CAMBRIA

February 26, 2002

Ms. Eva Chu
Alameda County of Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Re: **Post-Remediation Sampling Report and Environmental Risk Assessment**
Balaam Brothers Property
1350 Powell Street
Emeryville, California

Dear Ms. Chu:

On behalf of the Balaam Brothers Partnership, Cambria Environmental Technology, Inc. (Cambria) prepared this *Post-Remediation Sampling Report and Environmental Risk Assessment* for the above-referenced site. This report describes the results of the post-remediation soil, groundwater, and soil gas investigation sampling and environmental risk assessment completed in accordance with Cambria's February 11 and February 20, 2003 workplans approved by the Alameda County Department of Environmental Health (ACDEH).

Cambria has completed all the site activities required to facilitate issuance of a No Further Action (NFA) letter, as discussed during our February 20, 2003 meeting. The results of the sampling and risk assessment show that residual hydrocarbons do not pose a significant risk to human health. This report concludes that no further action (NFA) is merited for the site. Due to property transfer deadlines, Cambria respectfully requests that the ACDEH approve residential development for the site and issue a NFA letter by the end of Thursday, February 27, 2003. We understand that a deed restriction has been prepared that encompasses the properties at 1300 and 1350 Powell Street.

To facilitate regulatory review, Cambria has hand delivered this report to you and Mr. Roger Brewer of the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). Thank you again for all your assistance with this important project.

If you have any questions or comments, please call me immediately at (510) 420-3303.

Sincerely,
Cambria Environmental Technology, Inc.

Bob Clark-Riddell, P.E.
Principal Engineer

cc: Mr. Roger Brewer, RWQCB, 1515 Clay Street, Suite 1400, Oakland, California 94612
Mr. David Diamond, Balaam Brothers Partnership, 1115 Hillview Road, Berkeley, California 94708
Mr. Mike Kim, Pulte Homes Corporation, 7031 Koll Center Parkway, Pleasanton, California 94566

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POST-REMEDIATION SAMPLING REPORT AND ENVIRONMENTAL RISK ASSESSMENT

Balaam Brothers Property
1350 Powell Street
Emeryville, California
Cambria Project No. 502-1795

February 26, 2003

Prepared for:

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TABLE OF CONTENTS

INTRODUCTION 1

SITE BACKGROUND 1

SOIL AND GROUNDWATER INVESTIGATION PROCEDURES AND RESULTS 2

Soil Analytical Results 3

Groundwater Analytical Results 4

Investigation Conclusions 5

ENVIRONMENTAL RISK ASSESSMENT 6

1. Summary of Site Investigation 6

Southern Property Boundary 7

Southeastern Excavation Wall 8

Western Property Boundary 8

Northern Excavation Floor 9

2. Summarize Past, Current and Anticipated Future Site Activities and Uses 9

3. Summarize Appropriateness of Tier 1 Lookup Tables and RBSLs 10

4. Soil and Groundwater Categorization 10

5. Exposure Point Concentrations 12

6. Selection of Tier 1 RBSLs and Comparison to Site Data 12

7. Tier 1 Conclusions 13

Tier 2 Risk Assessment 13

Benzene 13

Xylenes 17

Total Petroleum Hydrocarbons 18

Tier 2 Risk Assessment Conclusion 19

SOIL GAS INVESTIGATION PROCEDURES AND RESULTS 21

Soil Gas Investigation Procedures 21

Soil Gas Sampling Results 22

CONCLUSIONS 23

FIGURES

Figure 1 – Post-Remediation Conditions in Soil and Excavation Extent
Figure 2 – Benzene Concentrations in Soil After Remediation
Figure 3 – Post-Remediation Conditions in Groundwater
Figure 4 – Redevelopment Site Plan and Ground Floor

TABLES

Table 1a – Soil Analytical Data - Petroleum Hydrocarbons
Table 1b – Soil Analytical Data – Polynuclear Aromatic Hydrocarbons
Table 1c – Soil Analytical Data - Metals and Pesticides
Table 2a – Groundwater Analytical Data - Hydrocarbon Analyses
Table 2b – Groundwater Analytical Data - Volatile Organic Compounds
Table 2c – Construction Details and Water Levels for Temporary Wells
Table 3 – Residual Soil and Groundwater Samples With Constituents Exceeding Tier 1 RWQCB RBSLs
Table 4 – Soil Gas Analytical Results

APPENDICES

Appendix A – Soil Boring Permits
Appendix B – Field Activity Descriptions
Appendix C – Standard Field Procedures
Appendix D – Field Logs
Appendix E – Laboratory Analytical Reports
Appendix F – Site Geotechnical Reports
Appendix G – Site-Specific RBSLs from Oakland ULR Model

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POST-REMEDIATION SAMPLING REPORT AND ENVIRONMENTAL RISK ASSESSMENT

Balaam Brothers Property
1350 Powell Street
Emeryville, California

INTRODUCTION

Cambria Environmental Technology, Inc. (Cambria) is submitting this Post-Remediation Sampling Report and Environmental Risk Assessment for the above-referenced site (the Site) on behalf of the Balaam Brothers Partnership. Post-remediation soil and groundwater sampling was performed in accordance with Cambria's February 11, 2003 workplan, which received verbal approval on February 13, 2003 and written approval on February 14, 2003 from the Alameda County Department of Environmental Health (ACDEH). The environmental risk assessment was also requested by the ACDEH letter dated February 14, 2003. A meeting was held with the ACDEH and interested parties on February 20, 2003 to discuss the preliminary results of the post-remediation sampling and the risk assessment. At the meeting the ACDEH requested shallow soil gas sampling to further evaluate subsurface conditions and the potential risk of residual hydrocarbons. Shallow soil gas sampling was performed in accordance with Cambria's February 20, 2003 workplan, which ACDEH approval on February 21, 2003.

This objective of this additional work is to further assess subsurface conditions after remediation described in Cambria's *Corrective Action Completion Report* dated December 13, 2002, and to facilitate issuance of a No Further Action (NFA) letter. Upon receipt of an NFA letter from the local regulatory agencies, Pulte Homes plans to purchase the Site property and the adjacent property at 1300 Powell Street for redevelopment as high-density housing. This report describes the requested post-remediation sampling and risk assessment, and concludes that residual hydrocarbons do not pose a significant risk to human health and that issuance of a NFA letter is merited at this time.

SITE BACKGROUND

The Site is located on the northeast corner of the intersection of Powell Street and Hollis Street, in a mixed industrial/commercial area within Emeryville, California (see Figure 1). The Site background is more completely described in Cambria's *Corrective Action Completion Report*. In summary, the Site has been impacted by petroleum hydrocarbons from two former underground storage tanks (USTs) and four former aboveground storage tanks (ASTs) which were placed in

service during the 1930s, and operated until the early 1950s by Cook's Oil Company and Standard Oil Company. The locations of the USTs and ASTs are shown on Figure 2.

Based on both available site history and environmental sampling results, the USTs were the source of a release of both gasoline and diesel fuel which impacted soil and shallow groundwater in the southern portion of the Site, whereas the ASTs were the source of a release of heavier, predominantly diesel-range, hydrocarbons which impacted the central and northern portions of the Site. Benzene, toluene, ethylbenzene and xylenes [BTEX] constituents are chemicals of concern (COC) in the southern portion of the Site. Polynuclear aromatic hydrocarbons (PAHs) were analyzed in selected samples and were only detected at concentrations substantially lower than RWQCB RBSLs, and so were not considered COCs for the Site. The ASTs were removed sometime prior to leasing of the property by Balaam Brothers in the late 1950s. The USTs were removed by Balaam Brothers in 1987.

Implementation of the approved corrective action plan was designed to remediate petroleum hydrocarbons to facilitate issuance of a no further action (NFA) letter. The Site cleanup goals were agreed to by the ACDEH and the San Francisco Bay Regional Water Quality Control Board (RWQCB) in a June 21, 2002 letter. Remediation of the site by excavation and disposal of impacted soil was completed in November 2002. The remediation involved excavating most of the Site to 10 feet below grade surface (bgs), and excavating other areas to up to 16 feet bgs to target impacted soil and reduce potential impact to groundwater. A total of 16,338 tons was transported and disposed offsite.

Post-remediation groundwater sampling was conducted in December 2002. Cambria submitted a *Corrective Action Completion Report* on December 13, 2002. The ACDEH subsequently requested confirmation sampling of native soil at the base of the backfilled excavation, additional sampling of the three remaining temporary groundwater monitoring wells at the Site, and a risk evaluation.

SOIL AND GROUNDWATER INVESTIGATION PROCEDURES AND RESULTS

To further assess subsurface conditions in soil and groundwater, Cambria advanced seven soil borings (AB-A through AB-G). The boring locations were approved by the ACDEH and permitted by Alameda County Department of Public Works. Soil boring permits are included in Appendix A. Soil samples were collected from borings AB-B through AB-G where native material was first encountered after drilling through the imported backfill material. For boring

AB-A, a soil sample was collected from native soil at approximately 3 feet bgs immediately (within 2 feet) south of sample EX-A-S-3 (9-24-02), where prior benzene concentrations exceeded risk based screening levels (RBSLs) established by the RWQCB. During verbal approval by Eva Chu of the ACDEH on February 13, 2003, Ms. Chu requested additional groundwater sampling of the remaining temporary groundwater wells and analyzing a grab groundwater sample from proposed boring AB-B. Cambria sampled wells TW-6, TW-7 and TW-8, but was unable to sample well TW-4 due to damage by site grading activities. Ms. Chu also requested relocating boring AB-B approximately 15 feet south of the location proposed in the workplan.

Soil samples were collected using a hollow-stem auger drill rig. Soil samples were collected a few inches below the interface between excavation backfill and native soil using a hammer-driven split-spoon sampler. Temporary wells were purged with a peristaltic pump prior to sampling. An additional description of the field activities is presented as Appendix B. Cambria's *Standard Field Procedures for Hand-Auger Soil Borings*, *Standard Field Procedures for Soil Borings*, and *Standard Field Procedures for Monitoring Wells* are presented as Appendix C. Field logs are included in Appendix D.

Soil Analytical Results

Soil analytical results are summarized on Table 1a. Laboratory analytical results are included in Appendix E. TPH and benzene concentrations are shown on Figures 1 and 2, respectively. Soil samples during this investigation were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), TPH as motor oil (TPHmo), and TPH as bunker oil (TPHbo) by EPA Method 8015C; and for benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE) by EPA Method 8021B. Silica gel filtration was used for the TPHd, TPHmo and TPHmo analyses. The cleanup standard for site soil less than 10 feet depth was 1,000 mg/kg total TPH. To avoid the quantification of overlapping results, the 'total TPH' was calculated by adding the TPHg results (C6-C9 range) and the TPHbo results (C10 and higher range). As requested by the ACDEH, 'combined TPH' was calculated by adding the TPHg+TPHd+TPHmo. Combined TPH includes overlapping results in the C18 to C23 range for TPHd and TPHmo.

Petroleum hydrocarbons were detected in soil from five of the seven borings. The maximum detected concentrations were 20 mg/kg TPHg (AB-A), 400 mg/kg TPHd (AB-D) and 68 mg/kg TPHmo (AB-D).

During this investigation, no benzene or MTBE was detected in soil and no petroleum hydrocarbon concentrations in soil exceeded RBSLs. This is a significant result because borings AB-B, AB-B and AB-C were located near former samples with benzene concentrations exceeding Tier 1 RBSLs. These current results suggest that residual hydrocarbons were limited in extent and likely attenuated due to volatilization during the four-month excavation activities.

For comparison purposes with site remediation data, prior site data is also included on Table 1a and Figures 1 and 2. Please notice that Table 1a is divided into three subsections: 1) post remediation conditions (sample data from soil remaining after remediation), 2) during remediation (data from samples collected during excavation), and 3) pre-remediation investigative data. Figures 1 and 2 show results from a number of pre-remedial boring samples that were collected prior to excavation from depths approximately coincident with the final excavation base elevation (e.g. borings 9, 12, EB-9 and EB-10). The figures also show confirmation results from samples collected directly from the excavation floor immediately after excavation of contaminated soil (for example, EX-B-B-10 (7-24-02), EX-E-B-7, EX-K-C-6, etc). The figures also show sidewall samples from the boundary of the final remedial excavation.

Soil logging during installation of boring AB-C, which encountered native material at approximately 16 feet depth, indicates that the deeper excavation area at the site extended eastward under the location of boring AB-C and sample location EX-A-B-10 (where benzene was detected above RWQCB RBSLs). This soil logging information and the lack of benzene detected in soil from boring AB-C indicates that the benzene-impacted soil at EX-A-B-10 was overecavated. Therefore, the only benzene and xylenes in excess of RBSLs (if not attenutated) are only present in a limited area along the south wall and floor of the excavation near samples EX-A-S-3 (10/2/02) and EX-A-S-9 (7/24/02). The limited results for residual soil from prior sampling that exceed Tier 1 RBSLs are discussed in the Risk Assessment section below.

Groundwater Analytical Results

Analytical results are summarized on Table 2a and Figure 3. Laboratory analytical reports are included in Appendix E. Groundwater samples were also analyzed for TPHg, TPHd, TPHmo, TPHbo, BTEX and MTBE. Silica gel filtration was also used for the TPHd, TPHmo and TPHmo analyses. The cleanup standard for site groundwater was 10,000 to 20,000 ug/L total TPH. As requested by the ACDEH, 'combined TPH' was calculated by adding the TPHg+TPHd+TPHmo (see Table 2a). Combined TPH includes overlapping results in the C18 to C23 range for TPHd and TPHmo.

During this investigation, petroleum hydrocarbons were detected in groundwater from boring AB-A and in well TW-6 while no petroleum hydrocarbons were detected in wells TW-7 and TW-8. The only constituents detected during this investigation were TPHd at 130 ug/L (AB-B), toluene at 1.3 ug/L (TW-6), ethylbenzene at 0.56 ug/L (AB-B), and xylenes at 2.8 ug/L (TW-6). During this investigation, no benzene, MTBE, TPHg, TPHmo, or TPHbo was detected in groundwater soil and no petroleum hydrocarbon concentrations in groundwater exceeded RBSLs.

For comparison purposes with site remediation data, prior site data is also included on Table 2a and Figure 3. Note that Table 2a is into post-remediation and pre-remediation subsections. Analytical results from post-remediation groundwater monitoring indicates that site groundwater has been remediated to well below the cleanup standard of 10,000 to 20,000 ug/L total TPH. The one sample results from TW-6 on December 4, 2002 that exceeded Tier 1 RBSLs for TPH but did not exceed site cleanup levels are discussed in the Risk Assessment section below.

Investigation Conclusions

Cambria concludes the following based on the findings of this additional soil and groundwater sampling:

- No chemicals of concern were detected above cleanup standards or RBSLs during this additional investigation.

- Analytical results from residual native soil indicate that all site soil has been excavated to the cleanup standard of 1,000 mg/kg total or combined TPH. The two soil sample results that exceeded the TPH cleanup standard are located along the edge of the excavation at the western property boundary. Benzene and xylenes in excess of RBSLs were detected in a limited area along the south wall and floor of the excavation near samples EX-A-S-3 (10/2/02) and EX-A-S-9 (7/24/02).

- Post-remediation analytical results indicate that site groundwater has been remediated to well below the cleanup standard of 10,000 to 20,000 ug/L total or combined TPH.

ENVIRONMENTAL RISK ASSESSMENT

In conjunction with the post-remediation soil and groundwater investigation described above, an environmental risk assessment was performed to evaluate the potential risk from residual hydrocarbons. The ACDEH requested this risk assessment and subsequently requested shallow soil gas sampling to further evaluate the potential risk from residual BTEX compounds. Results of the soil gas sampling, which did not detect BTEX above Tier 1 RBSLs, and the risk assessment presented below indicate that residual hydrocarbons do not pose a significant risk to human health. The soil gas sampling results are introduced below and detailed later in this report. The site-specific environmental risk assessment was initially performed based on the residual contaminant concentration data, and involved the following:

- A Tier 1 risk assessment using the Regional Water Quality Control Board – San Francisco Bay Region (RWQCB) guidance document *Application of Risk Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwater* (RWQCB 2001); and

- For constituents whose residual concentrations exceed Tier 1 Risk Based Screening Levels (RBSLs), a Tier 2 risk assessment is presented using guidance derived from both the RWQCB document, and relevant guidance from the City of Oakland's *Oakland Risk-Based Corrective Action: Technical Background Document* (City of Oakland, 1999).

After completing the requested shallow soil gas sampling, the environmental risk assessment was expanded by comparing soil gas analytic results to RBSLs established by the December 24, 2002 RWQCB guidance document, *Interim Soil Gas Screening Levels for Evaluation of Potential Indoor-Air Impacts and Request for Comments* (RWQCB 2002).

The following sections are presented based on the outline presented in RWQCB 2001.

1. Summary of Site Investigation

Detailed site investigation information is presented in Cambria's *Corrective Action Completion Report*, submitted to ACDEH on December 13, 2002, and is supplemented by additional sampling performed by Cambria in February 2003. Investigation activities have determined the types of impacted media (soil and groundwater), sources of chemical releases (USTs and ASTs containing diesel, gasoline and oil at 1350 and 1300 Powell Street and potential fuel or oil spills on the adjacent Union Pacific Railroad property), and identity of all chemicals of concern (long-chain petroleum hydrocarbons (primarily diesel-range) in the northern part of the Site; both long-

and short-chain petroleum hydrocarbons and volatile gasoline constituents [BTEX] in the southern portion of the Site).

A complete tabulation of analytical results showing residual concentrations of chemicals of concern is presented in Tables 1 and 2. These samples were collected in accordance with the ACDEH-approved workplans for the site, and are considered to be representative of site conditions. These data are described in more detail in the preceding sections, and are presented on Figures 1 through 3. Additional figures in Cambria's *Corrective Action Completion Report* show additional data from before and during site remediation.

Table 3 lists all residual soil or groundwater sample concentrations that exceed RWQCB surface soil and groundwater RBSLs for residential land use where groundwater is not a current or potential source of drinking water, as listed on Table B of RWQCB (2001). Out of more than 50 soil samples representative of residual contamination at the site, only eight samples contained chemicals of concern at concentrations exceeding the RWQCB RBSLs. As indicated in Table 3, and on Figures 1, 2 and 3, these samples represent the following areas at the site.

Southern Property Boundary

Three samples located close to the southern property boundary, adjacent to Powell Street, contained benzene (maximum concentration of 3.5 mg/kg) above the RBSL, and two of the samples also contained xylenes above the RBSL (maximum concentration of 4.5 mg/kg). The lateral and vertical extent of benzene and xylenes in these samples is extremely limited based on the lack of these analytes detected in all adjacent samples of residual soil.

Sample EX-A-S-3 [10/2/02] contained 3.5 mg/kg benzene and 4.5 mg/kg xylenes at a depth of 3 feet at the southern excavation boundary. However, *no* benzene was detected in any of the following nearby samples shown on Figure 2: sample AB-A-3.5, located approximately 3 feet southwest away at a depth of 3 to 3.5 feet, sample EX-A-S-9 [9/24/02] located approximately 10 feet north at a depth of 9 feet, samples SS-8 (fill) and SS-8 (native) located approximately 20 feet to the east at depths of 0.5 and 7.5 feet, and sample AB-B-15.5 located approximately 30 feet north at a depth of 15.5 feet. Xylenes in these samples was either non-detectable or at concentrations several orders of magnitude lower than the RBSL. Given the significant exposure of the excavation sidewalls , the significant source removal, and the adjacent sample results, it is likely that the benzene and xylenes in the vicinity of sample EX-A-S-3 have decreased below RBSLs as a result of natural attenuation processes.

Approximately 40 feet east of the above area of concern is sample EX-A-S-9 [7/24/02], which contained 2.0 mg/kg benzene and 2.1 mg/kg xylenes at the excavation sidewall at a depth of 9 feet. Overlying soil at this location was loose sand that had filled a previously existing excavation beneath a former propane tank, and which extended approximately 20 feet along the property boundary and beneath the adjacent sidewalk beyond the property boundary. Since field observations clearly indicated that this sand had not been impacted by petroleum hydrocarbons, Ms. Eva Chu (ACDEH) directed that no confirmation samples should be collected from this material. Nearby samples to the west (SS-8 [fill] and SS-8 [native] collected from depths of 0.5 and 7.5 feet, and east (trench 1-3 and trench 1-9) did not contain detectable benzene or xylenes. The original excavation base sample (EX-A-B-10 [7/24/02]) collected approximately 20 feet to the north at a depth of 10 feet contained 0.47 mg/kg benzene. Sample AB-C-17 (2/14/03) was collected at a depth of 17 feet immediately to the north of the prior excavation base sample, and did not contain detectable benzene or xylenes. Boring AB-C encountered excavation backfill until a depth of approximately 16 feet, indicating that the 16 feet deep excavation extended beneath the locations of boring AB-C and sample EX-A-B-10 (7/24/02). Therefore, benzene and xylenes in excess of RBSLs (if not attenutated) are only present in a limited area along the south wall and floor of the excavation. However, results of shallow soil gas sampling (described below), which did not detect any benzene and did not detect xylenes above Tier 1 RBSLs, suggests that benzene in this vicinity has attenuated and that residual BTEX concentrations do not pose a significant risk to human health.

Southeastern Excavation Wall

One sample EX-A-E-9 (8/17/02) along the eastern wall of the excavation contained TPHd at a concentration (570 mg/kg) at a concentration slightly exceeding the RBSL (500 mg/kg) at a depth of 9 feet. The lateral extent of the area impacted above the RBSL is very small, as indicated by the close proximity of numerous samples with lower concentrations (Figure 1).

Western Property Boundary

Three samples were located at or near the western property boundary adjacent to the Union Pacific Railroad tracks. These samples are EX-C-NW-3 (9/13/02), EX-C-W-3 (9/13/02) and EX-L-NW-9 (11/20/02). All three samples contained elevated concentrations of diesel-range hydrocarbons (TPHd). The southern two samples, which had the highest TPH-D concentrations (over 2,000 mg/kg) also had elevated concentrations of motor-oil-range hydrocarbons (TPH-mo). Because the two southernmost samples were excavation sidewall samples located on the property boundary, they are representative of offsite COC concentrations and not onsite COC

concentrations. In addition, all adjacent samples, including shallower or deeper samples at the same locations, which had TPH levels lower than the RBSL (500 mg/kg).

Northern Excavation Floor

One sample was located in the northernmost portion of the excavation and contained only TPHd (780 mg/kg) at a concentration exceeding the RBSL (500 mg/kg).

No soil samples containing gasoline-range total petroleum hydrocarbons (TPHg) exceeded the RWQCB RBSL of 400 mg/kg. The highest concentration detected in residual soil was 350 mg/kg in sample EX-A-S-9 (7/24/02), located at the southern excavation boundary in the same sample that contained the highest level of benzene (2.0 mg/kg) exceeding the RBSL. Due to the sidewall exposure during excavation activities, hydrocarbons in that area have likely attenuated.

Only one groundwater sample, collected from temporary well TW-6, contained an analyte (TPHd) at a concentration exceeding the RWQCB RBSL. However, this sample was collected shortly after well installation. Both subsequent samples collected from the same well contained TPHd at a substantially lower concentration than the RBSL. Therefore, it is likely that the initial sample from this well had been cross-contaminated as a result of well drilling procedures, and that the later samples are more representative of groundwater concentrations.

No known groundwater extraction wells that might be impacted by site contamination are known to exist. Groundwater in the vicinity of the site is not protected for beneficial use. The nearest surface water body, which is also the nearest potentially sensitive ecological habitat is the San Francisco Bay, which is located 1/2 mile west of the site.

2. Summarize Past, Current and Anticipated Future Site Activities and Uses

Past site uses are described in detail in the *Corrective Action Completion Report* (Cambria 2002), and described briefly in the preceding sections. All site buildings have been demolished to facilitate environmental remediation and receipt of a no further action (NFA) letter from the ACDEH. Upon receipt of an NFA letter, it is expected that the site will be developed primarily as a complex of three-story townhomes, interspersed with driveways and limited landscaped areas. Each of the multi-unit townhomes is anticipated to have garages and home offices located on the ground floor, with living areas located on the second and third floors. A commercial space (e.g. a restaurant or coffee shop) is anticipated to be located at the southwestern corner of the property. A map of the proposed development was previously submitted to ACDEH by anticipated buyer of

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the property (Pulte Homes). Figure 4 shows the site development plan and the proposed ground floor plan.

The adjacent 1300 Powell Street site is anticipated for development as part of the same multi-unit townhome complex as the 1350 Powell Street site. The adjacent Union Pacific Railroad property is anticipated to be developed as a greenway/bikepath after acquisition by the City of Emeryville.

3. Summarize Appropriateness of Tier 1 Lookup Tables and RBSLs

The use of the Tier 1 lookup tables and RBSLs are appropriate for initial risk screening for the site. Tier 1 RBSLs exist for all COCs. The Site is a typical small Emeryville redevelopment site that does not have a high public profile. Soil and groundwater conditions do not differ significantly from those assumed in development of the lookup tables, except that the lookup tables generally use more conservative site-specific parameters than those for the site. The area impacted by site COCs is contained within a highly developed urban setting, and therefore impacts do not pose heightened threats to sensitive ecological habitats. The thickness of vadose-zone soils impacted by volatile organic compounds is substantially less than 15 feet. Site COCs are petroleum hydrocarbons and their constituents. The only individual constituents that exceed RBSLs in soil and groundwater are benzene and xylenes. However, benzene and xylenes concentrations in shallow soil gas do not exceed Tier 1 RBSLs. Because soil gas concentrations provide a more direct evaluation of the potential for residual COCs to volatilize from soil and groundwater to indoor air, soil gas RBSLs generally supercede soil and groundwater RBSLs. Therefore, residual BTEX concentrations do not pose a significant risk to human health.

4. Soil and Groundwater Categorization

The Site lies within the Emeryville Brownfields Groundwater Management Zone, as defined in the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report* (RWQCB, 2003). This report states that: "Groundwater is not currently used for any municipal, domestic, industrial, or agricultural purpose in Emeryville. No extractive beneficial uses are planned in the future. Remedial strategies should focus on protecting potential aquatic receptors and potential future irrigation or industrial uses. Achievement of drinking water objectives within a reasonable time period is an appropriate long-term goal. Emeryville has developed a sub-regional groundwater monitoring plan that will provide information on both the shallow and deeper aquifer water quality. In addition, Emeryville has developed a detailed GIS system for tracking contaminated properties that will help to prevent inappropriate land uses. Lastly, Emeryville may consider

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assuming some of the liability for the groundwater pollution as well as overseeing smaller cleanups under an agreement with DTSC and the Regional Board."

Based on the predominant clay soil-type underlying the site and the presence of shallow groundwater only in thin, discontinuous confined zones beneath the Site, groundwater yield is anticipated to be insufficient for sustainable groundwater production for municipal, domestic, industrial, or agricultural purposes. Groundwater yield during sampling of temporary wells was approximately 0.2 gallons per minute, which equates to approximately 290 gallons per day. Groundwater quality and yield parameters may be brackish based on proximity to San Francisco Bay, although this supposition has not been verified.

Native soil throughout the Site is predominantly silty clay and clayey silt, with sporadic generally thin discontinuous layers of clayey gravel and sand. The base of the remedial excavation was predominantly clay. The soil used for backfilling the excavation primarily consisted of clay with shallow sandy silt and silty sand. As described in documents in Appendix F, the bottom 3 to 5 feet of the excavation was backfilled with fat clay, which was overlain by onsite fat and lean clays. The final few feet of the backfill consisted of sandy silt and silty sand. The native materials are described as interbedded layers of stiff lean clay, stiff silt, and medium dense clayey sand, in an October 16, 2001 memorandum from Subsurface Consultants (Appendix F). A sieve analysis of presumably native soil during the shallow soil gas sampling indicates that soil at 3 to 3.5 feet bgs from location SV-4C along the southern property boundary was clayey sand with gravel (Appendix F). Subsurface Consultants noted clayey sand in one boring, with silty clay and lean clay overlaying and underlying the clayey sand. Based on this information, fine-grained soil types having very low permeabilities predominate throughout the Site. The excavation is now filled with clean fill to at least five feet deep, and the remainder of the excavation cavity up to 16 feet deep was backfilled with low permeability materials.

Figures 2 and 3 show the concentrations of petroleum hydrocarbons underlying the clean fill and in the excavation sidewalls. Areas that were excavated to depths of 10 feet or more were backfilled with clean, imported material and some onsite materials. With ACDEH approval, approximately 250 tons of reused shallow overburden soil and approximately 300 tons of shallow soil beneath the former dock and shed along the western property were reused in the deeper site excavation. The reused soil was from stockpiles A2 and SP-1, for which the analytical results are shown on Table 1a. The maximum TPH concentration in the reused soil was 410 mg/kg. All analytical results for the reused soil were below the RBSLs. The soil was reused from the northern portion of the site where BTEX compounds were not a COC.

