



**Weiss Associates**

5500 Shellmound Street, Emeryville, CA 94608-2411

Environmental and Geologic Services

Fax: 510-547-5043 Phone: 510-450-6000

*Add mtBE*

PROFESSIONAL  
26 MAR 11 PM 3:05

March 6, 1996

Susan Hugo  
Alameda County Department  
of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

Re: **Investigation Workplan**  
Shell Service Station  
WIC #204-2495-0101  
1800 Powell Street  
Emeryville, California  
WA Job #81-0794-04

Dear Ms. Hugo:

As you requested in your meeting with Shell Oil Products Company (Shell) engineer R. Jeff Granberry on November 20, 1995, Weiss Associates (WA) submits this workplan to assess whether petroleum or other hydrocarbons are in soil and ground water downgradient of the Shell site referenced above (Figure 1). To meet this objective, WA proposes to drill and sample up to four soil borings along the south side of Powell Street. The proposed soil boring locations are shown on Figure 2. A brief site history and WA's proposed scope of work are presented below.

### Site History

The site is built on fill consisting of imported clayey and sandy soil and industrial and construction waste and refuse. Paraffine Company bought ten acres on the Emeryville waterfront in 1884 and filled areas along the shoreline through 1969. Based on available log data, the fill at the Shell service station site is at least 10 feet deep and appears continuous across the site.

Products manufactured by Paraffine included: linoleum and other hard-surfaced floor coverings, roofing and building materials, paints, varnishes, lacquers and enamels. A 1949 aerial photograph shows two above ground storage tanks located about 700 feet north of the current Shell site. The contents of the former above ground tanks are unknown. Further information about Paraffine Plant is presented in the attached Journal of the Emeryville Historical Society, Volume IV, Number 2, Summer 1993 (Attachment A).

A previously completed site assessment report described a 1957 aerial photograph that showed that the area of the Shell site was completely filled with soil and waste material. Dumping

was active west of the Shell site. According to the site assessment report, a 1969 aerial photograph indicated that all of the above ground tanks observed in earlier photographs had been removed. The removal of the tanks was apparently related to the closure of the Paraffine facility in the 1960s.

By 1970, land use in the area began to convert from industrial complexes to hotels, condominiums, restaurants and office buildings. Given present and historical land use within the vicinity of the Shell service station, it does not appear that the shallow ground water is likely to be used as a potable, industrial or agricultural water source. Also, over 3,000 parts per million (ppm) total dissolved solids (TDS) have been detected in ground water from the Shell wells and therefore the water is not suitable for domestic or municipal supply by state standards.

In September 1982, an underground fuel leak was reported in the Shell service station in which the fiberglass piping connected to the underground storage tank was damaged and about 3,200 gallons of super unleaded gasoline was lost.

Shell has installed seven ground water monitoring wells in the site vicinity since 1988. Quarterly monitoring and sampling of the wells began in 1988. Up to 2.38 feet of separate-phase hydrocarbons (SPH) have been detected on top of ground water in well S-9 (Figure 2) since February 22, 1995. The SPH appears to be an oil consisting of hydrocarbons heavier than gasoline. Thus, it is unlikely that the SPH did not result from Shell's operation onsite because Shell has not operated a garage or waste oil tank.

Ground water depth in the site vicinity ranges from 7.5 to 12 feet below existing grade. Local ground water flow direction is to the south. Up to 4,900 parts per billion (ppb) TPH-D, 1600 ppb TPH-G and 530 ppb benzene were detected in the most recent quarterly monitoring event (Attachment B).

In November 1995, WA collected a SPH sample from monitoring well S-9 (Figure 2) and submitted the sample to Shell's Westhollow analytical laboratory in Houston, Texas for analysis. The analysis indicated that the SPH is about 50% gasoline and 50% of a hydrocarbon mixture with carbon range of n-C<sub>20</sub> to over n-C<sub>50</sub>, possibly roofing tar. The laboratory's report is in Attachment C.

### **Proposed Scope of Work**

The scope of work for this investigation includes:

- Locating underground utilities downgradient of the site and preparing a site-specific health and safety plan;
- Obtaining city encroachment permits from the Emeryville Department of Public Works and drilling permits from the Alameda County Zone 7 Water Agency;

- Drilling four soil borings (Figure 2) using a Geoprobe drill rig, collecting soil samples at 5-foot intervals for hydrogeologic description and possible chemical analysis. WA's standard field procedures are included as Attachment D;
- Analyzing selected soil samples for total petroleum hydrocarbons between C<sub>5</sub> and C<sub>32</sub>, petroleum oil and grease, (metals, volatile organic compounds, and semi-volatile organic compounds; *LD CAM BTEX*);
- Collecting one ground water sample from each boring for ~~possible~~ laboratory analysis;
- Preparing a subsurface investigation report that will include the site background, and present the results of the investigation.

WA will implement this workplan once Shell receives your written approval. Please call Tom Fojut at (510)450-6000 if you have any questions or comments.

Sincerely,  
Weiss Associates



*Yi-Ran Wu*

Yi-Ran Wu  
Staff Engineer

*James W. Carmody*

James W. Carmody, C.H.G.  
Senior Project Hydrogeologist

Encl.:  
Figures  
Attachments A - Journal of the Emeryville Historical Society  
Attachment B - Fourth Quarter 1995 Monitoring Report  
Attachment C - Separate-Phase Hydrocarbon Analysis Report  
Attachment D - Standard Field Procedures

cc:  
R. Jeff Granberry, Shell Oil Company, P.O. Box 4023, Concord, California 94524  
Kevin Graves, Regional Water Quality Control Board - San Francisco Bay Region,  
2101 Webster Street, Suite 500, Oakland, California 94612

YEW/JWC:all  
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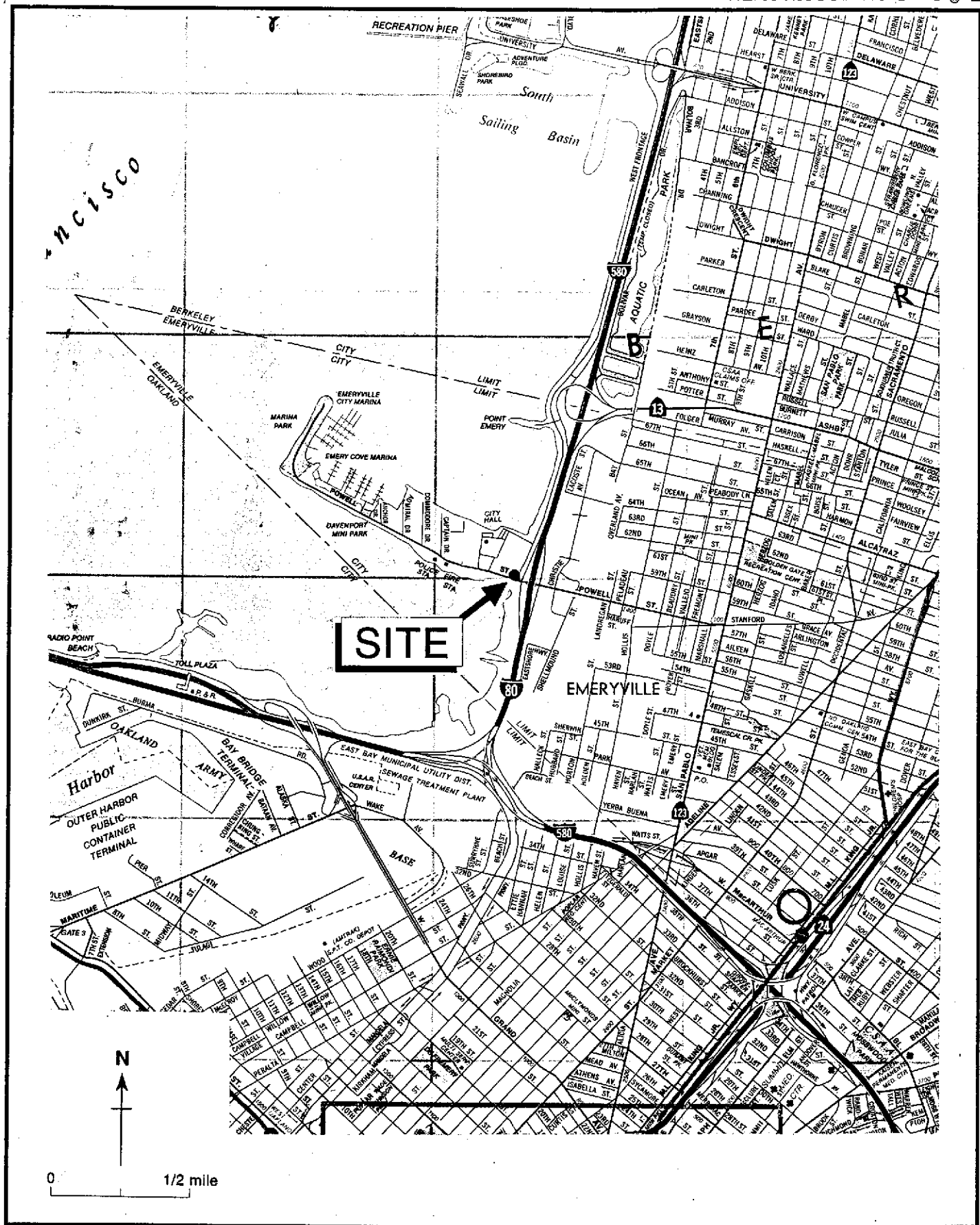
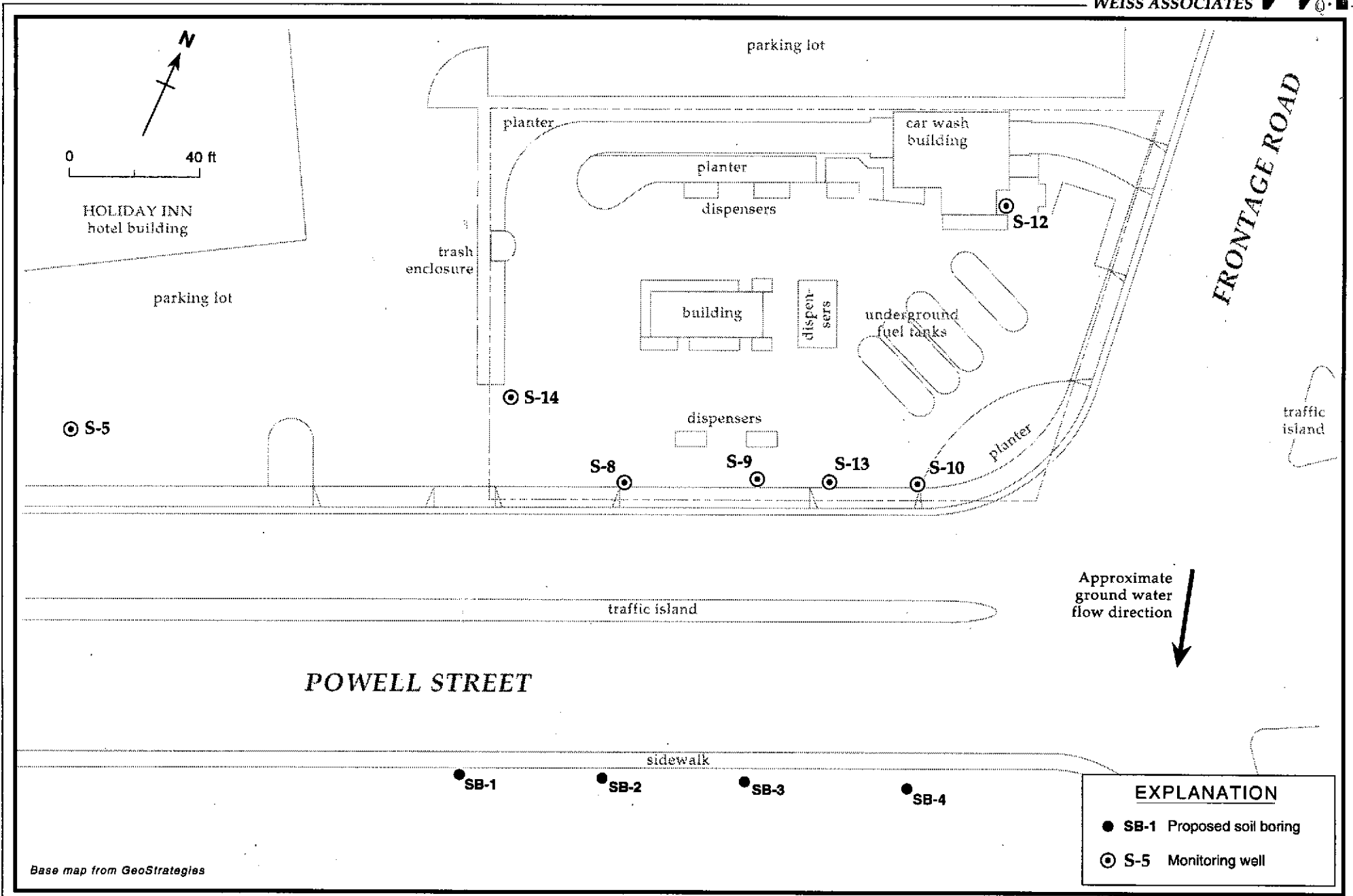


