of product was present in most water samples.

The results of Phase I environmental investigations were presented in a Fuel Leak Assessment Report (CECC, March 13, 1987). At the conclusion of Phase I, the following items remained unassessed:

1. The extent of groundwater contamination offsite;

2. The concentrations of TPH-g and BTX in offsite ground water, if any;

3. The potential threat of this groundwater contamination to nearby ground water with actual or potential beneficial use; and

4. The volume of contaminated soil requiring remediation.

Phase II investigations were initiated in June 1987 to assess: (1) the potential threat of contamination of usable groundwater sources, as well as (2) the potential for offsite migration of the groundwater contamination. Several treatment options for contaminated soil and ground water were also examined, and a preliminary remedial action feasibility plan for treatment and/or removal of contaminated soil was prepared, for presentation under separate cover.

TABLE 2

SOIL ANALYSIS RESULTS, ALL BORINGS

WELL NO.	DEPTH (BGS)	TOTAL PETROLEUM HYDROCARBONS (mg/kg) AS GASOLINE	AS DIESEL FUEL
B-1	6', 10', 14', COMPOSITE	0.74	<0.4
B-1	18'	29	<0.4
B-1	23'	15	<0.4
B-2	6'	410	<4
B-2	11'	1200	<4
B-2	16'	200	<4
B-2	21'	80	<4
B-3	10'	<0.1	<0.4
B-3	15'	7.2	18
B-3	21'	51	<4
B-4	5', 10', COMPOSITE	<1	<1.5
B-4	15'	<1	<1.5
B-5	5'	<1	<1.5
B-5	10', 15', COMPOSITE	<1	<1.5
B-6	5', 10', COMPOSITE	<1	<1.5
B-6	15'	8.6, 4.7*	<1.5

*REPLICATE

Analysis performed by gas chromatography, using flame ionization detection. Commercial fuel sample used as comparison standards.

Detection limits: TPH as gasoline: 1 mg/kg
TPH as diesel: 1.5 mg/kg

TABLE 3

GROUNDWATER ANALYSIS RESULTS, ALL WELLS

WELL NO.	SAMPLES COLLECTED JAN-FEB 1987				SAMPLES COLLECTED JUNE 1987			
	TPH* (mg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	XYLENE (µg/L)	TPH* (mg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	XYLENE (µg/L)
MW-1	12	4130	2270	1710	8.1	1500	<10	880
MW-2	51	8800	9000	7700	54	6800	5700	5900
MW-3	15	2900	1600	2200	15	3400	1600	2300
MW-4	--	--	--	--	150	10,000	3100	16,000
MW-5	--	--	--	--	49	5000	3800	4400
MW-6	--	--	--	--	94	14,000	8900	14,000

*AS GASOLINE

Analysis for benzene, toluene, and xylene by EPA Method 602.

Analysis for TPH for capillary gas chromatography, using flame ionization detection. Commercial fuel samples used as comparison standards.

Detection limits: BTX: 1 µg/L
TPH as gasoline: 0.05 mg/L

Phase II was completed in September 1987. The results and interpretation of the Phase II work are presented herein. The work was performed by CECC staff and their subcontractor, Datum Exploration, Inc., under the direction of John Gallinatti, Project Manager.

2. REGIONAL HYDROGEOLOGY

The site lies within the San Leandro Cone, a low-gradient alluvial fan which originates at the mouth of Castro Valley and spreads westward onto the Bay Plain (DWR, 1967). This cone consists of alluvial sediments which overlie marine clay and terrigenous sand and silt of intertidal provenances.

The shallowest regional aquifer in area is a permeable, water-bearing alluvial sand, named the Newark aquifer. This aquifer is a series of laterally discontinuous saturated lenses of coarse to fine sediments 10 to 100 feet thick at depths less than 200 feet. The regional hydraulic gradient is westward, from the mouth of Castro Valley towards the San Francisco Bay.

3. INVESTIGATIVE METHODS

3.1 PHASE II, SITE ASSESSMENT, PURPOSE AND SCOPE

In June, 1987, CECC proceeded with Phase II to assess: (1) the size and location of the groundwater plume onsite and (2) the number of wells within 1/2 mile of the site, which could be impacted by site groundwater contamination. Phase II comprised the tasks described below (see also Table 4).

Task A: Three borings were drilled and monitoring wells installed in same at the site periphery.

Task B: The three former wells and the three new wells were purged and sampled, and groundwater samples were analyzed for TPH-g and BTX.

Task C: All well head elevations were surveyed, groundwater elevations were sampled, and the site groundwater gradient was calculated.

Task D: An inventory of groundwater wells within a 1/2-mile radius of the site was compiled.

Task E: A summary report was prepared describing the work completed and interpretations therefrom.

3.2 INVESTIGATIVE METHODS

The investigative methods used to achieve the Phase II goals are detailed below by task. The rationale for each task is briefly stated, followed by a description of the methodology employed. Each task description concludes with a presentation of results. Conclusions and interpretations are presented in subsequent sections of the report.

3.2.1 Task A: Well Installation and Soil Sampling/Analysis

Rationale: Three borings (see Drawing 2) were drilled at the periphery of the station property to further examine the lateral extent of soil and groundwater contamination, and to assess the possibility for offsite migration of the contaminant plume. Three 2-inch monitoring wells were constructed in each boring (MW-4 through MW-6).

Methodology: Three borings, designated MW-4 through MW-6, were drilled on June 18, 1987 at the locations shown on the Site Plan (Drawing 2). The borings were drilled by Datum Exploration, Inc. to 30 to 31 feet bgs using an 8-inch hollow-stem auger (see Appendix C for detailed description). The soil cuttings from these borings were logged in detail using the Unified Soil Classification System (USCS) (see Appendix B for Boring Logs). Soil cuttings obtained during drilling were stored onsite in DOT-approved hazardous waste drums, where they remain as of this writing.

As summarized in Appendix C, the following procedures were followed in collecting soil samples. Samples for chemical analysis were taken at five to seven-foot intervals throughout the length of each boring using a 2.5-inch I.D. modified California split-barrel sampler equipped with clean brass sample liners. Before each use, the sampler was cleaned by scrubbing with alconox and rinsing with distilled water. The soil samples were retained in the 6-inch long brass liners, and immediately capped, labeled and sealed upon removal from the sampler. The samples were then packed with reusable refrigerant in insulated containers at approximately 4°C, and transported to the laboratory. Prior to testing, the samples were stored in the absence of light under refrigerated conditions.

The borings were terminated approximately 15 feet below the water table encountered in drilling, to meet State guidelines for well construction. Two-inch diameter PVC casing and well screen were installed with a sand pack, bentonite and cement grout seal in each boring, and secured with a flush security casing (see Table 4). Mr. Craig Mayfield, Alameda Flood Control District, observed well installation and placement of the grout seal.

TABLE 4

WELL CONSTRUCTION DETAIL, ALL WELLS
(FEET BELOW GROUND SURFACE)

WELL NO.	MW-1	MW-2	MW-3	(NEW) MW-4	(NEW) MW-5	(NEW) MW-6
BLANK CASING	1/2-10	1/2-10	1/2-10	1/2-10 1/2	1/2-10 1/2	1/2-10 1/2
SLOTTED SCREEN	10-30	10-30	10-30	10 1/2-30 1/2	10 1/2-30 1/2	10 1/2-30 1/2
FILTER PACK	9 3/4-31	9 3/4-30 1/3	9 1/4-31	10 1/2-31	10 1/2-31	10 1/2-31
BENTONITE SEAL	8 3/4-9 1/4	8 3/4-9 1/4	8 3/4-9 1/4	10-10 1/2	10-10 1/2	10-10 1/2
CEMENT GROUT	1-8 3/4	1-8 3/4	1-8 3/4	1/2-10	1/2-10	1/2-10

The new wells were purged and developed on June 24, 1987, according to procedures presented in Appendix C.

The soil samples were analyzed for TPH (in mg/kg, wet weight basis) as gasoline and as diesel fuel by Kennedy/Jenks/Chilton, San Francisco.

Results: The analytical results for soil samples presented in Table 2, and Appendix E shows that contamination as TPH-g exists at borings for MW-1, MW-2, MW-3 and MW-6. A fence diagram (Drawing 3), based on drilling logs from all six borings, shows a consistent stratigraphic succession of soil horizons across the site.

