



September 4, 2001

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Mr. Don Hwang
Alameda County Health Care Services Agency
Environmental Health Department
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

SEP 07 2001

Subject: *Former Chevron Station #9-0517*
3900 Piedmont Avenue
Oakland, CA
Delta Project No. DG90517B.3C99

Mr. Hwang:

Per our telephone conversation this afternoon I am sending you a copy of the Site Conceptual Model and Risk-Based Corrective Action Evaluation (report No. 346420.04, dated December 14, 2000), prepared by Delta Environmental Consultants, Inc. network associate Gettler-Ryan Inc. This report was originally submitted to your office on December 21, 2000.

Please call me at 916.631.1300 if you have questions.

Sincerely,
DELTA ENVIRONMENTAL CONSULTANTS, INC.
Network Associate GETTLER-RYAN INC.

A handwritten signature in black ink that reads "Stephen J. Carter". The signature is fluid and cursive, with a long horizontal stroke at the end.

Stephen J. Carter, R.G.
Senior Geologist

Attachment: *Site Conceptual Model and Risk-Based Corrective Action Evaluation report*

Steve



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**SITE CONCEPTUAL MODEL
AND RISK-BASED CORRECTIVE ACTION EVALUATION**

for
Former Chevron Service Station #9-0517
3900 Piedmont Avenue
Oakland, California

Report No. 346420.04

Prepared for:

Mr. Thomas Bauhs
Chevron Products Company
P.O. Box 6004
San Ramon, California 94583

Prepared by:

Delta Environmental Consultants Inc.
Network Associate
Gettler-Ryan Inc.
6747 Sierra Court, Suite G
Dublin, California 94568

Barbara Sieminski
Project Geologist
R.G. 6676



Stephen J. Carter
Senior Geologist
R.G. 5577

December 14, 2000



GETTLER-RYAN INC.

TRANSMITTAL

TO: Mr. Thomas Bauhs
Chevron Products Company
P.O. Box 6004
San Ramon, CA 94583

DATE: December 21, 2000
PROJECT #: 346420.04/DG90517B.3C99

SUBJECT: Site Conceptual Model and
RBCA Evaluation Report for
Chevron Service Station #9-
0517.

FROM:
Barbara Sieminski
Project Geologist
Gettler-Ryan Inc.
6747 Sierra Court, Suite G
Dublin, California 94568

SEP 07 2001

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	12/14/00	Site Conceptual Model and Risk-Based Corrective Action Evaluation for Chevron Service Station #9-0517, 3900 Piedmont Avenue, Oakland, California.

THESE ARE TRANSMITTED as checked below:

- For review and comment Approved as submitted Resubmit __ copies for approval
 As requested Approved as noted Submit __ copies for distribution
 For approval Return for corrections Return __ corrected prints
 For your files

cc: Mr. James Brownell, Delta Environmental Consultants, Inc.
Ms. Bette Owen, Chevron Products Company
Mr. Larry Seto, Alameda County Health Services Agency
Mr. Neil B. Goodhue & Mrs. Diane Goodhue, property owners
GR File

COMMENTS: Attached is a copy of the report for your use. Copies of this report have been submitted to the above listed parties. Please call if you have questions.

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SITE CONCEPTUAL MODEL AND RISK-BASED CORRECTIVE ACTION EVALUATION

for
Former Chevron Service Station #9-0517
3900 Piedmont Avenue
Oakland, California

Report No. 346420.04

1.0 INTRODUCTION

At the request of Chevron Products Company (Chevron), Delta Environmental Consultants Inc./Gettler-Ryan Inc. (GR) is submitting this report presenting the site conceptual model (SCM), and documenting the results of the implementation of the Risk-Based Corrective Action (RBCA) planning process, as described in ASTM E-1739 "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Sites" for the former Chevron Service Station located at 3900 Piedmont Avenue in Oakland, California. The purpose of this work was to evaluate whether the implementation of further environmental investigation and/or remediation related to soil and groundwater is warranted at the site. This report was prepared based on information supplied by Chevron, and describes site hydrogeological conditions and distribution of contaminants in space and time, identifies potential current and future receptors, presents the RBCA model results for the site, and recommends the most appropriate action plan for the site.

2.0 SITE DESCRIPTION

2.1 General

The subject site is situated on the eastern corner of Piedmont Avenue and Montell Street in Oakland, California (Figure 1). The subject site was utilized as a service station to approximately 1978. Sometime after October 1978, the service station was demolished, and a commercial building was constructed in the western portion of the site along Piedmont Avenue. The eastern portion of the site was converted to the parking lot. Until sometime before 1998, the building was used by Homestead Federal Savings Association. Presently, PCS Smart Mart (Pacific Bell mobile service agent) occupies the building. Locations of the current site features are shown on Figure 2.

The site vicinity is used for transportation, commercial, and residential purposes. The subject site is bounded by Piedmont Avenue to the northwest, Montell Street to the southwest, a residential property (apartment buildings) to the southeast and a commercial property (restaurant) to the northeast. The apartment building is located approximately 15 feet of the southeastern boundary of the subject site. The restaurant building is situated along the northeastern border of the subject site. A commercial/residential building (stores on the ground floor and apartments on the upper floors) is situated across Piedmont Avenue (approximately 50 feet northwest of the subject site). A restaurant building is located across Piedmont Avenue (approximately 50 feet west of the subject site). A parking lot and a commercial building (Blockbuster Video Store) are located across Montell Street. The Blockbuster Video Store building is located approximately 80 feet southwest of the subject site. The site vicinity is shown on the maps included in Appendix A.

2.2 Previous Environmental Work

Phase I Environmental Investigation

In May 1993, Augeas Corporation (AC) conducted a Phase I environmental investigation at the subject site. Results of this investigation indicated that Chevron owned the subject property from at least December 1940 through February 1979. The property was utilized as the Chevron service station up to approximately 1978. At least four underground storage tanks (USTs) were present at the subject site, based on the site map dated April 12, 1955. These USTs included two waste oil USTs located along the northwestern site boundary, a 7,500-gallon fuel UST, and at least one other UST of an unknown size and contents located further to the east (bordering Montell Street). A permit to remove four USTs was issued by the Oakland Fire Prevention Bureau to Egan & Paradiso Construction Company on October 5, 1978. The USTs were noted as being 25 feet east of Piedmont Avenue.

A government agency databases search indicated that 30 generators of hazardous waste (Resource Conservation and Recovery Act [RCRA] sites) and 9 sites with leaking underground storage tanks (LUST sites) are located within 1-mile radius of the subject site. However, no registered tanks were identified in the immediate vicinity of the subject site. A map showing environmental problem sites is included in Appendix B. Based on the AC review of State Water Resources Control Board's *Well Investigation Program* of August 1991, contaminated public water wells are not present within a 1-mile radius of the subject site.

Phase II Environmental Site Assessment

In October 1993, Environmental and Science Engineering, Inc (ESE) conducted a soil and groundwater investigation to evaluate petroleum hydrocarbon impact to the soil and groundwater beneath the site. Eight soil borings (FNBO-1 through FNBO-8) were drilled at the site. Eleven soil samples collected from depths between 6 and 11 feet below ground surface (bgs) were submitted for analyses. Soil samples were analyzed for total recoverable petroleum hydrocarbons (TRPH), total petroleum hydrocarbons as gasoline (TPHg), total petroleum hydrocarbons as diesel (TPHd), and the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX). Five of the eleven soil samples were analyzed for volatile organic compounds (VOCs).

TRPH were detected in five of the eleven soil samples analyzed at concentrations ranging from 10 parts per million (ppm) to 350 ppm. TPHg were detected in eight of the eleven soil samples analyzed at concentrations ranging from 1.4 ppm to 3,400 ppm. Benzene was detected in two samples at concentrations of 0.03 ppm and 1.0 ppm. VOCs were not detected in any of the analyzed soil samples. Soil analytical data are summarized in ESE *Table 1, Analytical Results for Soil Samples* included in Appendix C.

One grab groundwater sample was collected from boring FNBO-6. TRPH (2,800 parts per billion [ppb]), TPHg (7,800 ppb) and benzene (7.7 ppb) were detected in this sample. VOCs were not detected in this

sample except acetone (30 ppb) and carbon disulfide (33 ppb). Grab groundwater analytical data are summarized in Cambria *Table 1, Soil and Groundwater Analytic Data* included in Appendix D.

Monitoring Well Installation

In July 1998, GR installed two on-site (MW-1 and MW-2) and two off-site (MW-3 and MW-4) groundwater monitoring wells to evaluate soil and groundwater conditions at the subject site. Soil encountered in borings MW-1 through MW-4 consisted predominantly of interbedded clays, silts and clayey gravels to the total depth explored of 20 feet bgs. Groundwater was encountered within the sandy silt layer at depths of approximately 10.2 to 12.0 feet bgs and stabilized at depths of 7.4 to 9.1 feet bgs.

The soil sample collected from boring MW-4 at an approximate depth of 11 feet bgs contained TPHg (80 ppm) and benzene (2.0 ppm). A low concentration of benzene (0.0070 ppm) was also detected in the soil sample collected from boring MW-2 at an approximate depth of 6 feet bgs. TPHg or benzene were not detected in any other soil samples collected from borings MW-1 through MW-4. MTBE was not detected in any of the soil samples.

Laboratory analytical results for the unsaturated sample collected from boring MW-1 at 6 feet bgs indicated 0.059% fraction organic carbon, 1.68 gram per cubic centimeter (gm/cc) dry density, 2.01 gm/cc natural density, 2.52 gm/cc matrix density, 33.1% porosity and 19% moisture content. The results for the Capillary fringe sample collected from boring MW-1 at 11 feet bgs indicated 0.15% fraction organic carbon, 1.60 gm/cc dry density, 1.99 gm/cc natural density, 2.62 gm/cc matrix density and 38.7% porosity. Analytical results of soil samples collected from well borings are summarized in GR *Table 2, soil Analytical Results* included in Appendix C.

Groundwater Monitoring and Sampling

Quarterly monitoring and sampling of site wells began in August 1998. During the period of August 1998 to July 2000, depth to shallow groundwater beneath the site fluctuated between 5.5 and 12 feet bgs. The groundwater flow direction fluctuated between southwest, west and northwest, and the average gradient was 0.02. Groundwater monitoring and sampling data are summarized in Blaine Tech *Cumulative Table of Well Data and Analytical Results*, included in Appendix D. Historic potentiometric maps are also included in Appendix D.

Off-site wells MW-3 and MW-4 contained hydrocarbons at concentrations up to 12,000 ppb of TPHg, 3,100 ppb of benzene, and 820 ppb of MtBE. Hydrocarbon concentrations in these wells have not changed significantly since the groundwater monitoring began. Onsite well MW-1 has never contained hydrocarbons. Onsite well MW-2 contained a low concentration of MtBE (3.4 ppb) during the initial sampling in August 1998, and 4,000 ppb of TPHg and 240 ppb of benzene during the May 2000 sampling event. Based on nondetectable concentrations of TPHg and benzene in well MW-2 during all other sampling events including the most recent event conducted in July 2000, the concentrations detected in May 2000 appear to be anomalous.

2.3 Geology and Hydrogeology

The subject site is located at the western edge of the Piedmont Hills, approximately 2 miles east of San Francisco Bay and 1 mile north of Lake Merritt. The site is a relatively flat, paved lot at an elevation of approximately 85 feet above mean sea level. As mapped by Helley and others (1979, *Flatland Deposits of the San Francisco Bay Region, California: U.S. Geological Survey Professional Paper 943*), soil in the site vicinity consists of Late Pleistocene alluvium consisting of weakly consolidated, slightly weathered, poorly sorted, irregularly interbedded clay, silt, sand and gravel. The nearest surface water is Glen Echo Creek located approximately 400 feet east of the site. Based on historical monitoring data, the groundwater flow direction in the vicinity of the site fluctuates between southwest, west, and northwest.

The boring logs indicate that the subject site is underlain by interbedded clays, silts and clayey gravels to the total depth explored of 20 feet bgs. Coarser grained materials (clayey gravel and sandy to gravelly silt) were generally encountered immediately below ground surface. These materials extended to depths ranging from 4 to 15.5 feet bgs and were underlain by clays and sandy clays. Groundwater was encountered within the sandy silt layer at depths of between 10 and 12 feet bgs and stabilized at depths between approximately 7.5 and 9 feet bgs. Boring logs, and Cambria's geologic cross section are included in Appendix E.

3.0 SITE CONCEPTUAL MODEL

The site conceptual model was prepared based on the site assessment and quarterly monitoring and sampling data collected at the site to date. A pictorial representation of the site conceptual model is presented on Figure 3.

3.1 Release Scenario and Plume Characterization

A service station operated at the subject site from at least December 1940 to 1978. Fuel and waste oil USTs (potential on-site primary sources of release) were present at the site at that time. Underground and aboveground station facilities were removed sometime at the end of 1978 or beginning 1979, and a commercial building was constructed in the western portion of the property, over the former UST pits area. Data regarding soil conditions or remediation activities (if any implemented) at the time of UST removal are not available.

Environmental investigations conducted at the site indicated that soil and shallow groundwater beneath the subject site have been impacted by petroleum hydrocarbons. The dissolved hydrocarbon plume is located beneath the western corner of the subject site and beneath the adjacent streets. Affected soil appears to be present within the smear zone (5.5 to 12 feet bgs) above the dissolved hydrocarbon plume. The lateral extent of hydrocarbon impacted soil has been delineated to 80 ppm of TPHg and 2 ppm of benzene to the northwest (downgradient), and to nondetectable TPHg and benzene concentrations in all other directions. The extent of TPHg and benzene affected soil is depicted on Figures 4 and 5. MtBE has not been detected in soil beneath the subject site.

Groundwater beneath the subject site has been monitored and sampled since August 1998 through the network of four groundwater monitoring wells. During this period of time groundwater depth ranged from 5.5 to 12 feet bgs, and the groundwater flow direction fluctuated between southwest, west, and northwest. The groundwater sampling data indicate that groundwater beneath the immediate western vicinity of the subject site (wells MW-3 and MW-4) has been impacted by gasoline hydrocarbons at concentrations up to 12,000 ppb of TPHg, 3,100 ppb of benzene, and 820 ppb of MtBE. As MtBE was not added to gasoline when the station was closed in 1978, the presence of MtBE in wells MW-3 and MW-4 appears to be from the secondary source (such as fuel spills from cars parked on the streets, or a recent spill at the upgradient/crossgradient gas station transported through underground utility trenches). Hydrocarbon concentrations in wells MW-3 and MW-4 have not changed significantly since the groundwater monitoring began (Figures 7 through 10). The lateral extent of hydrocarbon impacted groundwater has not been delineated west (downgradient) of the subject site (Figure 6). However, it is possible that the lateral migration of hydrocarbon impacted groundwater is restricted due to the lithology of the water bearing zone (silty and clayey material of low to moderate hydraulic conductivity). Groundwater remediation has not been implemented at this site.

3.2 Potential Receptors

The hydrocarbon plume likely extends beneath PCS Smart Mart building, beneath Montell Street and Piedmont Avenue, and possibly beneath the commercial and commercial/residential (stores on the ground floor/apartments on the upper floors) buildings across the streets. Most of this area is paved with asphalt or concrete. The residential buildings on the property bounding the subject site to the southeast (upgradient), and across Montell Street (approximately 50 feet south [crossgradient to upgradient] of the subject site) are located outside of the plume.

The potential exposure receptors are current and future workers in the on-site commercial building (and possibly in the buildings across the street), current and future site visitors (clients, motorists, pedestrians), and construction workers (underground utility maintenance workers). It appears that the residential occupants of the building across Piedmont Avenue would be affected to the lesser degree than the commercial occupants of the building, due to their location on the upper floors of the building. Potential hydrocarbons volatilizing from groundwater into the building are most likely to accumulate on the ground floor of the building, and then become diluted by ventilation (open doors, windows, etc.).

No water producing wells are located at the site. The presence of water producing wells within the off-site portion of the plume appears to be unlikely based on the land usage, however, it cannot be excluded until a complete well survey confirms the absence of such wells. Potential exposure mediums are ambient air, indoor air in commercial buildings, and soil and groundwater in potential future excavation areas. The major exposure pathway is inhalation of hydrocarbon vapors volatilizing from smear zone soils and groundwater to ambient and indoor air. Dermal contact with hydrocarbon impacted soil and groundwater is the potential exposure pathway for utility maintenance/construction workers. Groundwater ingestion could be a potential exposure pathway but only if public or domestic wells are present within the dissolved plume.

3.3 Other Environmental Issues

The lateral extent of hydrocarbon impacted groundwater has not been delineated in the downgradient direction of the subject site. However, the presence of MtBE in wells MW-3 and MW-4 indicates that an off-site source of hydrocarbons is present in the subject site vicinity. It appears that the hydrocarbons detected in the downgradient vicinity of the subject site partially originated from the off-site secondary source. The location or magnitude of influence of this off-site source is unknown.

Impacted public water wells were not present within 1-mile radius of the subject site, based on AC's review of the SWRCB's *Well Investigation Program* of August 1991. There are no water producing wells at the subject site, based on the site inspection. However, a complete well survey identifying all active, destroyed, and abandoned wells (public, domestic, irrigation, and industrial water producing wells, monitoring wells, cathodic protection wells, etc.) was not performed for the subject site. The wells (if present within the dissolved plume) may act as exposure points, or vertical conduits to deeper water bearing zones.

An underground utility survey has not been conducted, therefore, it is not known if underground utility trenches are a factor in plume migration in the subject site vicinity. The dissolved hydrocarbon plume at the subject site extends beneath the public streets (Piedmont Avenue and Montell Street), in the area where underground utilities are likely to be present. Due to shallow groundwater, the underground utility trenches (if present within the plume area) may act as preferential pathways and conduits that could enhance migration of contaminants from the subject site and also from the off-site secondary source to the vicinity of the subject site.

4.0 RISK-BASED CORRECTIVE ACTION (RBCA)

Tier 1 of the RBCA process involves comparison of the site constituent concentrations to generic Risk-Based Screening Levels (RBSL) to evaluate whether further evaluation and/or active remediation is required. RBSL values are derived from standard exposure equations and reasonable maximum exposure (RME) estimates per U.S. EPA guidelines. RBSL concentration limits are designed to be protective of human health even if exposure occurs directly within the on-site area of affected soil or groundwater and inherently provide conservative estimates of potential threats to human health and the environment. According to the RBCA process, if Tier 1 limits are not exceeded, the user may proceed directly to compliance monitoring and/or no further action. However, if these generic screening levels are exceeded, the affected media may be addressed by 1) remediating to the generic Tier 1 limits, if practicable, 2) conducting Tier 2 evaluation to develop site-specific remediation goals, or 3) implement an interim action to abate risk "hot spots".

4.1 Site Parameters

The complete exposure pathways are those that could pose a reasonable potential for contaminant contact with a human or environmental receptor. Under Tier 1 RBCA, only on-site receptors apply. Based on the land usage within a plume, commercial types of exposure scenarios were evaluated for the site. A construction worker exposure was also evaluated. There are no water supply wells at the site, and an assumption was made that there are no water supply wells within the off-site portion of the plume.

Therefore, groundwater ingestion or subsurface soil leaching to groundwater exposure pathways were not considered complete pathways. The smear zone extends from 5 to 12 feet bgs. The surface soil (<3 feet bgs) is not impacted. There is a commercial building and a parking lot (paved with asphalt) present within the on-site plume area. Therefore, the only complete exposure pathways identified are volatilization to outdoor and indoor air from subsurface soils and from groundwater (commercial and construction worker receptor) and direct ingestion and dermal contact (construction worker only). These exposure pathways were evaluated during this RBCA analysis.

Site specific physical data was used in this RBCA evaluation. These parameters included most conservative values for contaminated soil area (10,000 ft²), depth to top of affected soil (5 ft), depth to groundwater (5 ft), thickness of affected subsurface soils (7 ft), soil porosity in vadose zone (38%), soil density (1.6 g/cm³), fraction of organic carbon in vadose zone (0.15%). Where appropriate and consistent with site conditions, default values were used. The mean values were used as representative hydrocarbon concentrations in source media. The representative soil concentrations were calculated based on hydrocarbon concentrations in soil samples collected at depths between 5 and 12 feet bgs (smear zone) from borings FNBO-1 through FNBO-8, and well borings MW-1 through MW-4. The representative groundwater concentrations were calculated based on the current (November 1999) hydrocarbon concentrations in the groundwater samples from wells MW-1 through MW-4.

4.2 Results of RBCA Analysis

Based on the RBCA analysis and review of the RBSLs, site conditions are below generic Tier 1 screening levels and, according to the RBCA decision making process, no further work is necessary (except to confirm assumptions). Pertinent input and output data for the plume including site specific parameters used in the analysis are presented in Appendix G.

5.0 DISCUSSION AND CLOSURE PLAN

Site conditions consist of petroleum impacted soil and groundwater. Hydrocarbon impacted soil appears to be present only within the smear zone (5 to 12 feet bgs). The lateral extent of hydrocarbon impacted soil has been delineated to 80 ppm of TPHg and 2 ppm of benzene to the northwest (downgradient), and to nondetectable TPHg and benzene concentrations in all other directions. The soil beneath the site does not appear to have been impacted by MtBE.

Concentrations of dissolved hydrocarbons in the source area appear to stabilize. The lateral extent of hydrocarbon impacted groundwater has been delineated except downgradient of the subject site. However, it is possible that the lateral migration of hydrocarbon impacted groundwater is restricted due to the lithology of the water bearing zone (silty and clayey material of low to moderate hydraulic conductivity).