Figure 1. Site Location Map - Shell Service Station WIC# 204-2495-01, 1800 Powell Street, Emeryville, California



Base map from GeoStrategies

Figure 2. Proposed Soil Boring Locations - Shell Service Station - WIC# 204-2495-0107, 1800 Powell Street, Emeryville, California

**ATTACHMENT A**

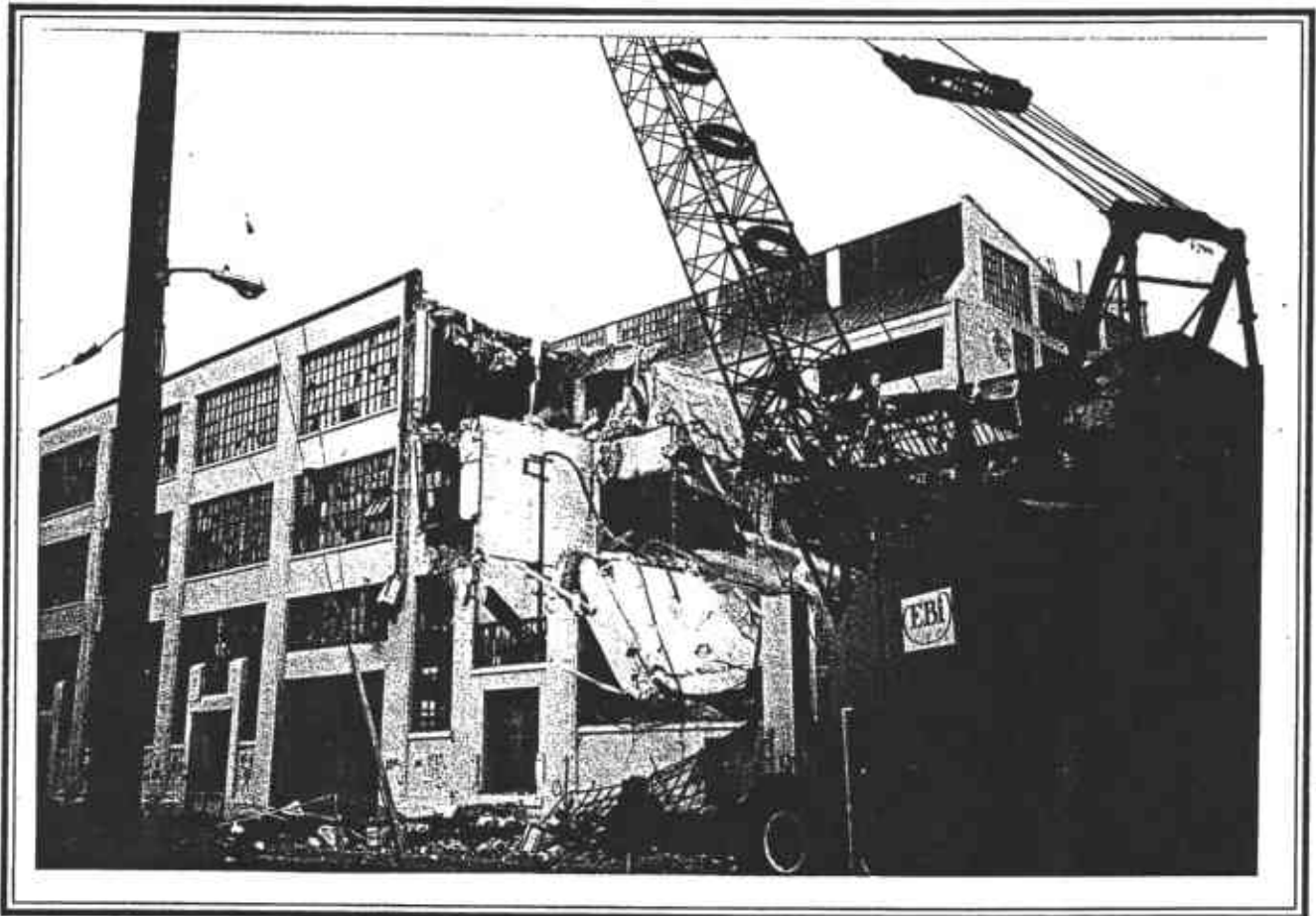
**JOURNAL OF THE EMERYVILLE HISTORICAL SOCIETY**

The Emeryville Historical Society  
6389 Racine Street  
Oakland, CA 94609

PLACE  
STAMP  
HERE

TO:

ADDRESS CORRECTION REQUESTED



*INSIDE: The Westinghouse Building: A piece of industrial America bites the dust.*

### *About the Emeryville Historical Society. . .*

The Emeryville Historical Society was established in 1989 by a small group of people interested in historical research and preservation. Incorporated as a non-profit educational corporation, it is funded by memberships, subscriptions, and donations, including a Community Projects Grant from the City of Emeryville. The society produces a quarterly journal, back issues of which are available for \$2.50. Other society projects include exhibits and oral history interviews. Phone messages may be left at 655-9320.

The Society welcomes new active members as well as subscribers. Subscribers will receive the quarterly newsletter as well as notices of other Historical Society activities. Dues are \$10.00 per year. Submissions of historical materials and information are also greatly appreciated.

Core members of the Society are: Donald Hausler, Nancy Smith, Tony Molatore, Vernon Sappers, Paul Herzoff, Ray Raineri, Arrol Gellner, Phil Stahlman, and Richard Ambro.

#### The Emeryville Historical Society New Member Information

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Phone(s) \_\_\_\_\_ Date \_\_\_\_\_

Number of Years in Emeryville \_\_\_\_\_ Special Interests \_\_\_\_\_

I am interested in:  Active Membership  Subscriber Membership

Please enclose a check for \$10.00 payable to The Emeryville Historical Society and mail to:

The Emeryville Historical Society  
6389 Racine Street  
Oakland, CA 94609



facilities for the repair of transformers, turbines, and electric motors (including the Westinghouse traction motors which power BART). The additions, the last of them built of wood to conserve steel for the war effort, ultimately extended the building nearly to 53rd Street.