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The areas where soil remains at concentrations exceeding residential RBSLs are described above in paragraph 1 and are shown on Figures 1 and 2. This soil had no field indications of hydrocarbon impact. Therefore, a total of approximately 550 tons of soil was reused at the Site. The reused soil was placed in the deeper excavation areas between 8 and 16 feet bgs. Analytical results from soil stockpiles are presented in Table 2.

5. Exposure Point Concentrations

Maximum concentrations of chemicals present in impacted media are shown on Tables 1a and 2a. Concentrations exceeding RBSLs are shown on Table 3. Sampling density was insufficient to use statistical parameters (e.g. 95% Upper Confidence Limits used to average exposure areas <1,000 square feet in size) in lieu of maximum concentration values.

There is virtually no possibility that impacted media at the site could pose an elevated threat to surface water bodies. The measured gradient at the site is 0.04 ft/ft, and the hydraulic conductivity at the site is extremely low due to the high clay content of site soils. Hydraulic conductivity values for inspection of the water level elevation contour map indicates that the horizontal component of the hydraulic gradient (dh/dl) is approximately 0.04 ft/ft. Assuming a hydraulic conductivity (K) of 1 x 10^{-5} centimeters per second, which is a relatively high (conservative) value for typical site soils, and an effective porosity (n_e) of approximately 0.2, Darcy's law ($vx = (K/ n_e) \times dh/dl$) indicates that the average linear groundwater velocity (vx) would be approximately 0.6 meters per year (2 feet per year). Velocities would be substantially lower in the predominant clay units at the site. Therefore, groundwater velocities at the site are extremely low (probable actual velocities are less than 1 foot/year), as shown by the lack of significant contamination detected in groundwater underlying the site more than 50 years after the initial release, despite the pre-remediation presence of free product in shallow groundwater.

No background comparisons were used in the risk assessment.

6. Selection of Tier 1 RBSLs and Comparison to Site Data

Since the Site lies within the Emeryville Brownfields Groundwater Management Zone where groundwater is not considered a drinking source, since the anticipated future Site usage is residential development, and since impacted soil lies at depths of less than 10 feet bgs, the Tier 1 RBSLs used are the surface soil and groundwater RBSLs for residential land use where groundwater is not a current or potential source of drinking water, as listed on Table B of the RWQCB document.

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As described in paragraph 1 above, and as shown in Tables 1a, 2a and 3, an RBSL comparison with site data showed that maximum sample concentrations in four general areas exceeded soil and groundwater RBSLs when maximum sample values were used for comparison. As also described in paragraph 1 and 3, soil gas concentrations did not exceed RBSLs for soil gas.

7. Tier 1 Conclusions

The extent of soil impacts above Tier 1 RBSLs is for TPHd and benzene are illustrated on Figures 1 and 2, respectively. Groundwater at the site is not impacted above RBSLs. Based on the comparison between site data and the Tier 1 RBSLs for soil and groundwater, four very limited areas of soil contamination have potential risks to human health or the environment based on potential impacts from TPHd, benzene and xylenes. However, since the assumptions regarding site conditions inherent in the Tier 1 RBSLs are significantly more conservative than actual site conditions, a Tier 2 risk assessment, documented in the following section indicates that these risks are significantly overestimated.

If Tier 1 risk assessment assumptions were used, then land-use restrictions (i.e. use of engineered vapor barriers beneath buildings) and institutional controls (i.e. deed restriction and risk-management plan pertaining to digging or excavation at the site) could be implemented to mitigate potential human health risks and odor issues in four small areas of the Site. However, a decision to require such restrictions and controls should be based on further analysis presented in the Tier 2 risk assessment presented in the following section.

Tier 2 Risk Assessment

A number of factors combine to cause the Tier 1 RBSLs for soil and groundwater to be grossly conservative comparators for the 1350 Powell Street site. These factors are discussed in detail below on an analyte-by-analyte basis.

Benzene

As shown in Table 1a and Figure 2, a small area containing benzene in soil at a maximum concentration of 3.5 mg/kg in residual soils was identified at the southern property boundary. This exceeds the RWQCB RBSL of 0.18 mg/kg. As discussed above, the most recent sampling results combined with the known susceptibility of benzene to natural attenuation processes provide a strong qualitative basis for the argument that the benzene concentrations in this area may have already been significantly reduced below the levels measured in the samples. In

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addition, it should be noted that the benzene RBSL for soil is grossly over-conservative for the Site for the reasons presented below.

In the Tier 1 risk assessment, the maximum sample concentration was utilized as the exposure point concentration (EPC) for benzene. Generally, when sufficient sampling data are available, an upper estimate of the average concentration (i.e. the 95% UCL) of the exposure area (not to exceed 1,000 square feet) is used as the EPC for conducting risk calculations. However, a sufficient number of samples was not collected in this area because, as described in the preceding sections, benzene is only present in a very restricted area along the southern property boundary. All site soil located north of these two samples, and extending to depths of 10 to 16 feet consists of uncontaminated clean fill, and is underlain by native soil that does not contain detectable benzene. Therefore, any EPC used for calculating risk should account for the presence of the large volume of uncontaminated soil that constitutes the majority of any reasonable exposure area located in this area. As a "worst case" scenario, assuming that the center of any size exposure area was located above the wall sample with the maximum detected residual concentration of benzene, then all soil to the north could be assumed to have a concentration value of zero, which would result in an average concentration for the exposure area of 50% of the maximum soil concentration, even if all soil located south of the center contained the maximum detected concentration of benzene. This would result in a "worst case" EPC of 1.75 mg/kg benzene. In actuality, pre-remediation samples collected within the excavation area and samples collected outside the excavation area show that benzene concentrations decreased dramatically with distance southwards away from the former UST area, and therefore likely attenuate to levels below RBSLs a short distance beneath the Powell Street sidewalk. Therefore, more realistic benzene EPCs should be substantially lower than 1.75 mg/kg, probably by at least an order of magnitude.

The RBSL is based on a target cancer-risk of 10^{-6} and a target non-cancer hazard index (HI) of 0.2. As noted by RWQCB (2001), this target risk "represents the upper (most stringent) end of the potentially acceptable cancer risk range of 10^{-4} of 10^{-6} recommended by the U.S. Environmental Protection Agency" and reflects the highly conservative assumption that cumulative effects of five similar chemicals with an HI of 0.2 at a site could exceed the more commonly applied HI threshold of 1. The City of Oakland's *Oakland Risk-Based Corrective Action: Technical Background Document* (City of Oakland, 1999) which was developed as part of the Urban Land Redevelopment Program for Oakland provides a set of Oakland-specific RBSLs that are based on both the widespread acceptance by Oakland community and government representatives of 10^{-5} as a target risk value and 1 as a target HI value for sites in the Oakland area, and on Oakland-specific default model parameters used for calculating risks. Since the Site

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is located less than 1/4 mile (i.e. 3 blocks) from the Oakland border, both the target risk value developed by local community and government representatives, and the default model parameters based on Oakland environmental conditions (i.e. climate, soil type, building characteristics, exposure assumptions) are pertinent to the site. If a 10^{-5} target cancer risk value is used in the RWQCB risk calculations, the RWQCB RBSL becomes 1.8 mg/kg, approximately 50% of the maximum detected concentration at the site. If this RBSL is combined with the 1.75 mg/kg "worst case" EPC described in the preceding bullet, then all Site benzene EPCs are less than RBSLs, indicating no significant risk to human health.

An important assumption used in computing RBSLs is that for the purposes of calculation, natural attenuation of COCs is assumed not to occur. However, benzene and other petroleum hydrocarbons are highly susceptible to natural attenuation in the subsurface, through a combination of factors, including primarily biodegradation and volatilization. In particular, it was noted by RWQCB (2001) that the "Johnson and Ettinger model over-predicted the soil gas concentration of petroleum-based volatile organic compounds such as benzene in the vadose zone by up to three to five orders of magnitude. This was interpreted to reflect substantial, natural biodegradation of the vapor-phase of these chemicals in the subsurface. This in turn caused the models to over predict impacts to indoor air by several orders of magnitude and makes use of the model for this group of chemicals questionable." This is generally considered to be the reason that computer models used to calculate indoor air EPCs tend to dramaticallly overestimate EPCs. Natural attenuation at the Site will result in substantial reductions of EPCs, and therefore cumulative risks, over the default exposure periods. This is likely to be the factor resulting in the greatest overstimates of risk at the site, although quantitative estimates of the degree of degradation are not given in any commonly used regulatory agency risk calculation methods.

The RWQCB RBSL is based on direct human exposure to contaminated soil, whereas the principal exposure pathway of concern is inhalation of benzene volatilized into indoor air. The RWQCB does not provide an inhalation-based RBSL for benzene because model calculations used for developing inhalation-based RWQCB RBSLs (the Johnson & Ettinger model) have been determined to greatly overestimate exposures to humans, as described in the RWQCB's *Application of Risk Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwater*. The RWQCB notes that overestimates are apparently a result of natural attenuation of benzene vapor and sorbed benzene in the subsurface, and other characteristics that are not accounted for in the model. The RWQCB RBSL for indoor air inhalation is simply the direct exposure RBSL. RWQCB indicates that this value is used in place of an inhalation-derived value because it is assumed that risks from inhalation at a given concentration are lower than risks from ingestion or dermal contact (RWQCB states "Because of the low confidence in the model-

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derived screening levels for benzene in particular, an assumption was made that the already conservative soil screening levels for direct-contact (0.18 mg/kg residential, 0.39 mg/kg commercial/industrial) are also adequate for the protection of indoor air quality"). For this reason, the RWQCB RBSLs for indoor air inhalation are usable only as an extremely conservative screening tool, and cannot be adjusted for site-specific conditions. The City of Oakland (1999) Urban Land Redevelopment Program's Risk-Based Corrective Action Program utilizes a spreadsheet model (Oakland Model) for calculating risks based on an the ASTM (1995) indoor air inhalation model to estimate indoor air exposures (the ASTM model employs the Johnson and Ettinger model calculations). Although this model is also considered to be overly conservative based on the lack of consideration for natural attenuation, it provides a means to calculate risks derived from inhalation of indoor air using Oakland-specific environmental parameters and the target 10^{-5} risk range. Oakland Model results calculated assuming the default silty clay soil type result in indoor air inhalation Tier 2 screening levels for soil of 1.9 mg/kg, and for direct contact screening levels of 19 mg/kg. To further refine this model, several site-specific parameters were substituted into the model using the interactive spreadsheet published on the program web page (www.oaklandpw.com/ulrprogram/index.htm) as follows:

- Ceiling Height: The proposed residential development is planned to have an 8 foot minimum and 10 foot maximum ceiling height, whereas the Oakland model default is 7.5 feet. An 8-foot (244 cm) ceiling height (the most conservative realistic value) was used.

- Foundation Thickness: The proposed development is planned to use an 8" (20 cm) minimum slab thickness which was used in lieu of the default 6" thickness.

- Depth to Source: A depth to (contaminant) source of 9.8 feet (300 cm) was used in lieu of the default 3.3 feet (100 cm). Although one impacted site soil sample is located at a depth of approximately 3 feet bgs, most of the footprint of any future site development would located over soil excavated to 10 feet or deeper. Given that detectable benzene does not occur directly beneath most parts of all townhouse units, this is a highly conservative input parameter.

- Depth to Groundwater: This parameter was set to 16.4 feet (500 centimeters) in lieu of the default of 9.8 feet (300 centimeters).

Based on the site-specific parameters given above, the Oakland Model calculates a site-specific Tier 2 screening level of 3.3 mg/kg benzene, which is close to the maximum detected site concentration. Considering that this model is known to overestimate risks by several orders of magnitude, this screening level is considered grossly conservative.

As shown in Figure 4, although the planned future site use is for residential townhomes, the development plans designate the ground floor for the residential townhomes as garages with attached home offices. Such uses would tend to substantially reduce the receptor exposure periods that are used as default parameters in the Oakland Model RBSLs for indoor air inhalation, which are based on the assumption of ground floor dwelling units. As also shown on Figure 4, the planned site development will cap the entire Site with buildings and pavement, except for a few small limited landscape areas.

The Tier 2 risk assessment for benzene described above indicates that a wide range of factors result in overestimation of risks to human health. These factors indicate that EPCs should be reduced to numbers substantially below 1.75 mg/kg and that Tier 2 RBSLs or screening levels should be increased to levels of 1.8 mg/kg or higher, even while disregarding the potential for natural attenuation and retaining very conservative assumptions regarding other exposure parameters. And the Oakland Model calculates a site-specific Tier 2 screening level of 3.3 mg/kg for benzene, which is just below our maximum detected benzene concentration of 3.5 mg/kg, For this reason, the Tier 2 risk assessment indicates that benzene in soil and groundwater does not constitute a significant risk to human health. The shallow soil gas sampling results, where no benzene was detected in three analyzed samples, further demonstrates that the benzene does not pose a significant risk to human health.

Xylenes

As shown in Tables 1a and 3, the two samples containing the maximum detected concentrations of benzene in soil also contain xylenes at concentrations above the RWQCB RBSL of 1.0 mg/kg. However, a Tier 2 review of the RWQCB RBSL components for xylene in soil indicates that this RBSL is based on the potential for xylenes to impact groundwater. As stated in the RWQCB RBSL guidance, when groundwater data are available, and contaminants are in contact with groundwater, then groundwater sampling data and groundwater RBSLs should be used in lieu of the soil RBSL, because they provide a more accurate assessment of the potential for COCs to leach to groundwater. Therefore, the direct contact and inhalation of indoor air RBSLs should be used in lieu of the leaching-to-groundwater RBSL. The RBSLs for direct contact and inhalation of indoor air for xylenes are both 210 mg/kg, which far exceed site concentrations. Based on this

Tier 2 risk assessment, xylenes are not considered to be a significant risk to human health. In addition, the shallow soil gas sampling results, where xylenes concentrations did not exceed RBSLs, further demonstrates that the xylenes do not pose a significant risk to human health.

Total Petroleum Hydrocarbons

As shown in Tables 1a and 3 and on Figure 1, five samples collected from residual soils contained total petroleum hydrocarbons in the ranges of diesel and/or motor oil at concentrations exceeding the RWQCB RBSL surface soils for middle distillate TPH (500 mg/kg). A Tier 2 review of the RWQCB RBSL components for this TPH range indicates that the RBSL is based on three residential categories which have identical RBSL values. These are a ceiling value for nuisance (odors, etc.), a direct contact substitute of the pyrene RBSL (i.e. the RBSL for pyrene, a PAH commonly present in petroleum hydrocarbons, is used as a single chemical substitute for a wide range of petroleum hydrocarbons), and the leaching-to-groundwater RBSL.

As noted above for xylenes, the leaching-to-groundwater RBSL is not applicable to the site due to the fact that groundwater data are available, and no vadose zone was present beneath the contaminated unit (i.e. all underlying soils were saturated).

PAHs were analyzed in a number of pre-remediation soil samples, and pyrene was detected at a maximum concentration of 0.29 mg/kg, several orders of magnitude below RBSLs, and was generally not detectable. Other PAHs were detected at similar, low or non-detect concentrations. These PAH analyses were in most cases conducted on soil samples containing several hundred to several thousand mg/kg TPH, indicating that PAHs constitute an insignificant fraction of detected TPH. Therefore, use of the pyrene surrogate to assess risks derived from direct contact with TPH may not be valid, and it is probable that generally less toxic aliphatic hydrocarbons may constitute a large fraction of the TPH. It should also be noted that the direct contact RBSLs for both surface and subsurface soils are based on target noncancer HI of 0.2. If the target HI value of 1.0 used in the Oakland Risk Based Corrective Action program is applied in lieu of 0.2, then direct contact RWQCB RBSLs for surface and subsurface soil would become 2,500 mg/kg and 80,000 mg/kg, respectively. Similarly, if the direct contact RBSL for pyrene is computed using the Oakland Model, incorporating the site-specific parameters listed above under "Benzene" the resulting RBSL is 1,200 mg/kg. Using default Tier 1 parameters in the Oakland Model actually results in a higher RBSL of 1,600 mg/kg. No residual hydrocarbons are present at or above these concentrations at the site, with the exception of two samples located at the property boundary. As was described for benzene above, the EPCs for these excavation wall samples should be set at substantially less than half of the measured concentration to account for the large volumes of non-

detect clean backfill located immediately adjacent to them, which would result in EPCs of less than 1,500 mg/kg.

The 500 mg/kg ceiling threshold pertaining to odor, etc. is based on odor thresholds and volatility for typical compositions of TPH. For subsurface soils, interpreted to be soils at depths of greater than 10 feet, the RBSL components for direct contact and nuisance (i.e. odor, etc) are 16,000 mg/kg and 5,000 mg/kg, respectively, substantially greater than any residual site concentrations, so TPH concentrations at that depth should be of no concern

Based on this Tier 2 risk assessment for TPH, residual TPH in soil is not considered to be a significant risk to human health. Only a few isolated samples of residual soil have TPH concentrations greater than the ceiling threshold value for nuisance concerns (i.e. odor, etc.), and except for two samples collected along the western property boundary, TPH concentrations in these samples do not greatly exceed the ceiling threshold value. Therefore, it appears unlikely that such concerns would create impacts, with the possible exception of the two samples collected along the western property boundary. It should be noted that those samples represent offsite contamination that is considered unlikely to impact onsite buildings, and is likely to be remediated during planned redevelopment by the City of Emeryville, and that adjacent parts of the site contain clean fill.

Tier 2 Risk Assessment Conclusion

Based on the Tier 2 risk assessment described above, the presence of residual COCs present at concentrations exceeding RWQCB Tier 1 RBSLs for soil and groundwater does not constitute a significant threat to human health. TPH concentrations exceed ceiling levels for nuisance concerns (e.g. odor) in a few isolated samples, but these samples represent relatively small areas that generally do not underlie proposed building footprints, and are thought to be insufficient to constitute a nuisance. In addition, concentrations of COCs in shallow soil gas do not exceed Tier 1 RBSLs. Because soil gas concentrations provide a more direct evaluation of the potential for residual COCs to volatilize from soil and groundwater to indoor air, soil gas RBSLs generally supercede soil and groundwater RBSLs. Therefore, residual BTEX concentrations do not pose a significant risk to human health.

As described in the June 21, 2002 letter from ACDEH pertaining to Site cleanup goals, concurrence with the cleanup goals described in the *Corrective Action Completion Report* was predicated on five additional requirements, which are listed and discussed below.

1. "Clean imported soil shall comprise the upper 2 feet of all landscaped areas, planting boxes, etc." Except for the small building in the southwest corner of the property, essentially all soil to a depth of 5 feet or more at the property has been replaced with clean imported fill. The building was demolished approximately 1 week prior to completion of this report, and it is anticipated that any landscape areas will be excavated to at least 2 feet depth and replaced with clean imported soil.

2. "Vapor barriers (membranes) shall underlie the entirety of all inhabited structures; no utilities shall penetrate vapor barriers." This requirement was predicated on the assumption that the remedial excavation would encompass only approximately 25% of the volume of the actual final remedial excavation, and that significant volumes of impacted soil up to 1,000 mg/kg TPH would be left in place. However, residual COC concentrations are substantially lower than originally anticipated, and the Tier 2 risk assessment indicates that no significant health threats are present based on risk modeling that uses standard building construction default parameters. Screening levels for potential nuisance impacts indicate that such impacts are unlikely to occur. Therefore, the quantitative data presented herein and shallow soil gas data provide no basis for this requirement, so it is recommended that it be deleted. In addition, it should be noted that ground floors of the planned townhomes will primarily be used as garages and offices, so exposure assumptions used in estimating risks to humans result in overestimates of risks.

3. "Final site development plans must be submitted prior to site development." Site development plans have been previously submitted to ACDEH by Pulte Homes, the prospective site developer. A map illustrating the site development plan and the ground floor is included as Figure 4.

4. "Post-remediation groundwater monitoring program shall be conducted to confirm residual groundwater contaminants found at the sites." Groundwater monitoring was conducted at the site in both December 2002 and February 2003. In addition, offsite grab groundwater samples were collected by the City of Emeryville on the property downgradient/crossgradient from the Site. Groundwater sampling data showed that groundwater beneath the Site has not been significantly impacted by Site contamination, so that continued monitoring is not necessary.

5. "Deed notifications/restrictions shall be filed, the details will be determined at a later date." Although the Tier 2 risk assessment indicates that significant threats to human health are not present, and nuisance impacts are unlikely to occur, the ACDEH has requested recording of a deed restriction for the Site. The deed restriction will specify that single-family homes and

water wells are not allowed on the Site without clearance from the ACDEH, and may reference any vapor barriers required by the ACDEH.

SOIL GAS INVESTIGATION PROCEDURES AND RESULTS

During the February 20, 2003 meeting to discuss the preliminary results of the post-remediation sampling and the risk assessment, a shallow soil gas investigation was requested by the ACDEH to further evaluate the potential risk to human health from residual BTEX in soil and/or groundwater. The ACDEH and RWQCB representative, Roger Brewer, acknowledged that residual BTEX compounds at the Site did not likely pose a significant risk to human health for the planned development, and that shallow soil gas sampling was the most appropriate assessment tool for evaluating the potential risk of residual COCs impacting indoor air in future Site buildings. Shallow soil gas sampling was performed in accordance with Cambria's February 20, 2003 workplan, which ACDEH approval on February 21, 2003. Due to insufficient soil gas recovery in select probes, Cambria discussed soil gas sampling procedures with Eva Chu of the ACDEH and Roger Brewer of the RWQCB. Cambria expanded the planned scope of work to sample deeper soil and alternative locations based on discussions with Mr. Brewer. As also requested by Mr. Brewer, one shallow soil sample was collected for sieve analysis to characterize the soil type and confirm the high clay content of the Site soil.

Soil Gas Investigation Procedures

On February 24, 2003, Cambria advanced nine borings/probes (SV-1, SV-1A, SV-2, SV-3, SV-4, SV-4A, SV-4B, SV-5, SV-6, and SV-7) to collect shallow soil gas, and advanced one soil boring (SV-4C) to collect a shallow soil sample for a sieve analysis to characterize the consistency of the shallow soil. Soil gas boring locations are shown on Figure 5.

Soil gas samples were collected at discrete depth intervals using a direct push rod with an expendable point, expendable point holder, and disposable polyethylene tubing. The expendable point was placed in the expendable point holder, which in turn was attached to the direct push drive rod and driven to depth. The drive rod and expendable point holder were retracted six inches, exposing the polyethylene tubing by separating the expendable point from the point holder and creating the desired void in the soil. Soil gas probes SV-1, SV-2, SV-3, SV-4, SV-5, SV-6, and SV-7 were installed at a sampling depth interval of 3.0 - 3.5 ft bgs. Soil gas probes SV-1A, SV-4A, and SV-4B were installed at a sampling depth interval of 4.5 - 5.0 ft bgs. During installation of the probe, hydrated bentonite was used to seal the area around the drive rod at ground surface to prevent ambient air intrusion from occurring. After installation, soil gas

sampling probes were allowed a minimum of 20 minutes to equilibrate subsurface conditions. Soil gas sampling probes were subjected to leak detection testing prior to purging and sampling. After purging of the approximately three to five volumes of the sampling line and the 6-inch boring void space, samples were collected in Tedlar bags using a differential pressure sampling device (a vacuum chamber). Soil gas samples were analyzed for BTEX by EPA Method 8021B.

The gas sampling pump was a diaphragm pump capable of applying a vacuum of approximately 25.5 inches of mercury. If insufficient gas was recovered in the Tedlar bag, gas recovery was attempted again. For select borings with insufficient gas recovery, additional gas sampling probes were installed nearby at the same depth or deeper (4.5 to 5 ft bgs).

Soil Gas Sampling Results

Soil gas samples were collected from soil gas probes SV-2, SV-3, and SV-6. Insufficient soil gas was recovered in probes SV-1, SV-1A, SV-4, and SV-5, due to the low permeability of the clayey soil. No soil gas was recovered from soil borings SV-4B or SV-7 due to groundwater entry. The encountered 'groundwater' may be rainwater that infiltrated the shallow imported fill material; standing water was present approximately twenty-five feet to the northwest of these sampling locations (the standing water suggests that significant low permeability soils are present in the shallow subsurface beneath the overlying shallow sandy import material). Probe SV-4B was installed in presumably native material a few feet from Powell Street, while probe SV-7 was installed within the imported fill (Figure 5). Soil gas probe SV-4A was abandoned and replaced with SV-4B due to a leak detection test failure.

No benzene or ethylbenzene (<250 micrograms per cubic meter (ug/m^3)) was detected above the laboratory reporting limit in the soil gas samples. The maximum detected toluene and xylenes concentrations were 1,100 ug/m^3 and 1,800 ug/m^3, respectively, in soil gas from SV-6. These concentrations are significantly below the RBSLs for shallow soil gas presented in the December 24, 2002 RWQCB, *Interim Soil Gas Screening Levels for Evaluation of Potential Indoor-Air Impacts and Request for Comments* (RWQCB 2002). Soil gas analytical results and RBSLs are summarized in Table 4. Analytical Laboratory reports are included in Appendix E.

CONCLUSIONS

Cambria concludes the following based on the findings of this additional sampling and risk assessment:

- No chemicals of concern were detected above cleanup standards or RBSLs during this additional investigation.

- Analytical results from residual native soil indicate that all site soil has been excavated to the cleanup standard of 1,000 mg/kg total TPH. The two soil sample results that exceeded the TPH cleanup standard are located along the edge of the excavation at the western property boundary.

- Post-remediation analytical results indicate that site groundwater has been remediated to well below the cleanup standard of 10,000 to 20,000 ug/L total TPH.

- The shallow soil gas results and risk assessment show that residual TPH and BTEX do not pose a significant risk to human health or the environment. Deed restrictions and/or vapor barriers, if required by the local regulatory agencies, would only further safeguard human health at this Site.

- Issuance of a NFA letter is merited at this time.

Post Remediation Conditions in Soil and Excavation Extent

EXPLANATION

Depth	TPHg	TPHd	TPHmo	Combined*

Bold outline for results from Cambria 2003

Concentrations in soil are in parts per million (ppm, mg/kg)
Concentrations exceeding 1,000 ppm total TPH are shown in **bold**

- Approximate location of excavation floor boring (Cambria 2003)
- Approximate location of excavation sidewall soil sample (Cambria, 2002)
- Approximate location of excavation floor soil sample (Cambria, 2002)
- Approximate location of deeper soil boring (Lowney Associates, 2002)
- Approximate location of shallow soil boring (Lowney Associates, 2002)
- Approximate location of exploratory boring (R.T. Hicks, 2001)

2' depth range | 10' depth range | 16' depth range
6' depth range | 13' depth range | Excavation boundary

* - Combined TPH equals cumulative result of TPHg + TPHd + TPHmo. This quantification includes overlapping results from C18 to C23 range within TPHd and TPHmo analyses.

