- Not sure if TPH conc of 73 mg/kg is representative of shallow soil contamination - Revised RBCA submitted 2/13/02

JAN 24 2002

Subsurface Investigation and
ASTM RBCA Health Risk Assessment

Former J & R Automobile Dismantlers
819-823 East 12th Street
Oakland, California

January 11, 2002 BEI Job No. 201064

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Blymyer Engineers, Inc.

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1.0 Introduction

1.1 Background

Blymyer reviewed Phase I Environmental Site Assessment (ESA) and Phase II Environmental Site Investigation reports prepared by Basics Environmental (Basics) in 1996. In the Phase I ESA, Basics documented the presence of heavy oil contamination (surface staining and distressed vegetation) in an unpaved area behind the building at the subject site. Basics also determined that a cleanup order had been issued for this contamination by the Alameda County Health Care Services Agency (ACHCSA) in 1991, and that the subject site was shown as an active site on the Regional Water Quality Control Board's Fuel Leak List.

Basics performed a subsurface investigation in the unpaved area which consisted of the installation of four soil bores (B1 through B4, Figure 2) to a depth of 16 to 19 feet below ground surface (bgs). Soil samples were collected at 0.5 feet, 5 feet, 10 feet and 15 feet bgs in each soil bore. Grab groundwater samples were collected from three of the soil bores. All samples were analyzed for Total Recoverable Petroleum Hydrocarbons (TRPH; EPA Method 418.1) and the five metals associated with leaking underground fuel tanks (LUFT; cadmium, chromium, lead, nickel and zinc). Concentrations of TRPH up to 19,000 milligrams per kilogram (mg/kg) and lead up to 870 mg/kg were detected in the soil samples collected at 0.5 feet bgs. TRPH concentrations were non-detectable in the soil samples at 5 feet bgs, indicating that the heavy oil contamination observed during the Phase I ESA was limited to near-surface soil. TRPH was found in two of the soil bores at a depth of 10 feet bgs and in one of the grab groundwater samples. Basics attributed the deeper soil and groundwater contamination to another source, possibly a former sump located in the unpaved area.

The ACHCSA issued a "Second Notice of Violation," dated March 21, 2001, requesting a technical workplan to delineate soil and groundwater contamination at the site. The letter requested submittal of a workplan by April 23, 2001.

On June 27, 2001, Blymyer Engineers issued a workplan entitled *Phase II Subsurface Investigation Workplan* to the ACHCSA. The ACHCSA approved the workplan, with modifications, in a letter entitled *Work Plan Approval*, dated July 2, 2001. The ACHCSA requested an additional soil bore be advanced in, or near, the former sump and that the grab groundwater samples be collected in non-preserved bottles. Blymyer Engineers responded in a letter to the ACHCSA entitled *Modified Bore Locations for Phase II Subsurface Investigation Workplan*, dated July 11, 2001. In the referenced Blymyer Engineers letter, bore B8 was relocated to the depression identified as the former sump, in that it would be reasonably considered a worst-cast location. The referenced letter also included a fifth bore (B9) at the former location of B8, and the collection of two soil samples at a depth of 2 feet bgs in bore B9 and B7, in an attempt to limit the vertical depth of elevated metal concentrations. These modifications were verbally accepted by the ACHCSA in a telephone conversation on July 24, 2001.

1.2 Site Conditions

The property is located in the city of Oakland, Alameda County, California (Figure 1). It is bounded on the northeast by 12th Street and on the southeast, southwest, and northwest by commercial buildings. Across 12th Street are located additional commercial buildings. The property is located approximately 1,650 feet north of the Brooklyn Basin of the Alameda - Oakland Estuary. The site is predominately unpaved, with a relatively small concrete slab located in the northeastern portion of the site, immediately adjacent to the 12th Street sidewalk.

1.3 Proposed Scope of Work

The following proposed scope of work for the subsurface investigation was contained in the workplan and subsequent revisions:

- Prepare a technical workplan for submittal to the ACHCSA to describe the work and to document standard operating procedures.

- Obtain a drilling permit from the Alameda County Public Works Agency and contact Underground Service Alert (USA) for utility clearance.

- Prepare a site-specific health and safety plan to outline potentially hazardous work conditions and contingencies for an emergency.

- Drill four soil bores to a depth of 15 feet bgs using a Geoprobe direct-push rig as indicated in the workplan, and subsequent revisions.

- Drill a fifth soil bore to a depth of 2 feet bgs using a Geoprobe direct-push rig as indicated in the workplan revision.

- Field screen and collect soil and grab groundwater samples for laboratory analysis and for lithologic description.

- Backfill the soil bores with concrete grout upon completion.

- Analyze soil and grab groundwater samples as indicated in the workplan, and subsequent revisions.

- Perform a Tier II risk assessment using the data collected in the subsurface investigation to determine site-specific target levels (SSTLs) to be used as cleanup levels for soil and groundwater at the site.

- Prepare a final report to document the results of the subsurface investigation and risk assessment.

2.0 Environmental Setting

2.1 Regional Geology and Hydrogeology

The site is located in the gently sloping East Bay Plain of the San Francisco Bay Area, approximately 1,650 feet north of the Brooklyn Basin of the Alameda - Oakland Estuary at an approximate elevation of 18 feet National Geodetic Vertical Datum.

The San Francisco Bay Area is a region dominated by northwest trending topography, located in the Coast Range Province of California. The topography of the region reflects activity of a major fault system that includes the San Andreas Fault Zone on the west side of San Francisco Bay and the Hayward Fault at the base of the Berkeley Hills on the east side of the Bay, which defines the base of the Berkeley Hills. Rock types in the region range from Jurassic age sedimentary, metamorphic, and plutonic basement to Quaternary alluvium (Norris and Webb, *Geology of California*, 1990).