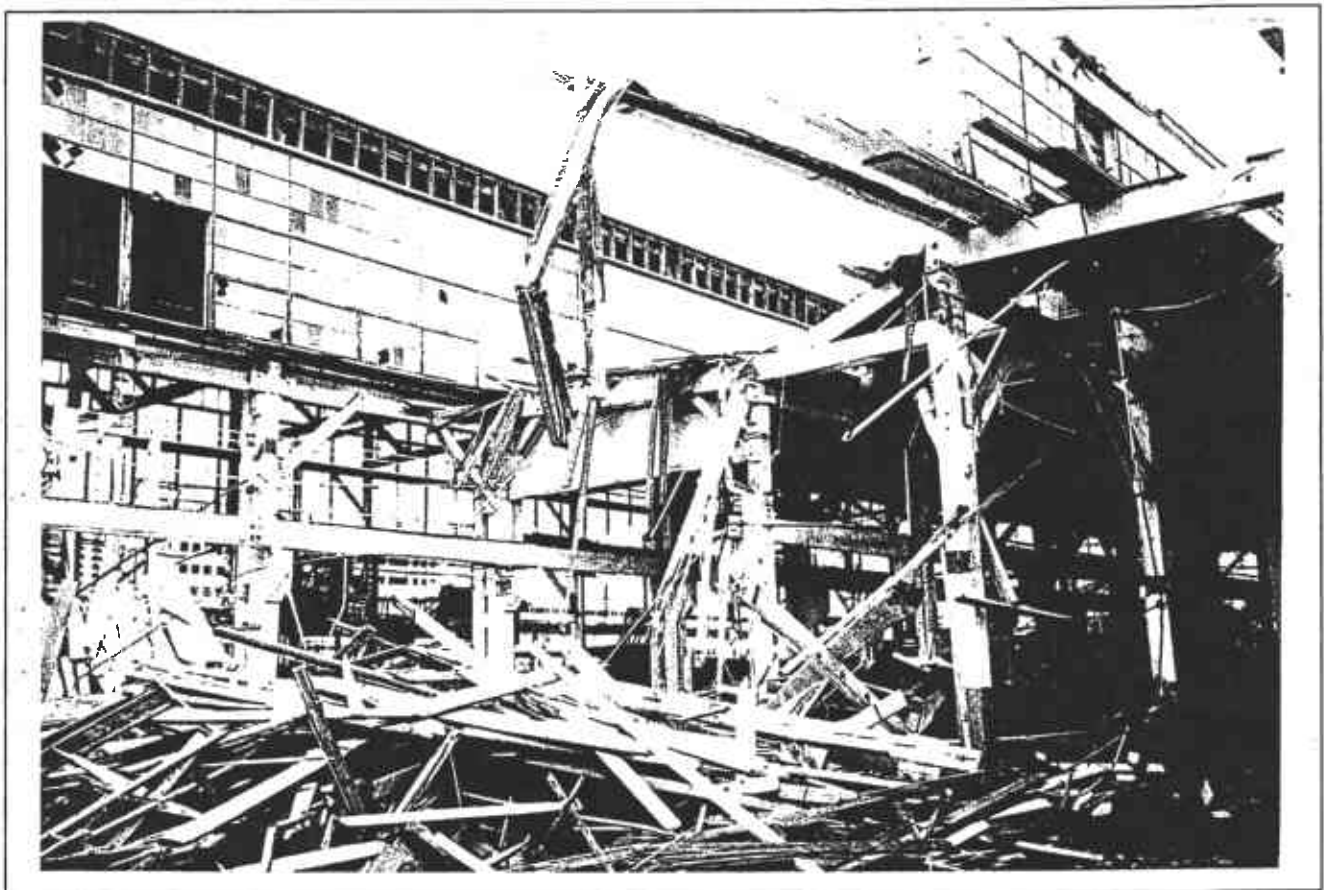
Unfortunately, in 1924 little was known about how concrete-frame structures would react to earthquakes. Like many other warehouses, the Westinghouse Building was designed for very heavy gravity loads but lacked "shearwalls" — sections of solid wall designed to resist the sideways or "lateral" movement which earthquakes impart to structures.

The result could be seen after the 1989 Loma Prieta earthquake. The building's facade was severely damaged, showing the telltale X-shaped cracks characteristic of shear failure. The bases of

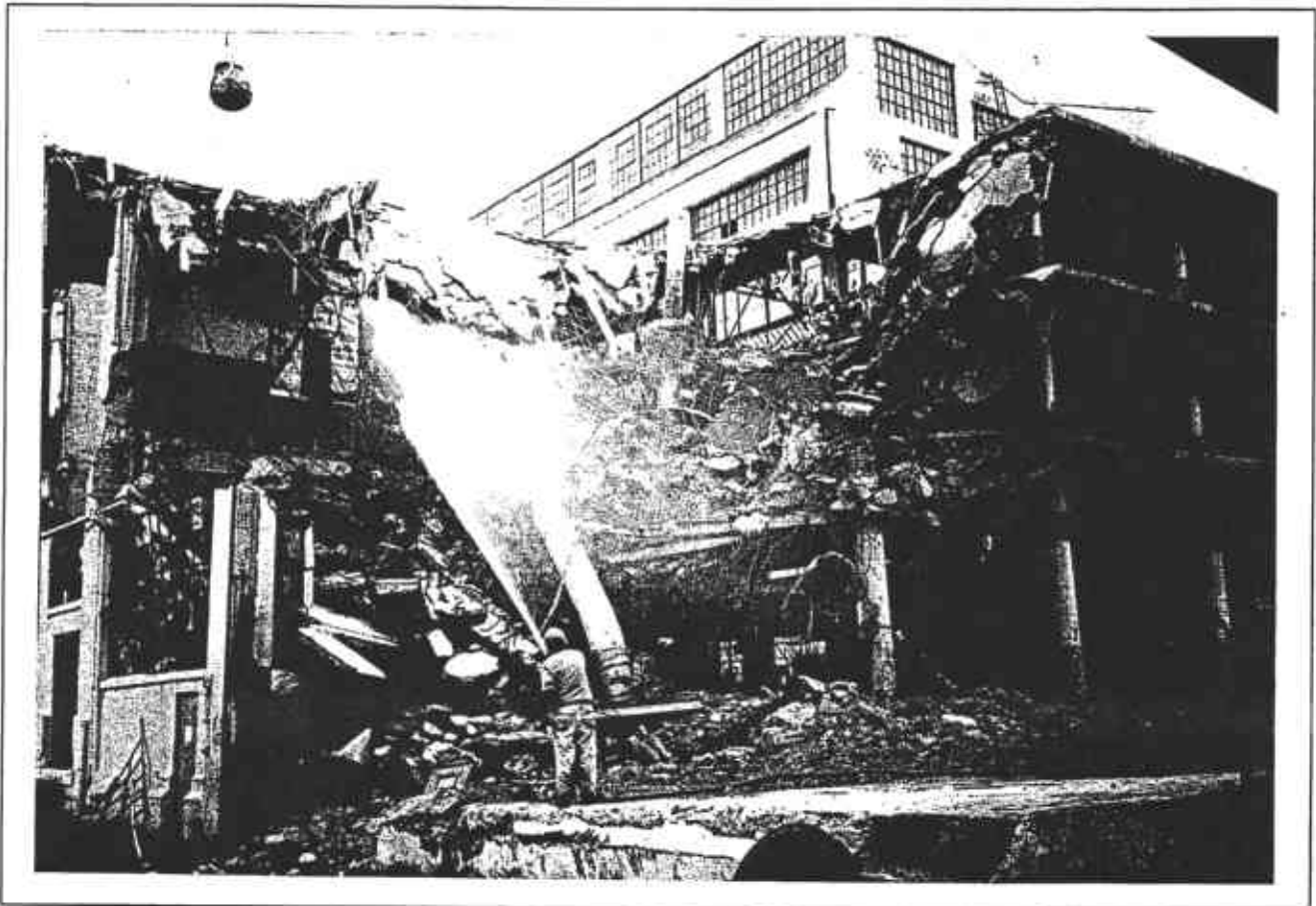
several structural columns on the south wall were sheared completely through, making repair impractical.

Fortunately, the building was no longer in use at the time of the quake. Soon afterward, the heavily-damaged front bay of the building was removed. Faced with astronomical estimates for seismic upgrading and little hope of finding a buyer, Westinghouse finally opted to demolish the structure.

The vacant Westinghouse site will require detoxification due to its contamination by hazardous materials once used in the manufacture and repair of electrical gear (in particular, Polychlorinated Biphenyls or PCBs). These materials, once used routinely and without special precautions, are now classified as extremely toxic.



*The northern annex of the Westinghouse plant during demolition. This portion, built during World War II, was of wooden construction in order to conserve steel for the war effort.*



*May, 1993: Another piece of U.S. industrial history yields to the demolition ball.*

reputation— and his first fortune — with his invention of the railroad air brake in the late 1860s. It was a device which revolutionized American railroading and halted a fifty-year long trend of increasing fatalities in railroad-related accidents.

After founding the Westinghouse Air Brake Company, George Westinghouse went on to develop automatic railroad signalling apparatus which had an equally profound effect on the safety of railroading.

In 1885 Westinghouse co-invented the alternating-current transformer, which made long-distance transmission of electricity possible. In the late 1890s he founded the Westinghouse Electric Corporation, which rapidly became one of the giants of the budding American electrical industry.

Westinghouse was the prototypical American self-made industrialist. A contemporary once noted of him:

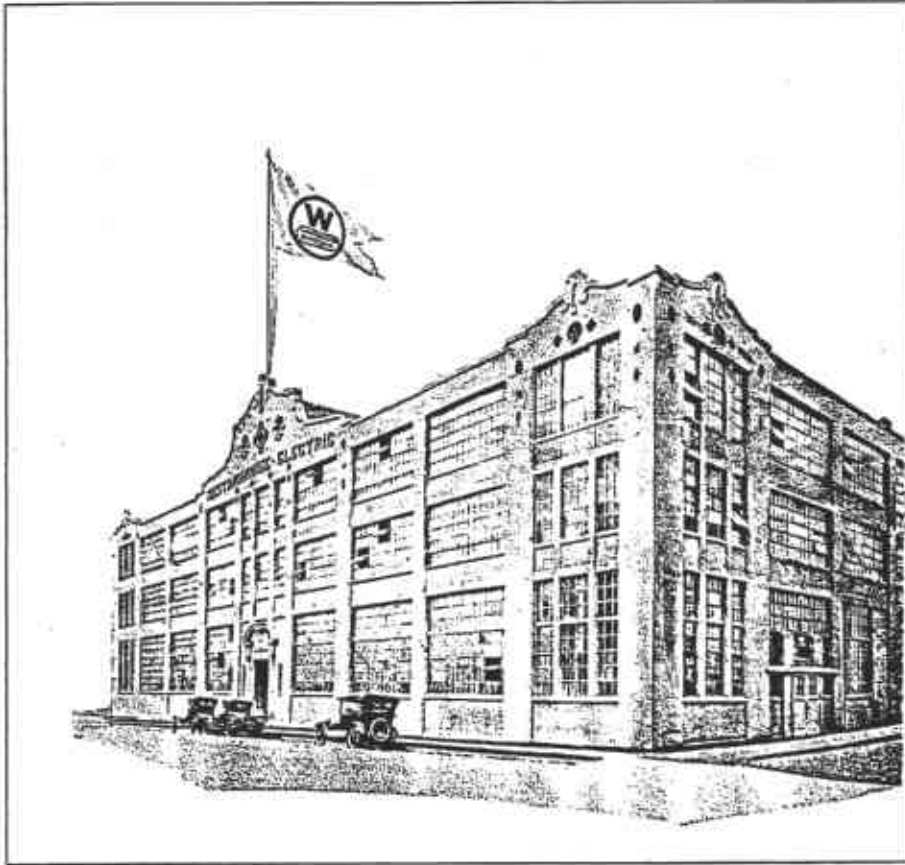
“Like a lion in the forest, he breathed deep and

with delight the smoky air of his factories. . . he was transformed into a giant when confronted with difficulties which seemed insurmountable.”