** - Soil sample location was excavated

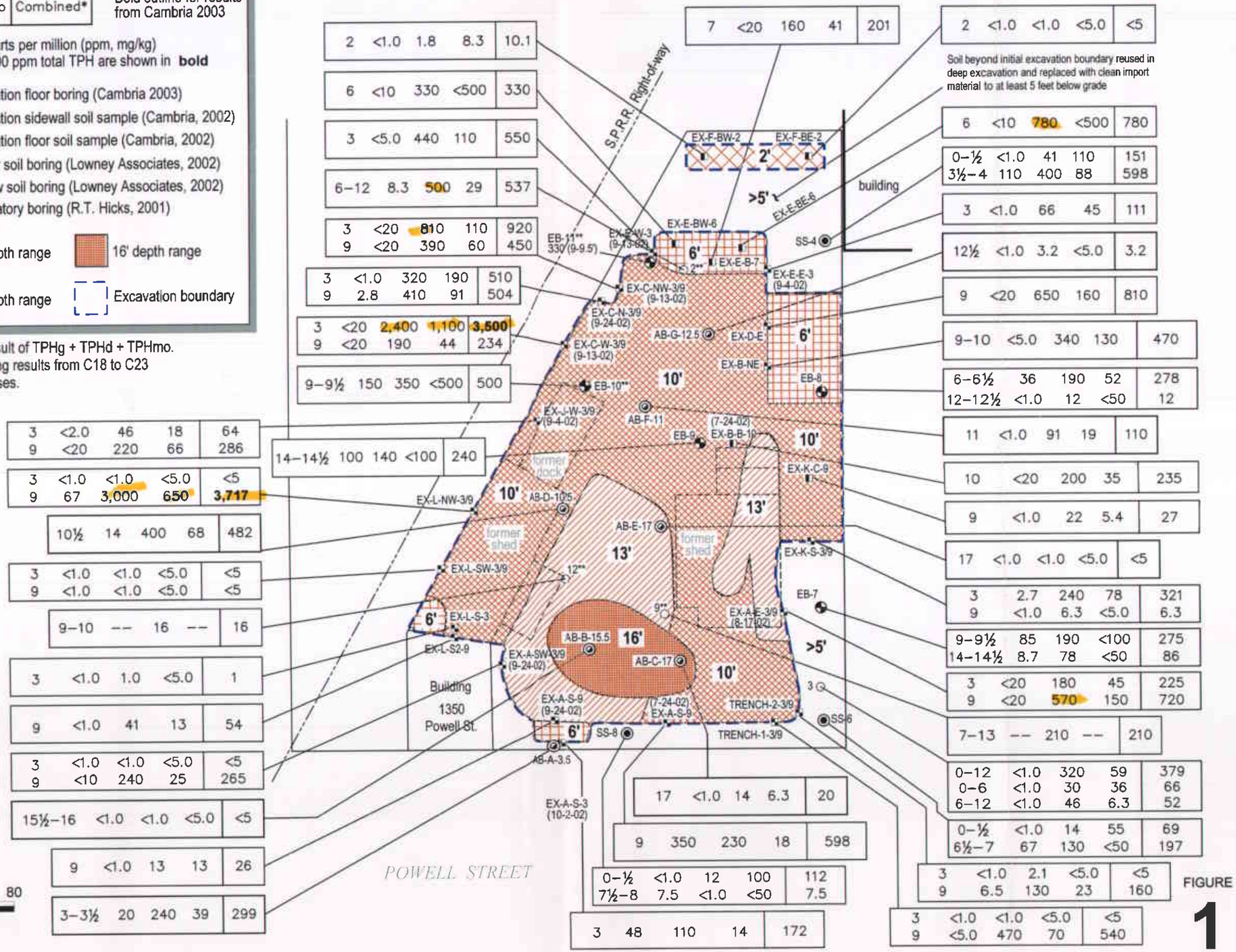


FIGURE **1**

Balaam Property
1350 Powell Street
Emeryville, California

CAMBRIA

\\BALAAM BROTHERS\FIGURES\CAMBRIA\SAMPLES 10\1902_02-18.DWG

Benzene Concentrations in Soil After Remediation

EXPLANATION

Depth	Benzene

Concentrations in soil are in parts per million (ppm, mg/kg)

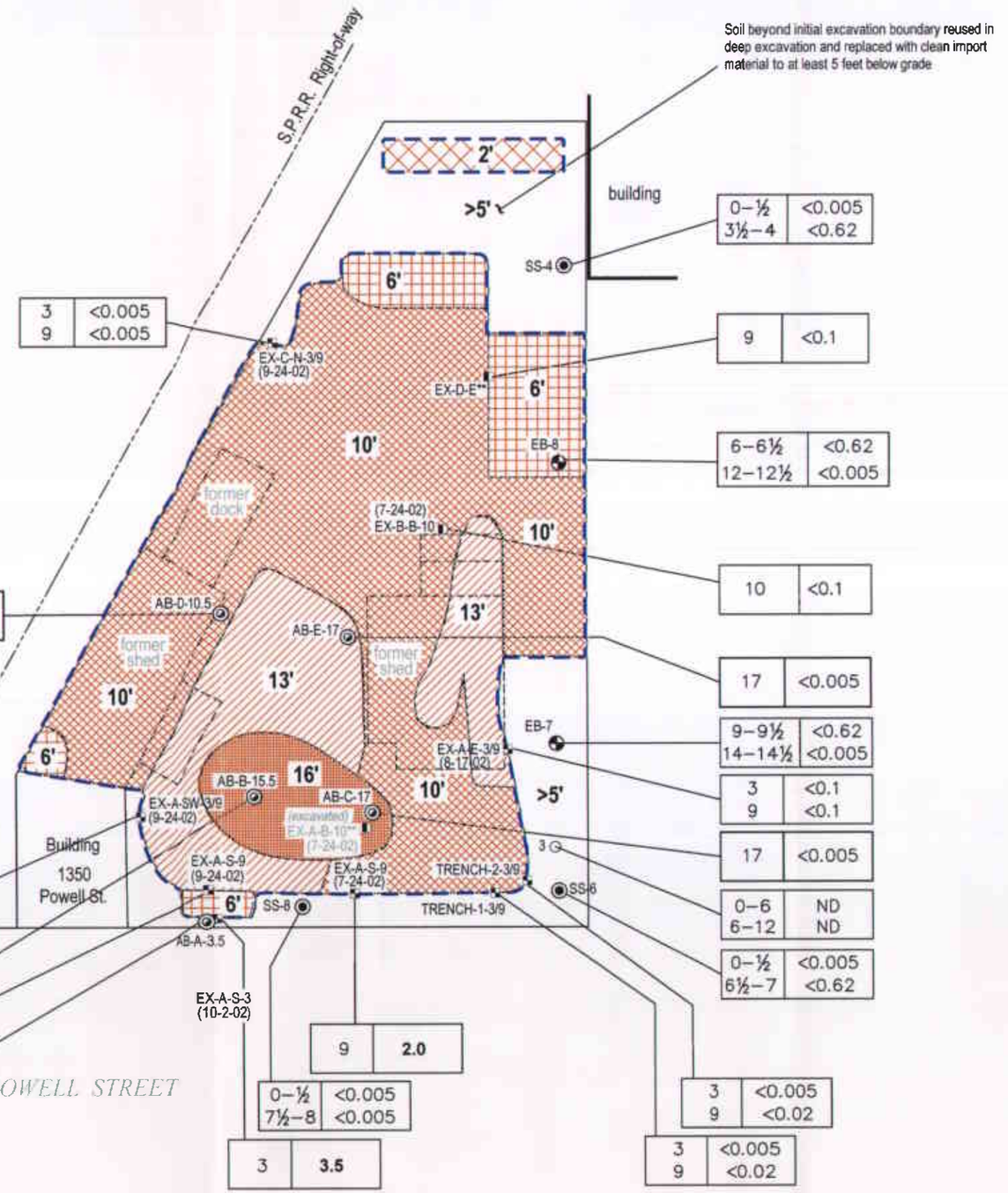
Detections are shown in **bold**

- Approximate location of excavation floor boring (Cambria 2003)
- Approximate location of excavation sidewall soil sample (Cambria, 2002)
- Approximate location of excavation floor soil sample (Cambria, 2002)
- Approximate location of deeper soil boring (Lowney Associates, 2002)
- Approximate location of shallow soil boring (Lowney Associates, 2002)
- Approximate location of exploratory boring (R.T. Hicks, 2001)

2' depth range | 10' depth range | 16' depth range

6' depth range | 13' depth range | Excavation boundary

** - Soil sample location was excavated



0 20 40 80

Scale (ft)

FIGURE **2**

Balaam Property
1350 Powell Street
Emeryville, California

CAMBRIA

L:\BALAAM BROTHERS\FIGURES\CAMBRIA\BENZENE_02-18.DWG

EXPLANATION

AB-B ◎ — Approximate location of excavation floor boring (Cambria 2003)

TW-1 ⊕ — Temporary well location

BM △ — Benchmark in sidewalk, 19.39 feet elevation

▭ — Excavation Area

10.28 — Groundwater Elevation as of 12/11/02 (feet above sea level **). Elevation not calculated for sampling on 02/14/03 due to damaged casings.

0.04 — Groundwater flow direction and gradient (feet above sea level **)

10.00 — Groundwater elevation contour line as of 12/11/02 (feet above sea level **)

Total TPH — Combined Total Petroleum Hydrocarbons (TPH) by EPA Method 8015C Total TPH does not equal cumulative result of TPHg + TPHd + TPHmo. To avoid quantification of overlapping results, Total TPH = TPHg (C6-C9) + TPHbo (C10+)

TPHg — TPH as gasoline by EPA Method 8015C

TPHd — TPH as diesel by EPA Method 8015Cm with silica gel cleanup

TPHmo — TPH as motor oil by EPA Method 8015Cm with silica gel cleanup

TPHbo — TPH as bunker oil by EPA Method 8015Cm with silica gel cleanup

Benzene — Benzene by EPA Method 8021B

PNA's — Polynuclear aromatic hydrocarbons by EPA Method 8270D

NA — Not Analyzed

Concentrations are in parts per billion (ppb, µg/L)

* — The reporting limit for phenanthrene was 50 µg/L

** — Based on 19.39' benchmark in sidewalk

TW-7		
Date	12/05/02	02/14/03
GW Elev.	*10.28*	---
Total TPH	79	<250
TPHg	<50	<50
TPHd	79	<50
TPHmo	<250	<250
Benzene	<0.5	NA
PNAs	NA	NA

TW-8		
Date	12/05/02	02/14/03
GW Elev.	*11.51*	---
Total TPH	<250	<250
TPHg	<50	<50
TPHd	<50	<50
TPHmo	<250	<250
Benzene	<0.5	NA
PNAs	<10*	NA

TW-5	
Date	12/04/02
GW Elev.	---
Total TPH	310
TPHg	<50
TPHd	220
TPHmo	<250
Benzene	<0.5
PNAs	<10*

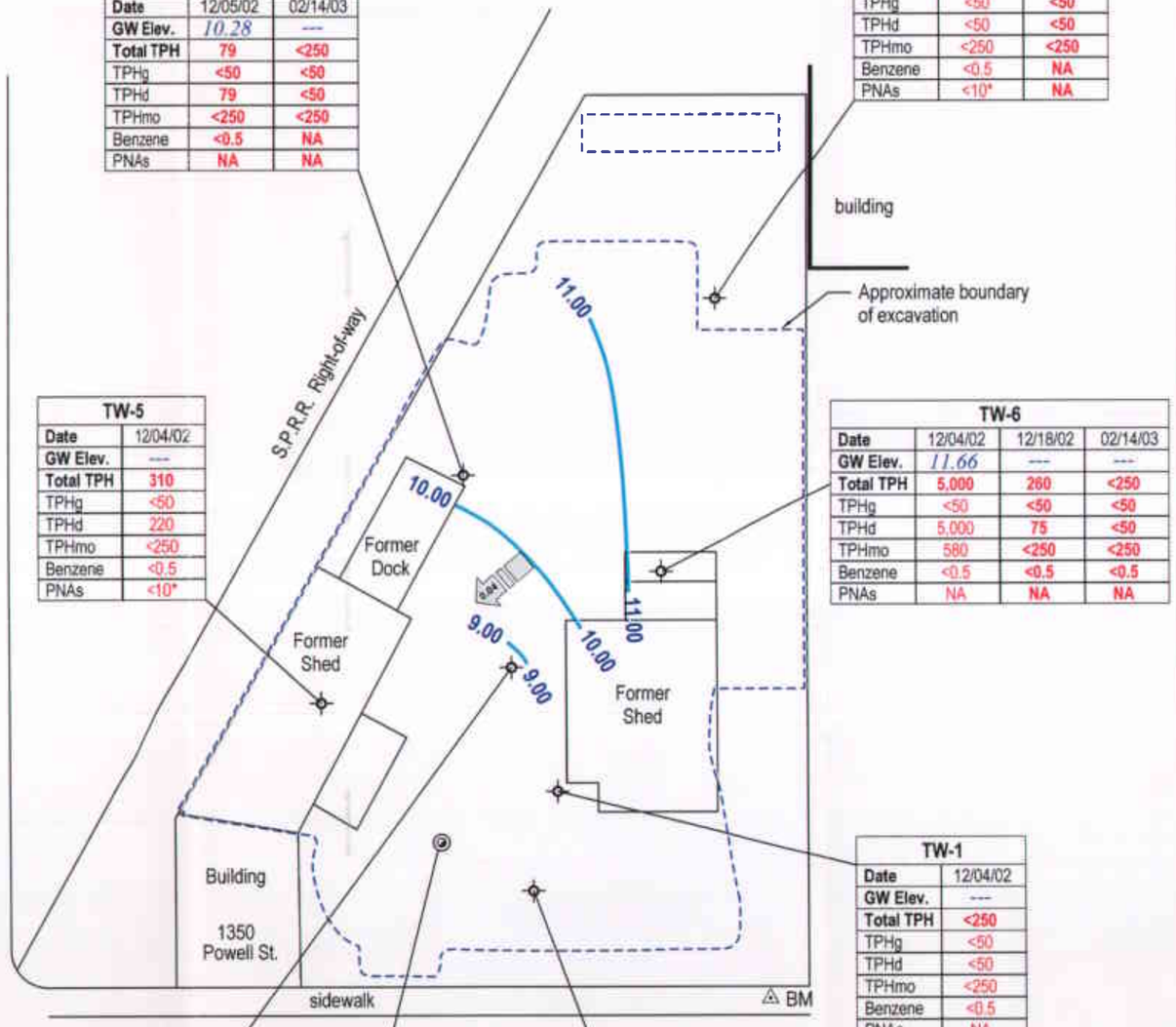
TW-6			
Date	12/04/02	12/18/02	02/14/03
GW Elev.	*11.66*	---	---
Total TPH	5,000	260	<250
TPHg	<50	<50	<50
TPHd	5,000	75	<50
TPHmo	580	<250	<250
Benzene	<0.5	<0.5	<0.5
PNAs	NA	NA	NA

TW-1	
Date	12/04/02
GW Elev.	---
Total TPH	<250
TPHg	<50
TPHd	<50
TPHmo	<250
Benzene	<0.5
PNAs	NA

TW-4	
Date	12/05/02
GW Elev.	*8.78*
Total TPH	<250
TPHg	<50
TPHd	<50
TPHmo	<250
Benzene	<0.5
PNAs	<10*

AB-B	
Date	02/14/03
GW Elev.	---
Total TPH	<250
TPHg	<50
TPHd	130
TPHmo	<250
Benzene	<0.5
PNAs	NA

TW-2	
Date	12/04/02
GW Elev.	---
Total TPH	596
TPHg	56
TPHd	340
TPHmo	<250
Benzene	11
PNAs	<10*



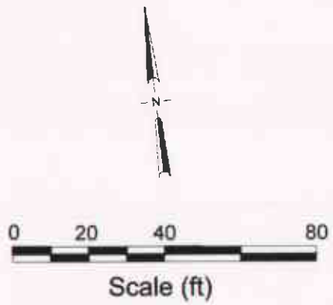


FIGURE 3

Post Remediation Conditions in Groundwater

CAMBRIA

Balaam Property
1350 Powell Street
Emeryville, California

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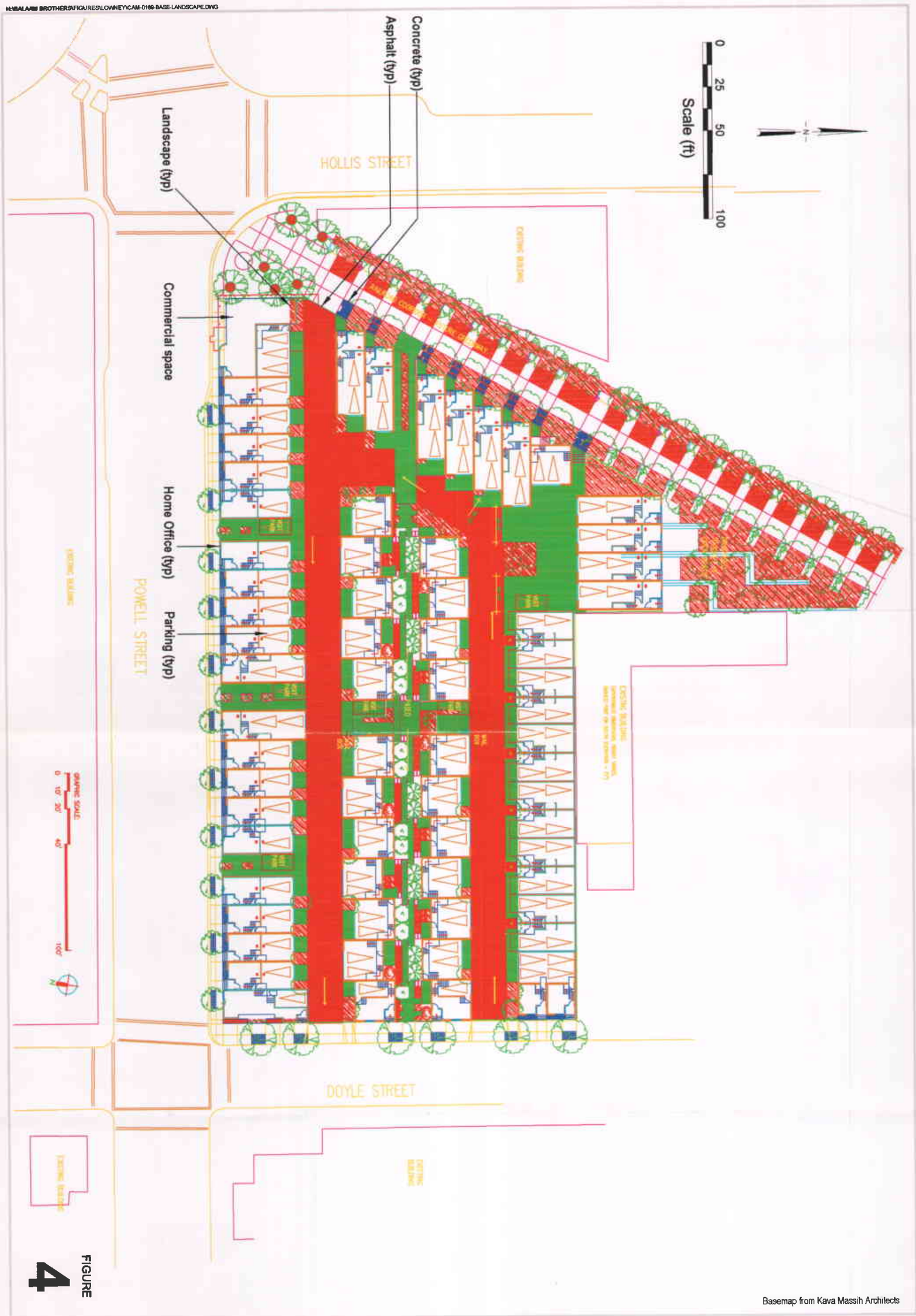

FIGURE 4

Basemap from Kava Massih Architects

Balaam Property
1350 Powell Street
Emeryville, California

CAMBRIA

Redevelopment Site Plan and Ground Floor

EXPLANATION

Depth	Benzene

Concentrations in soil are in micrograms per cubic meter (µg/m³)

▲ - Approximate location of soil vapor sample location (Cambria 2003)

IMP - Soil impermeable to soil vapor flow - no vapor sample recovered

WATER - Soil vapor sampling terminated due to groundwater entry into soil boring

LK - Boring replaced by SV-4B due to failed leak test

Sieve Analysis - Soil sample collected for sieve analysis

2' depth range

10' depth range

16' depth range

6' depth range

13' depth range

Excavation boundary

N

0 20 40 80

Scale (ft)

FIGURE

5

Soil Gas Concentrations After Remediation

CAMBRIA

Balaam Property

1350 Powell Street

Emeryville, California

Table 1a. **Soil Analytical Data - Petroleum Hydrocarbons**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	8015m	8015	8015	8015	8,015	8,015	8021	8021	8021	8021	8021
		Residential RBSL*:	400	500	500	NE	NE	NE	0.18	8.4	24	1.0	1.0
		Cleanup Goal:	--	--	--	--	1,000	1,000	--	--	--	--	--
Post Remediation Conditions (Sample Data from Soil After Excavation)													
Cambria Excavation Floor Borings, 2003													
AB-A-3.5	3-3.5'	2/12/2003	20	240	39	240	260	299	<0.02	0.053	0.037	0.057	<0.2
AB-B-15.5	15-15.5'	2/14/2003	<1.0	<1.0	<5.0	<5.0	<5	<5	<0.005	<0.005	<0.005	<0.005	<0.05
AB-C-17	16.5-17'	2/14/2003	<1.0	14	6.3	15	15	20	<0.005	<0.005	<0.005	<0.005	<0.05
AB-D-10.5	10-10.5'	2/14/2003	14	400	68	430	444	482	<0.050	<0.050	<0.050	0.20	<0.50
AB-E-17	16.5-17'	2/14/2003	<1.0	<1.0	<5.0	<5.0	<5	<5	<0.005	<0.005	<0.005	<0.005	<0.05
AB-F-11	10.5-11'	2/14/2003	<1.0	91	19	93	93	110	--	--	--	--	--
AB-G-12.5	12-12.5'	2/14/2003	<1.0	3.2	<5.0	<5.0	<5	3	--	--	--	--	--
Hicks Borings, 2001													
Borehole #3**	Composite 0'-6'	8/7/2001	ND	30	36	--	--	66	ND	ND	ND	ND	ND
Borehole #3**	Composite 6'-12'	8/7/2001	ND	46	6.3	--	--	52	ND	ND	ND	ND	ND
Lowney Associates Borings, 2002													
EB-7**	9'-9.5'	3/4/2002	85	190	<100	--	--	275	<0.62	<0.62	<0.62	<0.62	<0.62
EB-7**	14'-14.5'	3/4/2002	8.7	78	<50	--	--	87	<0.005	<0.005	<0.005	<0.005	<0.005
EB-8**	6'-6.5'	3/4/2002	36	190	52	--	--	278	<0.62	<0.62	<0.62	<0.62	<0.62
EB-8**	12'-12.5'	3/4/2002	<1.0	12	<50	--	--	12	<0.005	<0.005	<0.005	<0.005	<0.005
Lowney Associates Borings, 2002													
SS-4 (fill)**	0'-0.5'	3/6/2001	<1.0	41	110	--	--	151	<0.005	<0.005	<0.005	<0.005	<0.005
SS-4 (native)**	3.5'-4'	3/6/2001	110	400	88	--	--	598	<0.62	<0.62	<0.62	<0.62	<0.62
SS-6 (fill)**	0'-0.5'	3/6/2001	<1.0	14	55	--	--	69	<0.005	<0.005	<0.005	<0.005	<0.005
SS-6 (native)**	6.5'-7'	3/6/2001	67	130	<50	--	--	197	<0.62	<0.62	<0.62	<0.62	<0.62
SS-8 (fill)**	0'-0.5'	3/6/2001	<1.0	12	100	--	--	112	<0.005	<0.005	<0.005	<0.005	<0.005
SS-8 (native)**	7.5'-8'	3/6/2001	7.5	<1.0	<50	--	--	8	<0.005	<0.005	<0.005	<0.005	<0.005

Table 1a. **Soil Analytical Data - Petroleum Hydrocarbons**
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1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
Sidewall Sampling Event I													
North Side of Property													
EX-B-B-10**	10'-10.5'	7/24/2002	<20	200	35	180	180	235	<0.1	<0.1	<0.1	<0.1	<1
South Side of Property													
EX-A-S-9**	9'-10'	7/24/2002	350	230	18	210	560	598	**2.0**	0.30	3.4	**2.1**	<2.0
Sidewall Sampling Event II													
North Side of Property													
EX-B-NE-9**	9'-10'	8/7/2002	<5.0	340	130	370	370	470	--	--	--	--	--
EX-E-BW-6**	6'-6.5'	8/7/2002	<10	330	<500	550	550	330	--	--	--	--	--
EX-E-BE-6**	6'-6.5'	8/7/2002	<10	**780**	<500	730	730	780	--	--	--	--	--
EX-F-BE-2**	2'-3'	8/7/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-F-BW-2**	2'-3'	8/7/2002	<1.0	1.8	8.3	8.1	8	10	--	--	--	--	--
Sidewall Sampling Event IV													
South Side of Property													
EX-A-E-9**	9'-9.5'	8/17/2002	<20	**570**	150	520	520	720	<0.1	<0.2	<0.1	<0.05	<1
EX-A-E-3**	3'-4'	8/17/2002	<20	180	45	160	160	225	<0.1	<0.2	<0.1	<0.05	<1
North Side of Property													
EX-D-E-9**	9'-9.5'	8/19/2002	<20	650	160	590	590	810	<0.1	<0.1	<0.1	<0.05	<1
Sidewall Sampling Event VI													
North Side of Property													
EX-E-B-7**	7'-7.5'	9/4/2002	<20	160	41	140	140	201	--	--	--	--	--
EX-E-E-3**	3'-3.5'	9/4/2002	<1.0	66	45	70	70	111	--	--	--	--	--
EX-J-W-3**	3'-3.5'	9/4/2002	<2.0	46	18	44	44	64	--	--	--	--	--
EX-J-W-9**	9'-9.5'	9/4/2002	<20	220	66	230	230	286	--	--	--	--	--

Table 1a. **Soil Analytical Data - Petroleum Hydrocarbons**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
Sidewall Sampling Event VII													
North Side of Property													
EX-E-W-3**	3'-3.5'	9/13/2002	<5.0	440	110	470	470	550	--	--	--	--	--
EX-C-NW-3**	3'-3.5'	9/13/2002	<20	**810**	110	960	960	920	--	--	--	--	--
EX-C-NW-9**	9'-9.5'	9/13/2002	<20	390	60	410	410	450	--	--	--	--	--
EX-C-W-3**	3'-3.5'	9/13/2002	<20	**2,400**	**1,100**	2,800	2,800	3,500	--	--	--	--	--
EX-C-W-9**	9'-9.5'	9/13/2002	<20	190	44	190	190	234	--	--	--	--	--
Sidewall Sampling Event VIII													
North Side of Property													
EX-C-N-3**	3'-3.5'	9/24/2002	<1.0	320	190	360	360	510	<0.005	<0.005	<0.005	<0.005	<0.05
EX-C-N-9**	9'-9.5'	9/24/2002	2.8	410	91	400	403	504	<0.005	<0.005	0.016	<0.005	<0.05
South Side of Property													
EX-A-SW-3**	3'-3.5'	9/24/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	0.0095	0.0051	<0.005	<0.005	<0.05
EX-A-SW-9**	9'-9.5'	9/24/2002	<10	240	25	240	240	265	<0.05	<0.05	<0.05	<0.05	<0.5
EX-A-S-9**	9'-9.5'	9/24/2002	<1.0	13	13	27	27	26	<0.005	<0.005	<0.005	<0.005	<0.05
Sidewall Sampling Event IX													
South Side of Property													
EX-A-S-3 (10-2-02)**	3'-3.5'	10/2/2002	48	110	14	110	158	172	**3.5**	0.16	3.1	**4.5**	<0.5
TRENCH-1-9 (10-2-02)**	9'-9.5'	10/2/2002	<5.0	470	70	480	480	540	<0.02	<0.02	<0.02	<0.02	<0.2
TRENCH-1-3 (10-2-02)**	3'-3.5'	10/2/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	<0.005	<0.005	<0.005	<0.005	<0.05
TRENCH-2-3 (10-2-02)**	3'-3.5'	10/2/2002	<1.0	2.1	<5.0	<5.0	<5	2	<0.005	<0.005	<0.005	<0.005	<0.05
TRENCH-2-9 (10-2-02)**	9'-9.5'	10/2/2002	6.5	130	23	130	137	160	<0.02	<0.02	0.030	<0.02	<0.2
Sidewall Sampling Event X													
North Side of Property													
EX-K-S-3**	3'-3.5'	10/5/2002	2.7	240	78	250	253	321	--	--	--	--	--
North Side of Property									--	--	--	--	--
EX-K-S-9**	9'-9.5'	10/7/2002	<1.0	6.3	<5.0	8.5	9	6	--	--	--	--	--
EX-K-C-9**	9'-9.5'	10/7/2002	<1.0	22	5.4	24	24	27	--	--	--	--	--