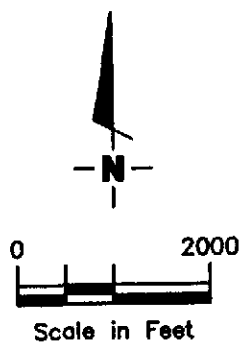
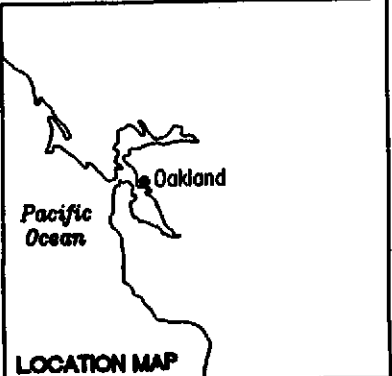
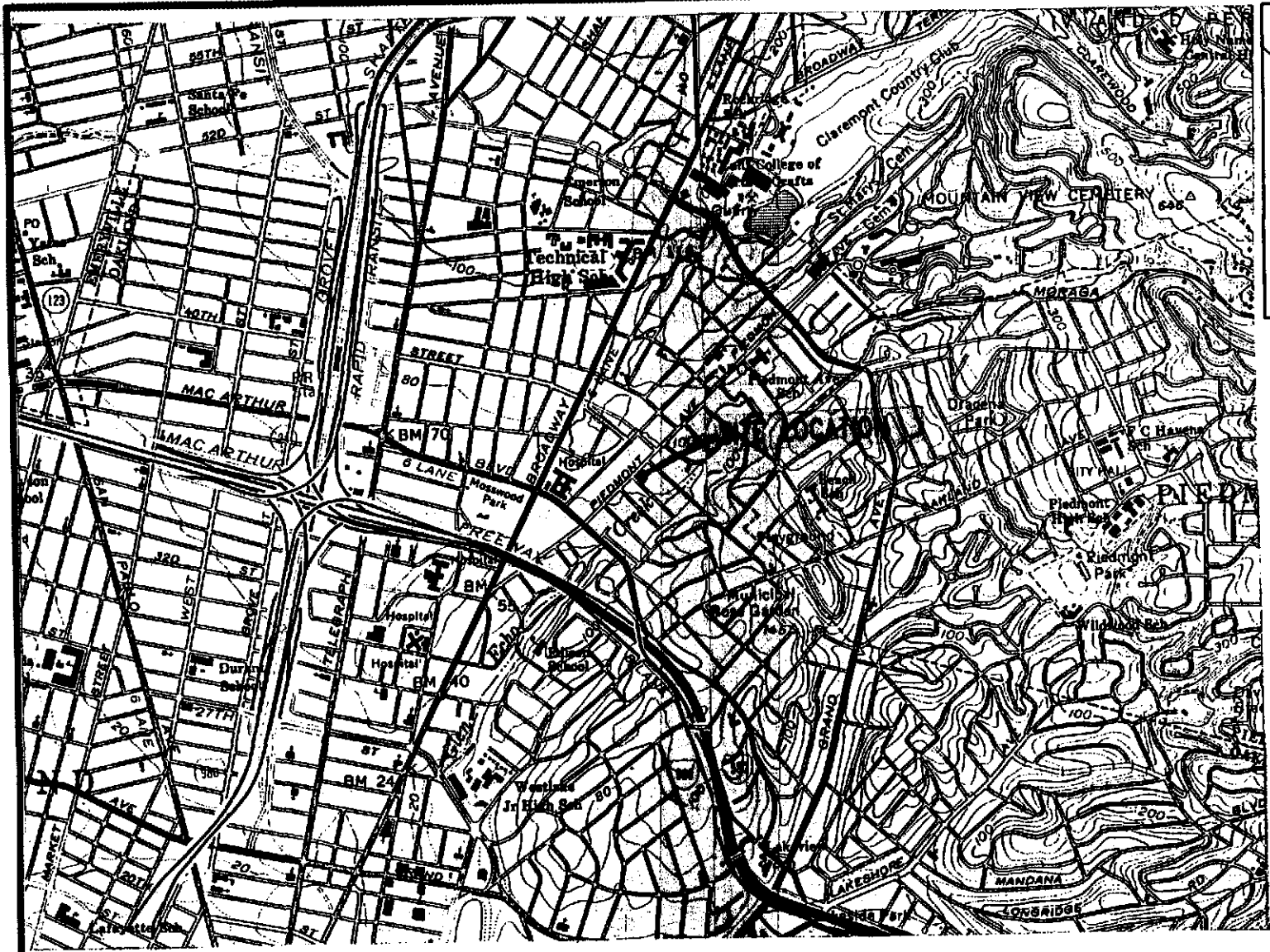
Based on the presence of MtBE, an off-site secondary source of hydrocarbons appears to contribute to groundwater contamination in the western (downgradient) vicinity of the subject site. The location and magnitude of influence of this off-site source is unknown. Underground utilities may be present in the western vicinity of the subject site. Due to shallow groundwater, the utility trenches may act as preferential

pathways enhancing migration of hydrocarbons originated from the subject site and also from the off-site secondary source toward the downgradient vicinity of the subject site. Due to plume commingling, it appears that the additional environmental investigation in the western vicinity of the subject site would not provide significant additional information specific to the subject site plume delineation.

RBCA analysis indicates that modeled concentrations of hydrocarbons volatilizing to outdoor air from subsurface soil and groundwater do not exceed RBSLs for commercial use of the subject property. RBSLs are also not exceeded for a construction worker. However, the RBCA analysis was conducted based on the assumption that there are no water producing wells within a dissolved hydrocarbon plume and groundwater ingestion is not a valid exposure pathway. A well survey is needed to confirm the RBCA assumption. If well survey results indicate that groundwater ingestion shall be considered a valid exposure pathway for the site, the RBCA will need to be re-evaluated.

Based on the site environmental condition, and RBCA analysis it appears that risk mitigation or additional environmental investigation (other than a well survey) is not required at the subject site. There are no potential threats to human health and the environment based on the site current usage. Therefore, natural attenuation appears to be the most appropriate approach to remediate the site.

If well survey results indicate that no well receptors or conduits are located in the immediate downgradient vicinity of the subject site, GR recommends initiating site closure proceedings. Monitoring and sampling of wells MW-1 through MW-4 shall be continued to verify groundwater conditions until a closure status is granted. However, based on nondetectable hydrocarbon concentrations in wells MW-1 and MW-2, GR recommends reducing frequency of sampling of these wells to semiannual. Wells MW-3 and MW-4 shall be sampled quarterly. All wells shall be monitored quarterly.



Base Map: USGS Topographic Map



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Dublin, CA 94568

VICINITY MAP
Former Chevron Service Station No. 9-0517
3900 Piedmont Avenue
Oakland, California

FIGURE

1

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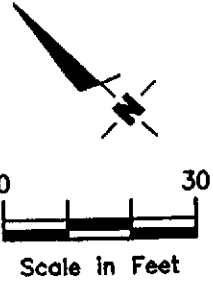
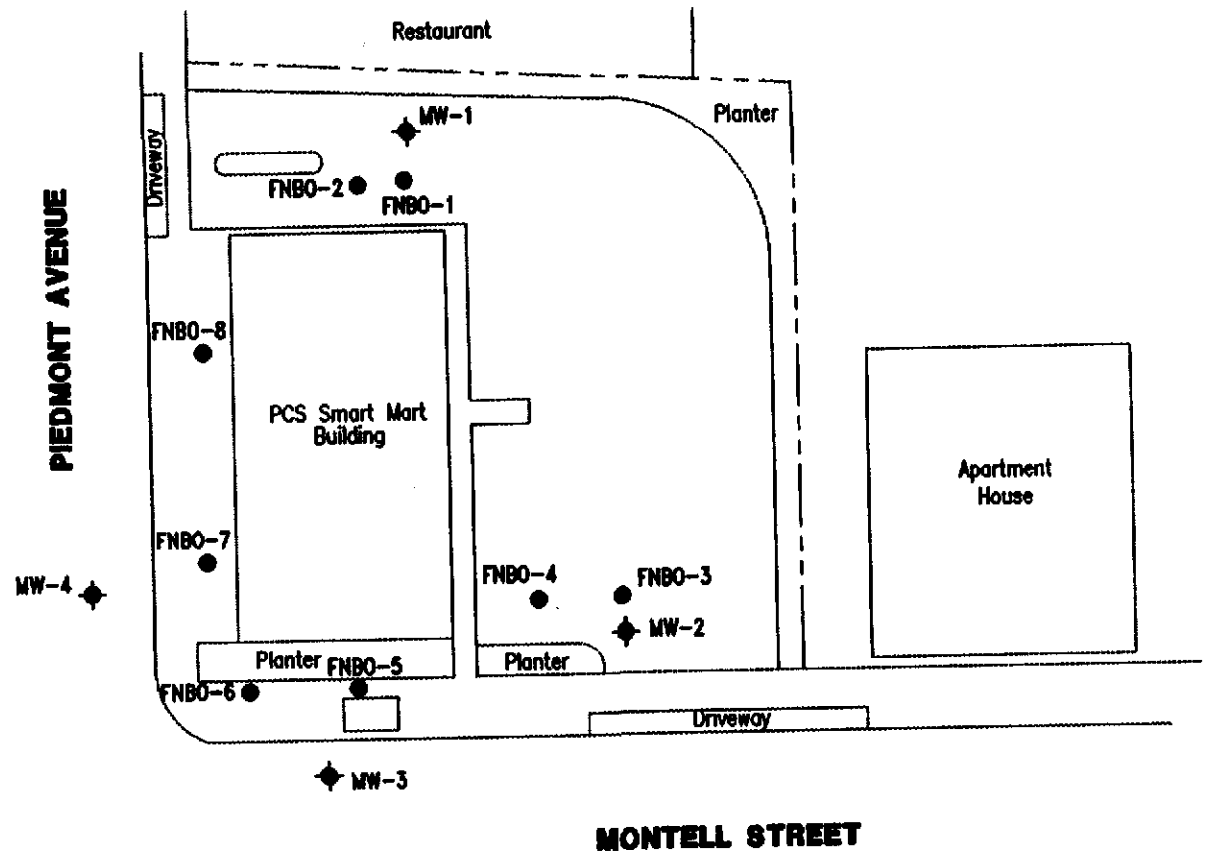
REVIEWED BY
[Signature]

DATE
12/00

REVISED DATE

EXPLANATION

- ◆ Groundwater monitoring well
- Soil boring



Source: Figure Modified From Drawing Provided By Cambria Environmental.



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SITE PLAN
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

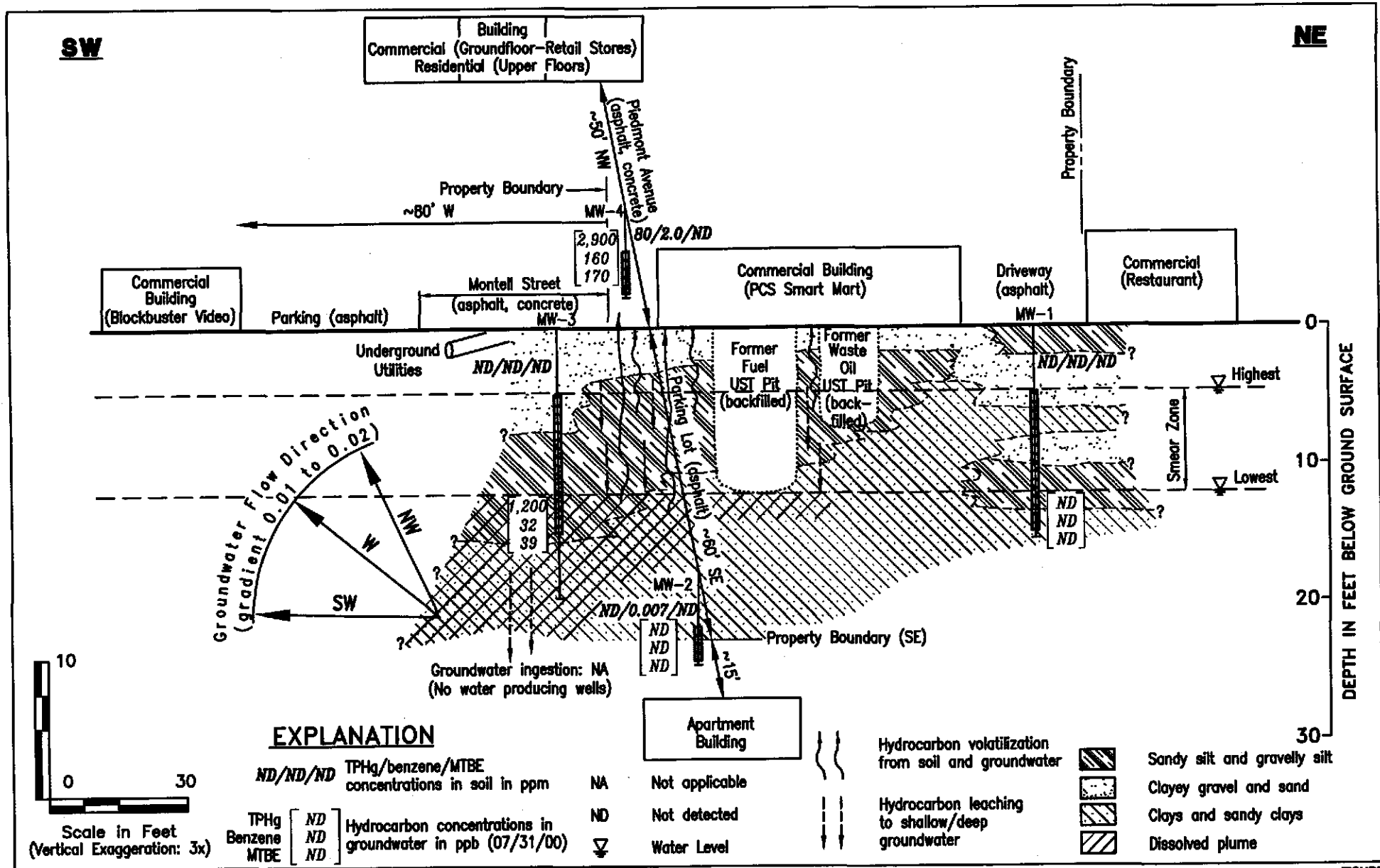
FIGURE
2

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 346420.04

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DATE
 12/00

REVISED DATE



SITE CONCEPTUAL MODEL
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

FIGURE
3

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 Dublin, CA 94568

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 346420.04

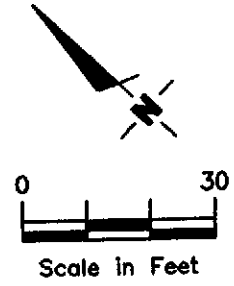
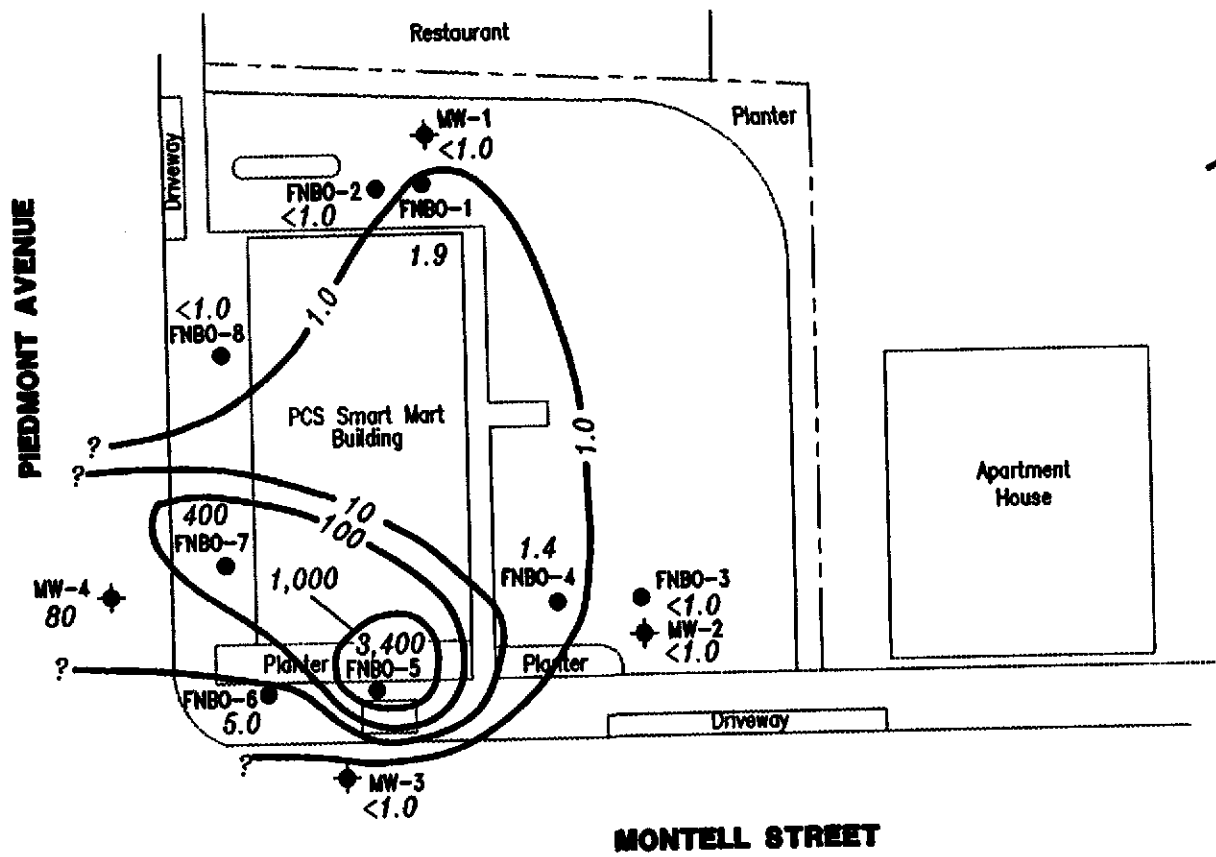
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DATE
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REVISED DATE

EXPLANATION

- ◆ Groundwater monitoring well
- Soil boring
- 500 Maximum concentration of TPHg in soil between depths 5 and 12 feet in ppm
- 500 --- TPHg concentration contour



Source: Figure Modified From Drawing Provided By Cambria Environmental.



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TPHg CONCENTRATION IN SOIL
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

FIGURE

4

JOB NUMBER
 346420.04

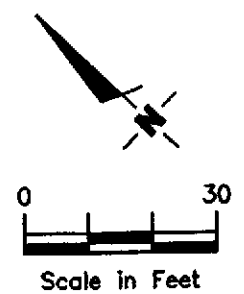
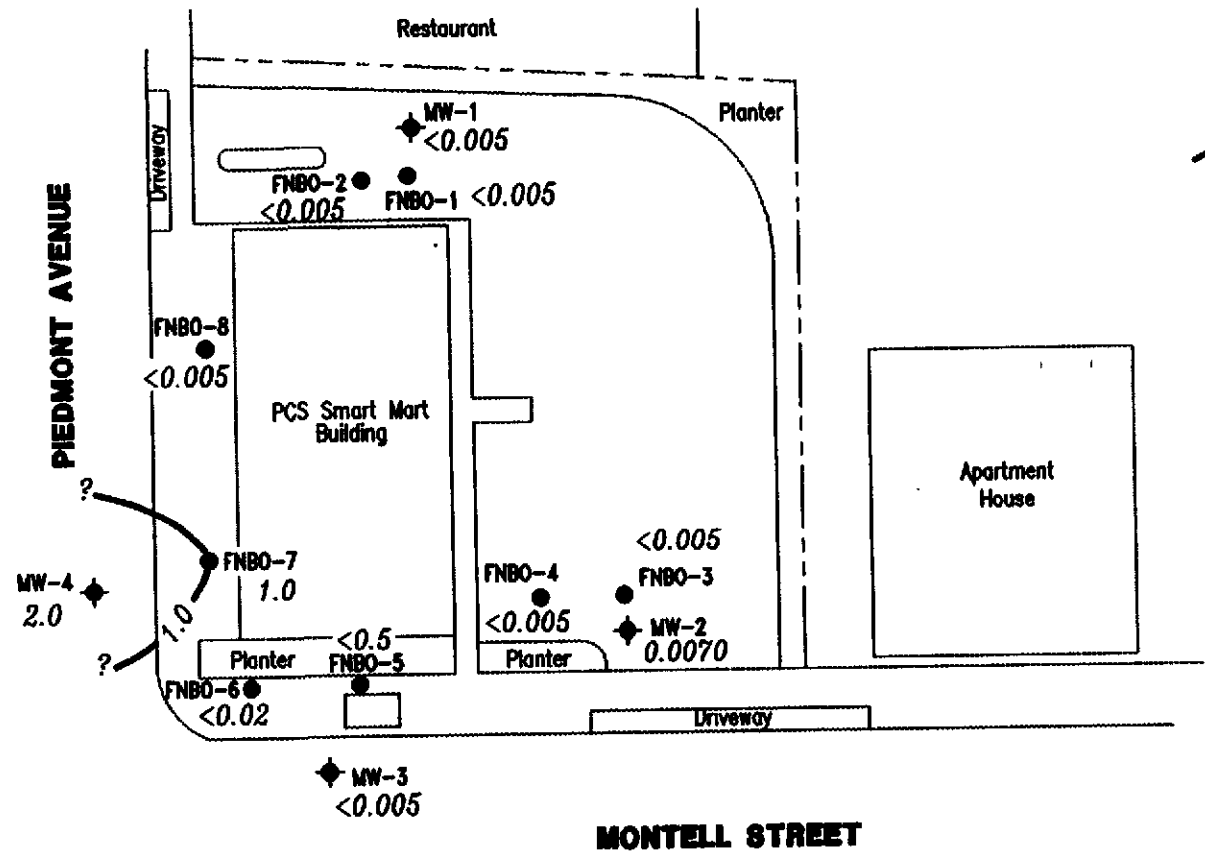
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 [Signature]

DATE
 12/00

REVISED DATE

EXPLANATION

- ◆ Groundwater monitoring well
- Soil boring
- 5.00 Maximum concentration of Benzene in soil between depths 5 and 12 feet in ppm
- 5.00— Benzene concentration contour



Source: Figure Modified From Drawing
 Provided By Cambria Environmental.



