Oakland
All-America City
1993

CITY OF OAKLAND

DALZIEL BUILDING • 250 FRANK H. OGAWA PLAZA, SUITE 5301 • OAKLAND, CALIFORNIA 94612-2034

Public Works Agency
Environmental Services

FAX (510) 238-7286
TDD (510) 238-7644

4457 / RO 238

January 17, 2002

Mr. Barney Chan
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

JAN 18 2002

Re: Site Remediation and On-Site Closure Report
2662 Fruitvale Avenue
Oakland, California 94621

1/18/02

Dear Mr. Chan:

The City of Oakland Environmental Services Division is pleased to present this Risk Management Plan and Site Remediation/Site Closure Report for the property located at 2662 Fruitvale Avenue in Oakland. Our consultant, Cambria Environmental Inc. completed all on-site soil and groundwater remediation activities previously approved by your office. As such, the City of Oakland respectfully requests a "letter of concurrence" from your office indicating that the property is suitable for residential development.

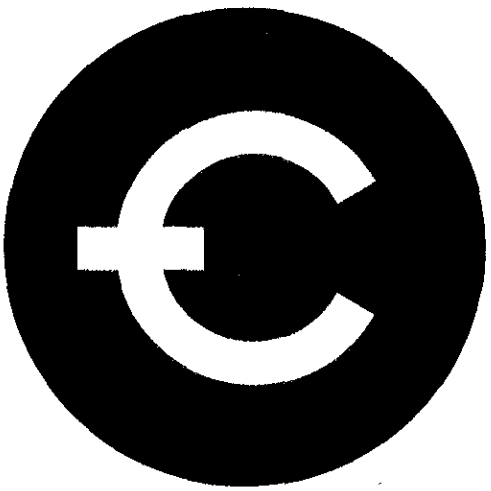
Pending off-site remedial activities associated with the site should be completed in late Spring 2002. Addendums to the Risk Management Plan and Site Remediation/Closure Report will be submitted to your office upon completion of these tasks. The City will petition your office for full site closure at this time.

If you have questions or require additional information, please contact me at (510) 238-6259.

Sincerely,

Joseph A. Cotton, R.G.
CITY OF OAKLAND-Environmental Program Specialist

JAN 1 8 2002



CAMBRIA

January 14, 2002

Mr. Joseph Cotton
City of Oakland, Public Works Agency
Environmental Services Division
250 Frank H. Ogawa Plaza, Ste. 5301
Oakland, California 94612-2034

Re: **Site Remediation and Closure Report**
2662 Fruitvale Avenue
Oakland, California 94621
Cambria Project #153-1664-028

Dear Mr. Cotton:

As required by the Alameda County Health Care Services Agency (ACHCSA), Cambria Environmental Technology, Inc. (Cambria) has prepared this site remediation and closure report for the above-referenced site.

Cambria understands that the City of Oakland will forward a copy of this report to the ACHCSA. If you have any questions or comments regarding this report, please call me at (510) 420-3303.

Sincerely,
Cambria Environmental Technology, Inc.

Bob Clark-Riddell, P.E.
Principal Engineer

Enc: Site Remediation and Closure Report

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

January 14, 2002

Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Risk Management Plan**
2662 Fruitvale Avenue
Oakland, California 94621
Cambria Project #153-1664-028

Dear Mr. Chan:

On behalf of the City of Oakland, Cambria Environmental Technology, Inc., (Cambria) is submitting this Risk Management Plan (RMP) for the above-referenced site. The Alameda County Health Care Services Agency (ACHCSA) frequently requires a RMP as a condition of regulatory case closure. The site background and the RMP are presented below.

SITE BACKGROUND

Site Location and UST Status: The Site is located on the northeast corner of Fruitvale Avenue and Davis Street in Oakland, California. The area use is mixed commercial and residential. Cambria understands that an automobile service station occupied the Site from the 1940s until 1978. The underground storage tanks (USTs), including three gasoline USTs and one additional UST (presumably used for waste oil storage), were removed from the Site in 1978. The City of Oakland purchased the property from Texaco in 1983.

Lithology: The site lithology consists primarily of clays. Below approximately 8-10 ft below ground surface (bgs), sands and gravels are encountered, though in the northeastern portion of the site, sands were encountered between 1 and 4 ft bgs. Local lithologic variation is consistent with general categories for soils within the City of Oakland (Merritt sands, sandy silts, and clayey silts), as detailed in the City of Oakland 2000 *Oakland Risk-Based Corrective Action: Technical Background Document.*

Groundwater Depth and Flow Direction: Depth to groundwater is approximately 8 to 11 ft bgs, and groundwater flows towards the west-southwest with an approximate gradient of 0.02 ft/ft.

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

Nearby Surface Water: Sausal Creek is located approximately 500 ft west of the subject site. Peralta Creek is located approximately 1,500 ft east-southeast of the subject site.

Investigation and Remediation: Petroleum hydrocarbons and lead in soil and groundwater have been investigated and remediated under regulatory oversight by the ACHCSA. Additional investigation and remediation information, including a risk evaluation and remediation goals, is presented in Attachment A.

RISK MANAGEMENT PLAN

A copy of this RMP should be provided to the City of Oakland Community and Economic Development Agency for its records. The objective of this RMP is to protect potential future site occupants, construction workers, groundwater resources, and the environment.

1. Notice of change in land use for this property should be sent to:

   Alameda County Health Care Services Agency
   Environmental Health Services
   Environmental Protection (LOP)
   1131 Harbor Bay Parkway, Suite 250
   Alameda, California 94502

2. Due to the presence of residual gasoline in the subsurface, construction workers who may handle subsurface soil (soil at depths greater than 3 ft below ground surface) during future construction activities should take appropriate precautions. A health and safety plan should be prepared that requires Level D protection for all workers as per Occupational Health and Safety Administration (OSHA) rules (29 CFR 1910.120). Level D protection generally includes gloves, work clothes, boots, and hard hats, if required. If site excavation activities encounter hydrocarbon odor, hydrocarbon staining, or any other indication of the potential presence of petroleum hydrocarbons, air quality monitoring should be performed. Until air quality in the work area is determined, construction workers should have OSHA Level C protection. Level C protection generally includes at a minimum a half-face filtering respirator with organic vapor cartridges, nitrile or latex gloves, and the protection specified in Level D. In the event that groundwater is encountered during construction activities, direct contact with the groundwater should be avoided.

3. If subsurface soil is excavated during site construction activities, a soil management plan governing sampling of excavated soil to determine disposal or reuse options should be prepared and submitted to the ACHCSA. If it becomes necessary to evacuate any

groundwater during site construction activities, such groundwater should be stored in temporary containers and analyzed for disposal options.

4. The shallow groundwater beneath the property should not be used for any purpose, unless analyzed and treated, if necessary. If shallow groundwater is proposed for use, appropriate notice should be given to the ACHCSA.

CLOSING

If you require any additional information, please contact Cambria at (510) 420-0700.

Sincerely,
Cambria Environmental Technology, Inc.

Ian D. Young
Senior Staff Geologist

Bob Clark-Riddell, P.E.
Principal Engineer

Attachment: A – January 14, 2002, Site Remediation and Closure Report

cc: Mr. Joseph Cotton, R.G., City of Oakland, Public Works Agency,
Environmental Services Division
250 Frank H. Ogawa Plaza, Ste. 5301
Oakland, California 94612-2034

H:\City of Oakland\2662 Fruitvale\Remediation Report\Fruitvale RMP.doc

CAMBRIA

SITE REMEDIATION AND CLOSURE REPORT

2662 Fruitvale Avenue
Oakland, California 94621
Cambria Project #153-1664-028

January 14, 2002

Prepared for:

City of Oakland, Public Works Agency
Environmental Services Division
250 Frank H. Ogawa Plaza, Ste. 5301
Oakland, California 94612-2034

Prepared by:

Cambria Environmental Technology, Inc.
1144 65th Street, Suite B
Oakland, California 94608

Ian Young
Senior Staff Geologist

Bob Clark-Riddell, P.E.
Principal Engineer

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

SITE REMEDIATION AND CLOSURE REPORT

2662 Fruitvale Avenue
Oakland, California 94621
Cambria Project #153-1664-028

January 14, 2002

INTRODUCTION

Cambria Environmental Technology, Inc. (Cambria) has prepared this site remediation and closure report for the above-referenced site. This report describes the completed activities required by the Alameda County Health Care Services Agency (ACHCSA) to facilitate development of the site. The site background, risk screen evaluation and remediation goals, onsite remediation activities, sensitive receptor survey, conclusions, and a request for a regulatory action are presented below. Having completed the onsite remediation required by the ACHCSA, Cambria concludes that the site is suitable for development.

SITE BACKGROUND

This section summarizes the site background. This site background is based on Cambria's review of the following reports: 1) September 1993 *Phase III Soil and Groundwater Investigation* by Baseline Environmental Consulting (Baseline), 2) September 1995 *Supplemental Groundwater Investigation* by Baseline, and 3) January 30, 2001 *Results of Semi Annual Groundwater Monitoring* by Innovative Technical Solutions, Inc. (ITSI). Previous consultant figures and tables presenting the investigation and analytical data reviewed by Cambria are included Cambria's *Risk Screening Evaluation* dated March 1, 2001 (Appendix A).

Site Location and UST Status: The Site is located on the northeast corner of Fruitvale Avenue and Davis Street in Oakland, California (Figure 1). The area use is mixed commercial and residential. Cambria understands that an automobile service station occupied the Site from the 1940s until 1978. The underground storage tanks (USTs), including three gasoline USTs and one additional UST (presumably used for waste oil storage), were removed from the Site in 1978. The City of Oakland purchased the property from Texaco in 1983.

Lithology: Vadose zone soils consist primarily of clays. Below approximately 8 to 10 ft below ground surface (bgs), sands and gravels are encountered. In the northeastern portion of the site, sands were encountered between 1 and 4 ft bgs in borings MW-F1, F-11, and F-13. The City of Oakland 2000

Oakland Risk-Based Corrective Action: Technical Background Document provides three general categories for soils within the City of Oakland: Merritt sands, sandy silts, and clayey silts. Based on the boring logs included in the reports reviewed by Cambria and on the site location and regional geology, the site soil type is "clayey silt."

Groundwater Depth and Flow Direction: Depth to groundwater is approximately 8 to 11 ft bgs, and groundwater flows towards the west-southwest with an approximate gradient of 0.02 ft/ft.

Contaminants of Concern: Petroleum hydrocarbons have been detected in onsite and offsite soil and groundwater. The petroleum compounds of concern are benzene, toluene, ethylbenzene, and xylenes (BTEX). Lead has been detected in site soil. Tabulated data from the September 1993 *Phase III Soil and Groundwater Investigation Report*, the September 1995 *Supplemental Groundwater Investigation Report* and the January 30, 2001 *Results of Semi-Annual Groundwater Monitoring* are presented in Appendix A.

Contaminant Distribution: Consistent with leakage from former USTs and subsequent migration via groundwater, petroleum hydrocarbons in soil occur primarily at depths of 8 to 11 ft bgs. Potentially elevated concentrations of lead occur in two shallow soil (0 to 3 ft bgs) locations (F-4 and F-6). In groundwater, petroleum hydrocarbons are primarily located offsite (downgradient) beneath the sidewalk (well MW-F4) and Davis Street (MW-13). Separate-phase hydrocarbons (free product) was detected at a thickness of 0.02 ft in offsite, downgradient well MW-13 in June 1997 and March 1998, but no measurable free product has been detected since. During the recent three semi-annual monitoring events, no petroleum hydrocarbons were detected in onsite groundwater.

Site Remediation: Oxygen-releasing compounds (ORC) and hydrogen peroxide were introduced into the site subsurface in 1998 and in 2000. The ORC application was purportedly conducted via approximately 5 borings along Fruitvale Avenue. The hydrogen peroxide was delivered via site wells using 96-ounce volumes of 3% solution. Results of the application were mixed, with some areas of significant contaminant reduction and areas with less reduction. In general, the application of ORC and hydrogen peroxide showed promise as effective remedial techniques. Absorbent socks have also been used in an attempt to recover any residual free product in offsite well MW-13.

RISK EVALUATION AND SITE REMEDIATION GOALS

To establish remediation goals for the site, Cambria conducted risk evaluations for residential site use using the City of Oakland's *Oakland Risk-Based Corrective Action: Technical Background Document.* Cambria's risk screen evaluation for petroleum hydrocarbons is summarized below in Table A and detailed in prior reports included in Appendix B.

Table A - Results of Hydrocarbon Exposure Pathways (Residential)
Based on City of Oakland - Version 2000 - SSTLs for Clayey Silt

Exposure Scenario	Target Risk Level	SSTL	Maximum Site Concentration	Result
Benzene				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	1.9 mg/kg	0.3 mg/kg (onsite) 1.7 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	5.5 mg/l	<0.005 mg/l (onsite) 0.270 mg/l (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	19 mg/kg	<0.2 mg/kg	Potential health risk is below target level.
Toluene				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	930 mg/kg	3.7 mg/kg (onsite) 11 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	>SOL	<0.005 mg/l (onsite) 0.035 mg/l (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	7,100 mg/kg	0.75 mg/kg	Potential health risk is below target level.
Ethylbenzene				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	SAT	8.8 mg/kg (onsite) 66 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	>SOL	<0.005 mg/l (onsite) 1.1 mg/l (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	3,900 mg/kg	3.4 mg/kg	Potential health risk is below target level.
Xylenes				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	SAT	17 mg/kg (onsite) 230 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	>SOL	<0.005 mg/l (onsite) 0.34 mg (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	53,000 mg/kg	1.5 mg/kg	Potential health risk is below target level.

SSTL = Site-Specific Target Level
SAT = SSTL exceeds saturated soil concentration of chemical>SOL = SSTL exceeds solubility of chemical in water
NA = Not applicable

Cambria's risk screen evaluation for lead in site soil is summarized below in Table B and detailed in prior reports included in Appendix B. To evaluate the risk posed by residual lead concentrations,

Cambria compared analytic results to the EPA Region 9 Preliminary Remediation Goal (PRG) of 400 mg/kg. Lead concentrations exceeded the PRG in one area (sample F4-2'), located near the middle of the site.

Table B - Results of Lead Exposure Pathways (Residential)
Based on Lead Concentrations using
EPA Region 9 Preliminary Remediation Goal

Exposure Scenario	Target Risk Level	SSTL	Maximum Site Concentration	Result
		Lead		
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	NA	NA	NA
Volatilization from groundwater to indoor air	$1x10^{-5}$	NA	NA	NA
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-6}$	400 mg/kg (EPA PRG)	480 mg/kg	Maximum site concentration exceeds SSTL.

SSTL = Site-Specific Target Level
NA = Not applicable

The results of the risk screening indicate that petroleum hydrocarbon concentrations in site soil and groundwater do not exceed the site-specific target levels in the Oakland risk-based corrective action guidance document. This suggests that residual hydrocarbons onsite and immediately adjacent to the site do not pose a significant risk to human health. However, the lead concentrations in one shallow soil sample (480 mg/kg in F4-2' located 2 ft bgs) slightly exceeded the EPA PRG risk screening criteria of 400 mg/kg. The removal of this shallow lead-bearing soil is the focus of the limited excavation described below.

ONSITE SOIL AND GROUNDWATER REMEDIATION

To facilitate site development and case closure, Cambria completed the onsite remedial tasks described in the *Remediation Workplan* dated September 17, 2001. The ACHCSA approved this workplan on September 24, 2001. In a letter dated September 27, 2001, the ACHCSA revised the workplan approval, authorizing closure of onsite well MW-F2 in addition to onsite wells MW-F1 and MW-F3 The ACHCSA letters are included in Appendix C. The procedures, results, and conclusions of the limited soil excavation, ORC treatment trench installation, and well closure are described below.

Limited Soil Excavation

To remove shallow soil impacted by lead and hydrocarbons, Cambria coordinated the excavation of soil near the middle of the site. The excavation targeted lead concentrations (480 mg/kg) detected at 2 ft below grade surface (bgs) in shallow soil sample F4-2'. The remedial goal was the USEPA Preliminary Remediation Goal (PRG) of 400 mg/kg for lead remediation. Excavation also was designed to remove soil impacted by total petroleum hydrocarbons as motor oil (940 mg/kg TPHmo), also detected in sample F4-2'. The 940 mg/kg TPHmo concentration exceeded nuisance thresholds.

Cambria excavated an area approximately 5 ft long by 5 ft wide by 3 ft deep (approximately 10 cubic yards, or 15 tons, of impacted soil) around sample location F4-2'. Field observations (odors, discoloration) were used to determine the need for any additional immediate soil excavation. Excavated soil was stockpiled onsite pending analysis and appropriate offsite disposal. After initial excavation activities, confirmation soil samples were collected from the pit excavation sidewalls (samples TP-1 through TP-4) and bottom (sample TP-5), and submitted for analysis. Laboratory analytical reports are presented in Appendix D. Field data sheets are presented as Appendix E.

Soil analytical data from the excavation sampling is summarized in Table 1. As shown in Table 1, no residual hydrocarbons were detected in the confirmation samples from the sidewalls or bottom of the excavation. Lead was detected in confirmation samples at concentrations ranging from 7.3 to 28 mg/kg, well below the PRG of 400 mg/kg. The detected lead concentrations are likely due to background lead in site soil. Additional details of the limited soil excavation are described below in the section entitles *Field Activity Details of Excavation and ORC Treatment Trench Installation.*

ORC Treatment Trench Installation

Additional site remediation was conducted to accelerate natural attenuation of residual nuisance-level petroleum hydrocarbons located in the saturated zone downgradient and offsite of the site. The additional remediation consisted of excavating a trench on the site and installing approximately 510 pounds of oxygen releasing compound (ORC) materials within the trench. The trench was approximately 20 feet long, 2 feet wide and 10.5 feet deep, and was located approximately ten feet from the sidewalk along Davis Street. ORC material was installed in the historic saturated zone/capillary fringe, which is estimated to be approximately 8 to 10 feet bgs. A total of approximately 20 cubic yards of soil (30 tons) was removed from the subsurface and stockpiled onsite pending analysis and appropriate offsite disposal. Field data sheets are presented in Appendix E. Additional details of the limited soil excavation are described immediately below.

Field Activity Details for Excavation and ORC Treatment Trench Installation

Field Date: November 28, 2001

Personnel Present: Matt Meyers, Cambria Geologist, and Bob Clark-Riddell, Cambria Professional Engineer.