3.2.2 Task B: Well Development; Sampling and Analysis

Rationale: The RWQCB requires that water quality be assessed and analyzed at sites with unauthorized discharges, such as this site.

Methodology: Each of the six wells at the site was sounded for potential floating product and groundwater elevation. All the wells lacked 1/4 inch or more of measurable floating product. Therefore, these wells were purged, and groundwater samples were collected and analyzed for TPH-g (in mg/L) and BTX (in μ/L).

The groundwater samples were collected and transported to Kennedy/Jenks/Chilton analytical laboratory in accordance with EPA protocol and chain-of-custody procedures.

Results: TPH-g and BTX results indicated significant contamination for all parameters in all wells (see Appendix E and Table 3). Wells MW-4 and MW-6, located at the west (downgradient) and south extremities of the property, respectively, were most contaminated. The lowest concentrations of contaminants were present in MW-1, located at the east extremity (upgradient) of the property (Drawing A).

Water levels for all wells as of July 22, 1987 are presented in Table 5.

3.2.3 Task C: Survey of Well Elevations/Gradient Calculations

Rationale: The RWQCB requires calculation of hydraulic gradient at sites with potential groundwater contamination, to indicate the geographic location(s) of groundwater potentially threatened by downgradient migration of contaminant plume(s).

Methodology: The elevations of the tops of well casings (TOCs) were surveyed for MW-1 through MW-6 (see Table 5), and the depths to ground water were measured from these TOC elevations (see Table 5). The groundwater gradient was calculated from these data and the groundwater flow direction was inferred by hydraulic head differentials.

TABLE 5

WATER ELEVATIONS IN WELLS (JULY 1987)
(Relative to Arbitrary Datum)

WELL NO.	ELEVATION TOC (FT.)	ELEVATION OF WATER TABLE (FT.)
1	99.91	82.08
2	99.32	82.13
3	98.90	82.11
4	100.00	81.90
5	100.00	82.17
6	99.05	82.05

Results: The onsite groundwater gradient is relatively small, and the precise direction of groundwater flow difficult to quantify accurately. However, using well data from four wells near the site, the neighborhood shallow groundwater gradient (less than 50 feet bgs) within 1/2 mile of the site was approximated as 0.014 to the west.

Nearby domestic wells 7.

3.2.4 Task D: Well Inventory

Rationale: In Confirmed Release cases, the RWQCB requires a well inventory to assess: (1) the potential for contamination to migrate vertically to deep ground water via improperly constructed or abandoned wells; and (2) the potential for contamination to impact ground water with domestic, municipal, or other beneficial use. A well inventory was therefore performed to identify the number,

depth and location of groundwater wells within a 1/2-mile radius using certain public records. This information was used to identify wells potentially impacted by site groundwater conditions.

Methodology: An inventory of wells within a 1/2-mile radius of the site was compiled from available well logs and well permits in the July 1987 Alameda County Flood Control and Water Conservation District, Hayward Quadrangle Files (see Drawing 6). Available information included well depth, well use, date drilled, and, occasionally, depth to water and well designation (township, range, and section).

Results: Fifteen wells were included in the inventory (see Table 6). Five of these were within 1,500 feet of the site, and the ten others were within 1,500 to 2,650 feet of the site. The wells within 1/2 mile of the site were categorized as shallow (TD[1] less than 100 feet bgs) and deep (TD deeper than 100 feet bgs) (see Drawing 6). Of the inventory, ten wells were classified as shallow, with five used for water supply, three for groundwater monitoring, and two for unspecified use.

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1 TD = Termination Depth

Based on neighborhood groundwater gradient, three supply wells (N1, J1, M2) are located 1,100 to 1,300 feet down-gradient of the site. Well N1 is a deep (255 feet) domestic supply well which was drilled in 1946. The screened interval of the well is not documented on the driller's log, so the well may partially draw from the uppermost aquifer. J1 and C1 are shallow (29 feet) irrigation wells that were drilled during the drought of 1977. It is not known if these wells are presently in use.

TABLE 6

WELL INVENTORY

WELL NO. (3S/2W)	WELL DEPTH (FEET)	DATE DRILLED	USE	DEPTH TO FIRST WATER (FEET)	DISTANCE FROM CENTER OF SITE
17N1	255	07/46	DOMESTIC	--	1500 FT.
17P3	34	04/86	MONITORING	10	1500 FT.
17Q5	63	--	UNSPECIFIED	--	1500 FT.
20B3	29	07/77	IRRIGATION	6	1500 FT.
20C1	29	05/77	IRRIGATION	21	1500 FT.
17F3	200	06/31	IRRIGATION	--	1/2 MI.
17J3	49	01/86	MONITORING	23	1/2 MI.
17K2	680	07/65	TEST	--	1/2 MI.
17M2	72	--/53	IRRIGATION	30	1/2 MI.
17Q2	603	03/37	INDUSTRIAL	--	1/2 MI.
17R7	83	--	UNSPECIFIED	--	1/2 MI.
18J1	202	--/53	DOMESTIC	55	1/2 MI.
18R7	30	08/86	MONITORING	12	1/2 MI.
20B1	72	05/83	DOMESTIC	--	1/2 MI.
20D1	42	09/77	IRRIGATION	20	1/2 MI.

Well locations and water level data from Alameda County Flood Control and Water Conservation District (Hayward Quadrangle)

"--" = No information available

4. CONCLUSIONS AND INTERPRETATIONS

The principal conclusions and interpretations of this phase of site investigations are summarized below.

4.1 CONCLUSIONS

- Soil contamination was detected in all samples from boring B-2, the boring closest to the inferred source. In the remainder of the borings, contamination was not detected above 15 feet bgs, and only low concentrations of TPH-g (10-50 ppm) was detected between 15 feet bgs and the water table (≈20 feet bgs) (see Table 2).

- No floating product was present at the time of monitoring, but sheen was present in MW-3. Dissolved constituents of gasoline (BTX) were found in groundwater samples from all six wells (see Table 3).

- A groundwater gradient of 0.014 west was calculated from groundwater elevation data from wells at and near the site.

- The base of the shallowest saturated zone was not intersected in the six borings. Consequently, the depth to second ground water was not established.

- The well inventory indicated one shallow monitoring well, three shallow irrigation wells, one deep domestic well, and one shallow well of unspecified use downgradient of the E-Z Serve site. Of these, the shallow monitoring well is within a few hundred feet of the site, and the other wells are all further than 1,000 feet from the site. According to the RWQCB Guidelines for Addressing Fuel Leaks (1985), this site is a confirmed "Fuel Case". In such cases, the RWQCB normally requires: (1) determination of the lateral and vertical extent of contamination, (2) assessment of the potential for migration of contamination to known and potential water sources and (3) groundwater cleanup.