The property is located on the Temescal Formation and consists of alluvium derived from the Franciscan rocks of the nearby Berkeley and Oakland Hills. The alluvium is a pale to dark yellow-orange that is composed of clayey gravel, sandy silty clay, and sand-clay-silt mixtures. It overlays the Alameda Formation that consists of continental and marine sediments. (Radbruch, *Areal and Engineering Geology of the Oakland West Quadrangle, California*, 1957).

The regional groundwater flow direction generally ranges towards the Alameda - Oakland Estuary. At the present time the Brooklyn Basin to the south on the estuary is the closest point on the bay front; however, the shoreline previously approached to within 800 feet of the site to the west-southwest at a now infilled minor tributary to the estuary and likely locally influences groundwater. The subject site is situated within the former margins of this tributary.

2.2 Climate

The East Bay Plain exhibits a Mediterranean-type climate with cool, wet winters and warmer, dry summers. Mean annual precipitation in Oakland is 25.42 inches. Mean monthly rainfall is 4.03 inches in January and 0.05 inches in August. Mean maximum temperatures are 54.5 degrees Fahrenheit (°F) in January and 70.6°F in July; mean minimum temperatures are 43.4°F in January and 56.8°F in July; average temperatures are 49°F in January and 63.7°F in July (National Oceanic and Atmospheric Administration, *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961-1990*, 1990).

3.0 Data Collection

3.1 Soil Bore Installation

On August 7, 2001, Blymyer Engineers installed four soil bores to depths ranging between 20 to 24 feet bgs at the site (Figure 2), and a fifth bore to a depth of 2.5 feet bgs. The bores were installed after submitting a *Drilling Permit Application* to the ACPWA to obtain a drilling permit. A copy of the permit is enclosed as Appendix A. The soil bores were drilled by Gregg Drilling, Inc. using a Geoprobe hydraulic push system. Soil was collected continuously in isobutylene sleeves and soil samples were collected for description at changes in lithology in each soil bore. Soil samples were field-screened for organic vapors using a Photoionization Detector (PID) and lithologically described using the Unified Soil Classification System. Groundwater was encountered in each bore at between approximately 14 to 18.5 feet bgs, but field stabilized at higher elevations depending on the length of time the bore was allowed to remain open. Soil samples were selected for laboratory analysis based upon depth and elevated PID readings.

The workplan specified that soil samples would be collected at 5, 10, and 15 feet bgs. This was modified slightly in the field if soil was not recovered from those depth intervals, or if an elevated PID response or heavily stained soil was in close proximity to these pre-specified intervals. Letter modifications to the workplan by the ACHCSA and Blymyer Engineers also specified the collection of soil samples at a depth of 2 feet bgs in bores B8 and B9 in an attempt to limit the depth of soil impacted by elevated metal concentrations. Bore B8, placed at the location of the depression identified as a sump, was required to be relocated in the field several feet outside the depression due to very poor recovery. The initial (within the sump) location was logged as B8a and the relocated position was logged as B8b. Additionally, because the intent of the 2 foot bgs soil sample for metal analysis was to determine typical metal content at the 2 foot depth at the site, the highly impacted soil encountered in bores B8a and B8b would preclude an understanding of that aspect of the contamination. As a consequence, the 2 foot bgs soil sample for metal analysis to have been collected from bore B8 was collected in bore B7. Soil descriptions and PID results are shown in the soil bore logs, included as Appendix B.

A temporary PVC well screen was placed in each deeper soil bore in order to collect grab groundwater samples for laboratory analysis. When obtained, the grab groundwater sample from each bore was noted as turbid. After collection of the groundwater samples, all soil bores were backfilled with bentonite grout. The soil cuttings from the advancement of the soil bores were contained in labeled, DOT-approved, 5-gallon pails. The pails were stored on-site pending proper disposal by the client. All soil and groundwater samples were collected in accordance with previously forwarded Blymyer Engineers Standard Operating Procedures (SOPs).

3.2 Soil and Groundwater Analytical Methods

The soil and groundwater samples were sent to McCampbell Analytical, Inc. (McCampbell), a California-certified laboratory located in Pacheco, California. The soil and groundwater samples were analyzed on a standard 5-day turnaround time for TRPH using EPA Method 418.1 and the five LUFT metals using EPA Method 6010. The grab groundwater samples were filtered by the laboratory prior to analysis. The two soil samples and two grab groundwater samples with the highest TRPH concentrations were additionally analyzed on a standard 5-day turnaround for Volatile Organic Compounds (VOCs) using EPA Method 8240 and Semi-VOCs (SVOCs) using EPA Method 8270. Soil sample B9-2, collected for metals analysis, was additionally analyzed for TRPH. Additionally, soil samples B6-5 and B6-15 were analyzed for Total Organic Carbon (TOC) in support of the generation of a Tier II risk assessment.

Due to an elevated limit of detection for SVOCs in the soil samples with elevated TRPH results, an additional soil sample (B8B-10) was submitted for analysis of SVOCs. B8B-10 was selected based on elevated, but slightly lower, TRPH concentrations.

Analytical results for the soil samples are summarized in Tables I and II, while analytical results for groundwater samples are summarized in Table III. Copies of the laboratory reports are included as Appendix C.