Table 1a. **Soil Analytical Data - Petroleum Hydrocarbons**
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		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
Pothole Sampling under former building													
EX-L-SW-3**	3'-3.5'	11/20/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-L-SW-9**	9'-9.5'	11/20/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-L-NW-3**	3'-3.5'	11/20/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-L-NW-9**	9'-9.5'	11/20/2002	67	**3,000**	**650**	2,800	2,867	3,717	--	--	--	--	--
EX-L-S-3**	3'-3.5'	11/20/2002	<1.0	1.0	<5.0	<5.0	<5	1	--	--	--	--	--
EX-L-S2-9**	9'-9.5'	11/22/2002	<1.0	41	13	42	42	54	--	--	--	--	--
During Remediation (Data from Samples Collected During Excavation)													
Sidewall Sampling Event I													
North Side of Property													
EX-B-W-6	6'-7'	7/24/2002	<200	**4,600**	**1,900**	5,000	5,000	6,500	<1	<1	<1	<1	<10
EX-B-N-7	7'-8'	7/24/2002	<200	**9,600**	**2,800**	10,000	10,000	12,400	<1	<1	<1	<1	<10
EX-B-E-8	8'-9'	7/24/2002	<100	**1,900**	**500**	1,700	1,700	2,400	<0.5	<0.5	<0.5	<0.5	<5.0
EX-B-S-9	9'-10'	7/24/2002	<200	**12,000**	**2,300**	11,000	11,000	14,300	<1	<1	<1	<1	<10
EX-B-B-10**	10'-10.5'	7/24/2002	<20	200	35	180	180	235	<0.1	<0.1	<0.1	<0.1	<1
South Side of Property													
EX-A-W-3	3'-4'	7/24/2002	**900**	330	25	300	1,200	1,255	**19**	**89**	**29**	**130**	<10
EX-A-W-7	7'-8'	7/24/2002	**460**	**3,300**	**520**	3,800	4,260	4,280	**21**	3.6	12	**14**	<10
EX-A-N-2.5	2.5'-3.5'	7/24/2002	67	200	13	180	247	280	**2.5**	0.26	0.39	0.37	<0.5
EX-A-N-9.5	9.5'-10'	7/24/2002	**2,100**	**2,700**	<500	2,300	4,400	4,800	**36**	**24**	**85**	**350**	<10
EX-A-B-10	10'-10.5'	7/24/2002	7.4	99	18	88	95	124	**0.47**	0.027	0.038	0.13	<0.2
EX-A-E-3	3'-4'	7/24/2002	67	170	28	150	217	265	**1.4**	0.34	0.043	0.12	<0.2
EX-A-E-8	8'-9'	7/24/2002	240	**7,100**	**900**	6,900	7,140	8,240	**6.2**	1.5	1.4	**2.7**	<10
EX-A-S-9**	9'-10'	7/24/2002	350	230	18	210	560	598	**2.0**	0.30	3.4	**2.1**	<2.0
Sidewall Sampling Event II													
North Side of Property													
EX-B-NE-9**	9'-10'	8/7/2002	<5.0	340	130	370	370	470	--	--	--	--	--
EX-B-W-9	9'-10'	8/7/2002	<100	**3,800**	**640**	3,900	3,900	4,440	--	--	--	--	--
EX-B-N-9	9'-10'	8/7/2002	<100	**7,100**	**1,300**	7,100	7,100	8,400	--	--	--	--	--
EX-B-N-3	3'-4'	8/7/2002	<1.0	17	16	24	24	33	--	--	--	--	--
EX-C-E-9	9'-10'	8/7/2002	<100	**3,200**	**820**	3,200	3,200	4,020	--	--	--	--	--
EX-C-E-3	3'-4'	8/7/2002	19	390	100	360	379	509	--	--	--	--	--
EX-C-N-9	9'-10'	8/7/2002	16	**1,600**	<500	1,700	1,716	1,616	--	--	--	--	--

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1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
EX-C-N-3	3'-4'	8/7/2002	<10	**510**	140	470	470	650	--	--	--	--	--
EX-C-W-9	9'-10'	8/7/2002	39	**2,600**	**570**	2,800	2,839	3,209	--	--	--	--	--
EX-C-W-3	3'-4'	8/7/2002	<40	**920**	250	850	850	1,170	--	--	--	--	--
EX-D-S-9	9'-10'	8/7/2002	<100	**4,200**	**810**	4,200	4,200	5,010	--	--	--	--	--
EX-D-S-3	3'-4'	8/7/2002	<10	340	72	300	300	412	--	--	--	--	--
EX-D-N-9	9'-10'	8/7/2002	<10	300	95	320	320	395	--	--	--	--	--
EX-E-BW-6**	6'-6.5'	8/7/2002	<10	330	<500	550	550	330	--	--	--	--	--
EX-E-BE-6**	6'-6.5'	8/7/2002	<10	**780**	<500	730	730	780	--	--	--	--	--
EX-E-S-3	3'-4'	8/7/2002	<100	**12,000**	**2,600**	11,000	11,000	14,600	--	--	--	--	--
EX-F-BE-2**	2'-3'	8/7/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-F-BW-2**	2'-3'	8/7/2002	<1.0	1.8	8.3	8.1	8	10	--	--	--	--	--
Sidewall Sampling Event III													
South Side of Property													
EX-F-N-3	3'-4'	8/10/2002	<20	**1,300**	220	1,200	1,200	1,520	<0.1	<0.1	<0.1	<0.1	<1
EX-F-N-9	9'-10'	8/10/2002	15	**1,000**	180	1,100	1,115	1,195	<0.05	0.052	0.065	<0.05	<0.5
EX-F-B-10	10'-10.5'	8/10/2002	11	**1,500**	400	1,300	1,311	1,911	<0.05	<0.05	<0.05	<0.05	<0.5
Note: EX-F is really an extension of EX-A in this case													
Sidewall Sampling Event IV													
South Side of Property													
EX-A-E-9**	9'-9.5'	8/17/2002	<20	**570**	150	520	520	720	<0.1	<0.2	<0.1	<0.05	<1
EX-A-E-3**	3'-4'	8/17/2002	<20	**180**	45	160	160	225	<0.1	<0.2	<0.1	<0.05	<1
North Side of Property													
EX-C-W-9	9'-9.5'	8/19/2002	58	**1,900**	430	2,000	2,058	2,388	<0.1	<0.1	0.30	<0.05	<1
EX-C-W-3	3'-4'	8/19/2002	47	**2,600**	**540**	2,300	2,347	3,187	<0.1	<0.1	0.21	<0.05	<1
EX-E-S-3	3'-4'	8/19/2002	<20	**3,500**	**640**	3,700	3,700	4,140	<0.1	<0.2	<0.1	<0.05	<1
EX-D-W-9	9'-9.5'	8/19/2002	<20	420	140	450	450	560	<0.1	<0.1	<0.1	<0.05	<1
EX-D-W-3	3'-4'	8/19/2002	12	270	62	240	252	344	<0.05	<0.05	0.056	<0.02	<0.5
EX-B-NW-9	9'-9.5'	8/19/2002	11	**1,000**	<500	1,600	1,611	1,011	<0.05	<0.1	<0.05	<0.02	<0.5
EX-B-NW-3	3'-4'	8/19/2002	<20	**4,900**	**970**	4,900	4,900	5,870	<0.1	<0.1	<0.1	<0.05	<1
EX-D-E-9**	9'-9.5'	8/19/2002	<20	650	160	590	590	810	<0.1	<0.1	<0.1	<0.05	<1
EX-D-E-3	3'-4'	8/19/2002	21	**3,100**	**840**	3,100	3,121	3,961	<0.1	<0.1	<0.1	<0.05	<1
TRENCHAB	0'-7'	8/17/2002	25	**2,500**	**560**	2,900	2,925	3,085	<0.1	<0.1	0.21	<0.05	<1
EX-H-8	8'-9'	8/20/2002	61	**1,600**	**550**	2,000	2,061	2,211	--	--	--	--	--
Sidewall Sampling Event V													

Table 1a. **Soil Analytical Data - Petroleum Hydrocarbons**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
South Side of Property													
EX-A-E-9	9'-9.5'	8/27/2002	16	**570**	120	560	576	706	<0.02	<0.02	0.16	0.33	<0.2
EX-A-E-3	3'-4'	8/27/2002	53	**2,300**	**650**	2,600	2,653	3,003	<0.05	<0.05	0.40	0.57	<0.5
Sidewall Sampling Event VI													
North Side of Property													
EX-E-B-7**	7'-7.5'	9/4/2002	<20	160	41	140	140	201	--	--	--	--	--
EX-E-W-3	3'-3.5'	9/4/2002	<50	**1,100**	410	1,100	1,100	1,510	--	--	--	--	--
EX-E-E-3**	3'-3.5'	9/4/2002	<1.0	66	45	70	70	111	--	--	--	--	--
EX-D-NW-9	9'-9.5'	9/4/2002	<50	**620**	120	560	560	740	--	--	--	--	--
EX-D-NW-3	3'-3.5'	9/4/2002	<50	150	30	140	140	180	--	--	--	--	--
EX-J-W-3**	3'-3.5'	9/4/2002	<2.0	46	18	44	44	64	--	--	--	--	--
EX-J-W-9**	9'-9.5'	9/4/2002	<20	220	66	230	230	286	--	--	--	--	--
EX-J-S-9	9'-9.5'	9/4/2002	26	**1,700**	**520**	1,600	1,626	2,246	--	--	--	--	--
EX-J-S-3	3'-3.5'	9/4/2002	6.3	290	97	310	316	393	--	--	--	--	--
Sidewall Sampling Event VI													
North Side of Property													
EX-J-W-3	3'-3.5'	9/9/2002	16	240	41	240	256	297	--	--	--	--	--
EX-J-W-9	9'-9.5'	9/9/2002	160	**4,900**	<5,000	6,400	6,560	5,060	--	--	--	--	--
Sidewall Sampling Event VII													
North Side of Property													
EX-E-W-3**	3'-3.5'	9/13/2002	<5.0	440	110	470	470	550	--	--	--	--	--
EX-C-NW-3**	3'-3.5'	9/13/2002	<20	**810**	110	960	960	920	--	--	--	--	--
EX-C-NW-9**	9'-9.5'	9/13/2002	<20	390	60	410	410	450	--	--	--	--	--
EX-C-W-3**	3'-3.5'	9/13/2002	<20	**2,400**	**1,100**	2,800	2,800	3,500	--	--	--	--	--
EX-C-W-9**	9'-9.5'	9/13/2002	<20	190	44	190	190	234	--	--	--	--	--
EX-C-N-3	3'-3.5'	9/13/2002	31	**3,100**	**1,100**	3,400	3,431	4,231	--	--	--	--	--
EX-C-N-9	9'-9.5'	9/13/2002	21	**840**	190	830	851	1,051	--	--	--	--	--
Sidewall Sampling Event VIII													
North Side of Property													
EX-C-N-3**	3'-3.5'	9/24/2002	<1.0	320	190	360	360	510	<0.005	<0.005	<0.005	<0.005	<0.05
EX-C-N-9**	9'-9.5'	9/24/2002	2.8	410	91	400	403	504	<0.005	<0.005	0.016	<0.005	<0.05
South Side of Property													
EX-A-SW-3**	3'-3.5'	9/24/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	0.0095	0.0051	<0.005	<0.005	<0.05
EX-A-SW-9**	9'-9.5'	9/24/2002	<10	240	25	240	240	265	<0.05	<0.05	<0.05	<0.05	<0.5
EX-A-W-9	9'-9.5'	9/24/2002	12	140	<100	140	152	152	<0.05	<0.05	0.061	<0.05	<0.5

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Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
EX-A-W-3	3'-3.5'	9/24/2002	2.4	28	<5.0	27	29	30	<0.005	0.0056	0.017	<0.005	<0.05
EX-A-S-9**	9'-9.5'	9/24/2002	<1.0	13	13	27	27	26	<0.005	<0.005	<0.005	<0.005	<0.05
EX-A-S-3	3'-3.5'	9/24/2002	**810**	**630**	54	640	1,450	1,494	**21**	**14**	**33**	**120**	<5.0
Sidewall Sampling Event IX													
North Side of Property													
EX-D-E-3 (10-2-02)	3'-3.5'	10/2/2002	<10	**3,300**	**960**	3,700	3,700	4,260	<0.05	0.074	<0.05	<0.05	<0.5
South Side of Property													
EX-A-S-3 (10-2-02)**	3'-3.5'	10/2/2002	**48**	110	14	110	158	172	**3.5**	0.16	3.1	**4.5**	<0.5
TRENCH-2-3 (10-2-02)**	3'-3.5'	10/2/2002	<1.0	2.1	<5.0	<5.0	<5	2	<0.005	<0.005	<0.005	<0.005	<0.05
TRENCH-2-9 (10-2-02)**	9'-9.5'	10/2/2002	6.5	130	23	130	137	160	<0.02	<0.02	0.030	<0.02	<0.2
TRENCH-1-9 (10-2-02)**	9'-9.5'	10/2/2002	<5.0	**470**	70	**480**	480	540	<0.02	<0.02	<0.02	<0.02	<0.2
TRENCH-1-3 (10-2-02)**	3'-3.5'	10/2/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	<0.005	<0.005	<0.005	<0.005	<0.05
Sidewall Sampling Event X													
North Side of Property													
EX-D2-E-3	3'-3.5'	10/5/2002	<10	**2,600**	**1,500**	3,100	3,100	4,100	--	--	--	--	--
EX-D2-S-3	3'-3.5'	10/5/2002	<20	**3,400**	**730**	3,900	3,900	4,130	--	--	--	--	--
EX-K-N-3	3'-3.5'	10/5/2002	<50	**1,900**	<500	2,000	2,000	1,900	--	--	--	--	--
EX-K-S-3**	3'-3.5'	10/5/2002	2.7	240	**78**	250	253	321	--	--	--	--	--

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Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
North Side of Property													
EX-K-C-9**	9'-9.5'	10/7/2002	<1.0	22	5.4	24	24	27	--	--	--	--	--
EX-K-N-9	9'-9.5'	10/7/2002	<4.0	350	57	360	360	407	--	--	--	--	--
EX-K-S-9**	9'-9.5'	10/7/2002	<1.0	6.3	<5.0	8.5	9	6	--	--	--	--	--
Pothole Sampling under former building													
PH-1-3	3'-3.5'	11/5/2002	<5.0	67	13	66	66	80	--	--	--	--	--
PH-2-3	3'-3.5'	11/5/2002	2.6	50	13	50	53	66	--	--	--	--	--
PH-2-9	9'-9.5'	11/5/2002	19	**940**	180	920	939	1,139	--	--	--	--	--
PH-1-9	9'-9.5'	11/5/2002	41	**620**	120	640	681	781	--	--	--	--	--
PH-3-3	3'-3.5'	11/5/2002	<1.0	10	<5.0	9.6	10	10	--	--	--	--	--
PH-3-9	9'-9.5'	11/5/2002	84	**7,300**	**1,500**	6,700	6,784	8,884	--	--	--	--	--
EX-L-SW-3**	3'-3.5'	11/20/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-L-SW-9**	9'-9.5'	11/20/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-L-NW-3**	3'-3.5'	11/20/2002	<1.0	<1.0	<5.0	<5.0	<5	<5	--	--	--	--	--
EX-L-NW-9**	9'-9.5'	11/20/2002	67	**3,000**	**650**	2,800	2,867	3,717	--	--	--	--	--
EX-L-S-3**	3'-3.5'	11/20/2002	<1.0	1.0	<5.0	<5.0	<5	1	--	--	--	--	--
EX-L-S-9	9'-9.5'	11/20/2002	13	**1,100**	270	1,100	1,113	1,383	--	--	--	--	--
EX-L-S2-9**	9'-9.5'	11/22/2002	<1.0	41	13	42	42	54	--	--	--	--	--
Stockpile Samples													
STOCKPILE A	--	7/24/2002	60	330	--	--	--	--	<0.2	1.4	1.6	**7.8**	<2.0
STOCKPILE B	--	7/24/2002	<1.0	**970**	350	--	--	1,320	<0.005	0.0064	0.031	0.079	<0.05
STOCKPILE B2	--	8/7/2002	<10	**660**	160	650	650	820	--	--	--	--	--
STOCKPILE C	--	8/7/2002	<10	200	41	210	210	241	<0.05	<0.05	<0.05	<0.05	<0.5
STOCKPILE A2***	--	8/27/2002	<1.0	44	40	84	84	84	<0.005	<0.005	<0.005	<0.005	<0.05
SP-1-1***	--	8/27/2002	<20	400	290	480	480	690	--	--	--	--	--
SP-1-2***	--	8/27/2002	<1.0	51	68	110	110	119	--	--	--	--	--
SP-1-3***	--	8/27/2002	1.6	250	230	330	332	482	--	--	--	--	--
SP-1-4***	--	8/27/2002	<1.0	400	170	470	470	570	--	--	--	--	--
SP-1-5***	--	8/27/2002	<1.0	170	120	190	190	290	--	--	--	--	--
SP-1-6***	--	8/27/2002	1.2	410	220	540	541	631	--	--	--	--	--
SP-2-1	--	8/27/2002	<1.0	380	300	690	690	680	--	--	--	--	--
SP-2-2	--	8/27/2002	<100	**8,000**	**2,400**	8,400	8,400	10,400	--	--	--	--	--

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Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
SP-2-3	--	8/27/2002	<100	**88,000**	**19,000**	89,000	89,000	107,000	--	--	--	--	--
SP-2-4	--	8/27/2002	<40	**2,000**	**640**	2,100	2,100	2,640	--	--	--	--	--
SP-3-1	--	8/27/2002	<10	360	200	400	400	560	--	--	--	--	--
SP-3-2	--	8/27/2002	<10	**680**	320	880	880	1,000	--	--	--	--	--
STOCKPILE A3	--	9/30/2002	78	**160**	45	170	248	283	--	--	--	--	--
STOCKPILE A3 (10-3-02)	--	10/3/2002	25	**940**	180	860	885	1,145	--	--	--	--	--
N STOCKPILE 1,2,3,4	--	10/7/2002	<50	**2,700**	**950**	3,100	3,100	3,650	--	--	--	--	--
COMPOSITE (SP-1 through SP-6)		11/5/2002	11	70	13	66	77	94	--	--	--	--	--
STOCKPILE 1	--	11/20/2002	<1.0	25	20	36	36	45	--	--	--	--	--
STOCKPILE 2	--	11/20/2002	<3.3	170	59	180	180	229	--	--	--	--	--
Pre-Remediation Investigation Data													
Hicks Borings, 2001													
Borehole #1	Composite 0'-2.5'	8/7/2001	ND	78	99	--	--	177	ND	ND	ND	ND	ND
Borehole #1	Composite 4'-12'	8/7/2001	**750**	**1400**	55	--	--	2,205	ND	ND	ND	ND	ND
Borehole #2	Composite 0'-6'	8/7/2001	45	**2200**	200	--	--	2,445	ND	ND	ND	ND	ND
Borehole #2	Composite 6'-12'	8/7/2001	8.3	**500**	29	--	--	537	ND	ND	ND	ND	ND
Borehole #3**	Composite 0'-6'	8/7/2001	ND	30	36	--	--	66	ND	ND	ND	ND	ND
Borehole #3**	Composite 6'-12'	8/7/2001	ND	46	6.3	--	--	52	ND	ND	ND	ND	ND
Borehole #4	Composite 0'-6'	8/7/2001	230	**1600**	ND	--	--	1,830	ND	ND	0.32	0.97	ND
Borehole #4	Composite 6'-12'	8/7/2001	250	**1600**	ND	--	--	1,850	ND	ND	0.14	ND	ND
Borehole #5	Composite 0'-6'	8/7/2001	67	**4300**	220	--	--	4,587	ND	ND	ND	ND	ND
Borehole #5	Composite 6'-12'	8/7/2001	17	**2400**	110	--	--	2,527	ND	ND	ND	ND	ND
Borehole #6	Composite 11.5'-13'	9/27/2001	--	ND	--	--	--	--	ND	ND	ND	ND	ND
Borehole #6	Composite 12'-16'	9/27/2001	--	21	--	--	--	--	ND	ND	ND	ND	ND
Borehole #6	Composite 4'-10'	9/27/2001	--	**970**	--	--	--	--	ND	ND	ND	ND	ND
Borehole #8	Composite 0'-5'	9/27/2001	--	13	--	--	--	--	ND	ND	ND	ND	ND
Borehole #8	Composite 5.25'-7'	9/27/2001	--	**2800**	--	--	--	--	ND	ND	ND	ND	ND
Borehole #9	Composite 7'-13'	9/27/2001	--	210	--	--	--	--	ND	ND	ND	ND	ND
Borehole #10	Composite 0'-10'	9/27/2001	--	**170**	--	--	--	--	ND	ND	ND	ND	ND
Borehole #12	Composite 9'-10'	9/27/2001	--	16	--	--	--	--	ND	ND	ND	ND	ND
Lowney Associates Borings, 2002													
SS-1 (fill)	0'-0.5'	3/6/2001	<1.0	**2,400**	**3,100**	--	--	5,500	<0.005	<0.005	<0.005	<0.005	<0.005

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1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8,015**	**8,015**	**8021**	**8021**	**8021**	**8021**	**8021**
		Residential RBSL*:	**400**	**500**	**500**	**NE**	**NE**	**NE**	**0.18**	**8.4**	**24**	**1.0**	**1.0**
		Cleanup Goal:	--	--	--	--	**1,000**	**1,000**	--	--	--	--	--
SS-1 (native)	3.5'-4'	3/6/2001	110	94	<50	--	--	204	<0.62	<0.62	<0.62	<0.62	<0.62
SS-2 (fill)	0'-0.5'	3/6/2001	<1.0	100	**960**	--	--	1,060	<0.005	<0.005	<0.005	<0.005	<0.005
SS-2 (native)	5'-5.5'	3/6/2001	26	150	<50	--	--	176	<0.62	<0.62	<0.62	<0.62	<0.62
SS-3 (fill)	0'-0.5'	3/6/2001	<1.0	34	<50	--	--	34	<0.005	<0.005	<0.005	<0.005	<0.005
SS-3 (native)	3.5'-4'	3/6/2001	210	**790**	<500	--	--	1,000	<6.2	<6.2	<6.2	<6.2	<6.2
SS-4 (fill)**	0'-0.5'	3/6/2001	<1.0	41	110	--	--	151	<0.005	<0.005	<0.005	<0.005	<0.005
SS-4 (native)**	3.5'-4'	3/6/2001	110	400	88	--	--	598	<0.62	<0.62	<0.62	<0.62	<0.62
SS-5 (fill)	0'-0.5'	3/6/2001	<1.0	**960**	**1,900**	--	--	2,860	<0.005	<0.005	<0.005	<0.005	<0.005
SS-5 (native)	7'-7.5'	3/6/2001	210	**700**	<250	--	--	910	<0.62	<0.62	<0.62	<0.62	<0.62
SS-6 (fill)**	0'-0.5'	3/6/2001	<1.0	14	55	--	--	69	<0.005	<0.005	<0.005	<0.005	<0.005
SS-6 (native)**	6.5'-7'	3/6/2001	67	130	<50	--	--	197	<0.62	<0.62	<0.62	<0.62	<0.62
SS-7 (fill)	0'-0.5'	3/6/2001	<1.0	4.3	<50	--	--	4	<0.005	<0.005	<0.005	<0.005	<0.005
SS-7 (native)	6'-6.5'	3/6/2001	260	440	<50	--	--	700	<0.62	<0.62	<0.62	<0.62	<0.62
SS-8 (fill)**	0'-0.5'	3/6/2001	<1.0	12	100	--	--	112	<0.005	<0.005	<0.005	<0.005	<0.005
SS-8 (native)**	7.5'-8'	3/6/2001	7.5	<1.0	<50	--	--	8	<0.005	<0.005	<0.005	<0.005	<0.005
SS-9 (fill)	0'-0.5'	3/6/2001	<1.0	5.4	83	--	--	88	<0.005	<0.005	<0.005	<0.005	<0.005
SS-9 (native)	4.5'-5'	3/6/2001	110	120	<500	--	--	230	<0.62	<0.62	<0.62	<0.62	<0.62
Lowney Associates Borings, 2002													
EB-7**	9'-9.5'	3/4/2002	85	190	<100	--	--	275	<0.62	<0.62	<0.62	<0.62	<0.62
EB-7**	14'-14.5'	3/4/2002	8.7	78	<50	--	--	87	<0.005	<0.005	<0.005	<0.005	<0.005
EB-8**	6'-6.5'	3/4/2002	36	190	52	--	--	278	<0.62	<0.62	<0.62	<0.62	<0.62
EB-8**	12'-12.5'	3/4/2002	<1.0	12	<50	--	--	12	<0.005	<0.005	<0.005	<0.005	<0.005
EB-9	7.5'-8'	3/5/2002	260	**560**	<250	--	--	820	<0.62	<0.62	<0.62	<0.62	<0.62
EB-9	14'-14.5'	3/5/2002	100	140	<100	--	--	240	<0.62	<0.62	<0.62	<0.62	<0.62
EB-10	6'-6.5'	3/5/2002	380	**1,100**	<500	--	--	1,480	<3.1	<3.1	<3.1	<3.1	<3.1
EB-10	9'-9.5'	3/5/2002	150	350	<500	--	--	500	<0.023	<0.023	<0.023	<0.023	<0.023
EB-11	6'-6.5'	3/5/2002	160	**820**	<500	--	--	980	<0.62	<0.62	<0.62	<0.62	<0.62
EB-11	9'-9.5'	3/5/2002	130	330	<250	--	--	460	<0.62	<0.62	<0.62	0.92	<0.62
EB-12	6'-6.5'	3/5/2002	**980**	110	<500	--	--	1,090	**3.4**	**15**	9.5	**43**	<2.5
EB-12	8'-8.5'	3/5/2002	**760**	**890**	<500	--	--	1,650	**12**	5.4	7.1	**5.7**	<3.1
Lowney Associates Test Pits, 2002													
TP-2B	1.5'	3/8/2002	--	**1,800**	<1000	--	--	--	--	--	--	--	--

Table 1a. **Soil Analytical Data - Petroleum Hydrocarbons**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	TPHg (C6-C9) (mg/kg)	TPHd (C10-C23) (mg/kg)	TPHmo (C-18+) (mg/kg)	TPHbo (C-10+) (mg/kg)	Total TPH (mg/kg)	Combined TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
		EPA Method:	8015m	8015	8015	8015	8,015	8,015	8021	8021	8021	8021	8021
		Residential RBSL*:	400	500	500	NE	NE	NE	0.18	8.4	24	1.0	1.0
		Cleanup Goal:	--	--	--	--	1,000	1,000	--	--	--	--	--

Abbreviations and Notes:

* = Risk Based Screening Level (RBSL), CRWQCB, December 2001, Table B
** = Residual after excavation completion.
*** = Stockpile soil reused in deeper excavations at site.
TPHg = Total petroleum hydrocarbons as gasoline
TPHd = Total petroleum hydrocarbons as diesel
TPHmo = Total petroleum hydrocarbons as motor oil
TPHbo = Total petroleum hydrocarbons as bunker oil
Total TPH = TPHg + TPHbo.
Combined TPH = TPHg + TPHd + TPHmo
MTBE = Methyl tert-butyl ether
mg/kg = Milligrams per kilogram
<n = Below detection limit of n mg/kg
-- = Not analyzed

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Table 1b. **Soil Analytical Data - PAHs**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID / Sample ID	Depth - feet bgs	Date Sampled	Naphthalene[1] (mg/kg)	Acenaphthene[1] (mg/kg)	Fluorene[1] (mg/kg)	Phenanthrene[1] (mg/kg)	Anthracene[1] (mg/kg)	Pyrene[1] (mg/kg)	Chrysene[1] (mg/kg)	PCBs (mg/kg)
		EPA Method:								
		Residential RBSL*:	**4.9**	**16**	**5.1**	**11**	**2.9**	**55**	**3.8**	**NE**
Lowney Associates Borings										
SS-1 (fill)	0'-0.5'		<0.075	<0.05	<0.025	0.15	<0.025	<0.025	0.099	<0.05
SS-1 (native)	3.5'-4'		<0.015	0.13	0.44	<0.005	<0.005	<0.005	<0.005	<0.05
SS-2 (fill)	0'-0.5'		<0.15	<0.1	<0.05	<0.05	<0.05	0.014	<0.05	<0.05
SS-2 (native)	5'-5.5'		<0.015	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
SS-3 (fill)	0'-0.5'		<0.015	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
SS-3 (native)	3.5'-4'		<0.015	<0.01	0.25	0.075	<0.005	<0.005	<0.005	<0.05
SS-4 (fill)	0'-0.5'		<0.075	<0.05	<0.025	0.11	<0.025	<0.025	<0.025	<0.05
SS-4 (native)	3.5'-4'		<0.015	<0.01	0.27	0.027	<0.005	<0.005	<0.005	<0.05
SS-5 (fill)	0'-0.5'		<0.15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SS-5 (native)	7'-7.5'		<0.015	<0.01	0.49	0.71	<0.005	<0.005	<0.005	<0.05
SS-6 (fill)	0'-0.5'		<0.15	<0.1	<0.05	<0.05	<0.05	0.29	<0.05	<0.05
SS-6 (native)	6.5'-7'		<0.015	<0.01	0.033	<0.005	0.016	<0.005	<0.005	<0.05
SS-7 (fill)	0'-0.5'		<0.015	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
SS-7 (native)	6'-6.5'		0.62	<0.01	0.33	0.53	<0.005	<0.005	<0.005	<0.05
SS-8 (fill)	0'-0.5'		<0.075	<0.05	<0.025	<0.025	<0.025	<0.025	<0.025	<0.05
SS-8 (native)	7.5'-8'		<0.015	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
SS-9 (fill)	0'-0.5'		<0.075	<0.05	<0.025	<0.025	<0.025	0.2	<0.025	<0.05
SS-9 (native)	4.5'-5'		<0.015	<0.01	0.088	<0.005	0.067	<0.005	<0.005	<0.05
Lowney Associates Test Pits										
TP-2B	1.5'		0.25	ND	ND	0.88	ND	ND	ND	ND
Cleanup Goal							**1,000**			

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Table 1b. **Soil Analytical Data - PAHs**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	Naphthalene[1] (mg/kg)	Acenaph-thene[1] (mg/kg)	Fluorene[1] (mg/kg)	Phenan-therene[1] (mg/kg)	Anthra-cene[1] (mg/kg)	Pyrene[1] (mg/kg)	Chrysene[1] (mg/kg)	PCBs (mg/kg)
Sample ID		EPA Method:								

Abbreviations and Notes:

[1] = Other VOCS were not detected at or above the stated laboratory reporting limit
* = Risk Based Screening Level (RBSL), CRWQCB, December 2001, Table B
mg/kg = Milligrams per kilogram
<n = Below detection limit of n mg/kg
-- = Not analyzed

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Table 1c. **Soil Analytical Data - Metals and Pesticides**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Depth - feet bgs	Date Sampled	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Organochlorine Pesticides (mg/kg)
EPA Residential PRG:			**0.39/22**	**9**	**400**	**23**	
Residential RBSL*:			**0.39**	**1.7**	**200**	**4.7**	**NE**
Background Concentration:**			**14**	**1.5**	**14.7**	**0.3**	**NE**
Lowney Associates Borings							
SS-1 (fill)	0'-0.5'		<1.0	**2.6**	110	**<0.05**	--
SS-1 (native)	3.5'-4'		--	--	**4.3**	--	--
SS-2 (fill)	0'-0.5'		**3.7**	**2.0**	**32**	**0.12**	ND
SS-2 (native)	5'-5.5'		**2.7**	**1.3**	**5.6**	<0.05	ND
SS-6[1] (fill)	0'-0.5'		**4.3**	**2.0**	19.0	**0.088**	ND
SS-6 (native)	6.5'-7'		**1.8**	**2.4**	**5.6**	<0.05	ND
SS-7[1] (fill)	0'-0.5'		**30**	**3.4**	**22**	**0.19**	ND
SS-7 (native)	6'-6.5'		**2.7**	**1.5**	**5.0**	<0.05	ND
Lowney Associates Test Pits							
TP-2B	1.5'		**9.0**	**2.1**	**54**	**0.21**	--

Abbreviations and Notes:

* = Risk Based Screening Level (RBSL), CRWQCB, December 2001, Table B
** = Lawrence Berkeley National Laboratory Environmental Restoration Program, 1995
mg/kg = Milligrams per kilogram
<n = Below detection limit of n mg/kg
-- = Not analyzed
ND = Not detected
NE = Not established

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Table 2a. **Groundwater Analytical Data - Hydocarbon Analyses**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Date Sampled	TPHg (C6-C9) (ug/L)	TPHd (C10-C23) (ug/L)	TPHmo (C-18+) (ug/L)	TPHbo (C-10+) (ug/L)	Total TPH (ug/L)	Combined TPH (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	Naphthalene (ug/L)
EPA Method:		**8015m**	**8015**	**8015**	**8015**	**8015**	**8015**	**8021**	**8021**	**8021**	**8021**	**8021**	**8270D**
MCL*:		**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**1.0**	**150**	**700**	**1,750**	**13**	**NE**
RBSL:**		**--**	**--**	**--**	**--**	**--**	**--**	**46**	**130**	**290**	**13**	**1,800**	**24**
Cleanup Goal:		**--**	**--**	**--**	**--**	**20,000**	**20,000**	**--**	**--**	**--**	**--**	**--**	**--**
Post-Remediation													
Cambria Temporary Wells (Installed December 4, 2002)													
TW-1	12/4/2002	<50	<50	<250	<250	<250	<250	<0.5	<0.5	<0.5	<0.5	--	--
TW-2	12/4/2002	56	340	<250	540	596	396	11	1.3	1.8	1.6	--	<10
TW-4	12/5/2002	<50	<50	<250	<250	<250	<250	<0.5	<0.5	<0.5	<0.5	--	<10
TW-5	12/4/2002	<50	220	<250	310	310	220	<0.5	<0.5	<0.5	<0.5	--	<10
TW-6	12/4/2002	<50	5,000	580	5,000	5,000	5,580	<0.5	0.52	<0.5	<0.5	--	--
TW-6	12/18/2002	<50	75	<250	260	260	75	<0.5	<0.5	<0.5	<0.5	--	--
TW-6	2/14/2003	<50	<50	<250	<250	<250	<250	<0.5	1.3	<0.5	2.8	<5.0	--
TW-7	12/5/2002	<50	79	<250	<250	79	79	<0.5	<0.5	<0.5	<0.5	--	--
TW-7	2/14/2003	<50	<50	<250	<250	<250	<250	--	--	--	--	--	--
TW-8	12/5/2002	<50	<50	<250	<250	<250	<250	<0.5	<0.5	<0.5	<0.5	--	<10
TW-8	2/14/2003	<50	<50	<250	<250	<250	<250	--	--	--	--	--	--
Cambria Grab Groundwater from Slotted PVC in Boring (February 14, 2003)													
AB-B	2/14/2003	<50	130	<250	<250	<250	130	<0.5	<0.5	0.56	<0.5	<5.0	--
Pre-Remediation													
Hicks Sampling (Temp wells / stand pipes)													
1	8/01	5400	--	--	--	--	--	<5.0	ND	ND	ND	ND	27
2	8/01	3700	--	--	--	--	--	<5.0	ND	ND	ND	5.6	ND
3	8/01	130	--	--	--	--	--	<5.0	ND	ND	ND	ND	ND
4	9/01	**66,000**	4,473	<5.0	--	**66,000**	**70,473**	**200**	53	12	**29.4**	ND	**59**

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Table 2a. **Groundwater Analytical Data - Hydocarbon Analyses**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Date Sampled	TPHg (C6-C9) (ug/L)	TPHd (C10-C23) (ug/L)	TPHmo (C-18+) (ug/L)	TPHbo (C-10+) (ug/L)	Total TPH (ug/L)	Combined TPH (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	Naphthalene (ug/L)
	EPA Method:	**8015m**	**8015**	**8015**	**8015**	**8015**	**8015**	**8021**	**8021**	**8021**	**8021**	**8021**	**8270D**
	MCL*:	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**1.0**	**150**	**700**	**1,750**	**13**	**NE**
	RBSL:**	--	--	--	--	--	--	**46**	**130**	**290**	**13**	**1,800**	**24**
	Cleanup Goal:	--	--	--	--	**20,000**	**20,000**	--	--	--	--	--	--
4B	9/01	--	--	--	--	--	--	**350**	97	32	**170**	ND	**150**
6	9/01	--	--	--	--	--	--	<5.0	ND	ND	ND	ND	ND
7	9/01	--	--	--	--	--	--	<5.0	ND	ND	ND	ND	ND
9	9/01	--	--	--	--	--	--	<5.0	ND	ND	ND	ND	ND
Lowney Sampling (Grab groundwater)													
EB-7	3/5/2002	260	7,300	<500	--	7,560	7,560	<0.5	<0.5	<0.5	<1.0	<5.0	--
EB-8	3/5/2002	<50	100	<580	--	100	100	<0.5	<0.5	<0.5	<1.0	<5.0	--
EB-9	3/5/2002	17,000	**24,000,000**	<2,000,000	--	**24,017,000**	**24,017,000**	<5.0	<5.0	<5.0	<10	<50	--
EB-10	3/5/2002	5,900	**4,400,000**	<400,000	--	**4,405,900**	**4,405,900**	<5.0	<5.0	<5.0	<10	<50	--
EB-11	3/5/2002	280	2,100	<580	--	2,380	2,380	<5.0	<5.0	<5.0	<10	100	--
EB-12	3/5/2002	**170,000**	**20,000,000**	<1,500,000	--	**20,170,000**	**20,170,000**	**5,800**	77	<50	<100	<500	--
Cambria Sampling (Hicks temp wells / stand pipes)													
4B	7/24/2002	2,700	2,000	340	2,100	4,800	5,040	**790**	14	18	4.5	<10	--
7	7/24/2002	280	1,100	420	1,300	1,580	1,800	0.65	<0.5	<0.5	<0.5	<5.0	--
1/10/1904	7/24/2002	<50	600	780	960	985	1,380	<0.5	<0.5	<0.5	<0.5	<5.0	--
10	7/24/2002	1,300	**30,000**	9,500	**32,000**	**33,300**	**40,800**	<5.0	<5.0	<5.0	<5.0	<50	--
11	7/24/2002	280	1,400	900	1,800	2,080	2,580	0.51	1.6	<0.5	0.78	<5.0	--
12	7/24/2002	1,400	950	1,200	1,600	3,000	3,550	**360**	1.7	10	**1.1**	<5.0	--
Cambria Sampling (Grab from excavation pit near former UST)													
EX-A-W1	8/2/2002	2,900	**23,000**	7,900	**23,000**	**25,900**	**48,900**	**240**	49	80	**360**	<50	--

Table 2a. **Groundwater Analytical Data - Hydocarbon Analyses**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Date Sampled	TPHg (C6-C9) (ug/L)	TPHd (C10-C23) (ug/L)	TPHmo (C-18+) (ug/L)	TPHbo (C-10+) (ug/L)	Total TPH (ug/L)	Combined TPH (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	Naphthalene (ug/L)
EPA Method:		8015m	8015	8015	8015	8015	8015	8021	8021	8021	8021	8021	8270D
MCL*:		NE	NE	NE	NE	NE	NE	1.0	150	700	1,750	13	NE
RBSL**:		--	--	--	--	--	--	46	130	290	13	1,800	24
Cleanup Goal:		--	--	--	--	20,000	20,000	--	--	--	--	--	--

Abbreviations and Notes:

TPHg = Total petroleum hydrocarbons as gasoline
TPHd = Total petroleum hydrocarbons as diesel
TPHmo = Total petroleum hydrocarbons as motor oil
TPHbo = Total petroleum hydrocarbons as bunker oil
MTBE = Methyl tert-butyl ether
ug/L= Micrograms per liter
<n = Below detection limit of n mg/kg
* = Drinking water Maximum Contaminant Levels - California DHS, January 11, 2001
** = Risk Based Screening Level (RBSL) for benzene, toluene, ethylbenzene, xylenes, and methyl tertiary butyl ether (CRWQCB, December 2001, Table B).
NE = Not establisehed
-- = Not analyzed/Not applicable
Combined TPH = TPHg + TPHd + TPHmo
Total TPH = TPHg + TPHbo.

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Table 2b. **Groundwater Analytical Data - Volatile Organic Compounds**
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Date Sampled	Screen Interval	n-Butylbenzene[1]	Sec-Butylbenzene[1]	Iso-Propylbenzene[1]	Napthalene[1]	n-Propylbenzene[1]
EPA Method:							
MCL*:			**NE**	**NE**	**NE**	**NE**	**NE**
RBSL:**			**NE**	**NE**	**NE**	**24**	**NE**
EB-7	3/5/2002	--	<1.0	**3.4**	<0.5	**4.2**	<1.0
EB-8	3/5/2002	--	<1.0	<1.0	<0.5	<1.0	<1.0
EB-9	3/5/2002	--	**42**	**45**	**29**	**22**	**28**
EB-10	3/5/2002	--	**23**	**21**	**14**	**20**	**13**
EB-11	3/5/2002	--	**20**	**25**	**14**	**16**	<10
EB-12	3/5/2002	--	<100	<100	<50	<100	<100

Abbreviations and Notes:

[1] = Other VOCS were not detected at or above the stated laboratory reporting limit
TPHg = Total petroleum hydrocarbons as gasoline
TPHd = Total petroleum hydrocarbons as diesel
TPHmo = Total petroleum hydrocarbons as motor oil
TPHbo = Total petroleum hydrocarbons as bunker oil
MTBE = Methyl tert-butyl ether
ug/L= Micrograms per liter
<n = Below detection limit of n mg/kg
* = Drinking water Maximum Contaminant Levels - California DHS, January 11, 2001
** = Risk Based Screening Level (RBSL), CRWQCB, December 2001, Table B
NE = Not establisehed
-- = Not analyzed

Table 2c. Construction Details and Water Levels for Temporary Wells
Balaam Airgas
1350 Powell Street, Emeryville, California

Well ID	Date Measured	Well Elevations (MSL)	Screen Interval (ft)	First Encountered Water Depth (ft)	Static Water Depth (ft)	Groundwater Elevations (MSL)
TW-1	12/4/2002	--	20-30	20.0	5.0	not surveyed
TW-2	12/4/2002	--	10-20	16.0	8.3	not surveyed
TW-4	12/4/2002	19.19	15-25	21.0	--	--
TW-4	12/5/2002	19.19	15-25	--	9.3	--
TW-4	12/11/2002	19.19	15-25	--	10.41	8.78
TW-5	12/4/2002	--	15-25	11.0	6.0	not surveyed
TW-6	12/4/2002	20.80	20-30	26.0	--	--
TW-6	12/5/2002	20.80	20-30	--	5.0	--
TW-6	12/11/2002	20.80	20-30	--	9.14	11.66
TW-6	2/14/2003	*	20-30	--	5.09[1]	*
TW-7	12/4/2002	19.10	20-30	26.0	--	--
TW-7	12/5/2002	19.10	20-30	--	5.0	--
TW-7	12/11/2002	19.10	20-30	--	8.82	10.28
TW-7	2/14/2003	*	20-30	--	5.56[1]	*
TW-8	12/4/2002	18.08	20-30	26.0	5.0	--
TW-8	12/11/2002	18.08	20-30	--	6.57	11.51
TW-8	2/14/2003	*	20-30	--	3.10[1]	*

Table 2c. Construction Details and Water Levels for Temporary Wells
Balaam Airgas
1350 Powell Street, Emeryville, California

Well ID	Date Measured	Well Elevations (MSL)	Screen Interval (ft)	First Encountered Water Depth (ft)	Static Water Depth (ft)	Groundwater Elevations (MSL)

Abbreviations and Notes:

* = Not available due to top of casing damaged during construction activities.

1 = Static water depth is approximate due to top of casing damaged during construction activities.

ft = depth below ground surface in feet.

MSL = elevation surveyed relative to a benchmark on the sidewalk of Powell Street with a noted elevation of 19.39 ft.

not surveyed = well was abandoned prior to survey due to grading activities.

-- = not applicable/not measured.

Table 3. **Residual Soil and Groundwater Samples With Constituents Exceeding Tier 1 RWQCB RBSLs**
Balaam Airgas
1350 Powell Street, Emeryville, California

		Date / EPA Method:	TPHg (C6-C9) 8015m	TPHd (C10-C23) 8015	TPHmo (C-18+) 8015	TPHbo (C-10+) 8015	Total TPH 8015	Benzene 8021	Toluene 8021	Ethylbenzene 8021	Xylenes 8021
SOIL			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
		Residential RBSL*:	**400**	**500**	**500**	**500**	**NE**	**0.18**	**8.4**	**24**	**1.0**
Sample ID	**Depth**	**Cleanup Goal:**	--	--	--	--	**1,000**	--	--	--	--
Samples along Southern Property Boundary											
EX-A-S-9	9'-10'	7/24/2002	350	230	18	210	560	**2.0**	0.30	3.4	**2.1**
EX-A-E-9	9'-9.5'	8/17/2002	<20	**570**	150	**520**	520	<0.1	<0.2	<0.1	<0.05
EX-A-S-3	3'-3.5'	10/2/2002	48	110	14	110	158	**3.5**	0.16	3.1	**4.5**
Samples in Northern Part of Excavation											
EX-E-BE-6	6'-6.5'	8/7/2002	<10	**780**	<500	**730**	730	--	--	--	--
Samples on or Adjacent to Railroad Property											
EX-C-NW-3	3'-3.5'	9/13/2002	<20	**810**	110	**960**	960	--	--	--	--
EX-C-W-3	3'-3.5'	9/13/2002	<20	**2,400**	**1,100**	**2,800**	**2,800**	--	--	--	--
EX-L-NW-9	9'-9.5'	11/20/2002	67	**3,000**	**650**	**2,800**	**2,867**	--	--	--	--
GROUNDWATER			(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
		RBSL*:	**500**	**640**	**640**	**640**	--	**46**	**130**	**290**	**13**
		Cleanup Goal:	--	--	--	--	**20,000**	--	--	--	--
Cambria Temporary Wells (Installed December 4, 2002)											
TW-6	12/4/2002		<50	**5,000**	580	**5,000**	5,000	<0.5	0.52	<0.5	<0.5
TW-6	12/18/2002		<50	75	<250	260	260	<0.5	<0.5	<0.5	<0.5
TW-6	2/14/2003		<50	<50	<250	<250	<250	<0.5	1.3	<0.5	2.8

Abbreviations and Notes:

* = Risk Based Screening Level (RBSL), CRWQCB, December 2001, Table B
TPHg = Total petroleum hydrocarbons as gasoline
TPHd = Total petroleum hydrocarbons as diesel
TPHmo = Total petroleum hydrocarbons as motor oil
TPHbo = Total petroleum hydrocarbons as bunker oil
Total TPH = TPHg + TPHbo.
MTBE = Methyl tert-butyl ether
mg/kg = Milligrams per kilogram
<n = Below detection limit of n mg/kg
-- = Not analyzed

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Table 4. Soil Vapor Analytical Results
Balaam Airgas
1350 Powell Street, Emeryville, California

Sample ID	Date Sampled	Soil Gas Sampling Interval (ft)	Benzene (ug/m^3)	Toluene (ug/m^3)	Ethylbenzene (ug/m^3)	Xylene (ug/m^3)	Comment
RBSL*	--	--	**580**	**55,333**	**1,400,000**	**1,000,000**	
SV-1	2/24/2003	3-3.5	--	--	--	--	No vapor recovery due to low permeability soil.
SV-1A	2/24/2003	4.5-5	--	--	--	--	No vapor recovery due to low permeability soil.
SV-2	2/24/2003	3-3.5	<250	730	<250	920	
SV-3	2/24/2003	3-3.5	<250	<250	<250	400	
SV-4	2/24/2003	3-3.5	--	--	--	--	No vapor recovery due to low permeability soil.
SV-4A	2/24/2003	4.5-5	--	--	--	--	Boring replaced by SV-4B due to failed leak test.
SV-4B	2/24/2003	4.5-5	--	--	--	--	Ground water encountered; no vapor recovered.
SV-5	2/24/2003	3-3.5	--	--	--	--	No vapor recovery due to low permeability soil.
SV-6	2/24/2003	3-3.5	<250	1,100	<250	1,800	
SV-7	2/24/2003	3-3.5	--	--	--	--	Ground water encountered, no vapor recovered.

Abbreviations and Notes:

* = Risk Based Screening Level (RBSL), RWQCB, *Interim Soil Gas Screening Levels for Evaluation of Potential Indoor-Air Impacts and Request for Comments*, December 24, 2002

ft = depth below ground surface in feet.

ug/m^3 = micrograms per cubic meter

-- = not applicable/not measured.

APPENDIX A

Soil Boring Permits

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510) 782-1939
APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 1350 Powell St
Emeryville, CA

CLIENT
Name Bahman Brothers Partnership
Address 1115 Gilman Rd Phone —
City Berkeley Zip 94708

APPLICANT
Name ~~Cambria~~ Jason Olson
Cambria Environmental Fax 510-420-9170
Address 5900 Hollis St Ste A Phone 510-420-3338
City Emeryville Zip 94608

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	X
Cable	☐	Other	☐		

DRILLER'S NAME Woodward Drilling Co.
DRILLER'S LICENSE NO. 710079

Soil Boring
~~WELL~~ PROJECTS
Drill Hole Diameter 8 in. Maximum
~~Casing Diameter~~ ~~in.~~ Depth 20 ft.
~~Surface Seal Depth~~ ~~ft.~~ Owner's Well Number

GEOTECHNICAL PROJECTS
Number of Borings 2 Maximum
Hole Diameter 2 in. Depth 17 ft.

STARTING DATE 2/14/03
COMPLETION DATE 2/14/03

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.
APPLICANT'S SIGNATURE [signature] DATE 2/12/03
PLEASE PRINT NAME Jason Olson Rev.9-18-02

FOR OFFICE USE

PERMIT NUMBER W03-0127
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.

APPROVED [signature] DATE 2-13-03

APPENDIX B

Field Activity Descriptions

APPENDIX A

FIELD ACTIVITY DESCRIPTIONS

February 2003 Subsurface Investigation

Field activities completed during the installation of soil borings AB-A through AB-G and the sampling of temporary wells TW-6, TW-7, and TW-8 are presented below. The discussion is organized according to the nature of the individual activity.

Field Activities

Field Activity Dates: On February 12, 2003, boring AB-A was installed using a hand auger. On February 14, 2003, borings AB-B through AB-G were installed using a hollow-stem auger rig. On February 14, 2003, wells T-6, T-7, and T-8 were sampled.

Personnel Present: Cambria Geologists Jason Olson and Matt Meyers conducted the field activities under the supervision of Bob Clark-Riddell, Professional Engineer.

Permits: Alameda County Public Works Drilling Permit Number W03-0127. (Appendix A).

Drilling Company: Woodward Drilling Co of Rio Vista, California (C-57 License No. 710079).

Drilling Method: Boring AB-A was advanced by hand auger. Borings AB-B through AB-G were advanced by a hollow-stem auger rig.

Number of Borings: Seven (AB-A through AB-G) (Figure 1).

Boring Depths: Soil borings were advanced to depths of 3.5 to 20 ft below ground surface (bgs).

Boring Sampling: Soil samples were collected from all of the borings at selected depths during drilling, and were classified according to the Unified Soil Classification System (USCS). A grab groundwater sample was collected from boring AB-B.

Soil Lithology: The site subsurface soils generally consisted of approximately 10-16 ft of engineered backfill, underlain by native sandy clays to a total explored depth of 20 ft bgs.

Depth to Water: Groundwater was first encountered in boring AB-B at 17 ft bgs, and boring AB-C at 14 ft bgs. Groundwater was not encountered in the remaining borings. Depth to water measurements for wells TW-6, TW-7, and TW-8 are approximate due to top of

casing damage during site construction activities. Depth to water for wells TW-6, TW-7, and TW-8 ranged from approximately 3 to 5.5 ft bgs.

Well Sampling: On February 14, 2002, Cambria gauged and sampled existing temporary wells TW-6, TW-7, and TW-8. The wells were purged and sampled with a peristaltic pump using dedicated, disposable polyethylene tubing. Well TW-4 was not sampled due to its destruction during site construction activities.

Chemical Analyses: McCampbell Analytical of Pacheco, California analyzed selected soil and groundwater samples for: BTEX and MTBE by EPA Method 8021B and/or TPH as gasoline by EPA Method 8015, and/or TPH as diesel, motor oil, and bunker oil by EPA Method 8015 with silica gel cleanup.

APPENDIX C

Standard Field Procedures

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STANDARD FIELD PROCEDURES FOR HAND-AUGER SOIL BORINGS

This document describes Cambria Environmental Technology's standard field methods for drilling and sampling soil borings using a hand-auger. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- X Principal and secondary grain size category (i.e. sand, silt, clay or gravel)
- X Approximate percentage of each grain size category,
- X Color,
- X Approximate water or product saturation percentage,
- X Observed odor and/or discoloration,
- X Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- X Estimated permeability.

Soil Boring and Sampling

Hand-auger borings are typically drilled using a hand-held bucket auger to remove soil to the desired sampling depth. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the augered hole. The vertical location of each soil sample is determined using a tape measure. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

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

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

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

Water Sampling

Water samples, if they are collected from the boring, are collected from the open borehole using bailers. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are collected usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory QA/QC blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

The borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55-gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

2/19/03

CAMBRIA

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Cambria Environmental Technology's standard field methods for drilling and sampling soil borings. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e. sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

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

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

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

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch type sampler, collected from the open borehole via pump/bailer, or collected from within screened PVC inserted into the borehole via a pump/bailer . The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are collected usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory QA/QC blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licenced waste haulers and disposed in secure, licenced facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licenced waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

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CAMBRIA

STANDARD FIELD PROCEDURES FOR MONITORING WELLS

This document describes Cambria Environmental Technology's standard field methods for drilling, installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Well Construction and Surveying

Groundwater monitoring wells are installed in soil borings to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

APPENDIX D

Field Logs

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

Boring/Well Name AB-A page 1 of 1
PE/RG BCR
Hand Augered to 3.0' Total Depth 3.5'
Date Started 2/12/03
Date Completed 2/12/03
Well Development Date (yield) —
Ground Surface Elevation —
Top of Casing Elevation —
Screened Interval —
Depth to water (first encountered) —
Depth to water (static) —
Located AS SHOWN ON MAP

Client Name Balaam Brothers
Job/Site Name Airgas
Location 1350 Powell St, Emeryville
Project Number 502-1975-013
Driller JO
Drilling Method HAND Auger
Boring Diameter 2"
Logged by JO

Depth/Sample Interval	Time	Sample ID	PID/Odor	Graphic Symbol	USC Class	Soil Type and Comments	Color	Penetration Resistance/ Blow Counts	Moisture	Percentages: Clay	Silt	Sand	Gravel	Plasticity	Estimated Permeability
					CL	SANDY Clay - Slight HC odor	DARK GREY	—	—	85	-	15	-	Med.	Low
						SAMPLE collected w/ slide Hammer + 6" Sleeve.									
						Terminated @ 3.5'									

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

Boring/Well Name AB-B page 1 of 1
PE/RG BCE
Hand Augered to 3 Total Depth 20.0
Date Started 2/14/03
Date Completed 2/14/03
Well Development Date (yield) NA
Ground Surface Elevation 17.48
Top of Casing Elevation
Screened Interval
Depth to water (first encountered) 17
Depth to water (static) 10.00'
Located SEE SITE MAP

Client Name Balgam
Job/Site Name Airgas
Location 1350 Powell ST
Project Number 502-1975
Driller Woodward
Drilling Method Hollow Stem Auger
Boring Diameter 8"
Logged by M Meyers

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	12:30	/	/	/	SW	FILL SAND F-M GRAINED	ORANG BRN	MED-DENSE	MOIST		10	90		/	H
5	12:40	AB-B-6.0	/	/	CL	CLAY TRACE SAND	DK BRN	5/5/5	DAMP	80	10	10		H	L
0	12:50	AB-B-12.5			CL	AS ABOVE		5/6/8							
								11/11/16							
5	12:55	AB-B 15.5			CL	14. NATIVE SANDY CLAY VF-F SAND, TRACE GRAV TO 10m	VT BRN	12/12/16	MOIST	70		25	5	H	L
	1:10				SC	VERY COARSE SANDS WELL ROUNDED SIEVED	4		SAT	30		70		/	H
0						Advanced to 20' to get GW Sample									
5															
0															

Q:\SPECIALTY FIGURES\BORING-SHEET.AI

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

Boring/Well Name AB-C page 1 of 1
PE/RG JASON OLSON
Hand Augered to 3' Total Depth 17.5
Date Started 2/14/03
Date Completed 2/14/03
Well Development Date (yield) NA
Ground Surface Elevation ~19.12
Top of Casing Elevation NA
Screened Interval NA
Depth to water (first encountered) 19.0
Depth to water (static) 8.0
Located SEE SITE MAP

Client Name Balcom
Job/Site Name Airgas
Location Powell St, Emeryville
Project Number 502-1795
Driller Woodward
Drilling Method 8" Hollow Stem Auger
Boring Diameter 8"
Logged by M. Meyers

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	7:25				SW	SAND, F GRAINED : FILL	ORANG BRN	DENSE	MOIST			100		/	H
	7:30					FILL									
5					CL	CLAY FILL	DK BRN	STIFF	"	80	/	20	/	H	L
10					CL	AS ABOVE		9/9/13							
								5/7/13							
			ODOR		CL	SANDY CLAY F SAND		4/4/5		80	/	20	/		
			14.			SOME ANGULAR GRAV TO 20mm	MED BRN		SAT	45	15	15	5	M	L
15					CL		"	7/7/7	"						9/9/17
		AB-B-17	SLIGHT ODOR		CL	NATIVE: @ 16' SANDY CLAY F-VC SAND, WELL ROUNDED	LT BRN	8/9/15	"	60	10	20	10	L	L
	8:10	1	0.9			GRAVEL TO 8mm. well sorted.									
20															
25															

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

Boring/Well Name AB-B page 1 of
PE/RG BCR
Hand Augered to 3' Total Depth 11
Date Started 7/14/03
Date Completed 7/14/03
Well Development Date (yield) NA
Ground Surface Elevation 18.57
Top of Casing Elevation NA
Screened Interval NA
Depth to water (first encountered) NA
Depth to water (static) NA
Located SEE SITE MAP

Client Name Balcom
Job/Site Name Airgas
Location 1350 Powell St
Project Number 502-1975
Driller Woodward
Drilling Method 8" Hollow Stem Auger
Boring Diameter 8"
Logged by M. Meyers

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	11:45				SM	SAND AS OTHERS	ORG BRN		MOIST	10		90		/	H
5					SC	SANDY CLAY F SANDS, ~~LOOSE FO~~ BIG KNOCKS	DK BRN	9/9/12	DAMP	60	10	30		M	L
	12:05	AB-D-9.0	23		SC	NATIVE: CLAYEY, SAND: ANG GRAV TO 10mm, predom F SAND SOME BLUE STAINING	LT BRN	6/6/9	MOIST	30		60	10	L	M
0	12:10	AB-D 10.5	143		SC	CLAY SAND: (NATIVE) F SANDS	BLUE GRAY	9/12/17		40		60		L	M
5															
0															
5															
0															

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

Boring/Well Name AB-E
Client Name Balcan
Job/Site Name Airgas
Project Number 502-1975