Westinghouse Electric Corporation’s Emeryville facility was constructed in 1924 as a regional warehouse for Westinghouse products, which by this time included light bulbs, home appliances, and many other items in addition to electrical distribution equipment.

The original three-story building used a concrete-frame construction system featuring a patented mushroom-head column which was very popular for industrial buildings from the twenties through the fifties. The building’s interior featured a four-story-high crane bay with its own spur track for the unloading of railroad flatcars, allowing massive transformers and other equipment to be brought directly into the building for reconditioning.

Subsequent additions to the north end of the plant during World War II contained repair



*Above: The familiar Westinghouse "W" logo, suggesting an electrical circuit schematic. Left: The Westinghouse Building strikes a proud pose in this photo taken shortly after its completion in 1924.*

# goodbye WESTINGHOUSE

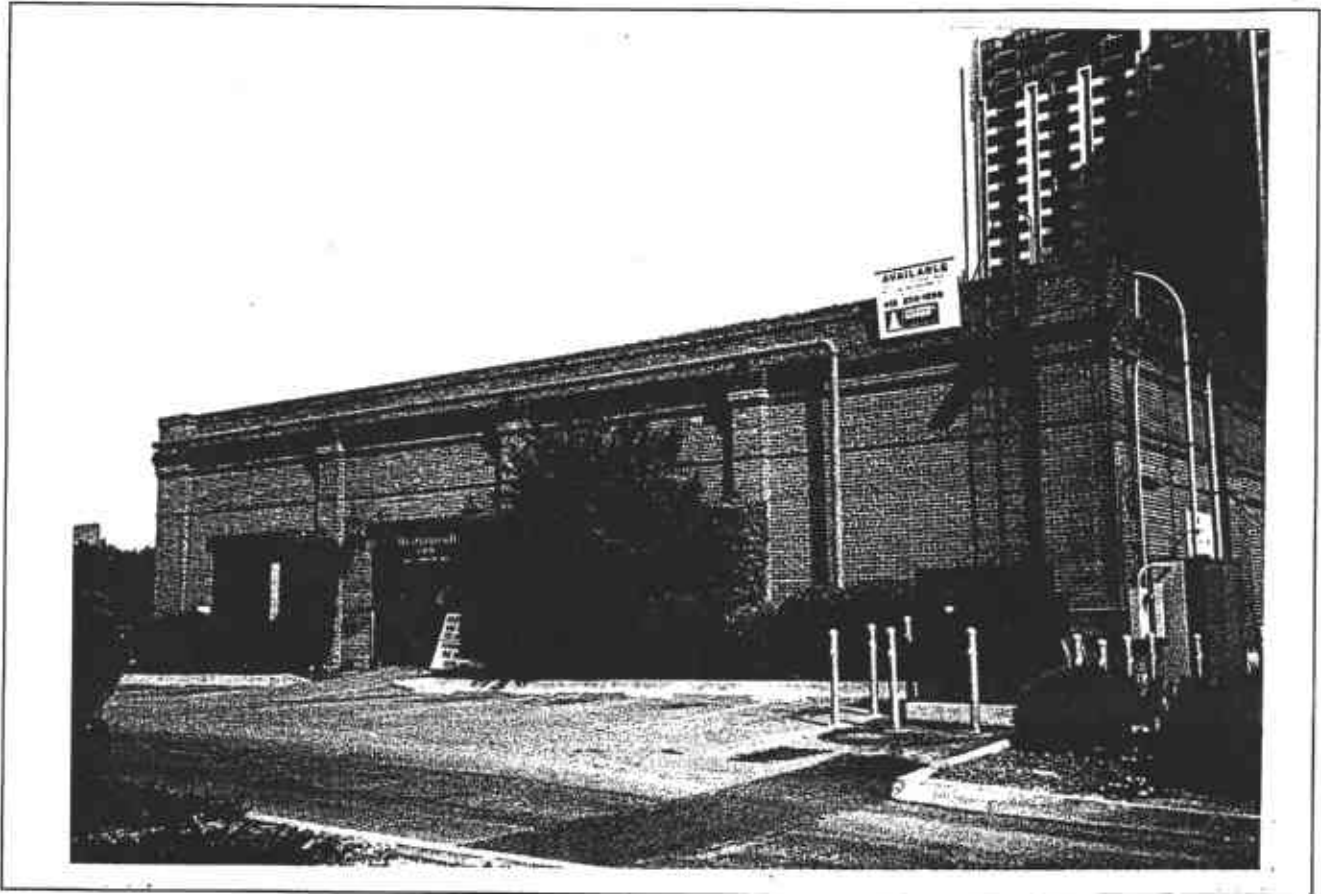
## AN EMERYVILLE LANDMARK BITES THE DUST

By Arrol Gellner

**L**ike most grownup boys, I still love a good building-wrecking show, and the demolition of the quake-damaged Westinghouse Building thruout May provided one. Carried out by the Thomas D. Eychner Wrecking Co., the demolition work was highly visible from surrounding areas. Today, the Westinghouse Building is only a memory.

But what do we really know about Westinghouse the company? Most of us associate it with refrigerators and washing machines. But there is much more to the story.

The Westinghouse Electric Corporation was once one of the world's leading manufacturers of electric motors and electrical switching equipment. Its founder, George Westinghouse, made his



*A contemporary photo of Weatherford BMW, which occupies one of the few remaining buildings of the Pabco plant.*

with the new environmental laws.

In 1972, Pabco closed the Emeryville plant and moved some of its operation to Antioch. Pabco stopped producing building materials after the Emeryville plant closed. The company is today a division of the Fibreboard Corporation (based in Concord, California) and manufactures only specialized, high-temperature insulation.

During the 1970s, the Emeryville property was subdivided for primarily non-industrial uses, and many of the over 30 Pabco buildings were demolished. By 1975, a number of retail and restaurant tenants had opened in the Pabco warehouses that now comprise the Emery Bay Public Market. The two Pabco warehouse buildings were joined by a gabled arcade as part of the extensive 1988 renovation designed by Brocchini Architects, Oakland, which created the main retail/restaurant complex of the Emery Bay

Public Market.

And now you know what gopher poison, one of the largest industrial complexes in Alameda County, and Emery Bay Public Market have in common.

• • •

a wide range of new products including a full line of paints, floor covering, roofing material, and box board. As revenues increased substantially with this expansion, starting in 1912, Paraffine began buying up companies that were not related to the building materials business. In 1918, the Paraffine Paint Company and its now 8 subsidiaries combined to become the Paraffine Companies, Inc.

As a result of a capital restructuring and a new stock offering when the subsidiaries were merged, the Paraffine companies raised new funds for even more expansion of their plant facilities. The company expanded the Emeryville operation with a new linoleum plant and a large brick warehouse in 1919. This building was almost doubled in size in 1923 with additions to the north and south elevations. It is still standing today as part of the Emery Bay Public Market.

During the economic boom of the 1920s, the Paraffine Companies grew to be the largest building materials manufacturing firm in the West, with 6,000 different products. According to an article in the January 1928 Oakland Outlook, Paraffine was also the second-largest industrial firm in Alameda County. Its products were sold throughout the United States and were exported to South America, China, India, and Australia.

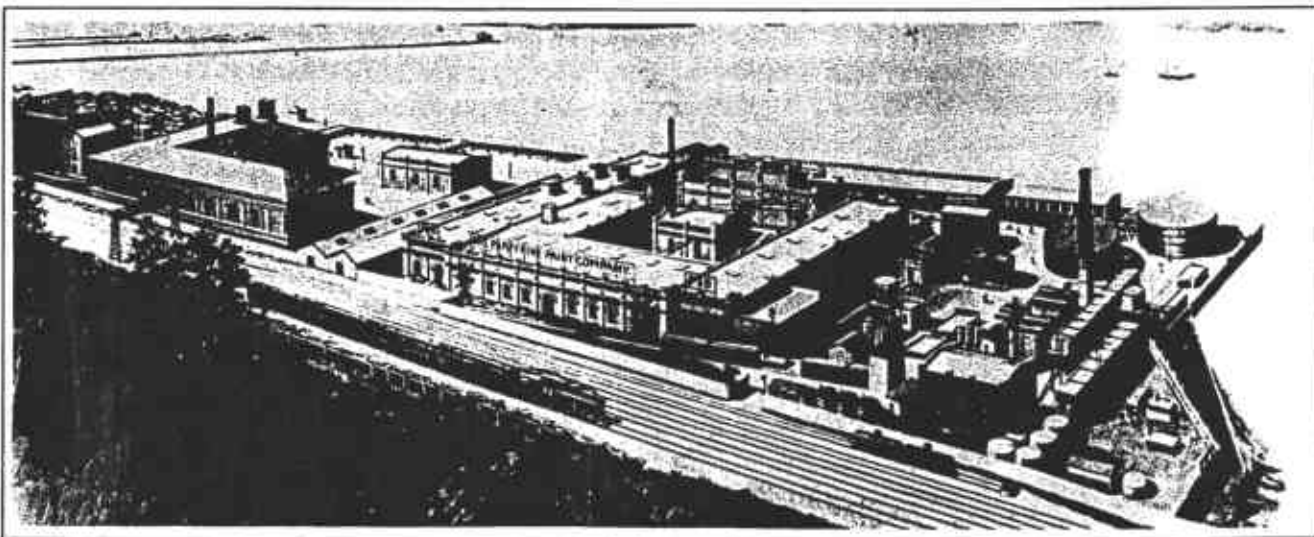
In 1938, the Paraffine Companies had 11

manufacturing plants on 38 of the 150 acres the company had assembled in Emeryville through filling the Bay and buying adjacent parcels. During the years before World War II, the company again expanded its line of products to include fiber shipping cases, corrugated cartons, glass bottle, paper pails and cartons, and insulation materials. This expansion led to the Paraffine Companies changing the company's name to Pabco, the brand name for most of its product line.