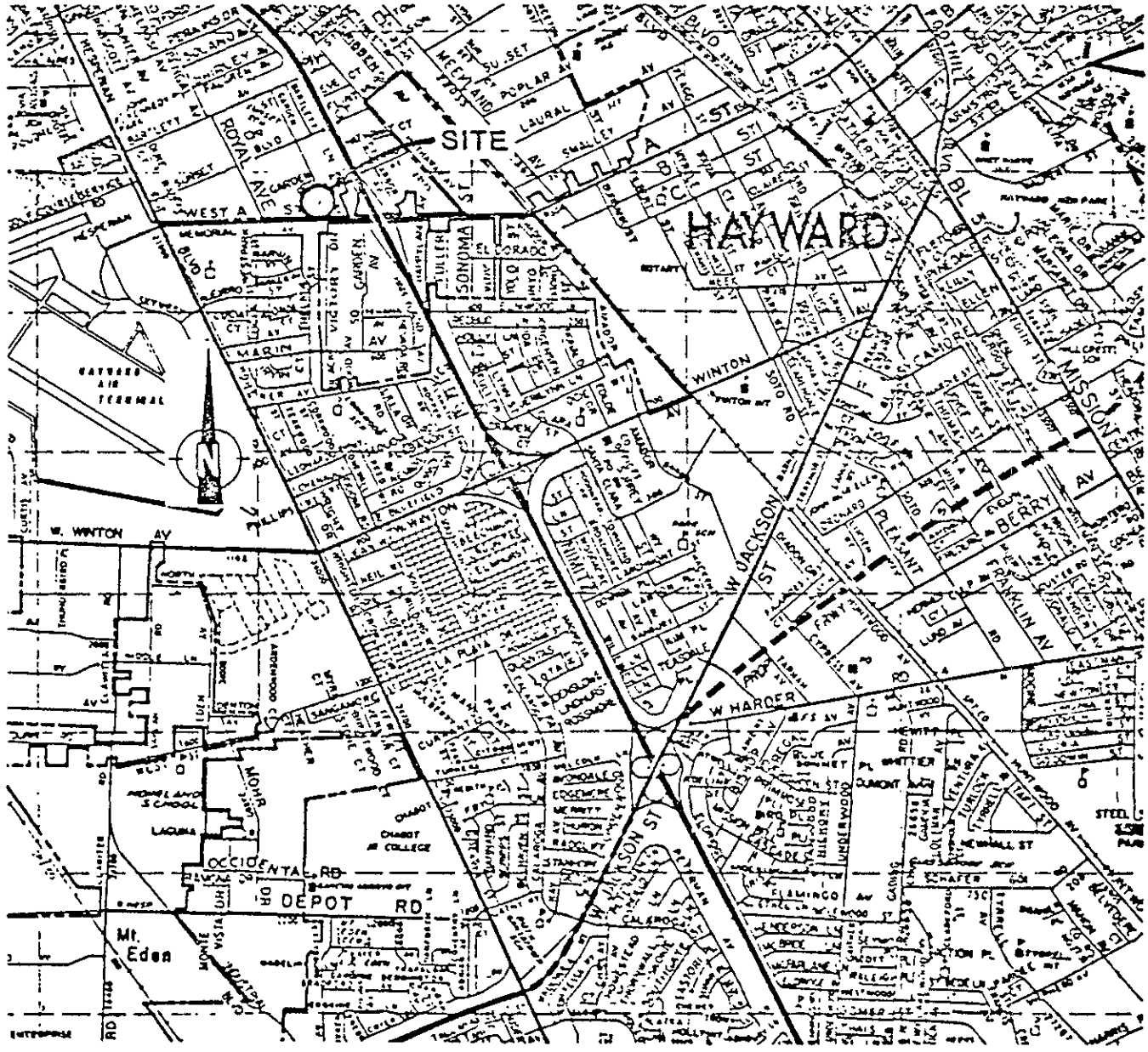
4.2 INTERPRETATION OF RESULTS

- The soil stratigraphy appears uniform across the site, with shallow soil comprising chiefly clay and silty sand. As shown in the geologic fence diagram for this site (Drawing 3), the site stratigraphy consists of: (1) gray to olive, stiff moist clay (5 feet 20± feet bgs), with irregular, sandy lenses at 15 feet bgs; (2) mottled light brown to gray, stiff silty and clayey sand containing lenses of silt and clay (>20± feet bgs). The upper clay and subjacent silty sand layers are laterally continuous below the site, but individual lenses within these units appear laterally discontinuous.

- The lateral extent, or "zero line," of the groundwater contaminant plume has not been defined. However, available data indicate that groundwater contamination as dissolved (not floating) constituents extends to the western and southern property boundaries.

- Soil contamination appears to be localized near the inferred leak source. The distribution of contamination in soil appears consistent with a single leak source.

Based on available data, CECC concludes that gasoline leaked from one of the underground storage tank lines on the property. Once discharged, this gasoline moved principally downward through surficial clay until it reached the water table. The soil was contaminated by the gasoline as it migrated downward, leaving measurable residual gasoline contamination in soil. The residual contamination is lowest in concentration at or near the water table, and highest at shallow depth near the inferred leak. Groundwater contamination was created when the gasoline reached the water table. Once in the saturated zone, this groundwater contamination was sufficiently mobile to spread laterally to an unknown extent.



Source: Thomas Brothers Maps
Alameda County, 1972

1000 0 1000FT.
SCALE

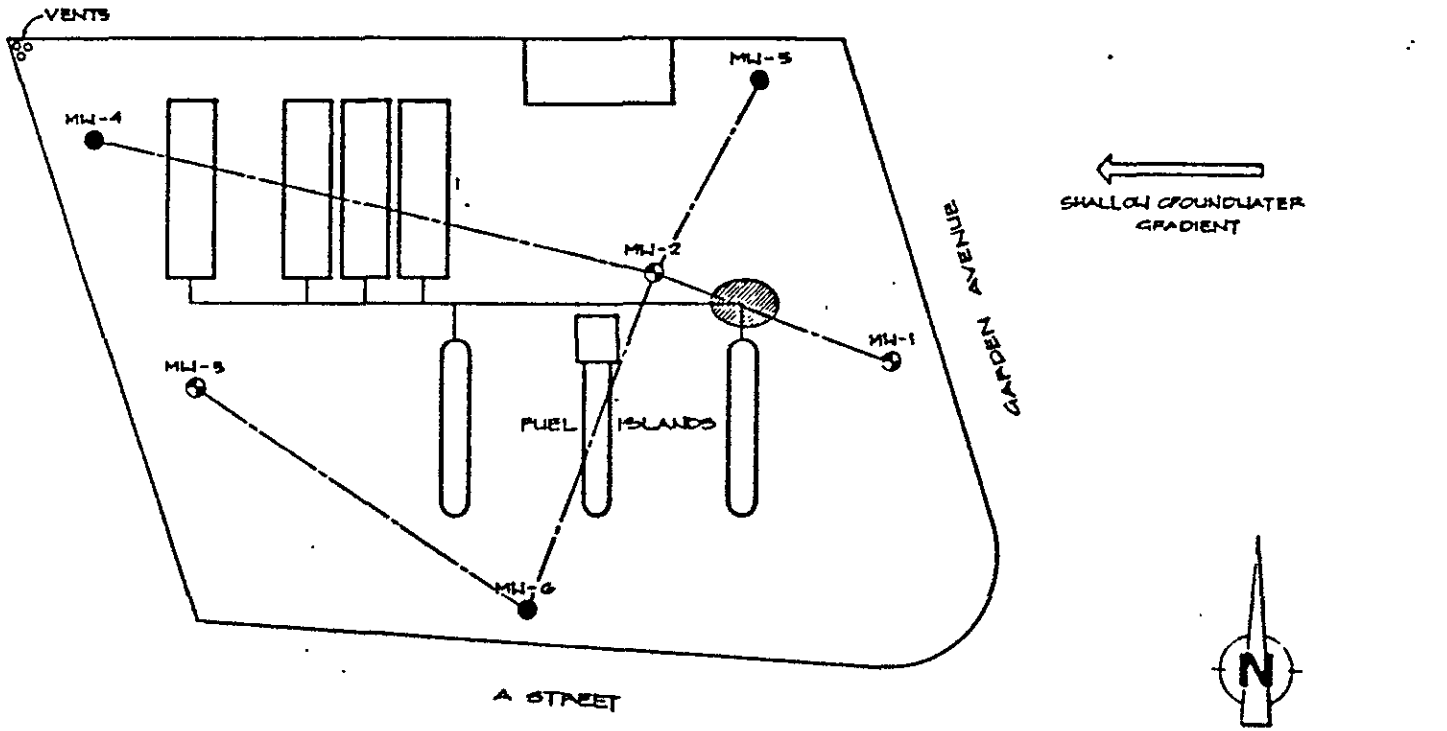
SITE LOCATION MAP

E-Z SERVE-MOBIL No. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California
Consulting Engineers and Geologists

Scale: AS SHOWN	Project No.: 86-44-361-02
Prepared by: RRS	Date: 1-13-87
Checked by: JLG	Drawing No.: 1
Approved by:	

ATTACHMENT 1



Tanks removed 6/90

1W-2, MW-5, MW-6 -	Abandon & Close Drill new wells around same area
MW-1, MW-3, MW-4 -	Reconstruct or drill new wells

SITE PLAN - LOCATION OF FENCE DIAGRAM SECTION

E-Z SERVE MOBIL NO. 1255
525 WEST A STREET
HAYWARD, CALIFORNIA

Not the original map from the Report.

This map does show well locations for Converse wells.