Excavation Contractor: Bluewater Environmental Services, Inc., of San Leandro, California (California Contractor's License #631366).

Equipment: The pit and trench were excavated using a backhoe excavator.

Excavation Dimensions: The final pit excavation in the middle of the site was approximately 5 ft long, 5 ft wide, and 3 ft deep. The final ORC treatment trench excavation was approximately 20 ft long, 2 ft wide and 10.5 ft deep. Both excavation locations are shown on Figure 2.

Soil Sampling: Confirmation soil samples were collected from the pit excavation sidewalls (samples TP-1 through TP-4) and bottom (sample TP-5). Soil samples were collected per Cambria's standard excavation sampling procedures (Appendix F).

Chemical Analysis: Confirmation soil samples were analyzed for TPH as gasoline (TPHg), TPH as kerosene (TPHk), and TPHmo by modified EPA Method 8015; for benzene, toluene, ethylbenzene, and total xylenes (BTEX) be EPA Method 8020; and for lead by EPA Method 6010. The analytical results are summarized on Table 1, and the analytical report is included as Appendix D.

Backfill Method: The shallow pit excavation in the middle of the site was backfilled to grade with fine-grained, low permeability imported fill material and was compacted. The ORC treatment trench excavation was backfilled to 5 ft bgs with self-compacting pea gravel and ORC/pea gravel slurry. The remainder of the trench was backfilled with fine-grained, low permeability imported fill material and was compacted in 1-ft lifts. To help prevent trench settlement, a geotextile membrane was used between the upper fine-grained soil/fill and the lower self-compacting backfill at approximately 5 ft bgs.

Soil Disposal: Soil samples were collected from the pit excavation stockpile (SP 1-4) and the trench stockpile (ST 1-6). Samples were submitted to an analytical laboratory for compositing and analysis for TPHg, TPHd, TPHmo, BTEX, and lead. The analytical results are summarized on Table 1, and the analytical report is included as Appendix D. Stockpiled soil will be disposed of at an approved offsite waste disposal facility. Standard field procedures for soil stockpile sampling are included as Appendix G.

Well Closure

On December 11, 2001, GAIA Consulting, Inc. (GAIA), decommissioned three existing site wells by pressure grouting. GAIA's *Well Abandonment Report* with accompanying Alameda County Public Works Agency well destruction permits is included in Appendix H.

RECEPTOR SURVEY

As requested by the ACHCSA, a sensitive receptor survey was conducted to clear locations of proposed hydrogen peroxide introduction, and to identify and safeguard any known sensitive receptors. The sensitive receptor survey included an evaluation of subsurface utilities/conduits, wells, basements, surface water, hospitals and schools near the site.

Utility and Conduit Study

To conduct the survey, Cambria contacted Underground Services Alert (USA) to mark subsurface utilities beneath public property in the subject area. Cambria also subcontracted a private utility locator (Fore Site of Pleasant Hill, California) to confirm and evaluate the presence and location of utilities and conduits. Cambria also reviewed a subsurface utility map from the City of Oakland Department of Engineering, which is included in Appendix I. Figure 3 shows the locations of utilities and conduits near the site.

Based on the City of Oakland map in Appendix I, there are three sanitary sewers near the site. The first sanitary sewer is a 6" diameter line beneath Davis Street. The invert elevation of this sewer-line is 98 ft (based on City of Oakland datum) uphill and east of the site, and is 92.71 ft where it intersects the 12" diameter sewer beneath Fruitvale Avenue. Cambria estimates that the invert elevation is approximately 94 ft where is first enters the residual hydrocarbon plume footprint (the residual plume is beneath Davis Street primarily near and between wells MW-F4 and MW-13). The second sanitary sewer is a 12" diameter sewer beneath Fruitvale Avenue that intercepts the 6" diameter sewer beneath Davis Street. The 12" diameter sewer has an invert elevation of 91.8 ft as it intersects the estimated hydrocarbon plume footprint. Parallel to and west of the 12" diameter sewer is an 18" diameter sewer with an invert elevation of 91.95 ft as it intersects the estimated hydrocarbon plume footprint. Therefore, the invert (flow line) of the nearby sanitary sewer pipes are located at elevations of approximately 91.8 to 94 ft, with the deepest sewer being the 12" diameter sewer beneath Fruitvale Avenue. NA

Based on monitoring data from September 1994 to December 2000, the groundwater elevation in nearby wells has ranged from 90.35 to 94.95 (MW-F4) and from 88.93 and 93.4 ft (MW-13)(City of Oakland datum). Further analysis of the historical groundwater elevations indicates that the deepest sewer apparently intersects the groundwater table downgradient of the site during the winter/spring rainy season, and is above the groundwater table during the dry season (summer and early fall). For example, during the highest observed groundwater elevations in wells MW-F4 and MW-13

(December 13, 1996) Cambria estimates that the groundwater elevation near the deepest storm sewer was 93.60 ft, which is approximately 1.8 ft above the deepest sewer's invert elevation of 91.8 ft. And during the lowest observed groundwater elevations in MW-F4 and MW-13 (September 9, 1994), the groundwater elevation near the deepest sewer was 89.4 ft, which is 2.4 ft below the elevation of the invert elevation of the deepest sewer.

Therefore, the sewer and any associated trench backfill material could be potential conduits for migration of dissolved hydrocarbons during the annual rainy season when the groundwater table rises. The potential for the utility conduits to contribute to hydrocarbon migration via groundwater will be mitigated by the planned groundwater remediation, and by continued natural attenuation of the hydrocarbon plume. Furthermore, the results of the risk screening analysis indicate that residual hydrocarbons concentrations in groundwater onsite and adjacent to the site are below site-specific target levels in the Oakland risk-based corrective action guidance document, and do not pose a significant risk to human health. Finally, historical elevation data from offsite groundwater well MW-F5 and the receptor survey results indicate that physical exposure scenarios within 150 to 200 ft from the site do not change significantly.

Well Documentation Review

Cambria requested a ¼-mile radius well survey of the subject site from the Department of Water Resources (DWR) to identify any water-producing wells within the site vicinity and to assess the potential for conduits to exist between the shallow and deeper water-bearing zones. The DWR report is included as Appendix J, and indicates that no wells are reported within ¼-mile of the subject site.

Door-to-Door Well Survey and Basement Survey

On November 27, 2001, Cambria conducted a door-to-door survey within 200 ft of the site to inquire about any known wells or basements near the site. This survey included fifty-four businesses and/or residences within the 200-ft radius. The survey involved interviewing occupants and nearby businesses, leaving questionnaires with the occupants or at the property, and mailing the questionnaires to the remaining locations.

Table 2 summarizes the distribution and response of the survey questionnaires. The ten survey responses were obtained during occupant interviews, and include responses from the businesses closest to the residual hydrocarbon plume. Copies of the door-to-door survey questionnaire responses

are included in Appendix K. No questionnaire respondents reported any wells or basements on their property.

In the course of this survey, Cambria also observed nearby structures to look for obvious indications of subgrade features. The only subgrade feature observed within 200 ft of the subject site was a subgrade parking garage approximately 250 ft south of the site on the east side of Fruitvale Avenue. The parking garage extends approximately 5 ft below grade, is open to the atmosphere, and appears to be well ventilated. Since groundwater monitoring indicates that the dissolved plume has not migrated to offsite wells located 150 ft downgradient of the site, the residual hydrocarbons are not likely to pose a risk to the parking garage.

Surface Water Bodies

To identify surface water bodies in the site vicinity, Cambria reviewed the United States Geological Survey (USGS) West Oakland Quadrangle 7.5-minute series topographic map and the most recent Thomas Guide map for the site vicinity. The nearest surface water body is Sausal Creek, lying west of the subject site, approximately 500 ft due west at its nearest point (Figure 1). Peralta Creek lies approximately 1,500 ft east-southeast of subject site at its nearest point. Both creeks run roughly parallel to the historical site groundwater gradient. Since groundwater monitoring indicates that the dissolved plume has not migrated to offsite wells located 150 ft from the site, the residual hydrocarbons do not pose a risk to the identified surface water bodies.

Schools and Hospitals

Cambria reviewed the most recent Thomas Guide map for the site vicinity to identify schools or hospitals in the site vicinity. No schools or hospitals lie within a ¼-mile radius of the subject site.

CONCLUSIONS

Having successfully implemented the onsite portions of the approved remedial workplan, Cambria concludes that the site is ready for residential development. And with no wells or basements reported near the site, the sensitive receptor survey results suggest that there is no significant risk associated with residual hydrocarbons located offsite and downgradient of the site. Planned offsite remediation will further improve the quality of offsite hydrocarbons in groundwater, and will not interfere with site development activities. Based on the results of the conduit study, Cambria plans to perform offsite groundwater remediation using hydrogen peroxide introduction in the late spring when the groundwater elevation isanticipated to be below the nearby sewers. Upon satisfactory completion of offsite groundwater remediation, Cambria understands that the ACHCSA anticipates granting case closure for the site.

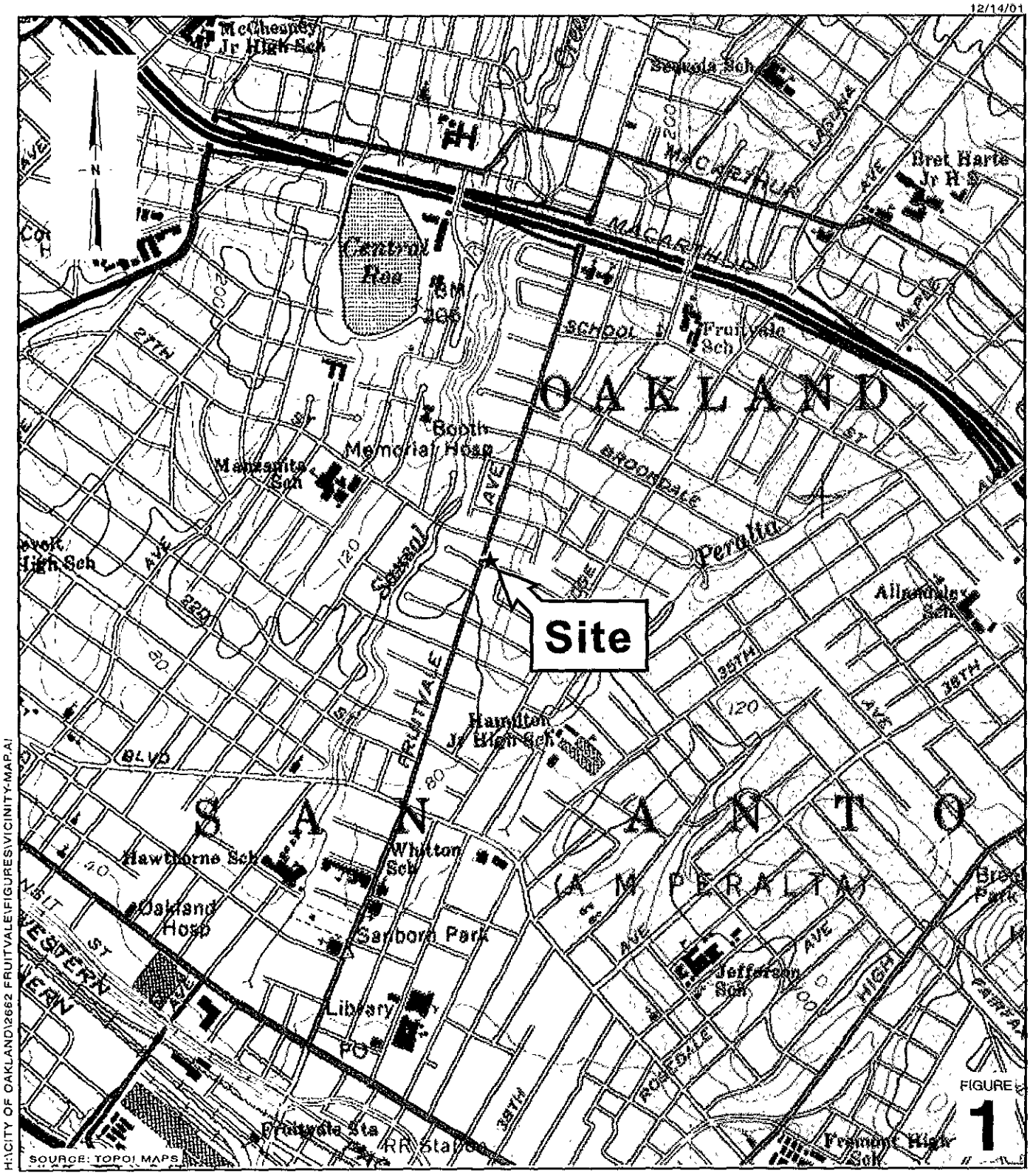
REQUESTED REGULATORY ACTION

On behalf of the City of Oakland, Cambria requests that the ACHCSA prepare a "letter of concurrence" indicating that the subject property is suitable for residential development.

ATTACHMENTS

Figure 1 – Vicinity Map
Figure 2 – Excavation Locations
Figure 3 – Underground Utility Locations
Table 1 – Soil Analytical Data
Table 2 – Door-to-Door Receptor Survey
Appendix A – Soil and Groundwater Data from Site Investigations
Appendix B – Risk Screening Evaluations
Appendix C – Regulatory Approval of Remediation Workplan
Appendix D – Laboratory Analytical Report
Appendix E – Field Data Sheets
Appendix F – Excavation Sampling Procedures
Appendix G – Soil Stockpile Sampling Procedures
Appendix H – Well Abandonment Report
Appendix I – City of Oakland Department of Engineering Subsurface Utility Map
Appendix J – Department of Water Resources Well Survey Report
Appendix K – Door-to-Door Survey Questionnaire Responses

12/14/01



H:\CITY OF OAKLAND\2662 FRUITVALE\FIGURES\VICINITY-MAP.AI

FIGURE 1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

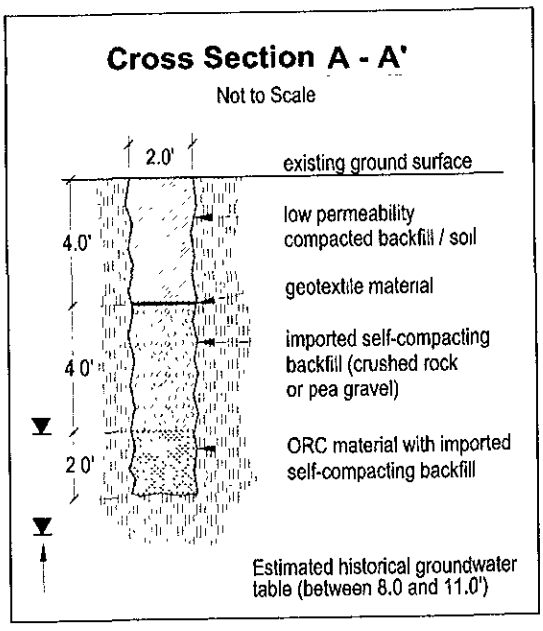
City of Oakland

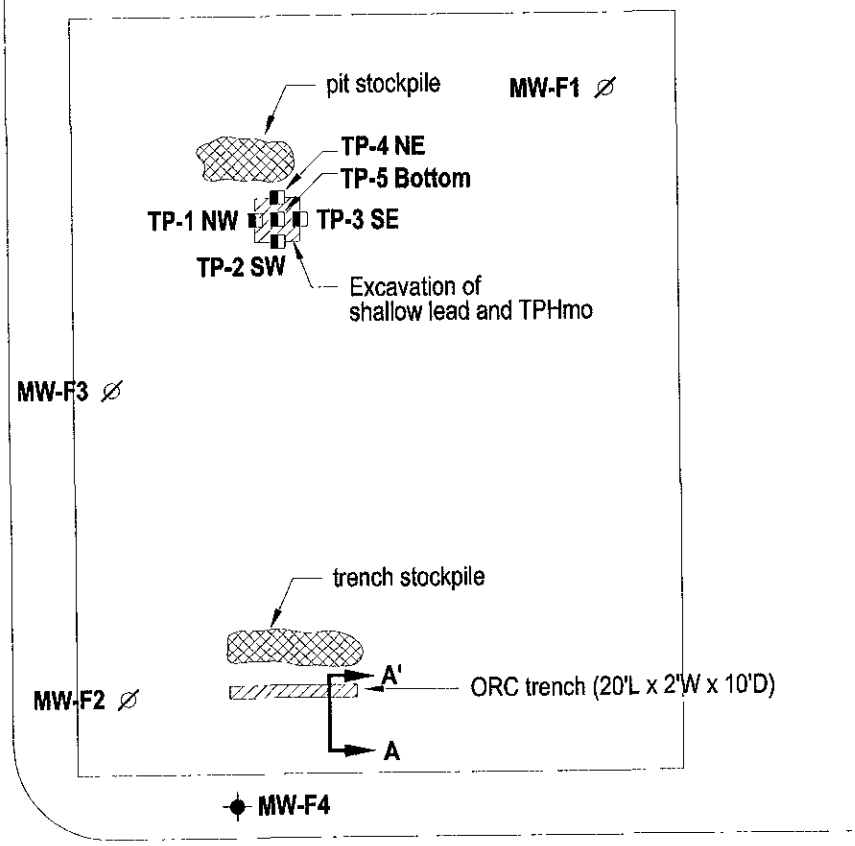
2662 Fruitvale Avenue

Oakland, California

CAMBRIA

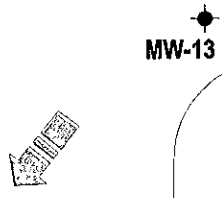
Vicinity Map





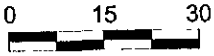
FRUITVALE AVENUE

DAVIS STREET



Historical Groundwater Flow Direction

MW-F6



Scale (ft)

MW-F5

EXPLANATION

MW-1	Monitoring well location
MW-F1	Closed (decomissioned) well location
P-1 NW	Soil sample location