After the United States became involved in World War II, Pabco's Emeryville factory operated 24 hours a day, employing 3,000 people (in three 8-hour shifts) in support of the war effort. The concrete-block warehouse that is today part of the Emery Bay Public Market was built during the war years expansion of the Pabco complex.

Pabco also prospered and grew during the building boom that occurred after the war years. By 1956, Pabco had plants in 3 California cities besides Emeryville, and in another 5 cities outside California. 1956 was also the year Pabco acquired a 100% interest in the Fibreboard Corporation, a manufacturer of cardboard boxes.

Fibreboard had a number of strikes and other union problems during the 1960s that disrupted work at Pabco's Emeryville factory, where 9 unions represented the workers. The Emeryville facility also ran into a number of problems complying



*A somewhat tidied-up rendering of the Pabco complex as it appeared during the twenties.*



*An aerial view of the Pabco plant in its heyday. The plant extended from the Southern Pacific main line to the waterfront and beyond, as space requirements dictated. The filled-in wharf area at foreground is the approximate location of the present Charley Brown's Restaurant. At background is the Westinghouse building with its colossal roof sign.*

paint for the initials of the company's founders, proved to be an excellent preservative and waterproofing material for both metal and wood. The company's first major contract was waterproofing the piers along the San Francisco waterfront with P&B paint. By 1887, the Paraffine Paint Company was producing 15,000 gallons of asphalt paint from its recently-opened plant.

Although the company's main office was in San Francisco, the Paraffine Paint Company decided to locate their factory in Emeryville for the same reasons that eventually drew many other industries to the city: cheap land; proximity to raw materials; access to both local and international markets; and excellent rail and water transportation connections. Another advantage of the Emeryville site for Paraffine was that when the company needed more land for expansion, they simply filled in San Francisco Bay.

During the 1890s, the firm's original wood-frame buildings were replaced with 5 more substantial brick structures and an oil refinery (none of these structures are extant today). As the company increased the size of its facility, it also increased its product line, which during the 1890s included a variety of waterproof roofing and building papers it had developed by soaking burlap with the asphalt paint it had invented in 1883. When burlap became too expensive, the company replaced it with felt. When felt prices got too high, it constructed its own felt manufacturing plant.

Although the 1906 earthquake destroyed Paraffine's main office in San Francisco, the Emeryville factory was not damaged, thus permitting it to take advantage of the significant increase in demand for building materials needed for the rebuilding of San Francisco. After 1906, the company created several new divisions to produce

# Gophers

## ... AND THE MARCH OF INDUSTRY

### A History of the Paraffine Paint Company By Ward Hill

**W**hat do gopher poison, one of the largest industrial complexes in Alameda County, and the Emery Bay Public Market have in common?

The answer to this question involves one of the earliest industries in the history of Emeryville, the Paraffine Paint Company, which opened its manufacturing facility in 1884 on a 2-acre site adjacent to both San Francisco Bay and the Northern Railroad tracks. This site today is the eastern section of the Emery Bay Public Market's parking lot.

The Paraffine Paint Company was founded by Truman Pierce, a drug store owner, and Melvin Beardsley, an oil expert. Pierce and Beardsley spent most of the year 1883 trying to figure out what to do with the black, tarry, insoluble residue

left as a byproduct after refining California petroleum (which has a particularly high asphalt content).

One day Mr. Pierce accidentally knocked over a can of gopher poison into a barrel of the petroleum residue, which immediately began to dissolve. The two men immediately realized that the liquefied asphalt produced by combining the gopher poison (which is largely carbon disulphide) with the petroleum residue made an excellent acid-proof paint. The next step was to form a company and begin manufacture.

The Paraffine Paint Company initially produced only asphalt paint from the simple wood-frame building the company erected in 1884 in Emeryville. The asphalt paint, known as P&B



JOURNAL  
*of the*  
EMERYVILLE HISTORICAL SOCIETY

Volume IV, Number 2 Summer 1993

*Gophers*  
**... AND THE MARCH OF INDUSTRY**

(A History of the Paraffine Paint Company)

By Ward Hill.....Page 4

Goodbye Westinghouse

By Arrol Gellner.....Page 8

Credits:

Historical photographs courtesy of the Oakland Public Library and Vernon J. Sappers

Contemporary photographs by Donald Hausler

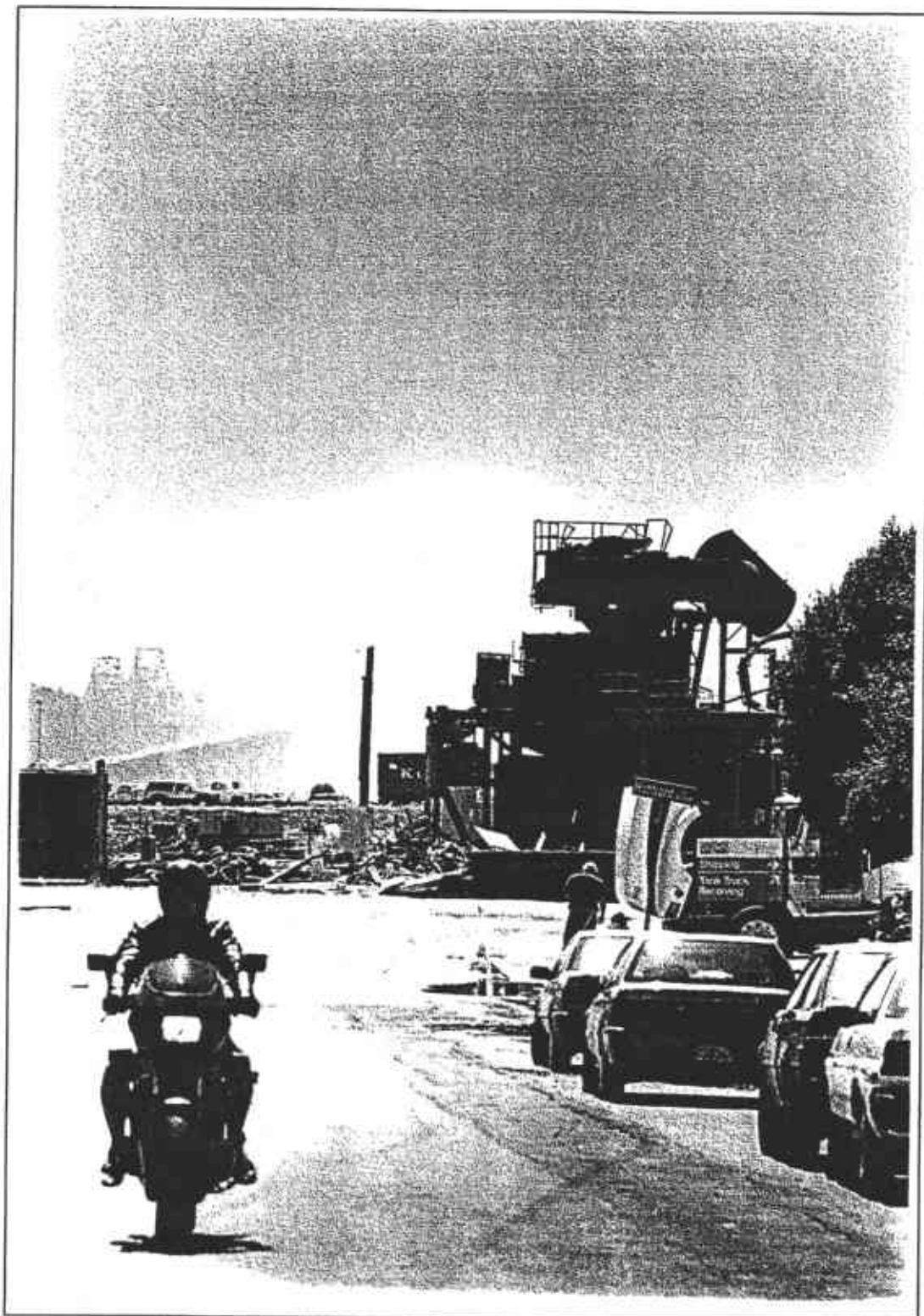
Editing, design, and production by Arrol Gellner, Donald Hausler, and Nancy Smith

Screening and printing by Copymat, Berkeley, California

The Journal of the Emeryville Historical Society is a quarterly publication sent to members and subscribers of the Emeryville Historical Society, a nonprofit corporation.

Back issues are available from the EHS.





*What's coming and what's going: This 1993 photograph by Beatriz Coll shows the ruins of Judson Steel Works silhouetted between Hubbard Street and the Bay Bridge (Copyright 1993 by Coll Photography).*

THE JOURNAL OF THE EMERYVILLE HISTORICAL SOCIETY  
VOLUME IV, NUMBER 2  
SUMMER 1993

*Gophers*  
**... AND THE MARCH OF INDUSTRY**  
A HISTORY OF THE PARAFFINE PAINT CO.



**ATTACHMENT B**

**FOURTH QUARTER 1995 MONITORING REPORT**



February 1, 1996

Brian Oliva  
Alameda County Department  
of Environmental Health  
1131 Harbor Bay Parkway  
Suite 250  
Alameda, CA 94502

Re: **Fourth Quarter 1995**  
Shell Service Station  
WIC #204-2495-0101  
1800 Powell Street  
Emeryville, California  
WA Job #81-0794-205

Dear Mr. Oliva:

This status report satisfies the quarterly reporting requirements prescribed by California Administrative Code Title 23 Waters, Division 3, Chapter 16, Article 5, Section 2652.d.