3.3 Soil Geotechnical Analysis Methods

Soil samples from bores B6 and B7 were also submitted to Cooper Testing Laboratory (Cooper) in Mountain View, California, for geotechnical parameters in support of a Tier II risk analysis for the site. Sample B6-17-18, variously described by the Cooper as clayey sand to sandy silt, was submitted for analysis for moisture density, porosity, and percentage moisture. Sample B7-16.5-17.5, described as a clay with sand, was submitted for analysis for hydraulic conductivity. The results of the testing are summarized in Table IV, and the laboratory report is attached as Appendix D.

4.0 Data Interpretation

4.1 Site Geology, Hydrogeology, and Contaminant Observations

The upper portion of the soil horizon at the site was underlain by a minimum of 6 feet of silty clay; however, the silty clay or clayey silt did extend to a depth of 15.5 feet bgs in B6. At a depth of 9.5 to 10 feet bgs in bore B6, the silty clay contained over 50 percent oyster (?) shell fragments. Beneath the silty clay in soil bores B5, B7 and B8b, a clayey gravel was encountered at approximate depths of 6.0, 7.5, and 11.5 feet bgs, respectively. The clayey gravel was composed of up to an estimated 80% of fine to medium grained angular gravel. The bottom of the clayey gravel was encountered at the depths of 10.5, 11, and 15 feet bgs, respectively. In these bores, a second silty clay was encountered beneath the clayey gravel to depths of 13, 12, and 18 feet bgs, respectively. In bore B7 additional clayey gravel, with an interbed of silty sand was found to a depth of 15.5 feet bgs. Beneath the silty clay in bores B5, B6, and B8b, and the clayey gravel in B7, an intermix of more granular bedding units which ranged from silty sand, clayey silt, clayey gravel, and poorly graded fine grained sand was encountered. Groundwater was generally associated within these more granular units; however, in B6 groundwater was encountered in the clay 1.5 feet above the contact with the more granular units. It is suspected, but not confirmed, that groundwater is confined. For detailed lithologic descriptions, please refer to the soil bore logs included in Appendix B.

Bores B5 and B6 were placed outside the area of visibly stained surface soil. Significant discoloration of soil was not noted in these two bores. Bore B6 did however contain a light greenish-brown sandy gravel layer at a depth of 16.0 to 16.5 feet bgs. It could not conclusively be determined if this coloration was related to the migration of contaminants along this water-bearing unit.

Bores B7, B8a, B8b and B9 were placed within the area of discolored surface soil. There was no vegetation within this area (Figure 2). The black surface stained soil extended to an approximate depth of 3.5 feet in bore B7. Bore B9 was drilled and sampled to a total depth of 2.5 feet bgs, but did not appear to extend below the surface staining.

A potential void was encountered at an approximate depth of 5.5 to 7.0 feet in bore B7. Immediately below this void or soft soil, the silty clay was oily and stained black. At 8 feet bgs a trace of metal, potentially dragged down hole, was noted in the recovered soil core. At a depth interval between 8.5 to 10.5 feet bgs a gray-brown clayey gravel with low PID responses was encountered. This unit appeared to somewhat limit the vertical migration of contaminants. Within, and more strongly beneath, the clayey gravel an unknown odor was reported by the driller. A moderately elevated PID response was also noted beneath the clayey gravel, and the soil became greenish in color. One-inch amorphous blobs of black stained soil were observed in the recovered cores in the depth range of 13 to 15.5 feet bgs. A silty clay at a depth of 16.5 to 17.5, within the water-bearing zones encountered in the bore, appeared to vertically limit the observed greenish discoloration.

Bore B8a was placed within the depression previously identified as a likely sump. The potential sump is depressed approximately one foot below adjacent grade. Bore B8a was pushed to a total depth of 12 feet bgs; however, minimal recovery was obtained over the total depth. Based on the minimal recovery, the entire bore appeared to consist largely of fill. The upper several feet appeared to consist of glass, brick, and metal, and was very oily. At an approximate depth of 5 feet bgs, dominantly red brick was encountered. At an approximate depth of 7 feet bgs, the recovered fill consisted of paper, wood, and other organics. What soil was recovered was very slick with oil, and stained black. Below a depth of 10 feet, the only recovery was a thick black goo coating the liner. Strong odors were present below a depth of approximately 6 feet bgs. The driller reported settling under foot as he worked in and around the likely sump. Bore B8b was drilled within 3 feet of the depression in order to obtain the required soil samples.

Discolored soil was pervasive in bore B8b. At a depth of approximately 3.5 feet bgs the black surface staining was replaced by a dark to medium green discoloration of the soil. A sweet odor was noted. The green discoloration essentially extended to the total explored depth of the bore, 24 feet bgs. A sheen was noted on groundwater, encountered at a depth of 18.5 feet bgs. Elevated PID responses were noted through out the explored depth of the bore, including below groundwater.

4.2 Discussion of Soil Sample Analytical Results

Analysis for TRPH in all soil samples has yielded detectable concentrations in all near surface soil samples collected at the site at a depth of approximately 0.5 feet bgs (Table I). The concentrations range from low concentrations (26 and 32 mg/kg) in bores B5 and B6 located outside the area of stained and distressed vegetation, to higher concentrations (330 and 54,000 mg/kg) in bores B7 and B8b, located within the stained area. Previously installed bores B1 through B4 (located inside and outside the black stained area) also detected TRPH in all soil samples collected at the 0.5-foot depth (Table I). Although the 0.5-foot soil sample from bore B2 was mapped as outside the zone of staining, detectable TRPH was elevated (4,400 mg/kg).

