

**REPORT OF TIER 2 RISK-BASED
CORRECTIVE ACTION ASSESSMENT**

**Former Oakland Tribune Maintenance Garage
2302 Valdez Street, Oakland, California**

GA Project No. 125-01-02

Prepared for:

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March 16, 1998

March 16, 1998

UST Local Oversight Program
Alameda County Health Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Attention: Mr. Tom Peacock

Subject: Report of Tier 2 Risk-Based Corrective Action Assessment
Former Oakland Tribune Maintenance Garage
2302 Valdez Street, Oakland, California
GA 125-01-02
LOP Site ID No.: 3663

Ladies and Gentlemen:

Gribi Associates is pleased to submit this report on behalf of Oakland Tribune, Inc., providing results of a Tier 2 Risk-Based Corrective Action (RBCA) assessment conducted for the former Oakland Tribune Maintenance Garage located at 2302 Valdez Street in Oakland, California. The RBCA assessment included: (1) Conducting a survey to identify groundwater wells in the vicinity; (2) Conducting groundwater monitoring of wells MW-1, MW-2, MW-4, and MW-9 without purging the wells prior to sampling; (3) Conducting RBCA model calculation; and (4) Preparing a RBCA assessment report. The goal of the RBCA assessment has been to determine whether or not remaining hydrocarbons at the site pose a significant environmental or health risk for nearby receptors. The RBCA assessment was conducted in accordance with American Society for Testing and Materials (ASTM) *Standard Guide to Risk-Based Corrective Action at Petroleum Release Sites*, (E 1739).

Our review of available site data indicates that hydrocarbon releases from the UST system and floor sump sources migrated vertically downward to the groundwater table, located at about 13 feet in depth, and migrated laterally in a downgradient (south) direction. Further, low-permeability soils beneath the site have resulted in a localized soil and groundwater hydrocarbon plumes, limited to an area immediately surrounding the former USTs and extending in a downgradient direction. Based on this conceptual site model, we eliminated the surface soil and surface water exposure pathways. Remaining possible complete exposure pathways include: (1) Inhalation of hydrocarbon vapors via subsurface soil and groundwater volatilization to both outdoor air and enclosed buildings; and (2) Ingestion of hydrocarbons in groundwater resulting from dissolved plume migration and from hydrocarbons in subsurface soil leaching to groundwater.

Gribi Associates conducted Tier 2 RBCA calculations using the *Tier 1 and Tier 2 RBCA Spreadsheet System*, Version 1.01 computer model developed by Groundwater Services, Inc. This model provides for Tier 2 RBCA calculations in accordance with and using default values contained in

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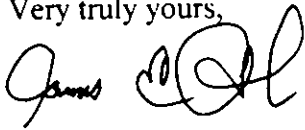
ASTM Standard E-1739. Based on preliminary exposure pathway screening, Gribi Associates ran RBCA calculations for the air, subsurface soil and groundwater exposure pathways identified above.

Based on model risk calculations, it appears that remaining hydrocarbons in subsurface soils and groundwater pose no significant environmental or health risk to surrounding receptors. Model calculations also show that representative constituent concentrations in subsurface soils and groundwater are below calculated site-specific target cleanup levels (SSTLs) calculated for the site.

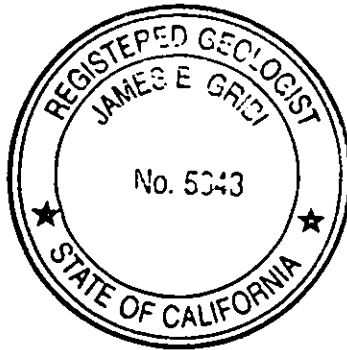
Based on RBCA calculations showing no significant risk from remaining hydrocarbons, we request that Alameda County Department of Environmental Health review this site for regulatory closure, with no additional remediation or monitoring required.

We appreciate the opportunity to present this report for your review. Please call if you have questions or require additional information.

Very truly yours,



James E. Gribi
Registered Geologist
California No. 5843



JEG/ct
Enclosure

c Mr. Chad Schwartz, Esq.
Mr. Arthur Goldman, Ritchie Commercial

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1.0 INTRODUCTION

Gribi Associates was contracted by Oakland Tribune, Inc. to conduct a Tier 2 Risk-Based Corrective Action (RBCA) assessment for the former Oakland Tribune Maintenance Garage site located at 2302 Valdez Street in Oakland, California (see Figure 1 and Figure 2). The goal of the RBCA assessment has been: (1) To calculate environmental and health risk posed by remaining hydrocarbons at the site; (2) To determine cleanup levels for soil and groundwater which are protective of public health and safety; and (3) To prepare a Corrective Action Plan for the site, based on results of the RBCA assessment.

1.1 Scope of Work

In order to complete the RBCA assessment, Gribi Associates was contracted to conduct the following scope of work.

1. **Re-sample MW-1, MW-2, MW-4, and MW-9 without purging wells.**
2. **Conduct a well survey.**
3. **Conduct ASTM RBCA modeling.**
4. **Prepare RBCA report and Corrective Action Plan (CAP) for site.**

The RBCA assessment was conducted in accordance with American Society for Testing and Materials (ASTM) *Standard Guide to Risk-Based Corrective Action at Petroleum Release Sites*, (E 1739).

1.2 Limitations

The services provided under this contract as described in this report include professional opinions and judgments based on data collected. These services have been provided according to generally accepted environmental protocol. The opinions and conclusions contained in this report are typically based on information obtained from:

1. Observations and measurements made by our field staff.
2. Contacts and discussions with regulatory agencies and others.
3. Opinions and judgments of Gribi Associates based on the information available.

2.0 SITE BACKGROUND

The following sections provide a general background about the regional setting and about the site history. Results of the well survey are also described in this section.

2.1 General Site Description

The project site property consists of approximately eight contiguous rectangular parcels which total approximately 46,342 square feet. The subject property spans the southern portion of the block bordered by Valdez Street on the west, Waverly Street on the east and 23rd Street on the south.

The project site comprises a large warehouse on the southern end of the Valdez tract block and an asphalt covered parking area north from the warehouse, which spans the block between Valdez Street and Waverly Street. The warehouse consists of an approximately 14,000 square-foot rectangular building, built on a solid concrete slab foundation. The warehouse building is almost entirely open, except for a small office suite at the southwest corner of the building. Large doors located at the south, west, and north ends of the project site building provide access to the warehouse building.

Within the warehouse building adjacent to the eastern interior wall are three hydraulic lifts. Each lift consists of a rectangular concrete vault measuring approximately 15 feet by two feet by eight feet deep which contains all of the mechanical lift equipment and apparently holds the hydraulic fluid. Each of the three lifts also contains a separate piston lift located approximately five feet west from the main vault.

The open asphalted area located north from the warehouse building is leased by a company which operates an attended parking lot in this area. This area is enclosed by a chain-link fence with the entrance to the parking lot located on Valdez Street.

2.2 Regional Setting

The project site is located on the northeast corner of Valdez Street and 23rd Street in Oakland, California. The project site is located in a mostly commercial area of Oakland, with predominately retail, commercial, and light industrial land usage in the area. An older residential apartment building is present approximately 70 feet south from the project site, on the southeast corner of Valdez Street and 23rd Street. According to a maintenance worker at this adjacent apartment building, this building does contain a basement; however, this basement is a finished structure and is used only for storage. It appears that this basement attains a maximum depth of about six to eight feet below surface grade.

The project site is situated on the gently southwest-sloping East Bay Plain, approximately one and one-half miles east-northeast from San Francisco Bay, Oakland Inner Harbor and two miles west-southwest from the Oakland Hills. The project site elevation is about 20 feet above mean sea level, and the project site vicinity is underlain by several tens to hundreds of feet of Bay Mud sediments. The Bay Mud sediments found along the East Bay Plain generally consist of low-permeability silts and clays, with occasional thin sand lenses.

The Bay Mud sediments generally do not make good groundwater aquifers, and there is generally no significant beneficial groundwater usage in Bay Mud sediments in the site area.

2.3 Results of Well Survey

Gribi Associates conducted a well survey in January 1998 which consisted of (1) Telephone interviewing Alameda County Public Works Agency personnel knowledgeable about local groundwater wells; and (2) Obtaining results of a well permit database search conducted by Alameda County Public Works Agency personnel. A copy of this database search is included in Appendix A.

According to Alameda County Public Works staff, only groundwater monitoring and some industrial and irrigation wells are permitted within the site vicinity, with no domestic or commercial drinking

water wells permitted. All residences and businesses are connected to the non-groundwater municipal drinking water system. Furthermore, because non-groundwater municipal water supplies have been developed since at least the 1920s, there is little likelihood of unpermitted drinking water wells in the immediate area.

The database search conducted by Alameda County personnel includes permitted wells within a one-quarter mile radius from the project site. This search shows a total of 54 wells located at 16 sites. These 54 wells include: (1) 46 groundwater monitoring wells (including nine wells at the project site); (2) One irrigation well; (3) One domestic well; (4) Four investigative boring; (5) One geotechnical boring; and (6) One destroyed well. The one irrigation well, the one domestic well, and one of the monitoring wells are located at 2100 Harrison Street, approximately 800 feet south from the project site. The domestic and irrigation wells at this site are apparently screened from shallow depth to 290 feet below surface.

2.4 Site History

Based on previous environmental site assessment activities conducted by others, the project site apparently operated as an auto repair facility and/or a gasoline filling station/maintenance garage from the early 1900s until about 1986. The Oakland Tribune occupied the project site maintenance garage from 1943 until 1986, and the subject gasoline underground storage tank (UST) and waste oil UST were apparently present on the site prior to 1943.

The two USTs were removed by Clayton Environmental Consultants in February 1988. Soil samples collected beneath removed USTs showed elevated levels of gasoline constituents and heavy hydrocarbons. Based on these results, the UST excavation cavity was apparently overexcavated vertically down to about 18 feet in depth, and approximately 30 cubic yards of hydrocarbon-impacted soil was stockpiled onsite. The excavation cavity was subsequently backfilled with clean imported fill material and re-surfaced to match existing grade.

During the UST removal, the floor sump located at the northeast side of the site was removed, and approximately 30 cubic yards of hydrocarbon-impacted soil was excavated and stockpiled onsite. This excavation cavity was subsequently backfilled with clean imported fill and re-surfaced to match existing grade.

Soil and groundwater investigation and remediation activities at the project site were conducted by J. H. Kleinfelder Associates, Clayton Environmental Consultants, Dames & Moore, Century West Engineering, and Gribi Associates. These investigation and remediation activities are summarized in Table 1.

Date	Consultant	Activity
08/87	Kleinfelder	Drilled eight soil borings adjacent to USTs, floor sump, gasoline fuel dispenser, & hydraulic lifts.
02/88	Clayton	Removed gasoline & waste oil USTs; overexcavated 30 cubic yards of hydrocarbon-impacted soil; backfilled with clean imported fill.

Table 1
SUMMARY OF PREVIOUS SITE ACTIVITIES
 Oakland Tribune Maintenance Garage

Date	Consultant	Activity
02/88	Clayton	Removed the floor sump; overexcavated 30 cubic yards of hydrocarbon-impacted soil; backfilled with clean imported fill.
08/88	Clayton	Drilled, installed, & sampled three groundwater monitoring well (MW-1, MW-2, & MW-3).
09/89	Dames & Moore	Drilled eight soil borings (SB-1, SB-2, SB-3, & SB-8 through SB-12); drilled, installed, & sampled four groundwater monitoring wells (MW-4 through MW-7); conducted aquifer tests on the four newly-installed wells.
08/90	Dames & Moore	Drilled, installed, & sampled two groundwater monitoring wells (MW-8 & MW-9).
01/96	Century West	Purged & sampled nine groundwater monitoring wells (MW-1 through MW-9).
01/98	Gribi Associates	Purged & sampled four groundwater monitoring wells (MW-1, MW-2, MW-4, & MW-9).
02/98	Gribi Associates	Sampled four groundwater monitoring wells (MW-1, MW-2, MW-4, & MW-9) without purging wells.

3.0 SITE CHARACTERIZATION

As Table 1 indicates, extensive site characterization activities have been conducted at the project site. Soil analytical results from these previous investigations are summarized in Table 2 (see Figure 3 and Figure 4). These results include analysis for Total Petroleum Hydrocarbons (TPH); Total Oil and Grease (TOG); Total Petroleum Hydrocarbons as Gasoline (TPH-G); and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX). Note that soil samples from SB-5 and SB-12 at 16 feet in depth were also analyzed for Semi-Volatile Organic Compounds (SVOCs) and for 14 selected Metals. These samples contained background levels of analyzed metals and extremely low levels (slightly above detection levels) of some SVOCs.