FIGURE

2

H:\CITY OF OAKLAND\2662 FRUITVALE\FIGURES\EXC-LOC.DWG

City of Oakland

2662 Fruitvale Avenue

Oakland, California

CAMBRIA

Excavation Locations

CAMBRIA

Table 1. Soil Analytical Data - City of Oakland, 2662 Fruitvale Avenue, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	TPHg	TPHk	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	Lead
			←				mg/kg			→
Confirmation Samples										
TP-1 NW	11/28/01	1.5	<1.0	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	10
TP-2 SW	11/28/01	1.5	<1.0	<1.0	<1.0	<0 005	<0 005	<0.005	<0 005	7 3
TP-3 SE	11/28/01	1.5	<1.0	<1.0	<1 0	<0 005	<0 005	<0.005	<0.005	28
TP-4 NE	11/28/01	1.5	<1.0	<1.0	<1 0	<0.005	<0.005	<0.005	<0 005	8
TP-5 bottom	11/28/01	3.0	<1.0	<1.0	<1.0	<0.005	<0.005	<0 005	<0.005	7.4
Stockpile Samples										
SP 1-4	11/28/01	---	<1 0	4 0	65	<0.005	<0 005	<0 005	<0.005	15
ST 1-6	11/28/01	---	33	28	5.3	<0.005	<0.005	<0.005	<0.005	9.4

Abbreviations and Methods:

mg/kg = Milligrams per kilogram, equivalent to parts per million (ppm)
TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8015
TPHk = Total petroleum hydrocarbons as kerosene by EPA Method 8015
TPHmo = Total petroleum hydrocarbons as motor oil by EPA Method 8015
Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020
Lead by EPA Method 6010

CAMBRIA

Table 2. Door-to-Door Receptor Survey - City of Oakland, 2662 Fruitvale Avenue, Oakland, California

Address	Date	Interviewed occupant	Left Questionnaire	Mailed Questionnaire	Any Wells or Basement?
East side of Fruitvale Avenue					
2604 Fruitvale Ave.	11/28/01	---	Yes	---	Left on doorstep - no response
2608 Fruitvale Ave	11/30/01	---	---	Yes	No response
2614 Fruitvale Ave.	11/28/01	Yes	---	---	No known wells or basement
2616 Fruitvale Ave	11/30/01	---	---	Yes	No response
2618 Fruitvale Ave.	11/30/01	---	---	Yes	No response
2620 Fruitvale Ave	11/30/01	---	---	Yes	No response
2622 Fruitvale Ave	11/30/01	---	---	Yes	No response
2624 Fruitvale Ave	11/28/01	Yes	---	---	No known wells or basement
2670 Fruitvale Ave	11/30/01	---	---	Yes	No response
2672 Fruitvale Ave.	11/30/01	---	---	Yes	No response
2672A Fruitvale Ave.	11/30/01	---	---	Yes	No response
2676 Fruitvale Ave	11/28/01	---	Yes	---	No known wells or basement
2678 Fruitvale Ave.	11/30/01	---	---	Yes	No response
2682 Fruitvale Ave	11/30/01	---	---	Yes	No response
2700 Fruitvale Ave	11/30/01	---	---	Yes	No response
2702 Fruitvale Ave.	11/28/01	---	Yes	---	Left on doorstep - no response
2704 Fruitvale Ave	11/30/01	---	---	Yes	No response
2708 Fruitvale Ave.	11/28/01	---	Yes	---	Left with occupant - no response
2710 Fruitvale Ave	11/30/01	---	---	Yes	No response
2712 Fruitvale Ave	11/30/01	---	---	Yes	No response
West side of Fruitvale Avenue					
2603 Fruitvale Ave.	11/28/01	---	Yes	---	Left with occupant - no response
2615 Fruitvale Ave	11/30/01	---	---	Yes	No response
2617 Fruitvale Ave.	11/30/01	---	---	Yes	No response
2621 Fruitvale Ave.	11/28/01	Yes	---	---	No known wells or basement
2655 Fruitvale Ave	11/30/01	---	---	Yes	No response
2681 Fruitvale Ave.	11/30/01	---	---	Yes	No response
2701 Fruitvale Ave.	11/30/01	---	---	Yes	No response
2703 Fruitvale Ave.	11/28/01	Yes	---	---	No known wells or basement
2707 Fruitvale Ave.	11/30/01	---	Yes	---	Apartment manager - no response
2709 Fruitvale Ave.	11/30/01	---	---	---	Apt. - see 2709 Fruitvale Ave.
2711 Fruitvale Ave.	11/30/01	---	---	---	Apt. - see 2709 Fruitvale Ave.
2715 Fruitvale Ave	11/30/01	---	---	---	Apt - see 2709 Fruitvale Ave.
2717 Fruitvale Ave	11/30/01	---	---	---	Apt. - see 2709 Fruitvale Ave.
2719 Fruitvale Ave	11/30/01	---	---	---	Apt. - see 2709 Fruitvale Ave.

7

CAMBRIA

Table 2. Door-to-Door Receptor Survey - City of Oakland, 2662 Fruitvale Avenue, Oakland, California

Address	Date	Interviewed occupant	Left Questionnaire	Mailed Questionnaire	Any Wells or Basement?
North side of East 27th Street					
3110 East 27th Street	11/30/01	---	---	Yes	No response
3114 East 27th Street	11/28/01	Yes	---	---	No known wells or basement
3118 East 27th Street	11/30/01	---	---	Yes	No response
3128 East 27th Street	11/30/01	---	---	Yes	No response
3140 East 27th Street	11/30/01	---	---	Yes	No response
South side of East 27th Street					
3115 East 27th Street	11/30/01	---	---	Yes	No response
3121East 27th Street	11/30/01	---	---	Yes	No response
3129 East 27th Street	11/30/01	---	---	Yes	No response
3135 East 27th Street	11/30/01	---	---	Yes	No response
3145 East 27th Street	11/28/01	---	---	Yes	No response
North side of Davis Street					
3038 Davis Street	11/28/01	Yes	---	---	No known wells or basement
3050 Davis Street	11/28/01	---	Yes	---	Apartment manager - no response
3052 Davis Street	11/28/01	---	---	---	Apt. - see 3050 Davis St
3054 Davis Street	11/28/01	---	---	---	Apt. - see 3050 Davis St.
3056 Davis Street	11/28/01	---	---	---	Apt - see 3050 Davis St
3058 Davis Street	11/28/01	---	---	---	Apt. - see 3050 Davis St.
3118 Davis Street	11/28/01	Yes	---	---	No known wells or basement
3124 Davis Street	11/30/01	---	Yes	---	Left on doorstep - no response
3132 Davis Street	11/30/01	---	---	Yes	No response
3142 Davis Street	11/28/01	Yes	---	---	No known wells or basement
South side of Davis Street					
3043 Davis Street	11/28/01	Yes	---	---	No known wells or basement
3049 Davis Street	11/30/01	---	---	Yes	Apartment manager - no response
3051 Davis Street	11/30/01	---	---	Yes	Apt. - see 3049 Davis St.
3053 Davis Street	11/30/01	---	---	Yes	Apt. - see 3049 Davis St.
3055 Davis Street	11/30/01	---	---	Yes	Apt - see 3049 Davis St.
3115 Davis Street	11/30/01	---	---	Yes	Apartment - no response
3117 Davis Street	11/30/01	---	---	Yes	Apartment - no response
3119 Davis Street	11/30/01	---	---	Yes	Apartment - no response
3121 Davis Street	11/30/01	---	---	Yes	Apartment - no response
3123 Davis Street	11/28/01	Yes	---	---	No known wells or basement
East side of Prentiss Place					
2630 Prentiss Place	11/30/01	---	---	Yes	No response
2634Prentiss Place	11/30/01	---	---	Yes	No response
West side of Prentiss Place					
2631 Prentiss Place	11/30/01	---	---	Yes	No response
2637 Prentiss Place	11/30/01	---	---	Yes	No response

CAMBRIA

Table 2. Door-to-Door Receptor Survey - City of Oakland, 2662 Fruitvale Avenue, Oakland, California

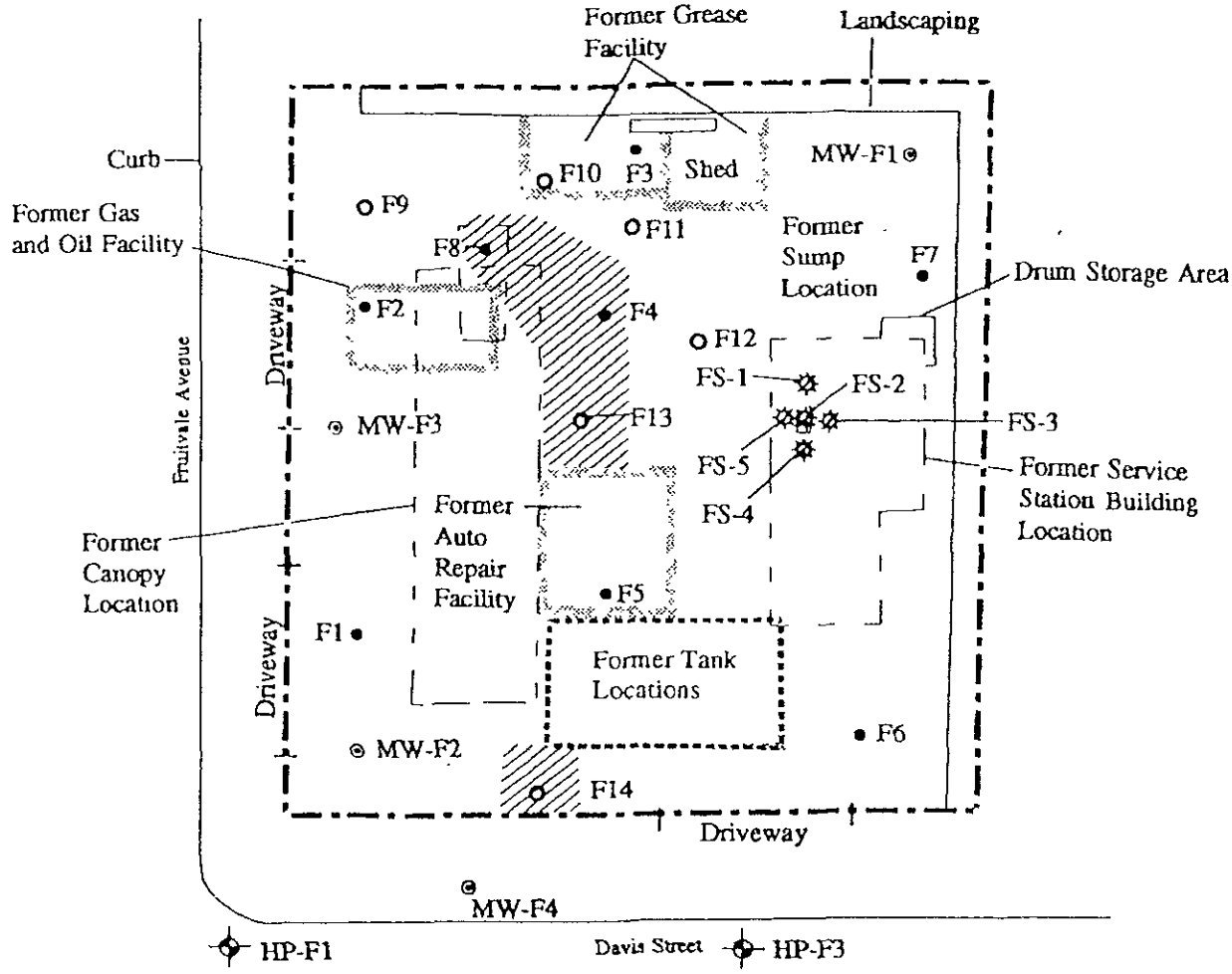
Address	Date	Interviewed occupant	Left Questionnaire	Mailed Questionnaire	Any Wells or Basement?
2639 Prentiss Place	11/30/01	---	---	Yes	No response
2645 Prentiss Place	11/30/01	---	Yes	---	Left on doorstep - no response
North side of Bloom Street					
3070 Bloom Street	11/30/01	---	---	Yes	No response
3072 Bloom Street	11/30/01	---	---	Yes	No response

Appendix A

Soil and Groundwater Data from Site Investigations

SITE PLAN

Figure 2



MW-13

Legend

		Areas with Elevated TPH Concentrations
F1 to F8	•	Soil Boring Location - Phase II
F9 to F14	○	Soil Boring Location - Phase III
FS-1	✲	Sump Area Boring Location
MW-F2	⊙	Monitoring Well Location
HP-F1	⊕	Temporary Well Location
	— · — · —	Project Site Boundary

0 30 Feet

2662 Fruitvale Avenue
Oakland, California

BASELINE

92404-DO 8/2/95

TABLE 1
SUMMARY OF ANALYTICAL RESULTS, SOIL
2662 Fruitvale Avenue
Oakland, California
(mg/kg, unless indicated)

Sample Location	Sample Date	Depth (feet)	TPH as Gasoline[1]	TPH as Kerosene[2]	TPH as Motor Oil[2]	Total/ Nonpolar Oil & Grease[3]	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Xylenes[4]
Soil Borings										
F1	1-20-93	2.0[5]	<1	<1.0	<10	--	<0.005	<0.005	<0.005	<0.005
		9.5[5]	6	<1.0	<10	--	<0.005	<0.005	0.014	<0.005
		11.0[5]	66	<1.0	<10	--	<0.005	0.072	0.260	<0.005
F2	1-21-93	2.0[5]	<1	<1.0	11	--	<0.005	<0.005	<0.005	<0.005
		8.0[5]	1.1	<1.0	<10	--	<0.005	<0.005	<0.005	<0.005
F3	1-20-93	2.0	--	<1.0	<10	--/<50	--	--	--	--
		8.0	--	<1.0	14	--/300	--	--	--	--
F4	1-20-93	2.0[6]	3.7	<5.0	940 S	--	<0.005	<0.005	0.0064	<0.005
		10.0[5]	15	<1.0	<10	--	<0.005	<0.005	0.320	<0.005
F5	1-20-93	2.0[7,8]	<1	<1.0	<10	--	<0.005	<0.005	<0.005	<0.005
		8.0[7,8]	<1	<1.0	<10	--	<0.005	<0.005	<0.005	<0.005
F6	1-21-93	2.0[8,9]	--	<1.0	<10	--	<0.005	<0.005	<0.005	<0.005
		8.0[6,8]	--	<1.0	<10	--	<0.005	<0.005	<0.005	<0.005
F7	1-20-93	2.0[7,8]	--	<1.0	13	--	<0.005	<0.005	<0.005	<0.005
		8.5[7,8]	--	<1.0	<10	--	<0.005	<0.005	<0.005	<0.005
F8	1-20-93	2.0[5]	220	<1.0	44	--	<0.005	<0.005	3.400	17.000 S
		8.5[5]	810	<1.0	<10	--	<0.005	<0.005	5.400	<0.005
F9	8-10-93	3.0[10]	<1	<1	<30	--	<0.005	<0.005	<0.005	<0.005
		9.5[10]	10	76	<30	--	<0.005	<0.005	0.052	0.042
F10	8-10-93	3.0[10]	<1	<1	<30	--/<50	<0.005	<0.005	<0.005	<0.005
		10.0[10]	30	33	<30	--/<50	<0.005	<0.005	0.073	0.250

(Continued)

Table 1 - Summary of Analytical Results, Soil (*continued*)

Sample Location	Sample Date	Depth (feet)	TPH as Gasoline[1]	TPH as Kerosene[2]	TPH as Motor Oil[2]	Total/ Nonpolar Oil & Grease[3]	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Xylenes[4]
F11	8-10-93	2.5[10]	<1	2	<30	--/<50	<0.005	<0.005	<0.005	<0.005
		10.0[10]	2	6	<30	--/<50	<0.005	0.012	<0 005	0.009
F12	8-10-93	2.5[10]	2	2	<30	--	<0 005	0.007	<0.005	<0 005
		9.5[10]	2	<1	<30	--	<0 005	<0.005	<0.005	<0.005
F13	8-10-93	3.0[10]	230	12	90	--	<0.030	0.75	0.55	1.5
		9.5[10]	1,500	650 S	<30	--	<0.200	3.7 S	8.8 S	8.1
F14	8-10-93	3.0[10]	<1	<1	<30	--	<0.005	<0.005	<0.005	<0.005
		10.5[10]	1,600 S	150	<30	--	0.3 S	3.1	5.7	6.0
F-S1	9-8-94	5.5	--	--	--	<50/<50	--	--	--	--
F-S2	9-8-94	6.0[9,11]	<1	--	650	--/1,600	<0.005	<0.005	<0.005	<0.005
		11.0[9,11]	<1	--	<10	--/<50	<0.005	<0.005	<0.005	<0.005
F-S3	9-8-94	5.5	--	--	--	<50/<50	--	--	--	--
F-S4	9-8-94	4.5	--	--	--	<50/<50	--	--	--	--
F-S5	9-8-94	5.5	--	--	--	210/200	--	--	--	--
Monitoring Wells										
MW-F1	8-11-93	3.0[10]	<1	--	<10	--	<0.005	<0.005	<0.005	<0.005
		10.0[10]	<1	--	<10	--	<0 005	<0.005	<0 005	<0.005
MW-F2	8-10-93	3.0[10]	<1	<1	<30	--	<0 005	<0.005	<0.005	<0.005
		12.0[10]	<1	3	<30	--	<0.005	<0.005	<0.005	<0.005
MW-F3	8-11-93	3.0[10]	<1	--	<10	--	<0.005	<0.005	<0.005	<0.005
		10.0[10]	33	--	<10	--	<0 015	<0.015	0.077	<0.005
MW-F4	9-7-94	5.5	<1	37[13]	<30	--	<0.005	<0.005	<0.005	<0.005
		11.0	W 2,100[12,13]	420[13] W	<300	--	1.7[12] W	11[12] W	66[12] W	230[12] W

(Continued)

02/02/01 14:11 FAX 510 420 1200

Table 1 - Summary of Analytical Results, Soil (*continued*)

Sample Location	Sample Date	Depth (feet)	TPH as Gasoline[1]	TPH as Kerosene[2]	TPH as Motor Oil[2]	Total/ Nonpolar Oil & Grease[3]	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Xylenes[4]
MW-F5	4-27-95	5.0[14]	<1	--	--	--	<0.005	<0.005	<0.005	<0.005
		9.5	<1	--	--	--	<0.005	<0.005	<0.005	<0.005
MW-F6	6-26-95	5.0	<1	--	--	--	<0.005	<0.005	<0.005	<0.005
		11.0	<1	--	--	--	<0 005	<0.005	<0.005	<0.005

Notes:
<x.x = Compound not identified above detection limits.
x.x = Bold values indicate compound identified above detection limits.
-- = Compound not analyzed.
TPH = Total Petroleum Hydrocarbons.
Sample locations are shown on Figure 2.
Laboratory reports for April and June 1995 samples are included in Appendix D.
TTLC = Total threshold limit concentration.
STLC = Soluble threshold limit concentration.