Incomplete Package
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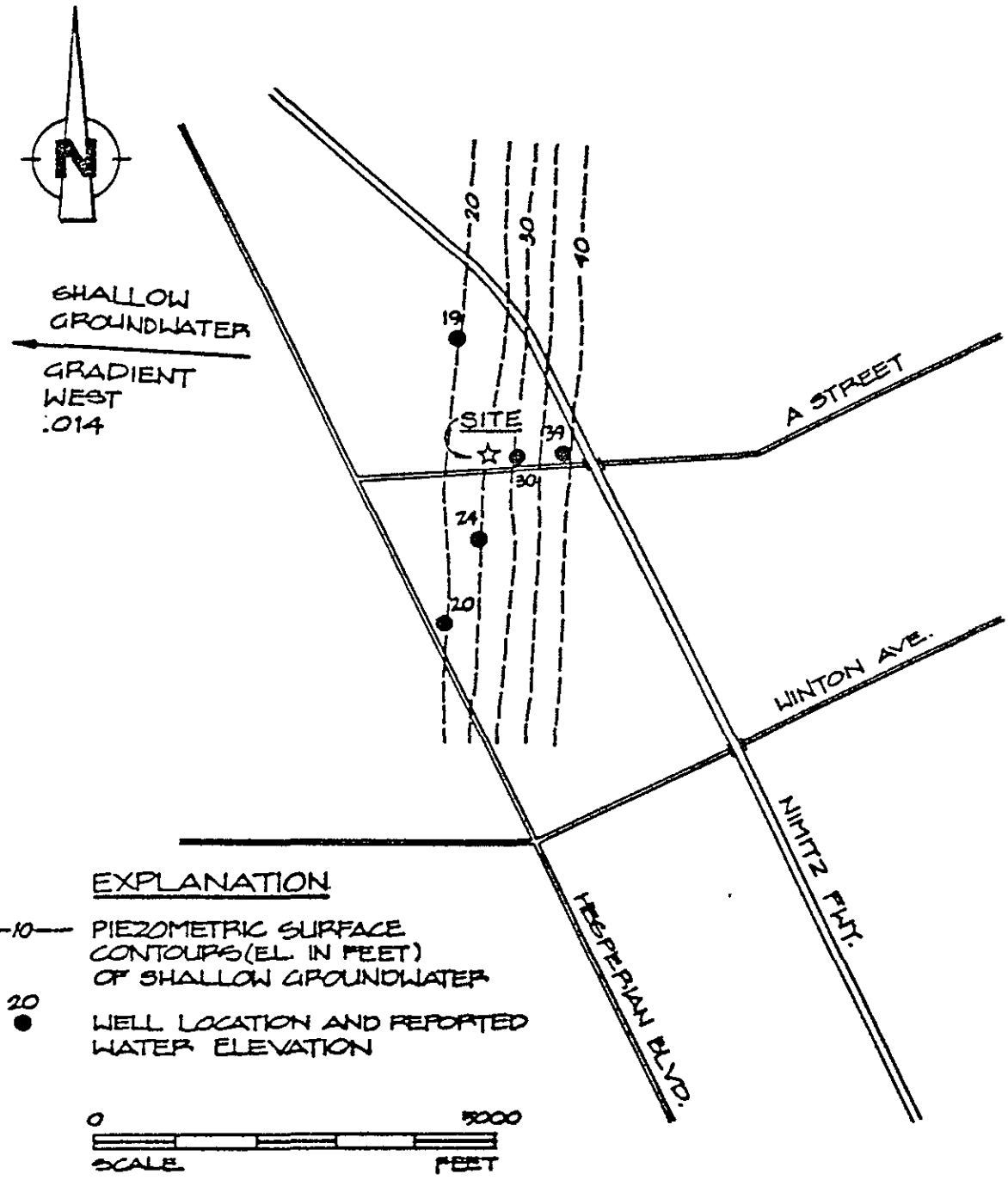


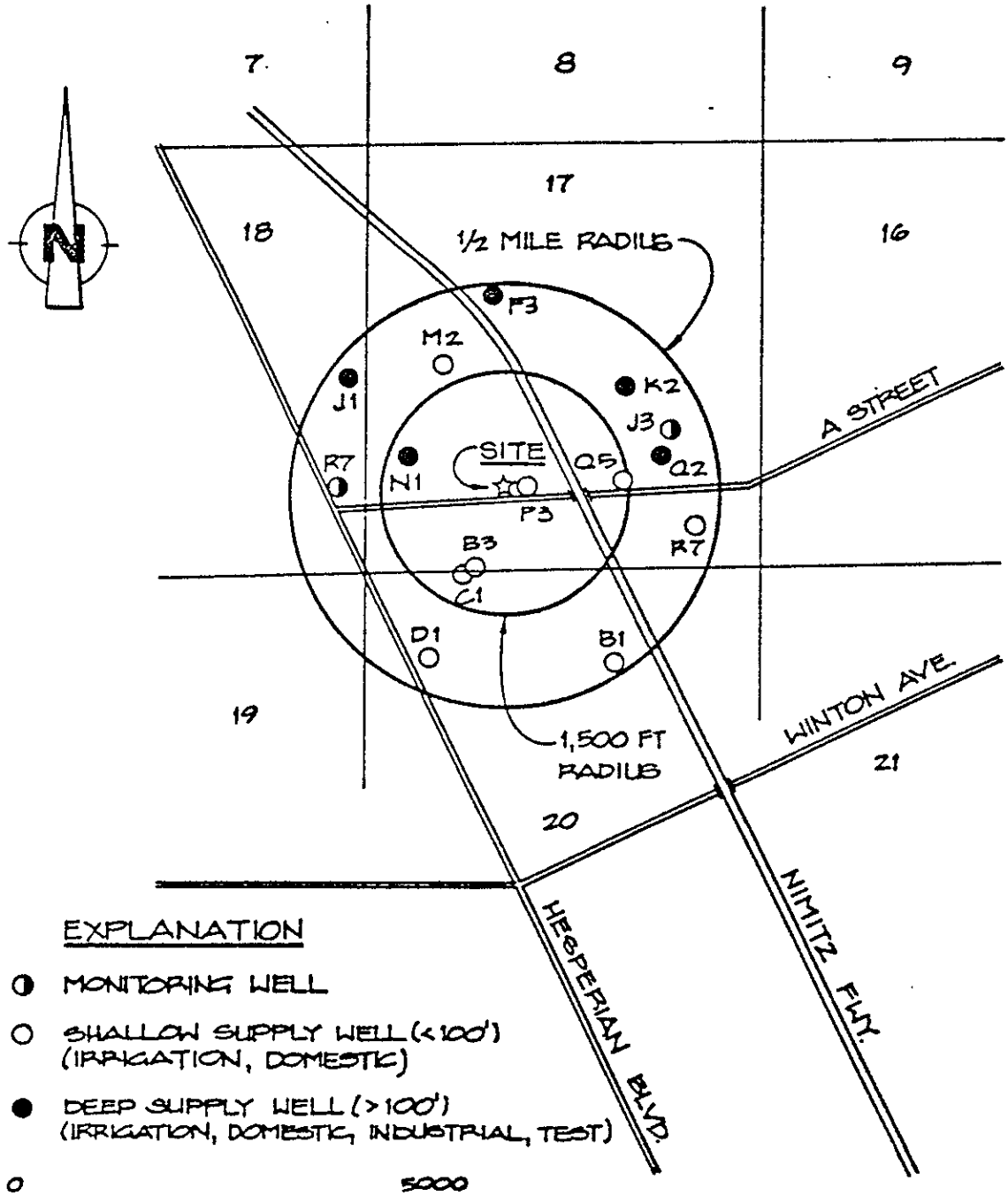
WELL LOCATIONS AND WATER LEVEL DATA FROM ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT.

GROUNDWATER CONTOUR MAP - SITE VICINITY

E-Z SERVE MOBIL NO. 1235
525 WEST A STREET
HAYWARD, CALIFORNIA

Scale: AS SHOWN	Project No.: 86-44-361-02
Prepared by: LOL	Date: 9-4-87
Checked by: AAM	Drawing No.: 5
Approved by: JDG	

Converse Environmental Consultants California — Consulting Engineers and Geologists



DATA SOURCE: ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT; HAYWARD QUADRANGLE.