Table 2
SUMMARY OF SOIL ANALYTICAL RESULTS
 Former Oakland Tribune Maintenance Garage

Sample ID	Date	Depth (ft)	Constituent (mg/kg)						
			TPH	TOG	TPH-G	B	T	E	X
B-1	08/87	Unknown	<10	--	--	<0.5	<0.5	<0.2	<0.5
B-2	08/87	Unknown	<10	--	--	<0.5	<0.5	<0.2	<0.5
B-3	08/87	Unknown	6,500	5,400	40	0.6	8.2	8.3	40
B-4	08/87	Unknown	<10	--	--	<0.5	<0.5	--	<0.5
B-5	08/87	Unknown	<10	--	--	<0.5	<0.5	--	<0.5
B-6	08/87	Unknown	<10	--	--	<0.5	<0.5	--	<0.5
B-7	08/87	Unknown	<10	<50	ND	<0.5	<0.5	<0.2	<0.5
B-8	08/87	Unknown	<10	<50	ND	<0.5	<0.5	<0.2	<0.5

Table 2
SUMMARY OF SOIL ANALYTICAL RESULTS
 Former Oakland Tribune Maintenance Garage

Sample ID	Date	Depth (ft)	Constituent (mg/kg)						
			TPH	TOG	TPH-G	B	T	E	X
MW-1	08/88	6.5	--	480	--	ND	ND	ND	ND
		11.5	--	210	--	ND	ND	ND	ND
MW-2	08/88	6.5	--	470	--	ND	ND	ND	ND
		11.5	--	330	--	ND	ND	ND	ND
		15.0	--	1,600	--	0.21	0.20	3.3	96
MW-3	08/88	11.5	--	3,600	--	0.07	0.40	--	9.5
		16.5	--	350	--	ND	ND	ND	ND
SB-1	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		21	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
SB-2	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		21	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
SB-3	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		21	--	<6	655	0.31	0.53	<0.04	2.34
MW-4	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		21	--	<6	17	0.05	0.11	<0.04	0.58
MW-5	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	10,200	428	0.6	1.1	4.1	6.8
MW-6	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
MW-7	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
SB-8	08/89	11	--	<6	7.7	<0.04	0.05	<0.04	0.09
		16	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		21	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
SB-9	08/89	11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		21	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
SB-10	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
SB-11	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
SB-12	08/89	6	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		11	--	<6	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	1,150	560	0.74	0.70	1.0	14.2
MW-9	05/90	11	--	--	<1.0	<0.04	<0.04	<0.04	<0.04
		16	--	--	2.2	<0.04	<0.04	<0.04	<0.04

Groundwater analytical results from previous investigations are summarized in Tables 3 and 4 (see Figure 5). Table 3 summarizes groundwater analytical results for TPH as Diesel (TPH-D), TPH as Motor Oil (TPH-MO), TPH-G, BTEX, and Methyl-t-butyl Ether (MTBE). Note that Table 3 also contains groundwater analytical results for groundwater samples collected from MW-1, MW-2, MW-4, and MW-9 on February 11, 1998. These samples were collected with a clean disposable bailer, without prior purging of the wells. The laboratory data report for this sampling is contained in Appendix B. Table 4 summarizes detected halogenated volatile organic compounds in groundwater.

Table 3									
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS FOR									
PETROLEUM HYDROCARBONS									
Former Oakland Tribune Maintenance Garage									
Sample ID	Sampling Date	Concentration (mg/l)							
		TPH-D	TPH-MO	TPH-G	B	T	E	X	MTBE
MW-1	08/16/88	.. ¹	..	..	1.0	0.30	0.40	0.60	..
	07/27/89	..	..	..	0.10	0.0051	<0.001 ²	0.26	..
	5/14/90	..	..	..	0.37	0.13	0.17	0.11	..
	01/18/96	0.99	<0.5	3.3	0.330	0.039	0.10	0.085	..
	12/30/97	<0.100 ³	0.190	6.3	1.10	0.073	0.35	0.20	<0.050
	02/11/98	<0.05	<0.10	3.5	0.63	0.049	0.21	0.13	<0.100
MW-2	08/16/88	..	..	..	<0.0004	<0.0003	<0.0003	<0.0004	..
	07/27/89	..	..	..	0.024	<0.001	<0.001	0.08	..
	5/14/90	..	..	..	<0.03	0.012	0.12	0.02	..
	01/18/96	..	..	0.20	<0.0005	0.0008	0.0034	0.0025	..
	12/30/97	<0.100 ³	0.150	0.32	<0.0005	<0.0005	0.0035	0.00083	<0.005
	02/11/98	<0.05	<0.10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
MW-3	08/16/88	..	..	..	0.052	0.001	0.0049	0.017	..
	07/27/89	..	..	..	<0.001	<0.001	<0.001	0.011	..
	05/14/90	..	..	..	<0.0005	<0.0005	<0.0005	<0.0005	..
	01/18/96	1.2 ⁴	2.5	..	..	..	..	..	..
MW-4	08/15/89	..	..	..	<0.0005	<0.0005	<0.0005	<0.0005	..
	05/14/90	..	..	..	0.22	0.02	0.12	0.18	..
	01/18/96	0.47 ⁴	<0.5	0.42	0.005	0.0008	0.0054	0.0071	..
	12/30/97	0.079 ⁴	0.21	0.19	0.0045	0.00093	0.0037	0.0031	<0.005
	02/11/98	<0.05	<0.10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
MW-5	08/15/89	..	..	..	<0.0005	<0.0005	<0.0005	<0.0005	..
	05/14/90	..	..	..	0.043	0.001	0.0094	0.011	..
	01/18/96	<0.05	<0.5	..	..	..	..	..	..

Table 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS FOR
PETROLEUM HYDROCARBONS
Former Oakland Tribune Maintenance Garage

Sample ID	Sampling Date	Concentration (mg/l)							
		TPH-D	TPH-MO	TPH-G	B	T	E	X	MTBE
MW-6	08/15/89	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	05/14/90	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	01/18/96	<0.05	<0.5	--	--	--	--	--	--
MW-7	08/15/89	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	05/14/90	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	01/18/96	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
MW-8	05/18/90	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	01/18/96	<0.05	<0.5	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	--
MW-9	05/18/90		--	--	0.0085	0.0081	0.0044	0.0054	--
	01/18/96	0.70 ¹	<0.5	2.4	0.028	0.020	0.028	0.028	--
	12/30/97	<0.10 ²	<0.10	4.7	0.056	0.020	0.030	0.027	<0.025
	02/11/98	<0.05	<0.10	5.2	0.050	0.033	0.096	0.074	<0.025

- 1 - Not analyzed for this analyte.
- 2 - Not detected above the expressed value.
- 3 - West Laboratory report states "Increased reporting limit due to gas and oil range interference."
- 4 - NET laboratory report states: "The positive result appears to be a lighter hydrocarbon than Diesel."
- 5 - West Laboratory report states "Not typical diesel."
- 6 - West Laboratory report states "Increased reporting limit due to gasoline range interference."

Table 4
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS FOR
HALOGENATED VOLATILE ORGANICS
Former Oakland Tribune Maintenance Garage

Sample ID	Sampling Date	Concentration (ug/l)							
		CARB.	CHL.	1,2-DCB	1,3-DCB	1,4-DCB	1,1-DCA	1,2-DCA	TCE
MW-1	07/27/89	0.7	2.6	0.5	<0.5	<0.5	1.2	1.9	1.4
	05/14/90	<0.5	<0.5	4.0	<0.5	<0.5	2.9	1.0	1.6
MW-2	07/27/89	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	05/14/90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-3	07/27/89	0.7	0.5	11.0	2.7	31.0	<0.5	<0.5	<0.5
	05/14/90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-4	08/15/89	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.2	<0.5
	05/14/90	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5
MW-5	08/15/89	0.9	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	05/14/90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-6	08/15/89	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	05/14/90	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5

Table 4
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS FOR
HALOGENATED VOLATILE ORGANICS
 Former Oakland Tribune Maintenance Garage

Sample ID	Sampling Date	Concentration (ug/l)							
		CARB.	CHL.	1,2-DCB	1,3-DCB	1,4-DCB	1,1-DCA	1,2-DCA	TCE
MW-7	08/15/89	20.0	4.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	05/14/90	64	16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-8	05/18/90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-9	05/18/90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

CARB. - Carbon Tetrachloride
 1,3-DCB - 1,3-Dichlorobenzene
 1,2-DCA - 1,2-Dichloroethane

CHL. - Chloroform
 1,4-DCB - 1,4-Dichlorobenzene
 TCE - Trichloroethene

1,2-DCB - 1,2-Dichlorobenzene
 1,1-DCA - 1,1-Dichloroethane

Based on our review and interpretation of available site data, we draw the following conclusions about the project site:

- **Subsurface soils consist of a low permeability clay layer, underlain by more permeable sands and gravels below about 16 feet in depth.** Well borings and investigative soil borings encountered clays, silty clays, sandy clays, and gravelly clays down to about 16 feet below grade. Soils beneath about 16 feet in depth consist primarily of clayey sands and gravels. Dames & Moore conducted single well slug tests on wells MW-4 through MW-7 in August 1989 using the Bower and Rice method. Calculated hydraulic conductivities in the four wells, which are all screened from about ten feet to 25 feet in depth, ranged from 2.41×10^{-5} to 2.68×10^{-4} , with an average hydraulic conductivity of 1.08×10^{-4} .
- **Subsurface soils are not significantly impacted by waste oil range hydrocarbons.** Waste oil range hydrocarbons have been encountered in three areas of the site: (1) Adjacent to a former floor sump located in the northeast corner of the site building; (2) Adjacent to the assumed inlet to the former waste oil UST, located adjacent to MW-1; and (3) In soil samples from MW-2, located on the south side of the project site building. However, soil analytical results from borings located downgradient (south) from these locations indicates that these waste oil-impacted soils are very localized and do not represent a significant soil impact.
- **Subsurface soils are gasoline impacted at approximate groundwater depth (10 to 15 feet in depth), extending south away from the former USTs.** Soil analytical results from samples at approximate groundwater depth show TPH-G results ranging between nondetect to 560 milligrams per kilogram. Benzene concentrations in these soil samples tend to be nondetectable at increased distance away from the UST and floor sump source areas.
- **Groundwater is not significantly impacted by waste oil range hydrocarbons or identified solvents.** Groundwater analytical results show low levels of diesel and motor oil range hydrocarbons immediately adjacent to source areas, but not extending

downgradient (south). Some halogenated volatile organic compounds (chlorinated solvents) were encountered in some of the wells in 1989, but not in 1990. Only MW-7 showed levels of some halogenated volatile organics (carbon tetrachloride and chloroform) both in 1989 and 1990. However, this well is on the upgradient side of the site, and these detected halogenated volatile organics appear to have resulted from offsite sources.

- **Levels of TPH-G and BTEX constituents in groundwater decrease rapidly to almost nondetectable levels downgradient from the former USTs.** It appears that natural attenuation of slowly migrating gasoline constituents has resulted in a marked decrease in the more volatile BTEX constituents downgradient from UST source areas. Furthermore, it is not clear from available data whether or not gasoline constituents encountered in MW-9 resulted from project site sources or from some unidentified source.

Thus, hydrocarbon releases from the UST system and floor sump sources migrated vertically downward to the groundwater table, located at about 13 feet in depth, and migrated laterally in a downgradient (south) direction. Further, low-permeability soils beneath the site have resulted in a localized soil and groundwater hydrocarbon plumes, limited to an area immediately surrounding the former USTs and extending in a downgradient direction. Also, it appears that natural attenuation has resulted in relatively low concentrations of BTEX constituents within the soil and groundwater hydrocarbon plumes.

4.0 RISK-BASED CORRECTIVE ACTION MODELING

In order to develop risk-based cleanup goals for the project site, Gribi Associates conducted Tier 2 Risk-Based Corrective Action (RBCA) modeling for the project site. This RBCA modeling included: (1) Conducting preliminary exposure pathway screening for the site to eliminate incomplete exposure pathways; (2) Conducting RBCA risk calculations and developing individual constituent Site Specific Target Levels (SSTLs) using a computer model; and (3) Evaluating results of RBCA modeling.

4.1 Preliminary Exposure Pathway Screening

Gribi Associates conducted a preliminary evaluation of all potential exposure pathways for the project site. The purpose of this evaluation was to eliminate those exposure pathways which are not complete and, hence, do not apply to the project site. Results of this evaluation are summarized in Table 4.

<p align="center">Table 4 PRELIMINARY EXPOSURE PATHWAY SCREENING Former Oakland Tribune Maintenance Garage</p>		
Exposure Pathway	Complete?	Discussion
Air Exposure Pathway		
Surface soil volatilization to ambient air	No	Soils not impacted above 3 feet in depth.
Subsurface soil volatilization to ambient air	Possible	Possible inhalation of vapors.
Subsurface soil volatilization to enclosed space	Possible	Possible inhalation of vapors.