[1] Test Method = DOHS Method/LUFT, EPA 5030/8015.
[2] Test Method = DOHS Method/LUFT, EPA 3550/8015.
[3] Test Method = SMWW 17:5520EF for total and 5520E&F for nonpolar.
[4] Test Method = EPA 5030/8020.
[5] Sample also analyzed for lead; lead concentration less than TTLC and less than ten times STLC.
[6] Sample also analyzed for lead; lead concentration (480 mg/kg) less than TTLC, and greater than ten times STLC; soluble lead concentration (1.1 mg/L) less than STLC.
[7] Sample also analyzed for Title 26 metals; all metal concentrations less than TTLC and less than ten times STLC.
[8] Sample also analyzed for volatile organic compounds (EPA 8240); no compounds detected above reporting limits.
[9] Sample also analyzed for Title 26 metals; lead concentration (120 mg/kg) less than TTLC, and greater than ten times STLC; soluble lead concentration (0.6 mg/L) less than STLC.
[10] Sample also analyzed for halogenated hydrocarbons (EPA 8010); no compounds detected above reporting limits
[11] Sample also analyzed for soluble lead; soluble lead not identified above reporting limits.
[12] Results obtained past the recommended holding time.
[13] Sample chromatogram does not match the pattern of the standard.
[14] Unknown compound (0.53 mg/kg) was identified outside the gasoline range, as reported by the laboratory.

TABLE 2
SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
2662 Fruitvale Avenue
Oakland, California
(mg/L)

Sample Location	Sample Date	TPH as Gasoline[1]	TPH as Motor Oil[2]	Benzene[3]	Toluene[3]	Ethyl-benzene[3]	Xylenes[3]
Monitoring Wells							
MW-F1	08-16-93[4]	<0.05	<0.5	<0.002	<0.002	<0.002	<0.002
	06-29-94	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005
	09-09-94	<0.9	--	<0.0009	<0.0009	<0.0009	<0.0009
	12-21-94	<0.05	--	<0 0005	<0 0005	<0.0005	<0.0005
	06-30-95	<0.05	--	<0 0005	<0.0005	<0.0005	<0.0005
MW-F2	08-16-93[4]	<0.05	<0.5	<0.002	<0.002	<0.002	<0.002
	06-29-94	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005
	09-09-94	<0.9	--	<0.0009	<0.0009	<0.0009	<0.0009
	12-21-94	0.096	--	<0.0005	<0.0005	<0.0005	<0.0005
	06-30-95	0.34	--	<0 0005	<0.0005	<0.0005	0.0005
MW-F3	08-16-93[4]	<0.1	<0.5	<0.002	<0.002	<0.002	<0.002
	06-29-94	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005
	09-09-94	<0.9	--	<0.0009	<0.0009	<0.0009	<0.0009
	12-21-94	0.13	--	<0.0005	0.0013	<0.0005	<0.0005
	06-30-95	0.11	--	<0.0005	<0.0005	<0.0005	<0.0005
MW-F4	09-09-94	3.4-3.5	--	0.029/0.028	0.0030/0.0028	0.038/0.033	0.094/0.099
	12-21-94	37	--	0.66	<0 1	2.3	5.9
	06-30-95	9.2	--	0.18	0.019	0.76	1.0
MW-F5	06-30-95	0.10	--	<0.0005	<0.0005	<0.0005	<0.0005
MW-F6	06-30-95	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005
MW-13	12-21-94	3.3	--	0.33	<0.013	0.024	0.24
	06-30-95	22	--	0.85	<0.0005	1.2	1.6

Table 2 - Summary of Analytical Results, Groundwater (*continued*)

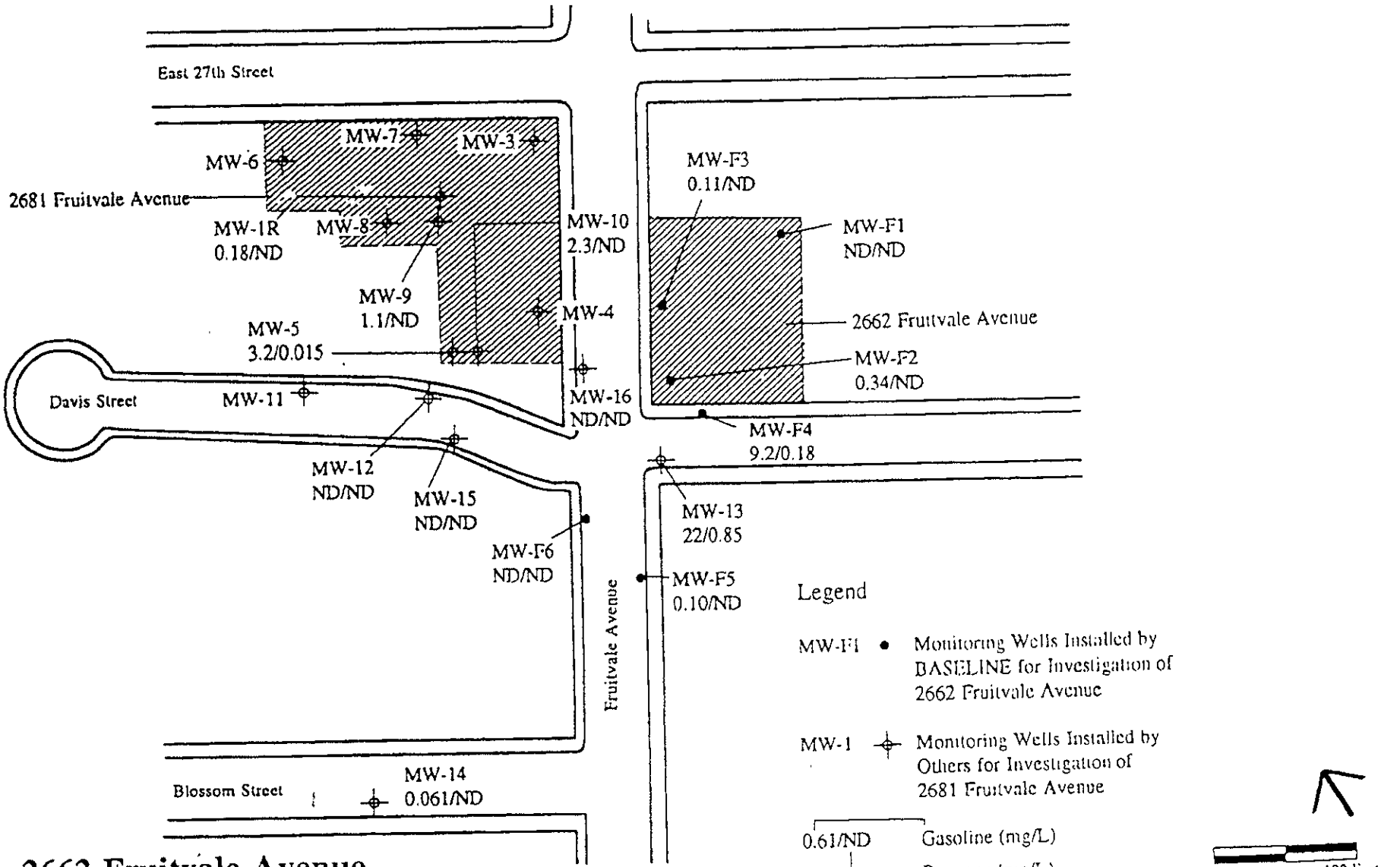
Sample Location	Sample Date	TPH as Gasoline[1]	TPH as Motor Oil[2]	Benzene[3]	Toluene[3]	Ethyl-benzene[3]	Xylenes[3]
Soil Borings							
F1[5]	1-20-93	13	<0.5	0.61	<0.018	0.83	0.046
F2[5,6]	1-20-93	6.8	<0.5	0.011	<0.002	0.016	<0.002
F5	1-20-93	<0.05	--	--	--	--	--
F7	1-20-93	<0.05	<0.5	--	--	--	--
Hydropunch							
HP-F1	9-09-94	26	--	0.46	0.16	1.5	4.4
HP-F3	9-09-94	0.21	--	0.0009	0.0007	0.0049	0.02
Wells Monitored by Others[7]							
MW-1R	06-30-95	0.18	--	<0.0005	<0.0005	0.0026	0.00069
MW-5	06-30-95	3.2	--	0.015	<0.005	0.02	0.0073
MW-9	06-30-95	1.1	--	<0.002	<0.002	0.041	0.064
MW-10	06-30-95	2.3	--	<0.005	<0.005	0.013	0.011
MS-12	06-30-95	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005
MW-14	06-30-95	0.061	--	<0.0005	<0.0005	<0.0005	<0.0005
MW-15	06-30-95	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005
MW-16	06-30-95	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005

Notes: <x.x = Compound not identified above reporting limits.
x.x = Bold values indicate compound identified above reporting limits.
x.x/x.x = Analytical testing results for duplicate samples.
– = Compound not analyzed.
TPH = Total Petroleum Hydrocarbons.
Sample locations are shown on Figures 2 and 3.
Laboratory reports for June 1995 groundwater analyses are included in Appendix D.

1 Test Method = EPA 5030/8015.
2 Test Method = EPA 3510/8015.
3 Test Method = EPA 602 or 624.
4 Water collected from open boreholes in January 1993.
5 Sample also analyzed for Title 26 metals; all metal concentrations less than STLC.
6 Sample contained trans-1,3-dichloropropene
7 Samples collected by Blaine Tech Services, Inc and analyzed by Sequoia Analytical.

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUNDWATER - 30 June 1995

Figure 4



2662 Fruitvale Avenue
Oakland, California

Source: Base Map - Modified from Groundwater Technology, Inc., 1993, Site Plan Map.

92404-120 8/1/95 CADD File N

BASELINE

02/02/01 14:19 FAX 510 238 7286 ENVIRONMENTAL SERVICES 014

January 30, 2001

Project No: 97-037

Mr. Joseph Cotton
City of Oakland Environmental Services
250 Frank H. Ogawa Plaza, Suite 5301
Oakland, CA 94612

Results of Semi-Annual Groundwater Monitoring on December 22, 2000
2662 Fruitvale Avenue
Oakland, California

Dear Mr. Cotton:

Innovative Technical Solutions, Inc. (ITSI) is pleased to provide the results of the semi-annual groundwater monitoring performed on December 22, 2000 for the property located at 2662 Fruitvale Avenue in Oakland. Additionally, a discussion of the periodic application of hydrogen peroxide in selected monitoring wells from August through December is provided.

Figure 3 shows the site layout and approximate location of the monitoring wells sampled as part of this semi-annual groundwater monitoring event. The semi-annual groundwater monitoring included monitoring seven monitoring wells, MW-F1 through MW-F6 and MW-13, and sampling five monitoring wells, MW-F2, MW-F4, MW-F5, MW-F6, and MW-13. Monitoring wells MW-F1 and MW-F3 were removed from the semi-annual monitoring program as suggested in the November 18, 1999, letter from Alameda County. Monitoring well MW-F2 was retained to provide an upgradient "background" water quality sample.

The purpose of this groundwater monitoring program is to identify changes in shallow groundwater quality at the site over time, including an evaluation of groundwater conditions that may serve as indicators of intrinsic bioremediation of petroleum hydrocarbons occurring beneath the site. On October 31, 1998, oxygen-releasing compounds (ORC) were placed in the saturated zone along the downgradient property line to enhance natural biodegradation of the petroleum hydrocarbons, and a petroleum hydrocarbon-absorbent sock was placed in MW-13 to recover available free product during this monitoring event. These events were documented in the *Completion Report, Treatment of Groundwater Impacted with Petroleum Hydrocarbons Using Enhanced Natural Bioremediation*, (Innovative Technical Solutions, Inc., December 28, 1998).

Table 1

Groundwater Elevations
2662 Fruitvale Avenue
Oakland, California

Monitoring Well ID	Casing Elevation[1] (feet)	Date Measured	Product Thickness (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)	Note
MW-F1	104.41	08/16/93	-	11.13	93.28	1
		06/29/94	-	10.38	93.53	1
		09/09/94	-	11.56	92.85	1
		12/21/94	-	8.96	95.45	1
		06/30/95	-	10.49	93.92	1
		12/29/95	-	9.38	95.03	1
		06/27/96	-	10.69	93.72	1
		12/13/96	-	8.55	95.86	1
		06/26/97	-	11.23	93.18	
		03/11/98	-	8.73	95.68	
		12/11/98	-	9.38	95.03	
		06/29/99	-	10.87	93.54	
		01/21/00	-	9.42	94.99	
		06/27/00	-	9.92	94.49	
		12/22/00	-	9.91	94.50	
MW-F2	102.22	08/16/93	-	12.15	90.07	1
		06/29/94	-	11.74	90.48	1
		09/09/94	-	12.21	90.01	1
		12/21/94	-	10.34	91.88	1
		06/30/95	-	11.32	90.90	1
		12/29/95	-	9.94	92.28	1
		06/27/96	-	11.51	90.71	1
		12/13/96	-	8.62	93.60	1
		06/26/97	-	11.96	90.26	
		03/11/98	-	7.70	94.52	
		12/11/98	-	10.40	91.82	
		06/29/99	-	11.42	90.80	
		01/21/00	-	10.32	91.9	
		06/27/00	-	10.47	91.75	
		12/22/00	-	10.52	91.70	
MW-F3	102.42	08/16/93	-	11.99	90.43	1
		06/29/94	-	11.40	91.02	1
		09/09/94	-	12.39	90.03	1
		12/21/94	-	9.32	93.10	1
		06/30/95	-	11.14	91.28	1
		12/29/95	-	10.08	92.34	1
		06/27/96	-	11.31	91.11	1
		12/13/96	-	8.76	93.66	1
		06/26/97	-	11.85	90.57	
		03/11/98	-	8.82	93.6	
		12/11/98	-	9.61	92.81	
		06/29/99	-	11.25	91.17	
		06/27/00	-	10.28	92.14	
		12/22/00	-	10.24	92.18	

ITSI

Table 1 (Continued)

Groundwater Elevations
2662 Fruitvale Avenue
Oakland, California

Monitoring Well ID	Casing Elevation[1] (feet)	Date Measured	Product Thickness (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)	Note
MW-F4	101.56	09/09/94	-	11.21	90.35	1
		12/21/94	-	8.00	93.56	1
		06/30/95	-	10.08	91.48	1
		12/29/95	-	8.52	93.04	1
		06/27/96	-	9.75	91.81	1
		12/13/96	-	6.61	94.95	1
		06/26/97	-	10.94	90.62	
		03/11/98	-	8.40[2]	-	
		12/11/98	-	9.40	92.16	
		06/29/99	-	10.36	91.20	
		01/21/00	-	8.11	93.45	
		06/27/00	-	9.43	92.13	
		10/6/00	-	10.80	90.76	
		11/13/00	-	9.50	92.06	
		12/22/00	-	10.80	90.76	
MW-F5	100.32	06/30/95	-	11.09	89.23	1
		12/29/95	-	9.37	90.95	1
		06/27/96	-	11.33	88.99	1
		12/13/96	-	8.72	91.60	1
		06/26/97	-	11.61	88.71	
		03/11/98	-	8.79	91.53	
		12/11/98	-	9.62	90.70	
		06/29/99	-	11.07	89.25	
		01/21/00	-	9.39	90.93	
		06/27/00	-	10.29	90.03	
		12/22/00	-	9.99	90.33	
MW-F6	100.11	06/30/95	-	10.96	89.15	1
		12/29/95	-	9.84	90.27	1
		06/27/96	-	10.98	89.13	1
		12/13/96	-	8.44	91.67	1
		06/26/97	-	11.35	88.76	
		03/11/98	-	8.60	91.51	
		12/11/98	-	10.12	89.99	
		06/29/99	-	10.96	89.15	
		01/21/00	-	9.37	90.74	
		06/27/00	-	10.12	89.99	
		12/22/00	-	9.85	90.26	

ITSI

Table 1 (Continued)

Groundwater Elevations
2662 Fruitvale Avenue
Oakland, California

Monitoring Well ID	Casing Elevation[1] (feet)	Date Measured	Product Thickness (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)	Note
MW-13	101 20	09/09/94	-	12.27	88 93	1
		12/21/94	-	9.32	91 88	1
		06/30/95	-	11 32	89.88	1
		12/29/95	-	9.00	92 20	1
		06/27/96	-	11 49	89 71	1
		12/13/96	-	8 28	92 92	1
		06/26/97	0 02	11 76	89.45[3]	
		03/11/98	0 02	8.11	93.11[3]	
		12/11/98	-	9.30	91.90	
		06/29/99	-	11.08	90.12	
		06/27/00	-	10.48	90 72	
		01/21/00	-	9 22	91 98	
		06/27/00	-	10.48	90 72	
		10/6/00	-	11.19	90.01	
		11/13/00	-	10 50	90.70	
		12/22/00	-	10.31	90.89	

[1] From Table 3, Groundwater Elevation and Gradient Determination Data, February 7, 1997, BASELINE.
[2] Depth to groundwater not stabilized.
[3] Groundwater elevation calculated assuming a specific gravity of 0.75 for product.