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
3:10				SW	SAND FILL FINE-MED GRAINED	ORG. BRN		MOIST		10	90		—	H
3:15	AB-E -5.5			SC	CLAY SAND MOTTLED MATERIALS	11	5/6"	DAMP	30	30	30	10	—	M
3:20	AB-E -9			SC	AS ABOVE	OK BRN	6/6/11	MOIST						
				SC	SOME BLUE STAINING		7/7/4	SAT						
				SC	FILL NO STAINING	BLK	7/9/22	MOIST						
				SC	AS ABOVE	OK BRN	5/5/7							
3:40	AB-E -17			SC	CIS NATIVE CLAYEY SAND, TRACE WELL ROUNDED GRAVELS TO 8mm M-VC SANDS, SOME SORTING	LT BRN	6/9/15 7/7/12	SAT	40	—	55	5	Y	M

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CAMBRIA

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

Boring/Well Name AB-F
Client Name Balcom
Job/Site Name Airgas
Project Number 502-1975

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
				SW	SAND FILL	DK BRN	DENSE	MOIST	10		90	/	/	H
4:05	AB-F -5.5			CH	SANDY CLAY, WELL GRADED, F-C SANDS, MOTTLED MATERIALS.	DK BRN	6/7/12	DAMP	80		20		H	L
4:10	AB-F -9			CH	AS ABOVE.	11	12/15/21	MOIST						
4:15	AB-F -11			CL	@10' NATIVE SANDY CLAY WELL ROUNDED AND SORTED M-VC SANDS, SOME LAYERING.	LT BRN	13/15/17	MOIST	70		30		M	L

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

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

Boring/Well Name AB-6 page 1 of 1
PE/RG JO
Hand Augered to 3' Total Depth 12.5'
Date Started 2/14/03
Date Completed 2/14/03
Well Development Date (yield) NA
Ground Surface Elevation 18.63 NA
Top of Casing Elevation
Screened Interval NA
Depth to water (first encountered) NA
Depth to water (static) NE
Located SEE SITE MAP

Client Name Balgam
Job/Site Name Airgas
Location 1350 Powell St.
Project Number 502-1975
Driller WOODWARD
Drilling Method 8" Hollow Stem Auger
Boring Diameter 8"
Logged by M. MEYERS

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
	11:00				SC	SAND FILL F-M GRAINED	LT BRN	1 LOOSE	MOIST		10	90		/	H
	11:26	AB-6 -5.5			SC	SANDY CLAY M-C SANDS	DK BRN	9/9/12	11	75	10	15		H	L
	11:25	AB-6 -8.5			SC	AS ABOVE		9/12/15							
					SC	10' NATIVE CLAYEY SAND, SOME BLUE STAINING F-M SANDS	LT BRN	12/14/21	11	30		70		L	H
			7.0			AS ABOVE		12/17/24							
	11:35	AB-6 12.5													

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CAMBRIA

WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
TW- 4	12:56					Well Destroyed
TW- 8	12:55	-	3.10		23.90	TOC destroyed
TW- 7	1:00		5.56		29.77	TOC destroyed
TW 6	1:05		5.09		22.75	TOC Destroyed

Project Name: Argus

Project Number: 502-1795

Measured By: JG

Date: 2/14/03

F:\TEMPLATE\FORMS\FIELD\GW-DEPTH.WPD

CAMBRIA

WELL SAMPLING FORM

Project Name: Airgas	Cambria Mgr: BCR	Well ID: TW-6
Project Number: 502-1795	Date: 2/14/03	Well Yield:
Site Address: 1350 Powell Emeryville	Sampling Method: Perist. Pump	Well Diameter: 1" & pvc
		Technician(s): JO
Initial Depth to Water: 5.09	Total Well Depth: 22.75	Water Column Height: 17.66
Volume/ft: 0.08	1 Casing Volume: 1.41	3 Casing Volumes: 4.23
Purging Device: Perist. Pump	Did Well Dewater?: No	Total Gallons Purged: ≈ 4.5
Start Purge Time: 1:52	Stop Purge Time: 2:11	Total Time: 19 mins

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. (°C)	pH	Cond. (uS)	Comments
1:59	1	17.2	7.40	1510	
2:07	2	16.7	7.26	1344	
2:11	3	16.8	7.21	1408	

Fe = **mg/L** **ORP =** **mV** **DO =** **mg/L**

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
TW-6	2/14/03	2:11	4 VOA 1 AMBER	HCl none	See C.o.C →	

CAMBRIA

WELL SAMPLING FORM

Project Name: Airgas	Cambria Mgr: BCR	Well ID: TW-7
Project Number: 502-1795	Date: 2/14/03	Well Yield:
Site Address: 1350 Powell Emeryville	Sampling Method: Perist. Pump	Well Diameter: 1" ~~2~~ pvc
		Technician(s): JO
Initial Depth to Water: 5.56	Total Well Depth: 29.77	Water Column Height: 24.21
Volume/ft: 0.08	1 Casing Volume: 1.93	3 Casing Volumes: 5.79
Purging Device: Perist. Pump	Did Well Dewater?: NO	Total Gallons Purged: 6
Start Purge Time: 3:30	Stop Purge Time: 3:55	Total Time: 20 mins

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. (°C)	pH	Cond. (uS)	Comments
3:38	1	16.0	6.66	1437	
3:45	2	16.2	6.68	1352	
3:50	3	16.0	6.64	1329	

Fe = **mg/L** **ORP =** **mV** **DO =** **mg/L**

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
TW-7	2/14/03	3:50	1 Amber 1 VOA	None HCl	See CoC →	

\TEMPLATE\FORMS\FIELD\WELLSAMP2.WPD
SM 5/31/94

CAMBRIA

WELL SAMPLING FORM

Project Name: Airgas	Cambria Mgr: BCR	Well ID: TW-8
Project Number: 502-1795	Date: 2/14/03	Well Yield:
Site Address: 1350 Powell Emeryville	Sampling Method: Peristaltic Pump	Well Diameter: 1" ☐ pvc
		Technician(s): JO
Initial Depth to Water: 3.10*	Total Well Depth: 23.90	Water Column Height: 20.80
Volume/ft: 0.08	1 Casing Volume: 1.67	3 Casing Volumes: 5.01
Purging Device: Peristaltic Pump	Did Well Dewater?: No	Total Gallons Purged: ~5.00
Start Purge Time: 2:30	Stop Purge Time: 2:54	Total Time: 24 mins

* TOC Damaged

Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. (°C)	pH	Cond. (uS)	Comments
2:38	1	15.8	7.30	958	
2:46	2	15.9	7.10	948	
2:54	3	15.9	7.08	913	

Fe = **mg/L** **ORP =** **mV** **DO =** **mg/L**

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
TW-8	2/14/03	3:15	11 VOA 1 amBGR	HCl NONE	See CoC →	

APPENDIX E

Laboratory Analytical Reports

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 Env. Technology 6262 Hollis St. Emeryville, CA 94608	Client Project ID: #502-1795; Balaam Airgas	Date Sampled: 12/18/02
		Date Received: 12/18/02
	Client Contact: Bob Clark-Riddell	Date Reported: 12/19/02
	Client P.O.:	Date Completed: 12/19/02

WorkOrder: 0212330

December 19, 2002

Dear Bob:

Enclosed are:

1). the results of 1 analyzed sample from your **#502-1795; Balaam Airgas project,**

2). a QC report for the above sample

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager

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 Env. Technology	Client Project ID: #502-1795; Balaam Airgas	Date Sampled: 12/18/02
6262 Hollis St.		Date Received: 12/18/02
Emeryville, CA 94608	Client Contact: Bob Clark-Riddell	Date Extracted: 12/19/02
	Client P.O.:	Date Analyzed: 12/19/02

Client Defined Gasoline Range (C6-C9) Volatile Hydrocarbons as Gasoline with BTEX *

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0212330

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	TW-6	W	ND	---	ND	ND	ND	ND	1	104
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	5.0	0.5	0.5	0.5	0.5	ug/L	
		S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg	

*water and vapor samples are reported in µg/L, soil and sludge samples in mg/kg, wipe samples in µg/wipe, and TCLP extracts in µg/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 (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) 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 Env. Technology	Client Project ID: #502-1795; Balaam Airgas	Date Sampled: 12/18/02
6262 Hollis St.		Date Received: 12/18/02
Emeryville, CA 94608	Client Contact: Bob Clark-Riddell	Date Extracted: 12/18/02
	Client P.O.:	Date Analyzed: 12/18/02

Diesel(C10-23) Motor Oil(C18+) Bunker Oil(C10+) Range Extractable Hydrocarbons with Silica Gel Clean-Up*

Extraction method: SW3510C Analytical methods: SW8015C Work Order: 0212330

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	TPH(bo)	DF	% SS
001B	TW-6	W	75,b	ND	260	1	104

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	250	250	µg/L
	S	NA	NA	NA	mg/Kg

* water and vapor samples are reported in µg/L, wipe samples in ug/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all TCLP / STLC / SPLP extracts in µg/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) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent / mineral spirit.

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

QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W WorkOrder: 0212330

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 5403 Spiked Sample ID: 0212338-001A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	ND	60	109	112	2.13	112	112	0.0262	80	120
MTBE	ND	10	107	97.6	8.84	85.2	91	6.55	80	120
Benzene	ND	10	120	111	7.29	105	110	4.80	80	120
Toluene	ND	10	113	105	7.23	100	105	5.02	80	120
Ethylbenzene	ND	10	115	110	4.03	107	111	3.70	80	120
Xylenes	ND	30	113	110	2.99	107	110	3.08	80	120
%SS:	103	100	109	101	7.66	98.4	101	2.98	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS -- MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

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

QC SUMMARY REPORT FOR SW8015C

Matrix: W WorkOrder: 0212330

EPA Method: SW8015C	Extraction: SW3510C	BatchID: 5398	Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(d)	N/A	7500	N/A	N/A	N/A	106	108	1.85	70	130
%SS:	N/A	100	N/A	N/A	N/A	110	112	1.80	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

0212330 **RUSH**

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

EDF Required? ☒ Yes ☐ No

Report To: Bob Clark-Riddell Bill To: SAME

Company: Cambria Environmental Technology Inc.

6262 Hollis Street
Emeryville, CA 94608 E-mail: briddell@cambria-env.com

Tele: 510 420 3303 Fax: 510-450-8295

Project #: 502-1795 Project Name: Balgam Diesel

Project Location: 1350 Powell St, Emeryville

Sampler Signature:

SAMPLE ID (Field Point Name)	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
TW-6		12/18/02	3:00p	5	VOA	X					X	X		

Analysis Request	Other	Comments
BTEX & TPH as Gas (602/8020 + 8015)/ MTBE	TPH/BTEX TPH(d/mo)/602 w/silica gel cleanup	
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	X	

Relinquished By:	Date:	Time:	Received By:
	12/18/02	3:30p	Same Location
Relinquished By: TLC Randy L. Marcus	Date: 12/18/02	Time: 4:05 pm	Received By:
Relinquished By: TLC Randy L. Marcus	Date: 12/18/02	Time: 5:00 pm	Received By: Mich Valles

Remarks: NO OVERLAP IN CARBON RANGE

McCampbell Analytical Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0212330

Client:
Cambria Env. Technology
6262 Hollis St.
Emeryville, CA 94608

TEL: (510) 450-1983
FAX: (510) 450-8295
ProjectNo: #502-1795; Balaam Airgas
PO:

Date Received: **12/18/02**
Date Printed: **12/18/02**

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests					
					SW8015C	8021B/8015				
0212330-001	TW-6	Water	12/18/02 3:00:00 PM	☐	B	A				

Prepared by: Sonia Valles

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0302217

Client:
Cambria Env. Technology
5900 Hollis Street, Suite A
Emeryville, CA 94608

TEL: (510) 450-1983
FAX: (510) 450-8295
ProjectNo: #502-1975-013; Airgas
PO:

Date Received: 2/14/03
Date Printed: 2/19/03

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests <>	SW8015C	M8021B/8015C	
0302217-001	AB-B-15.5	Soil	2/14/03 1:10:00 AM	☐	A	A	A	
0302217-002	AB-C-17	Soil	2/14/03 8:10:00 AM	☐		A	A	
0302217-003	AB-D-10.5	Soil	2/14/03 12:10:00 PM	☐		A	A	
0302217-004	AB-E-17	Soil	2/14/03 3:40:00 PM	☐		A	A	
0302217-005	AB-F-11	Soil	2/14/03 4:15:00 PM	☐		A	A	
0302217-006	AB-G-12.5	Soil	2/14/03 11:35:00 AM	☐		A	A	
0302217-007	AB-B	Water	2/14/03 2:30:00 PM	☐		B	A	
0302217-008	AB-C	Water	2/14/03 12:00:00 PM	☑		B	A	
0302217-009	TW-6	Water	2/14/03 2:11:00 PM	☐		B	A	
0302217-010	TW-7	Water	2/14/03 3:50:00 PM	☐		A	A	
0302217-011	TW-8	Water	2/14/03 3:15:00 PM	☐		A	A	

Prepared by: Melissa Valles

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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 Env. Technology	Client Project ID: #502-1975-013; Airgas	Date Sampled: 02/14/03
		Date Received: 02/14/03
5900 Hollis Street, Suite A	Client Contact: Bob Clark-Riddell	Date Extracted: 02/14/03
Emeryville, CA 94608	Client P.O.:	Date Analyzed: 02/14/03-02/15/03

Client Defined Gasoline Range (C6-C9) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Work Order: 0302217

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	AB-B-15.5	S	ND	ND	ND	ND	ND	ND	1	105
002A	AB-C-17	S	ND	ND	ND	ND	ND	ND	1	101
003A	AB-D-10.5	S	14,g	ND<0.5	ND<0.05	ND<0.05	ND<0.05	0.20	10	97.9
004A	AB-E-17	S	ND	ND	ND	ND	ND	ND	1	102
005A	AB-F-11	S	ND	--	--	--	--	--	1	102
006A	AB-G-12.5	S	ND	--	--	--	--	--	1	98.8
007A	AB-B	W	ND	ND	ND	ND	0.56	ND	1	99.7
009A	TW-6	W	ND	ND	ND	1.3	ND	2.8	1	99.6
010A	TW-7	W	ND	--	--	--	--	--	1	96.6
011A	TW-8	W	ND	--	--	--	--	--	1	99.5
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	5.0	0.5	0.5	0.5	0.5		ug/L
		S	1.0	0.05	0.005	0.005	0.005	0.005		mg/Kg

*water and vapor samples are reported in µg/L, soil and sludge samples in mg/kg, wipe samples in µg/wipe, and TCLP extracts in µg/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 (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

Angela Rydelius, Lab Manager

DHS Certification No. 1644

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 Env. Technology	Client Project ID: #502-1975-013; Airgas	Date Sampled: 02/14/03
		Date Received: 02/14/03
5900 Hollis Street, Suite A	Client Contact: Bob Clark-Riddell	Date Extracted: 02/14/03
Emeryville, CA 94608	Client P.O.:	Date Analyzed: 02/14/03-02/15/03

Diesel(C10-23) Motor Oil(C18+) Bunker Oil(C10+) Range Extractable Hydrocarbons with Silica Gel Clean-Up*

Work Order: 0302217

Extraction method: SW3550C Analytical methods: SW8015C

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	DF	% SS
0302217-001A	AB-B-15.5	S	ND	ND	1	101
0302217-002A	AB-C-17	S	14,a	6.3	1	102
0302217-003A	AB-D-10.5	S	400,a	68	1	89.9
0302217-004A	AB-E-17	S	ND	ND	1	101
0302217-005A	AB-F-11	S	91,a	19	1	100
0302217-006A	AB-G-12.5	S	3.2,b	ND	1	102
0302217-007B	AB-B	W	130,a	ND	1	101
0302217-009B	TW-6	W	ND	ND	1	85.2
0302217-010A	TW-7	W	ND	ND	1	87.2
0302217-011A	TW-8	W	ND	ND	1	85.9
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	250		µg/L
		S	1.0	5.0		mg/Kg

* water and vapor samples are reported in µg/L, wipe samples in ug/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all TCLP / STLC / SPLP extracts in µg/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 appear to be derived from diesel (asphalt); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent / mineral spirit.

Angela Rydelius, Lab Manager

DHS Certification No. 1644

RUSH 030211

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

RUSH

CHAIN OF CUSTODY RECORD

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

EDF Required? ☒ Yes ☐ No

Report To: Bob Clark-Riddell Bill To: Cambria

Company: Cambria Environmental Technology Inc.
6262 Hollis Street
Emeryville, CA 94608

E-mail: mmeyers@cambria-env.com
Tele: 510-420-3319 Fax: 510-450-8295

Project #: 502-1975-013 Project Name: Airgas

Project Location: 1350 Power St, Alameda

Sampler Signature:

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other
AB-B-15.5		2/4/02	1:10	1	tube		X				X			
AB-C-17		"	8:10											
AB-D-10.5		"	12:10											
AB-E-□		"	3:40											
AB-F-11		"	4:15											
AB-G-12.5		"	11:35	↓	↓		↓				↓			

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	Comments
X															X TPHg + TPHd/mo/bc in Silica Gel cleanup No overlaping CARBON Chains	

ICE/t° ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT
DECHLORINATED IN LAB
PRESERVATION APPROPRIATE ✓
CONTAINERS
PRESERVED IN LAB

	VOAs	O&G	METALS	OTHER

Relinquished By:	Date:	Time:	Received By:
	2/4	Courier	Courier to Lancaster
Relinquished By:	Date: 2/14	Time: 5:45	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks: !!!Rush!!!
Silica Gel Cleanup
No overlap in CARBON Chains!

RUSH!!!

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

EDF Required? ☒ Yes ☐ No

Report To: Deb Clark - Riddell Bill To: CAMBRIA

Company: Cambria Environmental Technology Inc.

6262 Hollis Street

Emeryville, CA 94608 E-mail: mmeyers@cambria-env.com

Tele: 510-420-3319 Fax: 510-450-8295

Project #: 502-1775-013 Project Name: Airgas

Project Location: 1350 Powell St

Sampler Signature:

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8013)/ 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: TPHd + TPHmo / 8021 w/ Silica Gel Cleanup; NO overlapping Carbon Chains	Comments
AB-B		2/14/03	2:30	9	Amber Vials	X					X	X			X															X	
AB-C		2/14/03	12:00	9	Amber Vials	X					X	X			X															X	HOLD
TW-6		2/14/03	3:11	5	Amber Poly						X	X			X															X	
TW-7		2/14/03	2:55	2	Amber Poly						X	X			X															X	
TW-8		2/14/03	3:15	2	↓						X	X			X															X	

Relinquished By:	Date:	Time:	Received By:
	2/14	5:00	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks: !!Rush!!!

NO overlap in CARBON Chains - Silica Gel Cleanup

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

EDF Required? ☐ Yes ☐ No

Report To: Bob Clark-Riddell Bill To: Cambria

Company: Cambria Environmental Technology Inc.

6262 Hollis Street

Emeryville, CA 94608 E-mail: mmeyers@cambriaenvcons.com

Tele: 510 420-3319 Fax: 510-450-8295

Project #: 562-1975-013 Project Name: Balloon Airgas

Project Location: 1350 Powell St.

Sampler Signature:

SAMPLE ID (Field Point Name)	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
AB-G-5.5		2/14/03	11:20	1	TUBE		X				X			
AB-G-8.5			11:25	1	"		X				X			
4														
AB-D-7.0			12:05	1	"		X				X			
AB-H-3.5			2:35	1	"		X				X			
AB-B-6.0			12:40	1	"		X				X			
AB-B-12.5			12:50	1	"		X				X			
AB-H-5			2:40	1	"		X				X			
AB-G-5.5			3:15	1	"		X				X			
AB-F-5.5			4:05	1	"		X				X			
AB-F-9			4:10	1	"		X				X			
AB-H-6.5			2:45	1	"		X				X			

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	Comments

Relinquished By:	Date:	Time:	Received By:
	2/14	5:00	Jose Guzman for Forrest
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks: HOLD SAMPLES

McCampbell Analytical Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0302158

Client:
Cambria Env. Technology
5900 Hollis Street, Suite A
Emeryville, CA 94608

TEL: (510) 450-1983
FAX: (510) 450-8295
ProjectNo: #502-1975 TSK13; Air Gas
PO:

Date Received: 2/12/03
Date Printed: 2/12/03

					Requested Tests	
Sample ID	ClientSampID	Matrix	Collection Date	Hold	SW8015C	8021B/8015
0302158-001	AB-A-3.5	Soil	2/12/03 3:30:00 PM		A	A

Prepared by: Melissa Valles

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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 Env. Technology	Client Project ID: #502-1975 TSK13; Air Gas	Date Sampled: 02/12/03
5900 Hollis Street, Suite A		Date Received: 02/12/03
Emeryville, CA 94608	Client Contact: Bob Clark Riddell	Date Extracted: 02/12/03
	Client P.O.:	Date Analyzed: 02/13/03

Client Defined Gasoline Range (C6-C9) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0302158

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	AB-A-3.5	S	20,g,m	ND<0.2	ND<0.02	0.053	0.037	0.057	5	---#

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	ug/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg

*water and vapor samples are reported in µg/L, soil and sludge samples in mg/kg, wipe samples in µg/wipe, and TCLP extracts in µg/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 (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

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 Env. Technology	Client Project ID: #502-1975 TSK13; Air Gas	Date Sampled: 02/12/03
5900 Hollis Street, Suite A		Date Received: 02/12/03
Emeryville, CA 94608	Client Contact: Bob Clark Riddell	Date Extracted: 02/12/03
	Client P.O.:	Date Analyzed: 02/12/03

Diesel(C10-C23)Motor Oil(C18+)Bunker Oil(C10+)Range Extractable Hydrocarbons with Silica Gel Clean-Up*

Extraction method: SW3550C Analytical methods: SW8015C Work Order: 0302158

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	TPH(ba)	DF	% SS
001A	AB-A-3.5	S	240,a	39	240	1	87.4
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	NA	NA	NA		ug/L
		S	1.0	5.0	5.0		mg/Kg

* water and vapor samples are reported in µg/L, wipe samples in ug/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all TCLP / STLC / SPLP extracts in µg/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) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent / mineral spirit.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

Rush - 24 Hour **RUSH** 030210

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

EDF Required? ☒ Yes ☐ No

Report To: Bob Clark Risley Bill To: Cambria

Company: Cambria Environmental Technology Inc.

6262 Hollis Street

Emeryville, CA 94608 E-mail: jo[illegible]sone@cambria-env.com

Tele: 510-420-3338 Fax: 510-450-8295

Project #: 502-1975 TSK13 Project Name: AIRGAS

Project Location: 1350 Powell St., Emeryville, CA

Sampler Signature:

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other	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	Comments
AB-A-3.5	~~[illegible]~~	2/12	3:30	1	Brass Tube		X				X				X															X	TPHg + TPHd/mo/BO w/ Silica gel Cleanup

ICE/t° ✓
GOOD CONDITION
HEAD SPACE ABSENT
DECHLORINATED IN LAB

PRESERVATION ✓ VOAS | O&G | METALS | OTHER
APPROPRIATE ✓
CONTAINERS
PRESERVED IN LAB

Relinquished By:	Date:	Time:	Received By:
[signature]	2/12	5:30	[signature]
[signature]	2/12	6:25	[signature]

Remarks: Btex, TPHg + TPHd/mo/Bo w/silica gel cleanup
NO OVERLAP IN CARBON RANGE
!!! RUSH !!!

Sent By: McCampbell Analytical, Inc.; 1-925-798-4012; Feb-10-03 4:22PM; Page 2

McCampbell Analytical Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0302303

Client:
Cambria Env. Technology
5900 Hollis Street, Suite A
Emeryville, CA 94608

TEL: (510) 450-1983
FAX: (510) 450-8295
ProjectNo: #502-1795 TSK 13; Airgas
PO:

Date Received: 2/24/03
Date Printed: 2/24/03

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests <>	8021B/8015					
0302303-001	SV-2	Air	2/24/03		A	A					
0302303-002	SV-3	Air	2/24/03 10:25:00 AM			A					
0302303-003	SV-6	Air	2/24/03 11:05:00 AM			A					

Prepared by: Melissa Valles

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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 Env. Technology	Client Project ID: #502-1795 TSK 13; Airgas	Date Sampled: 02/24/03
5900 Hollis Street, Suite A		Date Received: 02/24/03
Emeryville, CA 94608	Client Contact: Bob Clark Riddell	Date Extracted: 02/25/03
	Client P.O.:	Date Analyzed: 02/25/03

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0302303

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	SV-2	A	---	---	ND	730	ND	920	1	88.7
002A	SV-3	A	---	---	ND	ND	ND	400	1	87.8
003A	SV-6	A	---	---	ND	1100	ND	1800	1	89.6
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		A	25000	2500	250	250	250	250	1	ug/m³
		S	NA	NA	NA	NA	NA	NA	1	mg/Kg

* vapor samples are reported in ug/m³, soil and sludge samples in mg/kg, wipe samples in µg/wipe, and TCLP extracts in µg/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 (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

Rush 24 Hour 030303

RUSH

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

EDF Required? ☒ Yes ☐ No

Report To: Bob Clark-Riddell Bill To: CAMBRIA

Company: Cambria Environmental Technology Inc.

6262 Hollis Street

Emeryville, CA 94608 E-mail:

Tele: 510-420-3338 Fax: 510-420-0700

Project #: 502-1795 TSK 13 Project Name: A. Regis

Project Location: 1350 Powell St, Emeryville

Sampler Signature:

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	Soil	Air	Sludge	Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX & [illegible] (602/8020)	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	Comments
SV-2			1053	2	Tedlar Bags			X							X																
SV-3			1025	↓	↓			↓							X																
SV-6			1105	↓	↓			↓							X																

ICE/t° _____
GOOD CONDITION ✓
HEAD SPACE ABSENT _____
DECHLORINATED IN LAB _____

PRESERVATION APPROPRIATE ✓
CONTAINERS _____
PRESERVED IN LAB _____

VOAS	O&G	METALS	OTHER

Relinquished By:	Date:	Time:	Received By:
	2/24/03	341	
Relinquished By:	Date: 2/24	Time: 4:30	Received By: Nicki Valler
Relinquished By:	Date:	Time:	Received By:

Remarks: BTEX By 8020
Rush 24 Hour

APPENDIX F

Site Geotechnical Reports

LOWNEY ASSOCIATES
Environmental / Geotechnical / Engineering Services

Fax Transmittal

☐ **Mountain View Office**
405 Clyde Avenue
Mountain View, CA 94043
Tel: 650.967.2365
Fax: 650.967.2785

☐ **Oakland Office**
167 Filbert Street
Oakland, CA 94607
Tel: 510.267.1970
Fax: 510.267.1972

☐ **Fullerton Office**
251 E Imperial Hwy, Ste 470
Fullerton, CA 92835
Tel: 714.441.3090
Fax: 714.441.3091

☒ **San Ramon Office**
2258 Camino Ramon
San Ramon, CA 94583
Tel: 925.275.2550
Fax: 925.275.2555

To: **Cambria Environmental**
Attn: Jason Olson
Fax: 510-420-3394
CC:

From: Scott Leck
Date: February 26, 2003
Pages: 2 (including Cover)
Project: Elevation 22
Job #: 1424-9E

Please notify us if you received this fax in error by calling the office indicated above.

Remarks: ☐ **Urgent** ☐ **For your review** ☐ **Reply ASAP** ☐ **Please comment**

Jason,

Attached is a copy of the laboratory sieve data for Sample SV-4C submitted by your firm. Please call me at (925-275-2550-x114) if you have any questions.