**Fourth Quarter 1995 Activities:**


- Blaine Tech Services, Inc. (BTS) of San Jose, California measured ground water depths and collected ground water samples from the site wells (Figures 1 and 2). The BTS report describing these activities, including the analytic report for the ground water samples, are included as Attachment A.
- Weiss Associates (WA) calculated ground water elevations, compiled the analytic data (Table 1) and prepared a map showing ground water elevations and benzene concentrations (Figure 2).

**Anticipated First Quarter 1996 Activities:**

- WA will submit a report presenting the results of the first quarter 1996 ground water sampling and ground water depth measurements. The report will include tabulated chemical analytic results, ground water elevations and a ground water elevation contour and benzene concentration in ground water map.

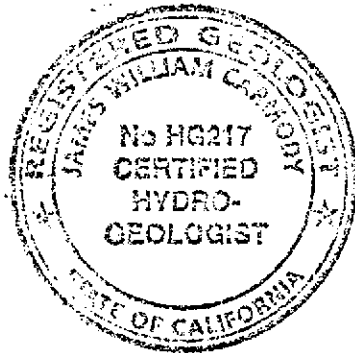
Brian Oliva  
February 1, 1996


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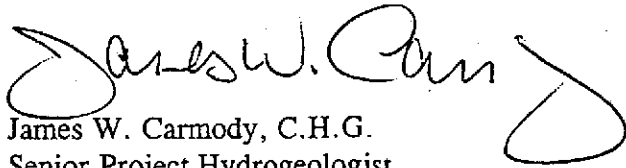
Weiss Associates 

Please call if you have any questions.

Sincerely,  
Weiss Associates



  
Grady S. Glasser  
Technical Assistant

  
James W. Carmody, C.H.G.  
Senior Project Hydrogeologist

Attachments: A - BTS' Ground Water Monitoring Report

cc: R. Jeff Granberry, Shell Oil Company, P.O. Box 4023, Concord, California 94524  
Kevin Graves, Regional Water Quality Control Board - San Francisco Bay Region,  
2101 Webster Street, Suite 500, Oakland, California 94612

GSG/JWC:all  
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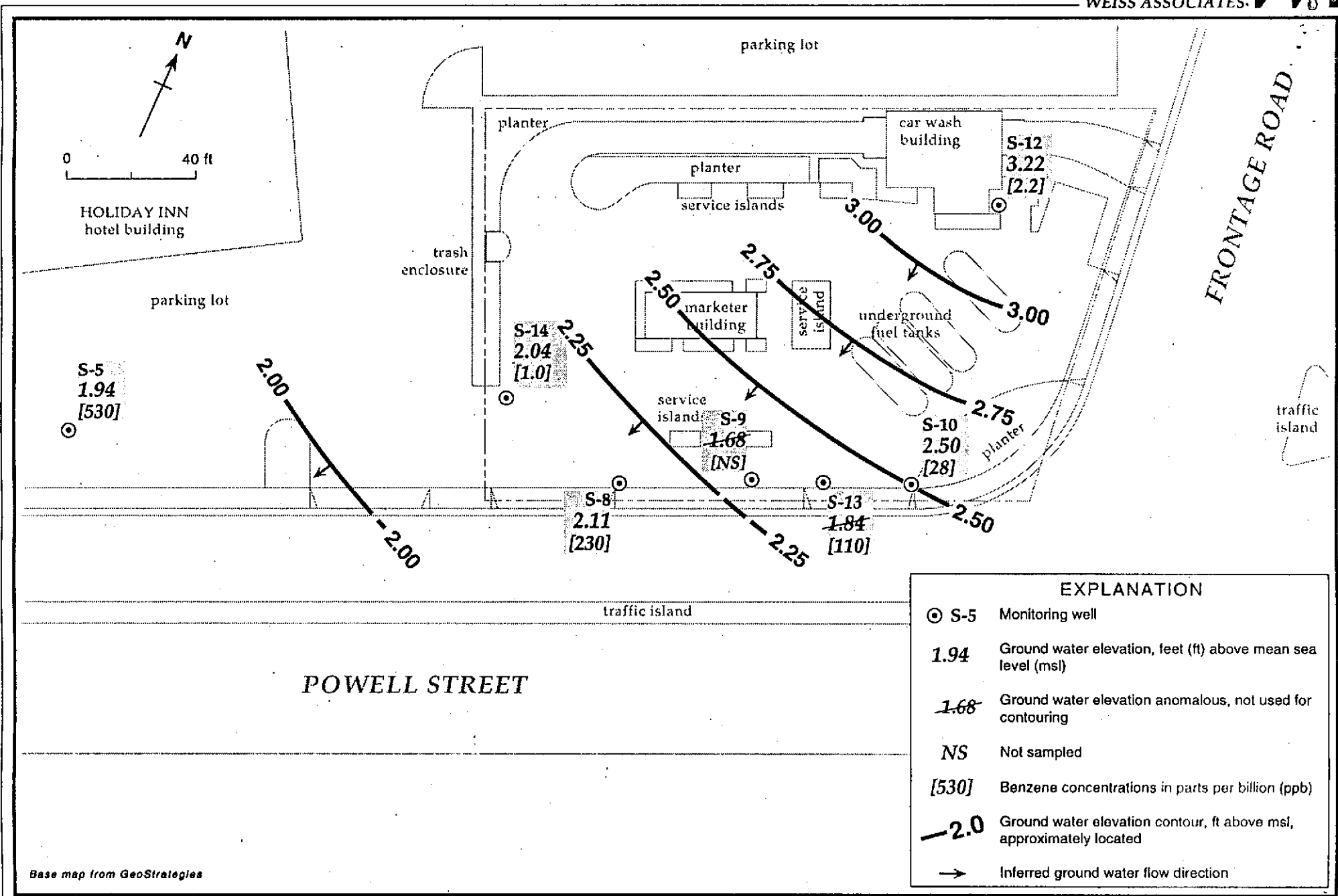


Figure 2. Monitoring Well Locations, Ground Water Elevation Contours, and Benzene Concentrations in Ground Water - December 8, 1995 - Shell Service Station - WIC# 204-2495-0107, 1800 Powell Street, Emeryville, California

Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	TPH-G	TPH-D	parts per billion (µg/L)			
									B	T	E	X
S-5	10/26/84	11.72	---	---	---	---	3,000	---	660	20	20	70
	02/09/85		---	---	---	---	2,800	---	740	20	20	140
	04/27/85		---	---	---	---	4,300	---	750	10	20	<30
	07/06/85		---	---	---	---	1,500	---	300	8.0	7.0	9.0
	10/24/85		---	---	---	---	2,100	---	760	10	40	50
	01/03/86		---	---	---	---	1,300	---	520	9.0	8.0	10
	07/05/86		8.36	---	3.36	---	1,400	---	500	10	4.0	<10
	10/18/86		---	---	---	---	4,200	---	1,100	9.0	14	7.0
	01/13/87		---	---	---	---	4,500	6,100	1,100	15	30	25
	07/07/87		9.15	---	2.57	---	3,200	---	1,000	16	9.0	12
	10/10/87		9.67	---	2.05	---	1,700	---	16	5.7	5.2	8.9
	02/11/88		9.00	---	2.72	---	1,300	---	300	5.0	<5	<5
	05/10/88		8.61	---	3.11	---	1,900	---	490	<0.5	<5	<5
	08/31/88		9.61	---	2.11	---	6,700	---	760	26	<25	<25
	12/03/88		9.47	---	2.25	---	2,900	---	890	5.3	7.3	13
	02/16/89		8.29	---	3.43	---	1,300	---	280	3.0	3.4	9.4
	08/10/89		9.30	---	2.42	---	1,700	---	530	5.5	<5	5.8
	11/11/89		9.42	---	2.30	---	---	---	---	---	---	---
	02/21/94		7.95	---	3.77	---	1,000	---	250	<5	<5	<5
	02/21/94 <sup>dup</sup>		7.95	---	3.77	---	1,300	---	220	<5	<5	11
	05/16/94		8.00	---	3.72	---	1,200	---	230	<5	<5	<5
	08/09/94 <sup>a</sup>		---	---	---	---	---	---	---	---	---	---
	11/09/94		8.32	---	3.40	---	1,600	---	220	3.2	1.8	5.0
	11/09/94 <sup>dup</sup>		8.32	---	---	---	1,600	---	250	3.3	1.9	5.9
	02/22/95 <sup>a</sup>		---	---	---	---	---	---	---	---	---	---
	05/02/95 <sup>a</sup>		---	---	---	---	---	---	---	---	---	---
	05/10/95		---	---	---	---	910	---	170	1.5	1.3	5.2
	08/24/95		8.78	---	2.94	---	620	---	210	<0.5	1.2	5.3
	12/08/95		9.78	---	1.94	---	1,600	---	510	3.3	1.5	6.6
	12/08/95 <sup>dup</sup>		9.78	---	1.94	---	1,600	---	530	1.8	1.1	5.4



Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California (continued)