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BENZENE CONCENTRATION IN SOIL
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

FIGURE

5


JOB NUMBER
 346420.04

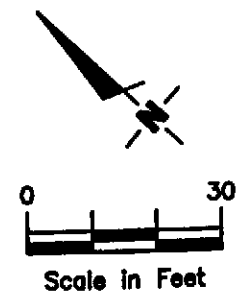
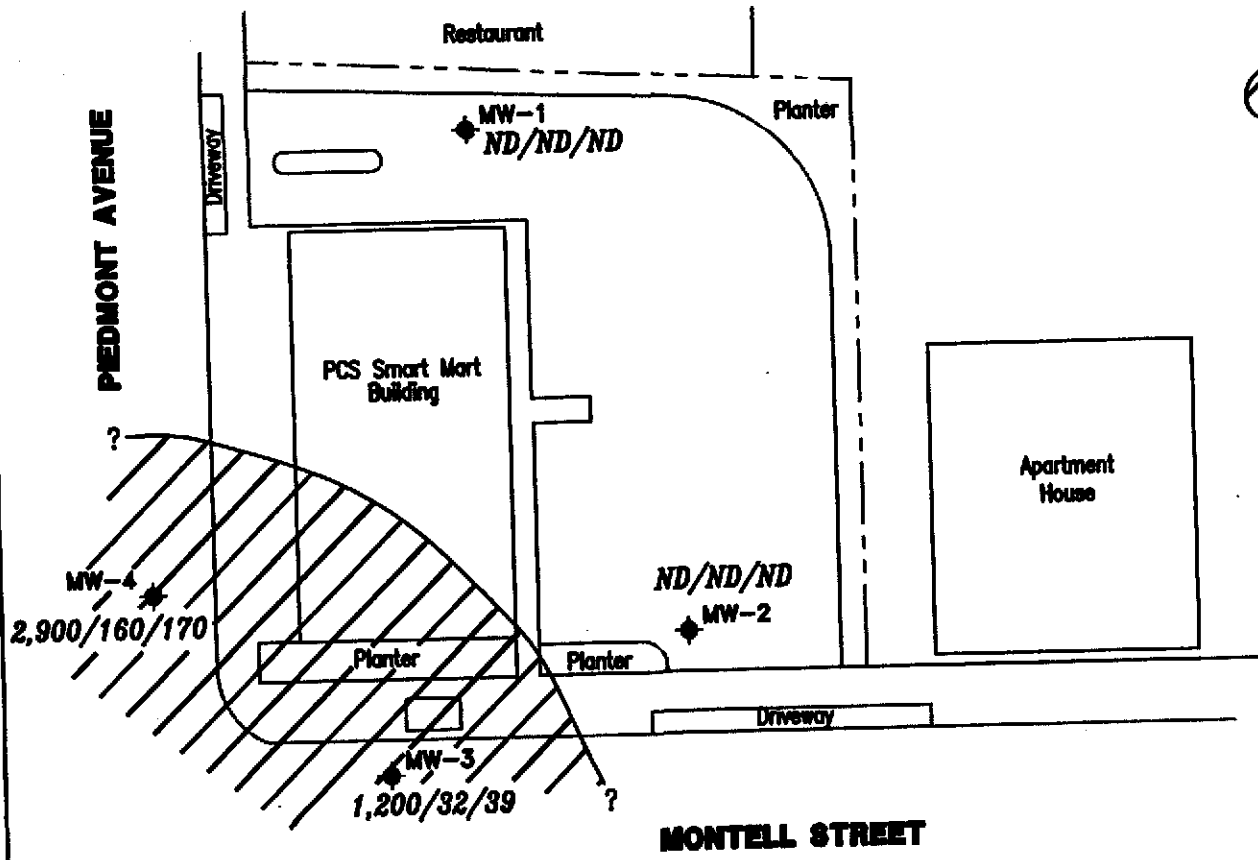
REVIEWED BY

DATE
 12/00

REVISED DATE

EXPLANATION

- ◆ Groundwater monitoring well
- A/B/C TPHg/Benzene/MTBE concentrations in groundwater in ppb
- ND Not detected
-  Dissolved hydrocarbon plume



Source: Figure Modified From Drawing Provided By Cambria Environmental.



Gottler - Ryan Inc.

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Dublin, CA 94568

HYDROCARBON CONCENTRATIONS IN GROUNDWATER ON 07/31/00 FIGURE
Former Chevron Service Station No. 9-0517
3900 Piedmont Avenue
Oakland, California

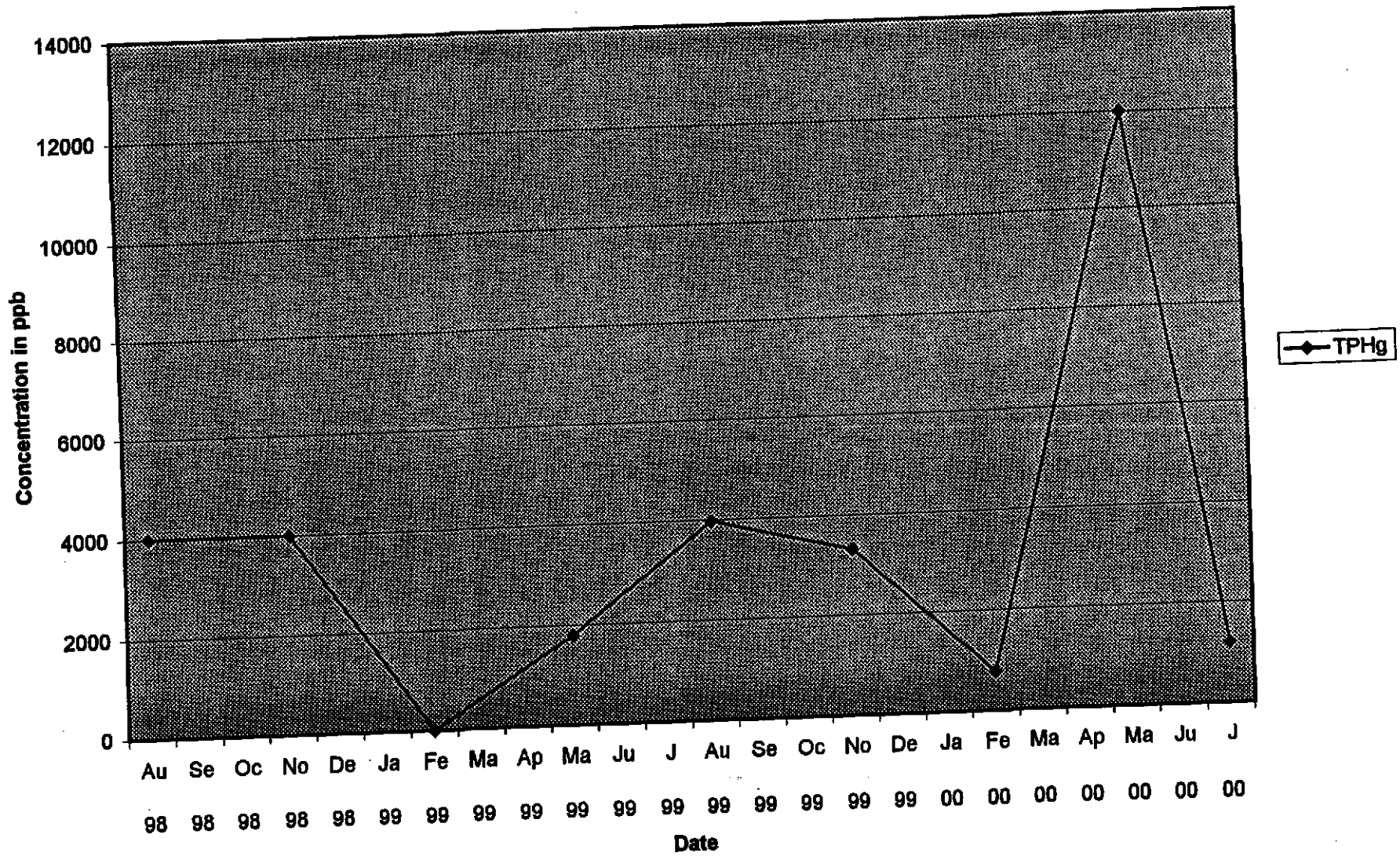
6

JOB NUMBER
346420.04

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DATE
12/00

REVISED DATE



TPHg CONCENTRATION IN WELL MW-3
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

FIGURE

7



Gettler - Ryan Inc.

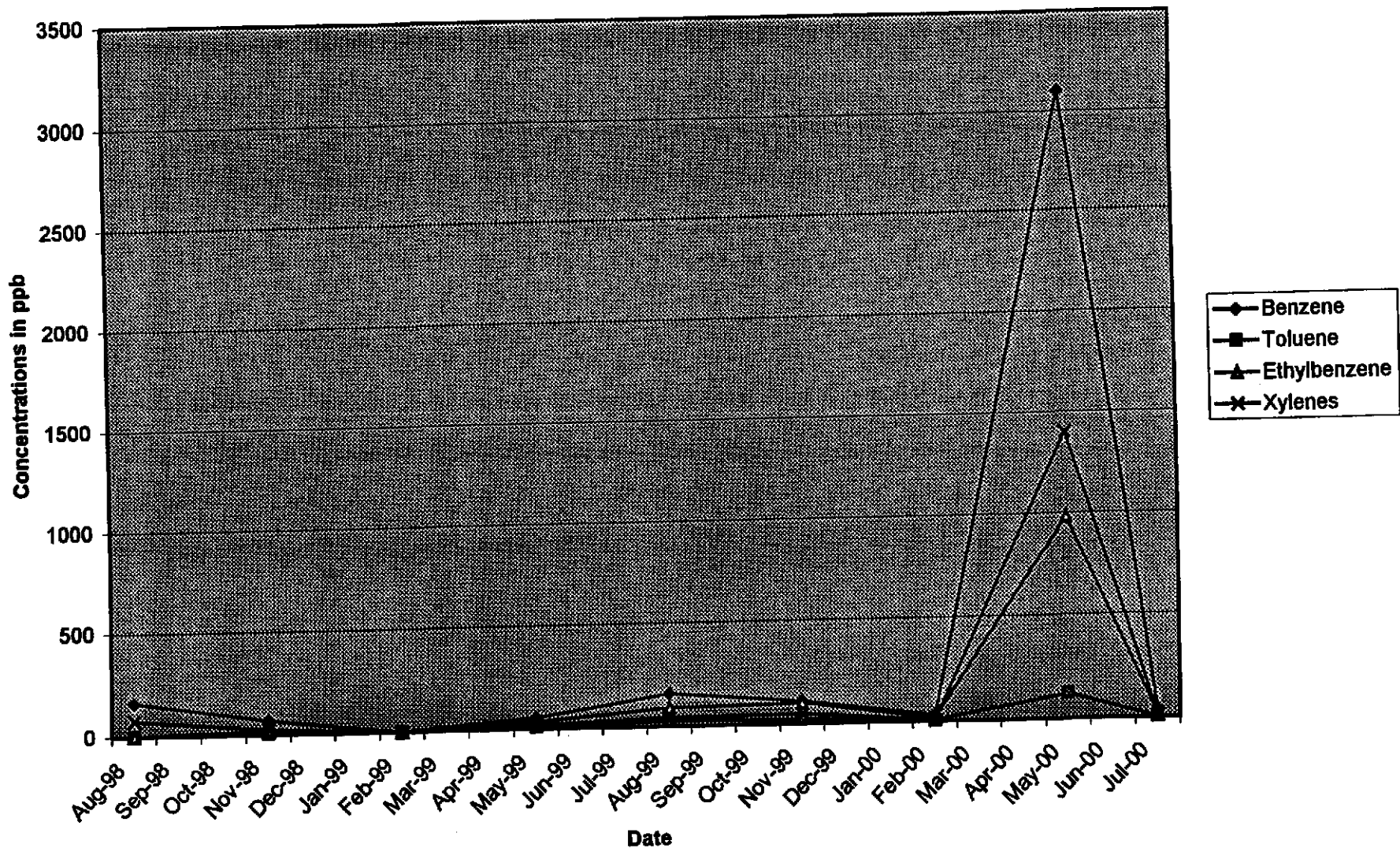
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 346420.04

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 12/00

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BTEX and MTBE CONCENTRATIONS IN WELL MW-3
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

FIGURE

8



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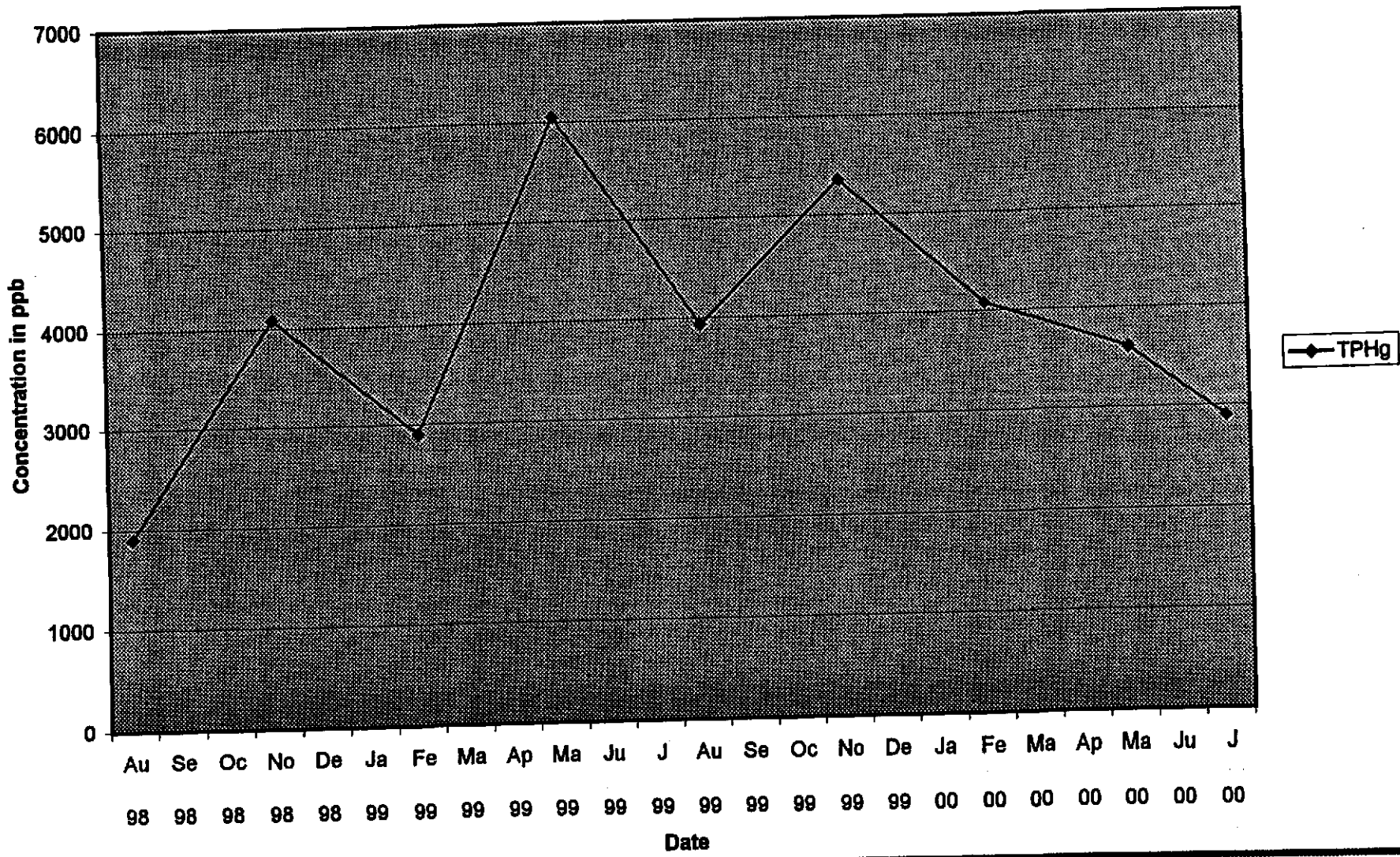
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FIGURE

9



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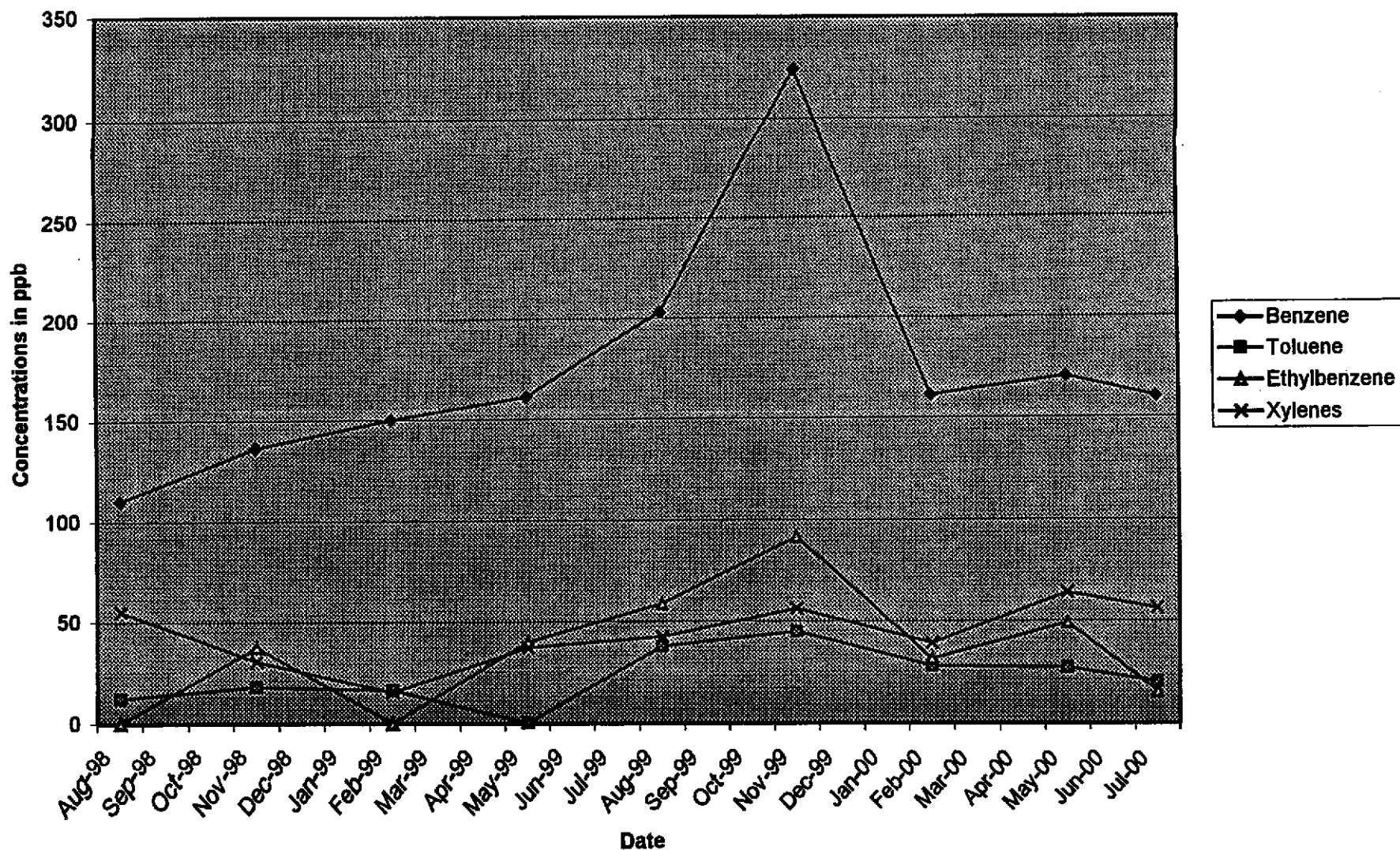
TPHg CONCENTRATION IN WELL MW-4
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

JOB NUMBER
 346420.04

REVIEWED BY

DATE
 12/00

REVISED DATE



BTEX and MTBE CONCENTRATIONS IN WELL MW-4
 Former Chevron Service Station No. 9-0517
 3900 Piedmont Avenue
 Oakland, California

FIGURE

10



Gettler - Ryan Inc.