The state of California has promulgated regulations that define hazardous contaminant concentrations in a solid material. A material is considered a toxic material when concentrations are over either the Soluble Threshold Limit Concentration (STLC) or over the Total Threshold Limit Concentration (TTLC). In general, a rule-of-thumb is utilized when contaminant concentrations are above the STLC, but below the TTLC. Because there is a 10-fold dilution in the STLC analysis of a solid material, the rule-of-thumb generally holds that if that contaminant concentration is under 10X the STLC, the material will not be hazardous by the STLC analysis. With respect to the analysis of metals at the site, the STLC and TTLC concentrations are listed at the bottom of Table II.

All soil samples were submitted for analysis for the five LUFT metals (Table II). Elevated concentrations were only present in near surface soil samples from the stained area (B1, B3, B4, B7, and B8), and from the area of bore B2. In general, lead appears to be present at concentrations over one or more of the regulatory defined concentrations (STLC or TTLC) in the near surface soil sample (0.5 feet bgs) at all locations within the stained area, and also at the location of B2. Additionally, cadmium, chromium, lead, nickel and zinc were present at elevated concentrations in soil sample B8b-0.5. Except for zinc, all metals were present in this soil sample at levels above the 10X STLC rule-of-thumb value. Lead was present over the TTLC.

With two exceptions, cadmium was only detected in the surface stained soil samples. Cadmium was rarely detected in subsurface soil (B6-10 and B8b-15), and then at low concentrations.

Based on elevated TRPH concentrations, three soil samples were submitted for analysis for VOCs and SVOCs in attempt to quantify worst-case concentrations of these chemicals. Initially two soil samples were submitted; however, the limits of detection were too elevated for use in a risk assessment evaluation. Submittal of the third sample resulted in lower limits of detection. Due to the consistent elevated TRPH concentrations in bore B8b, all three soil samples selected were from this bore.

The only VOCs detected were toluene, ethylbenzene, and total xylenes. Toluene was detected at concentrations of 50 and 140 micrograms per kilogram (μg/kg) in two samples. Ethylbenzene was detected at concentrations ranging between 30 and 1,400 μg/kg. Total xylenes were present at concentrations between 110 and 11,000 μg/kg. Benzene was not detected at limits of detection of between 5.0 and 100 μg/kg. VOCs have not previously been analyzed at the site. Detection of these compounds suggest that gasoline or diesel may have been used and disposed of at the site. The significant increase in toluene, ethylbenzene, and total xylenes at a depth of 15 feet may suggest a second, non-dumping source may be impacting the site, such as a fuel underground storage tank (UST).

The only SVOCs detected were 2-methylnaphthalene and naphthalene. 2-methylnaphthalene was present at concentrations of 0.36 and 6.0 mg/kg in soil samples B8b-10 and B8b-15, respectively. Naphthalene was present at concentrations of 0.38 and 7.2 mg/kg in soil samples B8b-10 and B8b-15, respectively. SVOCs have also not previously been analyzed at the site.

Total Organic Carbon (TOC) analysis was conducted on two soil samples in an attempt to determine background TOC concentrations in support of a Tier II risk analysis for the site. Soil samples B6-5 and B6-15 were selected based on nondetectable TRPH results and lack of discoloration of the soils. The results were 715 and 260 mg/kg, respectively.

4.3 Discussion of Groundwater Sample Analytical Results

TRPH was present in the grab groundwater samples collected from bores B5, B6, B7, and B8b (Table III) at concentrations ranging from 1.5 to 2,000 milligrams per liter (mg/L). The lowest concentrations were in groundwater obtained from bores B6 and B7, the highest was in bore B8b. Of the five LUFT metals, only cadmium was present in groundwater at a concentration of 0.0061 mg/L, in bore B8b. This concentration is slightly above the Maximum Contaminant Level (MCL) of 0.005 mg/L. Unpreserved grab groundwater was filtered of sediment prior to analysis, thus the results are representative of metal concentrations in groundwater and not of the sediment suspended in the groundwater. The only VOCs detected in groundwater at the site were benzene, toluene, ethylbenzene, and total xylenes (BTEX). The chemicals were present in groundwater obtained from B8b at concentrations of 1,700, 2,500, 790, and 4,100 micrograms per liter (μg/L), respectively. These concentrations are above their respective MCLs; however, the laboratory noted that the groundwater sample contained over 5% suspended sediment. Thus the analysis may represent analyte concentration of the suspended sediment, rather than in groundwater. Conversely, sheen was observed on groundwater at this location (and at the location of bores B2 and B3, previously installed). Only ethylbenzene was present in groundwater obtained from bore B7. Other than 2-methylnaphthalene and naphthalene, no SVOCs were detected in groundwater at the site. These compounds were present in groundwater collected from bore B8 at concentrations of 280 and 430 μg/L, respectively. The SVOC analysis resulted in moderately elevated limits of detection.

5.0 Initial Risk Evaluation

5.1 Risk Evaluation Using the Oakland Risk-Based Corrective Action Program

In order to conduct the risk assessment at the site, Blymyer Engineers initially proposed to use the model entitled *RBCA Tool Kit* by Groundwater Sciences, Inc. of Houston, Texas. This model utilizes equations directly out of the American Society for Testing and Materials (ASTM) 1739-95 document entitled *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* and dated November 1995. However, in order to determine if other, simpler risk assessment programs might be appropriate for the site, use of the Oakland Risk-Based Corrective Action (ORBCA) was investigated. The ORBCA program has also adopted the ASTM standard to city specific criteria and data, with several critical assumptions.