ITSI

Table 2

Summary of Laboratory Results for Groundwater Samples
2662 Fruitvale Avenue
Oakland, California

Monitoring Well ID	Date Sampled	TPHg (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethyl-benzene (mg/L)	Xylenes (mg/L)	Total Iron (mg/L)	Soluble Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Note
MW-F1	08/16/93	<0 05	<0 002	<0 002	<0 002	<0 002	-	-	-	-	1
	06/29/94	<0 05	<0 0005	<0 0005	<0 0005	<0 0005	-	-	-	-	1
	09/09/94	<0.9	<0.0009	<0 0009	<0.0009	<0.0009	-	-	-	-	1
	12/21/94	<0 05	<0 0005	<0 0005	<0 0005	<0 0005	-	-	-	-	1
	06/30/95	<0 05	<0 0005	<0 0005	<0 0005	<0 0005	-	-	-	-	1
	12/29/95	<0 05	<0.0005	<0 0005	<0.0005	<0 0005	-	-	-	-	1
	12/13/96	-	-	-	-	-	-	<0.10	8.5	38	1
	06/26/97	<0 05	<0.0005	<0 0005	<0 0005	<0.0005	0.1	<0 10	7.7	38	
	03/11/98	<0 05	<0.0005	<0.0005	<0 0005	<0 0005	0.90	<0 10	11	38	
	12/11/98	<0.05	<0 0005	<0.0005	<0.0005	<0.0005	<0 10	<0.10	7.1	38	
	06/29/99	<0.05	<0 0005	<0.0005	<0.0005	<0 0005	<0.10	<0 10	30	35	
	No longer part of semi-annual monitoring program										
MW-F2	08/16/93	<0.05	<0 002	<0.002	<0 002	<0.002	-	-	-	-	1
	06/29/94	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	09/09/94	<0.9	<0.0009	<0.0009	<0 0009	<0.0009	-	-	-	-	1
	12/21/94	0.096	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	06/30/95	0.34	<0.0005	<0.0005	<0.0005	0.0005	-	-	-	-	1
	12/29/95	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	06/27/96	0.064	[redacted]	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	12/13/96	0.06	<0 0005	<0.0005	<0.0005	<0.0005	-	0.24	0.20	8	1
	06/26/97	<0.05	<0 0005	<0.0005	<0.0005	<0 0005	0.1	<0.10	<0.05	7.4	
	03/11/98	0.20	0.00088	<0.0005	<0.0005	<0.0005	4.8	0.18	<0.05	7.1	
	12/11/98	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.25	<0.10	<0 05	7.8	
	06/29/99	<0.05	<0.0005	<0.0005	<0.0005	<0 0005	<0.10	<0.10	<1.0	<1.0	
	01/21/00	<0.05	<0 0005	<0.0005	<0.0005	<0.0005	<0.10	<0 10	<0.2	9	
	06/27/00	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	53	<0.10	<1.0	2	
	12/22/00	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.10	<0.10	<1.0	9.9	
MW-F3	08/16/93	<0 1	<0.002	<0.002	<0.002	<0.002	-	-	-	-	1
	06/29/94	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	09/09/94	<0.9	<0.0009	<0.0009	<0.0009	<0.0009	-	-	-	-	1
	12/21/94	0.13	<0.0005	0.0013	<0 0005	<0.0005	-	-	-	-	1
	06/30/95	0.11	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	12/29/95	0.35	0.0008	<0.0005	0.0012	0.0007	-	-	-	-	1
	06/27/96	0.088	[redacted]	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	12/13/96	0.18	<0.0005	<0.0005	<0.0005	<0.0005	-	0.11	0.69	23	1
	6/26/97	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.46	0.16	0.70	23	
	3/11/98	<0.05	<0.0005	<0.0005	<0 0005	<0.0005	0.11	0.20	2.5	28	
	12/11/98	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.31	0.12	0.97	30	
	6/29/99	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.10	<0.10	3	38	
	No longer part of semi-annual monitoring program										

Table 2 (Continued)

Summary of Laboratory Results for Groundwater Samples
2662 Fruitvale Avenue
Oakland, California

Monitoring Well ID	Date Sampled	TPHg (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethyl-benzene (mg/L)	Xylenes (mg/L)	Total Iron (mg/L)	Soluble Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Note
MW-F4	09/9/94*	3.5	0.029	0.003	0.038	0.099	-	-	-	-	1
	12/21/94	37	0.66	28	2.3	5.9	-	-	-	-	1
	06/30/95	9.2	0.18	<0.1	0.76	1.0	-	-	-	-	1
	12/29/95	38	0.61	0.019	4.3	5.8	-	-	-	-	1
	06/27/96	6.2	0.081	0.14	0.52	0.29	-	-	-	-	1
	12/13/96	27	0.39	0.05	3.2	3.7	-	6.6	<0.05	<2	1
	06/26/97	6.2	0.16	0.018	0.71	0.32	2.4	3.1	<0.05	0.2	
	03/11/98	9.5	0.062	0.03	1.0	0.80	1.2	3.0	<0 05	<0.1	
	12/11/98	12	0.34	0.051	2.0	0.62	5.7	5.9	<0 05	1.5	
	06/29/99	10	0.23	0.032	1.8	0.30	0.93	0.90	<1.0	9	
	01/21/00	7.9	0.033	<0 005	1.0	0.25	13	2.7	<0.2	<1 0	
	06/27/00	10	0.08	<0.025	1.1	0.32	160	<0.10	<1.0	<1 0	
	10/6/00	3	0.011	0.0018	0.12	0.069	0.24	<0.10	2.1	38	
	11/13/00	3.9	0.039	0.016	0.84	0.30	0.14	<0.10	<1.0	13	
	12/22/00	4.7	0.054	0.0096	0.85	0.34	0.32	0.17	<1.0	11	
MW-F5	06/30/95	0.10	<0 0005	<0.0005	<0 0005	<0.0005	-	-	-	-	1
	12/29/95	<0.05	<0.0005	<0 0005	<0.0005	0.0007	-	-	-	-	1
	06/27/96	<0.05	<0 0005	<0.0005	<0.0005	<0 0005	-	-	-	-	1
	12/13/96	<0.05	<0 0005	<0.0005	<0.0005	<0.0005	<0.10	<0 10	6.6	45	1
	06/26/97	<0 05	0.00320	0.0064	0.00073	0.0042	0.21	<0.1	6.1	45	
	03/11/98	<0 05	<0.0005	<0.0005	<0.0005	<0.0005	<0.10	<0.10	6.1	45	
	12/11/98	<0 05	<0.0005	<0.0005	<0.0005	<0 0005	0.58	0.19	6.0	41	
	06/29/99	<0.05	<0.0005	<0 0005	<0.0005	<0.0005	<0 10	<0.10	23	50	
	01/21/00	<0.05	<0 0005	<0.0005	<0.0005	<0.0005	0.14	<0.10	5.2	42	
	06/27/00	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	60	<0.10	20	37	
	12/22/00	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.10	<0.10	23	56	
MW-F6	06/30/95	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	12/29/95	<0.05	<0.0005	<0 0005	<0.0005	<0.0005	-	-	-	-	1
	06/27/96	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	1
	12/13/96	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	–	<0.10	0.44	39	1
	06/26/97	<0.05	<0.0005	<0 0005	<0.0005	<0 0005	0.22	0.18	<0.05	47	
	03/11/98	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.10	<0.10	0.14	49	
	12/11/98	<0 05	<0.0005	<0.0005	<0.0005	<0.0005	0.24	0.11	0.06	43	
	06/29/99	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.10	0.93	<1.0	54	
	01/21/00	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.11	<0.10	0.5	42	
	06/27/00	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	10	<0.10	<1.0	9	
	12/22/00	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	0.29	0.15	1.1	61	

ITSI

Table 2 (Continued)

Summary of Laboratory Results for Groundwater Samples
2662 Fruitvale Avenue
Oakland, California

Monitoring Well ID	Date Sampled	TPHg (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethyl-benzene (mg/L)	Xylenes (mg/L)	Total Iron (mg/L)	Soluble Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Note
MW-13	12/21/94	3.3	0.33	<0 013	0.024	0.24	-	-	-	-	1
	06/30/95	22	0.85	<0 0005	1.2	1.6	-	-	-	-	1
	12/29/95	22	0.97	0.078	1.8	2.4	-	-	-	-	1
	06/27/96	18	0.63	0.026	1.1	1.0	-	-	-	-	1
	12/13/96	16	0.67	0.04	1.2	1.0	–	6.8	<0.05	<2	1
	6/26/97*	11	0.42	0.037	0.64	0.26	7.7	6.9	<0.05	0.3	
	3/11/98*	13	0.30	<0.025	0.89	0.51	4.3	6.7	<0.05	2.3	
	12/11/98	12	0.45	0.048	0.91	0.48	6.6	7.0	<0.05	16	
	06/29/99	7	0.24	0.13	0.44	0.11	1.3	1.3	<1.0	11	
	01/21/00	7.3	0.036	<0 005	0.62	0.22	7.3	6.9	<0.2	<1.0	
	06/27/00	6.1	0.11	<0.025	0.27	0.038	15	<0.10	1	2	
	10/6/00	4.6	0.10	<0.025	0.19	0.036	4.3	3.5	<1	5.4	
	11/13/00	6.0	0.092	0.035	0.47	0.12	4.5	1.4	1.1	1.7	
	12/22/00	9.2	<0.024	0.033	0.53	0.12	6.7	6.7	1.0	<1 0	
MCL	–	–	0.001	0.150	0 700	1.75	–	–	–	–	

Note: Bold indicates detected concentrations. Shaded indicates concentrations exceeding MCLs.
1 Historical laboratory data provided by Baseline Environmental Consulting.
* Higher concentration reported for either the sample or field duplicate sample (QC/1)

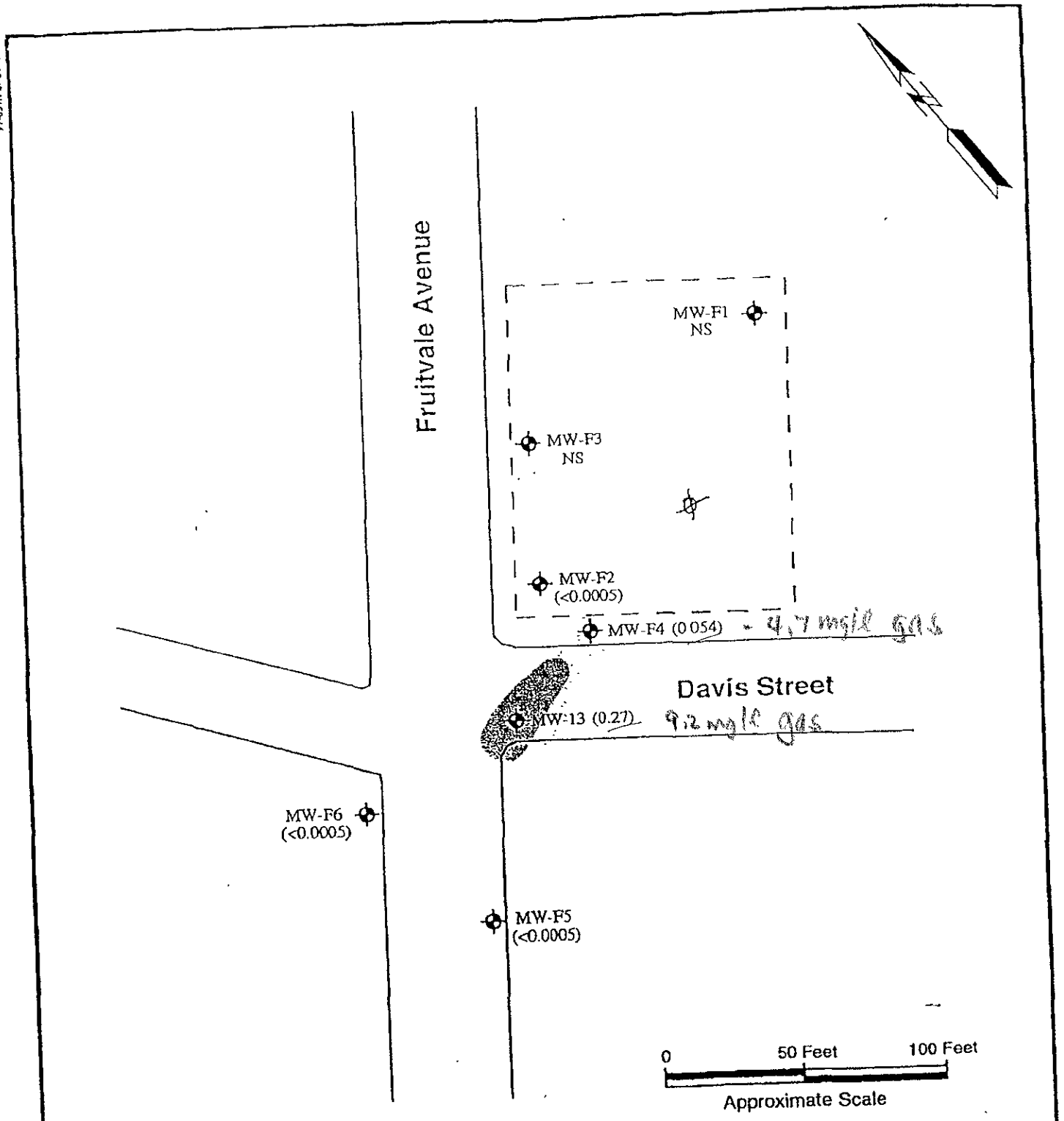
ITSI

Table 3

Bioremediation Indicator Parameters
2662 Fruitvale Avenue
Oakland, California

Monitoring Well ID	Date	Total Iron (mg/L)	Soluble Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Dissolved Oxygen (mg/L)	ORP (mV)
MW-F2	1/23/00	<0.10	<0.10	<0.2	9	8.63	121
	6/27/00	53	<0.10	<1.0	2	NA	130
	12/22/00	<0 10	<0.10	<1.0	9.9	9 12	155
MW-F4	1/23/00	13	2.7	<0.2	<1.0	9.19	81
	6/7/00	160	<0.10	<1.0	<1.0	NA	-57
	10/6/00	0.24	<0.10	2.1	38	17.37	283
	11/13/00	0.14	<0.10	<1.0	13	19 23	164
	12/22/00	0.32	0.17	<1.0	11	7.95	164
MW-F5	1/23/00	0.14	<0.10	5.2	42	8.53	189
	6/27/00	60	<0.10	20	37	NA	157
	12/22/00	<0.10	<0.10	23	56	9.69	95
MW-F6	1/23/00	0.11	<0.10	0.5	42	9.17	156
	6/27/00	10	<0.10	<1.0	9	NA	141
	12/22/00	0.29	0.15	1.1	61	8.82	100
MW-13	1/23/00	7.3	6.9	<0.2	<1.0	9.15	87
	6/7/00	15	<0.10	1.0	2	NA	-48
	10/6/00	4.3	3.5	<1.0	5.4	0.80	-36
	11/13/00	4.5	1.4	1.1	1.7	0.06	9.23
	12/22/00	6.7	6.7	1.0	<1.0	8.22	56

ITSI



Legend

Approximate Location of Monitoring Wells

0.035 Concentration of benzene in mg/L

Benzene ≥ 0.001 mg/L

Benzene ≥ 0.01 mg/L

Benzene ≥ 0.1 mg/L

Source: Modified from Figure 3, Groundwater Elevation Contour Map, 13 December 1996, BASELINE.

FIGURE 3

LABORATORY RESULTS FOR BENZENE FOR SAMPLES COLLECTED ON DECEMBER 22, 2000

2662 Fruitvale Avenue
Oakland, California

CITY OF OAKLAND

ITSI
INNOVATIVE TECHNICAL SOLUTIONS, INC.

97-037/F 4-Graphs

Figure 4a: Graph of Historical Concentrations of TPHg in MW-F4 and MW-13

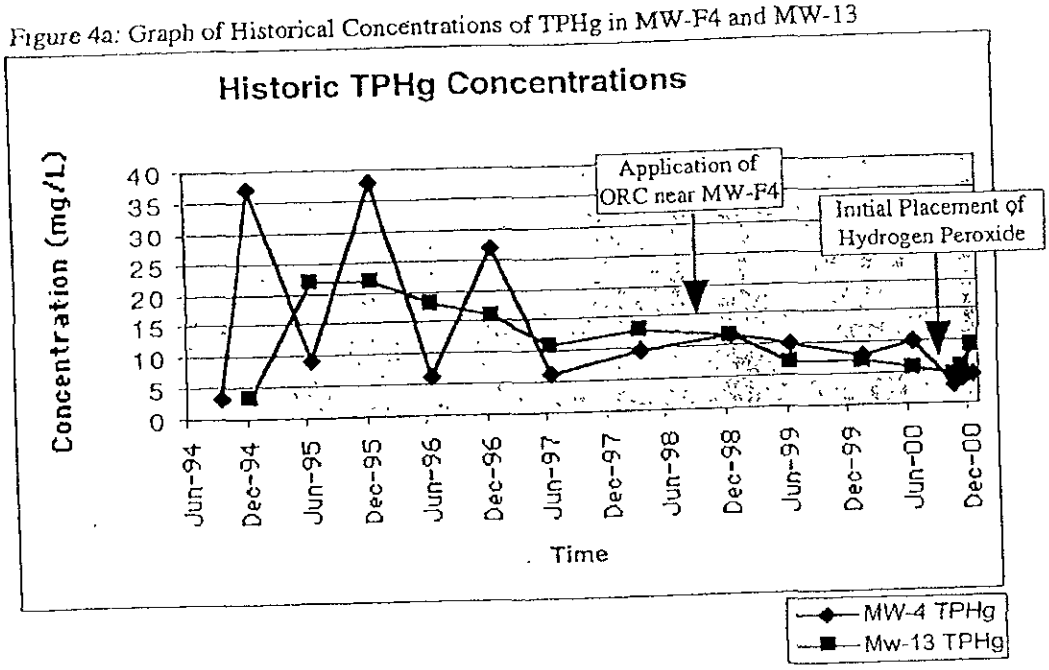


Figure 4b: Graph of Historical Concentrations of TPHg in MW-F4 and MW-13

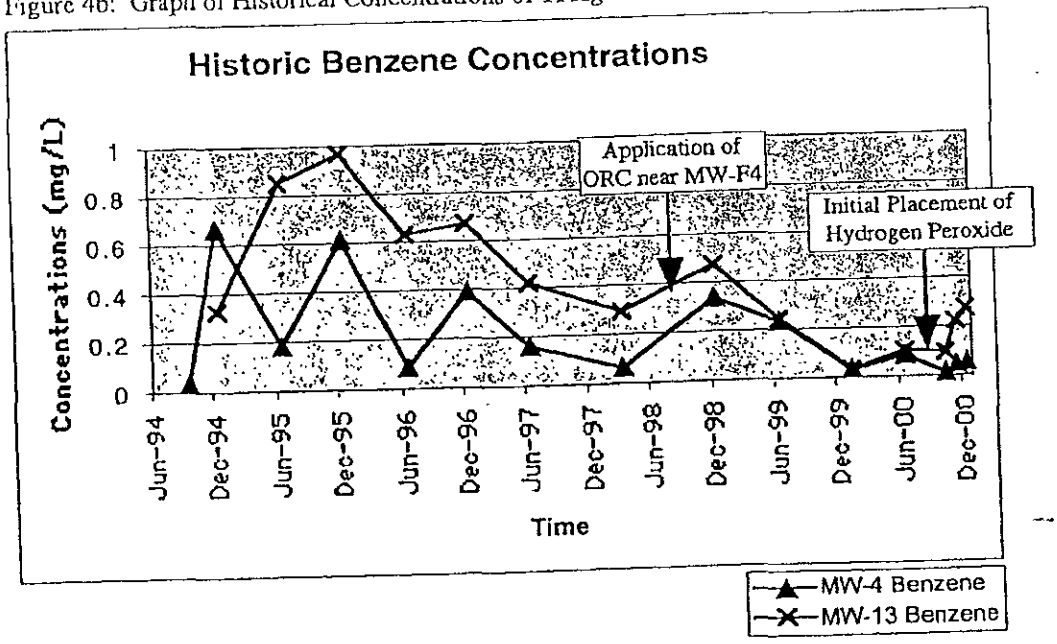


FIGURE 4

GRAPHS OF HISTORICAL CONCENTRATION TRENDS FOR TPHg AND BENZENE

2662 Fruitvale Avenue
Oakland, California

CITY OF OAKLAND

ITSI
INNOVATIVE TECHNICAL SOLUTIONS, INC.