Table 4
PRELIMINARY EXPOSURE PATHWAY SCREENING
 Former Oakland Tribune Maintenance Garage

Exposure Pathway	Complete?	Discussion
Groundwater volatilization to ambient air	Possible	Possible inhalation of vapors.
Groundwater volatilization to enclosed space	Possible	Possible inhalation of vapors
Soil Exposure Pathway		
Dermal contact/ingestion of surface soils	No	Soils not impacted above 3 feet in depth.
Dermal contact/ingestion of subsurface soils	No	No reasonable possibility of contact with subsurface soils.
Groundwater Exposure Pathway		
Soil leaching to groundwater, ingestion	Possible	Possible offsite wells.
Dissolved/free phase groundwater ingestion	Possible	Possible offsite wells.
Surface Water Exposure Pathway		
Soil leaching to surface water	No	No nearby surface water bodies.
Groundwater plume discharge to surface water	No	No nearby surface water bodies.

nothing above 3 feet

4.2 RBCA Model Calculations

Gribi Associates conducted Tier 2 RBCA calculations using the *Tier 1 and Tier 2 RBCA Spreadsheet System*, Version 1.01 computer model developed by Groundwater Services, Inc. This model provides for Tier 2 RBCA calculations in accordance with and using default values contained in ASTM Standard E-1739. Based on preliminary exposure pathway screening, as summarized above, Gribi Associates ran RBCA calculations for the following pathways: (1) Inhalation of hydrocarbon vapors via subsurface soil and groundwater volatilization to both outdoor air and enclosed buildings; and (2) Ingestion of hydrocarbons in groundwater, resulting from dissolved plume migration and from hydrocarbons in subsurface soil leaching to groundwater.

The RBCA modeling process can be divided into the following general tasks: (1) Input of site specific and general parameters; (2) Calculation of baseline intake rates and risk levels associated with actual site conditions; and (3) Calculation of Site-Specific Target Levels (SSTLs) for individual and multiple constituent health risks. These activities are summarized in the following sections.

4.2.1 Model Input Parameters

Input data tables generated as part of the computer model output are contained in Appendix C. These tables summarize general input parameters, chemical and toxicological data for specific site constituents, and user-specified values for key model parameters. Some of these specified values include the following:

- **Contaminants of concern (COC):** Benzene, toluene, ethylbenzene, and xylenes. Based on site use and investigative results.

- **Onsite groundwater ingestion exposure:** No receptors
- **Onsite surface soil direct ingestion/dermal contact exposure:** No identified near-surface BTEX impacts.
- **Onsite outdoor air exposure:** Commercial receptors
- **Offsite outdoor air exposure:** Residential receptors
- **Distance to offsite outdoor air receptors:** 70 feet. Distance to apartment building across Valdez Street to the south.
- **Distance to offsite groundwater receptors:** 800 feet. Distance to the nearest identified downgradient water supply wells.
- **Indoor onsite air exposure:** Commercial receptors only.
- **Contaminated subsurface soil area:** 5,500 square feet (calculated).
- **Depth to top of affected subsurface soils:** 11.0 feet
- **Depth to base of affected subsurface soils:** 13.44 feet (average of low 1989 groundwater depths and high 1998 groundwater depths in wells MW-1 through MW-7).
- **Vadose zone thickness:** 13.44 feet
- **Hydraulic conductivity:** 1×10^{-4} centimeters per second (average of Dames & Moore calculated values for MW-4 through MW-7).
- **Groundwater flow gradient:** 0.007 feet/foot (south). Average of gradient calculations from 1990, 1996, 1997, and 1998 monitoring events.
- **Representative subsurface soil COC concentrations:** Soil analytical data from 11 feet to 16 feet in depth from within the immediate plume area (a total of 18 soil samples from ~~B-4, B-7, B-8, MW-1, MW-2, MW-3, MW-4, MW-5, SB-8, SB-9, and SB-12~~) were entered on the spreadsheet. The model then calculated the upper 90% confidence limit (UCL) on the mean concentration for each constituent. The calculated UCL means are:

Benzene	0.097 mg/kg
Toluene	0.12 mg/kg
Ethylbenzene	0.11 mg/kg
Xylenes	0.35 mg/kg

- **Representative groundwater COC concentrations:** Groundwater analytical data from various dates from wells within the immediate plume area (a total of 24 groundwater samples from MW-1, MW-2, MW-3, MW-4, and MW-9) were entered on the spreadsheet. The model then calculated the upper 90% confidence limit

(UCL) on the mean concentration for each constituent. The calculated UCL means are:

Benzene	0.027 mg/kg
Toluene	0.0072 mg/kg
Ethylbenzene	0.015 mg/kg
Xylenes	0.023 mg/kg

- Target Risk Levels:** For benzene, which is a Class A carcinogen, we used Individual and Cumulative Carcinogenic Risk Goals of 10^{-5} and 10^{-4} , respectively, which represent upperbound excess lifetime risks from chronic exposure to individual and multiple constituents. The Individual Carcinogenic Risk Goal of 10^{-5} was used, rather than the ASTM value of 10^{-6} , based on telephone conversations with Ms. Madhulla Logan of Alameda County Department of Environmental Health. In order to evaluate individual and cumulative risk from non-carcinogenic effects, we used default Hazard Quotient and Hazard Index values of 1 for both, which represent the ratio of the exposure level to established hazard threshold levels for the COCs.
- Slope Factor for Benzene Oral and Inhalation Exposure:** Slope factor of 0.10 (State value), rather than the EPA slope factor of 0.029.

For other parameters, such as exposure parameters and building parameters, we used default values, which conform to ASTM E-1739 default parameter values and are conservative.

4.2.2 Model Calculations of Baseline Risk

Tabulated model calculations of site-specific constituent baseline intake rates and risk levels for each exposure pathway are contained in Appendix D. The baseline risk represents the excess risk to which the receptor would be exposed under current or anticipated future site conditions if no remedial measures are implemented. Total carcinogenic risk and toxic effects risk for each complete pathway are summarized in Table 5.

Exposure Pathway	Carcinogenic Risk				Toxic Effects Risk			
	Individual COC Risk		Cumulative COC Risk		Individual COC Risk		Cumulative COC Risk	
	Maximum Value	Target Risk	Total Value	Target Risk	Hazard Quotient	Applicable Limit	Hazard Index	Applicable Limit
Outdoor air exposure pathways	8.5×10^{-9}	1×10^{-5}	8.5×10^{-9}	1×10^{-4}	1.4×10^{-4}	1	1.4×10^{-4}	1
Indoor air exposure pathways	2.8×10^{-6}	1×10^{-5}	2.8×10^{-6}	1×10^{-4}	4.6×10^{-2}	1	4.7×10^{-2}	1
Surface soil Exposure Pathways	NC	1×10^{-5}	NC	1×10^{-4}	NC	1	NC	1
Groundwater exposure pathways	5.2×10^{-22}	1×10^{-5}	5.2×10^{-22}	1×10^{-4}	6.0×10^{-17}	1	9.2×10^{-17}	1

NC = Not calculated

Not considered

Not considered

Based on model risk estimates, it appears that there is no significant risk of exposure from any identified hydrocarbon constituents present at the project site.

4.2.3 Model Calculations of SSTL Values

Tabulated Site-Specific Target Levels (SSTLs) generated by the model are contained in Appendix E. Calculation of risk-based cleanup standards, or Site-Specific Target Levels (SSTLs), for subsurface soil and groundwater involves the reverse of calculation procedures used for baseline risk calculations. Given a target risk limit at the point of exposure, the maximum allowable COC concentration at the source is back-calculated using applicable exposure factors and toxicity parameters.

Calculations of SSTL values based on the indoor air exposure pathway provided the lowest (most conservative) SSTL values for subsurface soil and groundwater. These SSTL values are summarized in Table 6.

COC	Subsurface Soil		Groundwater	
	SSTL (mg/kg)	Representative Concentration (mg/kg)	SSTL (mg/L)	Representative Concentration (mg/L)
Benzene	0.62	0.097	0.22	0.027
Toluene	250	0.12	88	0.0073
Ethylbenzene	>Res	0.11	>Sol	0.015
Xylenes	>Res	0.35	>Sol	0.023

>Sol - Indicates that the risk-based target concentration is greater than the constituent solubility.
>Res = Indicates that the risk-based target concentration is greater than the constituent residual saturation value.

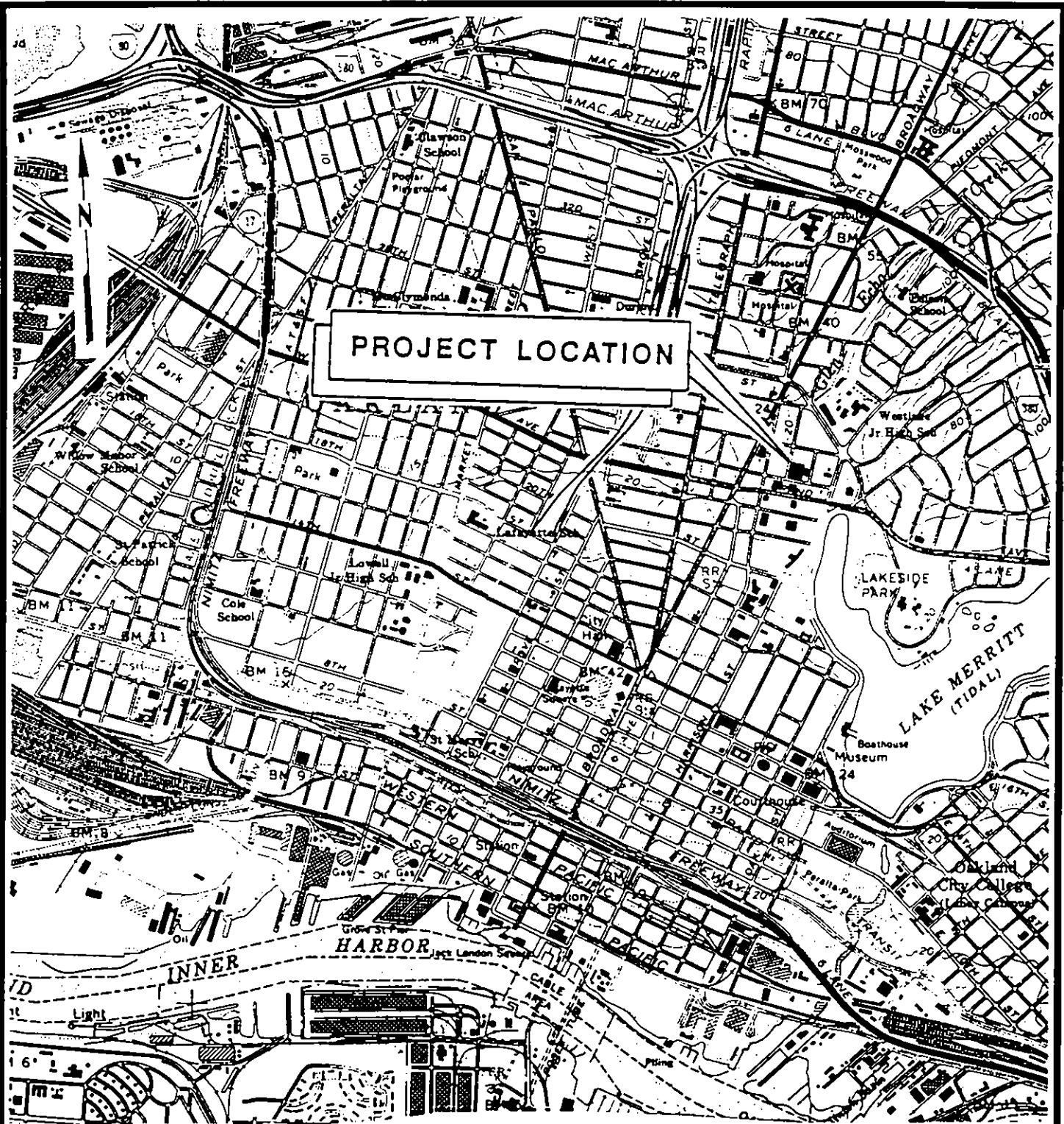
As shown in Table 6, no constituent representative concentrations exceed calculated SSTL values for the site.

4.3 Evaluation of RBCA Model Results

Based on model risk calculations, it appears that remaining hydrocarbons in subsurface soils and groundwater pose no significant environmental or health risk to surrounding receptors. Model calculations also show that representative constituent concentrations in subsurface soils and groundwater are below calculated site-specific target cleanup levels (SSTLs) calculated for the site.