The initial action required to the determine if the use of the ORBCA program would be appropriate at the site is to complete the *Oakland RBCA Eligibility Checklist* form. Eight criteria must be met in order to allow use of the program at a particular site. A minimum of two of the eight criteria could not be satisfied definitively. They are as follows:

- Removal of the sump may not remove all sheen-generating soil (Criteria 2; Groundwater samples B2-W and B3-W contained a lighter than water sheen per laboratory notes).

- Removal of the primary source, the sump, may reduce the number of Chemicals of Concern (COC) to six from an identified total of seven (Criteria 3; cadmium, lead, BTEX, and naphthalene are identified as the COC at this site). A maximum of five COC are allowable with use of the ORBCA program.

The use of the ORBCA program appears inappropriate at this site. A copy of the form is enclosed in Appendix E.

5.2 Risk Evaluation Using the RWQCB Risk-Based Screening Levels

The San Francisco Bay Regional Water Quality Control Board (SF-RWQCB) has also issued a risk-based decision making document (*Application of Risk-Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwater*, dated August 2000). This was also reviewed for appropriateness of use at the subject site. A principal assumption for use of the Tier I Lookup Tables contained in the document is that the number of COC is limited to five. This precludes use of the document at this site.

6.0 ASTM RBCA Health Risk Assessment

6.1 Overview

This health risk assessment (HRA) has been conducted to evaluate the potential of soil and groundwater contamination to adversely impact the health of future onsite residential occupants or construction workers (Figure 1). Blymyer Engineers has used the most recent update (January 23, 2001) of the model entitled *RBCA Tool Kit for Chemical Releases*, Version 1.3a, by Groundwater Sciences, Inc. of Houston, Texas, which completes all calculations required in the American Society for Testing and Materials (ASTM) standard PS-104 *Standard Provisional Guide for Risk-Based Corrective Action* (ASTM, 1998).

Blymyer Engineers has utilized existing data from the site in an attempt to determine the degree of health risk the residual chemical concentrations pose. It is the understanding of Blymyer Engineers that the tentative plan for redevelopment at the site consists of a three-story building with a largely commercial first floor, a single residential unit also located on the first floor, and four residential units on each of the second and third floors of the building. It is understood that within a prescribed period of time, the residential units will be sold to the future residents. As a consequence of the residential occupancy, the risk assessment has utilized conservative residential standards rather than less conservative commercial standards.

Existing soil and groundwater sample analytical results were utilized in conducting the assessment, and published, but conservative, chemical and soil parameter data were assumed where such input was required by the modeling program. These areas are discussed below.

Twelve chemicals or elements were encountered in soil or groundwater at the subject site. The risk assessment modeled risk for eleven of these Chemicals of Concern (COC). This included the volatile organic compounds (VOCs) benzene, toluene, ethylbenzene, and total xylenes (BTEX); the semi-volatile organic compounds (SVOCs) naphthalene and 2-methylnaphthalene (the latter as

naphthalene, see bleow); total recoverable petroleum hydrocarbons (TRPH, as aliphatic carbon compounds in the C21 to C34 range); and the metals cadmium, chromium (Cr^{3+}), nickel, and zinc, which have a known association with used motor oil.

Lead is the twelfth contaminant encountered at the site. Health risks associated with lead cannot be modeled by computer programs due to the lack of a published Reference Dose (RfD) for lead by the Federal Environmental Protection Agency (EPA). Exposure to a concentration of a contaminant below the RfD is considered safe. At the present time the EPA has not been able to establish that minimum concentration for lead. As a consequence, reliance on an alternative method to define a Site Specific Target Level (SSTL) has been followed.

Blymyer Engineers assumed risk to a number of potential receptors: an anticipated future residential occupant of the proposed building in outside and inside locations; a construction worker potentially exposed to subsurface contaminants during utility installation or modifications; a residential occupant exposed to un-remediated surface soil; a commercial worker at the adjacent restaurant to the northwest exposed to dust and vapor emissions; a commercial worker passing the facility on the sidewalk on the west side of 12th Street exposed to dust and vapor emissions; and a residential occupant located within 200 feet of the site, due to the mixed use of the area, exposed to dust and vapor emissions, and groundwater ingestion. Groundwater ingestion was assumed in the latter case as a conservative measure due to the known existence of very old hand dug groundwater wells in the local vicinity, at known and unknown locations. Utility workers were assumed to be exposed to dermal contact with impacted soil, inhalation and ingestion of impacted soil dust and vapors, and groundwater vapors. Onsite incidental ingestion of groundwater was not assumed, nor modeled, as it is considered to be an unlikely occurrence.

Blymyer Engineers used a Hazard Quotient (HQ) of 1.0 for individual health risks related to non-carcinogenic chemicals, a Hazard Index (HI) of 1.0 for cumulative health risks related to non-carcinogenic chemicals, an individual health risk of 10^{-6} for individual carcinogenic chemicals, and a total health risk of 10^{-5} for carcinogenic chemicals for potential receptors, consistent with current industry practice and Alameda County Health Care Services Agency (ACHCSA) standards.