Sincerely,

Scott M. Leck

Scott M. Leck, P.E., G.E.
Senior Project Engineer

Mail copy to follow: Yes No Time Sent: _____ Sent By: _____

SIEVE ANALYSIS

(Hydrometer Data on Separate Sheet)

LOWNEY ASSOCIATES
405 Clyde Avenue
Mountain View, CA 94043

Project No. 1424-9E

Project Name Elevation 22 (Powell Street)

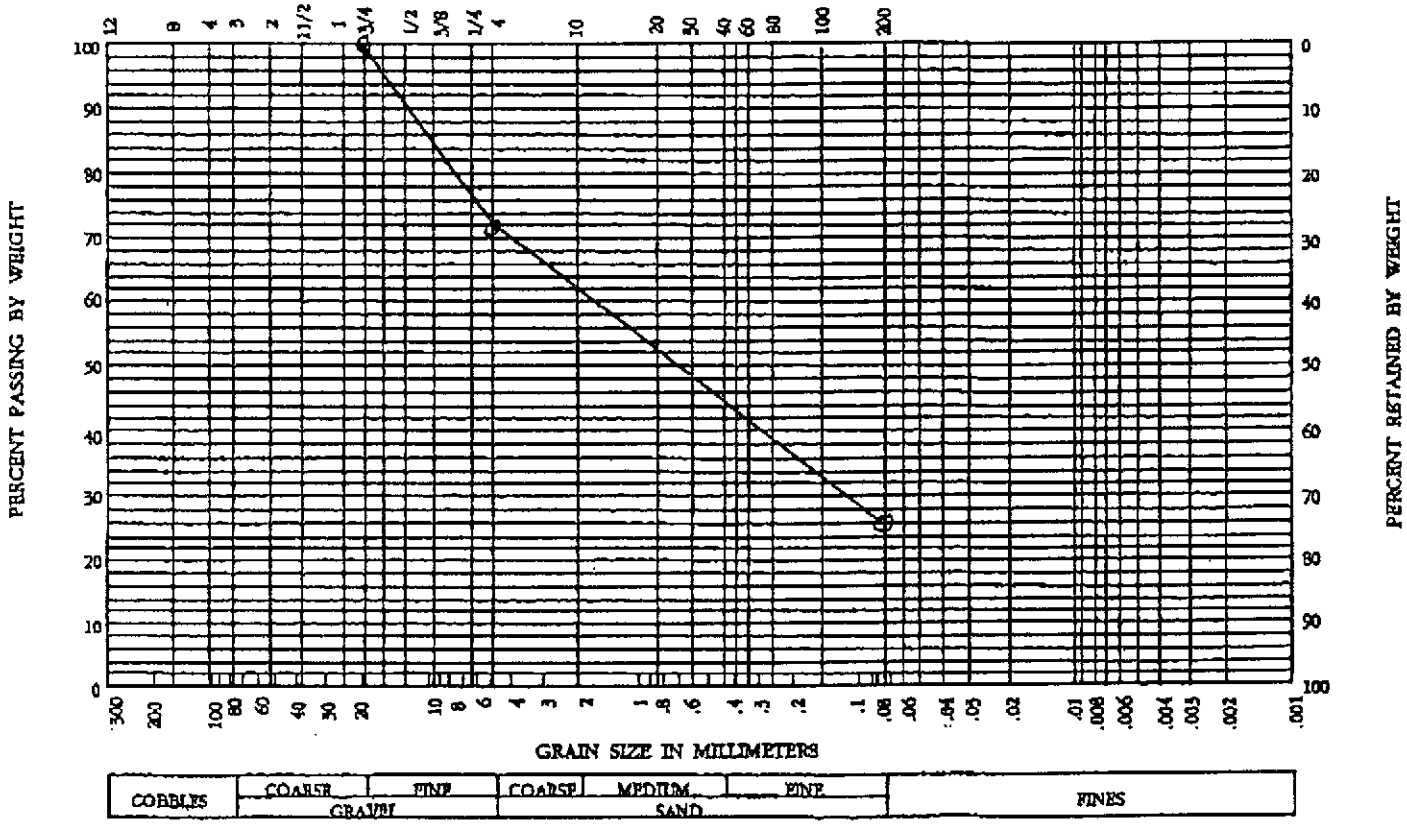
Boring/Sample No. SV-4C Depth (feet) _____

Date 2/26/03 Tested By _____

WASHED SIEVE (-#200)	
Weight of Soil Oven Dry Before Washing (grams)	
Weight of Soil Oven Dry Retained After Washing through # 200 Sieve (grams)	
Weight of Soil Oven Dry Retained After Dry Sieving through # 200 Sieve (grams)	
Weight of Soil Passing # 200 Sieve (grams)	
% Passing # 200 Sieve	26.4 % Fines

DRY SIEVE		
U.S. Standard Sieve Size	~~Cumulative~~ Weight Retained (grams)	~~Cumulative~~ Percent Retained
1"		
3/4"		
3/8"		
# 4	159.43	27.4% gravel
# 10		
# 16		
# 40		
# 50		
# 100		
# 200	263.31	45.8% Sand
Pan		
Total Sample	575	

U. S. Standard Sieve Sizes



Soil Classification Clayey Sand w/ Gravel Classification Symbol SC

LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

Mountain View
Oakland
San Ramon
Fullerton

February 19, 2003
1424-9D

Mr. Mike Kim
PULTE HOME CORPORATION
7031 Koll Center Parkway, Suite 150
Pleasanton, California 94566

RE: SUMMARY OF SUBSURFACE CONDITIONS
1300/1350 POWELL STREET
EMERYVILLE, CALIFORNIA

Dear Mr. Kim:

As you know, we completed a preliminary geotechnical investigation for the subject project and presented our recommendations in a report tilted "Preliminary Geotechnical Investigation, 1300/1350 Powell Street, Emeryville, California," dated February 21, 2002. Site environmental remediation activities have been performed, and are now complete. Remediation activities included removal of soils down to depths of about 6 to 10 feet below original site grades. We understand that you require a summary of the subsurface materials placed as fill in the excavation for review by Alameda County to obtain final closure of the site.

Soils used for backfill consisted of both imported soils and on-site soils not requiring remediation. In general, the lower 3 to 5 feet of fill soil consists of imported fat clay (CH) that had a Plasticity Index (PI) of 41, indicating that it has high plasticity and relatively low permeability. Materials placed above the fat clay include on-site fat and lean clays (CH, CL), and imported sandy silt (ML) and silty sand (SM) soils. All soils were to be compacted to at least 90 percent relative compaction in accordance with ASTM Designation D1557. Field density tests were performed during backfilling activities to confirm that the required compaction was achieved.

CLOSURE

This letter was prepared for the sole use of Pulte Home Corporation for application to the design of the proposed Elevation 22 residential development in Emeryville in accordance with generally accepted geotechnical engineering practices at this time and location. No warranty is expressed or implied.

We hope this provides the information you need at this time. If you have any questions, please call and we will be glad to discuss them with you.

Very truly yours,

LOWNEY ASSOCIATES

Scott M. Leck

Scott M. Leck, P.E., G.E.
Senior Project Engineer

SML:jcm

Copies: Addressee (2)

SR, P:\PROJECTS\1400\1424-9D Elev 22\1424-9D Elev 22 Powell Supplemental 021903 ltr.doc

Subsurface Consultants, Inc.

MEMORANDUM

To:	Michael D. Carey Levin Menzies Kelly & Associates	Date:	October 16, 2001
		Project Number:	1275.004
From:	Steven M. Wu		
Subject:	Foundation Alternatives for 1350 Powell Street Project		

This memorandum presents Subsurface Consultant Inc.'s (SCI's) preliminary foundation recommendations for the 1350 Powell Street project in Emeryville, California. The proposed project will consist of a group of low-rise, at-grade structures for 72 residential units. From a geotechnical standpoint, there are two foundation alternatives available for support of the new buildings: (1) spread footings supported on recompacted fill, or (2) deep foundations. Based on our understanding of the site's past use, we anticipate that there may be environmental considerations regarding the excavation and recompaction of onsite soils and recommend that the project environmental consultant provide input to the owner and design team during the foundation selection process.

SITE CONDITIONS

SCI drilled three test borings at the site on August 27, 2001. In general, the soils encountered at the site consist of interbedded layers of stiff lean clay, stiff silt, and medium dense clayey sand to the depths explored. The upper 1 to 6 feet of soil was identified as fill in our borings. The approximate locations of the borings are attached to this memorandum. Logs of the three borings are also attached to this memorandum.

We also reviewed a site plan provided by your environmental engineer, Randy Hicks, showing the approximate depth of fill from additional geoprobe borings performed by him. According to this map, the depth of fill ranges from 2.5 to 8 feet.

SEISMIC DESIGN (1997 UBC)

Based on the published geologic information and the results of our field investigation, it is our opinion that a soil profile type S_D, as defined in the 1997 Uniform Building Code, is applicable to the site. Near surface seismic factors for the site are governed by the proximity of the

Hayward Fault. In our opinion the following seismic design factors and coefficients are applicable to the site:

Seismic zone factor (Z) = 0.40

Soil profile type = S_D

Seismic coefficient: $C_a = 0.44\ N_a = 0.55$
$C_v = 0.64\ N_v = 1.07$

Near source factor: $N_a = 1.25$
$N_v = 1.67$

DISCUSSION OF FOUNDATION ALTERNATIVES

Based on our discussions with you, we understand that an oil company formerly occupied the 1350 Powell Street parcel. Although the underground facilities associated with its past use have been reportedly removed, sites of this nature often contain non-engineered, undocumented fill placed as backfill for the former underground structures. Based on the available subsurface information, the site appears to be underlain by an average of 5 feet of near-surface fill. The fill is generally non-uniform, variable in nature, and not suitable for support of the planned residential development.

Based on our review of the data, we judge that two foundation alternatives are available for support of the new building. The first alternative incorporates shallow spread footings supported on a layer of compacted fill. With this alternative, the upper 5 feet of fill should be excavated and either (1) replaced with compacted import fill, or (2) if environmentally acceptable, recompacted to provide a uniform base for the shallow foundations. From a geotechnical standpoint, the existing near-surface soils can likely be reused as structural fill, provided the criteria for fill and backfill materials provided below are satisfied.

The second alternative incorporates a deep foundation system consisting of either driven piles, cast-in-drilled-hole (CIDH) piers, or screwed-in-place Tubex piles. With deep foundations, removal of the upper 5 feet of fill will not be required. These foundation systems gain support in the soils that underlie the fill. However, the upper foot of soil below the slab-on-grade floor should still be reworked or replaced with import fill to provide a uniform bearing layer beneath the slab. Advantages and disadvantages of each deep foundation type are as follows:

1. The main advantages of a driven pile system are that it is a very common, relatively quickly installed, and cost effective foundation system. The disadvantages are that noise and vibration associated with pile driving may disturb neighboring structures and occupants.

2. The main advantage of a CIDH pier system is that it can be installed with minimal disturbance to adjacent structures and improvements. The main disadvantage is that soil cuttings and drilling fluids will be generated that will require disposal.

3. The main advantage of a Tubex pile system is that it can be installed with minimal disturbance to adjacent structures and that it does not generate large quantities of soil cuttings. The main disadvantage is the relatively high cost per pile.

If environmental concerns associated with disposal of soil cuttings generated during foundation construction are not a major concern, we recommend CIDH piers for the deep foundation alternative for this project.

PRELIMINARY RECOMMENDATIONS

The following sections present preliminary recommendations for the evaluation and costing of foundation alternatives. Geotechnical recommendations for final design will be presented in our geotechnical investigation report for the project once a preferred foundation type has been selected.

Alternative 1: Shallow Foundations over Engineered Fill

Earthwork

With this alternative, we recommend that the upper 5 feet of soil be excavated and recompacted (provided that reuse of existing fill soils is environmentally acceptable) or replaced with compacted import fill. Fill and backfill materials should contain no environmental contaminants or construction debris and be free of rocks or lumps larger than 4 inches in greatest dimension and contain no more than 15 percent larger than 2.5 inches. Fill should be nonexpansive in nature, with a liquid limit not exceeding 40 percent and a plasticity index not exceeding 15.

On-site fill soils may be segregated to satisfy this requirement. We recommend that your environmental consultant evaluate the feasibility and costs associated with the re-use of onsite fill soils.

Soil subgrades in areas to receive fill should be firm and non-yielding. Fill should be placed in layers not exceeding 8 inches in loose thickness, moisture conditioned to near optimum moisture content and compacted to at least 90 percent relative compaction (based upon ASTM D1557 test procedure).

Shallow Foundations

The following preliminary recommendations are based on the assumption that spread footings will be supported on compacted fill consisting of stiff lean clay or medium dense to dense clayey sand. Shallow foundations that bear on these materials can be preliminarily designed using the allowable average bearing pressures presented in the following table:

Allowable Bearing Pressures (Preliminary)

Load Condition	Allowable Bearing Pressure (pounds per square foot)
Dead load	1,800
Dead plus sustained live loads	2,200
Total loads, including wind or seismic	2,750

We estimate that the long-term total and differential settlement of new spread footing foundations constructed as recommended in this report should be less than 1 inch and ½-inch, respectively.

Resistance to lateral loads can be developed by passive pressure against the face of the foundations and frictional resistance between the bottoms of the footings and the underlying soil. Passive resistance can be determined using an equivalent fluid pressure of 300 pounds per square foot per foot of depth (pcf). The upper one foot of soil should be ignored, unless it is confined by a pavement or a slab. Frictional resistance can be calculated as 0.35 times the vertical dead load on the base of the spread footing foundation. The passive resistance is based on a factor of safety of 2.0. However, relatively large deflections would be required to mobilize the ultimate passive resistance. Therefore, in order to limit deformations to less than about ½-inch, we recommend that the passive resistance should be considered as an ultimate value. The frictional resistance should be considered as an ultimate value and can be mobilized with deformations of less than about ¼-inch.

Alternative 2: CIDH Piers with Limited Earthwork

Earthwork

With this alternative, we recommend that the upper foot of soil be excavated and recompacted (provided that reuse of existing fill soils is environmentally acceptable) or replaced with compacted import fill. Recommendations for fill and backfill materials are provided above in Alternative 1. Your environmental consultant should evaluate whether the on-site fill can be reused.

CIDH Pier Foundations

CIDH piers should be designed to develop support by skin friction in the lean clay and sand that underlie the site. Skin friction from the upper 5 feet of existing fill should be neglected. The piers should be at least 18 inches in diameter with cast-in-place concrete pier caps. The piers should have a minimum center-to-center spacing of three times the pier diameter.

The axial capacity of CIDH piers can be calculated using an allowable skin friction of 600 pounds per square foot (psf) for dead plus sustained live load capacity. Up to 80 percent of the downward dead plus live load capacity can be used for uplift. These values may be increased by one-third for total loads, including wind or seismic.

Lateral loads can be resisted by a passive pressure equal to an equivalent fluid weighing 300 pounds per cubic foot (pcf) acting on the embedded portion of the pile caps and on the upper 3 feet of the piers over twice the pier diameter. Additional lateral resistance can be provided by the structural rigidity of the piers. If required, SCI can provide additional lateral capacity (p-y) curves for the drilled piers.

Slab-on-Grade Floors

Soil subgrades beneath concrete slabs-on-grade should be properly prepared and be relatively smooth and non-yielding under equipment loads. A layer of clean, angular crushed rock, at least 4 inches thick, should be placed beneath interior slabs to provide a capillary moisture break. The crushed rock should conform to the following gradation criteria:

Sieve Size	Percent Passing
1 inch	100
3/4 inch	90 – 100
No. 200	0 – 3

If the migration of water vapor through the slabs is unacceptable, a vapor barrier should be considered. The vapor barrier should consist of an impermeable membrane at least 10 mil thick placed above the crushed rock. The membrane should be covered with 2 inches of sand for protection during construction.

Slab reinforcing should be provided in accordance with the anticipated use and loading of the slab.

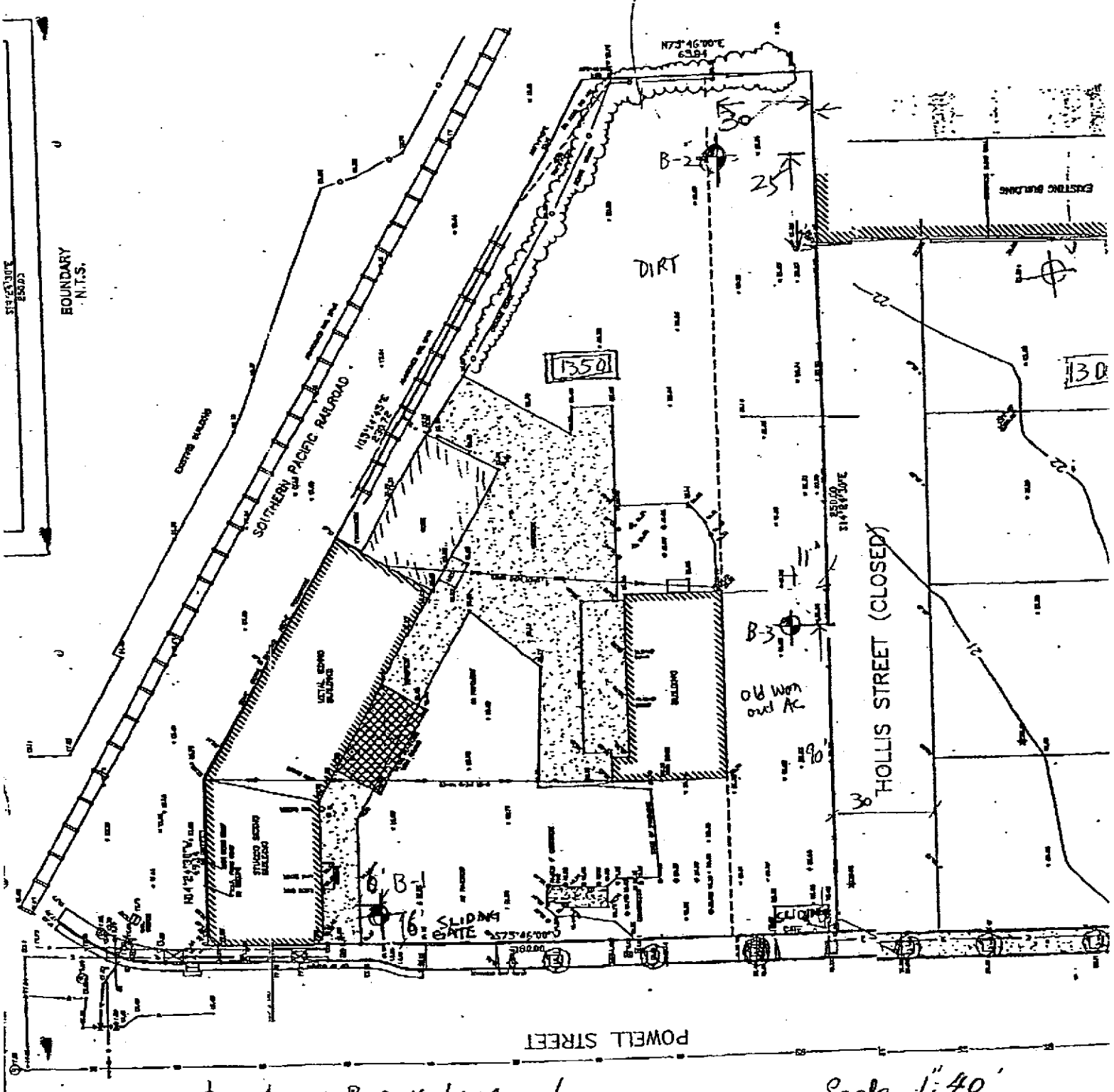
CLOSURE

We trust that this memorandum provides you with the preliminary information that you require. Design-level geotechnical recommendations for the selected alternative will be presented in our final report. If you have any questions regarding this memorandum, please contact us.

SMW:WDM foundation alternatives 1350 Powell.doc

Area = 3,335 ft²

DRAFT



Approx. Boring Location

Scale 1" = 40'

1350 POWELL ST.,

Project Name & Location: 1350 Powell Street, Emeryville, California	Ground Surface Elevation: 18 feet
	Elevation Datum: Project Datum
Drilling Coordinates/Location Description: not surveyed	Start: Date 8/27/01 Time 10:05 / Finish: Date 8/27/01 Time 11:00
Drilling Company & Driller: Bay Area Exploration, Robert, Dave & Jeremy	Drilling Fluid: N/A / Hole Diameter: 8"
Rig Type & Drilling Method: CME 75 / Hollow Stem Auger	
Sampler Type(s): A) California (2.5" O.D., 2.0" I.D.)	Logged By: AHL / ▽ GWL during drilling ▼ GWL after drilling
Sampling Method(s): A) 140 lb automatically tripped hammer w/30" drop	Backfill Method: Cement Grout / Date: 8/28/01

Depth (feet)	Sampler Type	Blows/6 inches of Pressure	Blows/12 inches	Sample Interval	Graphic Log	SOIL DESCRIPTIONS GROUP NAME (GROUP SYMBOL) color, consistency/density, moisture condition, other descriptions (Local Name or Material Type)	LABORATORY DATA Moisture Content (%)	Dry Density (pcf)	Other
0						ASPHALT- 2" thick			
	A	3 6 6	12			CLAYEY SAND WITH GRAVEL (SC) yellowish brown to reddish brown, medium dense, moist, (fill)			OVM = 261 ppm
						LEAN CLAY WITH GRAVEL (CL) grey to black, stiff, moist, with hydrocarbon smell, (fill)			
	A	3 6 8	14						OVM = 350 ppm
5	A	3 5 7	12			SILTY CLAY (CL-ML) grey, stiff, moist			OVM = 153 ppm
						LEAN CLAY WITH SAND AND GRAVEL (CL) light brown with black, reddish brown, and grey inclusion, stiff, moist ▽			
10	A	2 5 5	10						
						▼ LEAN CLAY (CL) mottled yellowish brown and light brown, stiff to very stiff, moist			
15	A	2 5 5	10						
						DRAFT			
20	A	4 6 9	15			grades with sand			
						SILTY CLAY (CL-ML) dark grey, stiff, moist			
25	A	3 3 5	8						
30									

Notes:
Boring terminated at 26.5'.
Groundwater was encountered at 9' during drilling and 13' after drilling.

LOG OF BORING 01-382.GPJ GEO-ENV.GDT 9/5/01

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

1350 Powell Street
Emeryville, California

JOB NUMBER PW 01.382 | DATE 9/01

BORING B-1

Project Name & Location: 350 Powell Street, Emeryville, California	Ground Surface Elevation: 21 feet
	Elevation Datum: Project Datum
Drilling Coordinates/Location Description: not surveyed	Start: Date 8/27/01 Time 11:30 — Finish: Date 8/27/01 Time 12:45
Drilling Company & Driller: Bay Area Exploration, Robert, Dave & Jeremy	Drilling Fluid: N/A — Hole Diameter: 8"
Rig Type & Drilling Method: CME 75 / Hollow Stem Auger	Logged By: AHL — ▽ GWL after drilling
Sampler Type(s): A) California (2.5" O.D., 2.0" I.D.)	
Sampling Method(s): A) 140 lb automatically tripped hammer w/30" drop	Backfill Method: Cement Grout — Date: 8/28/01

Depth (feet)	Sampler Type	Blows/6 inches of Pressure	Blows/12 inches	Sample Interval	Graphic Log	SOIL DESCRIPTIONS GROUP NAME (GROUP SYMBOL) color, consistency/density, moisture condition, other descriptions (Local Name or Material Type)	LABORATORY DATA Moisture Content (%)	Dry Density (pcf)	Other
0	A	3 4 5	9			SANDY LEAN CLAY WITH GRAVEL (CL) brown, stiff, moist, (fill)			
						SILTY CLAY (CL-ML) dark grey to black, stiff, moist, with brown stain			OVM = 10.4 ppm
	A	2 4 6	10						OVM = 25.1 ppm
5	A	2 4 4	8						OVM = 28 ppm
						CLAYEY SAND (SC) olive gray, medium dense, moist			
10	A	4 8 12	20			LEAN CLAY (CL) mottled olive, grey and yellowish brown, very stiff, moist			OVM = 141 ppm
15	A	3 4 5	9			grades to with sand and occasional gravel			OVM = 13.4 ppm
20	A	2 5 6	11			grades to without sand and gravel			OVM = 13.4 ppm
25	A	7 14 17	31						
30									

DRAFT

Notes:
Boring terminated at 26.5'.
Groundwater was encountered at 19' after drilling.

LOG OF BORING 01-382.GPJ GEO-ENV.GDT 9/5/01

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

1350 Powell Street
Emeryville, California

JOB NUMBER PW 01.382 — DATE 9/01

BORING B-2

Project Name & Location: 1350 Powell Street Emeryville, California	Ground Surface Elevation: 21 feet Elevation Datum: Project Datum
Drilling Coordinates/Location Description: not surveyed	Start: Date 8/27/01 Time 13:05 — Finish: Date 8/27/01 Time 14:30
Drilling Company & Driller: Bay Area Exploration, Robert & Dave	Drilling Fluid: N/A — Hole Diameter: 8"
Rig Type & Drilling Method: CME 75 / Hollow Stem Auger	
Sampler Type(s): A) California (2.5" O.D., 2.0" I.D.)	Logged By: AHL — ▽ GWL during drilling ▼ GWL after drilling
Sampling Method(s): A) 140 lb automatically tripped hammer w/30" drop	Backfill Method: Cement Grout — Date: 8/28/01

Depth (feet)	Sampler Type	Blows/6 Inches of Pressure	Blows/12 Inches	Sample Interval	Graphic Log	SOIL DESCRIPTIONS GROUP NAME (GROUP SYMBOL) color, consistency/density, moisture condition, other descriptions (Local Name or Material Type)	LABORATORY DATA Moisture Content (%)	Dry Density (pcf)	Other
0						ASPHALT- 2" thick asphalt over 4" aggregate base			
	A	12 9 8	17			SANDY LEAN CLAY WITH GRAVEL (CL) brown, very stiff, damp, (fill)			OVM = 70 ppm
						LEAN CLAY WITH GRAVEL (CL) mottled grey, black and dark grey, very stiff, moist, gravel up to 1/2" in diameter.(fill)			
	A	7 9 13	22			strong hydrocarbon smell at 3'			OVM = 2500 ppm
5	A	9 17 13	30						OVM = 596 ppm
						CLAYEY SAND (SC) grey, medium dense, moist, sand medium to coarse grained			
10	A	8 9 8	17			▽ LEAN CLAY (CL) mottled light brown and reddish brown, with black inclusion, very stiff, moist, with occasional sand			OVM = 198 ppm
						CLAYEY SAND (SC) brown, medium dense, moist, coarse to medium grained sand			
15	A	4 10 11	21			▼			OVM = 13.5 ppm
						DRAFT			
20	A	5 8 12	20			SILTY LEAN CLAY WITH SAND AND GRAVEL (CL) brown, very stiff, moist, with fine grained sand and occasional gravel up to 1/4" in diameter			OVM = 10.4 ppm
						SILT (ML) gray, very stiff, moist			
25	A	4 8 12	20						
30									

Notes:
Boring terminated at 26.5'.
Groundwater was encountered at 10' during drilling and 14' after drilling.