5.0 REQUEST FOR REGULATORY SITE CLOSURE

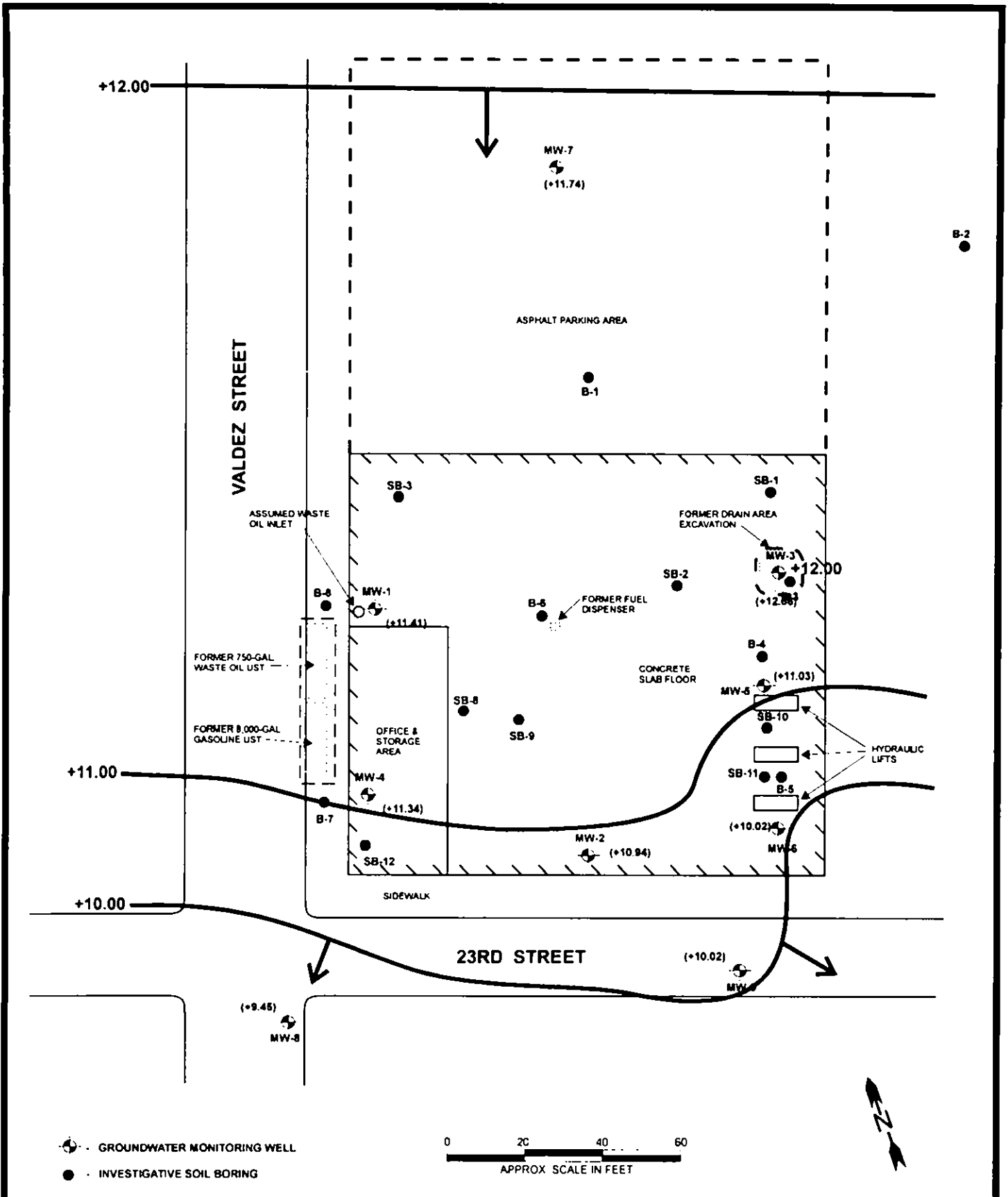
Based on RBCA calculations showing no significant risk from remaining hydrocarbons, we request that Alameda County Department of Environmental Health review this site for regulatory closure, with no additional remediation or monitoring required.



TOPOGRAPHY FROM OAKLAND WEST, CA.
7.5-MINUTE QUADRANGLE MAP, 1993.



DESIGNED BY:	CHECKED BY:	SITE VICINITY MAP	DATE: 01/09/98	FIGURE: 1
DRAWN BY: JG	SCALE: 1:24,000		GRIBI Associates	
PROJECT NO: 125-01-01		FORMER OAKLAND TRIBUNE SHOP 2302 VALDEZ STREET OAKLAND, CALIFORNIA		



DESIGNED BY:	CHECKED BY:	GROUNDWATER ELEVATION MAP 02/11/98	DATE: 02/27/98	FIGURE: 2
DRAWN BY: JG	SCALE:		GRIBI Associates	
PROJECT NO. 125-01-02		FORMER OAKLAND TRIBUNE SHOP OAKLAND, CALIFORNIA		

VALDEZ STREET

ASPHALT PARKING AREA

ASSUMED WASTE OIL INLET

FORMER 750 GAL WASTE OIL UST

FORMER 8,000-GAL GASOLINE UST

OFFICE & STORAGE AREA

FORMER DRAIN AREA EXCAVATION

FORMER FUEL DISPENSER

CONCRETE SLAB FLOOR

HYDRAULIC LIFTS

SIDEWALK

6: <1
11: <1
18: <1

NT

NT

B-1

B-2

SB-3

6: <1
11: <1
16: 655

SB-1

6: <6
11: <6
16: <6

ND

6.5: NT
11.5: NT

6: <6
11: <6
16: <6

11.5: NT
15.5: NT

B-8

NT

B-6

40

B-4

NT

MW-1

11: 7.7
16: <1
21: <1

11: <1
16: <1
21: <1

6: <1
11: <1
16: <1

6: <1
11: <1
16: 428

ND

B-7

6: <1
11: <1
16: 17

6.5: NT
11.5: NT
15: NT

6: <1
11: <1
16: <1

6: <1
11: <1
16: <1

6: <1
11: <1
16: 560

6.5: NT
11.5: NT
15: NT

6.5: NT
11.5: NT
15: NT

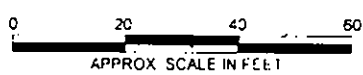
6: <1
11: <1
16: <1

6: <1
11: <1
16: <1

70ft residential

grade
5/20/98 Verified

- - INVESTIGATIVE SOIL BORING
- ⊕ - GROUNDWATER MONITORING WELL



DEPTH: TPH-G (MG/KG) NT = NOT TESTED

DESIGNED BY:	CHECKED BY:	SOIL TPH-GASOLINE	DATE 02/27/98	FIGURE: 4
DRAWN BY JG	SCALE:		GRIBI Associates	
PROJECT NO. 125-01-02		FORMER OAKLAND TRIBUNE SHOP OAKLAND, CALIFORNIA		

VALDEZ STREET

MW-7

01/18/96	
TPH-D	< 50
TPH-MO	< 500
TPH-G	< 50
B	< 0.50
T	< 0.50
E	< 0.50
X	< 0.50

ASPHALT PARKING AREA

ASSUMED WASTE OIL INLET

02/11/98	
TPH-D	< 50
TPH-MO	< 100
TPH-G	3,500
B	630
T	49
E	210
X	130
MTBE	< 100

FORMER DRAIN AREA EXCAVATION

01/18/96	
TPH-D	1,200
TPH-MO	2,500

FORMER FUEL DISPENSER

FORMER 750 GAL WASTE OIL UST

CONCRETE SLAB FLOOR

01/18/96	
TPH-D	< 50
TPH-MO	< 500

FORMER 8,000 GAL GASOLINE UST

OFFICE & STORAGE AREA

02/11/98	
TPH-D	< 100
TPH-MO	< 50
TPH-G	< 50
B	< 0.50
T	< 0.50
E	< 0.50
X	< 0.50
MTBE	< 5

01/18/96	
TPH-D	< 50
TPH-MO	< 500

01/18/96	
TPH-D	< 50
TPH-MO	< 500

02/11/98	
TPH-D	< 50
TPH-MO	< 100
TPH-G	< 50
B	< 0.50
T	< 0.50
F	< 0.50
X	< 0.50
MTBE	< 5

SIDEWALK

23RD STREET

01/18/96	
TPH-D	< 50
TPH-MO	< 500
TPH-G	< 50
B	< 0.50
T	< 0.50
E	< 0.50
X	< 0.50

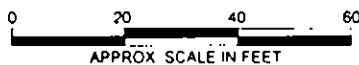
MW-8

02/11/98	
TPH-D	< 50
TPH-MO	< 100
TPH-G	5,200
B	50
T	33
E	96
X	74
MTBE	< 250

MW-9

GROUNDWATER MONITORING WELL

ALL CONCENTRATIONS IN MICROGRAMS PER LITER (UG/L)



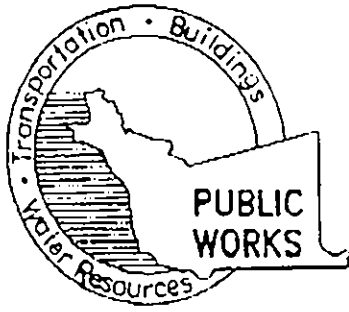
DESIGNED BY:	CHECKED BY:
DRAWN BY: JG	SCALE
PROJECT NO. 125-01-02	

GROUNDWATER HYDROCARBON RESULTS, VARIOUS DATES
FORMER OAKLAND TRIBUNE SHOP
OAKLAND, CALIFORNIA

DATE: 02/27/98	FIGURE: 5
GRIBI Associates	

APPENDIX A

**WELL SURVEY FROM ALAMEDA COUNTY
PUBLIC WORKS AGENCY**



COUNTY OF ALAMEDA
 PUBLIC WORKS AGENCY
 951 Turner Court, Hayward, CA 94545
 (510) 670-5543

DATE: 2-24

No of Pages (including cover): 4

FAX TRANSMITTAL

T O	_____
	Jim Gribi

FAX: _____	

F R O M	_____
	Andrew Godfrey

FAX: _____	

Should you have problems receiving this FAX transmittal, please call _____

SUBJECT: Wells

TRANSMITTING THE FOLLOWING:



APPENDIX B

**LABORATORY DATA REPORT FOR
FEBRUARY 11, 1998 SAMPLING**

WEST LABORATORY

Sample Log 17999
February 20, 1998

Jim Gribi
Gribi Associates
884 Vintage
Suisun, CA 94585

Subject : 4 Water samples
Project Name : Oakland Tribune Site
Project Number : 125-01-02

Location : Oakland, CA

Dear Mr. Gribi,

Chemical analysis on the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. USEPA protocols for sample storage and preservation were followed.

WEST Laboratory is certified by the State of California (# 1346). If you have any questions regarding procedures or results, please call me at 530-757-0920.

Sincerely,


Stewart Podolsky

Sample: MW-1

From : Oakland Tribune Site (Proj. # 125-01-02)

Sampled : 02/11/98

Extracted: 02/18/98

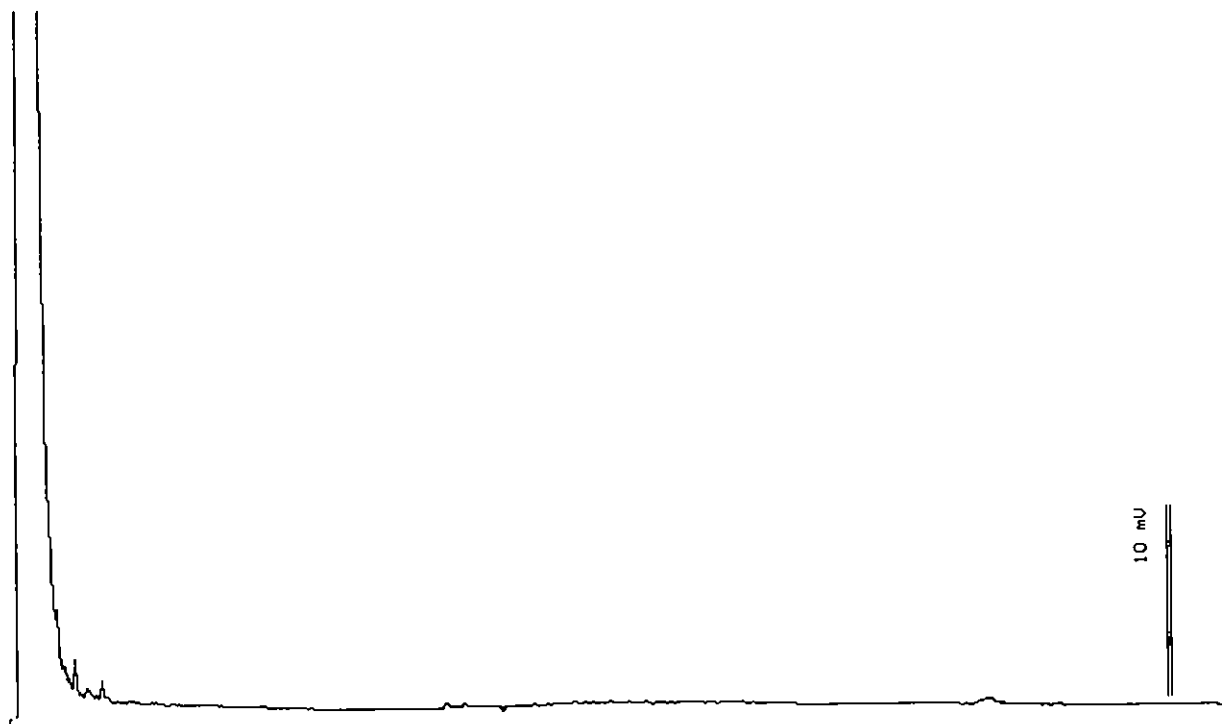
Dilution : 1:1

Matrix : Water


QC Batch : DW980204

Run Log : 7397B

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



EPA Mod 8015

Date: 02-18-98 Time: 12:37:11
Column : 0.53mm ID X 15m DB1 (J&H Scientific)
Stewart Podolsky
Senior Chemist