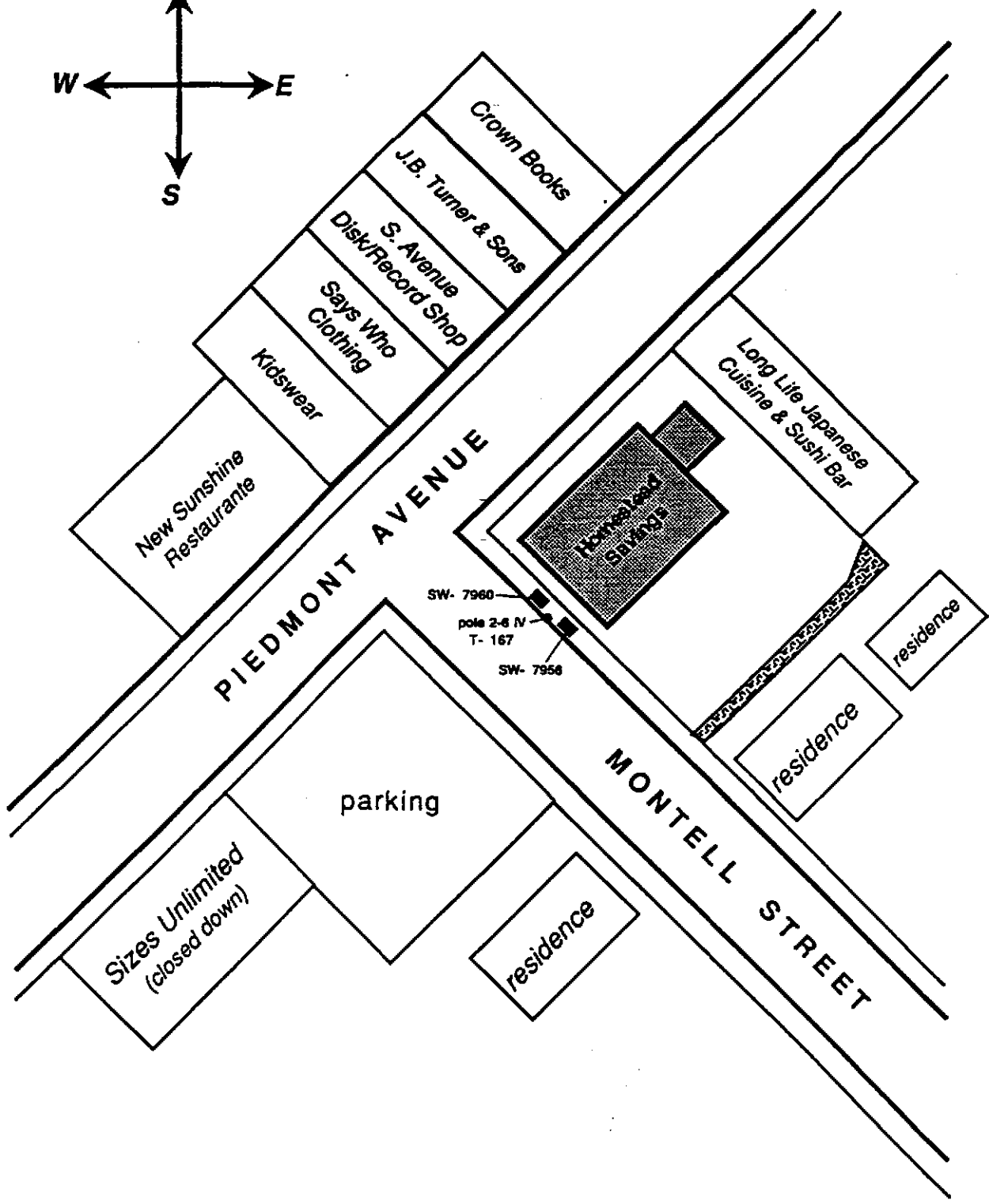
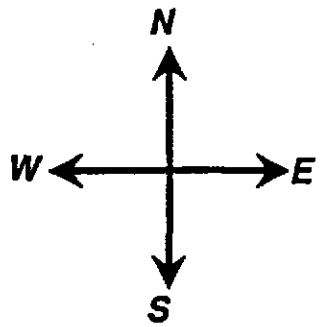
6747 Sierra Ct., Suite J (925) 551-7555
 Dublin, CA 94568

JOB NUMBER
 346420.04

REVIEWED BY
 [Signature]

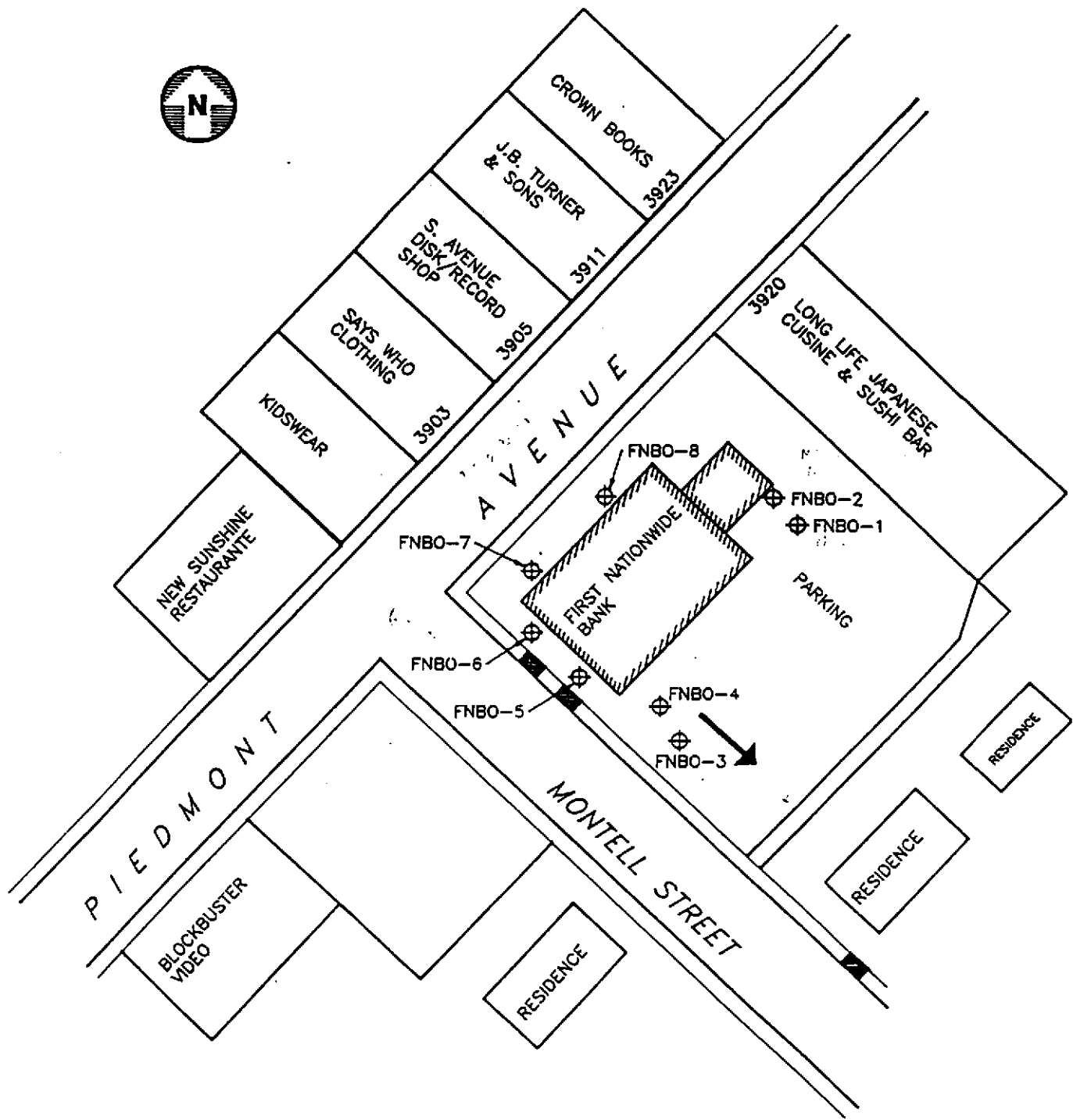
DATE
 12/00

REVISED DATE






Map Not to Scale
Transformers in black

AUGEAS CORPORATION	Figure 2B- Adjacent Properties Map	jt
	Homestead Savings, 3900 Piedmont Ave, Oakland, CA	03/16/93



LEGEND

-  TRANSFORMER
-  SOIL BORING LOCATION
-  SURFACE DRAINAGE FLOW



**Environmental
Science &
Engineering, Inc.**

DATE

11/93

REVISED

CAD FILE

51461001

SITE MAP

**FIRST NATIONWIDE BANK
3900 PIEDMONT AVENUE
OAKLAND, CALIFORNIA**

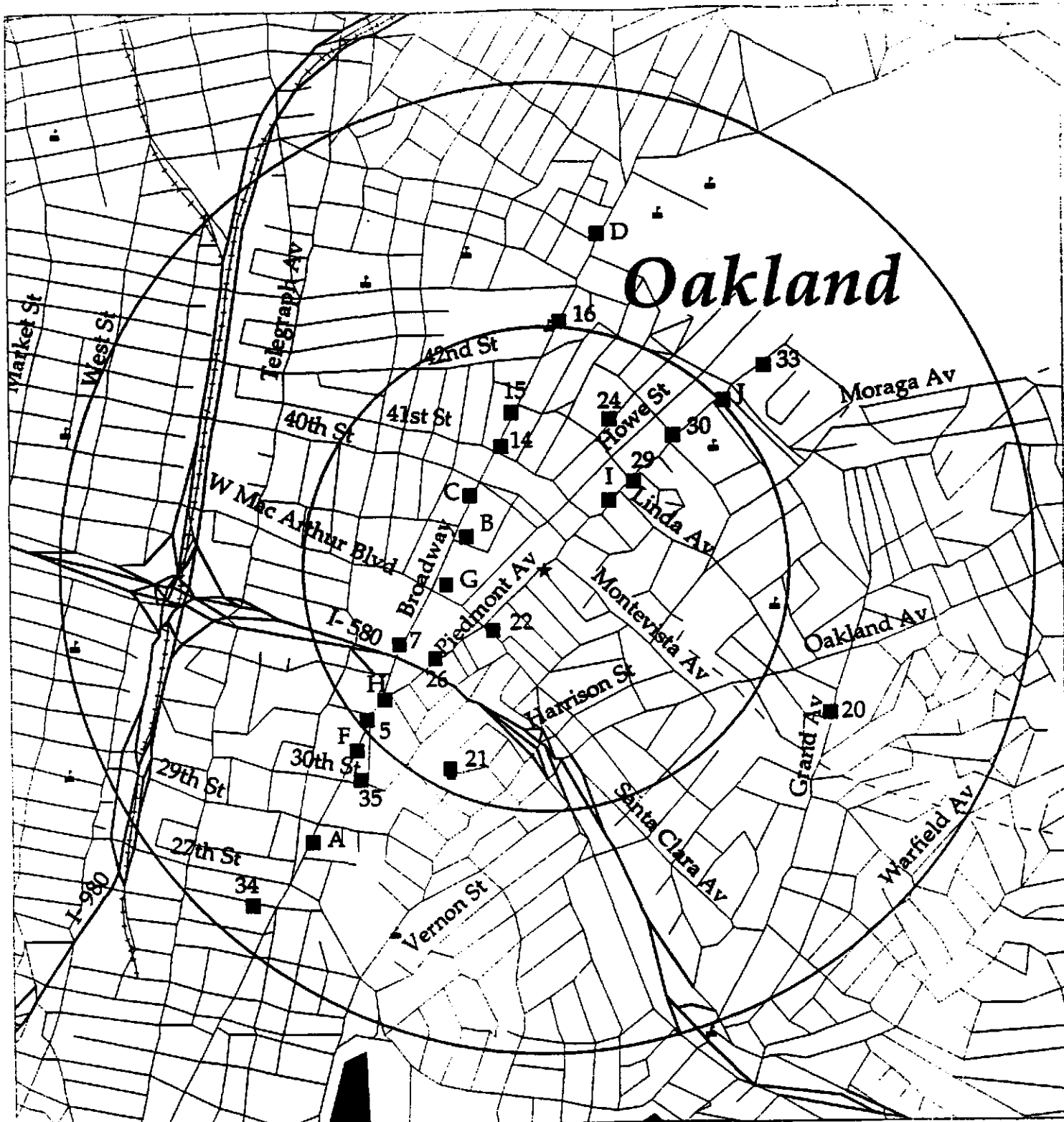
FIGURE NO.

2

PROJ. NO.

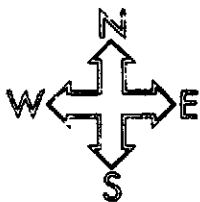
6-93-5146

4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520



3900 Piedmont Avenue
Oakland, CA 94611

Alameda County -



1 Inch = .30 Miles

1/2 and 1 Mile Radius

★ = Subject Property

TABLE 1

ANALYTICAL RESULTS FOR SOIL SAMPLES

First Nationwide Bank
3900 Piedmont Avenue
Oakland, California

Sample I.D.	Depth (feet bgs)	Date Sampled	TRPH (mg/Kg)	VOCs (mg/Kg)	TPH-G (mg/Kg)	TPH-D (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)
FNBO-1	10.5	10/20/93	350	ND	1.9'	<5.0	<0.005	<0.005	<0.005	<0.005
FNBO-2	10	10/20/93	86	ND	<1.0	<5.0	<0.005	<0.005	<0.005	<0.005
FNBO-3	10.5	10/20/93	NA	NA	<1.0	<5.0	<0.005	<0.005	<0.005	<0.005
FNBO-4	6	10/20/93	320	ND	1.4	<5.0	<0.005	<0.005	<0.005	<0.005
FNBO-5	6	10/21/93	NA	NA	3,400	<500	<0.5	<0.5	19.0	7.5
FNBO-5	10	10/21/93	160	ND	15.0	<5.0	0.03	<0.005	0.31	0.12
FNBO-6	5.5	10/21/93	NA	NA	5.0'	<10	<0.02	<0.02	<0.02	<0.02
FNBO-6	10	10/21/93	10.0	ND	3.6'	<5.0	<0.005	<0.005	0.034	0.041
FNBO-7	6	10/21/93	NA	NA	350 ¹	<400	<0.40	<0.40	<0.40	<0.40
FNBO-7	11	10/21/93	NA	NA	400 ¹	<500	1.0	1.5	5.0	13.0
FNBO-8	11	10/21/93	NA	NA	<1.0	<5.0	<0.005	<0.005	<0.005	<0.005

NOTES:

bgs = below ground surface

TRPH = Total Recoverable Petroleum Hydrocarbons by EPA Method 418.1

VOCs = Volatile Organic Compounds by EPA Method 8260

TPH-G = Total Petroleum Hydrocarbons as Gasoline and/or light petroleum distillate by EPA Method-8260

TPH-D = Total Petroleum Hydrocarbons as Diesel by EPA Method-8260

mg/Kg = milligram per kilogram or parts per million (ppm)

ND = None Detected

NA = Not Analyzed

- = quantified as light petroleum distillates
- ¹ = quantified as gasoline and light petroleum distillates
- < = less than listed detection limits

Table 2. Soil Analytical Results - Former Chevron Service Station #9-0517, 3900 Piedmont Avenue, Oakland, California.

Sample ID	Depth (ft)	Date	TPHg	ppm					MTBE	Fraction Organic Carbon %	Dry gm/cc	Bulk Density		Porosity %	Moisture %
				B	T	E	X	Natural gm/cc				Matrix gm/cc			
MW1-6	6.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	0.059	1.68	2.01	2.52	33.1	19	
MW1-11	11.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	0.15	1.60	1.99	2.62	38.7	---	
MW1-16	16.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
MW2-6	6.0	07/21/98	<1.0	0.0070	<0.0050	0.010	0.0090	<0.025	---	---	---	---	---	---	
MW2-11	11.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
MW2-16	16.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
MW3-6	6.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
MW3-10.5	10.5	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
MW3-16	16.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
MW4-6	6.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
MW4-11	11.0	07/21/98	80	2.0	1.7	4.7	5.8	<0.25	---	---	---	---	---	---	
MW4-16	16.0	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	---	---	---	---	---	---	
SP-(A-D)comp	---	07/21/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	

EXPLANATION:

TPHg - Total Petroleum Hydrocarbons as gasoline
 MTBE - Methyl t-Butyl Ether
 ft - Feet
 ppm - Parts per million
 gm/cc - gram per cubic centimeter
 -- - Not analyzed/not applicable

ANALYTICAL METHODS:

TPHg, benzene, toluene, ethylbenzene, xylenes, MTBE - EPA Methods 8015Mod/8020
 Porosity, densities - Method API RP-40

ANALYTICAL LABORATORY:

Sequoia Analytical (ELAP #1210)

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Service Station #9-0517
3900 Piedmont Avenue
Oakland, California

Vertical Measurement are in feet.

Analytical values are in parts per billion (ppb).

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylenes	MTBE
MW-1									
08/03/98	87.89	75.46	12.43	<50	<0.5	<0.5	<0.5	<0.5	<2.5
11/23/98	87.89	78.84	9.05	<50	<0.5	<0.5	<0.5	<0.5	<2.0
02/08/99	87.89	81.39	6.50	<50	<0.5	<0.5	<0.5	<0.5	<2.5
05/07/99	87.89	80.76	7.13	<50	<0.5	<0.5	<0.5	<0.5	<5.0
08/23/99	87.89	78.74	9.15	<50	<0.5	<0.5	<0.5	<0.5	<2.5
11/03/99	87.89	78.35	9.54	<50	<0.5	<0.5	<0.5	<0.5	<2.5
02/15/00	87.89	81.99	5.90	<50	<0.5	<0.5	<0.5	<0.5	<5.0
05/12/00 ³	87.89	80.84	7.05	<50	<0.50	<0.50	<0.50	<0.50	<2.5
07/31/00	87.89	79.49	8.40	<50	<0.50	<0.50	<0.50	<0.50	<2.5
MW-2									
08/03/98	86.09	74.75	11.34	<50	<0.5	<0.5	<0.5	<0.5	3.4
11/23/98	86.09	79.19	6.90	<50	<0.5	<0.5	<0.5	<0.5	<2.0
02/08/99	86.09	80.86	5.23	<50	<0.5	<0.5	<0.5	<0.5	<2.5
05/07/99	86.09	79.97	6.12	<50	<0.5	<0.5	<0.5	<0.5	<5.0
08/23/99	86.09	79.68	6.41	<50	<0.5	<0.5	<0.5	<0.5	<2.5
11/03/99	86.09	78.80	7.29	<50	<0.5	<0.5	<0.5	<0.5	<2.5
02/15/00	86.09	81.60	4.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
05/12/00	86.09	80.19	5.90	4,000 ⁴	240	26	100	76	<100
07/31/00	86.09	79.51	6.58	<50	<0.50	<0.50	<0.50	<0.50	<2.5

Table 1
Groundwater Monitoring Data and Analytical Results
 Former Chevron Service Station #9-0517
 3900 Piedmont Avenue
 Oakland, California

Vertical Measurement are in feet.

Analytical values are in parts per billion (ppb).

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylenes	MTBE
MW-3									
08/03/98	86.28	74.20	12.08	4000	160	<5.0	<5.0	73	180
11/23/98	86.28	78.59	7.69	4000	67.7	7.56	17.1	24.5	41.2
02/08/99	86.28	80.01	6.27	<50	<0.5	<0.5	<0.5	<0.5	<2.5
05/07/99	86.28	79.32	6.96	1800	53.6	8.96	33	18.6	21.4
08/23/99	86.28	78.36	7.92	3970	155	24	88.8	39.8	185
11/03/99	86.28	78.36	7.92	3320	108	19.9	98.4	44.8	<25
02/15/00	86.28	80.54	5.74	779	26.7	3.82	15.4	4.24	<12.5
05/12/00	86.28	79.52	6.76	12,000 ^d	3,100	120	980	1,400	820
07/31/00	86.28	78.98	7.30	1,200 ^d	32	<5.0	11	7.3	39
MW-4									
08/03/98	87.22	74.30	12.92	1900	110	12	<0.5	55	130
11/23/98	87.22	77.82	9.40	4080	136	17.8	37.2	30.1	51.8
02/08/99 ¹	87.22	79.40	7.82	2900	150	16	<5.0	15	230/30.7 ²
05/07/99	87.22	79.80	7.42	6050	161	<25	39.8	36.9	<250/30.2 ²
08/23/99	87.22	77.83	9.39	3930	203	37.6	58.6	42.2	255
11/03/99	87.22	77.41	9.81	5350	324	44.7	91.5	56.1	<50
02/15/00	87.22	79.50	7.72	4080	161	27.7	31.1	39.1	73.9
05/12/00	87.22	79.31	7.91	3,600 ^d	170	27	49	64	170
07/31/00	87.22	78.57	8.65	2,900 ^d	160	20	15	56	170

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Service Station #9-0517
3900 Piedmont Avenue
Oakland, California

Analytical values are in parts per billion (ppb).

Vertical Measurement are in feet.

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	TPH- Gasoline	Benzene	Toluene	Ethyl- Benzene	Xylenes	MTBE
TRIP BLANK									
08/03/98	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
11/23/98	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.0
02/08/99	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
05/07/99	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0
08/23/99	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
11/03/99	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
02/15/00	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0
05/12/00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5
07/31/00	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5

Table 1
Groundwater Monitoring Data and Analytical Results
Former Chevron Service Station #9-0517
3900 Piedmont Avenue
Oakland, California

EXPLANATIONS:

Groundwater monitoring data and laboratory analytical results prior to May 12, 2000, were compiled from reports prepared by Blaine Tech Services, Inc.