WELL INVENTORY

E-2 SERVE MOBIL NO. 1235
525 WEST A STREET
HAYWARD, CALIFORNIA

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: AS SHOWN	Project No.: 86-44-361-02
Prepared by: LQL	Date: 9-4-87
Checked by: AAM	Drawing No.: 6
Approved by: JDG	

Converse Environmental
Consultants California

REPORT - FUEL LEAK ASSESSMENT
E-Z Serve Station No. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California

101 Howard Street, Suite A
San Francisco, California 94105

Telephone 415 543-7295

REPORT - FUEL LEAK ASSESSMENT
E-Z Serve Station No. 1235
525 West A Street
Hayward, California

Prepared for:

E-Z Serve of California
P. O. Box 3550
Ontario, California 91761

March 13, 1987
86-44-361-02

A Wholly Owned Subsidiary of
The Converse Professional Group

Converse Environmental Consultants California

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Telephone 415 543-7295

March 13, 1987
86-44-361-02

Mr. Mike Buckmaster
General Services Manager
E-Z Serve of California
P. O. Box 3550
Ontario, California 91761

Subject: Report - Fuel Leak Assessment
E-Z Serve Station No. 1235
525 West A Street
Hayward, California

Dear Mr. Buckmaster:

Enclosed are five copies of our report which transmits the results of our investigation of soil and groundwater contamination below the E-Z Serve Mobil station at 525 A Street in Hayward, California. The work was performed as per our proposal dated December 5, 1986 and as authorized on December 8. One copy each of this report should be forwarded to Mr. Tom Callaghan, RWQCB, and Ms. Suzanne Larson, Hayward Fire Department, as soon as possible.

We thank you for the opportunity to provide our services for this project, and would be pleased to develop a detailed scope of work for the program recommended in Section 8. Should you have any questions, please do not hesitate to call.

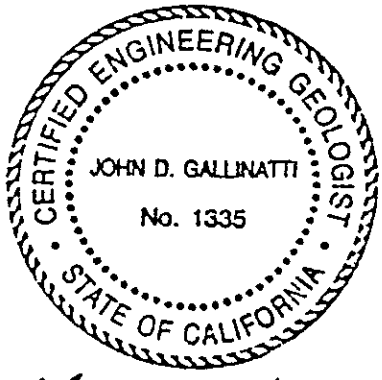
Respectfully submitted,

CONVERSE ENVIRONMENTAL CONSULTANTS CALIFORNIA

John D. Gallinatti
Project Geologist
EG 1335

Corey T. Dare
Senior Engineer
CE32948

CTD5:33



PROFESSIONAL CERTIFICATION

REPORT- FUEL LEAK ASSESSMENT
E-Z Serve Station No. 1235
525 West A Street
Hayward, California

March 13, 1987
86-44-361-02

This report has been prepared by the staff of Converse Environmental Consultants California under the supervision of the Engineer and/or Geologist whose seal(s) and signature(s) appear hereon.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the client, after being prepared in accordance with generally accepted professional engineering and geologic practice. No other warranty is expressed or implied.

Table of Contents

1. INTRODUCTION

The purpose of thise investigation was to make an initial assessment of the extent of gasoline contamination at the E-Z Serve Mobil Station located at 525 West A Street in Hayward, California (Drawing 1). A fuel system leak was discovered as a result of a discrepancy noticed during inventory reconciliation. A leak in the gasoline product line near the eastern pump island was subsequently discovered by E-Z Serve, and has since been repaired (Drawing 2).

A total of three borings were drilled on the station property. The borings were converted to groundwater monitoring wells. Soil samples recovered during drilling, and water samples obtained from the developed wells were tested by a laboratory for total petroleum hydrocarbons (soil and water) and benzene, toluene and xylene (water only). All data generated during this investigation were compiled, analyzed and evaluated for preparation of this report. The work was performed by Converse Environmental Consultants California (CECC) staff under the direction of Mr. John D. Gallinatti, Certified Engineering Geologist.

2. SITE INVESTIGATION AND WELL INSTALLATION

A total of three borings designated B1 through B3 were drilled on December 16, 1986 at the locations shown on the Site Plan (Drawing 2). Borings B1 and B2 were located approximately 40 feet east and 10 feet northwest of the product line leak, respectively, as indicated in Drawing 2. Boring B3 was located approximately 100 feet west of the product line leak. The borings were drilled to depths of 30 to 31 feet using an 8-inch O.D. hollow-stem auger by Datum Exploration, Inc., and logged by CECC personnel. The augers were steam cleaned prior to use and only used in a single boring. All drill cuttings are stored on site in DOT-approved hazardous waste drums. The drums will remain on site until appropriate disposal is arranged (at a licensed disposal facility, if required).

Soil samples for chemical analysis were taken at five to seven-foot intervals throughout the length of each boring using a 2.5-inch I.D. modified California split-barrel sampler equipped with clean brass sample liners. Before each use, the sampler was cleaned by scrubbing with alconox and rinsing with distilled water. The soil samples were retained in the 6-inch long brass liners, and immediately capped, labelled and sealed upon removal from the sampler. The samples were then packed with reusable refrigerant materials in insulated containers at approximately 4°C, and transported to the laboratory. Prior to testing, the samples were stored in the absence of light under refrigerated conditions.

At the desired total depth for each well, the auger was removed from the boring. Either 4-inch (B2 and B3) or 2-inch (B1) diameter PVC casing and well screen were installed with a sand pack, bentonite, cement grout seal, and metal hole cover. Boring/well logs showing the soils encountered and the well construction schematics are presented in Appendix A as Drawings A1 through A6. Well construction details and an explanation of the Unified Soil Classification System are given in Drawing A7.

The three wells were installed on December 16, 1986, and were developed on January 2, 1987. Water samples were obtained from the wells on January 6 and February 25, and transported to the laboratory for chemical analyses.

3. LABORATORY TESTING

Both soil and water samples recovered from the borings/wells were taken to Kennedy/Jenks/Chilton laboratories in San Francisco for chemical analyses. The samples were transported in accordance with EPA protocol and chain-of-custody procedures. Copies of all analytical results as submitted by the laboratory, plus the chain-of-custody records are included in Appendix B. All recovered soil samples were tested for total petroleum hydrocarbons (TPH) (in mg/kg, wet weight basis) as gasoline and as diesel fuel. Water samples were tested for total petroleum hydrocarbons (in mg/L) as gasoline and diesel fuel, as well as for benzene, toluene and xylene (in ug/L) and conductivity (in umho/cm).

4. SUBSURFACE CONDITIONS

The site lies within the San Leandro Cone, a low-gradient alluvial fan which originates at the mouth of Castro Valley and spreads westward onto the bay plain (DWR, 1967). Although the physiographic feature has an alluvial origin, the underlying sediments were largely deposited in the intertidal zone and predominantly consist of unconsolidated marine clay with some interlayered fine sand (Robinson, 1956, DWR 1963).

The regional hydraulic gradient is expected to be westward, from Castro Valley towards the bay. However, the local gradient may be significantly different than the regional gradient due to:

- drainage towards Sulphur Creek, approximately 1000 feet south of the site;
- drawdown from nearby groundwater wells; and
- local variations in permeability.

Soils encountered in the borings were found to consist of a surficial layer of clay or sandy clay underlain by clayey sand to the depth of the borings (30 to 31 feet). A section through the three borings showing the simplified soil conditions is presented in Drawing 3. The moderately to highly plastic, soft clay layer was found to extend to a depth of about 20 to 25 feet, underlain by more permeable layers of silty to clayey sand. Groundwater was encountered during drilling near the top of the clayey sand, at depths of 20.5 feet (B1 and B2) and 22 feet (B3). Water levels rose in the developed monitoring wells to depths ranging from 16.5 to 16.9 feet (measured on February 25, 1987). Conductivity measured in the water samples was 1200 umhos/cm.

5. SOIL AND WATER CONTAMINATION

Results of the chemical analyses of both soil and water are shown on Drawing 3.

TPH concentrations measured in soil samples from Boring B2 (adjacent to the leak) were significantly greater than concentrations measured in samples in the other two borings. Total petroleum hydrocarbons (TPH) as gasoline reach a peak value of 1200 ppm at a depth of 11 feet in Boring B2. In the same boring, concentrations of 410 ppm, 200 ppm, 80 ppm TPH occur at depths of 6, 16 and 21 feet respectively. The only significant soil contamination in the other two borings occurs within a few feet of the water table (top of the clayey sand). In Boring B1, a composite analysis of samples from depths of 6, 10, and 14 feet detected less than 1 ppm TPH, whereas, close to the top of the clayey sand concentrations of 29 ppm and 15 ppm were detected at 18 and 23 feet respectively. Similarly, in Boring B3, a concentration of 51 ppm was detected in a sample from a depth of 21 feet while samples from 10 and 15 feet had concentrations of less than 0.1 ppm and 7.2 ppm respectively. TPH as diesel was non-detectable in all samples except at a depth of 15 feet in Boring B3.