Appendix B

Risk Screening Evaluations

CAMBRIA

March 1, 2001

Mr. Joseph Cotton
City of Oakland -Public Works Agency
Environmental Services - Dalziel Building
250 Frank H. Ogawa Plaza, Suite 5301
Oakland CA 94612

Re: **Risk Screening Evaluation**
2662 Fruitvale Avenue
Oakland, California 94621

Dear Mr. Cotton:

Cambria Environmental Technology, Inc. (Cambria) is pleased to provide the City of Oakland (City) with this risk screening evaluation for subsurface compounds at the site referenced above (Site). We understand that the Site was previously occupied by a automobile service station and is to be redeveloped for residential use. This evaluation compares soil and groundwater concentrations primarily to risk-based screening levels in the City of Oakland May 17, 1999 *Oakland Risk-Based Corrective Action: Technical Background Document.* To evaluate lead concentrations in soil, lead concentrations were compared to screening levels in EPA Region 9 Preliminary Remediation Goals. Presented below are a site summary and our risk screening evaluation, conclusions, discussion and recommendations.

SITE SUMMARY

This site summary is based on Cambria's review of the following reports: 1) September 1993 *Phase III Soil and Groundwater Investigation* by Baseline Environmental Consulting (Baseline), 2) September 1995 *Supplemental Groundwater Investigation* by Baseline, and 3) January 30, 2001 *Results of Semi Annual Groundwater Monitoring* by Innovative Technical Solutions, Inc. (ITSI). Previous consultant figures and tables presenting the investigation and analytical data reviewed by Cambria are included as Attachment A.

Site Location and UST Status: The Site is located on the northeast corner of Fruitvale Avenue and Davis Street in Oakland, California. Cambria understands that an automobile service station occupied the Site from the 1940s until 1978. The underground storage tanks (USTs), including three gasoline USTs and one additional UST (presumably used for waste oil storage), were removed from the Site in 1978. The City of Oakland purchased the property from Texaco in 1983.

Oakland, CA
San Ramon, CA
Sonoma, CA
Portland, OR

Cambria
Environmental
Technology, Inc.

5144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

Lithology: Vadose zone soils consist primarily of clays. Below approximately 8-10 ft bgs, sands and gravels are encountered. In the north-eastern portion of the site, sands were encountered between 1 and 4 ft bgs in borings MW-F1, F-11, and F-13. The City of Oakland May 17, 1999 *Oakland Risk-Based Corrective Action: Technical Background Document* provides three general categories for soils within the City of Oakland: Merritt sands, sandy silts, and clayey silts. Based on the boring logs included in the reports reviewed by Cambria and on the site location and regional geology, the site soil type is "clayey silt."

Groundwater Depth and Flow Direction: Depth to groundwater is approximately 8 to 11 ft below ground surface (bgs), and groundwater flows towards the west-southwest with an approximate gradient of 0.02 ft/ft.

Contaminants of Concern: Petroleum hydrocarbons have been detected in onsite and offsite soil and groundwater. The petroleum compounds of concern are benzene, toluene, ethylbenzene, and xylenes (BTEX). Lead has been detected in site soil. Tabulated data from the September 1993 *Phase III Soil and Groundwater Investigation Report*, the September 1995 *Supplemental Groundwater Investigation Report* and the January 30, 2001 *Results of Semi-Annual Groundwater Monitoring* are presented in Attachment A.

Contaminant Distribution: Consistent with leakage from former USTs and subsequent migration via groundwater, petroleum hydrocarbons in soil occur primarily at depths of 8 to 11 ft bgs. Potentially elevated concentrations of lead occur in two shallow soil (0 to 3 ft bgs) locations (F-4 and F-6). In groundwater, petroleum hydrocarbons are primarily located offsite (downgradient) beneath the sidewalk (well MW-F4) and Davis Street (MW-13). During the past year (three semi-annual monitoring events), no petroleum hydrocarbons were detected in onsite groundwater.

RISK SCREENING EVALUATION

For the purposes of this evaluation, Cambria assumes no restrictions on future siting of residential buildings within the Site. Areas not within the footprint of any future building are assumed unpaved. Cambria assumes that site groundwater is not a current or potential future drinking water source. This evaluation uses a 1 meter (3.3 ft) bgs cutoff point between surficial and subsurface soil, consistent with the City of Oakland May 17, 1999 *Oakland Risk-Based Corrective Action: Technical Background Document.*

Exposure Scenarios: Based on assumed future site use, potential future residential exposure scenarios would include inhalation of onsite indoor and outdoor air, direct dermal contact with surficial soil, and soil ingestion/particulate inhalation.

Risk Screening Levels: Cambria used risk screening levels for BTEX as published by the City of Oakland in its May 17, 1999 *Oakland Risk-Based Corrective Action: Technical Background Document.* The City of Oakland did not publish a screening level for lead, so we used the EPA Region 9 Preliminary Remediation Goal (PRG) as a screening level. The San Francisco Bay Regional Water Quality Control Board (RWQCB - SFBR) recently published RBSLs for soil and groundwater (August 2000 *Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater*, Interim Final) that cover the City of Oakland as well as the San Francisco Bay Area. Cambria confirmed with Dr. Roger Brewer of the RWQCB that the RWQCB-SFBR continues to endorse the City of Oakland risk-based screening levels (RBSLs) and site-specific target levels (SSTLs).

Representative Concentrations: Cambria used maximum detected concentrations for BTEX and lead within each onsite medium: surficial soil (0 to 3.3 ft bgs), subsurface soil (>3.3 ft bgs), and groundwater. The surficial and subsurface soil data sets include all analytical results for onsite soil samples in the reports reviewed by Cambria. The groundwater data set includes analytical results for samples collected from onsite monitoring wells during the past year (semi-annual monitoring events conducted on January 21, 2000, June 27, 2000 and December 22, 2000). To be additionally conservative, Cambria also used maximum concentrations for BTEX within soil and groundwater immediately adjacent the site (from offsite boring MW-F4 and offsite wells MW-F4 and MW-13). For offsite groundwater, Cambria used the maximum concentration detected within the past year (year 2000). Maximum hydrocarbon and lead concentrations are presented below in Tables A and B, respectively.

Comparison to Screening Levels: Table A below presents Cambria's comparison of screening levels and the maximum onsite and offsite hydrocarbon concentrations. Since screening levels for inhalation of indoor air are more restrictive than levels for inhalation of outdoor air, Cambria evaluated inhalation exposure to indoor air only. Table B below presents Cambria's comparison for lead concentrations.

Table A - Results of Hydrocarbon Exposure Pathways (Residential)
Based on Onsite and Offsite Concentrations using
City of Oakland Tier 2 SSTLs for Clayey Silt

Exposure Scenario	Target Risk Level	SSTL	Maximum Site Concentration	Result
Benzene				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	3.3 mg/kg	0.3 mg/kg (onsite) 1.7 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	1.4 mg/l	<0.005 mg/l (onsite) 0.270 mg/l (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	19 mg/kg	<0.2 mg/kg	Potential health risk is below target level.
Toluene				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	1,600 mg/kg	3.7 mg/kg (onsite) 11 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	>SOL	<0.005 mg/l (onsite) 0.035 mg/l (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	7,100 mg/kg	0.75 mg/kg	Potential health risk is below target level.
Ethylbenzene				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	SAT	8.8 mg/kg (onsite) 66 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	>SOL	<0.005 mg/l (onsite) 1.1 mg/l (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	3,900 mg/kg	3.4 mg/kg	Potential health risk is below target level.
Xylenes				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	SAT	17 mg/kg (onsite) 230 mg/kg (offsite)	Potential health risk is below target level.
Volatilization from groundwater to indoor air	$1x10^{-5}$	>SOL	<0.005 mg/l (onsite) 0.34 mg (offsite)	Potential health risk is below target level.
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-5}$	53,000 mg/kg	1.5 mg/kg	Potential health risk is below target level.

SSTL = Site Specific Target Level
SAT = SSTL exceeds saturated soil concentration of chemical
>SOL = SSTL exceeds solubility of chemical in water
NA = Not applicable

Table B - Results of Lead Exposure Pathways (Residential)
Based on Lead Concentrations using
EPA Region 9 Preliminary Remediation Goal

Exposure Scenario	Target Risk Level	SSTL	Maximum Site Concentration	Result
Lead				
Volatilization from subsurface soil to indoor air	$1x10^{-5}$	NA	NA	NA
Volatilization from groundwater to indoor air	$1x10^{-5}$	NA	NA	NA
Ingestion/ Inhalation/ dermal contact with surficial soil	$1x10^{-6}$	400 mg/kg (EPA PRG)	480 mg/kg	Maximum site concentration exceeds SSTL.

SSTL = Site-Specific Target Level
NA = Not applicable

CONCLUSIONS

Petroleum hydrocarbon concentrations in site soil and groundwater do not exceed the site-specific target levels in the Oakland risk-based corrective action guidance document. This suggests that residual hydrocarbons onsite and immediately adjacent to the site do not pose a significant risk to human health. Lead concentrations, however, in one shallow soil sample (480 mg/kg in F4-2' located 2 ft bgs) slightly exceeded the EPA PRG risk screening criteria of 400 mg/kg.

DISCUSSION

Cambria's risk screen evaluation is based primarily on guidance provided by the City of Oakland. During a conversation on February 21, 2001, Mr. Roger Brewer of the RWQCB-SFBR suggested that Cambria use the May 17, 1999 *Oakland Risk-Based Corrective Action: Technical Background Document* for our risk screening. Dr. Roger Brewer is the author of the RWQCB-SFBR guidelines published in its August 2000 *Application of Risk Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater.*

The Oakland guidance document, like the EPA Region 9 PRG document, does not include risk screen levels for total petroleum hydrocarbons (TPH). TPH is a combination of many specific compounds, including compounds like BTEX. Dr. Brewer stated that the TPH risk screening criteria in the RWQCB guidance document are flexible and also reflect nuisance concerns. It is Cambria's opinion that TPH as gasoline (TPHg) concentrations detected in deeper site soil (approximately 10 ft bgs) do not pose a significant human health risk since the BTEX concentrations are below risk screen levels. However, TPHg detected at a concentration of 940 mg/kg (at 2 ft bgs in boring F4), exceeds the TPHg ceiling value of 500 mg/kg, and may pose a potential nuisance. (Ceiling values for TPH in soil and groundwater are recommended to protect against nuisance odors). The detected TPHg in soil has likely partially or fully biodegraded. Residual TPHg could be removed during future site construction grading or foundation preparation. The 940 mg/kg TPHg concentration was detected in the same sample as the lead concentration of concern.

To provide a very conservative risk screening evaluation, Cambria used maximum concentrations in nearby offsite groundwater. A thickness of approximately 0.1 ft of free product has been observed in well MW-13, which is located approximately 40 ft hydraulically downgradient of the site. Free product is limited to offsite well MW-13.

RECOMMENDATIONS

Cambria recommends removal of shallow soil near sample location F4-2', where lead and TPHg were detected. The excavation and removal could be conducted during future site construction grading or foundation preparation. After removal of the shallow lead-bearing and TPHg-bearing soil, additional analyses are recommended to confirm that residual lead concentrations in soil are beneath human health screening levels, and that residual TPHg concentrations are below nuisance concern levels. The City may wish to conduct additional soil sampling for lead and other metals before or during future site development, especially for any unpaved areas.

CLOSING

Cambria appreciates the opportunity to provide environmental consulting services to the City of Oakland. Please contact Bob Clark-Riddell at (510) 420-3303 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Robert W. Schultz, R.G.
Project Geologist

Bob Clark-Riddell, P.E.
Principal Engineer

I:\City of Oakland\2662 Fruitvale\Risk Screening2.wpd

Attachment: A - Soil and Groundwater Data and Figures from Site Investigations

Appendix C

Regulatory Approval of Remediation Workplan

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

September 24, 2001
StID 4457/ RO00000238

Mr. Joseph Cotton
City of Oakland Public Works
250 Frank H. Ogawa Plaza, Suite 5301
Oakland CA 94612-2034

Re: Remediation Workplan for 2662 Fruitvale Ave., Oakland CA 94601

Dear Mr. Cotton:

Our office has received and reviewed the September 17, 2001 Remediation Workplan for the referenced property as prepared by Cambria Environmental, your consultant. This work plan follows conversations with you and Mr. Bob Clark-Riddell of Cambria. The proposal includes a number of tasks, which intend to lead to regulatory site closure and residential development of this parcel. Because of the intended future use, additional remediation is proposed to provide additional insurance against potential health concerns.

As you are aware, the following tasks are proposed:

- Perform a utility, conduit and sensitive receptor survey. This includes a well survey within a ¼ mile radius of the site and passing out a questionnaire to homes within a 200 feet radius.
- Perform limited soil excavation near soil sample F4-2', where elevated lead and TPH as motor oil was found. Confirmation soil samples will be collected and analyzed after excavation.
- Install a trench approximately 20'x2'x10' up-gradient of the TPH plume and add approximately 500 pounds of oxygen releasing compound (ORC) within the capillary zone.
- Introduce an approximate 7.5% solution of hydrogen peroxide solution into site wells MW-F4 and MW-13, weekly over a period of four weeks.
- Prepare and submit a Risk Management Plan to be included with the site closure document and implemented during site development.

These tasks are approved. Please monitor wells MW-F4 and MW-13 and consider additional hydrogen peroxide addition if necessary. Your work plan was not explicit in stating the amount of this chemical, which will be added to these wells. The work plan also requests concurrence to close wells MW-F1 through MW-F3. Due to the proximity of MW-F2 to the areas of chemical addition, we request that MW-F2 not be closed, however, the other two well may be closed. Once the excavation has occurred, our office is prepared to approve on-site residential development. Site closure is reserved for the completion of the mentioned tasks and successful treatment of wells MW-F4 and MW-13,

Please keep our office informed of the progress in this remediation. You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. B. Clark-Riddell, Cambria Environmental, 1144 65th St., Suite B, Oakland CA 94608
Renwp2662Fruitvale

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

September 27, 2001
StID 4457/ RO0000238

Mr. Joseph Cotton
City of Oakland Public Works
250 Frank H. Ogawa Plaza, Suite 5301
Oakland CA 94612-2034

Re: Remediation Workplan for 2662 Fruitvale Ave., Oakland CA 94601

Dear Mr. Cotton:

This letter recounts our conversation of September 26, 2001 and approves the closure of monitoring MW-F2 in addition to MW-F1 and MW-F3. It was agreed that there would not be any significant loss of information with the closure of this well.

Please notify our office when you proceed with the previously approved tasks of your remediation work plan.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. B. Clark-Riddell, Cambria Environmental, 1144 65th St., Suite B, Oakland CA 94608
WellMWF2

Appendix D

Laboratory Analytical Report

McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1664; City of Oakland @ Fruitvale	Date Sampled: 11/28/01
		Date Received: 11/29/01
	Client Contact: Bob Clark Riddel	Date Extracted: 11/29-11/30/01
	Client P.O:	Date Analyzed: 11/29-11/30/01

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602, California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
84444	ST-1-6	S	33,b,j	---	ND	ND	0.032	0.062	---#
84445	SP-1-4	S	ND	---	ND	ND	ND	ND	103
84446	TP-1 NW	S	ND	---	ND	ND	ND	ND	101
84447	TP-2 SW	S	ND	---	ND	ND	ND	ND	103
84448	TP-3 SE	S	ND	---	ND	ND	ND	ND	105
84449	TP-4 NE	S	ND	---	ND	ND	ND	ND	102
84450	TP-5 bottom	S	ND	---	ND	ND	ND	ND	97
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

cluttered chromatogram; sample peak coelutes with surrogate peak

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?), f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone . 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail· main@mccampbell com

Cambria Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1664; City of Oakland @ Fruitvale	Date Sampled: 11/28/01
		Date Received: 11/29/01
	Client Contact: Bob Clark Riddel	Date Extracted: 11/29/01
	Client P.O:	Date Analyzed: 11/29/01

Kerosene Range (C9-C18) and Oil-Range (C18+) Extractable Hydrocarbons as Kerosene and Motor Oil*

EPA methods modified 8015, and 3550 or 3510, California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(k)+	TPH(mo)+	% Recovery Surrogate
84444	ST-1-6	S	28,e	5.3	100
84445	SP-1-4	S	4.0,g	65	95
84446	TP-1 NW	S	ND	ND	102
84447	TP-2 SW	S	ND	ND	89
84448	TP-3 SE	S	ND	ND	102
84449	TP-4 NE	S	ND	ND	92
84450	TP-5 bottom	S	ND	ND	92
Reporting Limit unless otherwise stated, ND means not detected above the reporting limit		W	50 ug/L	250 ug/L	
		S	1.0 mg/kg	5.0 mg/kg	

*water samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant), d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1664; City of Oakland @ Fruitvale	Date Sampled: 11/28/01
		Date Received: 11/29/01
	Client Contact: Bob Clark Riddel	Date Extracted: 11/29/01
	Client P.O:	Date Analyzed: 11/29/01

Lead*

EPA analytical methods 6010/200.7, 239.2+

Lab ID	Client ID	Matrix	Extraction °	Lead*	% Recovery Surrogate
84444	ST-1-6	S	TTLC	94	N/A
84445	SP-1-4	S	TTLC	15	N/A
84446	TP-1 NW	S	TTLC	10	N/A
84447	TP-2 SW	S	TTLC	73	N/A
84448	TP-3 SE	S	TTLC	28	N/A
84449	TP-4 NE	S	TTLC	8.0	N/A
84450	TP-5 bottom	S	TTLC	74	N/A
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		S	TTLC	3.0 mg/kg	
		W	TTLC	0.005 mg/L	
		---	STLC,TCLP	0.2 mg/L	

* soil and sludge samples are reported in mg/kg, wipe samples in ug/wipe, and water samples and all STLC / SPLP / TCLP extracts in mg/L

+Lead is analysed using EPA method 6010 (ICP)for soils, sludges, STLC & TCLP extracts and method 239.2 (AA Furnace) for water samples

@ DISTLC extractions are performed using STLC methodology except that deionized water is substituted for citric acid buffer as the extraction fluid. DISTLC results are not applicable to STLC regulatory limits.