TPH = Total Petroleum Hydrocarbons

ND = Not Detected

MTBE = Methyl tertiary butyl ether

-- = Not Measured/Not Analyzed

- ¹ Chromatogram pattern indicates gas and an unidentified hydrocarbon.
- ² Confirmation run.
- ³ Sheen present.
- ⁴ Laboratory report indicates gasoline C6-C12.

Table 1. Soil and Ground Water Analytic Data, Homestead Federal Savings, 3900 Piedmont Avenue, Oakland, California

Boring ID	Depth	Date Sampled	TRPH	VOCs	TPH _g	TPH _d	Benzene	Toluene	Ethylbenzene	Xylenes
(Concentration in ppm, mg/kg or mg/l)										
Soil Samples										
FNBO-1	10.5	10/20/93	350	ND	1.9 ^a	ND	ND	ND	ND	ND
FNBO-2	10	10/20/93	86	ND	ND	ND	ND	ND	ND	ND
FNBO-3	10.5	10/20/93	NA	NA	ND	ND	ND	ND	ND	ND
FNBO-4	6	10/20/93	320	ND	1.4	ND	ND	ND	ND	ND
FNBO-5	6	10/21/93	NA	NA	3,400	ND	ND	ND	19	7.5
FNBO-5	10	10/21/93	160	ND	15	ND	0.03	ND	0.31	0.12
FNBO-6	5.5	10/21/93	NA	NA	5.0 ^a	ND	ND	ND	ND	ND
FNBO-6	10	10/21/93	10	ND	3.6 ^b	ND	ND	ND	0.034	0.041
FNBO-7	6	10/21/93	NA	NA	350 ^b	ND	ND	ND	ND	ND
FNBO-7	11	10/21/93	NA	NA	400 ^b	ND	1.0	1.5	5.0	13
FNBO-8	11	10/21/93	NA	NA	ND	ND	ND	ND	ND	ND
Ground Water Sample										
FNBO-6		10/21/93	3	c	7.8	NA	0.0077	0.021	0.26	0.26

Table 1. Soil and Ground Water Analytic Data, Homestead Federal Savings, 3900 Piedmont Avenue, Oakland, California

Abbreviations

TRPH = Total recoverable petroleum hydrocarbons by EPA method 418.1
TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8260
TPHd = Total petroleum hydrocarbons as diesel by modified EPA Method 8260
VOCs = Volatile organic compounds by EPA method 8260
ND = No compounds detected above laboratory detection limit
NA = Not analyzed

Benzene by EPA Method 8260
Ethylbenzene by EPA Method 8260
Toluene by EPA Method 8260
Xylenes by EPA Method 8260

Notes:

All soil and ground water samples collected by Environmental Science and Engineering of Concord California

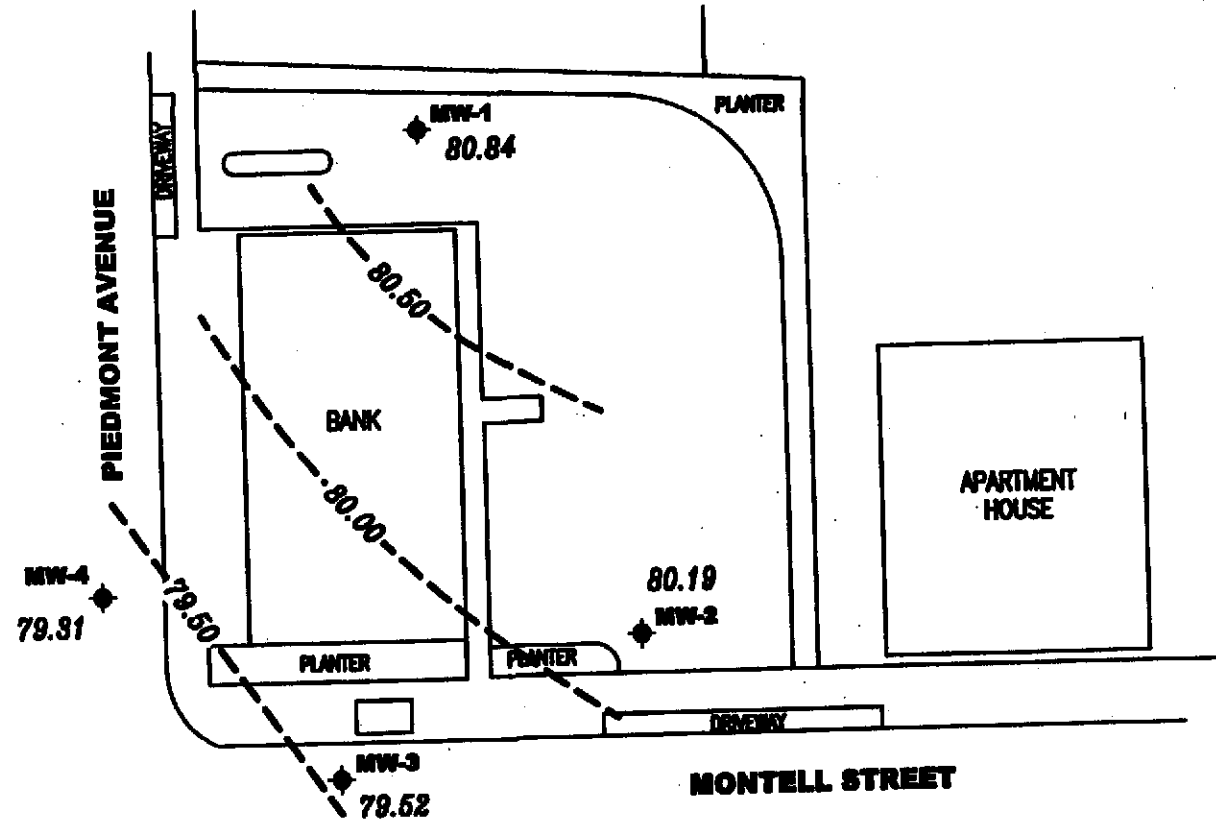
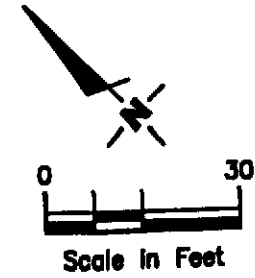
a = Quantified as light petroleum distillates.
b = Quantified as gasoline and light petroleum distillates
c = 0.03 ppm acetone and 0.035 ppm carbon disulfide detected Notes

EXPLANATION

- ◆ Groundwater monitoring well
- 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL)
- - - 99.99 - - - Groundwater elevation contour, dashed where inferred



Approximate groundwater flow direction at a gradient of 0.02 Ft./Ft.



Source: Elevations modified from data provided by RRM engineering contracting firm.



Gettler - Ryan Inc.

6747 Sierra Ct., Suite J
Dublin, CA 94568 (925) 551-7556

POTENTIOMETRIC MAP
Former Chevron Service Station #9-0517
3900 Piedmont Avenue
Oakland, California

FIGURE
1

PROJECT NUMBER
386420

REVIEWED BY

DATE
May 12, 2000

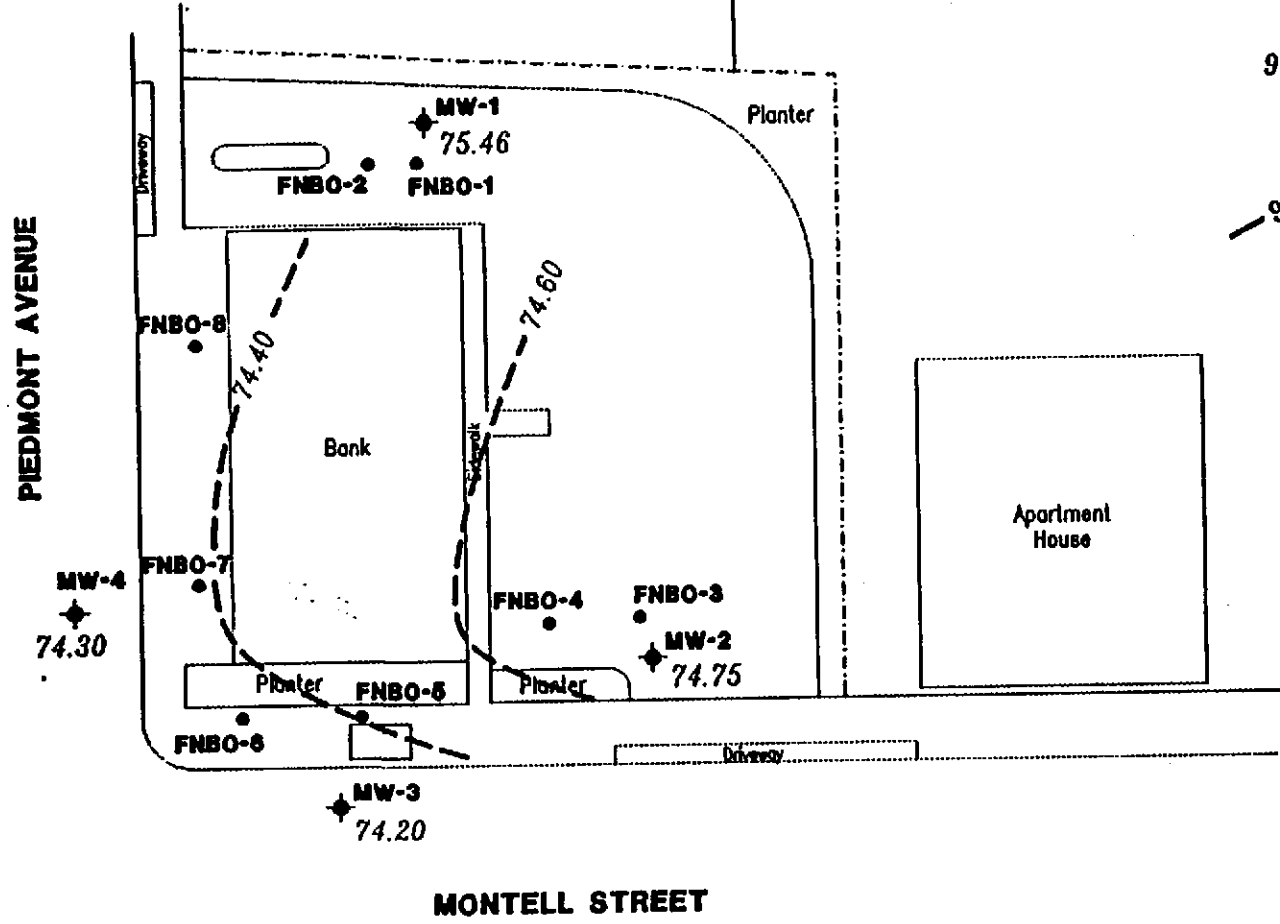
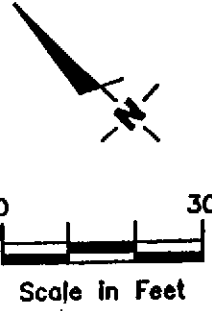
REVISED DATE

FILE NAME: P:\Environ\Chevron\9-0517\000-9-0517.DWG | Layout Tab: POT2

EXPLANATION

- ◆ Groundwater monitoring well
- Soil boring
- 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL)
- 99.99 --- Groundwater elevation contour, dashed where inferred.

Approximate groundwater flow direction at a gradient of 0.005 to 0.01 Ft./Ft.



Source: Figure Modified From Drawing Provided By Cambria Environmental.



Gettler - Ryan Inc.
 6747 Sierra Ct., Suite J (925) 551-7555
 Dublin, CA 94568

POTENTIOMETRIC MAP
 Former Chevron Service Station #0517
 3900 Piedmont Avenue
 Oakland, California

FIGURE

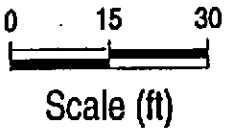
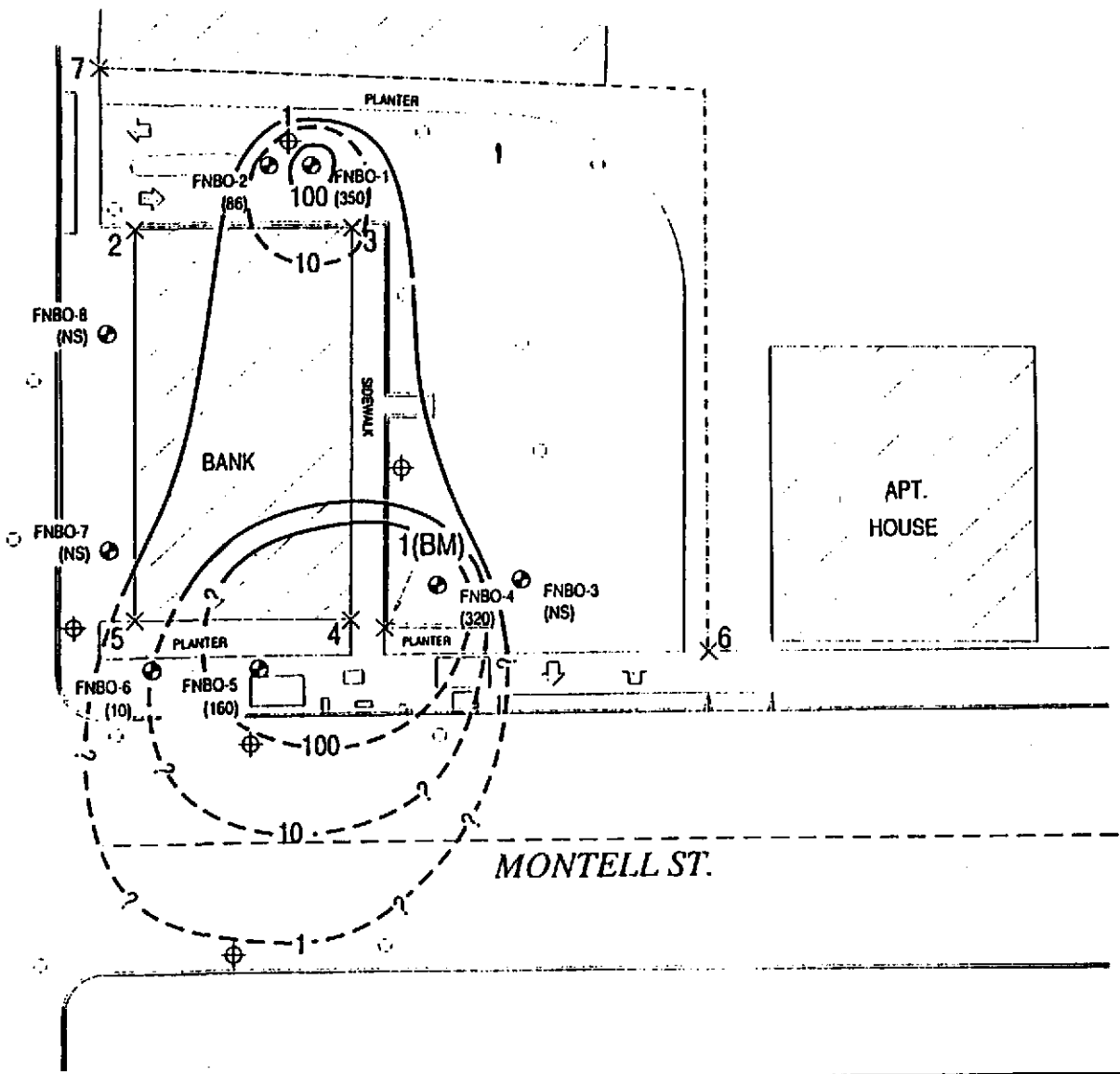
JOB NUMBER
6420.02

REVIEWED BY

DATE
August 3, 1998

REVISED DATE

PIEDMONT AVE.



BASE-MAP



CAMBRIA
Environmental Technology, Inc.

EXPLANATION	
FNBO-7 (350) ⊕	PREVIOUSLY DRILLED SOIL BORING (WITH TRPH CONCENTRATIONS - ppm)
⊕	PROPOSED WELL
○	PROPOSED SOIL BORING
- - -	PROPERTY LINE
5 X	SURVEY POINT AND IDENTIFICATION

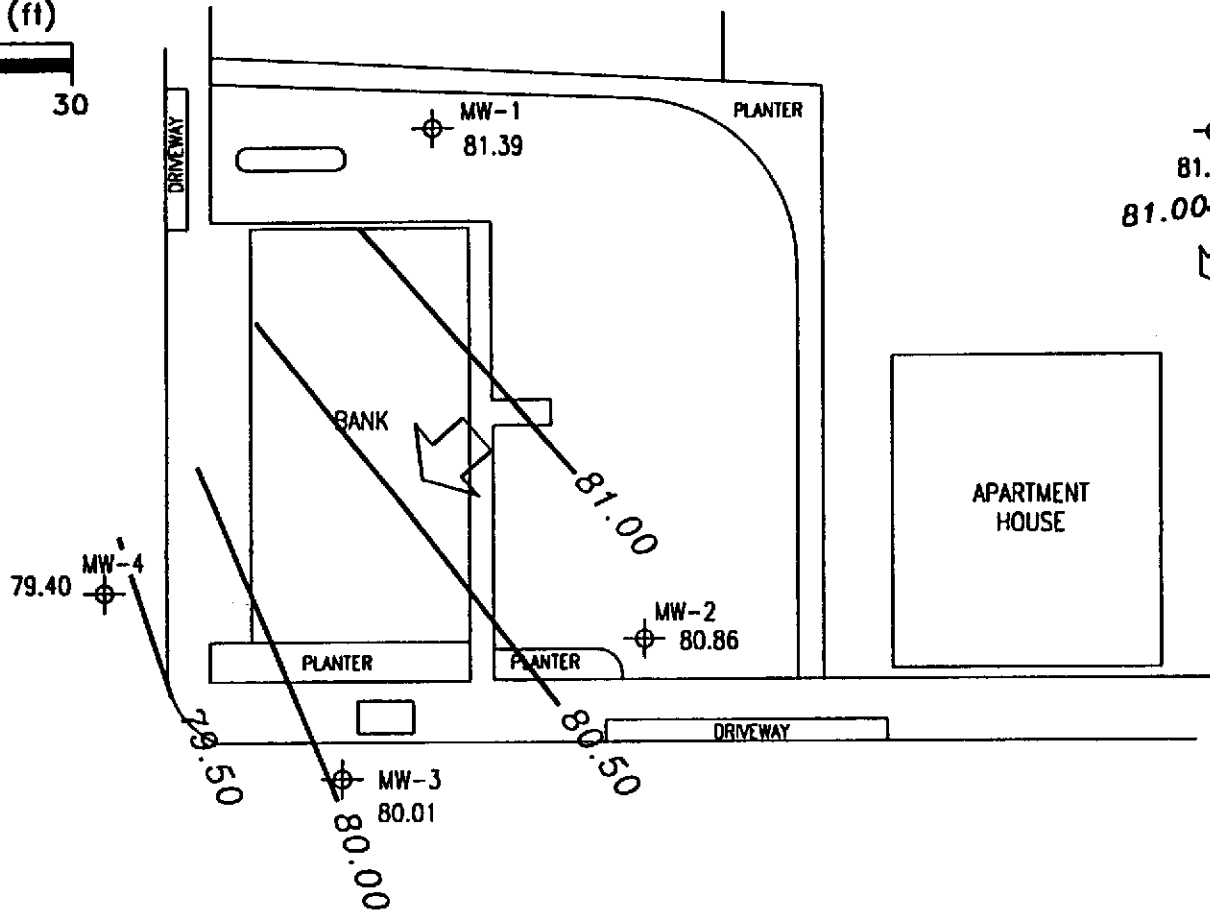
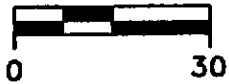
Estimated Distribution of TRPH in Soil
Between 5 and 11 ft Depths
First Nationwide Bank
3900 Piedmont Avenue
Oakland, California

F:\PROJECT\PHVTRPH

FIGURE
3



SCALE (ft)



EXPLANATION

- MONITORING WELL
- 81.39 GROUNDWATER ELEVATION (FT, MSL)
- 81.00 GROUNDWATER ELEVATION CONTOUR (FT, MSL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION;
APPROXIMATE GRADIENT = 0.02



Ref. 0517-gm.dwg
Basemap from Callier-Ryan, Inc.