No measurable free product was observed in any of the water samples. A faint sheen was noticed only on the water sample from B2 taken on January 6, 1987. Concentrations of both TPH and dissolved constituents (benzene, toluene, and xylenes) were much greater in Well B2 than in B1 or B3 (Drawing 3). Concentrations from water samples were as follows:

	B1	B2	B3
Total Petroleum Hydrocarbons as Gasoline (ppm)	12	51	15
Benzene (ppb)	4130	8800	2900
Toluene (ppb)	2270	9000	1600
Xylenes (ppb)	1710	7700	2200

6. SITE SENSITIVITY

The level of remediation which will be required at the site is dependent on the potential for contamination of potable sources of groundwater. A thorough investigation of this issue was beyond the scope of the present investigation; however, some preliminary observations can be made. Review of the Alameda County well inventory (Alameda County, 1987), indicates that there are six wells within a 1500 foot radius of the site. One well is a recently installed monitoring well across the street from the site, two wells are shallow (29 feet) irrigation wells drilled during the drought of 1977, two are older irrigation wells (60 to 80 feet), and one is a deep domestic well (255 feet). There are an additional 14 wells within a 1/2-mile radius of the site. The potential for aquifer contamination will depend on the location and thickness of aquitards (clay layers) below the site. Although the base of the clayey sand was not penetrated in any of the borings, the nature of the local deposits suggests that another clay layer could be expected within the top fifty feet.

7. EVALUATION AND CONCLUSIONS

The results of this investigation suggest that gasoline from a line leak has created a contaminant plume with a very limited horizontal extent in the upper 20 feet of soil (clay). However, the plume has migrated vertically downward through the clay, leading to contamination of groundwater in an underlying clayey sand layer. Soil and water contamination detected in wells B1 and B3 is believed to be the result of migration through the groundwater below a depth of 20 feet and associated upward migration into a capillary zone above the clayey sand. Some soil contamination detected in B3 may be the result of product migration through the trench backfill for the fuel piping. The extent of off-site contaminant migration through the groundwater has not been determined.

In accordance with the guidelines of the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), the detection of soil contamination levels exceeding 1000 ppm categorizes the site as a "Fuel Case." (RWQCB, 1985a) This categorization requires an abatement of the release (repair has been completed), definition of extent of free product (none found); sampling of water for dissolved constituents (values reported herein); and excavation of soil with concentrations greater than 1000 ppm. All of these items have been met except for the required soil excavation.

The next phase of work will require an assessment of the potential for toxic pollution of potable groundwater sources. This will involve a cooperative effort among E-Z Serve, CECC, and the RWQCB. Based on this assessment, the RWQCB may require remedial action and will set target clean-up levels for any required clean-up operations.

8. RECOMMENDATIONS

We recommend that the site investigation be continued in conjunction with discussions between E-Z Serve, CECC, and the RWQCB. We anticipate that further work will be required to estimate the following:

- the extent of off-site contamination of groundwater,
- the local hydraulic gradient,
- the location and use of nearby groundwater wells, and
- the potential for contamination of potable groundwater.

A program which includes the installation of a limited number of off-site soil borings and monitoring wells, a well inventory, a review of available geologic and hydrogeologic data, and water and soil sampling and analysis should be implemented. This will provide a data base sufficient for the RWQCB and CECC to assess the extent of contamination, assign clean-up levels, and design a cost-effective remedial action plan, if necessary. Due to the potential for continued migration of contaminants, we recommend that this program be carried out as quickly as possible.

9. REFERENCES

1. Alameda County Flood Control and Water Conservation District, 1987, Well Inventory Report and well data.

2. California Department of Water Resources, 1963, Alameda County Investigation, Bulletin #13.

3. California Department of Water Resources, 1967, Evaluation of Ground Water Resources, South Bay, Appendix A: Geology, Bulletin 118-1.

4. California Department of Water Resources, 1968, Evaluation of Groundwater Resources, South Bay, Volume 1: Fremont Study Area, Bulletin 118-1.

5. California Department of Water Resources, 1973, Evaluation of Ground Water Resources: South San Francisco Bay, Volume II: Additional Fremont Study Area, Bulletin #118-1.

6. California Regional Water Qaulity Control Board San Francisco Bay Region (1985a) "Guidelines for Addressing Fuel Leaks", Oakland, 24 pp., attachments.

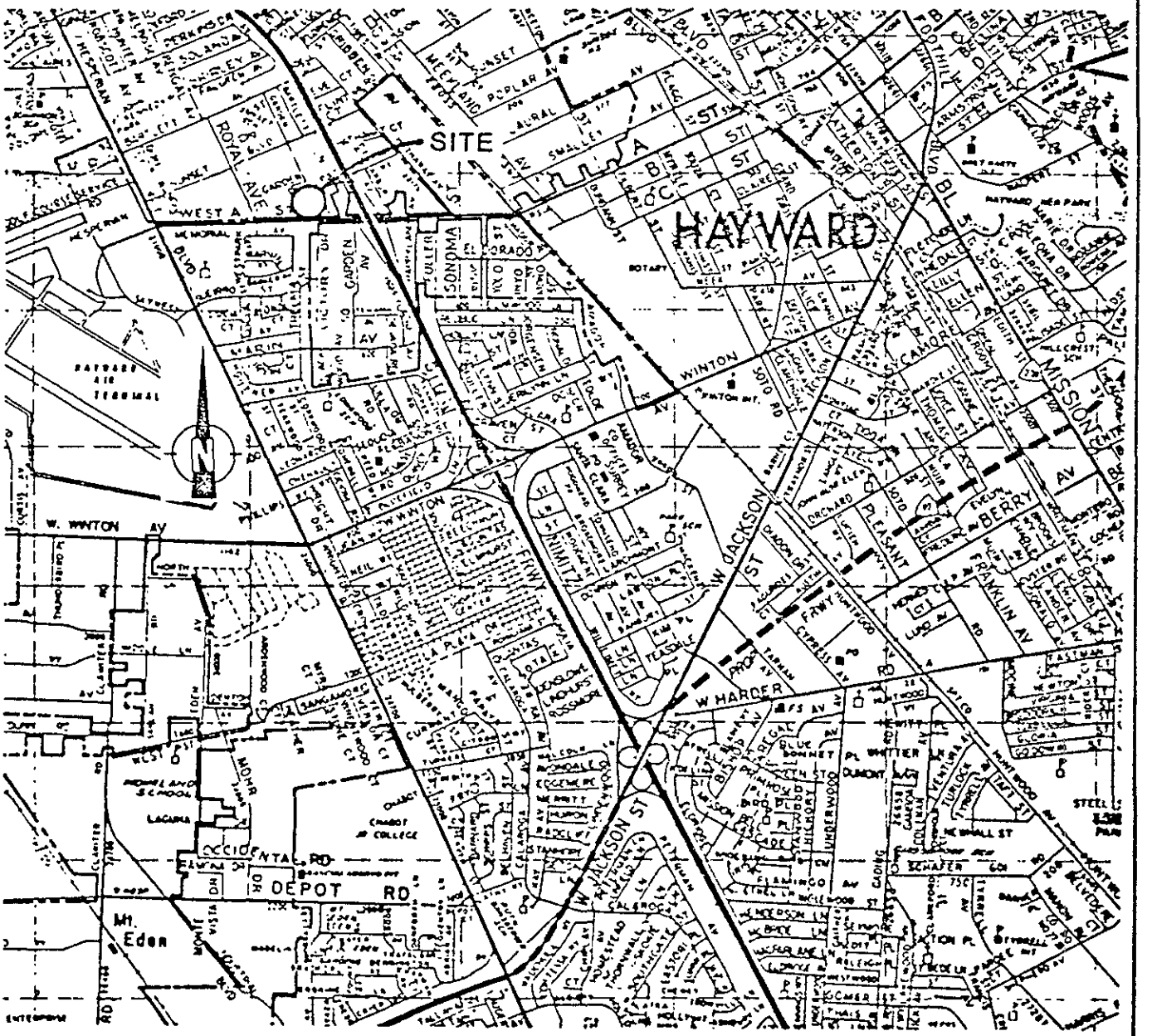
7. California Regional Water Quality Control Board San Francisco Bay Region (1985b) "Assessment of Contamination from Leaks of Hazardous Materials in the Santa Clara Groundwater Basin, 205j Report", Oakland, 161 pp.