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	TPH-G	TPH-D	parts per billion (µg/L)			
									B	T	E	X
S-6 <sup>b</sup>	04/27/85		---	---	---	---	6,500	---	2,400	30	50	210
	07/06/85		---	---	---	---	3,700	---	1,700	34	55	200
	10/24/85		---	---	---	---	< 50	---	23	< 0.5	< 5	10
	11/09/85 <sup>b</sup>		---	---	---	---	---	---	---	---	---	---
S-7 <sup>b</sup>	10/26/84		---	---	---	---	50	---	1.1	< 1	< 1	4
	02/09/85		---	---	---	---	---	---	0.90	< 1	< 1	< 3
	04/27/85		---	---	---	---	< 50	---	< 1	< 1	< 1	< 3
	07/06/85		---	---	---	---	70	---	2.2	< 1	< 1	< 3
	10/24/85		---	---	---	---	6,200	---	2,200	130	190	660
	11/09/85 <sup>b</sup>		---	---	---	---	---	---	---	---	---	---
S-8	10/26/84	12.76	---	---	---	---	1,000	---	610	9.0	1.0	42
	02/09/85		---	---	---	---	500	---	160	5.0	< 2	17
	04/27/85		---	---	---	---	2,700	---	1500	20	10	40
	07/06/85		---	---	---	---	440	---	180	5.0	2.0	12
	10/24/85		---	---	---	---	2,000	---	1,100	17	5.0	70
	01/03/86		---	---	---	---	1,900	---	1,300	20	< 10	70
	07/05/86		9.50	---	3.26	---	1,600	---	920	30	< 10	60
	10/18/86		---	---	---	---	1,400	---	640	< 10	< 10	30
	01/13/87		---	---	---	---	670	760	190	5.8	< 0.5	19
	04/22/87		---	---	---	---	2,400	---	740	54	5.7	59
	07/07/87		10.45	---	2.31	---	1,100	---	450	15	< 2.5	42
	10/10/87		10.83	---	1.93	---	340	---	4.0	0.60	< 0.5	17
	02/11/88		10.44	---	2.32	---	< 1,000	---	260	< 10	< 10	11
	05/10/88		10.17	---	2.59	---	1,800	---	700	14	< 5	46
	08/31/88 <sup>SPH</sup>		10.81	---	1.95	---	---	---	---	---	---	---
	12/03/88		10.81	---	1.95	---	960	---	250	4.3	< 2.5	14
	02/16/89		9.65	---	3.11	---	2,700	---	800	35	10	83
05/28/89		10.46	---	2.3	---	960	---	710	25	84	80	





Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California (continued)

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	← parts per billion (µg/L) →					
							TPH-G	TPH-D	B	T	E	X
	08/10/89		10.59	---	2.17	---	1,300	---	630	17	<5	46
	11/11/89		10.29	---	2.47	---	910	---	180	8	<2.5	15
	02/21/94		9.52	---	3.24	2,910	3,200	---	480	52	<5	130
	05/16/94		9.49	---	3.27	---	1,000	---	220	7.3	<5	28
	05/16/94 <sup>dup</sup>		9.49	---	3.27	---	1,000	---	280	10	<5	29
	08/09/94		10.37	---	2.39	4,500	400	---	27	6.6	<0.5	18
	11/09/94		9.58	---	3.18	4,600	650	---	170	5.3	<0.5	17
	02/22/95		9.02	---	3.74	---	650	---	210	10	1.2	22
	05/02/95		8.45	---	4.31	---	1,000	---	280	17	1.4	32
	08/24/95		10.02	---	2.74	---	480	---	180	11	1.0	19
	08/24/95 <sup>dup</sup>		10.02	---	2.74	---	700	---	180	6.5	<0.5	17
	12/08/95		10.65	---	2.11	---	740	---	230	6.9	0.7	15
S-9	10/26/84 <sup>SPH</sup>	12.75	---	---	---	---	---	---	---	---	---	---
	02/09/85 <sup>SPH</sup>		---	1.30	---	---	---	---	---	---	---	---
	04/27/85 <sup>SPH</sup>		---	1.25	---	---	---	---	---	---	---	---
	07/06/85 <sup>SPH</sup>		---	1.20	---	---	---	---	---	---	---	---
	10/24/85 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	01/03/86 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	04/11/86 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	07/05/86 <sup>SPH</sup>		9.67	---	3.08	---	---	---	---	---	---	---
	10/18/86 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	01/13/87 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	04/22/87 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	07/07/87 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	10/10/87 <sup>SPH</sup>		22.30	---	-9.55	---	---	---	---	---	---	---
	02/24/94 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	05/16/94 <sup>SPH</sup>		---	1.5	---	---	---	---	---	---	---	---
	08/09/94 <sup>SPH</sup>		11.80	2.0	0.95	---	---	---	---	---	---	---



Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California (continued)

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	TPH-G	TPH-D	B T E X			
									← parts per billion (µg/L) →			
	11/09/94 <sup>SPH</sup>		---	---	---	---	---	---	---	---	---	---
	02/22/95 <sup>SPH</sup>		11.40	2.38	3.25	---	---	---	---	---	---	---
	05/02/95 <sup>SPH</sup>		11.83	2.12	2.62	---	---	---	---	---	---	---
	12/08/95		11.92	1.06	1.68	---	---	---	---	---	---	---
S-10	10/26/84	12.58	---	---	---	---	700,000	---	37,000	100,000	20,000	110,000
	02/09/85		---	---	---	---	6,500	---	480	700	100	1800
	04/27/85		---	---	---	---	13,000	---	1,300	500	600	3700
	07/06/85		---	---	---	---	14,000	---	1,300	310	270	2400
	10/24/85		---	---	---	---	4,200	---	580	34	4	440
	01/03/86		---	---	---	---	1,700	---	360	10	7.8	170
	04/11/86 <sup>SPH</sup>		---	0.01	---	---	---	---	---	---	---	---
	07/05/86 <sup>SPH</sup>		9.16	0.01	3.42	---	---	---	---	---	---	---
	10/18/86 <sup>SPH</sup>		---	0.03	---	---	---	---	---	---	---	---
	01/13/87 <sup>SPH</sup>		---	0.03	---	---	---	---	---	---	---	---
	04/22/87 <sup>SPH</sup>		---	0.01	---	---	---	---	---	---	---	---
	07/07/87 <sup>SPH</sup>		9.41	0.03	3.17	---	---	---	---	---	---	---
	10/10/87 <sup>SPH</sup>		7.77	---	4.81	---	---	---	---	---	---	---
	02/11/88		6.41	---	6.17	---	1,200	---	470	16	<5	14
	05/10/88		9.04	---	3.54	---	1,100	---	100	6	4	19
	08/31/88 <sup>SPH</sup>		9.38	0.01	3.20	---	---	---	---	---	---	---
	12/03/88 <sup>SPH</sup>		6.89	---	5.69	---	---	---	---	---	---	---
	02/16/89		7.34	---	5.24	---	530	---	89	8.5	1.6	4.5
	05/28/89		6.60	---	5.98	---	240	---	65	3.8	2.2	8.6
	08/10/89		9.09	---	3.49	---	250	---	23	4.1	<1	6.4
	11/11/89 <sup>c</sup>		6.58	---	6	---	320	---	1.6	1.3	1.4	6.2
	02/21/94		8.32	---	4.26	---	1,400	---	190	9.9	<2.5	19
	05/16/94		8.35	---	4.23	---	300	---	45	8.6	6.2	19
	08/08/94		8.66	---	3.92	---	700	---	57	14	<0.5	9.3
	11/09/94		6.68	---	5.90	---	640	---	130	2.0	1.6	4.1

Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California (continued)

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	TPH-G	TPH-D	parts per billion (µg/L)			
									B	T	E	X
	02/22/95		9.12	---	3.46	---	500	---	65	5.9	1.0	8.2
	05/02/95		9.50	---	3.08	---	530	---	59	2.3	0.8	8.2
	08/24/95		10.06	---	2.52	---	350	---	35	4.6	<0.5	6.7
	12/08/95		10.08	---	2.50	---	690	---	28	4.6	0.9	8.6
S-12	07/06/85	12.84	8.22	---	---	---	<250	2,200	0.71	<0.5	<0.5	<3.6
	11/16/85		---	---	---	---	<250	1,400	18	<2	<2	<5
	01/03/86		---	---	---	---	<250	---	24	2	<2	<5
	07/05/86		8.27	---	4.57	---	80	---	15	0.7	<0.5	2
	10/18/86		---	---	---	---	150	---	12	9	<0.5	3.6
	01/13/87		---	---	---	---	120	1,000	3.6	0.8	<0.5	2.9
	04/22/87		---	---	---	---	100	820	3.7	3.8	0.8	11
	07/07/87		9.5	---	3.34	---	70	---	2.5	0.8	<0.5	2.4
	10/10/87		9.9	---	2.94	---	220	2,500	2.1	0.7	<0.5	1.2
	02/11/88		9.43	---	3.41	---	110	2,500	0.8	<0.5	<0.5	1.3
	05/10/88		8.65	---	4.19	---	140	3,800 <sup>d</sup>	0.8	0.8	<0.5	2.5
	08/31/88		9.86	---	2.98	---	190	2,600 <sup>d</sup>	3	15	0.5	4.5
	12/03/88		9.93	---	2.91	---	180	3,900 <sup>d</sup>	1.2	1	1	7.7
	02/16/89		8.08	---	4.76	---	350 <sup>e</sup>	2,100 <sup>d</sup>	0.6	<0.5	0.5	5.5
	05/28/89		9.08	---	3.76	---	290	2,200	2	1.6	4.4	6
	08/10/89		9.35	---	3.49	---	240	720	0.7	<0.5	<0.5	1.1
	11/11/89		9.28	---	3.56	---	210 <sup>e</sup>	4,100	0.7	0.5	<0.5	3.4
	02/21/94		8.22	---	4.62	---	240 <sup>f</sup>	2,200 <sup>g</sup>	0.7	<0.5	<0.5	3.6
	05/16/94		8.92	---	3.92	---	96	2,200	1.5	<0.5	<0.5	2.0
	08/08/94		---	---	---	---	110 <sup>h</sup>	3,500 <sup>i</sup>	<0.5	<0.5	<0.5	<0.5
	11/09/94		7.56	---	5.28	---	80	5,400 <sup>i</sup>	80	<0.5	<0.5	0.6
	02/22/95		7.98	---	4.86	---	110	2,900 <sup>j</sup>	0.7	<0.5	<0.5	3.7
	02/22/95 <sup>dup</sup>		7.98	---	4.86	---	110	3,400 <sup>j</sup>	4.8	7.1	<0.5	2.1

Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California (continued)