6.2 Overview of Subsurface Geology

When drilled in September 1996 and August 2001, the near-surface vadose zone sediments were mostly damp with an increase in moisture with depth. Sediments in the vadose zone are typically silty clays. The upper portion of the soil horizon at the site was underlain by a minimum of 6 feet of silty clay; however, the silty clay or clayey silt did extend to a depth of 15.5 feet bgs in bore B6. At a depth of 9.5 to 10 feet bgs in bore B6, the silty clay contained over 50 percent shell fragments. Beneath the silty clay in bores B5, B7 and B8b, a clayey gravel was encountered at approximate depths of 6.0, 7.5, and 11.5 feet bgs, respectively. The clayey gravel was composed of up to an estimated 80% of fine to medium grained angular gravel. Field observations suggested that sufficient clay was present in this unit to significantly decrease the permeability of the gravel unit; however, no laboratory tests were conducted to quantify this observation. It is likely that unobserved preferential pathways may be present as a result of the increase in grain size. The bottom of the clayey gravel was encountered at depths of 10.5, 11, and 15 feet bgs, respectively. In these bores, a second silty clay was encountered beneath the clayey gravel to depths of 13, 12, and 18 feet bgs, respectively. In bore B7 additional clayey gravel, with an interbed of silty sand was found to a depth of 15.5 feet bgs. Beneath the silty clay in bores B5, B6, and B8b, and the clayey gravel in B7, an intermix of more granular bedding units which ranged from silty sand, clayey silt, clayey gravel, to poorly graded fine grained sand was encountered. Groundwater was generally associated with these more granular units; however, in bore B6 groundwater was encountered in the clay 1.5 feet above the contact with the more granular units. It is suspected, but not confirmed, that groundwater is confined. For detailed lithologic descriptions, please refer to the soil bore logs included in Appendix B.

6.3 Risk Assessment Data Input and Output Screens

The *RBCA Tool Kit for Chemical Releases* consists of a series of screens that facilitate the input of site-related data, and subsequent data output. These are discussed in some detail below in order to document site-specific inputs, modifications, and outputs of standard modeling assumptions employed in the program.

6.3.1 Main Screen

Site location, name, and other relevant data is input on the Main Screen. Selection of Tier 1 or Tier 2 analysis is made. The subject site required a Tier 2 analysis. Calculation options are also selected in this screen. Calculation of Baseline Risk is selected if source zone concentrations are known. Calculation of Cleanup Standards is selected based on selected target risks (ie. individual health risk of 1 in a million [10^{-6}]). Both options were selected for this modeling effort.

A series of data entry and review screens is accessed from the Main Screen. As a consequence of the selection of both modes of risk calculation, input was required in each of the data input screens. A printout of the Main Screen is enclosed in Appendix F.

6.3.2 Exposure Pathway Input

In the *Exposure Pathway Identification* screen, health risk exposures with documented or potentially complete pathways are identified, classified as to onsite or offsite location, and the distance to the receptors is input. There are essentially three main exposure pathways; groundwater, surface soil, and air exposure. Copies of the input screen for these pathways are included in Appendix F and the resultant output *Exposure Pathway Flowchart* is also attached in Appendix F. It should be noted that input boxes which printout with a black background are locked by the program based on other input criteria, either program-specified or user-specified.

6.3.2.1 Groundwater Exposure

The proposed building will be supplied by city water. As a consequence, onsite exposure to groundwater is considered an incomplete pathway. In order to provide protection to groundwater resources and to attempt to preclude degradation of groundwater beneath adjacent properties, an offsite exposure at the Maximum Contaminant Level (MCL), set at appropriate state or federal levels, was identified to be coincident with the nearest assumed downgradient property boundary. This was

Can check if adjacent properties have irrigation or domestic well

defined to be at a distance of 30 feet west from the source (input distances are in metric, typically centimeters). For the purposes of the risk assessment, it was assumed that the sump is the dominant or sole source of groundwater contaminants at the site. Thus all distances were measured from the center of the sump. Additionally, a second offsite receptor was assumed to be present. Groundwater ingestion was assumed in the latter case as a conservative measure due to the known existence of very old hand dug groundwater wells in the local vicinity, at known and unknown approximate locations. It is unknown if these wells remain, or are operational, after so many years of publicly supplied water. For the purposes of the modeling program, it was assumed that the nearest downgradient house, from the sump source, has an operational well. The nearest downgradient house is at an approximate distance of 200 feet, at the intersection of 10th Street and 8th Avenue, west of the site; or along 9th Avenue south of the site. Groundwater exposure modeling evaluated both impacted groundwater, and leaching from impacted soil to groundwater for the completed pathways.

6.3.2.2 Surface Soil Exposure

Onsite commercial ingestion and dermal contact to surface soil was considered a complete pathway for the purpose of modeling risk to a construction worker excavating soil in the vicinity of the release. It is assumed that the construction worker will be exposed at the time of remedial actions at the site, or in the event that residual contamination can be allowed to remain onsite. This assumption precludes residential exposure to surface soil either through remediation, or through a partial capping of residually impacted areas at the site with a permanent structure such as a building.

6.3.2.3 Air Exposure

Multiple air exposure pathways were evaluated as a part of the modeling effort. An offsite commercial receptor pathway was assumed to be present in order to model risk to sidewalk traffic along 12th Street, the nearest downwind potential receptor during construction activities. This was defined to be at a distance of 25 feet from the sump source. A commercial receptor was selected forthis pathway in order to conservatively model the transient nature of sidewalk traffic (commercial

receptors are assumed to be exposed for eight hours each work day). This receptor was evaluated for outdoor air pathways including volatilization to ambient outdoor air from all soils (surface and subsurface), from groundwater, and from particulate emissions from surface soils.

An onsite residential receptor was evaluated for indoor and outdoor air pathways including volatilization from all soils and from groundwater. This was conducted in order that any risk from residual impacted soil or groundwater would be accounted for in the modeling program. Risks associated with completed indoor air pathways are typically the risk pathways that limit available remedial options.