Sample: MW-2

From : Oakland Tribune Site (Proj. # 125-01-02)

Sampled : 02/11/98

Extracted: 02/18/98

Dilution : 1:1

Matrix : Water

QC Batch : DW980204

Run Log : 7397C

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



EPA Mod 8015

Date: 02-18-98 Time: 13:45:53
Column : 0.53mm ID X 15m DB1 (J&W Scientific)


Stewart Podolsky
Senior Chemist

Sample: MW-4

From : Oakland Tribune Site (Proj. # 125-01-02)

Sampled : 02/11/98

Extracted: 02/18/98

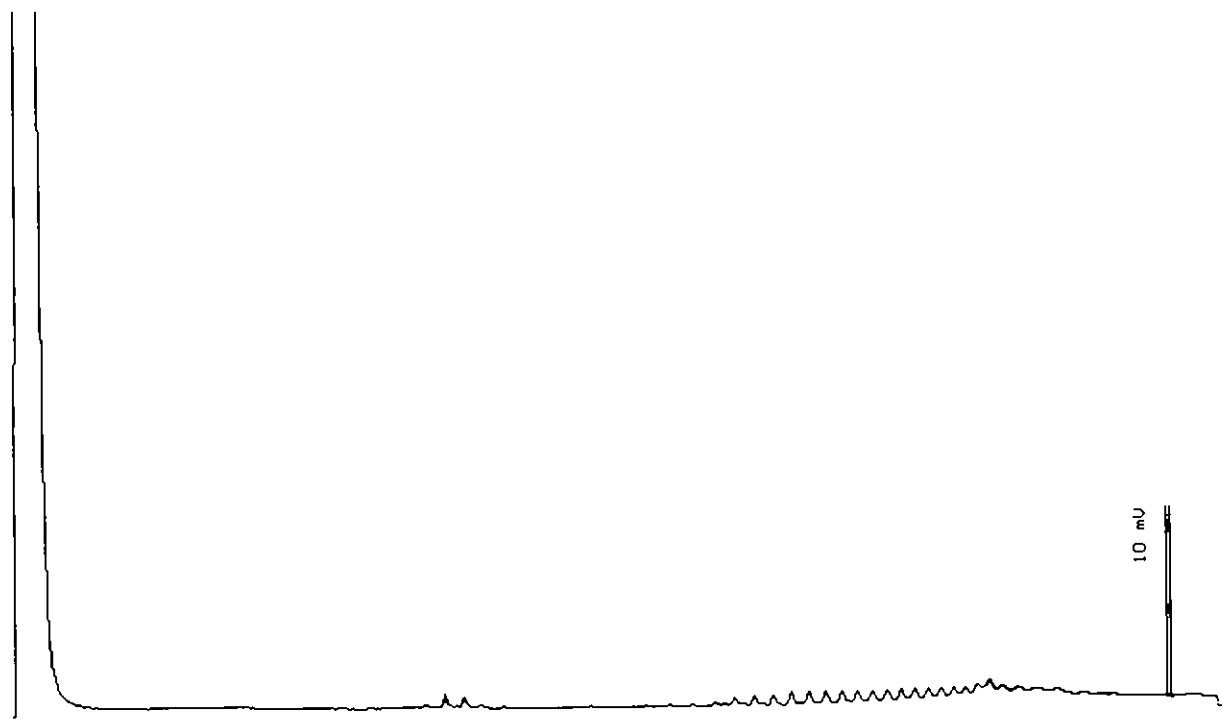
Dilution : 1:1

Matrix : Water


QC Batch : DW980204

Run Log : 7397C

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



EPA Mod 8015

Date: 02-18-98 Time: 14:20:14
Column : 0.53mm ID X 15m DB1 (J&W Scientific)
Stewart Podolsky
Senior Chemist

Sample: MW-9

From : Oakland Tribune Site (Proj. # 125-01-02)

Sampled : 02/11/98

Extracted: 02/18/98

Dilution : 1:1

Matrix : Water

QC Batch : DW980204

Run Log : 7397C

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



Date: 02-18-98 Time: 14:54:47
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

SP
Stewart Podolsky
Senior Chemist

Sample Log 17999

MTBE (Methyl-t-butyl ether) By EPA Method 8020/602

From : Oakland Tribune Site (Proj. # 125-01-02)


Sampled : 02/11/98

Received : 02/12/98

Matrix : Water

SAMPLE	Date Analyzed	(MRL) $\mu\text{g/L}$	Measured Value $\mu\text{g/L}$
MW-1	02/17/98	(100)	<100
MW-2	02/17/98	(5.0)	<5.0
MW-4	02/17/98	(5.0)	<5.0
MW-9	02/17/98	(250)	<250

Approved By:



Stewart Podolsky
Senior Chemist

Sample: MW-1

From : Oakland Tribune Site (Proj. # 125-01-02)

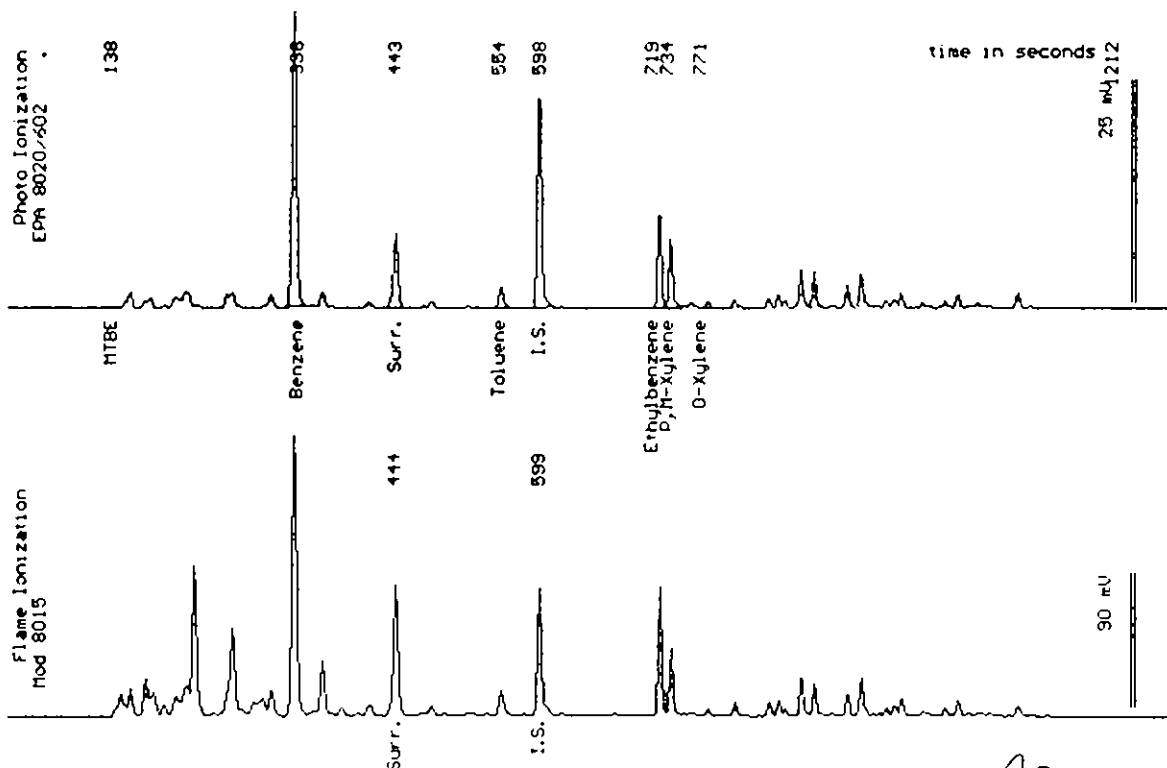
Sampled : 02/11/98

Dilution : 1:20

Run Log : 4170F

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(10)	630
Toluene	(10)	49
Ethylbenzene	(10)	210
Total Xylenes	(10)	130
TPH as Gasoline	(1000)	3500
Surrogate Recovery		107 %



Date Analyzed: 02-17-98
 Column : 0.53mm ID X 60m Restek Ptx-1701

Stu
 Stewart Podolsky
 Senior Chemist

Sample: MW-2

From : Oakland Tribune Site (Proj. # 125-01-02)

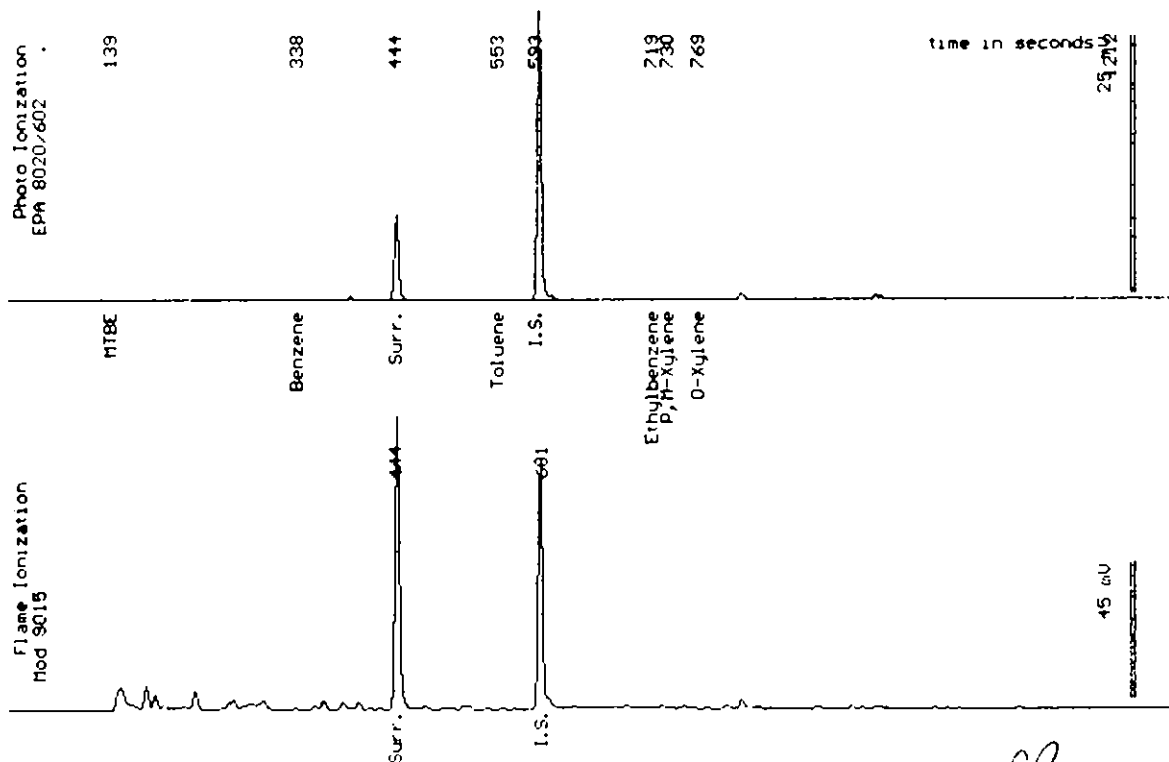
Sampled : 02/11/98

Dilution : 1:1

Run Log : 4170F

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.50)	<.50
Toluene	(.50)	<.50
Ethylbenzene	(.50)	<.50
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	<50
Surrogate Recovery		99 %



Date Analyzed: 02-17-98
 Column : 0.53mm ID X 60m Restek Rtx-1701

Stewart Podolsky
 Senior Chemist

Sample: MW-4

From : Oakland Tribune Site (Proj. # 125-01-02)