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	parts per billion (µg/L)					
							TPH-G	TPH-D	B	T	E	X
	05/02/95		8.44	---	4.40	---	140	2,800	2.4	1.1	0.8	4.3
	08/24/95		9.00	---	3.84	---	200	1,600	19	12	5.6	24
	12/08/95		9.62	---	3.22	---	170	2,700	2.2	0.7	0.9	3.6
S-13	07/06/85	12.59	9.26	---	---	---	700	3,600	200	<5	<5	45
	11/16/85		---	---	---	---	1,900	2,000	700	160	70	340
	01/03/86		---	---	---	---	2,800	---	1,400	130	10	500
	07/05/86		9.47	---	3.12	---	3,100	---	1,800	60	40	270
	10/23/86		---	---	---	---	3,400	---	1,500	28	28	250
	01/13/87		---	---	---	---	1,900	900	830	15	<10	99
	04/22/87		---	---	---	---	2,900 <sup>e</sup>	770 <sup>j</sup>	1,100	20	30	140
	07/07/87		10.38	---	2.21	---	1,500	---	880	10	6	160
	10/10/87		10.78	---	1.81	---	480	2,400	830	15	<0.5	120
	02/11/88		10.48	---	2.11	---	1,300	1,300	510	<10	<10	86
	05/10/88		9.48	---	3.11	---	1,000	1,300 <sup>d</sup>	470	<0.5	<5	50
	08/31/88 <sup>SPH</sup>		10.74	---	1.85	---	---	---	---	---	---	---
	12/03/88		10.3	---	2.29	---	900	2,400 <sup>d</sup>	290	4.6	<2.5	20
	02/16/89		7.6	---	4.99	---	840 <sup>e</sup>	1,200 <sup>d</sup>	310	3.5	<2.5	27
	05/28/89 <sup>e</sup>		10.6	---	1.99	---	2,100	4,600	1,100	19	50	350
	08/10/89 <sup>e</sup>		10.58	---	2.01	---	900	2,300	230	16	6.9	65
	11/11/89		9.84	---	2.75	---	2,800	2,800	200	15	8.6	58
	02/21/94		9.26	---	3.33	---	700	1,800 <sup>f</sup>	200	<5	<5	45
	05/16/94		9.62	---	2.97	---	650	1,700	180	2.5	<2.5	21
	08/08/94		10.32	---	2.27	---	470	2,600 <sup>i</sup>	12	1.5	0.5	14
	11/09/94 <sup>a</sup>		---	---	---	---	---	---	---	---	---	---
	02/22/95		8.92	---	3.67	---	550	2,400 <sup>j</sup>	190	4.0	<0.5	17
	05/02/95		9.52	---	3.07	---	790	2,100	250	6.9	1.2	22
	08/24/95		10.02	---	2.57	---	330	1,500	93	<0.5	<0.5	2.0
	12/08/95		10.75	---	1.84	---	440	2,400	110	2.2	0.8	23



Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California (continued)

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	TPH-G	TPH-D	parts per billion (µg/L)			
									B	T	E	X
S-14	11/16/85	12.69	---	---	---	---	<250	400	3	<2	<2	<5
	01/03/86		---	---	---	---	<250	---	3	2	<2	<5
	04/22/87		---	---	---	---	1,200	18,000	7.4	2.7	15	110
	07/07/87		10.32	---	2.37	---	190	---	6.5	0.6	1.9	26
	10/10/87		10.77	---	1.92	---	4,900	21,000	7	1.2	<0.5	25
	02/11/88		10.4	---	2.29	---	370	12,000 <sup>c</sup>	4.6	<2.5	<2.5	26
	05/10/88		9.66	---	3.03	---	660	2,200 <sup>d</sup>	2.9	<2.5	<2.5	24
	08/31/88		10.74	---	1.95	---	700	7,900	3.2	<2.5	<2.5	15
	12/03/88		10.69	---	2.00	---	210	11,000 <sup>d</sup>	<0.5	<0.5	0.8	6.8
	02/16/89		9.69	---	3.00	---	130 <sup>e</sup>	5,700 <sup>d</sup>	<0.5	<0.5	<0.5	4.4
	05/28/89		10.42	---	2.27	---	770	5,200	<0.5	<0.5	<0.5	4.5
	08/10/89		10.54	---	2.15	---	920	8,800	<1	<1	1.6	17
	11/11/89		9.91	---	2.78	---	710	28,000	20	57	25	69
	02/21/94		9.3	---	3.09	---	2,800	3,600	<5	<5	<5	14
	02/21/94		9.30	---	3.39	---	2,300 <sup>f</sup>	3,600 <sup>g</sup>	<5.0	<5	<5	14
	05/16/94		9.54	---	3.15	---	310	6,700	<2.5	<2.5	<2.5	3.1
	08/08/94		10.29	---	2.4	---	480 <sup>k</sup>	2,900 <sup>l</sup>	<0.5	0.6	<0.5	0.8
	08/08/94 <sup>dup</sup>		10.29	---	2.4	---	590 <sup>k</sup>	2,900 <sup>l</sup>	<0.5	0.6	<0.5	1.5
	11/09/94		9.52	---	3.07	---	170 <sup>k</sup>	6,400 <sup>i</sup>	0.7	<0.5	<0.5	2.7
	02/22/95		9.18	---	3.51	---	550	7,000 <sup>ij</sup>	<0.5	<0.5	<0.5	1.6
	05/02/95		9.49	---	3.2	---	210	2,300	1.0	0.9	1.1	6.3
	05/02/95 <sup>dup</sup>		9.49	---	3.2	---	160	2,600	0.6	0.6	0.7	3.8
	08/24/95		9.94	---	2.75	---	180	3,700	0.5	<0.5	<0.5	1.3
	12/08/95		10.65	---	2.04	---	190	4,900	1.0	<0.5	0.6	4.6
Trip	02/21/94		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5
Blank	02/24/94		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5
	05/16/94		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5
	08/08/94		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5
	11/09/94		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5



Table 1. Ground Water Elevations and Analytic Results - Shell Service Station WIC# 204-2495-0101, 1800 Powell Street, Emeryville, California (continued)

Well ID	Sampling Date	Top-of-Box Elevation (ft msl)	Depth to Water (ft)	Separate-Phase Hydrocarbon Thickness (ft)	Ground Water Elevation (ft msl)	TDS (ppm)	TPH-G	TPH-D	parts per billion (µg/L)			
									B	T	E	X
	02/22/95		---	---	---	---	<50	---	<0.5	0.9	<0.5	<0.5
	05/02/95		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5
	05/10/95		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5
	12/08/95		---	---	---	---	<50	---	<0.5	<0.5	<0.5	<0.5
DTSC MCLs				---		---	NE	NE	1	100 <sup>e</sup>	680	1,750

**Abbreviations:**

ft msl = Feet above mean sea level  
 TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015  
 TPH-D = Total petroleum hydrocarbons as diesel by Modified EPA Method 8015  
 B = Benzene by EPA Method 8020  
 T = Toluene by EPA Method 8020  
 E = Ethylbenzene by EPA Method 8020  
 X = Xylenes by EPA Method 8020  
 DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water  
 NE = Not established  
 <n = Not detected at a detection limit of n ppb  
 dup = Duplicate sample  
 SPH = Separate-phase hydrocarbons present, often unable to measure thickness accurately  
 --- = Not analyzed/not measured

**Notes:**

a = Well inaccessible  
 b = Well abandoned on 11/09/85  
 c = DTSC recommended action level; MCL not established  
 d = Compounds detected within the chromatographic range appear to be weathered diesel  
 e = Compounds detected within the chromatographic range of gasoline but not characteristic of the standard gasoline pattern.  
 f = The concentrations reported as gasoline for samples S-12 and S-14 are primarily due to the presence of a discrete peak  
 g = The concentrations reported as diesel for samples S-12, S-13 and S-14 are due to the presence of a combination of diesel and a heavier petroleum product of hydrocarbon range C18 - C36, possibly motor oil  
 h = The result for gasoline is an unknown hydrocarbon which consists of several peaks  
 i = The positive result appears to be a heavier hydrocarbon than diesel  
 j = Compounds detected within the chromatographic range of diesel appears to include gasoline compounds.  
 k = The positive result appears to be a heavier hydrocarbon than gasoline  
 l = Maximum concentration suitable for domestic water supply as defined by Regional Water Quality Control Board Resolution #89-39



**ATTACHMENT C**

**SEPARATE-PHASE HYDROCARBON ANALYSIS REPORT**

February 9, 1996

To: Yi-Ran Wu

From: Emiliano M. Hinojosa

A product sample was received by the Refinery & Environmental Analytical Chemistry Department of Westhollow Technology Center for product identification analysis. The sample was collected by Weiss Associates from a site located at 1800 Powell Street in Emeryville, California.

**S-9 Product**

This sample contains both gasoline range material and high boiling range material. Approximately fifty percent of the product in the sample is gasoline range material. The remaining material has a carbon range of n-C20 to n-C50+. The bulk of this high boiling range material is in the n-C20 to n-C50 range. The identification of this portion of the sample is not possible due to lack of references.

If you have any questions/comments, please call me at (713) 544-7815. Unless otherwise indicated, the sample will be disposed of three months from the date of issue of this memorandum.



Emiliano M. Hinojosa  
Westhollow Technology Center  
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Houston, Tx. 77082



**ATTACHMENT D**

**STANDARD FIELD PROCEDURES**

WA has developed standard procedures for drilling and sampling soil borings and installing, developing and sampling ground water monitoring wells. These procedures comply with Federal, State and local regulatory guidelines. Specific procedures are summarized below.

## **Soil Boring and Sampling**

### *Objectives/Supervision*

Soil sampling objectives include characterizing subsurface lithology, assessing whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and collecting samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG).

### *Soil Boring and Sampling*

Deep soil borings or borings for well installation are typically drilled using hollow-stem augers. Split-barrel samplers lined with steam-cleaned brass or stainless steel tubes are driven through the hollow auger stem into undisturbed sediments at the bottom of the borehole using a 140 pound hammer dropped 30 inches. Soil samples can also be collected without using hollow-stem augers by progressively driving split-barrel soil samplers to depths of up to 30 ft.

Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Near the water table and at lithologic changes, the sampling interval may be less than five ft.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

### *Sample Analysis*

After noting the lithology at each end of the sampling tubes, the tube chosen for analysis is immediately trimmed of excess soil and capped with Teflon tape and plastic end caps. The sample is labeled, stored in crushed ice at or below 4°C, and transported under chain-of-custody to a State-certified analytic laboratory.

### *Screening*

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatile from the soil. After ten to fifteen minutes, a portable photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the stratigraphy and ground water depth to select soil samples for analysis.

### *Grouting*

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe. If wells are completed in the borings, the well installation, development and sampling procedures summarized below are followed.