6.3.3 Exposure Factors and Target Risk Limits

This screen, attached in Appendix G, is accessed through the Exposure Pathway Identification screen, allows modification of standard ASTM exposure parameters, risk goal calculation options, and target health risk limits. The ASTM parameters correspond to the Reasonable Maximum Exposure (RME) values specified in EPA guidance (EPA, 1991). These parameters include the averaging time for carcinogens and non-carcinogens, body weight, exposure durations, exposure frequency, dermal exposure frequency, skin surface area (assuming 70 year life span; skin surface of an infant, child, and adult), ingestion rate of water, ingestion rate of soil, age adjustment of these two items, and soil-to-skin adherence factor. Site-specific modifications were not made to the exposure parameters. Risk goal calculations were requested for both individual and cumulative risk goals.

Site-specific modifications were not made to the target health risk limits. Blymyer Engineers used the standard Hazard Quotient (HQ) of 1.0 for individual health risks related to non-carcinogenic chemicals, a Hazard Index (HI) of 1.0 for cumulative health risks related to non-carcinogenic chemicals, an individual health risk of 10^{-6} for individual Class A and B carcinogenic chemicals, a cumulative health risk of 10^{-5} for Class A and B carcinogenic chemicals, and an individual health risk for 10^{-5} for Class C carcinogenic chemicals for potential receptors (Classes A and B refer to known or probable carcinogens, whereas Class C refers to possible carcinogens). This is consistent with current industry practice and ACHCSA standards. A printout of these data is included in Appendix G.

6.3.4 Source Media Chemicals of Concern

This screen allows selection of site-specific COC, leads to a screen that allows modification or input of additional COC relevant to the site, and leads to two additional screens that allow input of site-specific concentrations of the COC in groundwater and soil.

6.3.4.1 Selection and Modeling of Site-Specific COC

The program contains a database of over 100 chemicals from which to draw. The chemical database was modified in order to include California-specific chemical parameters for benzene. This specifically included the California Environmental Protection Agency (CalEPA) cancer potency factor (slope factor) of 0.1 kg-day/mg, in comparison to the EPA slope factor of 0.029 kg-day/mg, and the lower limit of detection for benzene required by CalEPA. User-specified custom chemical database output files are included in Appendix G, as is a copy of the chemical data output files for all selected COC (physical property data, toxicity data, and miscellaneous data files used in the risk assessment).

Health risks associated with lead cannot be modeled by computer programs due to the lack of a published Reference Dose (RfD) for lead by the EPA. Exposure to a concentration of a contaminant below the RfD is considered safe. The quantification of risk requires comparison to a RfD. At the present time the EPA has not been able to establish the minimum concentration for lead. Assumed RfD can be input, but are a matter of negotiation with a regulatory agency. As a consequence, and rather than pursue a negotiated approach, SF-RWQCB promulgated remedial goals, unless otherwise negotiated, will be relied on as an alternative method to define a Site Specific Target Level (SSTL) for lead.

Additionally, because a RfD has also not been promulgated for 2-methylnaphthalene, the chemical has been modeled in this program as naphthalene. In order to accomplish this, the detected concentrations of these two similar chemicals were added together and the total concentration was reported as naphthalene.

How were source zone conc. determined.

for shallow soil, use only soil data from < 3 feet bgs.

Use 95% UCL.

6.3.4.2 Site-Specific Analytical Data Sets

There are two methods for entering representative media concentrations for COC at a site. A user can directly enter the representative concentration for each chemical, or a user can enter all appropriate site analytical data and allow the program to calculate the maximum concentration, the statistical mean (geometric or arithmetic; industry standard and more conservative, respectively), or the Upper Confidence Level (UCL) on the mean. The UCL percentile can also be modified by the user. The user can then select which of these calculations is most representative of the source zone concentrations.

For the purposes of this modeling effort, the definition of the "source zone" was used in two manners. Specifically, the entire site should be considered as the source for surface particulate emission and chemical volatilization due to the extensive near surface contamination documented at the site. Conversely, the sump should be considered as the representative source zone for groundwater contamination (worst-case) as only in the vicinity of the sump did extensive contamination extend from the surface to groundwater, and below. In both cases, the representative concentrations for both soil and groundwater were modeled with the geometric mean. Because there was only one "representative" groundwater sample from the location of the sump, the groundwater mean was also the worst-case or maximum concentration encountered at the site. Copies of the groundwater analytical data inputs are attached in Appendix H. Also attached in Appendix H are copies of the data output files with the program-calculated maximum, mean, and UCL on mean concentrations for groundwater. Copies of the soil analytical data inputs are attached as Appendix I. Copies of the soil analytical output files, with program-calculated maximum, mean, and UCL on mean concentrations for soil, are attached in Appendix I.

6.3.5 Transport Modeling Options

This screen allows site-specific modeling options to be input. These modeling options include vertical transport in the surface soil column, lateral air dispersion, and groundwater dilution attenuation

factors. Factors included in the soil column vertical transport subset are outdoor air volatilization factors, indoor air volatilization factors, and soil-to-groundwater leaching factors. ASTM default models were utilized for vertical transport in the soil column and in the lateral air dispersion sections; however, because it is reasonable to anticipate biodegradation of the organic COC, first-order biodegradation decay was allowed in the groundwater dilution attenuation section, rather than only groundwater dispersion (no biodegradation). The surface soil zone was estimated to be 3 meters in thickness, an ASTM default thickness. Because impacted soil is predominantly present above an approximate depth of 2 feet this was judged to be conservative (excluding sump source zone) and would allow volatilization and particle emission from a depth of approximately 10 feet bgs. ASTM default half-lives were utilized for the organic chemicals encountered at the site. There were no default half-life values for the inorganic metal COC. Since metals are elements and decay is essentially not recognized in inorganic materials a half-life of 1.0E+6 days (2,739.7 years) was the input utilized for these COC. As an additional conservative measure it should be noted that the Domenico model implemented in the RBCA Tool Kit assumes degradation is proportional to "total concentration" (i.e., both dissolved in groundwater and sorbed to soil) as opposed to dissolved-phase concentrations only. A printout of these screens is attached as Appendix J, as is a copy of the output file screen for the COC half-lives.