PREPARED BY

RRM
engineering contracting firm

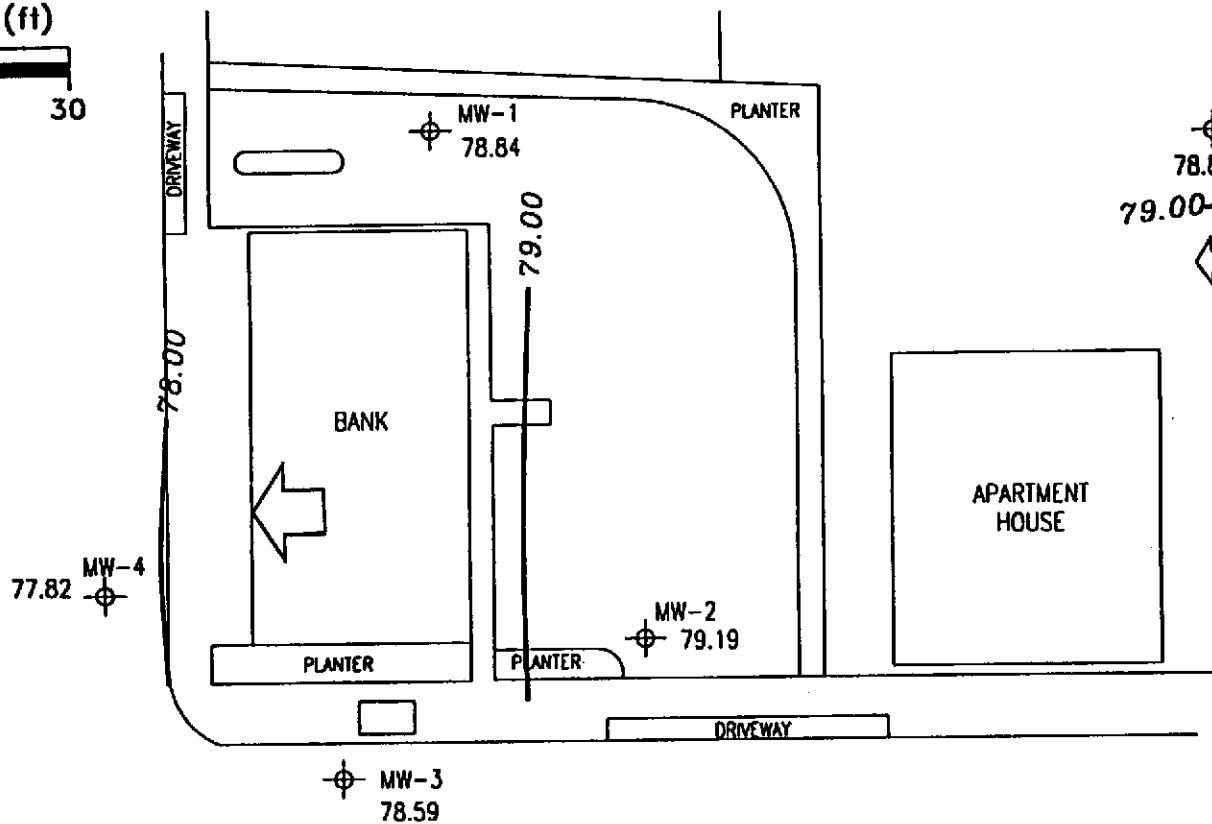
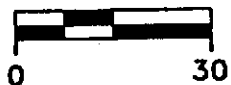
Former Chevron Station 9-0517
3900 Piedmont Street
Oakland, California

GROUNDWATER ELEVATION CONTOUR MAP,
FEBRUARY 8, 1999



FIGURE:
1
PROJECT:
DAC04

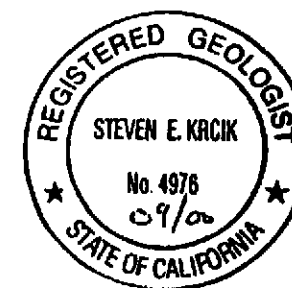


SCALE (ft)



EXPLANATION

-  MONITORING WELL
- 78.84 GROUNDWATER ELEVATION (FT, MSL)
- 79.00— GROUNDWATER ELEVATION CONTOUR (FT, MSL)
-  APPROXIMATE GROUNDWATER FLOW DIRECTION;
APPROXIMATE GRADIENT = 0.02



Ref. 0517-gr.dwg
Base map from Cettler-Ryan, Inc.

PREPARED BY

RRM
engineering contracting firm

Former Chevron Station 9-0517
3900 Piedmont Street
Oakland, California

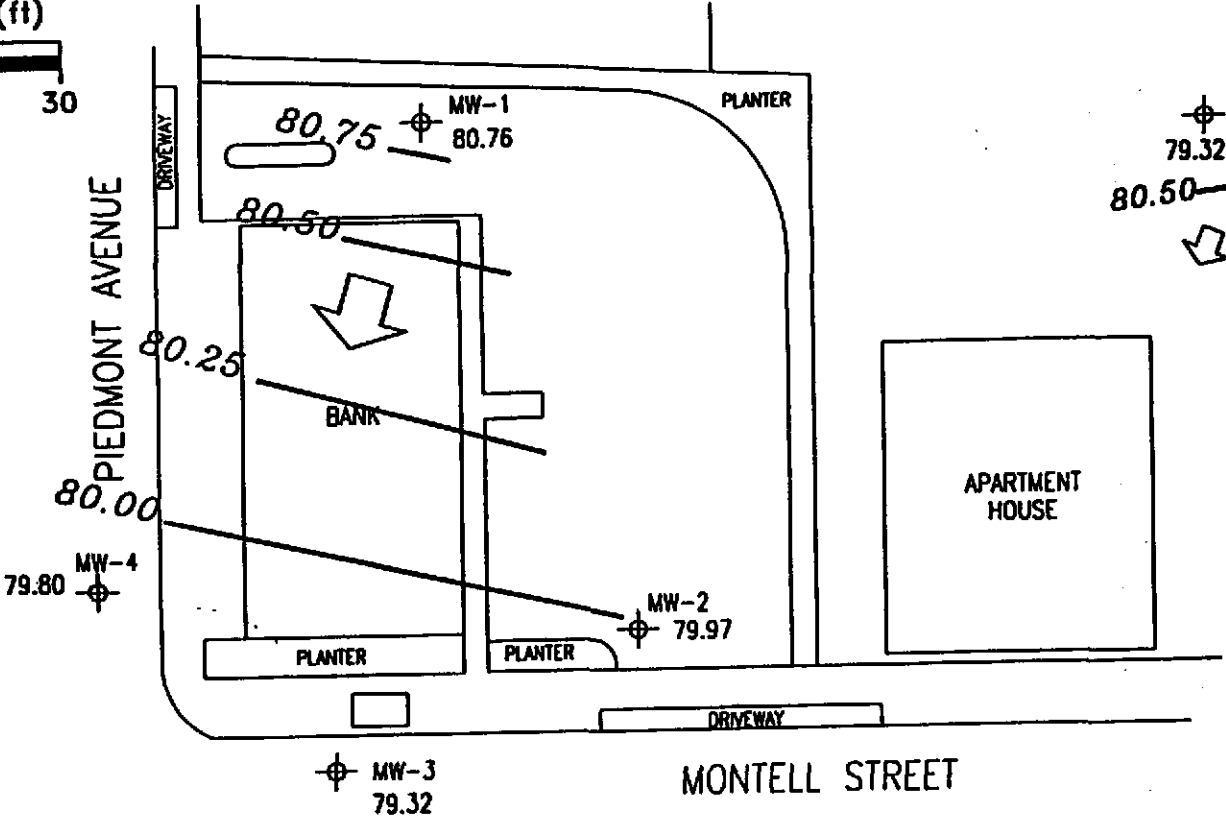
GROUNDWATER ELEVATION CONTOUR MAP,
NOVEMBER 23, 1998

FIGURE:

1
PROJECT:
DAC04



SCALE (ft)



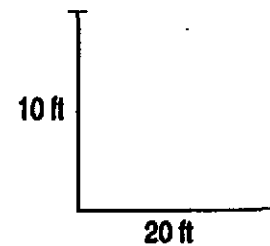
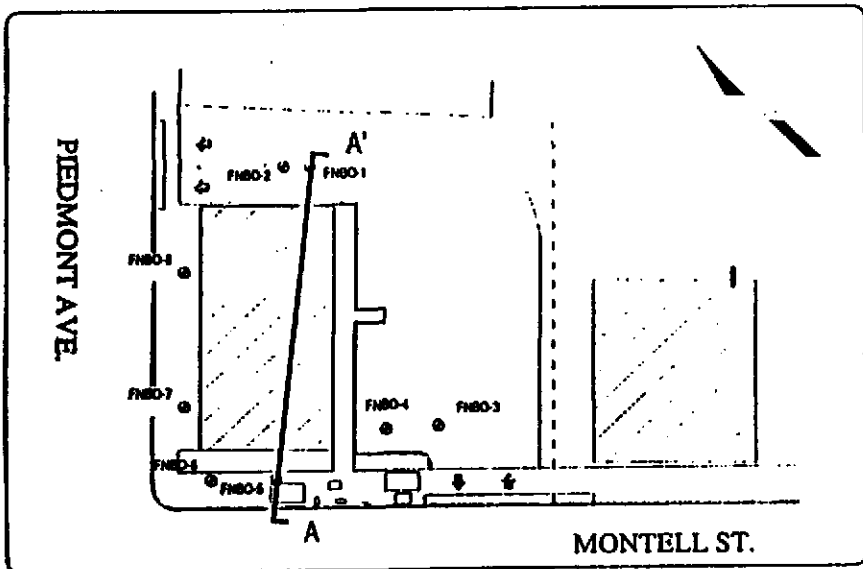
EXPLANATION

- MONITORING WELL
- 79.32 GROUNDWATER ELEVATION (FT, MSL)
- 80.50— GROUNDWATER ELEVATION CONTOUR (FT, MSL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION;
APPROXIMATE GRADIENT = 0.02

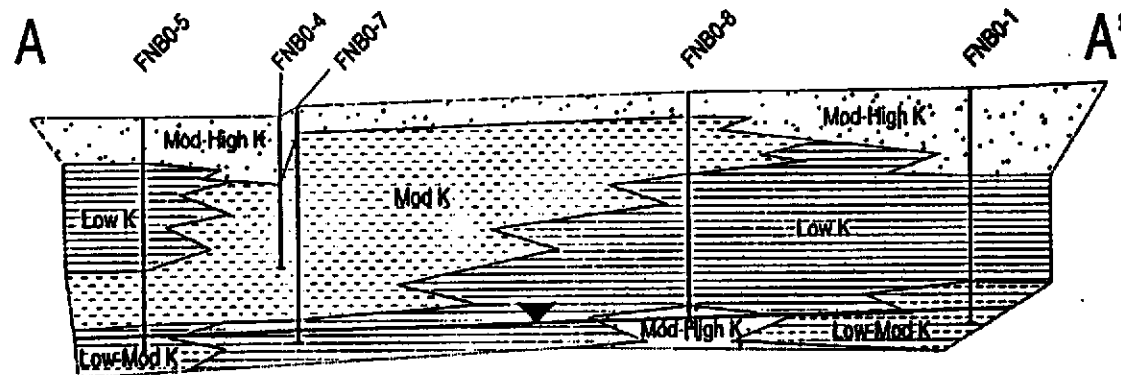


Ref. 0517-gm.dwg
Base map from Callier-Ryan, Inc.





<p>PREPARED BY</p>	<p>Former Chevron Station 9-0517 3900 Piedmont Street Oakland, California</p>	<p>GROUNDWATER ELEVATION CONTOUR MAP, MAY 7, 1999</p>	<p>FIGURE: 1 PROJECT: DAC04</p>
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Cross-Section Location Map



CAMBRIA
Environmental Technology, Inc.

- EXPLANATION**
-  Low permeability sediments
 -  Low to moderate permeability sediments
 -  Moderate permeability sediments
 -  Moderate to high permeability sediments

Cross-Section A-A'

3900 Piedmont Avenue
Oakland, California

FIGURE

2



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

FNBO-1

WELL COMPLETION

Completion Depth: **N/A**
 Size/Type: _____ From: _____ To: _____

Casing: _____
 Screen: **N/A**
 Filter: _____
 Seal: _____

Well Cap or Box: _____

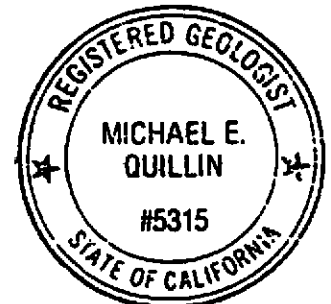
Project Name: **First Nationwide Bank** Project No: **6-83-5148**
 Location: **3900 Piedmont Avenue
Oakland, CA**

Page 1 of 1

Driller: **Sole Exploration Services, Inc.**
 Method: **Hollow Stem Auger**
 Hole Diameter: **6"** Total Depth: **11.5 Feet**
 Ref. Elevations: _____
 Logged By: **Chris Vachell**

Dates:
 Start: **10-20-83**
 Finish: **10-20-83**

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks
			Sampler Blows	Lithology	Well Installation		
0	ASPHALT						
0	SILTY GRAVEL FILL						
1							
2	SANDY SILT, light brown, stiff, damp, 10-20% fine to medium grained sands, no odor.	SM					
3							
4							
5	CLAYEY GRAVEL, dark brown, very dense, 30-40% clay, coarse sand to 1/2" gravel, damp, no odor.	GC					
6	CLAY, light brown, very stiff, damp, no odor.	CL	36 40 38				SAMPLE @ 6.0 FEET
7	CLAYEY GRAVEL, dark brown, very dense, 30-40% clay, coarse sand, to 1/2" gravel, damp, no odor.	CL					
8							
9							
10	CLAYEY SAND, light brown, very dense, moist, 10-20% clay, medium to coarse grained, no odor.	SC					
11	As above, grey, fine to medium grained sand, strong hydrocarbon odor.	SC	10 15 20				SAMPLE @ 10.5 FEET Water @ 11.0 feet TOTAL DEPTH - 11.5 FEET Backfilled with grout.
12							
13							
14							
15							
16							
17							





**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

FNBO-2

WELL COMPLETION

Completion Depth: *N/A*

Size/Type From To

Casing:
Screen: *N/A*
Filter:
Seat:

Well Cap or Box:

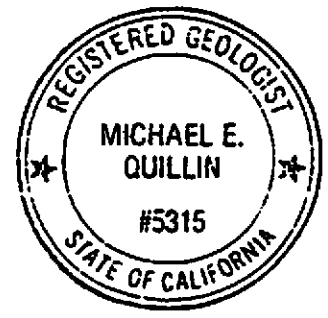
Project Name: First Nationwide Bank Project No: 6-83-5146
Location: 3900 Piedmont Avenue
Oakland, CA

Driller: Soils Exploration Services, Inc.
Method: Hollow Stem Auger
Hole Diameter: 6" Total Depth: 11.5 Feet
Ref. Elevations:
Logged By: Chris Valcheff

Page 1 of 1

Dates:
Start: 10-20-93
Finish: 10-20-93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks Water, drilling/completion, summary, sample type
			Sample/Blows	Lithology	Well Installation		
0	ASPHALT						
0	SILTY GRAVEL FILL						
2	SANDY SILT, light brown, stiff, damp, 10-20% fine to medium grained sands, no odor.	SM					
5	SANDY CLAY, dark brown, stiff, damp, 20-30% fine to medium grained sand, no odor.	SC	7 2 36				SAMPLE @ 6.0 FEET
8	SANDY CLAY, light brown, stiff, moist, 10-20% very fine to fine grained sand, no odor.	SC					
10	SILTY SAND, light brown, dense, moist, 10-20% silts, fine to medium grained sand, no odor.	SM	12 19 22				SAMPLE @ 10.0 FEET
11.5							Water @ 11.5 feet TOTAL DEPTH = 11.5 FEET Backfilled with grout.





**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

FNBO-3

WELL COMPLETION

Completion Depth: N/A

Size/Type From To

Casing:
Screen:
Filter: N/A
Seat:

Well Cap or Box:

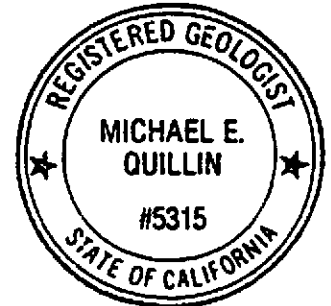
Project Name: First Nationwide Bank Project No: 6-93-5148
Location: 3900 Piedmont Avenue
Oakland, CA

Driller: Soils Exploration Services, Inc.
Method: Hollow Stem Auger
Hole Diameter: 6" Total Depth: 16.5 Feet
Ref. Elevations:
Logged By: Chris Valchett

Page 1 of 1

Dates:
Start: 10-20-93
Finish: 10-20-93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks
			Sample/Blows	Lithology	Well Installation		
0	ASPHALT						
0	SILTY GRAVEL FILL						
1							
2	SANDY SILT, gray, stiff, damp, 10-20% fine to medium grained sand, slight hydrocarbon odor.	SM					
2	As above, black.	SM					
3							
4	As above, brown, stiff, damp, 10-20% fine grained sand, no odor.	SM					
5							
6	SANDY CLAY, light brown, very stiff, damp, 30-40% medium to coarse grained sand, no odor.	CL	15 25 25				0 SAMPLE @ 6.0 FEET
7							
8	SANDY CLAY, light grey, stiff, damp, 5-10% fine grained sand, no odor.	CL					
9							
10	SANDY SILT, light grey with brown mottles, stiff, moist, 10-20% very fine grained sand, no odor.	SM	7 14				0 SAMPLE @ 10.6 FEET
11	As above, 20-30% very fine sand, saturated.		20				Water @ 11.0 feet
12							
13							
14							
15	As above, saturated.	SM					
16							
17							



SATURATED SAMPLES
TOTAL DEPTH = 16.5 FEET
Backfilled with grout.



**Environmental
Science &
Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

FNBO-4

WELL COMPLETION

Completion Depth: *N/A*

Size/Type _____ From _____ To _____

Casing: _____
Screen: *N/A*
Filter: _____
Seat: _____

Well Cap or Box: _____

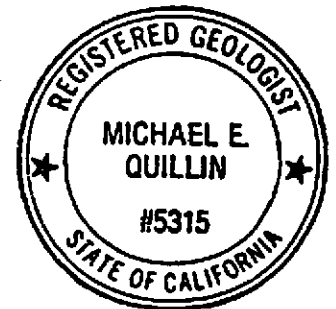
Project Name: First Nationwide Bank Project No: 6-83-5148
Location: 3900 Piedmont Avenue
Oakland, CA

Page 1 of 1

Driller: Soils Exploration Services, Inc.
Method: Hollow Stem Auger
Hole Diameter: 6" Total Depth: 7.5 Feet
Ref. Elevations: _____
Logged By: Chris Valchell

Date:
Start: 10-20-83
Finish: 10-20-83

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks <small>Water, drilling/completion, summary, sample type</small>
			Sample/Blows	Lithology	Well Installation		
0	ASPHALT						
0.5	SILTY GRAVEL FILL						
1							
1.5	GRAVELLY SILT, dark brown, stiff, damp, 20-30% gravel, no odor.	GM					
2							
3							
4	SANDY SILT, dark brown, stiff, damp, 10-20% medium to coarse grained sand, no odor.	SM					
5	As above, black with brown mottles, slight hydrocarbon odor.						
6							6.0 SAMPLE @ 6.0 FEET
7	OBSTRUCTED - Plastic (?)						OBSTRUCTED @ 7.0 FEET
8							TOTAL DEPTH = 7.5 FEET Backfilled with grout.
9							
10							
11							
12							
13							
14							
15							
16							
17							





**Environmental
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BORING LOG AND WELL COMPLETION SUMMARY

FNBO-5

WELL COMPLETION

Completion Depth: N/A

Size/Type From To

Casing:
Screen: N/A
Filter:
Seal:

Well Cap or Box:

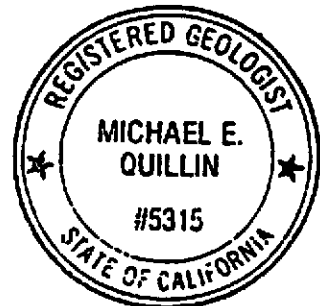
Project Name: First Nationwide Bank Project No: 6-93-6146
Location: 3900 Piedmont Avenue
Oakland, CA

Driller: Soils Exploration Services, Inc.
Method: Hollow Stem Auger
Hole Diameter: 6" Total Depth: 11.5 Feet
Ref. Elevations:
Logged By: Chris Valchert

Page 1 of 1

Dates:
Start: 10-21-93
Finish: 10-21-93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks Water, drilling/completion, summary, sample type
			Sample/Blows	Lithology	Well Installation		
0	TOPSOIL						
1	CONCRETE						
2	BASE FILL						
3	SANDY CLAY, brown, stiff, damp, 20-30% fine to medium grained sand, no odor.	SC					
4	As above, grey, strong hydrocarbon odor.						
5			4				
6			5				
7			21			1784	SAMPLE @ 6.0 FEET
8	SILTY SAND, grey/blue, soft, wet, 10-20% silts, medium to coarse grained sand, strong hydrocarbon odor.	SM				2500	Looks like free product.
9							
10							
11	SILT, grey, stiff, wet, strong hydrocarbon odor.	ML	1				SAMPLE @ 10.0 FEET
12			4				Water @ 11.0 feet
13			6			85	TOTAL DEPTH = 11.5 FEET Backfilled with grout.
14							
15							
16							
17							





**Environmental
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BORING LOG AND WELL COMPLETION SUMMARY

FNBO-5

WELL COMPLETION

Completion Depth: N/A

Size/Type _____ From _____ To _____

Casing:
Screen:
Filter: N/A
Seal:

Well Cap or Box:

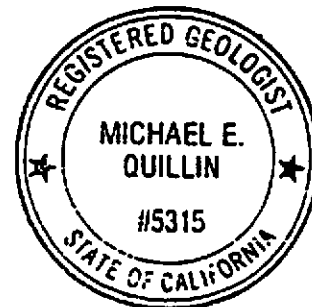
Project Name: First Nationwide Bank Project No: 6-93-6148
Location: 3900 Piedmont Avenue
Oakland, CA

Driller: Soils Exploration Services, Inc.
Method: Hollow Stem Auger
Hole Diameter: 6" Total Depth: 11.5 Feet
Ref. Elevations:
Logged By: Chris Vaichell

Page 1 of 1

Dates:
Start: 10-21-93
Finish: 10-21-93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks Water, drilling/completion, summary, sample type
			Sampler/ Blows	Lithology	Well Installation		
0	TOPSOIL						
1	CONCRETE						
2	BASE FILL						
3	SANDY CLAY, brown, stiff, damp, 20-30% fine to medium grained sand, no odor.	SC					
4	As above, grey, strong hydrocarbon odor.		4				
5			5				
6			21				SAMPLE @ 6.0 FEET
7						1784	
8	SILTY SAND, grey/blue, soft, wet, 10-20% silts, medium to coarse grained sand, strong hydrocarbon odor.	SM					2500 Looks like free product
9							
10							SAMPLE @ 10.0 FEET
11	SILT, grey, stiff, wet, strong hydrocarbon odor.	ML	1				Water @ 11.0 feet
12			4				TOTAL DEPTH = 11.5 FEET
13			8				Backfilled with grout.
14							
15							
16							
17							





**Environmental
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Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

FNBO-6

WELL COMPLETION

Completion Depth: *N/A*

Size/Type From To

Casing: *N/A*
Screen: *N/A*
Filter: *N/A*
Seal:

Well Cap or Box:

Project Name: First Nationwide Bank
Location: 3900 Piedmont Avenue
Oakland, CA

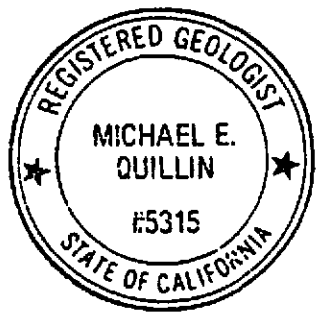
Project No: 6-93-5146

Page 1 of 1

Driller: Soils Exploration Services, Inc.
Method: Hollow Stem Auger
Hole Diameter: 6" Total Depth: 16.5 Feet
Rel. Elevations:
Logged By: Chris Velchett

Dates:
Start: 10-21-93
Finish: 10-21-93

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks
			Sampler Blows	Lithology	Well Installation		
0	TOPSOIL						
1	CONCRETE						
2	BASE FILL						
3	SANDY CLAY, brown, stiff, damp, 20-30% very fine to fine grained sand, no odor.	SC					
4	As above, grey, strong hydrocarbon odor.	SC					
5	As above, grey/green, "cedar"-like odor.	SC					
6	SANDY CLAY, green/brown, very stiff, damp, 30-40% coarse grained sand, strong hydrocarbon odor.	CL	12			696	SAMPLE @ 6.0 FEET
7			20				
8			34				
9	SANDY CLAY, grey/green, stiff, damp, 30-40% fine to medium grained sand, strong hydrocarbon odor.	CL					
10							
11	As above.	CL	17			412	SAMPLE @ 10.0 FEET
12			20				Water @ 11.0 feet
13			50				
14							
15			17				
16			20				NO RECOVERY
17			34				TOTAL DEPTH - 16.5 FEET Backfilled with grout.