8. Helley, E. J., K. R. Lajoie, W. E. Spangle, M. L. Blair, 1979, Flatland Deposits of the San Francisco Bay Region, U. S. Geological Survey Professional Paper 943.

9. Robinson, G. D. (1956) "Geology of the Hayward Quadrangle, California", U.S.G.S. Quadrangle Map GQ 88.

10. Webster, D. A., 1973, Map showing Areas bordering the Southern Part of San Francisco Bay Where a High Water Table May Adversely Affect Land Use, U.S. Geological Survey Miscellaneous Field Studies Map MF 530.

CTD5:31



Source: Thomas Brothers Maps
Alameda County, 1972

SITE LOCATION MAP

E-Z SERVE-MOBIL No. 1235
525 West A Street
Hayward, California

Scale: AS SHOWN	Project No.: 86-44-361-02
Prepared by: RRS	Date: 1-13-87
Checked by: JLG	Drawing No.: 1
Approved by:	

Converse Environmental Consultants California — Consulting Engineers and Geologists

Incomplete Package
Copied

Incomplete Package
Copied

LOG OF BORING NO. B1

DATE DRILLED 12/16/86

ELEVATION 45' EQUIPMENT: 8" Hollow Stem Auger

DEPTH ft.	DEPTH m.	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS mg/kg	TESTS	
						ASPHALT 6"						
				slightly moist	soft	dark brown	SANDY CLAY CL					
	1			moist	soft to medium	medium to light brown	CLAY CH					
5		D1									0.74 <0.4	9* d*
	2						increasing sand content to 10'±					
10	3	D2									0.74 <0.4	g* d*
					soft	light olive brown	trace fine sand					
	4	D3									0.74 <0.4	g* d*
15												
	5						increasing stiffness					
		D4								2-25	29 <4	g d
20	6				medium	mottled lt. brn. and mod. olive brn.						

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No: A-1
Approved by:	

DATE DRILLED 12/16/86

LOG OF BORING NO. B1 (cont.)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH m	DEPTH ft	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS PPM	TESTS	
				moist	medium	lt. bn.	CLAY CH		▽			
				wet	loose to med. dense	light brown	CLAYEY SAND SC					
		D5					(slight odor)				15 <0.4	g d
7	26											
8												
9	30	P		wet	loose	medium brown	SILTY SAND SM (No Odor) N=6					
							Bottom of Boring 31'0"					
10												
	36											
11												
12	40											

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No.: A-2
Approved by: JDK	

LOG OF BORING NO. B2

DATE DRILLED 12/16/86

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH ft.	DEPTH m.	SAMPLES	SYMBOL	WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS mg/kg	TESTS	
								ASPHALT 6"
								slightly moist / soft / dark brown / SANDY CLAY trace fine gravel (slight to moderate Odor) CL
1								
2	0.5	D1					410	g
							<4	d
								moist / soft to medium stiff / dark brown / CLAY (Moderate Odor) CH
								dark green-ish gray
3	1.0	D2					1200	g
							<4	d
								soft / (Strong odor)
4								
	1.5	D3					200	g
							<4	d
								medium / medium brown / trace of fine sand (Moderate-slight odor)
6					▼	2-25		
	2.0							

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale	None
Project No.	86-44-361-02
Prepared by	SR
Date	1/13/87
Checked by	
Drawing No.	A-3
Approved by	

LOG OF BORING NO. B2 (cont.)

DATE DRILLED 12/16/86

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH m	DEPTH ft	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS PPM	TESTS	
		D4		wet	medium	medium brown	SANDY CLAY trace minor fine sand (Very Slight Odor) CL		▽	80	<4	g d
7												
	25	P		wet	stiff	medium brown	SANDY CLAY/ CLAYEY SAND (No Odor) CL/SC N=10					
8												
9	30	P			very stiff		(No Odor) N=22					
							Bottom of Boring 30'4"					
10												
	35											
11												
12	40											

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale	None
Project No	86-44-361-02
Prepared by	SR
Date	1/13/87
Checked by	
Drawing No.	A-4
Approved by	

LOG OF BORING NO. B3

DATE DRILLED: 12/16/86

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH m	DEPTH ft	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS PPM	TESTS	
				—	—	—	ASPHALT 6"					
				dry	soft	dark brown	SANDY CLAY (No Odor) CL					
1	5											
2				slightly moist	soft	gray	SANDY CLAY (Faint Odor) CH					
		D1		moist	medium	dark gray	(Faint Odor)				<0.1 <0.1	g d
3	10											
				moist	soft	gray	CLAY (Moderate Odor) CH					
4												
	15	D2									7.2 18	g d
5										2-25		
6	20											

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No.: A-5
Approved by:	

LOG OF BORING NO. B3(cont.)

DATE DRILLED 12/16/86

ELEVATION 45' EQUIPMENT: 10" Hollow Stem Auger

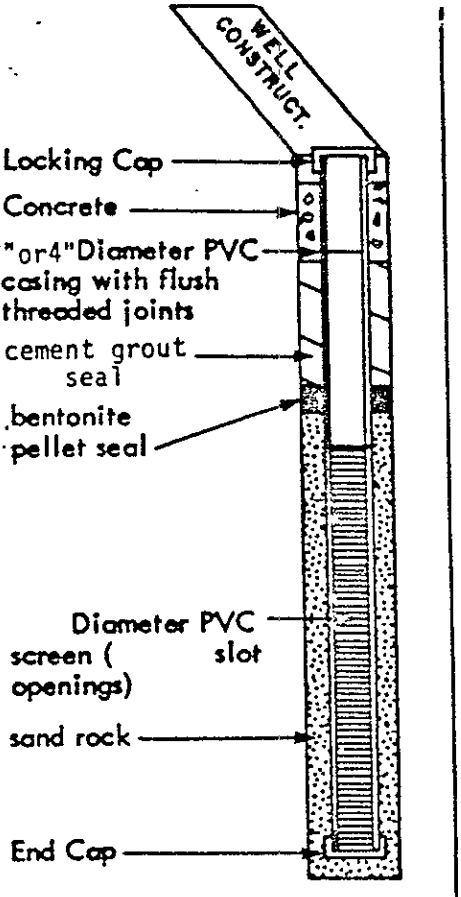
DEPTH ft	DEPTH m	SAMPLES	SYMBOL						WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS ppm	TESTS	
		D3		moist	medium	M.brown	CLAY (Moderate Odor)	CH				51 <4	g d
				wet									
25	7	P		wet	loose	M.brown	CLAYEY SAND (Faint Odor)	SC N=7					
30	9	P		wet	stiff	light brown	CLAYEY SILT with v. stiff clay lense (No Odor)	ML N=13					
35	10												
40	12												

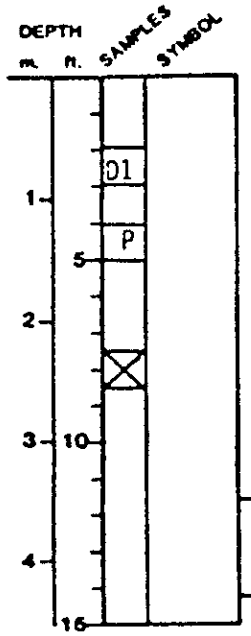
E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale	None
Project No	86-44-161-02
Prepared by	SR
Date	1/13/87
Checked by	
Drawing No.	A-6
Approved by	

MAJOR DIVISIONS			SYMBOLS	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	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	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 > half is smaller than No. 200 sieve	SILTS AND CLAYS Liquid limit less than 50		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





SAMPLE TYPE

DRIVE SAMPLE, 2.5" ID Sampler, driven with 140 lb. weight, 30" drop

STANDARD PENETRATION TEST
1.4" ID Sampler, driven with 140lb. weight, 30" drop

NO RECOVERY

Water level at time of drilling

Stabilized water level on date noted

TEST TYPE

	TESTS
CLASSIFICATION	
Plasticity	pi
Grain Size Analysis	ma
Specific Gravity	sg
Shrink/Swell	s/s
STRENGTH	
Direct Shear	ds
Unconfined Compression	uc
Triaxial Compression	tx
Vane Shear	vs
CONSOLIDATION	
DYNAMIC TESTS	
Cyclic Triaxial Compression	ctx
CHEMICAL	
Total Petroleum Hydrocarbons: as gasoline	g
as diesel	d
*=test result from composite sample	