° EPA extraction methods 1311(TCLP), 3010/3020(water,TTLC), 3040(organic matrices,TTLC), 3050(solids,TTLC); STLC - CA Title 22

surrogate diluted out of range; N/A means surrogate not applicable to this analysis

& reporting limit raised due to matrix interference

i) *liquid sample that contains greater than ~2 vol. % sediment;* this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Ave. South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC REPORT

EPA 8015m + 8020

Date: 11/29/01 **Matrix:** Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 112801	Extraction: EPA 5030				Instrument: GC-12		
Surrogate1	ND	97.000	98.000	100.00	97	98	1.0
Xylenes	ND	0.316	0.326	0.30	105	109	3.1
Ethylbenzene	ND	0.104	0.108	0.10	104	108	3.8
Toluene	ND	0.100	0.103	0.10	100	103	3.0
Benzene	ND	0.097	0.100	0.10	97	100	3.0
MTBE	ND	0.085	0.086	0.10	85	86	1.2
TPH (gas)	ND	0.937	0.944	1.00	94	94	0.7
SampleID: 112801	Extraction: EPA 3550				Instrument: GC-6 A		
Surrogate1	ND	86.000	86.000	100.00	86	86	0.0
TPH (diesel)	ND	132.500	131.000	150.00	88	87	1.1

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} 2\,100$$

RPD means Relative Percent Deviation

McCAMPBELL ANALYTICAL INC.
110 2nd Ave. South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC REPORT

Date: 11/29/01 **Extraction:** TTLC **Matrix:** Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 112801					Instrument: P-1 | AA		
Lead	ND	4.9	4.9	5.00	98	97	1.4

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation

28478 zc538

RUSH

McCAMPBELL ANALYTICAL INC.

1534 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (925) 798-1620 Fax: (925) 798-1622

Report To: ~~Ron Scheele~~ BOB CLARKE-RIDDELL Bill To: CAMBRIA

Company: Cambria Environmental Technology

~~6262 Hollis Street~~ 1144 65TH STREET, SUITE B

~~Emeryville, CA 94608~~ OAKLAND, CA 94608

Tele: (510) ~~450-1981~~ 420-3303 Fax: (510) ~~450-8295~~ 420-9170

Project #: 153-1664 Project Name: CITY OF OAKLAND @ FRUITVALE

Project Location: 2662 FRUITVALE AVE., OAKLAND

Sampler Signature:

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☒ 24 HOUR ☐ 48 HOUR ☐ 5 DAY

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other
ST-1	TRENCH STOCKPILE	11/28/01	3 pm	1	brass tube		X				X			
ST-2														
ST-3														
ST-4														
ST-5														
ST-6														
COMPOSITE SAMPLES		ST-1		THROUGH		ST-6								
SP-1	PIT STOCKPILE	11/28/01	5 pm	1	brass tube		X				X			
SP-2														
SP-3														
SP-4														
COMPOSITE SAMPLES		SP-1		THROUGH		SP-4								

Analysis Request

BTEX & TPH as Gas (602/8020 + 8015) MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other: TPH g / k / mo	Comments
					X								X		X	84444
					X								X		X	84445

Relinquished By: — Date: 11/29/01 Time: 6:30pm Received By: SECURE LOCATION

Relinquished By: Date: 11/29/01 Time: 10:11 Received By: #210

Relinquished By: Date: 11/29/01 Time: 1145 Received By:

Remarks

ICE/T ✓ GOOD CONDITION ✓ HEAD SPACE ABSENT

VOAS | O&G | METALS | OTHER

PRESERVATION APPROPRIATE CONTAINERS ✓

Sent By: McCampbell Analytical, Inc.; 1 925 798 4612; Sep-5-01 8:42AM; Page 2/2

McCAMPBELL ANALYTICAL INC.
110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME: ☐ RUSH ☒ 24 HOUR ☐ 48 HOUR ☐ 5 DAY

Report To: ~~Ron Scheele~~ BOB CLARKE-RIDDELL Bill To: CAMBRIA
Company: Cambria Environmental Technology
~~6262 Hollis Street~~ 1144 65TH STREET, SUITE B
~~Emeryville, CA 94608~~ OAKLAND, CA 94608
Tele: (510) ~~450-1983~~ 420-3303 Fax: (510) ~~450-8295~~ 420-9170
Project #: 153-1664 Project Name: CITY OF OAKLAND @ FRUITVALE
Project Location: 2662 FRUITVALE AVE., OAKLAND
Sampler Signature: [signature]

Analysis Request: BTEX & TPH as Gas (602/8020 + 8015)/ MTBE; TPH as Diesel (8015); Total Petroleum Oil & Grease (5520 E&F/B&F); Total Petroleum Hydrocarbons (418.1); EPA 601 / 8010; BTEX ONLY (EPA 602 / 8020); EPA 608 / 8080; EPA 608 / 8080 PCB's ONLY; EPA 624 / 8240 / 8260; EPA 625 / 8270; PAH's / PNA's by EPA 625 / 8270 / 8310; CAM-17 Metals; LUFT 5 Metals; Lead (7240/7421/239.2/6010); RCI
Other: TPH g/k/mo

SAMPLE ID	LOCATION	Date	Time	# Containers	Type Containers	Matrix	Method Preserved	BTEX ONLY (EPA 602/8020)	Lead (7240/7421/239.2/6010)	TPH g/k/mo	Comments
TP-1 NW	PIT NW WALL	11/28/01	4:30pm	1	brass tube	Soil X	Ice X	X	X	X	84446
TP-2 SW	PIT SW WALL	11/28/01	↓	↓	↓	↓	↓	↓	↓	↓	84447
TP-3 SE	PIT SE WALL	↓	↓	↓	↓	↓	↓	↓	↓	↓	84448
TP-4 NE	PIT NE WALL	↓	↓	↓	↓	↓	↓	↓	↓	↓	84449
TP-5 bottom	PIT Bottom	↓	↓	↓	↓	↓	↓	↓	↓	↓	84450

Relinquished By	Date	Time	Received By
[signature]	11/28/01	6:30pm	SECURE LOCATION
[signature]	11-29-01	10:15	[signature] #210
	11/29/01	1145	[signature]

Remarks: ✓ ✓ ✓ [illegible stamp]

Appendix E

Field Data Sheets

CAMBRI

NOTES

DAILY FIELD ~~REPORT~~

Project Name: CITY OF OAKLAND FRUITVALE	Cambria Mgr: BCR	Field Person: M. Meyers
Project Number: 153-1664	Date: 11/28/01	Site Address: 2662 FRUITVALE OAKLAND CA
General Tasks: EXCAVATE, BACKFILL, SAMPLE		

Time	Activity/Comments	Code	Hour
	JOB WAS COMPLETED AS OF 6 pm, 11/28/01		
	TRENCH:		
	SPECS - 20 ft long x 2 ft wide x 10.5 feet deep		
	JOSEPH ASKED VS TO GO TO 10.5 ft depth.		
	FROM 0-8' OBSERVED MOIST TO WET CLAYEY SILT, MED. BRN.		
	FROM 8-10.5' OBSERVED SATURATED GRAVELLY SAND, GRAY		
	VERY STRONG GASOLINE ODOR		
	GROUNDWATER @ 8'		
	SOME SLOUGHING FROM 8-10.5'		
	WATER WAS OBSERVED WITH A SHEEN.		
	BEGAN ADDING PEA GRAVEL & ORC		
	FIRST 6 BUCKET OF ORC ADDED BY DUMPING		
	ORY ORC INTO TRENCH. AFTER OPENING A		
	BUCKET I FOUND THE DIRECTIONS AND BEGAN		
	WETTING ORC PRIOR TO DUMPING IN TRENCH.		
	THIS CUT DOWN ON LOSS OF ORC DUE TO		
	WIND & DUST CLOUDS. ORC SLURRY & PEAGRAVEL		
	BROUGHT TO UNDER 6' BGS. PROBABLY MORE AROUND		
	7.5' BGS.		
	GEOTEXT. FILTER FABRIC ADDED @ 5' BGS.		
	THEN ADDED CLEAN IMPORTED SAND W/ SOME FINES &		
	COMPACTED IN 1 FT LIFTS WITH SHEEPS FOOT		
	ATTATCHMENT TO BACKHOE. UP TO SURFACE		
	TOOK 6 SAMPLES OF ~~STO~~ TRENCHES STOCKPICED (ST-1		
	MATERIAL FOR COMPOSITE TESTING.		THRU ST-
	STOCKPILES WERE BOTH ON VISQUENE & COVERED WITH VISQUENE		
	PIT WAS DUG BETWEEN 3-4 ft deep and 5' square.		
	SAMPLES WERE TAKEN FROM BOTTOM AND ALL FOUR SIDES.		
	4 SAMPLES WERE ALSO TAKEN FROM PIT'S STOCK PICE		
	BY THE TIME PIT WAS DUG IT WAS DARK MAKING IT		
	VERY DIFFICULT TO NOTICE COLOR DIFFERENCES.		
	PIT WAS BACKFILLED W/ CLEAN MATERIAL, SAME AS ABOVE		
	SAND W/ SOME FINE, COMPACTED IN 1 FOOT LIFTS.		

CAMBRI

DAILY FIELD REPORT

Project Name:	Cambria Mgr:	Field Person:
Project Number:	Date:	Site Address:
General Tasks:		

Time	Activity/Comments	Code	Hour
	BLUEWATER LEFT MATERIALS & BACKHOE ONSITE WALT SAID THEY WOULD PICK UP ON THE FOLLOWING MORNING 11/29/01. I LEFT SITE AT 6:10PM & THEY WERE ON THEIR WAY OUT.		

CAMBRIA

DAILY FIELD REPORT

Project Name: CITY OF OAKLAND FRUITVALE	Cambria Mgr: B. CLARK-RIDDELL	Field Person: M. MEYERS
Project Number: 153-1664	Date: 11/28/2001	Site Address: 2662 FRUITVALE AVE OAKLAND, CA
General Tasks: EXCAVATION, SAMPLING, BACKFILL		

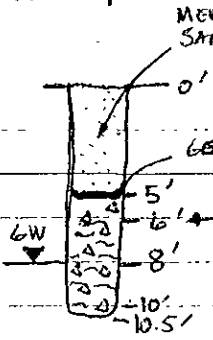
Time	Activity/Comments	Code	Hours
7:10 AM	ARRIVED ONSITE, ACCESSED SITE, MARKED EXCAVATION AREAS		
8:05	MR. CROSS ARRIVES ONSITE		
9:00	BACKHOE ARRIVES ONSITE		
9:15	BACKHOE UNLOADED OFF OF TRAILER & MOVED ONSITE. —USING H_2O FROM HOSE BID @ 3118 DAVIS ST.		
9:35	HELD SITE SAFETY MEETING		
9:45	BEGAN TRENCH AT WEST CORNER OF SITE 35' FROM FRUITVALE AVE ~22' FROM DAVIS ST.		
10:30	FROM CITY OF OAKLAND ARRIVES ONSITE -ASK US TO TAKE IT DOWN TO 10.5'		
11:00	TRENCH FINISHED - BREAK		
11:30	PEA GRAVEL ARRIVES & FILL MATERIAL 0-5' FILL 5' GEO TEXTILE MEMBRANE 5-10.5' PEAGRAVEL 6-10.5' PEAGRAVEL/ORC SLURRY		
4 pm	FINISH BACKFILL OF TRENCH		
4-4:20	FILLING BACKHOE RIGHT REAR TIRE WITH AIR.		
4:30	VISQUENE LAID OUT FOR OTHER STOCK PILE (SP)		
~~4:50~~	FINISHED EXCAVATION OF 5' x 5' x 3' DEEP PIT SAMPLES TAKEN FROM SIDEWALLS (4) AND BOTTOM (1)		
5:00	SAMPLES TAKEN FROM PIT'S STOCKPILE (4) TO BE COMPOSITED.		
5:15	TRENCH STOCK PILE COVERED		
5:25	PIT STOCK PILE COVERED		
5:45	PIT FILLED & COMPACTED		
6:10	LEFT SITE.		

CAMBRIA

Cambria Environmental Technology, Inc.
1144 65th Street, Suite B
Oakland, CA 94608
Tel. (510) 420-0700 Fax (510) 420-9170

~~Boring/Well Name~~ TRENCH T-1 page 1 of 1
Client Name CITY OF OAKLAND
Job/Site Name 2662 FRUITVALE
Project Number 153-1664

Depth/Sample Interval	Time	Sample ID	PID/Odor	Well Construction	USC Class	Soil Type and Comments	Color	Penetration Resistance/ Blow Counts	Moisture	Percentages: Clay	Silt	Sand	Gravel	Plasticity	Estimated Permeability
0'	9:45	/	/	/		CLAYEY SILT	MOD BRN		MOIST					POOR MOD	FAIR
5'															
7'						BECOMES WET			WET						
8'		/	GAS	/		SATURATED SILTY SAND M-VC SMELLS OF GASOLINE	GRAY		SAT		15	85		POOR	GOOD
10.5'						BOTTOM									



SHEEN ON WATER

BOTTOM OF TRENCH @ 10.5'

FILLED UP TO 5' MARK WITH PEA GRAVEL
ORC UP TO 6' MARK
GEO MEMBRANE @ 5' DEPTH
SILTY SAND FROM 0-5'

Q:\SPECIALTY FIGURES\BORING-2nd SHEET.AI

Appendix F

Excavation Sampling Procedures

EXCAVATION SAMPLING PROCEDURES

After confirming a release from underground gasoline storage tanks, product piping or pump islands, soil excavation is often done to remove hydrocarbon bearing soils that may pose a threat to ground water quality beneath a site. Soil samples are routinely collected to monitor the progress of the excavation and to confirm that soils containing hydrocarbons above regulatory limits have been completely removed. Cambria has developed standard operating procedures for collecting soil samples during routine excavation operations to ensure that the samples are collected, handled and documented in compliance with State and local regulatory agency regulations.

Excavation Sampling

Prior to collecting soil samples during excavation operations, Cambria field staff screen the removed soils with a portable photoionization detector (PID) to qualitatively assess the presence or absence of volatile hydrocarbons. The removed soil is typically segregated based on hydrocarbon concentration and stockpiled on site on plastic sheeting. When the PID measurements indicate that the hydrocarbon bearing soil has been completely removed, Cambria collects soil samples from the excavation sidewalls and bottom for confirmatory analysis at a State certified analytic laboratory.

The soil samples are collected in steam cleaned brass or steel tubes from either a driven split-spoon type sampler or the bucket of a backhoe or excavator. When a backhoe or excavator is used, approximately three inches of soil are scraped from the surface and the tube is driven into the exposed soil.

Upon removal from the sampler or the backhoe, the samples are trimmed flush, capped with Teflon tape and plastic end caps, labeled, logged and refrigerated for delivery under chain of custody to a State certified analytic laboratory.

Appendix G

Soil Stockpile Sampling Procedures

SOIL STOCKPILE SAMPLING PROCEDURES

After confirming a release from underground gasoline storage tanks, product piping or pump islands, soil excavation is often completed to remove hydrocarbon bearing soils which for pose a threat to ground water quality beneath a site. The removed soils are typically stockpiled on site pending the results of laboratory analysis for soil samples collected from the stockpiles. Cambria has developed standard sampling procedures to characterize stockpiled soils for on- or off-site treatment, or offsite disposal. The procedures ensure that the samples are collected, handled, and documented in compliance with Federal, State and local regulatory agency guidelines.

Cambria's stockpile sampling procedures are based primarily on Bay Area Air Quality Management District regulations[1] and those of the anticipated landfill. One composite soil sample is collected for every 20 to 50 cubic yards of excavated soil. Each composite sample consists of four discreet soil samples collected from the stockpile which are combined in the laboratory. The samples are collected by dividing each 20 to 50 cubic yard volume into 4 sectors. One discreet soil sample is collected from each sector.

The samples are collected by digging away approximately 2 ft of the surface soils. A clean brass tube is then driven into the exposed soils. The ends of the tube are trimmed flush, capped with Teflon tape and plastic end caps, labeled, refrigerated and transported under chain of custody to a State certified laboratory.

---

1 San Francisco Bay Area Air Quality Management District, 1989, Regulation 8, Organic Compounds, Rule 40, Aeration of Contaminated Soil and Removal of Underground Storage Tanks, February 15, 1989 7 pp.

Appendix H

Well Abandonment Report

GAIA
consulting, inc.
2101 Webster Street, 12th Floor Oakland, CA 94612
tel (510) 663-4257 fax (510) 663-4141
www gaiainc.com

December 12, 2001

Mr. Bob Clark-Riddell
Cambria Environmental Technology, Inc.
1144 65th Street, Suite B
Oakland, CA 94608

SUBJECT: Well Abandonment Report

Dear Bob,

This letter report summarizes the activities completed for well abandonment at the 2662 Fruitvale Avenue site in Oakland. Included in this letter report are copies of the permits from the Alameda County Public Works Agency and a figure showing the location of the wells.

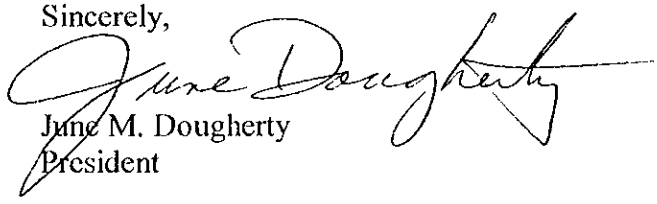
In preparation for redevelopment, at the City of Oakland's request, three on-site wells, MW-F1, MW-F2, and MW-F3, have been abandoned. Well abandonment began at 9:00AM on December 11, 2001. The following activities occurred:

- At 9:00 AM, all field personnel arrived at the site and went over the Health and Safety Plan.
- Wells MW-F1, MW-F2, and MW-F3 were located.
- Portland cement mixture was prepared.
- Wells MW-F1, MW-F2, and MW-F3 were filled in the following manner:
  A funnel and pump was attached to the casing inside the well. The casing was filled to the top with cement, as was the outer cylinder surrounding the casing. The outer cylinder was filled close to the top of the well box. (The casing at well MW-F3 was bent on one side. The top of the casing was cut off to allow the funnel to connect properly.) After settling, additional cement and bentonite were used to fill each well to the surface of the well box.
- Upon completion the site was secured by locking the gate.