LOG OF BORING 01-382.GPJ GEO-ENV.GDT 9/5/01

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

1350 Powell Street
Emeryville, California

JOB NUMBER PW 01.382 — DATE 9/01

BORING B-3

APPENDIX G

Site-Specific RBSLs from Oakland ULR Model

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Arsenic	Barium	Benz(a)anthracene	Benzene	Benzo(a)pyrene
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic					2.6E+00		1.7E+00	1.9E+01	1.7E-01
			Hazard	2.3E+03	2.3E+03	3.7E+03	1.2E+04	1.8E+01	5.0E+03		6.3E+01	
		Commercial/ Industrial	Carcinogenic					9.5E+00		4.3E+00	4.9E+01	4.3E-01
			Hazard	1.1E+04	1.1E+04	1.8E+04	5.6E+04	1.5E+02	7.1E+04		3.0E+02	
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic							SAT	3.3E+00	SAT
			Hazard	SAT	SAT	9.4E+03	SAT				1.1E+01	
		Commercial/ Industrial	Carcinogenic							SAT	5.0E+01	SAT
			Hazard	SAT	SAT	2.6E+05	SAT				3.0E+02	
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic							SAT	4.9E+02	SAT
			Hazard	SAT	SAT	SAT	SAT				2.0E+03	
		Commercial/ Industrial	Carcinogenic							SAT	1.9E+03	SAT
			Hazard	SAT	SAT	SAT	SAT				SAT	
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic					*4.4E+00*	*1.3E+02*	1.4E+01	*4.5E-03*	*1.2E+01*
			Hazard	4.0E+02	2.7E+02	1.5E+00	SAT	*4.4E+00*	*1.3E+02*		*4.5E-03*	*1.2E+01*
		Commercial/ Industrial	Carcinogenic					*4.4E+00*	*1.3E+02*	5.8E+01	*4.5E-03*	*1.2E+01*
			Hazard	SAT	SAT	9.7E+00	SAT	*4.4E+00*	*1.3E+02*		*4.5E-03*	*1.2E+01*
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic							>SOL	6.9E+00	>SOL
			Hazard	>SOL	>SOL	3.1E+04	>SOL				2.3E+01	
		Commercial/ Industrial	Carcinogenic							>SOL	1.0E+02	>SOL
			Hazard	>SOL	>SOL	8.5E+05	>SOL				6.2E+02	
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic							>SOL	>SOL	>SOL
			Hazard	>SOL	>SOL	>SOL	>SOL				>SOL	
		Commercial/ Industrial	Carcinogenic							>SOL	>SOL	>SOL
			Hazard	>SOL	>SOL	>SOL	>SOL				>SOL	
	Ingestion of Groundwater	Residential	Carcinogenic					*5.0E-02*	*1.0E+00*	5.6E-04	*1.0E-03*	*2.0E-04*
			Hazard	9.4E-01	9.4E-01	1.6E+00	>SOL	*5.0E-02*	*1.0E+00*		*1.0E-03*	*2.0E-04*
		Commercial/ Industrial	Carcinogenic					*5.0E-02*	*1.0E+00*	2.4E-03	*1.0E-03*	*2.0E-04*
			Hazard	>SOL	>SOL	1.0E+01	>SOL	*5.0E-02*	*1.0E+00*		*1.0E-03*	*2.0E-04*
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic					2.0E-02		1.6E-04	6.3E-02	1.1E-05
			Hazard	1.1E+00	1.7E+00	4.2E+01	>SOL	1.2E-01	2.8E+01		1.8E-01	

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Beryllium	Bis(2-ethylhexyl)-phthalate	Butyl benzyl phthalate	Cadmium	Carbon Disulfide
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	1.7E+00		1.7E+00	4.5E+04	2.4E+02		2.1E+04	
			Hazard		1.6E+02		3.6E+02	7.8E+02	7.8E+03	3.6E+01	1.4E+03
		Commercial/ Industrial	Carcinogenic	4.3E+00		4.3E+00	1.7E+05	6.2E+02		7.9E+04	
			Hazard		7.4E+02		5.1E+03	3.7E+03	3.7E+04	5.1E+02	6.5E+03
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	SAT		SAT		SAT			
			Hazard		SAT			SAT			5.2E+00
		Commercial/ Industrial	Carcinogenic	SAT		SAT		SAT			
			Hazard		SAT			SAT			1.4E+02
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	SAT		SAT		SAT			
			Hazard		SAT			SAT			9.4E+02
		Commercial/ Industrial	Carcinogenic	SAT		SAT		SAT			
			Hazard		SAT			SAT			SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic	SAT		SAT	9.6E+00	7.3E+04		*1.1E+00*	
			Hazard		SAT		9.6E+00	SAT	SAT	*1.1E+00*	6.0E+00
		Commercial/ Industrial	Carcinogenic	SAT		SAT	9.6E+00	SAT		*1.1E+00*	
			Hazard		SAT		9.6E+00	SAT	SAT	*1.1E+00*	3.9E+01
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	>SOL		>SOL		>SOL			
			Hazard		>SOL			>SOL			2.9E+01
		Commercial/ Industrial	Carcinogenic	>SOL		>SOL		>SOL			
			Hazard		>SOL			>SOL			8.0E+02
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	>SOL		>SOL		>SOL			
			Hazard		>SOL			>SOL			>SOL
		Commercial/ Industrial	Carcinogenic	>SOL		>SOL		>SOL			
			Hazard		>SOL			>SOL			>SOL
	Ingestion of Groundwater	Residential	Carcinogenic	5.6E-04		5.6E-04	4.0E-03	8.0E-02		*5.0E-03*	
			Hazard		>SOL		4.0E-03	3.1E-01	>SOL	*5.0E-03*	1.6E+00
		Commercial/ Industrial	Carcinogenic	>SOL		>SOL	4.0E-03	>SOL		*5.0E-03*	
			Hazard		>SOL		4.0E-03	>SOL	>SOL	*5.0E-03*	1.0E+01
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic	1.1E-04		1.2E-04		>SOL			
			Hazard		>SOL		2.0E+00	>SOL	>SOL	2.0E-01	9.4E+00

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Carbon Tetrachloride	Chloro-benzene	Chloroform	Chromium (III)	Chromium (VI)	Chrysene	Copper	Cresol(-m)	Cresol(-o)
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	1.2E+01		6.2E+01		1.2E+01	1.7E+01			
			Hazard	2.6E+01	6.6E+02	3.7E+02	7.1E+04	3.6E+02		2.6E+03	1.9E+03	1.9E+03
		Commercial/ Industrial	Carcinogenic	3.3E+01		1.6E+02		6.6E+01	4.3E+01			
			Hazard	1.2E+02	3.1E+03	1.8E+03	1.0E+06	5.1E+03		3.8E+04	9.2E+03	9.2E+03
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	1.2E+00		1.7E+01			SAT			
			Hazard	2.0E+00	3.4E+00	6.2E+01					SAT	SAT
		Commercial/ Industrial	Carcinogenic	1.8E+01		2.5E+02			SAT			
			Hazard	5.5E+01	9.3E+01	1.7E+03					SAT	SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	1.8E+02		2.4E+03			SAT			
			Hazard	3.6E+02	SAT	SAT					SAT	SAT
		Commercial/ Industrial	Carcinogenic	6.9E+02		SAT			SAT			
			Hazard	2.1E+03	SAT	SAT					SAT	SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic	*5.9E-03*	*1.6E-01*	*3.4E-01*		2.9E+00	SAT	*1.2E+00*		
			Hazard	*5.9E-03*	*1.6E-01*	*3.4E-01*	8.5E+07	2.9E+00		*1.2E+00*	4.8E+00	5.0E+00
		Commercial/ Industrial	Carcinogenic	*5.9E-03*	*1.6E-01*	*3.4E-01*		2.9E+00	SAT	*1.2E+00*		
			Hazard	*5.9E-03*	*1.6E-01*	*3.4E-01*	5.6E+08	2.9E+00		*1.2E+00*	3.2E+01	3.3E+01
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	3.6E+00		3.9E+01			>SOL			
			Hazard	6.1E+00	6.0E+01	1.5E+02					>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	5.4E+01		5.9E+02			>SOL			
			Hazard	1.7E+02	>SOL	4.0E+03					>SOL	>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	>SOL		>SOL			>SOL			
			Hazard	>SOL	>SOL	>SOL					>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	>SOL		>SOL			>SOL			
			Hazard	>SOL	>SOL	>SOL					>SOL	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic	*5.0E-04*	*7.0E-02*	*1.0E-01*		5.0E-02	>SOL	*1.3E+00*		
			Hazard	*5.0E-04*	*7.0E-02*	*1.0E-01*	1.6E+01	5.0E-02		*1.3E+00*	7.8E-01	7.8E-01
		Commercial/ Industrial	Carcinogenic	*5.0E-04*	*7.0E-02*	*1.0E-01*		5.0E-02	>SOL	*1.3E+00*		
			Hazard	*5.0E-04*	*7.0E-02*	*1.0E-01*	1.0E+02	5.0E-02		*1.3E+00*	5.1E+00	5.1E+00
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic	4.1E-02		3.9E-01		6.8E-02	>SOL			
			Hazard	7.1E-02	1.2E+00	1.9E+00	3.8E+02	1.9E+00		1.5E+01	6.7E+00	6.4E+00

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Cresol(-p)	Cyanide	Dibenz(a,h)-anthracene	Dichloro ethane (1,1-)	Dichloro-ethane (1,2-) (EDC)	Dichloro-ethylene (1,1-)	Dichloro-ethylene (cis-1,2-)	Dichloro-ethene (trans-1,2)
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic			4.9E-01	3.3E+02	2.7E+01	3.3E+00		
			Hazard	1.9E+02	2.8E+03		3.8E+03	1.1E+02	3.3E+02	3.7E+02	7.4E+02
		Commercial/ Industrial	Carcinogenic			1.3E+00	8.7E+02	7.1E+01	8.5E+00		
			Hazard	9.2E+02	4.1E+04		1.8E+04	5.1E+02	1.6E+03	1.8E+03	3.5E+03
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic			SAT	4.3E+01	9.4E+00	4.1E-01		
			Hazard	SAT			6.8E+02	3.7E+01	1.3E+01	7.2E+01	8.9E+01
		Commercial/ Industrial	Carcinogenic			SAT	6.5E+02	1.4E+02	6.1E+00		
			Hazard	SAT			SAT	1.0E+03	3.5E+02	2.0E+03	2.4E+03
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic			SAT	SAT	1.3E+03	6.2E+01		
			Hazard	SAT			SAT	SAT	2.3E+03	SAT	SAT
		Commercial/ Industrial	Carcinogenic			SAT	SAT	4.7E+03	2.3E+02		
			Hazard	SAT			SAT	SAT	SAT	SAT	SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic		6.2E+00	3.8E+01	1.4E-02	*9.9E-04*	*2.8E-02*	*1.9E-02*	*4.2E-02*
			Hazard	4.6E-01	6.2E+00		1.4E-02	*9.9E-04*	*2.8E-02*	*1.9E-02*	*4.2E-02*
		Commercial/ Industrial	Carcinogenic		6.2E+00	1.6E+02	1.4E-02	*9.9E-04*	*2.8E-02*	*1.9E-02*	*4.2E-02*
			Hazard	3.0E+00	6.2E+00		1.4E-02	*9.9E-04*	*2.8E-02*	*1.9E-02*	*4.2E-02*
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic			>SOL	1.2E+02	2.2E+01	2.6E+00		
			Hazard	>SOL			1.9E+03	8.6E+01	8.3E+01	1.5E+02	2.1E+02
		Commercial/ Industrial	Carcinogenic			>SOL	1.8E+03	3.2E+02	3.9E+01		
			Hazard	>SOL			>SOL	2.3E+03	>SOL	>SOL	5.8E+03
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic			>SOL	>SOL	4.8E+03	9.7E+02		
			Hazard	>SOL			>SOL	>SOL	>SOL	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic			>SOL	>SOL	>SOL	>SOL		
			Hazard	>SOL			>SOL	>SOL	>SOL	>SOL	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic		2.0E-01	1.6E-04	5.0E-03	*5.0E-04*	*6.0E-03*	*6.0E-03*	*1.0E-02*
			Hazard	7.8E-02	2.0E-01		5.0E-03	*5.0E-04*	*6.0E-03*	*6.0E-03*	*1.0E-02*
		Commercial/ Industrial	Carcinogenic		2.0E-01	7.0E-04	5.0E-03	*5.0E-04*	*6.0E-03*	*6.0E-03*	*1.0E-02*
			Hazard	5.1E-01	2.0E-01		5.0E-03	*5.0E-04*	*6.0E-03*	*6.0E-03*	*1.0E-02*
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic			1.4E-05	2.1E+00	2.4E-01	1.3E-02		
			Hazard	5.9E-01	7.0E+00		1.9E+01	7.2E-01	1.2E+00	1.8E+00	3.5E+00

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Dimethyl-benza(a) anthracene (7,12)	Dimethyl-phenol (2,4)	di-n-Butyl-phthalate	di-n-octyl-phthalate	Dinitro-toluene (2,4)	Dioxane (1,4)	Ethyl-benzene	Ethylene Dibromide	Flouran-thene
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic					6.3E+00	7.0E+01		5.5E-01	
			Hazard	1.2E+03	7.7E+02	3.9E+03	7.8E+02			3.9E+03	2.2E+00	1.6E+03
		Commercial/ Industrial	Carcinogenic					1.7E+01	1.8E+02		1.4E+00	
			Hazard	5.6E+03	3.7E+03	1.9E+04	3.7E+03			1.8E+04	1.0E+01	7.4E+03
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic					SAT	SAT		1.3E+01	
			Hazard		SAT	SAT	SAT			SAT	3.5E+00	SAT
		Commercial/ Industrial	Carcinogenic					SAT	SAT		1.9E+02	
			Hazard		SAT	SAT	SAT			SAT	9.5E+01	SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic					SAT	SAT		1.4E+03	
			Hazard		SAT	SAT	SAT			SAT	4.5E+02	SAT
		Commercial/ Industrial	Carcinogenic					SAT	SAT		SAT	
			Hazard		SAT	SAT	SAT			SAT	2.6E+03	SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic					1.5E-02	SAT	*1.6E+01*	*1.8E-04*	
			Hazard	SAT	4.3E+00	7.9E+06	SAT			*1.6E+01*	*1.8E-04*	SAT
		Commercial/ Industrial	Carcinogenic					6.2E-02	SAT	*1.6E+01*	*1.8E-04*	
			Hazard	SAT	2.8E+01	SAT	SAT			*1.6E+01*	*1.8E-04*	SAT
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic					>SOL	>SOL		1.3E+01	
			Hazard		>SOL	>SOL	>SOL			>SOL	3.6E+00	>SOL
		Commercial/ Industrial	Carcinogenic					>SOL	>SOL		1.9E+02	
			Hazard		>SOL	>SOL	>SOL			>SOL	9.8E+01	>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic					>SOL	>SOL		2.1E+03	
			Hazard		>SOL	>SOL	>SOL			>SOL	6.9E+02	>SOL
		Commercial/ Industrial	Carcinogenic					>SOL	>SOL		>SOL	
			Hazard		>SOL	>SOL	>SOL			>SOL	4.0E+03	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic					2.2E-03	>SOL	*7.0E-01*	*5.0E-05*	
			Hazard	>SOL	3.1E-01	1.6E+00	>SOL			*7.0E-01*	*5.0E-05*	>SOL
		Commercial/ Industrial	Carcinogenic					9.2E-03	>SOL	*7.0E-01*	*5.0E-05*	
			Hazard	>SOL	2.0E+00	1.0E+01	>SOL			*7.0E-01*	*5.0E-05*	>SOL
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic					6.4E-02	>SOL		5.9E-03	
			Hazard	>SOL	2.7E+00	7.3E+00	2.1E-03			3.6E+00	1.7E-02	>SOL

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Fluorene	Indeno-(1,2,3-CD) pyrene	Mercury	Methanol	Methyl ethyl ketone	Methylene Chloride	Methyl naphthalene (2-)	MTBE	Naphthalene
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic		1.7E+00				1.4E+02			
			Hazard	1.6E+03		3.9E+00	1.9E+04	2.2E+04	2.3E+03	1.6E+03	2.0E+02	1.6E+03
		Commercial/ Industrial	Carcinogenic		4.3E+00				3.7E+02			
			Hazard	7.4E+03		1.8E+01	8.9E+04	1.0E+05	1.1E+04	7.4E+03	9.3E+02	7.4E+03
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic		SAT				7.4E+01			
			Hazard	SAT		2.7E+01	2.8E+05	3.6E+04	4.4E+03	SAT	2.4E+04	SAT
		Commercial/ Industrial	Carcinogenic		SAT				1.1E+03			
			Hazard	SAT			SAT	SAT	SAT	SAT	SAT	SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic		SAT				SAT			
			Hazard	SAT		4.8E+03	SAT	SAT	SAT	SAT	SAT	SAT
		Commercial/ Industrial	Carcinogenic		SAT				SAT			
			Hazard	SAT		2.8E+04	SAT	SAT	SAT	SAT	SAT	SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic		SAT	*3.2E-01*			8.2E-03		*2.1E-02*	*2.4E+00*
			Hazard	5.2E+02		*3.2E-01*	7.1E+00	1.1E+01	8.2E-03	3.2E+02	*2.1E-02*	*2.4E+00*
		Commercial/ Industrial	Carcinogenic		SAT	*3.2E-01*			8.2E-03		*2.1E-02*	*2.4E+00*
			Hazard	SAT		*3.2E-01*	4.7E+01	7.3E+01	8.2E-03	2.1E+03	*2.1E-02*	*2.4E+00*
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic		>SOL				2.5E+02			
			Hazard	>SOL		1.7E+00	9.2E+05	9.6E+04	>SOL	>SOL	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic		>SOL				3.6E+03			
			Hazard	>SOL		4.7E+01	>SOL	>SOL	>SOL	>SOL	>SOL	>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic		>SOL				>SOL			
			Hazard	>SOL		6.6E+02	>SOL	>SOL	>SOL	>SOL	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic		>SOL				>SOL			
			Hazard	>SOL		3.9E+03	>SOL	>SOL	>SOL	>SOL	>SOL	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic		>SOL	*2.0E-03*			5.0E-03		*1.3E-02*	*2.0E-02*
			Hazard	6.3E-01		*2.0E-03*	7.8E+00	9.4E+00	5.0E-03	6.3E-01	*1.3E-02*	*2.0E-02*
		Commercial/ Industrial	Carcinogenic		>SOL	*2.0E-03*			5.0E-03		*1.3E-02*	*2.0E-02*
			Hazard	>SOL		*2.0E-03*	5.1E+01	6.1E+01	5.0E-03	4.1E+00	*1.3E-02*	*2.0E-02*
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic		>SOL				1.3E+00			
			Hazard	3.1E-01		3.6E-02	2.2E+02	1.5E+02	1.6E+01	6.1E-01	1.5E+00	1.5E+00

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Nickel	Nitro-benzene	PCBs	Phenan-threne	Phenol	Pyrene	Pyridine	Selenium	Silver	Styrene
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	3.4E+05	3.7E+03	3.6E-01				2.0E+03			
			Hazard	1.4E+03		9.8E-01	1.2E+04	2.3E+04	1.2E+03		3.6E+02	3.6E+02	7.7E+03
		Commercial/ Industrial	Carcinogenic	1.3E+06	9.9E+03	1.1E+00				5.1E+03			
			Hazard	2.0E+04		5.8E+00	5.6E+04	1.1E+05	5.6E+03		5.1E+03	5.1E+03	3.7E+04
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic		SAT	2.6E+03				9.5E+04			
			Hazard			SAT	SAT	SAT	SAT				SAT
		Commercial/ Industrial	Carcinogenic		SAT	SAT				SAT			
			Hazard			SAT	SAT	SAT	SAT				SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic		SAT	SAT				1.2E+06			
			Hazard			SAT	SAT	SAT	SAT				SAT
		Commercial/ Industrial	Carcinogenic		SAT	SAT				SAT			
			Hazard			SAT	SAT	SAT	SAT				SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic	*2.0E+01*	6.5E+00	*9.4E+00*				2.8E+00	*8.0E-01*	*2.6E+00*	*4.8E+00*
			Hazard	*2.0E+01*		*9.4E+00*	SAT	2.5E+01	SAT		*8.0E-01*	*2.6E+00*	*4.8E+00*
		Commercial/ Industrial	Carcinogenic	*2.0E+01*	2.8E+01	*9.4E+00*				1.2E+01	*8.0E-01*	*2.6E+00*	*4.8E+00*
			Hazard	*2.0E+01*		*9.4E+00*	SAT	1.6E+02	SAT		*8.0E-01*	*2.6E+00*	*4.8E+00*
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic		>SOL	>SOL				7.0E+04			
			Hazard			>SOL	>SOL	>SOL	>SOL				>SOL
		Commercial/ Industrial	Carcinogenic		>SOL	>SOL				>SOL			
			Hazard			>SOL	>SOL	>SOL	>SOL				>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic		>SOL	>SOL				>SOL			
			Hazard			>SOL	>SOL	>SOL	>SOL				>SOL
		Commercial/ Industrial	Carcinogenic		>SOL	>SOL				>SOL			
			Hazard			>SOL	>SOL	>SOL	>SOL				>SOL
	Ingestion of Groundwater	Residential	Carcinogenic	*1.0E-01*	1.3E+00	*5.0E-04*				6.7E-01	*5.0E-02*	*1.0E-01*	*1.0E-01*
			Hazard	*1.0E-01*		*5.0E-04*	>SOL	9.4E+00	>SOL		*5.0E-02*	*1.0E-01*	*1.0E-01*
		Commercial/ Industrial	Carcinogenic	*1.0E-01*	5.7E+00	*5.0E-04*				2.9E+00	*5.0E-02*	*1.0E-01*	*1.0E-01*
			Hazard	*1.0E-01*		*5.0E-04*	>SOL	6.1E+01	>SOL		*5.0E-02*	*1.0E-01*	*1.0E-01*
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic		2.8E+01	1.6E-05				2.6E+01			
			Hazard	7.9E+00		4.4E-05	>SOL	1.5E+02	>SOL		2.0E+00	2.1E+00	9.3E+00

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Tetrachloro-ethane (1,1,2,2-)	Tetrachloro-ethylene (PCE)	Tetraethyl Lead	Toluene	Trichloro-ethane (1,1,1-)	Trichloro-ethane (1,1,2-)	Trichloro-ethylene (TCE)	Vanadium	Vinyl Chloride
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	7.2E+00	3.8E+01				2.7E+01	1.3E+02		3.5E+00
			Hazard	1.0E+03	3.7E+02	3.9E-03	7.1E+03	1.4E+03	1.5E+02	2.2E+02	5.0E+02	
		Commercial/ Industrial	Carcinogenic	1.9E+01	1.0E+02				7.0E+01	3.3E+02		9.1E+00
			Hazard	4.7E+03	1.8E+03	1.9E-02	3.4E+04	6.5E+03	7.2E+02	1.1E+03	7.2E+03	
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	3.0E+01	1.4E+01				2.6E+01	4.9E+01		5.4E-02
			Hazard	4.2E+03	5.6E+01		1.7E+03	1.2E+03	1.5E+02	5.8E+01		
		Commercial/ Industrial	Carcinogenic	4.5E+02	2.0E+02				3.8E+02	7.4E+02		8.0E-01
			Hazard	SAT	SAT		SAT	SAT	3.9E+03	1.6E+03		
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	3.1E+03	SAT				3.3E+03	SAT		8.2E+00
			Hazard	SAT	SAT		SAT	SAT	SAT	SAT		
		Commercial/ Industrial	Carcinogenic	SAT	SAT				SAT	SAT		3.1E+01
			Hazard	SAT	SAT		SAT	SAT	SAT	SAT		
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic	6.6E-03	*5.2E-02*	*4.6E+00*	*1.8E+00*	*1.5E+00*	*2.0E-02*	*5.5E-02*		*1.1E-03*
			Hazard	6.6E-03	*5.2E-02*	*4.6E+00*	*1.8E+00*	*1.5E+00*	*2.0E-02*	*5.5E-02*	3.3E+02	*1.1E-03*
		Commercial/ Industrial	Carcinogenic	6.6E-03	*5.2E-02*	*4.6E+00*	*1.8E+00*	*1.5E+00*	*2.0E-02*	*5.5E-02*		*1.1E-03*
			Hazard	6.6E-03	*5.2E-02*	*4.6E+00*	*1.8E+00*	*1.5E+00*	*2.0E-02*	*5.5E-02*	2.2E+03	*1.1E-03*
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	1.7E+01	3.0E+01				2.8E+01	6.3E+01		7.3E-01
			Hazard	2.3E+03	1.2E+02		>SOL	>SOL	1.6E+02	7.4E+01		
		Commercial/ Industrial	Carcinogenic	2.5E+02	>SOL				4.1E+02	9.4E+02		1.1E+01
			Hazard	>SOL	>SOL		>SOL	>SOL	4.3E+03	>SOL		
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	2.5E+03	>SOL				>SOL	>SOL		2.7E+02
			Hazard	>SOL	>SOL		>SOL	>SOL	>SOL	>SOL		
		Commercial/ Industrial	Carcinogenic	>SOL	>SOL				>SOL	>SOL		1.0E+03
			Hazard	>SOL	>SOL		>SOL	>SOL	>SOL	>SOL		
	Ingestion of Groundwater	Residential	Carcinogenic	1.0E-03	*5.0E-03*	*1.5E-02*	*1.5E-01*	*2.0E-01*	*5.0E-03*	*5.0E-03*		*5.0E-04*
			Hazard	1.0E-03	*5.0E-03*	*1.5E-02*	*1.5E-01*	*2.0E-01*	*5.0E-03*	*5.0E-03*	1.1E-01	*5.0E-04*
		Commercial/ Industrial	Carcinogenic	1.0E-03	*5.0E-03*	*1.5E-02*	*1.5E-01*	*2.0E-01*	*5.0E-03*	*5.0E-03*		*5.0E-04*
			Hazard	1.0E-03	*5.0E-03*	*1.5E-02*	*1.5E-01*	*2.0E-01*	*5.0E-03*	*5.0E-03*	7.2E-01	*5.0E-04*
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic	4.5E-02	6.0E-02				1.8E-01	4.6E-02		2.6E-02
			Hazard	4.9E+00	5.3E-01	6.7E-06	1.1E+01	4.3E+00	7.8E-01	7.2E-02	2.8E+00	

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Table ?. Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Xylenes	Zinc
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic		
			Hazard	5.3E+04	2.1E+04
		Commercial/ Industrial	Carcinogenic		
			Hazard	2.6E+05	3.1E+05
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic		
			Hazard	SAT	
		Commercial/ Industrial	Carcinogenic		
			Hazard	SAT	
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic		
			Hazard	SAT	
		Commercial/ Industrial	Carcinogenic		
			Hazard	SAT	
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic	*2.7E+01*	
			Hazard	*2.7E+01*	8.9E+02
		Commercial/ Industrial	Carcinogenic	*2.7E+01*	
			Hazard	*2.7E+01*	5.8E+03
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic		
			Hazard	>SOL	
		Commercial/ Industrial	Carcinogenic		
			Hazard	>SOL	
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic		
			Hazard	>SOL	
		Commercial/ Industrial	Carcinogenic		
			Hazard	>SOL	
	Ingestion of Groundwater	Residential	Carcinogenic	*1.8E+00*	
			Hazard	*1.8E+00*	4.7E+00
		Commercial/ Industrial	Carcinogenic	*1.8E+00*	
			Hazard	*1.8E+00*	3.1E+01
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic		
			Hazard	6.6E+01	1.2E+02

*Italicized concentrations based on California MCLs
SAT = RBSL exceeds saturated soil concentration of chemical
>SOL = RBSL exceeds solubility of chemical in water

Inputs

		Residential		Commercial/ Industrial
Input Parameters	**Units**	**Child**	**Adult**	**Worker**
Soil-Specific Parameters				
Capillary fringe thickness	cm	=adult residential	152	=adult residential
Capillary fringe air content	cm^3/cm^3		0.010	
Capillary fringe water content	cm^3/cm^3		0.49	
Fraction organic carbon (FOC*)	g oc/g soil		0.02	
Groundwater Darcy velocity	cm/yr		6	
Groundwater mixing zone thickness	cm		1524	
Infiltration rate through the vadose zone	cm/yr		3	
Soil bulk density	g/cm^3		1.33	
Soil to skin adherence factor	mg/cm^2	1	1	1
Total soil porosity	cm^3/cm^3	=adult residential	0.5	=adult residential
Vadose zone air content	cm^3/cm^3		0.1	
Vadose zone water content	cm^3/cm^3		0.4	
Vadose zone thickness	cm		348	
Structural and Climatic Parameters				
Areal fraction of cracks in building foundation	cm^2/cm^2	=adult residential	0.001	0.001
Foundation air content	cm^3/cm^3		0.26	=adult residential
Foundation water content	cm^3/cm^3		0.12	
Foundation thickness	cm		20	20
Lower depth of surficial soil zone	cm		100.0	=adult residential
Depth to subsurface soil sources	cm		300	
Depth to groundwater	cm		500	
Width of source area parallel to wind or groundwater flow direction	cm		1500	
Outdoor air mixing zone height	cm		200	
Particulate emission rate	g/cm^2-s		1.38E-11	1.38E-11
Wind speed above ground surface in outdoor air mixing zone	cm/s		322	=adult residential

Inputs

Input Parameters	Units	Residential		Commercial/ Industrial
		Child	Adult	Worker
Exposure Parameters				
Averaging time for carcinogens	yr	=adult residential	70	=adult residential
Averaging time for non-carcinogens	yr	6	24	25
Averaging time for vapor flux	s	=adult residential	9.46E+08	7.88E+08
Body weight	kg	15	70	70
Building air volume/floor area	cm^3/cm^2	=adult residential	244	305
Exposure duration	yr	6	24	25
Exposure frequency	d/yr	350	350	250
Exposure frequency to water used for recreation	d/yr	120	120	0
Exposure time to indoor air	hr/d	24	24	9
Exposure time to outdoor air	hr/d	16	16	9
Exposure time to water used for recreation	hr/d	2	1.0	0
Groundwater ingestion rate	L/d	1	2	1
Indoor air exchange rate	1/s	=adult residential	5.60E-04	1.40E-03
Indoor inhalation rate	m^3/d	10	15	20
Ingestion rate of water used for recreation	L/hr	0.05	0.05	0
Outdoor inhalation rate	m^3/d	10	20	20
Skin surface area exposed to soil	cm^2	2000	5000	5000
Skin surface area exposed to water used for recreation	cm^2	8000	20000	0
Soil ingestion rate	mg/d	200	100	50
TARGET RISK LEVELS				
Individual Excess Lifetime Cancer Risk	unitless	=adult residential	1.0E-05	1.0E-05
Hazard quotient	unitless		1.0	1.0

Date: Thu, 20 Feb 2003 13:35:30 -0500
From: DrDSD@aol.com
To: briddell@cambria-env.com
Subject: oakland model spreadsheet
X-Mailer: Atlas Mailer 2.0
X-Spamscreen: Protected by WatchGuard SpamScreen (TM)
v6.1.B1000 Copyright (C) 1996-2002 WGTI WGTI
X-RCPT-TO: <briddell@cambria-env.com>

Bob: Attached is the Oakland model spreadsheet with the parameters set for clayey silt default + the modifications that are discussed in the risk assessment text. You can probably both send this to Eva/Roger and print it out as an appendix.

Alternatively, you can go to: http://www.oaklandpw.com/ulrprogram/wksheet2.xls, then do the following:

1. press the "clayey silts defaults" button

2.change the following:

foundation thickness to 20
depth to subsurface sources to 300
depth to groundwater to 500
building air volume/floor area (ceiling height) to 244

3. press enter

4. click to the RBSL worksheet to check the calculated RBSLs.
Dave

oakrisk.xls