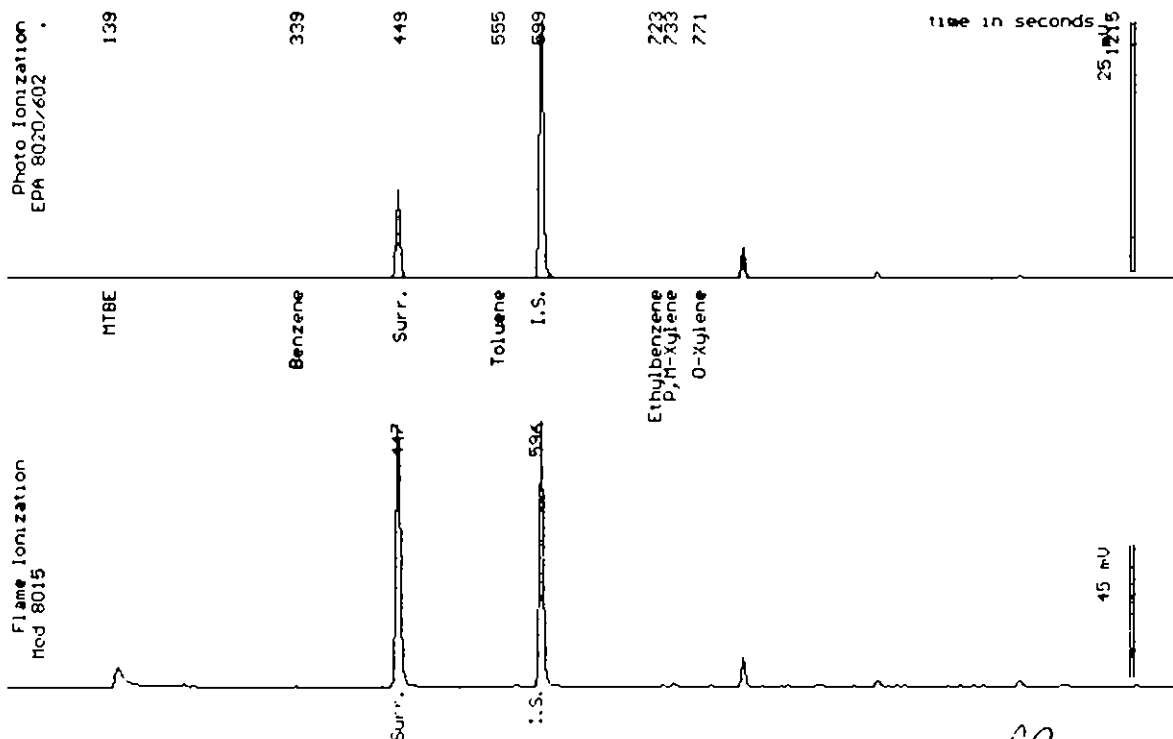
Sampled : 02/11/98

Dilution : 1:1

Run Log : 4170F

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.50)	<.50
Toluene	(.50)	<.50
Ethylbenzene	(.50)	<.50
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	<50
Surrogate Recovery		100 %



Date Analyzed: 02-17-98
 Column : 0.53mm ID X 60m Restek Rtx-1701

Stewart Podolsky
 Senior Chemist

Sample: MW-9

From : Oakland Tribune Site (Proj. # 125-01-02)

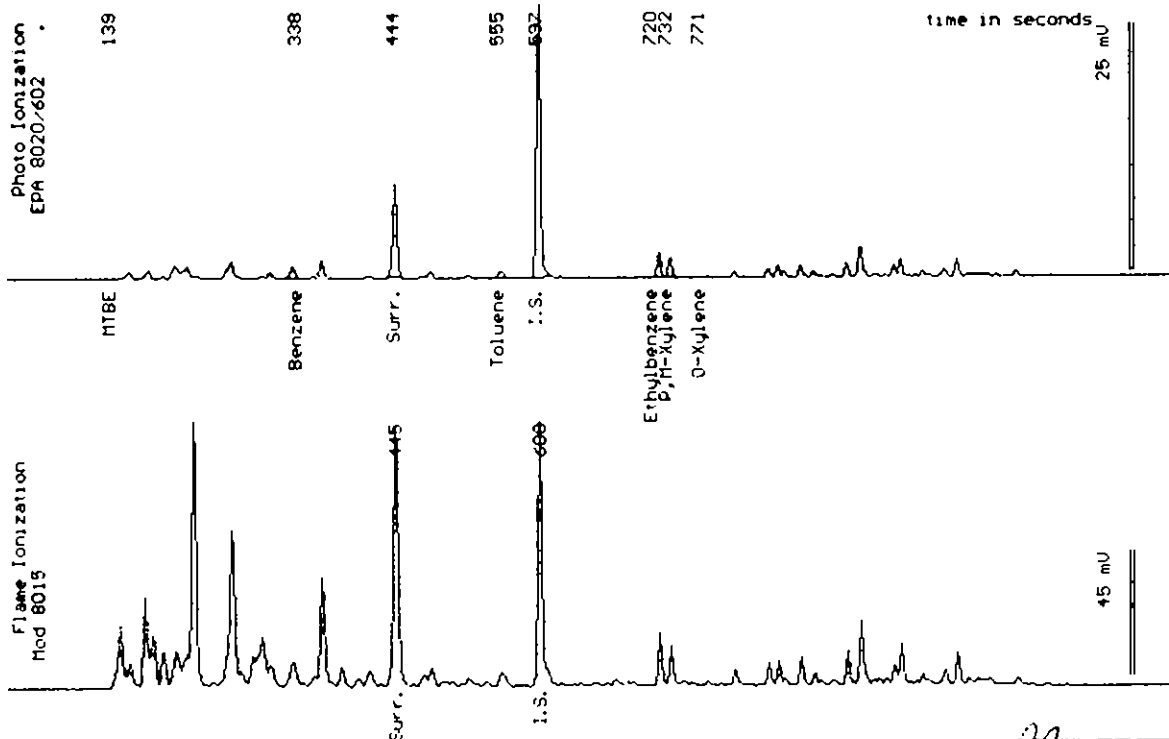
Sampled : 02/11/98

Dilution : 1:50

Run Log : 4170F

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(25)	50
Toluene	(25)	33
Ethylbenzene	(25)	96
Total Xylenes	(25)	74
TPH as Gasoline	(2500)	5200
Surrogate Recovery		103 %



Date Analyzed: 02-17-98
 Column : 0.53mm ID X 60m Restek Rtx-1701

Stuart Podolsky
 Stuart Podolsky
 Senior Chemist

WEST LABORATORY

February 19, 1998
Sample Log 17999


QC Report for EPA 602 & Modified EPA 8015
Run Log : 4170F
From : Oakland Tribune Site (Proj. # 125-01-02)
Sample(s) Received : 02/12/98

Parameter	Matrix Spike % Recovery	Matrix Spike Duplicate % Recovery	RPD *
Benzene	96	101	5
Ethylbenzene	98	101	3
TPH as Gasoline	107	109	2

* RPD = Relative Percent Difference

Parameter	Laboratory Control Sample % Recovery
Benzene	99
Ethylbenzene	99
Gasoline	107

Parameter	Method Blank
Benzene	<0.50 ug/L
Toluene	<0.50 ug/L
Ethylbenzene	<0.50 ug/L
Total Xylenes	<0.50 ug/L
TPH as Gasoline	<50 ug/L


Stewart Podolaky
Senior Chemist

WEST LABORATORY

February 17, 1998

QC Report
TPH Diesel/Motor Oil by 8015 Mod

QC Batch DW980204

Matrix: Water

Spike and Spike Duplicate Results


Parameter	Matrix Spike (%Rec)	Matrix Spike Dup. (%Rec)	RPD %
TPH as Diesel	Not enough sample for spiking. See duplicate LCS Data.		

Laboratory Control Spike

Parameter	Laboratory Control Spike (%Rec)	Laboratory Control Spike Dup. (%Rec)	RPD %
TPH as Diesel	99	93	6

Method Blank

Parameter	MDL(ug/L)	Measured Value(ug/L)
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100


Stewart Podolsky
Senior Chemist

West Analytical Labs

1046 Olive Drive, Suite 2, Davis, CA 95616 Phone #: (707) 864-5543

Phone#: 916-757-0920
 Fax#: 916-753-6091
 Sample Receiving#: 916-757-4608

Project Manager:

JIM GRIBI

Company/Address: GRIBI ASSOCIATES FAX #: SAME

684 VINTAGE AVE
 SUITE 200
 DAVIS, CA 95618

Project Number: ~~125-01-02~~ Project Name: OAKLAND TREBUNE SITE

Project Location: OAKLAND, CA
 Sampler Signature: *Jim Gribi*

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

ANALYSIS REQUEST	TAT	WEST Lab Number	For Lab Use ONLY	
			12 hour / 24 hour / 48 hour / 1 week / 2 weeks	17999
BTEX (602/8020)	X	17999 01	X	
BTEX/TPH as Gasoline (602/8020/M8015) + MTBE	X		X	
TPH as Diesel (M8015)	X		X	
TPH as Motor Oil (M8015)	X		X	
EPA 601/8010	X		X	
EPA 608/8080 - Pesticides				
EPA 608/8080 - PCB's				
EPA 624/8240				
EPA 625/8270				
CAM - 17 Metals				
LEAD(6010/7421/239.2)				
Cd, Cr, Pb, Zn, Ni				
TOTAL (M)				
WET (M)				

Sample ID	Sampling		Container (Type/Amount)			Method Preserved			Matrix		
	DATE	TIME	SLEEVE	GLASS	PLASTIC	HCl	HNO ₃	ICE	NONE	WATER	SOIL
MW-1	2/11/98		3	2		X		X		X	
MW-2	"		3	2		X		X		X	
MW-4	"		3	2		X		X		X	
MW-9	"		3	2		X		X		X	

Relinquished by: *Jim Gribi* Date Time: 2/12/98 12:30
 Received by: *John Wood*

Relinquished by: _____ Date Time: _____
 Received by: _____

Relinquished by: _____ Date Time: _____
 Received by: _____

Remarks:

Bill To:

Output Table 1

RBCA TIER 1/TIER 2 EVALUATION

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Site Name: Fomer Oak Ind UST Site
Job Identification: Oakland Tribune RBCA
Site Location: 2302 Valdez Street, Oakland, CA
Date Completed: 3/9/98
Compiled By: James E. Grib

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined>

Exposure Parameter	Definition (Units)	Adult	Residential (1-15 yrs)	Commercial/Industrial	Constrctn
AIC	Averaging time for carcinogens (yr)	70	6	25	1
AICr	Averaging time for non-carcinogens (yr)	30	15	70	1
BW	Body Weight (kg)	70	30	25	1
ED	Exposure Duration (yr)	30	6	25	1
EF	Averaging time for vapor flux (yr)	350	350	250	180
EF Dem	Exposure Frequency for dermal exposure	350	350	250	250
IRgw	Ingestion Rate of Water (l/day)	2	2	1	1
IRs	Ingestion Rate of Soil (mg/day)	100	100	50	100
IRad	Adjusted soil ing. rate (mg yr/kg-d)	1.1E+02	1.1E+02	9.4E+01	1.1E+02
IRa in	Inhalation rate indoor (m ³ /day)	15	20	20	10
IRa out	Inhalation rate outdoor (m ³ /day)	20	2.0E+03	5.8E+03	5.8E+03
SA	Skin surface area (dermal) (cm ²)	5.8E+03	2.1E+03	1.7E+03	5.8E+03
SAadj	Adjusted dermal area (cm ² -yr/kg)	2.1E+03	2.1E+03	1.7E+03	2.1E+03
M	Soil to Skin adherence factor	1	1	1	1
AAF-s	Age adjustment on soil ingestion	FALSE	FALSE	FALSE	FALSE
AAF-d	Age adjustment on skin surface area	FALSE	FALSE	FALSE	FALSE
tox	Use EPA tox data for air (or PEL based)?	TRUE	TRUE	TRUE	TRUE
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE	FALSE	FALSE	FALSE

Matrix of Exposed Persons to Complete Exposure Pathways	Residential	Commercial/Industrial	Constrctn
Outdoor Air Pathways:			
SS v	FALSE	FALSE	TRUE
IS v	TRUE	TRUE	TRUE
IS v	FALSE	TRUE	TRUE
IS v	FALSE	TRUE	TRUE
Indoor Air Pathways:			
IS b	FALSE	TRUE	TRUE
IS b	FALSE	TRUE	TRUE
IS b	FALSE	TRUE	TRUE
Soil Pathways:			
IS s	FALSE	TRUE	TRUE
Groundwater Pathways:			
IS g	TRUE	FALSE	FALSE
IS g	TRUE	FALSE	FALSE

Matrix of Receptor Distance and Location On- or Off-Site	Residential	Commercial/Industrial	On-Site
IS g	Distance	Distance	Distance
IS g	2.4E+04	2.4E+04	2.4E+04
IS g	2.1E+03	2.1E+03	2.1E+03
IS g	FALSE	FALSE	FALSE
IS g	FALSE	FALSE	FALSE
IS g	TRUE	TRUE	TRUE