UNIFIED SOIL CLASSIFICATION SYSTEM AND BORING LOG SYMBOLS

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Project No
86-44-361-02

Converse Environmental Consultants California
Geotechnical Engineering and Applied Sciences

Drawing No
A-7

Soil Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415/392-6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868604-606
Source	Soil I.D.:	Composite B-1, D-1 (6 ft) B-1, D-2 (10 ft) B-1, D-3 (14 ft)
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	0.74
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<0.4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference: "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco California 94105
415 362 0065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868607
Source	Soil I.D.:	B-1, D-4
	Depth:	18 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	29
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Everett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868608
Source	Soil I.D.:	B-1, D-5
	Depth:	23 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	15
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<0.4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 [illegible] Street
San Francisco, California 94107
415 362 [illegible]

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868609
Source	Soil I.D.:	B-2, D-1
	Depth:	6 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	410
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Everett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362-6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868610
Source	Soil I.D.:	B-2, D-2
	Depth:	11 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	1200
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415 [illegible]

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868611
Source	Soil I.D.:	B-2, D-3
	Depth:	16 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	200
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference: "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
652 Howard Street
San Francisco, California 94105
415/[illegible]

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868612
Source	Soil I.D.:	B-2, D-4
	Depth:	21 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	80
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Everett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415/362-6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	868613
Source	Soil I.D.: B-3, D-1 Depth: 10 ft
	Converse Proj. EZS 86-44-361-02
Date Collected	12/16/86
Time Collected	-
Collected by	Converse Consultants personnel

Analysis	Units		Replicate	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	<0.1	<0.1	Spike recovery 87%
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<0.4	<0.4	Spike recovery 66%

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference: "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868614
Source	Soil I.D.:	B-3, D-2
	Depth:	15 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	7.2
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	18

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Everett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415 [illegible]

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868615
Source	Soil I.D.:	B-3, D-3
	Depth:	21 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	51
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Everett R Smith

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

Water Analysis Report

For	Converse Consultants	Received	1/6/87
Attention	Ryan Tully	Reported	1/16/87
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	87118
Source EZS - Hayward Converse Proj. No. 86-44-361-01	Water I.D.: WS1-1 Depth: 2 ft below surface
Date Collected	1/6/87
Time Collected	1350
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as Gasoline)	mg/L	12
Total Petroleum Hydrocarbons (as diesel fuel)	mg/L	<1

Comments:
Analysis of pentane extract by capillary gas chromatography, using flame ionization detection. Commercial fuel samples used as comparison standards. Results reported in milligrams per liter.

Analyst KA Manager Leverett R. Smith

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

Water Analysis Report

For	Converse Consultants	Received	1/6/87
Attention	Ryan Tully	Reported	1/16/87
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	87120
Source EZS - Hayward Converse Proj. No. 86-44-361-01	Water I.D.: WS2-1 Depth: 2 ft below surface
Date Collected	1/6/87
Time Collected	1350
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as Gasoline)	mg/L	51
Total Petroleum Hydrocarbons (as diesel fuel)	mg/L	<1

Comments:
Analysis of pentane extract by capillary gas chromatography, using flame ionization detection. Commercial fuel samples used as comparison standards. Results reported in milligrams per liter.

Analyst KA Manager Leverett R. Smith

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

Water Analysis Report

For Converse Consultants
Attention Ryan Tully
Address The Folger Bldg., Suite A
101 Howard Street, San Francisco, CA 94105

Received 1/6/87
Reported 1/16/87

Lab. No.	87123
Source EZS - Hayward Converse Proj. No. 86-44-361-01	Water I.D.: WS3-1 Depth: 2 ft below surface
Date Collected	1/6/87
Time Collected	1350
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as Gasoline)	mg/L	15
Total Petroleum Hydrocarbons (as diesel fuel)	mg/L	<1

Comments:
Analysis of pentane extract by capillary gas chromatography, using flame ionization detection. Commercial fuel samples used as comparison standards. Results reported in milligrams per liter.

Analyst KA Manager Leverett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

For Converse Consultants
Attention Mr. Ryan Tully
Address The Folger Bldg., Suite A
101 Howard Street, San Francisco, CA 94105

Received 2/25/87
Reported 3/2/87

Lab. No. 871181

Source Station No.: MW1-2
EZS Hayward
Converse Proj. No.
86-44-361-01

Date Collected 2/25/87

Time Collected 1205

Collected by Converse Consultants personnel

Analysis	Units		Replicate	Analytical Results
Benzene	ug/L	4130	4100	Spike recovery 94%
Toluene	ug/L	2270	2230	Spike recovery 91%
Xylenes	ug/L	1710	1660	

Comments:

Analysis by EPA Method 602. Results reported in micrograms per liter.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst SL Manager Everett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

For	Converse Consultants	Received	2/25/87
Attention	Mr. Ryan Tully	Reported	3/2/87
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	871182
Source	Station No.: MW2-1
EZS Hayward Converse Proj. No. 86-44-361-01	
Date Collected	2/25/87
Time Collected	1400
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Benzene	ug/L	8800
Toluene	ug/L	9000
Xylenes	ug/L	7700

Comments:

Analysis by EPA Method 602. Results reported in micrograms per liter.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst SL Manager Leverett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

For Converse Consultants
Attention Mr. Ryan Tully
Address The Folger Bldg., Suite A
101 Howard Street, San Francisco, CA 94105

Received 2/25/87
Reported 3/2/87

Lab. No. 871183

Source Station No.: MW3-1
EZS Hayward
Converse Proj. No.
86-44-361-01

Date Collected 2/25/87

Time Collected 1310

Collected by Converse Consultants personnel

Analysis	Units	Analytical Results
Benzene	ug/L	2900
Toluene	ug/L	1600
Xylenes	ug/L	2200

Comments:

Analysis by EPA Method 602. Results reported in micrograms per liter.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst SL Manager Leverett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362 6065

For	Converse Consultants	Received	2/25/87
Attention	Mr. John Gallinatti	Reported	3/11/87
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		871181-3
Source EZS Hayward Converse Proj. No. 86-44-361-01	Sample I.D.:	MW-1, MW-2 and MW-3
Date Collected		2/25/87
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Conductivity @ 25°C	micromhos/cm	1,200

Comments:

Authorization by: Mr. John Gallinatti on 3/4/87.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst GB Manager Leverett R. Smith

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
95-99-361.02	EZS

Samplers: (signature) Lindsay R.

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH	Remarks
B-1	12/10/96			X	Sample 1 @ 6ft.	✓		
1				X	2 @ 10 ft	✓		Composite - TPH
				X	3 @ 14 ft	✓		
				X	4 @ 18 ft.	✓	X	
				X	5 @ 23 ft	✓	X	
B2				X	Sample 1 @ 6 ft	✓	X	
				X	2 @ 11 ft	✓	X	
				X	3 @ 16 ft	✓	X	
				X	4 @ 21 ft	✓	X	
B3				X	Sample 1 @ 10 ft	✓	X	
				X	2 @ 15 ft		X	
				X	3 @ 21 ft	✓	X	

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
86-44-361-01	EZS – Hayward

Samplers: (signature) Matt Hamilton

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	Total Petroleum Hydrocarbons							Remarks
WS1-1	1/6/87	1.50			2' below surface	1	✓							
WS1-2	1/6/87	1.50			"	1								
					"									
WS2-1	1/6/87	1.50			"	1	✓							
WS2-2	1/6/87	1.50			"	1								
WS2-3	1/6/87	1.50			"	1								
					"									
WS3-1	1/6/87	1.50			"	1	✓							
WS3-2	1/6/87	1.50			"	1								

Relinquished by: (signature) Matt Hamilton	Date/Time 1/6/87 12.00	Received by: (signature) Dawn Barnes 1/6/87 22	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
8644 361-01	EZS - Hayward

Samplers: (signature) Matt Howell

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	BTX - PPB	Remarks
MW-1	2/25/87	12.05			MW-1	3	✓	40 ml VOC Vials
MW-2	2/25	2.00			MW-2	3	✓	"
MW-3	2/25	1.10			MW-3	3	✓	"

Relinquished by: (signature) Matt Howell	Date/Time 2/25/87 3.15	Received by: (signature) Dawn Barnes K/S/C	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time