**Environmental
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Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

FNBO-7

WELL COMPLETION

Completion Depth: **N/A**

Size/Type From To

Casing:
Screen:
Filter: **N/A**
Seal:

Well Cap or Box:

Project Name: **First Nationwide Bank** Project No: **6-93-8148**

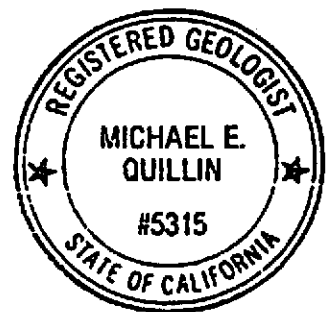
Location: **3900 Piedmont Avenue
Oakland, CA**

Page 1 of 1

Driller: **Soils Exploration Services, Inc.**
Method: **Hollow Stem Auger**
Hole Diameter: **6"** Total Depth: **11.5 Feet**
Ref. Elevations:
Logged By: **Chris Valchell**

Dates:
Start: **10-21-93**
Finish: **10-21-93**

Depth (ft)	Uthologic Description	USC	Graphic Log			Vapor	Remarks
			Sample/Blows	Lithology	Well Installation		
0	CONCRETE						
1	BASE FILL						
2	SANDY SILT, brown, stiff, damp, 10-20% fine to medium grained sands, no odor.	SM					
4	SANDY SILT, grey, damp, soft, 20-30% medium to coarse grained sand, strong hydrocarbon odor.	SM					Water in hole @ 4 feet (broken pipe??)
6	As above, very wet sample but not ground water.	SM	1 2 1				SAMPLE @ 6.0 FEET
10	SANDY CLAY, grey, very stiff, moist, 30-40% medium grained sand, strong hydrocarbon odor.	SC	14 42 53				1533 SAMPLE @ 11.0 FEET Water @ 11.5 feet TOTAL DEPTH = 11.5 FEET Backfilled with grout.





**Environmental
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Engineering, Inc.**

BORING LOG AND WELL COMPLETION SUMMARY

FNBO-8

WELL COMPLETION

Completion Depth: **N/A**

Size/Type	From	To
Casing:		
Screen: N/A		
Filter:		
Seat:		

Casing:
Screen: **N/A**
Filter:
Seat:

Project Name: **First Nationwide Bank**

Project No: **6-83-5148**

Location: **3900 Piedmont Avenue
Oakland, CA**

Page 1 of 1

Driller: **Soils Exploration Services, Inc.**

Method: **Hollow Stem Auger**

Hole Diameter: **8"**

Total Depth: **11.5 Feet**

Ref. Elevations:

Logged By: **Chris Valchell**

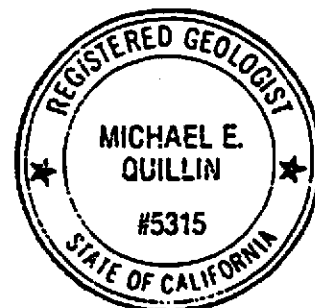
Dates:

Start: **10-21-83**

Finish: **10-21-83**

Well Cap or Box:

Depth (ft)	Lithologic Description	USC	Graphic Log			Vapor	Remarks
			Sample/Blows	Lithology	Well Installation		
0	CONCRETE						
1	GRAVEL FILL						
2	SANDY SILT, dark brown, stiff, damp, 10-20% fine to medium grained sands, no odor.	SM					
4	SANDY CLAY, orange/brown, stiff, damp, 10-20% very fine to fine grained sands, no odor.	SC					Water in hole @ 4 feet (broken pipe??)
5	As above, 20-30% medium to coarse grained sand, no odor.	SC	5				
6	As above, brown with grey mottling.	SC	10				SAMPLE @ 6.0 FEET
9	SANDY CLAY, brown, stiff, damp, 20-30% very fine to fine grained sand, no odor.	SC	21				
10			10				SAMPLE @ 10.0 FEET
11	SILTY SAND, brown, dense, medium to coarse grained sand, 10-20% silts, no odor.	SM	12				Water @ 11.0 feet
12			27				TOTAL DEPTH - 11.5 FEET Backfilled with grout.



PROJECT: Former Chevron Service Station #9-0517

LOCATION: 3900 Piedmont Avenue, Oakland, CA

G-R PROJECT NO.: 346420.02

SURFACE ELEVATION: 87.89 feet MSL

DATE STARTED: 07/21/98

WL (ft. bgs): 10.2 DATE: 07/21/98 TIME: 15:25

DATE FINISHED: 07/21/98

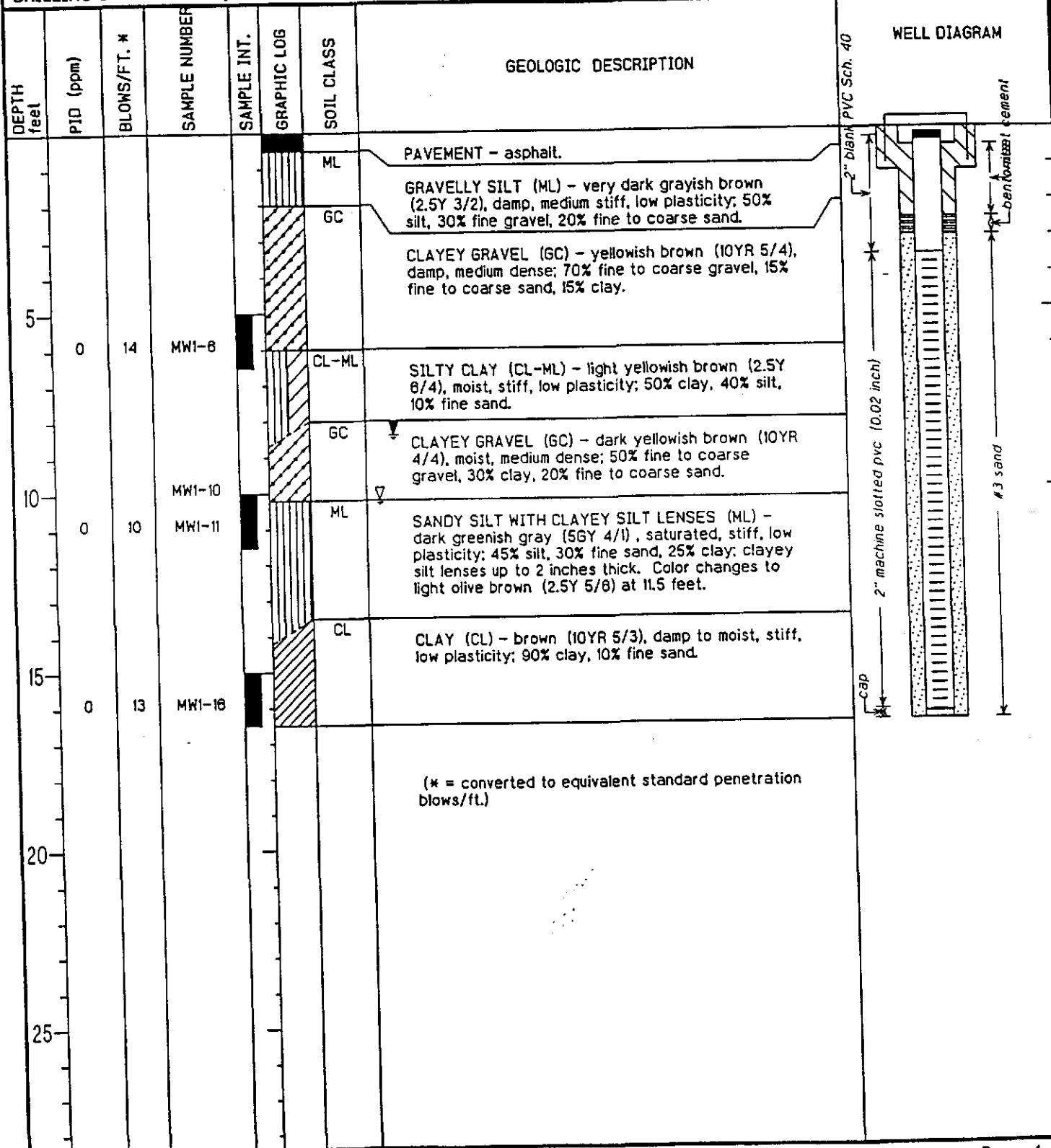
WL (ft. bgs): 8.4 DATE: 07/22/98 TIME: 16:00

DRILLING METHOD: 8 in. Hollow Stem Auger

TOTAL DEPTH: 16.5 Feet

DRILLING COMPANY: Bay Area Exploration, Inc.

GEOLOGIST: Barbara Sieminski



PROJECT: Former Chevron Service Station #9-0517

LOCATION: 3900 Piedmont Avenue, Oakland, CA

G-R PROJECT NO.: 346420.02

SURFACE ELEVATION: 88.09 feet MSL

DATE STARTED: 07/21/98

WL (ft. bgs): 12.0 DATE: 07/21/98 TIME: 13:55

DATE FINISHED: 07/21/98

WL (ft. bgs): 7.4 DATE: 07/22/98 TIME: 16:00

DRILLING METHOD: 8 in. Hollow Stem Auger

TOTAL DEPTH: 18.5 Feet

DRILLING COMPANY: Bay Area Exploration, Inc.

GEOLOGIST: Barbara Sieminski

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0						CL	PAVEMENT - asphalt.	
5	0	14	MW2-8			GC	SANDY CLAY (CL) - dark brown (10YR 3/3), moist, stiff, low plasticity; 80% clay, 30% fine to coarse sand, 10% fine gravel. Color changes to yellowish brown (10YR 5/3) at 3 feet.	
10	0	10	MW2-11			ML	CLAYEY GRAVEL WITH SAND (GC) - olive (5Y 5/4) mottled light olive brown (2.5Y 5/4), moist, dense; 50% fine to coarse gravel, 30% fine to coarse sand, 20% clay.	
15	10	13	MW2-16			CL	SANDY SILT (ML) - light olive brown (2.5Y 5/6) mottled light gray (2.5 Y 7/2), moist to saturated, stiff, low plasticity; 45% silt, 30% fine sand, 25% clay.	
						CL	CLAY (CL) - light olive brown (2.5Y 5/6), moist, stiff, low plasticity; 70% clay, 25% silt, 5% fine sand.	
20							(* = converted to equivalent standard penetration blows/ft.)	
25								

Gettler-Ryan, Inc.

Log of Boring MW-3

PROJECT: Former Chevron Service Station #9-0517

LOCATION: 3900 Piedmont Avenue, Oakland, CA

G-R PROJECT NO.: 346420.02

SURFACE ELEVATION: 86.28 feet MSL

DATE STARTED: 07/21/98

WL (ft. bgs): 11.0 DATE: 07/21/98 TIME: 10:55

DATE FINISHED: 07/21/98

WL (ft. bgs): 8.2 DATE: 07/22/98 TIME: 18:00

DRILLING METHOD: 8 in. Hollow Stem Auger

TOTAL DEPTH: 20 Feet

DRILLING COMPANY: Bay Area Exploration, Inc.

GEOLOGIST: Barbara Sieminski

DEPTH feet	P/D (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
						GC	PAVEMENT - asphalt.	
			MW3-5			SC	CLAYEY SAND (SC) - light yellowish brown (10YR 6/4), moist, medium dense; 60% fine sand, 40% clay.	
5	32	15	MW3-6			GC	CLAYEY GRAVEL WITH SAND (GC) - light yellowish brown (10YR 6/4), moist, medium dense; 55% fine to coarse gravel, 25% fine to coarse sand, 20% clay.	
			MW3-10			ML	SANDY SILT (ML) - greenish gray (5GY 4/1), moist to saturated, stiff, low plasticity; 55% silt, 30% fine sand, 15% clay.	
10	15	10	MW3-10.5				Color changes to olive (5Y 5/3) mottled greenish gray (5GY 5/1) at 11 feet.	
			MW3-16			CL	CLAY (CL) - brown (10YR 5/3), damp to moist, stiff, low plasticity; 90% clay, 10% fine sand.	
15	4.5	14	MW3-16					
			MW3-19.5			CL/SC	SANDY CLAY WITH CLAYEY SAND LENSES (CL/SC) - brown (10YR 5/3), moist, stiff, low plasticity; 70% clay, 30% fine sand; clayey sand lenses up to 1 inch thick.	
20	0	15	MW3-19.5					
25								

(* = converted to equivalent standard penetration blows/ft.)

Gettler-Ryan, Inc.

Log of Boring MW-4

PROJECT: Former Chevron Service Station #9-0517

LOCATION: 3900 Piedmont Avenue, Oakland, CA

G-R PROJECT NO.: 346420.02

SURFACE ELEVATION: 87.22 feet MSL

DATE STARTED: 07/21/98

ML (ft. bgs): 12.0 DATE: 07/21/98 TIME: 12:20

DATE FINISHED: 07/21/98

ML (ft. bgs): 0.1 DATE: 07/22/98 TIME: 16:00

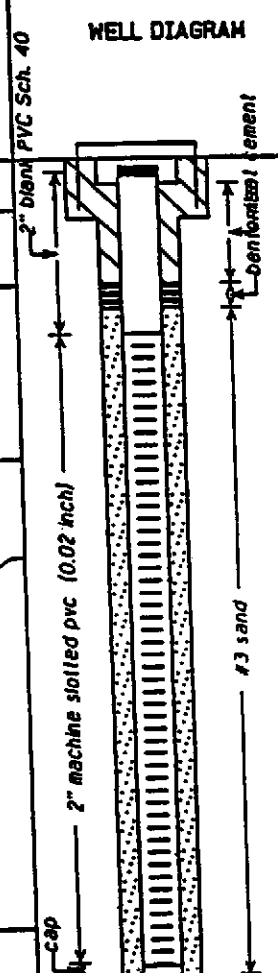
DRILLING METHOD: 8 in. Hollow Stem Auger

TOTAL DEPTH: 16.5 Feet

DRILLING COMPANY: Bay Area Exploration, Inc.

GEOLOGIST: Barbera Sieminski

DEPTH feet	PTD (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
							PAVEMENT - asphalt.	
						CL	SANDY CLAY (CL) - very dark gray (5Y 3/1), moist, medium stiff, low plasticity; 90% clay, 10% fine sand.	
						CL	SANDY CLAY (CL) - dark greenish gray (5GY 4/1), moist, medium stiff, low plasticity; 70% clay, 30% fine to coarse sand. Sand increases to 35-40%, trace fine gravel at 5 feet.	
5	0	14	MW4-8			GC	CLAYEY GRAVEL WITH SAND (GC) - dark gray (5Y 4/1) mottled brown (7.5YR 4/4), moist, medium dense; 50% fine to coarse gravel, 35% fine to coarse sand, 15% clay.	
						ML	∇ SANDY SILT (ML) - olive (5Y 5/3), moist to saturated, stiff, low plasticity; 55% silt, 30% fine sand, 15% clay.	
10	128	11	MW4-11				∇ Sand increases to 40% at 15 feet.	
15	2.8	12	MW4-16			CL	CLAY (CL) - brown (10YR 5/3), damp, stiff, low plasticity; 90% clay, 10% fine sand.	
20							(* = converted to equivalent standard penetration blows/ft.)	
25								



APPENDIX F

RBCA INPUT AND OUTPUT DATA

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Former Chevron SS99-0517 Job Identification: 348420
 Site Location: 3900 Piedmont Ave, Oakland Data Completed: 12/13/00
 Completed By: Barbara Sieminski

Software: GSI RBCA Spreadsheet
 Version: 1.0.1

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

Exposure Parameter	Definition (Units)	Residential		Commercial/Industrial		
		Adult	(1-6yrs)	(1-18 yrs)	Chronic	Constructn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	180
EF	Exposure Frequency (days/yr)	350			250	
EF.Derm	Exposure Frequency for dermal exposure	350			1	
IRgw	Ingestion Rate of Water (L/day)	2			50	100
IRs	Ingestion Rate of Soil (mg/day)	100	200		9.4E+01	
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			20	
IRa.in	Inhalation rate indoor (m ³ /day)	15			20	10
IRa.out	Inhalation rate outdoor (m ³ /day)	20			20	5.8E+03
SA	Skin surface area (dermal) (cm ²)	5.8E+03		2.0E+03	1.7E+03	
SAadj	Adjusted dermal area (cm ² -yr/kg)	2.1E+03				
M	Soil to Skin adherence factor	1			FALSE	
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	TRUE				

Surface Parameters	Definition (Units)	Residential	Constructn
A	Contaminated soil area (cm ²)	3.7E+08	1.0E+08
W	Length of affect. soil parallel to wind (cm)	1.0E+03	1.0E+03
W.gw	Length of affect. soil parallel to groundwater (cm)	1.0E+03	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lsa	Thickness of affected surface soils (cm)	6.9E-14	
Ps	Particulate areal emission rate (g/cm ² /s)		

Groundwater Parameters	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
Ugw.tr	Groundwater seepage velocity (cm/yr)	6.6E+03
Ka	Saturated hydraulic conductivity (cm/s)	
grad	Groundwater gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
bio?	Is biotenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Matrix of Exposed Persons to Complete Exposure Pathways	Residential		Commercial/Industrial	
	Chronic	Constructn	Chronic	Constructn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	TRUE
S.v	Volatilization from Subsurface Soils	FALSE	TRUE	
GW.v	Volatilization from Groundwater	FALSE	TRUE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	FALSE	TRUE	
GW.b	Vapors from Groundwater	FALSE	TRUE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	TRUE
Groundwater Pathways:				
GW.I	Groundwater Ingestion	FALSE	FALSE	
S.I	Leaching to Groundwater from all Soils	FALSE	FALSE	

Soil Parameters	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	5.0E+00		
hv	Vadose zone thickness (cm)	1.8E+02		
rho	Soil density (g/cm ³)	1.8		
foc	Fraction of organic carbon in vadose zone	0.18		
phi	Soil porosity in vadose zone	0.38		
Lgw	Depth to groundwater (cm)	1.5E+02		
La	Depth to top of affected subsurface soil (cm)	1.8E+02		
Lauba	Thickness of affected subsurface soils (cm)	2.1E+02		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	0.342	0.19	0.12
phi.a	Volumetric air content	0.038	0.18	0.28

Matrix of Receptor Distance and Location On- or Off-Site	Residential		Commercial/Industrial	
	Distance	On-Site	Distance	On-Site
GW	Groundwater receptor (cm)	TRUE	TRUE	TRUE
S	Inhalation receptor (cm)	TRUE		

Building Parameters	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (h ⁻¹)	1.4E-04	2.3E-04
Lcr	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Matrix of Target Risks	Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-08
TRc	Target Risk (class C carcinogens)	1.0E-05
THQ	Target Hazard Quotient	1.0E+00
Opt	Calculation Option (1, 2, or 3)	1
Tier	RBCA Tier	1

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
doy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA SITE ASSESSMENT

Tier 1 Worksheet 6.1

Site Name: Former Chevron SS#9-0517
 Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sleminski
 Date Completed: 12/13/2000

1 OF 1

**SURFACE SOIL RBSL VALUES
 (< 0 FT BGS)**

Target Risk (Class A & B) 1.0E-6 MCL exposure limit? Calculation Option: 1
 Target Risk (Class C) 1.0E-5 PEL exposure limit?
 Target Hazard Quotient 1.0E+0

RBSL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration (mg/kg)	Soil Leaching to Groundwater			Ingestion, Inhalation and Dermal Contact		X Construction Worker	Applicable RBSL (mg/kg)	RBSL Exceeded ? "X" if yes	Required CRF Only if "yes" left
			Residential (on-site)	Commercial (on-site)	Regulatory (MCL) (on-site)	Residential (on-site)	Commercial (on-site)				
71-43-2	Benzene	0.0E+0	NA	NA	NA	NA	NA	1.1E+2	1.1E+2	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	0.0E+0	NA	NA	NA	NA	NA	>Res	>Res	<input type="checkbox"/>	<1
1634-04-4	Methyl t-Butyl Ether	0.0E+0	NA	NA	NA	NA	NA	2.4E+2	2.4E+2	<input type="checkbox"/>	<1
108-88-3	Toluene	0.0E+0	NA	NA	NA	NA	NA	9.5E+3	9.5E+3	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	0.0E+0	NA	NA	NA	NA	NA	>Res	>Res	<input type="checkbox"/>	<1

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

RBCA SITE ASSESSMENT

Tier 1 Worksheet 6.2

Site Name: Former Chevron SS#9-0517
 Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski
 Date Completed: 12/13/2000

1 OF 1

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

Target Risk (Class A & B) 1.0E-6
 Target Risk (Class C) 1.0E-6
 Target Hazard Quotient 1.0E+0

MCL exposure limit?
 PEL exposure limit?