Matrix of Target Risks	Individual	Cumulative
TRab	3.0E+05	3.0E+05
TRc	1.0E+05	1.0E+05
TRQ	1.0E+00	1.0E+00
TRP	3	3
Tier	2	2

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm ²)	5.1E+08	5.1E+08
W gw	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
Uair	Length of affect. soil parallel to groundwater (cm)	1.5E+03	1.5E+03
delta	Ambient air velocity in mixing zone (cm/s)	2.3E+02	2.3E+02
Lss	Air mixing zone height (cm)	2.0E+02	2.0E+02
Pe	Thickness of affected surface soils (cm)	6.9E-14	6.9E-14
Pe	Particulate areal emission rate (g/cm ² /s)	6.9E-14	6.9E-14

Groundwater Definition (Units)	Value
delta gw	2.0E+02
l	Groundwater mixing zone depth (cm)
Ugw	Groundwater infiltration rate (cm/yr)
Ugw tr	Groundwater Darcy velocity (cm/yr)
Ks	Groundwater seepage velocity (cm/yr)
grad	Saturated hydraulic conductivity (cm/s)
Sw	Groundwater gradient (cm/cm)
Sd	Width of groundwater source zone (cm)
phi eff	Depth of groundwater source zone (cm)
loc sat	Effective porosity in water-bearing unit
BIO?	Fraction organic carbon in water-bearing unit
BC	Is biodegradation considered?
BC	Biodegradation Capacity (mg/L)

Soil	Definition (Units)	Value
hc	Capillary zone thickness (cm)	5.0E+00
hv	Vadose zone thickness (cm)	4.0E+02
rho	Soil density (g/cm ³)	1.7
foc	Fraction of organic carbon in vadose zone	0.01
phi	Soil porosity in vadose zone	0.38
Lgw	Depth to groundwater (cm)	4.1E+02
Ls	Depth to top of affected subsurface soil (cm)	3.4E+02
Lsubs	Thickness of affected subsurface soils (cm)	7.4E+01
ph	Soil/groundwater pH	6.5
ph w	Volumetric water content	0.342
ph a	Volumetric air content	0.038

Building	Definition (Units)	Residential	Commercial
Lb	Building volumetric ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (h ⁻¹)	1.4E-04	2.3E-04
Lck	Foundation crack thickness (cm)	1.5E+01	1.5E+01
etc	Foundation crack fraction	0.01	0.01

Transport Parameters	Definition (Units)	Residential	Commercial
ax	Longitudinal dispersivity (cm)	2.4E+03	2.4E+03
ay	Transverse dispersivity (cm)	8.0E+02	8.0E+02
az	Vertical dispersivity (cm)	1.2E+02	1.2E+02
dcy	Transverse dispersion coefficient (cm)	2.5E+02	2.5E+02
dcz	Vertical dispersion coefficient (cm)	1.7E+02	1.7E+02

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	MCL (mg/L)		Maximum Contaminant Level reference		Permissible Exposure Limit (mg/m3)		Relative Absorption Factors		Detection Limits (mg/L)		Half Life (First-Order Decay) (days)	
								Oral	Dermal	Groundwater	Soil	Saturated	Unsaturated
71-43-2	Benzene	5 00E-03	52 FR 25690	3 20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720
100-41-4	Ethylbenzene	7 00E-01	56 FR 3526 (30 Jan 91)	4 34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228
108-88-3	Toluene	1 00E+00	56 FR 3526 (30 Jan 91)	1 47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28
1330-20-7	Xylene (mixed isomers)	1 00E+01	56 FR 3526 (30 Jan 91)	4 34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360

Site Name: Former Oak Trib UST Site Site Location: 2302 Valdez Street, Oakland, CA Completed By: James E. Gribi Date Completed: 3/9/1998

Software version 1 0 1

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RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day)		Inhalation		Oral		Slope Factors 1/(mg/kg/day)		EPA Weight of Evidence	Is Constituent Carcinogenic ?
		RfD_oral	RfD_inhal	RfD_inhal	ref	SF_oral	ref	SF_inhal	ref		
71-43-2	Benzene	-	1.70E-03	R	1.00E-01	A	1.00E-01	A	1.00E-01	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-	-	-	-	D	FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	A,R	-	-	-	-	D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-	-	-	-	D	FALSE

Site Name: Former Oak Trib UST Site Site Location: 2302 Valdez Street, O Completed By: James E. Gribi Date Completed: 3/9/1998

Software version 1.0.1

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RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight		Diffusion Coefficients		log (Koc) or log(Kd)		Henry's Law Constant		Vapor Pressure		Solubility	
			(g/mole)	MW	in air (cm ² /s)	in water (cm ² /s)	(@ 20 - 25 C) log(Kd)	(@ 20 - 25 C) log(Koc)	(atm-cm ³ /mol)	(unitless)	(mm Hg)	(@ 20 - 25 C)	(mg/L)	
71-43-2	Benzene	A	78.1	5	9.30E-02	1.10E-05	1.58	A	5.29E-03	2.20E-01	9.52E+01	4	1.75E+03	A
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	8.50E-06	1.98	A	7.69E-03	3.20E-01	1.00E+01	4	1.52E+02	5
108-88-3	Toluene	A	92.4	5	8.50E-02	9.40E-06	2.13	A	6.25E-03	2.60E-01	3.00E+01	4	5.15E+02	29
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	8.50E-06	2.38	A	6.97E-03	2.90E-01	7.00E+00	4	1.98E+02	5

Site Name Former Oak Trib UST Site

Site Location 2302 Valdez Street, Oakl Completed By James E. Gribi

Date Completed: 3/9/1998

Software version 1 0 1

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REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene	2.7E-2	UCL			9.7E-2	UCL
Ethylbenzene	1.5E-2	UCL			1.1E-1	UCL
Toluene	7.2E-3	UCL			1.2E-1	UCL
Xylene (mixed isomers)	2.3E-2	UCL			3.5E-1	UCL

Site Name: Former Oak. Trib.UST Site
 Site Location: 2302 Valdez Street, Oakland, CA

Completed By: James E. Gribi
 Date Completed: 3/9/1998

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

Dilution Attenuation Factor

(DAF) in Groundwater

CONSTITUENT	Residential	Comm./Ind.
	Receptor	Receptor
Benzene	4.2E+17	1.0E+0
Ethylbenzene	8.0E+34	1.0E+0
Toluene	1.0E+100	1.0E+0
Xylene (mixed isomers)	2.9E+33	1.0E+0

Site Name: Former Oak. Trib.UST Site

Completed By: James E. Gribi

Site Location: 2302 Valdez Street, Oakland, CA

Date Completed: 3/9/1998

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene	720
Ethylbenzene	228
Toluene	28
Xylene (mixed isomers)	360

Site Name: Former Oak. Trib. UST Site Completed By: James E. Gribi
Site Location: 2302 Valdez Street, Oaklar Date Completed: 3/9/1998

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APPENDIX D

RBCA MODEL BASELINE RISK TABLES

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.3

Site Name: Former Oak, Trib. UST Site
 Site Location: 2302 Valdez Street, Oakland, CA

Completed By: James E. Gribi
 Date Completed: 3/9/1998

TIER 2 BASELINE RISK SUMMARY TABLE

BASELINE CARCINOGENIC RISK				BASELINE TOXIC EFFECTS						
EXPOSURE PATHWAY	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index	Toxicity Limit(s) Exceeded?	
	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit			Total Value	Applicable Limit
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	8.5E-9	1.0E-5	8.5E-9	N/A	<input type="checkbox"/>	1.4E-4	1.0E+0	1.4E-4	N/A	<input type="checkbox"/>
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	2.8E-6	1.0E-5	2.8E-6	N/A	<input type="checkbox"/>	4.6E-2	1.0E+0	4.7E-2	N/A	<input type="checkbox"/>
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-5	NC	N/A	<input checked="" type="checkbox"/>	NC	1.0E+0	NC	N/A	<input checked="" type="checkbox"/>
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	5.2E-22	1.0E-5	5.2E-22	N/A	<input type="checkbox"/>	6.0E-37	1.0E+0	9.2E-37	N/A	<input type="checkbox"/>
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	2.8E-6	1.0E-5	2.8E-6	N/A	<input type="checkbox"/>	4.6E-2	1.0E+0	4.7E-2	N/A	<input type="checkbox"/>

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: Former Oak Trib UST Site Site Location: 2302 Valdez Street, Oakland, CA Completed By: James E. Gribi Date Completed: 3/9/1998 1 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS	<input type="checkbox"/> (CHECKED IF PATHWAY IS ACTIVE)				
	1) SOURCE MEDIUM Exposure Concentration	2) NAT. VALUE (m ³ /kg) Receptor	3) EXPOSURE MEDIUM Outdoor Air POF Conc. (mg/m ³) (1)/(2)	4) EXPOSURE MULTIPLIER (REF*ED*BW*AT)	5) AVERAGE DAILY INTAKE RATE (mg/kg-day) (3) x (4)
SURFACE SOILS - VAPOR AND DUST INHALATION	Surface Soil Conc. (mg/kg)				
Constituents of Concern	0.0E+0				
Benzene	0.0E+0				
Ethylbenzene	0.0E+0				
Toluene	0.0E+0				
Xylene (mixed isomers)	0.0E+0				

NOTE: ABS = Dermal absorption factor (dim); BW = Body weight (kg); POE = Point of exposure
 AF = Adherence factor (mg/cm²); CF = Units conversion factor; ET = Exposure time (hr/day); SA = Skin exposure area (cm²/day)
 AT = Averaging time (days); FD = Exposure duration (yrs); IR = Inhalation rate (m³/day)

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: Former Oak Trib UST Site Site Location: 2302 Valdez Street, Oakland, CA Completed By: James E. Gntbi Date Completed: 3/9/1998 2 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

(CHECKED IF PATHWAY IS ACTIVE)

OUTDOOR AIR EXPOSURE PATHWAYS

SUBSURFACE SOILS VAPOR VOLATILIZATION	1) Source Medium Subsurface So Conc (mg/kg)		2) NAE Value (m ³ /kg) Receptor		3) Exposure Medium Outdoor Air POF Conc (mg/m ³) (1)/(2)		4) Exposure Multiplier (REF-ED/IR*AT) (m ³ /kg-day)		5) Average Daily Intake Rate (mg/kg-day) (3) X (4)	
	On-Site Commercial	Off-Site Residential	On-Site Commercial	Off-Site Residential	On-Site Commercial	Off-Site Residential	On-Site Commercial	Off-Site Residential	On-Site Commercial	Off-Site Residential
Constituents of Concern										
Benzene	9.7E-2	2.2E+5	5.2E-7	4.3E-7	7.0E-2	1.2E-1	3.6E-8	5.1E-8		
Ethylbenzene	1.1E-1	2.2E+5	5.9E-7	4.9E-7	2.0E-1	2.7E-1	1.1E-7	1.3E-7		
Toluene	1.2E-1	2.2E+5	6.6E-7	5.5E-7	2.0E-1	2.7E-1	1.3E-7	1.5E-7		
Xylene (mixed isomers)	3.5E-1	2.2E+5	1.9E-6	1.6E-6	2.0E-1	2.7E-1	3.7E-7	4.3E-7		

NOTE: ABS = Dermal absorption factor (d/m); BW = Body weight (kg); POE = Point of exposure
 AF = Absorption factor (mg/cm²); CF = Units conversion factor; ET = Exposure time (hrs/day); SA = Skin exposure area (cm²/day)
 AT = Averaging time (days); ED = Exposure duration (yrs); IR = Inhalation rate (m³/day)

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

Constituents of Concern	1) Exposure Concentration		2) NAE Value (m ³ /day)		3) Exposure Medium		4) Exposure Multiplier		5) Average Daily Intake Rate		TOTAL PATHWAY INTAKE (mg/kg-day)	
	Groundwater Conc. (mg/L)	Soil Gas Medium	On-Site Commercial	Receptor	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	Off-Site Residential
Benzene	2.7E-2		3.9E+4		6.9E-7		7.0E-2		4.8E-8		8.5E-8	5.1E-8
Ethylbenzene	1.5E-2		3.8E+4		4.0E-7		2.0E-1		7.9E-8		1.9E-7	1.3E-7
Toluene	7.2E-3		3.9E+4		1.8E-7		2.0E-1		3.6E-8		1.6E-7	1.5E-7
Xylene (mixed isomers)	2.3E-2		4.2E+4		5.5E-7		2.0E-1		1.1E-7		4.7E-7	4.3E-7

(Sum intake values from surface, subsurface & groundwater routes.)