This completes GAIA's tasks for abandonment and closure of the wells. We appreciate the opportunity to provide these services to Cambria Environmental on behalf of the City of Oakland.

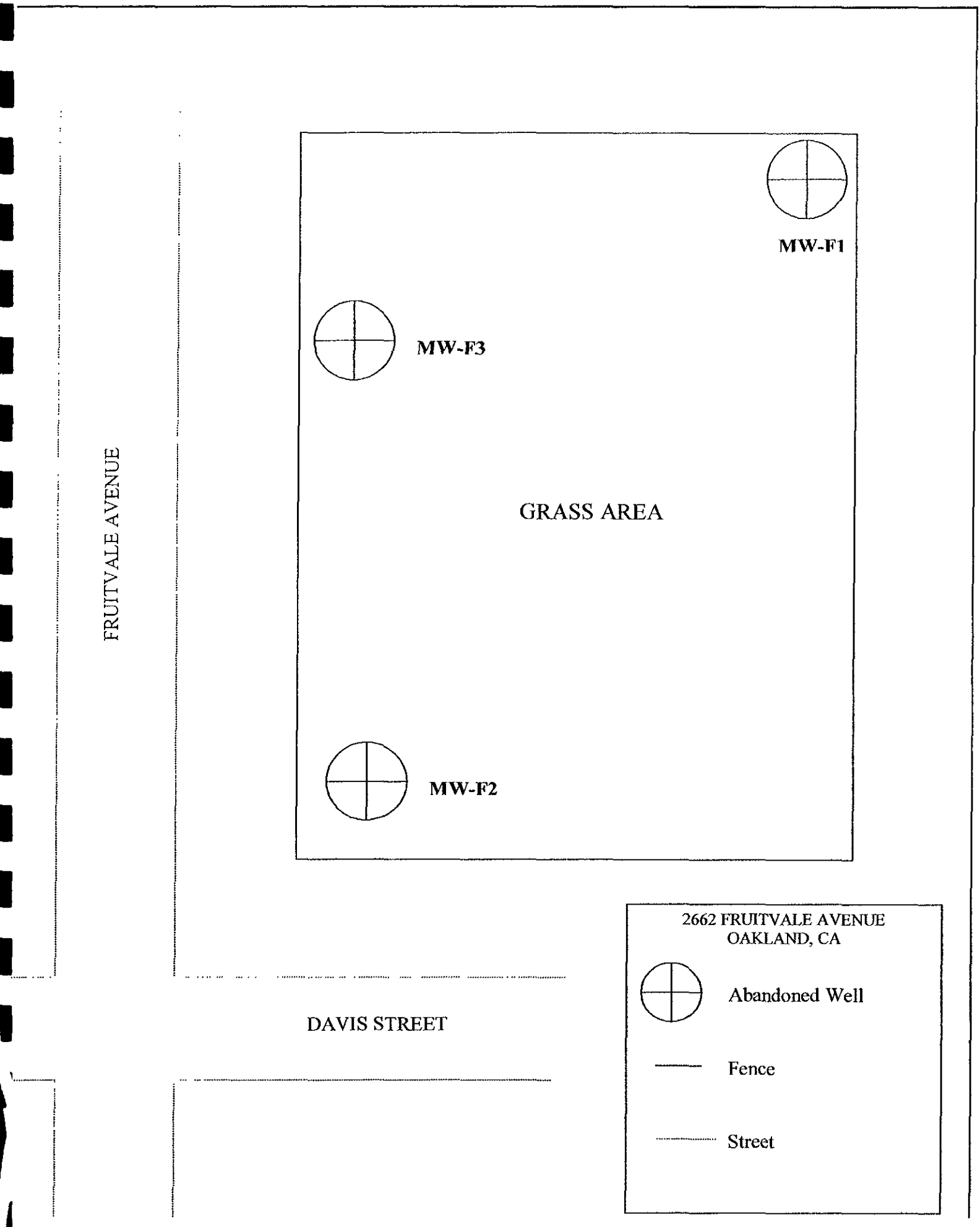
Printed on 100% recycled paper

Sincerely,



June M. Dougherty
President

GAIA Consulting, Inc.


MW-F1
MW-F3
GRASS AREA
MW-F2
FRUITVALE AVENUE
DAVIS STREET
2662 FRUITVALE AVENUE
OAKLAND, CA
Abandoned Well
Fence
Street

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-5554
FAX (510)782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 2662 Fruitvale Ave.
Oakland, CA
Closest cross st. = Davis st.

CLIENT
Name City of Oakland
Address Frank Ogawa Plaza Phone
City Oakland, CA Zip 94612

APPLICANT
Name GAIA Consulting, Inc.
Address 3000 Citrus Circle Ste 118 Fax 925-943-5389
City Walnut Creek, CA Phone 925-943-4989 Zip 94598

TYPE OF PROJECT
Well Construction — Geotechnical Investigation
Cathodic Protection — General
Water Supply — Contamination
Monitoring — Well Destruction X

PROPOSED WATER SUPPLY WELL USE
New Domestic — Replacement Domestic
Municipal — Irrigation
Industrial — Other ______

DRILLING METHOD:
Mud Rotary — Air Rotary — Auger
Cable — Other

DRILLER'S NAME Precision Sampling (Mug Charge)

DRILLER'S LICENSE NO. 636387

WELL PROJECTS
Drill Hole Diameter 7 1/4 in.
Casing Diameter 2.0 in.
Surface Seal Depth 20 ft.
Maximum Depth 22 ft.
Owner's Well Number MW-F2

GEOTECHNICAL PROJECTS
Number of Borings ______
Hole Diameter ______ in.
Maximum Depth ______ ft.

ESTIMATED STARTING DATE 12/12/01
ESTIMATED COMPLETION DATE 12/12/01

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE 12/5/01

PLEASE PRINT NAME Craig M. Zeffl

Rev.5-13-00

FOR OFFICE USE

PERMIT NUMBER W01 - 2104
WELL NUMBER ______
APN ______

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
(2.) Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

(F.) WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations

→ pressure grout.

APPROVED [signature] DATE 12-5-01

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-5554
FAX (510)782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 2662 Fruitvale Ave. Oakland, CA
Closest Cross St. = Davis St.

CLIENT
Name City of Oakland
Address Frank Ogawa Plaza Phone
City Oakland, CA Zip 94612

APPLICANT
Name GAIA Consulting, Inc.
Address 3XXX Citrus Circle Ste. 111 Fax 925-943-5389
City Walnut Creek, CA Phone 925-943-4989 Zip 94598

TYPE OF PROJECT
Well Construction
Cathodic Protection ☐
Water Supply ☐
Monitoring ☐
Geotechnical Investigation
General ☐
Contamination ☐
Well Destruction ☒

PROPOSED WATER SUPPLY WELL USE
New Domestic ☐ Replacement Domestic ☐
Municipal ☐ Irrigation ☐
Industrial ☐ Other ______ ☐

DRILLING METHOD:
Mud Rotary ☐ Air Rotary ☐ Auger ☐
Cable ☐ Other ☐

DRILLER'S NAME Precision Sampling (May change)

DRILLER'S LICENSE NO. 636387

WELL PROJECTS
Drill Hole Diameter 7 1/4 in. Maximum
Casing Diameter 2.0 in. Depth ____ ft.
Surface Seal Depth 26 ft Owner's Well Number MW-F3

GEOTECHNICAL PROJECTS
Number of Borings ______ Maximum
Hole Diameter ______ in. Depth ____ ft.

ESTIMATED STARTING DATE 12/12/01
ESTIMATED COMPLETION DATE 12/12/01

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No 73-68.

APPLICANT'S SIGNATURE [signature] DATE 12/05/01

PLEASE PRINT NAME Craig M. Zeff Rev.5-13-00

FOR OFFICE USE

PERMIT NUMBER W01-2106
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. (circled) Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie

F. (circled) WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

→ Pressure Grout

APPROVED [signature] DATE 12501

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-5554
FAX (510)782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 2662 Fruitvale Ave. Oakland, CA
Close Cross St.: Davis St.

CLIENT
Name City of Oakland
Address Front Lagoon Plaza Phone
City Oakland Zip 94612

APPLICANT
Name GAIA Consulting, Inc.
Address 5000 Clayton Road Ste. 111 Fax 925-943-5389
Phone 925-943-4989
City Walnut Creek, CA Zip 94598

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection		General	
Water Supply		Contamination	
Monitoring		Well Destruction	X

PROPOSED WATER SUPPLY WELL USE

New Domestic		Replacement Domestic	
Municipal		Irrigation	
Industrial		Other	

DRILLING METHOD:

Mud Rotary		Air Rotary		Auger	
Cable		Other			

DRILLER'S NAME Precision Sampling (Mayerson)
DRILLER'S LICENSE NO. 636387

WELL PROJECTS
Drill Hole Diameter 7 1/4 in. Maximum
Casing Diameter 2.0 in. Depth 26 ft.
Surface Seal Depth 21 ft. Owner's Well Number MW-F1

GEOTECHNICAL PROJECTS
Number of Borings
Hole Diameter in. Maximum
Depth ft

ESTIMATED STARTING DATE 12/12/01
ESTIMATED COMPLETION DATE 12/12/01

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE 12/05/01
PLEASE PRINT NAME Craig M. Zeff

Rev.5-13-00

FOR OFFICE USE

PERMIT NUMBER W01-2105
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

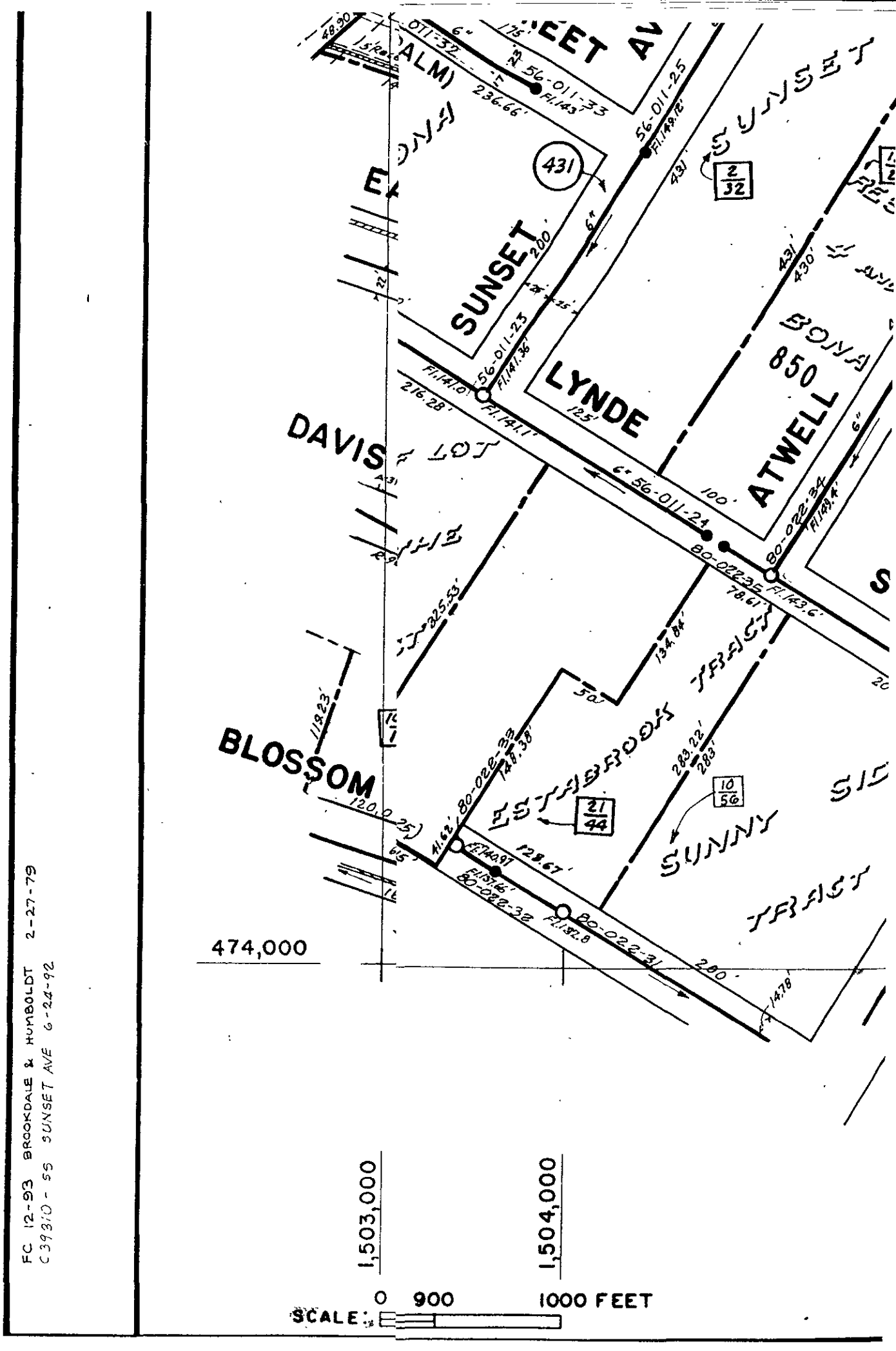
NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

Pressure grout

APPROVED [signature] DATE 12-5-01

Appendix I

City of Oakland Department of Engineering Subsurface Utility Map



FC 12-93 BROOKDALE & HUMBOLDT 2-27-79
C3930 - 55 SUNSET AVE 6-24-92

Appendix J

Department of Water Resources Well Survey Report

STATE OF CALIFORNIA - THE RESOURCES AGENCY
GRAY DAVIS, *Governor*

DEPARTMENT OF WATER RESOURCES
CENTRAL DISTRICT
3251 S STREET
SACRAMENTO, CA 95816-7017

DEC 20 2001

Mr. Ian Young
Cambria Environmental Technology
1144 – 65th Street, Suite C
Oakland, California 94608

Dear Mr. Young:

As you requested, a search of our records was done for *Water Well Drillers Reports* for wells at the following location:

A one-quarter mile radius of 2662 Fruitvale Avenue, Oakland
Township 02 South, Range 03 West, Section 5-D, E, and F
Township 02 South, Range 03 West, Section 6-A and H

We found no well reports for this area.

If you need additional information or have any questions, please contact Anne Roth at (916) 227-7632 or fax (916) 227-7600.

Sincerely,

for Robert L. Niblack, Chief
Geology and Groundwater Section

Appendix K

Door-to-Door Well Survey Questionnaire Responses

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes____ No✓____

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes____ No✓____
   If Yes,please describe:_____
   _____

3. Address (mandatory):3142 DAVIS ST

4. Name (optional):KEN MESUI

5. Contact Information (optional)_____

6. Additional Information/Comments: _____
   _____
   _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes____ No✓____

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes____ No✓____
   If Yes,please describe:_____
   _____

3. Address (mandatory):2624 FRUITVALE

4. Name (optional):_____

5. Contact Information (optional)_____

6. Additional Information/Comments: _____
   _____
   _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes____ No✓

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes____ No✓
   If Yes,please describe:_____

3. Address (mandatory):2614 Fruitvale

4. Name (optional):_____

5. Contact Information (optional)_____

6. Additional Information/Comments: _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes_____ No_X_

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes_____ No_X_
   If Yes,please describe:_____

3. Address (mandatory):_2621 Fruitvale Ave_____

4. Name (optional):_Isabell Florist_____

5. Contact Information (optional)_____

6. Additional Information/Comments: _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes____ No__✓__

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes____ No__✓__
   If Yes,please describe:_____
   _____

3. Address (mandatory):__2703 Fruitvale__

4. Name (optional):__Black & White__

5. Contact Information (optional)_____

6. Additional Information/Comments: _____
   _____
   _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes_____ No~~_____~~
2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes_____ No~~_____~~
   If Yes,please describe:_____
   _____
3. Address (mandatory):3114 E 27th
4. Name (optional):~~_____~~
5. Contact Information (optional)_____
6. Additional Information/Comments: _____
   _____
   _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes____ No✓

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes____ No✓
   If Yes,please describe:_____

3. Address (mandatory):3103 Davis

4. Name (optional):_____

5. Contact Information (optional)_____

6. Additional Information/Comments: _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes____ No✓____

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes____ No✓____
   If Yes,please describe:_____
   _____

3. Address (mandatory):_____

4. Name (optional):_____

5. Contact Information (optional)_____

6. Additional Information/Comments: _____
   _____
   _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes_____ No L
2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes_____ No_____
   If Yes,please describe:_____
   _____
3. Address (mandatory): 3038 Duval
4. Name (optional):_____
5. Contact Information (optional)_____
6. Additional Information/Comments: _____
   _____
   _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

CAMBRIA

November 28, 2001

Dear Tenant,

Cambria Environmental Technology Inc. (Cambria) is distributing this questionnaire on behalf of the owner of the property located at 2626 Fruitvale Avenue in Oakland, California. The owner of this property has been required by the Alameda County Health Care Services Agency (ACHCSA) to conduct a survey of potential sensitive receptors to groundwater within 200 feet of the property.

Underground Storage tanks (USTs), formerly used to store gasoline, were removed from the property in 1978. A subsequent investigation determined that the materials stored in the USTs had impacted groundwater beneath the site, prompting regulatory oversight from the ACHCSA. The ACHCSA is evaluating data to allow regulatory closure, and requires sensitive receptor data from the surrounding community. Cambria is asking that you complete the questions below and return the questionnaire in the envelope provided, unless provided to the questionnaire distributor. If you have any questions, please contact Bob Clark-Riddell at (510) 420-3303. A stamped envelope is provided to return this questionnaire. Thank you for your assistance.

Questionnaire

Please return by Wednesday, December 5, 2001

C/O Bob Clark-Riddell, Cambria Environmental, 1144 65th Street, Suite B, Oakland, CA 94608

1. To the best of your knowledge, does the property where you live have any irrigation, monitoring, or domestic wells?
   Yes____ No✓

2. To the best of your knowledge, does the property where you live have an accessible basement?
   Yes____ No____
   If Yes,please describe:_____

3. Address (mandatory):3443 Davis

4. Name (optional):_____

5. Contact Information (optional)_____

6. Additional Information/Comments: _____

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170