Calculation Option: 1

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

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable RBSL	RBSL Exceeded?	Required CRF
			Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)			
CAS No.	Name	(mg/kg)								(mg/kg)	<input type="checkbox"/> if yes	Only if "yes" left
71-43-2	Benzene	1.1E-2	NA	NA	NA	NA	2.4E-1	NA	1.7E+1	2.4E-1	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	2.1E-2	NA	NA	NA	NA	1.5E+3	NA	>Res	1.5E+3	<input type="checkbox"/>	<1
1634-04-4	Methyl t-Butyl Ether	1.8E-2	NA	NA	NA	NA	7.5E+3	NA	>Res	7.5E+3	<input type="checkbox"/>	<1
108-88-3	Toluene	9.5E-3	NA	NA	NA	NA	9.2E+2	NA	>Res	9.2E+2	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	2.0E-2	NA	NA	NA	NA	>Res	NA	>Res	>Res	<input type="checkbox"/>	<1

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

RBGA SITE ASSESSMENT

Tier 1 Worksheet 8.3

Site Name: Former Chevron SS#9-0517
 Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sleminski
 Date Completed: 12/13/2000

1 OF 1

GROUNDWATER RBSL VALUES

Target Risk (Class A & B) 1.0E-6
 Target Risk (Class C) 1.0E-6
 Target Hazard Quotient 1.0E+0

MCL exposure limit?
 PEL exposure limit?

Calculation Option: 1

RBSL Results For Complete Exposure Pathways ("X" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration (mg/L)	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable RBSL (mg/L)	RBSL Exceeded ? "X" if yes	Required CRF Only if "yes" left
			Residential (on-site)	Commercial (on-site)	Regulatory (MCL) (on-site)	Residential (on-site)	Commercial (on-site)	Residential (on-site)	Commercial (on-site)			
71-43-2	Benzene	4.2E-3	NA	NA	NA	NA	7.7E-2	NA	9.5E+0	7.7E-2	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	1.8E-3	NA	NA	NA	NA	>Sol	NA	>Sol	>Sol	<input type="checkbox"/>	<1
1834-04-4	Methyl t-Butyl Ether	1.0E-2	NA	NA	NA	NA	3.9E+3	NA	>Sol	3.9E+3	<input type="checkbox"/>	<1
108-88-3	Toluene	7.5E-4	NA	NA	NA	NA	8.8E+1	NA	>Sol	8.8E+1	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	2.2E-3	NA	NA	NA	NA	>Sol	NA	>Sol	>Sol	<input type="checkbox"/>	<1

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

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	4.2E-3	mean			1.1E-2	mean
Ethylbenzene	1.8E-3	mean			2.1E-2	mean
Methyl t-Butyl Ether	1.0E-2	mean			1.8E-2	mean
Toluene	7.5E-4	mean			9.5E-3	mean
Xylene (mixed isomers)	2.2E-3	mean			2.0E-2	mean

Site Name: Former Chevron SS#9-0517
 Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski
 Date Completed: 12/13/2000

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene	
Ethylbenzene	
Methyl t-Butyl Ether	
Toluene	
Xylene (mixed isomers)	

Site Name: Former Chevron SS#9-0517 Completed By: Barbara Sieminski
Site Location: 3900 Piedmont Ave, Oakl Date Completed: 12/13/2000

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

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

Site Name: Former Chevron SS#9-0517 Completed By: Barbara Sieminski
Site Location: 3900 Piedmont Ave, Oakla Date Completed: 12/13/2000

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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	1.0E+0	1.0E+0
Ethylbenzene	1.0E+0	1.0E+0
Methyl t-Butyl Ether	1.0E+0	1.0E+0
Toluene	1.0E+0	1.0E+0
Xylene (mixed isomers)	1.0E+0	1.0E+0

Site Name: Former Chevron SS#9-0517
 Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski
 Date Completed: 12/13/2000

RBCA SITE ASSESSMENT**EXPOSURE LIMITS IN GROUNDWATER AND AIR**

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m ³)
Benzene	5.0E-3	
Ethylbenzene	7.0E-1	
Methyl t-Butyl Ether		
Toluene	1.0E+0	
Xylene (mixed isomers)	1.0E+1	

Site Name: Former Chevron SS#9-0517
Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sleminski
Date Completed: 12/13/2000

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RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level		Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors		Detection Limits			Half Life (First-Order Decay) (days)		ref	
		MCL (mg/L)	reference			Oral	Dermal	Groundwater (mg/L)	Soil (mg/kg)	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	H
100-41-4	Ethylbenzene	7.00E-01	58 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
1634-04-4	Methyl t-Butyl Ether			1.44E+02	ACGIH	1	0.5					360	180	H
108-88-3	Toluene	1.00E+00	58 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	58 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: Former Chevron SS#9-0517 Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski Date Completed: 12/13/2000

Software version: 1.0.1

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RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day)			Slope Factors 1/(mg/kg/day)			EPA Weight of Evidence	Is Constituent Carcinogenic ?		
		Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Oral SF_oral	ref			Inhalation SF_inhal	ref
71-43-2	Benzene	-		1.70E-03	R	2.90E-02	A	2.90E-02	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.88E-01	A	-		-		D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-		-			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 Chevron SS#9-0517 Site Location: 3900 Piedmont Ave, Completed By: Barbara Sieminski Date Completed: 12/13/2000

Software version: 1.0.1

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RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole)		Diffusion Coefficients			log (Koc) or log(Kd) (@ 20 - 25 C)		Henry's Law Constant (@ 20 - 25 C)		Vapor Pressure (@ 20 - 25 C) (mm Hg)		Solubility (@ 20 - 25 C) (mg/L)		acid	base	ref
			MW	ref	In air (cm ² /s)	ref	In water (cm ² /s)	ref	log(l/kg)	ref	mol	(unitless)	ref	ref	pKa	pKb		
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A	
100-41-4	Ethylbenzene	A	106.2	5	7.80E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5	
1634-04-4	Methyl t-Butyl Ether	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A	
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29	
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5	

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oa Completed By: Barbara Sieminski

Date Completed: 12/13/2000

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Software version: 1.0.1

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Siemina Date Completed: 12/13/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SURFACE SOILS: VAPOR AND DUST INHALATION	Exposure Concentration		3) Exposure Medium Outdoor Air: POE 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) * (4)
	1) Source Medium Surface Soil Conc. (mg/kg)	2) NAE Value (m ³ /kg) Receptor			
Constituents of Concern					
Benzene	0.0E+0				
Ethylbenzene	0.0E+0				
Methyl t-Butyl Ether	0.0E+0				
Toluene	0.0E+0				
Xylene (mixed isomers)	0.0E+0				

NOTE: ABS = Dermal absorption factor (dlm)
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 Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Siemens Date Completed: 12/13/2000

2 OF 9

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SUBSURFACE SOILS: VAPOR

INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium		2) NAF Value (m ³ /kg) Receptor		3) Exposure Medium Outdoor Air: POE 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)	
	Subsurface Soil Conc. (mg/kg)	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial
Benzene	1.1E-2	3.4E+4		3.3E-7		7.0E-2		2.3E-8		
Ethylbenzene	2.1E-2	4.9E+4		4.2E-7		2.0E-1		8.3E-8		
Methyl t-Butyl Ether	1.8E-2	7.8E+4		2.3E-7		2.0E-1		4.5E-8		
Toluene	9.5E-3	7.8E+4		1.3E-7		2.0E-1		2.5E-8		
Xylene (mixed isomers)	2.0E-2	1.4E+5		1.4E-7		2.0E-1		2.7E-8		

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)

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland Completed By: Barbara Sleminski

Date Completed: 12/13/2000

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TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER: VAPOR INHALATION	Exposure Concentration						TOTAL PATHWAY INTAKE (mg/kg-day)				
	1) Source Medium		2) NAE Value (m ³ /L) Receptor		3) Exposure Medium Outdoor Air: POE 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)		
	Groundwater Conc. (mg/L)	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	
Constituents of Concern											
Benzene	4.2E-3	1.9E+4	2.2E-7	7.0E-2	1.5E-8	3.8E-8					
Ethylbenzene	1.8E-3	1.9E+4	9.6E-8	2.0E-1	1.9E-8	1.0E-7					
Methyl t-Butyl Ether	1.0E-2	4.4E+4	2.3E-7	2.0E-1	4.5E-8	9.0E-8					
Toluene	7.5E-4	1.9E+4	3.9E-8	2.0E-1	7.6E-9	3.2E-8					
Xylene (mixed isomers)	2.2E-3	2.1E+4	1.1E-7	2.0E-1	2.1E-8	4.8E-8					

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)

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-225-ZRX-486

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Siemens Date Completed: 12/13/2000

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TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SUBSURFACE SOILS: VAPOR INTRUSION TO BUILDINGS	Exposure Concentration					
	1) Source Medium	2) NAE Value (m ³ /kg) Receptor		3) Exposure Medium Indoor Air: POE Conc. (ng/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)
	Subsurface Soil Conc. (mg/kg)	On-Site Commercial		On-Site Commercial	On-Site Commercial	On-Site Commercial
Constituents of Concern						
Benzene	1.1E-2		4.9E+2	2.3E-5	7.0E-2	1.6E-6
Ethylbenzene	2.1E-2		1.0E+3	2.0E-5	2.0E-1	4.0E-6
Methyl t-Butyl Ether	1.8E-2		1.7E+3	1.1E-5	2.0E-1	2.1E-6
Toluene	9.5E-3		1.6E+3	6.0E-6	2.0E-1	1.2E-6
Xylene (mixed isomers)	2.0E-2		3.0E+3	6.7E-6	2.0E-1	1.3E-6

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)

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland Completed By: Barbara Sieminski

Date Completed: 12/13/2000

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TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER: VAPOR INTRUSION TO BUILDINGS	Exposure Concentration				4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (m ³ kg ⁻¹ day ⁻¹)	5) Average Daily Intake Rate (mg/kg-day) (3) X (4)	TOTAL PATHWAY INTAKE (mg/kg-day) (Sum Intake values from subsurface & groundwater routes.)	
	1) Source Medium	2) NAE Value (m ³ /L) Receptor		3) Exposure Medium Indoor Air: POE Conc. (mg/m ³) (1) / (2)			On-Site Commercial	
	Groundwater Conc. (mg/L)	On-Site Commercial		On-Site Commercial			On-Site Commercial	
Constituents of Concern								
Benzene	4.2E-3		1.6E+2	2.7E-5		7.0E-2		1.9E-6
Ethylbenzene	1.8E-3		1.4E+2	1.3E-5		2.0E-1		2.5E-6
Methyl t-Butyl Ether	1.0E-2		9.0E+2	1.1E-5		2.0E-1		2.2E-6
Toluene	7.5E-4		1.5E+2	5.0E-6		2.0E-1		9.7E-7
Xylene (mixed isomers)	2.2E-3		1.8E+2	1.4E-5		2.0E-1		2.7E-6
								3.5E-6
								6.4E-6
								4.3E-6
								2.2E-6
								4.0E-6

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)

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-225-ZRX-488

Site Name: Former Chevron SS# Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara SI Date Completed: 12/13/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SURFACE SOILS OR SEDIMENTS: DERMAL CONTACT	Exposure Concentration			
	1) Source Medium	2) Exposure Multiplier (SA*AF*ABS*CF*EP*ED)/(BW*AT) (kg/kg-day)		3) Average Daily Intake Rate (mg/kg-day) (1) x (2)
	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential On-Site Commercial
Constituents of Concern				
Benzene	0.0E+0			
Ethylbenzene	0.0E+0			
Methyl t-Butyl Ether	0.0E+0			
Toluene	0.0E+0			
Xylene (mixed isomers)	0.0E+0			

NOTE: ABS = Dermal absorption factor (dim) BW = Body weight (kg) EP = Exposure frequency (days/yr) 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 = Intake rate (mg/day)

Software: GSI RBCA Spreadsheet
 Version: 1.0.1

Serial: G-225-ZRX-406

Site Name: Former Chevron SS#9- Site Location: 3800 Piedmont Ave, Oakland Completed By: Barbara Siemins Date Completed: 12/13/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SURFACE SOILS OR SEDIMENTS: INGESTION	Exposure Concentration				TOTAL PATHWAY INTAKE (mg/kg-day)		
	1) Source Medium	2) Exposure Multiplier (IR*CF*EF*ED)/(BW*AT) (kg/kg-day)		3) Average Daily Intake Rate (mg/kg-day) (1) * (2)		(Sum Intake values from dermal & ingestion routes.)	
	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Constituents of Concern							
Benzene	0.0E+0						
Ethylbenzene	0.0E+0						
Methyl t-Butyl Ether	0.0E+0						
Toluene	0.0E+0						
Xylene (mixed isomers)	0.0E+0						

NOTE: ABS = Dermal absorption factor (dim) BW = Body weight (kg) EF = Exposure frequency (days/yr) 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 = Intake rate (mg/day)

Site Name: Former Chevron SS#9- Site Location: 3900 Piedmont Ave, Oakland Completed By: Barbara Siemens Date Completed: 12/13/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL: LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION	Exposure Concentration				5) Average Daily Intake Rate (mg/kg-day) (3) x (4)
	1) Source Medium Soil Concentration (mg/kg)	2) NAF Value (L/kg) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2)	4) Exposure Multiplier (IR x EF x ED) / (BW x AT) (L/kg-day)	
Constituents of Concern					
Benzene	1.1E-2				
Ethylbenzene	2.1E-2				
Methyl t-Butyl Ether	1.8E-2				
Toluene	9.5E-3				
Xylene (mixed isomers)	2.0E-2				

NOTE: ABS = Dermal absorption factor (dim) BW = Body Weight (kg) EF = Exposure frequency (days/yr) 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 = Intake rate (L/day)

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-225-ZRX-486

Site Name: Former Chevron SS#9- Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski

Date Completed: 12/13/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER: INGESTION	Exposure Concentration					MAX. PATHWAY INTAKE (mg/kg-day) <i>(Maximum Intake of active pathways and leaching & groundwater routes.)</i>
	1) Source Medium Groundwater Conc. (mg/L)	2) HAF Value (dim) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)(2)	4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (L/kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) x (4)	
Constituents of Concern						
Benzene	4.2E-3					
Ethylbenzene	1.8E-3					
Methyl t-Butyl Ether	1.0E-2					
Toluene	7.5E-4					
Xylene (mixed isomers)	2.2E-3					

NOTE: ABS = Dermal absorption factor (dim) BW = Body weight (kg) EF = Exposure frequency (days/yr) 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 = Intake rate (L/day)

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-225-2RX-486

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski

Date Completed: 12/13/2000

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TIER 1 PATHWAY RISK CALCULATION

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK			TOXIC EFFECTS			
		(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Commercial	(3) Inhalation Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3) On-Site Commercial	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Commercial	(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Commercial	
Benzene	A	3.8E-8	2.9E-2	1.1E-9	1.1E-7	1.7E-3	6.3E-5	
Ethylbenzene	D				1.0E-7	2.9E-1	3.5E-7	
Methyl t-Butyl Ether					9.0E-8	8.8E-1	1.1E-7	
Toluene	D				3.2E-8	1.1E-1	2.8E-7	
Xylene (mixed isomers)	D				4.8E-8	2.0E+0	2.4E-8	
Total Pathway Carcinogenic Risk =				1.1E-9	0.0E+0	Total Pathway Hazard Index =		6.4E-5 0.0E+0

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski

Date Completed: 12/13/2000

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TIER 1 PATHWAY RISK CALCULATION

Constituents of Concern	CARCINOGENIC RISK				TOXIC EFFECTS				
	(1) EPA	(2) Total Carcinogenic Intake Rate (mg/kg/day)	(3) Inhalation Slope Factor	(4) Individual COC Risk (2) x (3)	(5) Total Toxicant Intake Rate (mg/kg/day)	(6) Inhalation Reference Dose	(7) Individual COC Hazard Quotient (5) / (6)		
	Carcinogenic Classification	On-Site Commercial	(mg/kg-day) ⁻¹	On-Site Commercial	On-Site Commercial	(mg/kg-day)	On-Site Commercial	On-Site Commercial	
Benzene	A	3.5E-6	2.9E-2	1.0E-7	9.9E-6	1.7E-3	5.8E-3		
Ethylbenzene	D				8.4E-6	2.9E-1	2.3E-5		
Methyl t-Butyl Ether					4.3E-6	8.6E-1	5.0E-6		
Toluene	D				2.2E-6	1.1E-1	1.9E-5		
Xylene (mixed isomers)	D				4.0E-6	2.0E+0	2.0E-6		
Total Pathway Carcinogenic Risk =				0.0E+0	1.0E-7	Total Pathway Hazard Index =		0.0E+0	5.8E-3

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sleminski

Date Completed: 12/13/2000

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TIER 1 PATHWAY RISK CALCULATION

Constituents of Concern	CARCINOGENIC RISK					TOXIC EFFECTS									
	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Oral Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)					
		On-Site Residential	On-Site Commercial		On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial		On-Site Residential	On-Site Commercial				
Benzene	A			2.9E-2					1.0E-1						
Ethylbenzene	D								5.0E-3						
Methyl t-Butyl Ether									2.0E-1						
Toluene	D								2.0E+0						
Xylene (mixed isomers)	D														
Total Pathway Carcinogenic Risk =					0.0E+0		0.0E+0		Total Pathway Hazard Index =			0.0E+0		0.0E+0	

Site Name: Former Chevron SS#9-0517

Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sleminski

Date Completed: 12/13/2000

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TIER 1 PATHWAY RISK CALCULATION

Constituents of Concern	CARCINOGENIC RISK				TOXIC EFFECTS		
	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)	(3) Oral Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3)	(5) Total Toxicant Intake Rate (mg/kg/day)	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)
Benzene	A		2.9E-2			1.0E-1	
Ethylbenzene	D					5.0E-3	
Methyl t-Butyl Ether						2.0E-1	
Toluene	D					2.0E+0	
Xylene (mixed isomers)	D						

Total Pathway Carcinogenic Risk = 0.0E+0 0.0E+0

Total Pathway Hazard Index = 0.0E+0 0.0E+0

RBCA SITE ASSESSMENT

Tier 1 Worksheet 8.3

Site Name: Former Chevron SS#9-0517
 Site Location: 3900 Piedmont Ave, Oakland

Completed By: Barbara Sieminski
 Date Completed: 12/13/2000

TIER 1 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	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:	1.1E-9	1.0E-6	1.1E-9	N/A	<input type="checkbox"/>	6.3E-5	1.0E+0	6.4E-5	N/A	<input type="checkbox"/>
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.0E-7	1.0E-6	1.0E-7	N/A	<input type="checkbox"/>	5.8E-3	1.0E+0	5.8E-3	N/A	<input type="checkbox"/>
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	<input checked="" type="checkbox"/>	NC	1.0E+0	NC	N/A	<input checked="" type="checkbox"/>
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	<input checked="" type="checkbox"/>	NC	1.0E+0	NC	N/A	<input checked="" type="checkbox"/>
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	1.0E-7	1.0E-6	1.0E-7	N/A	<input type="checkbox"/>	5.8E-3	1.0E+0	5.8E-3	N/A	<input type="checkbox"/>