NOTE: ABS = Dermal absorption factor (dim)
 AF = Adherence factor (mg/cm²)
 AT = Averaging time (days)

BW = Body weight (kg)
 CF = Units conversion factor
 ED = Exposure duration (yrs)

EF = Exposure frequency (days/yr)
 ET = Exposure time (hrs/day)
 IR = Inhalation rate (m³/day)

POE = Point of exposure
 SA = Skin exposure area (cm²/day)

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.2

1 OF 4

Date Completed 3/9/1998

Completed By James E. Gribi

Site Location 2302 Valdez Street, Oakland, CA

Site Name Former Oak Trib. UST Site

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

■ (CHECKED IF PATHWAYS ARE ACTIVE)

TOXIC EFFECTS

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Inhalation Scope Factor	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)	
		On-Site Commercial	Off-Site Residential		On-Site Commercial	Off-Site Residential	On-Site Commercial	Off-Site Residential			
Benzene	A	8.5E-8	5.1E-8	1.0E-1	8.5E-9	5.1E-9	2.4E-7	1.2E-7	1.7E-3	1.4E-4	7.0E-5
Ethylbenzene	D						1.9E-7	1.3E-7	2.9E-1	6.8E-7	4.7E-7
Toluene	D						1.6E-7	1.5E-7	1.1E-1	1.4E-6	1.3E-6
Xylene (mixed isomers)	D						4.7E-7	4.3E-7	2.0E+0	2.4E-7	2.1E-7

Total Pathway Carcinogenic Risk = 8.5E-9

Total Pathway Hazard Index = 1.4E-4

7.2E-5

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name Former Oak Trib UST Site

Site Location 2302 Valdez Street, Oakland, CA Completed By James E. Gnbi Date Completed 3/9/1998

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TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS VAPOR INTRUSION TO BUILDINGS	Exposure Concentration		2) NAF V&ub (m ³ /kg) Receptor	3) Exposure Medium Indoor Air POL Conc (mg/m ³) (1): (2):	4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (m ³ /kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) X (4)
	1) SOURCE MEDIUM Subsurface Soil Conc (mg/kg)	On-Site Commercial				
Constituents of Concern						
Benzene	9.7E-2	4.3E+2	2.3E-4	7.0E-2	1.6E-5	
Ethylbenzene	1.1E-1	4.3E+2	2.5E-4	2.0E-1	5.0E-5	
Toluene	1.2E-1	4.3E+2	2.9E-4	2.0E-1	5.9E-5	
Xylene (m,xed isomers)	3.5E-1	4.3E+2	8.2E-4	2.0E-1	1.9E-4	

NOTE ABS = Dermal absorpion factor (dl/m²) BW = Body weight (kg) POE = Point of exposure
 AF = Adherence factor (mg/cm²) CF = Units conversion factor ET = Exposure time (hrs/day) SA = Skin exposure area (cm²/day)
 AT = Averaging time (days) ED = Exposure duration (yrs) IR = Inhalation rate (m³/day)

Site Name Former Oak Trib. UST Site Site Location 2302 Valdez Street Oakland, Completed By James E. Gribl Date Completed 3/9/1998

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS (CHECKED IF PATHWAY IS ACTIVE)

Constituents of Concern	Exposure Concentration		2) NAF Value (m ³ /L) Receptor	3) EXPOSURE MEDIUM Indoor Air POE Conc (mg/m ³) (1) / (2)	4) EXPOSURE MULTIPLIER (IR*EF*ED)/BW*AT (m ³ *kg-den)	5) AVERAGE DAILY INTAKE RATE (mg/kg-den) (3) X (4)	TOTAL PATHWAY INTAKE (mg/kg-dy)	
	1) SOURCE MEDIUM Groundwater Conc (mg/L)	On-Site Commercial					On-Site Commercial	Off-Site Commercial
Benzene	2.7E-2	1.7E-4	1.5E+2	1.7E-4	7.0E-2	1.2E-5	2.8E-5	2.8E-5
Ethylbenzene	1.5E-2	1.1E-4	1.4E+2	1.1E-4	2.0E-1	2.1E-5	7.1E-5	7.1E-5
Toluene	7.2E-3	4.8E-5	1.5E+2	4.8E-5	2.0E-1	9.4E-6	6.5E-5	6.5E-5
Xylene (mixed isomers)	2.3E-2	1.4E-4	1.6E+2	1.4E-4	2.0E-1	2.8E-5	1.9E-4	1.9E-4

NOTE: (Rate include release from subsurface & groundwater release)

NOTE: ABS = Dermal absorption factor (dl/m)
AF = Adherence factor (mg/cm²)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m³/day)
POE = Point of exposure
SA = Skin exposure area (cm²/day)

Site Name: Former Oak Trib UST Site Site Location: 2302 Valdez Street, Oakland, CA Completed By: James E. Gmbi Date Completed: 3/9/1998

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK			TOXIC EFFECTS		
		(2) Total Carcinogenic Intake Rate (mg/kg/day)	(3) Inhalation Scope Factor	(4) Individual COC Risk (2) x (3)	(5) Total Toxicant Intake Rate (mg/kg/day)	(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)
Benzene	A	On-Site Commercial 2.8E-5	1.0E-1	On-Site Commercial 2.8E-6	On-Site Commercial 7.9E-5	1.7E-3	On-Site Commercial 4.6E-2
Ethylbenzene	D				7.1E-5	2.9E-1	2.9E-4
Toluene	D				6.5E-5	1.1E-1	5.7E-4
Xylene (mixed isomers)	D				1.9E-4	2.0E+0	9.4E-5

Total Pathway Carcinogenic Risk = 0.0E+0 2.8E-6

Total Pathway Hazard Index = 0.0E+0 4.7E-2

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.1

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Site Name: Former Oak Trib UST Site Location: 2302 Valdez Street, Oakland, CA Completed By: James E. Grbi Date Completed: 3/9/1998

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SOIL LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION	Exposure Concentration		2) NAF Value (L/kg) Receptor	3) Exposure Medium Groundwater POE Conc (mg/L) (1)(2)	4) Exposure Multiplier (RUEF x DKBWAT) (L/kg-day)	5) Average Daily Intake Risk (mg/kg-day) (3) x (4)
	1) Source Magnitude Soil Concentration (mg/kg)	On-Site Residential					Off-Site Residential	Off-Site Residential
Constituents of Concern						
Benzene	9.7E-2	2.2E+17	4.4E-19	1.2E-2	1.2E-2	5.2E-21
Ethylbenzene	1.1E-1	9.5E+34	1.2E-36	2.7E-2	2.7E-2	3.2E-38
Toluene	1.2E-1	1.6E+100	7.7E-102	2.7E-2	2.7E-2	2.1E-103
Xylene (mixed isomc's)	3.5E-1	8.0E+33	4.4E-35	2.7E-2	2.7E-2	1.2E-36

NOTE: ABS = Dermal absorption factor (dim); BW = Body weight (kg); EF = Exposure frequency (days/yr);
 AF = Adherence factor (mg/cm²); CR = Units conversion factor; ET = Exposure time (hrs/day);
 AT = Averaging time (days); ED = Exposure duration (yrs); IR = Intake rate (L/day);
 POE = Point of exposure
 SA = Skin exposure area (cm²/day)

Site Name: Former Oak Trib UST - Site Location: 2302 Valdez Street, Oakland, CA

Completed By: James E. Gribi

Date Completed: 3/9/1998

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

■ (CHECKED) PATHWAY IS ACTIVE

GROUNDWATER INGESTION

Constituents of Concern	1) Source Medium		2) NAF Value (dpm)		3) Exposure Medium		4) Exposure Multiplier		5) Average Daily Intake Rate		MAX. PATHWAY INTAKE (mg/kg-dw)	
	Groundwater Conc. (mg/L)	Off-Site Residential	Receptor	Off-Site Residential	Groundwater POE Conc. (mg/L) (Y2)	Off-Site Residential	(IR*EF*ED)/(BW*AT) (L/kg-dw)	Off-Site Residential	(mg/kg-dw) (1) + (4)	Off-Site Residential	(Maximum Intake of active pathways self leaching & groundwater routes.)	
Benzene	2.7E-2	4.2E+17		6.5E-20	1.2E-2	7.6E-22		5.2E-21		5.2E-21		
Ethylbenzene	1.5E-2	8.0E+34		1.9E-37	2.7E-2	5.2E-39		3.2E-38		3.2E-38		
Toluene	7.2E-3	1.0E+100		7.2E-103	2.7E-2	2.0E-104		2.1E-103		2.1E-103		
Xylene (mixed isomers)	2.3E-2	2.9E+33		7.9E-36	2.7E-2	2.2E-37		1.2E-36		1.2E-36		

NOTE: ABS = Dermal absorption factor (dpm)
 AF = Adherence factor (mg/cm²)
 AT = Averaging time (days)

BW = Body weight (kg)
 CF = Units conversion factor
 ED = Exposure duration (yrs)

EF = Exposure frequency (days/yr)
 ET = Exposure time (hr/day)
 IR = Intake rate (L/day)

POE = Point of exposure
 SA = Sun exposure area (cm²/day)

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK			TOXIC EFFECTS		
		(2) Total Carcinogenic Intake Rate (mg/kg/day) Off-Site Residential	(3) Oral Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3) Off-Site Residential	(5) Total Toxicant Intake Rate (mg/kg/day) Off-Site Residential	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5)/(6) Off-Site Residential
Benzene	A	5.2E-21	1.0E-1	5.2E-22	3.2E-38	1.0E-1	3.2E-37
Ethylbenzene	D				2.1E-103	2.0E-1	1.1E-102
Toluene	D				1.2E-36	2.0E+0	6.0E-37
Xylene (mixed isomers)	D						

Total Pathway Carcinogenic Risk = 0.0E+0

Total Pathway Hazard Index = 9.2E-37

APPENDIX E
RBCA MODEL SSTL TABLES

RBCA SITE ASSESSMENT

Site Name: Former Oak Trib/JST Site Completed By: James E. Gribb
 Site Location: 2302 Valdez Street, Oakland, CA Date Completed: 3/9/1998
 Target Risk (Class A & B): 1 DE-5 MCL exposure limit?
 Target Risk (Class C): 1 CE-5 PEL exposure limit?
 Target Hazard Quotient: 1 DE+0

Calculation Option: 3
 Groundwater DAF Option: Domeneico - First Order (One-dimensional vert. dispersion)

**SUBSURFACE SOIL SSSL VALUES
 (> 0 FT BGS)**

CAS No.	Name	Representative Concentration (mg/kg)	Soil Leaching to Groundwater		Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSSL (mg/kg)	SSSTL Exceeded? <input type="checkbox"/> - If yes	Required CRF
			Residential 800' feet	Commercial 800' feet	Residential (on-site)	Commercial (on-site)	Residential 70 feet	Commercial (on-site)			
71-43-2	Benzene	9.7E-2	>Res	NA	NA	6.2E-1	1.9E+2	2.7E+2	6.2E-1	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	1.1E-1	>Res	NA	NA	>Res	>Res	>Res	>Res	<input type="checkbox"/>	<1
108-88-3	Toluene	1.2E-1	>Res	NA	NA	2.5E+2	>Res	>Res	2.5E+2	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	3.5E-1	>Res	NA	NA	>Res	>Res	>Res	>Res	<input type="checkbox"/>	<1

SSSL Results For Complete Exposure Pathways ("X" if Complete)

>Res indicates risk-based target concentration greater than constituent residual saturation value

RBCA SITE ASSESSMENT

Site Name: Former Oak Trib UST Site
 Site Location: 2302 Valdez Street, Oakland, CA
 Completed By: James E. Gribb
 Date Completed: 3/9/1998
 Calculation Option: 3
 Groundwater DAF Option: Domenico - First Order (One-directional vent dispersion)

GROUNDWATER SSTL VALUES

Target Risk (Class A & B): 1.0E-5
 Target Risk (Class C): 1.0E-5
 Target Hazard Quotient: 1.0E+0
 MCL exposure limit?
 PEL exposure limit?

SSTL Results For Complete Exposure Pathways ("X" if Complete)

CAS No.	Name	Representative Concentration (mg/L)	Groundwater Ingestion		Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		SSTL Exceeded ?	Required CRF	
			Res. den. (800 feet)	Commercial (or site)	Regulatory (VCL) 800 feet	X	Residential (on-site)	Commercial (on-site)			Residential (on-site)
71-43-2	Benzene	2.7E-2	>Sol	NA	NA	NA	2.2E-1	NA	5.6E+1	2.2E-1	<1
100-41-4	Ethylbenzene	1.5E-2	>Sol	NA	NA	NA	>Sol	NA	>Sol	>Sol	<1
108-88-3	Toluene	7.2E-3	>Sol	NA	NA	NA	8.8E+1	NA	>Sol	8.8E+1	<1
1330-20-7	Xylene (mixed isomers)	2.3E-2	>Sol	NA	NA	NA	>Sol	NA	>Sol	>Sol	<1

>Sol indicates risk-based target concentration greater than constituent solubility