6.3.6 Site-Specific Soil Parameters

This screen allows site-specific soil parameters to be input. These parameters include soil source zone and surface soil column characteristics. The depth to the water-bearing unit was input as 15 feet bgs, as a typical depth. It should be noted that depth to water in the field ranged between 14 to 18.5 feet bgs in August 2001. It is assumed that these differences were the result of local variations in lithology and a confined aquifer fluctuating in response to the pressure release at the location of the borehole. The base of the affected soil was input as 24 feet, based on the analytical data at borehole B8b. This is overly conservative assumption as elevated metal concentrations are not in contact with groundwater. An average length and width of 115 feet by 35 feet, respectively, was utilized to calculate the affected surface soil area. The dominant wind flow direction was assumed to be

northeast, across the longest dimension of the site (essentially the direction of B5 to B1). Because the groundwater flow direction is not precisely known at the site, it was assumed to be southwest across the site (essentially B1 to B5), to maximize the potential exposure. Because analysis was not conducted for all soil parameters for which direct entry is possible in the program, it was elected to select the predominant soil type for the site within the program. Silty Clay was identified as the most appropriate vadose zone soil encountered at the site based on the bore logs and site-specific laboratory data as previously discussed. Rainfall was directly input based on the average rainfall for the Oakland Museum climate station over the period of October 1970 to December 2000 which is available under the Western U.S. Climate Historical Summaries section of the Western Region Climate Center website (http://www.wrcc.dri.edu/index.html). A printout of the parameters used in this project is included in Appendix K. All user specified inputs appear with a white background; however, the Partitioning Parameters are ASTM default parameters re-input as user-specified parameters. These parameters were used as a conservative measure.

6.3.7 Site-Specific Groundwater Parameters

This screen allows site-specific groundwater parameters to be input. These parameters include water-bearing unit data, groundwater plume source zone, dispersion, and discharge to surface water input parameters. The hydraulic conductivity corresponds to site-specific data whereas the gradient is an ASTM default. The effective porosity is very conservative, as it is essentially impossible for effective porosity to match total porosity (site-specific soil parameter screen) in a silty clay unit. Sorption parameters are ASTM default parameters. The default groundwater pH is conservative as slightly acid pH values will lead to higher leaching of contaminants. Although the sump source will be assumed to be removed at a point in the future, residual effects such as the groundwater source width will remain. A 6.5-foot-thick mixing zone was utilized in order to account for groundwater fluctuations as documented by a significant zone of impacted soil below the water table in bore B8b. The ASTM default was used to calculate groundwater dispersion. Groundwater discharge to surface water was not an identified complete pathway, and thus was not calculated. A printout of this screen is attached in Appendix K.

6.3.8 Site-Specific Air Parameters

This screen allows site-specific air parameters to be input. These parameters include outdoor and indoor air pathway parameters. All outdoor air pathway parameters are ASTM default, or user-specified in a previous screen, and thus are locked on this screen. Only residential indoor pathways were calculated in this scenario. Building volume/area ratio, foundation area and foundation perimeter parameters are site-specific. These were derived from the preliminary structure design forwarded by Robert Mintz Design Studio. The parameters are for the individual ground floor residential unit, rather than the structure as a whole. A copy of the proposed tentative layout is attached in Appendix K. The remainder of the building parameters are ASTM default or locked parameters. A printout of the screen is attached in Appendix K.

A complete summary of input parameters discussed above (competed exposure pathways, exposure parameters, target risks, modeling options, and surface, subsurface soil column, building, groundwater, and transport parameters) is included in Appendix K.

6.4 Modeling Results; Baseline Risk Levels and Site Specific Target Levels

Based on the data inputs as outlined above, the modeling program calculated individual COC and cumulative baseline risks for carcinogens and non-carcinogens, and SSTL for surface soil, subsurface soil, and groundwater at the site. Please recall that the following discussion pertains to all identified COC at the site, except lead.

6.4.1 Baseline Health Risk Summary

Appendix L contains the printouts for baseline health risks. There is a set of summary tables, each more detailed than the previous data summary table. The *Baseline Risk Summary-All Pathways* is the first data table contained in Appendix L. It lists baseline carcinogenic risks and baseline toxic effects for carcinogen and non-carcinogen contaminants, respectively, for onsite exposures only. For

carcinogens, it lists maximum individual value, the appropriate individual target risk (10^{-6}), the cumulative total value, and the appropriate cumulative total risk (10^{-5}). For non-carcinogens it lists the maximum individual value, the appropriate individual hazard quotient limit (1.0), the cumulative total value, and the appropriate total hazard index limit (1.0) for all completed pathways (outdoor air, indoor air, soil exposure, and groundwater exposure pathways). Careful study of the table indicates that the carcinogenic target risks and toxic hazard quotient and hazard indexes are all exceeded in only a single pathway, the groundwater pathway. Since groundwater is not a complete pathway onsite, these exposures are located offsite. Further specific details follow and are based on the tables following this initial summary table.

The *Cumulative Risk Worksheet* follows the *Baseline Risk Summary-All Pathways* summary table. It lists all individual COC values, not just the maximum individual value, for all carcinogens and non-carcinogens for both onsite and offsite receptors. It also provides a cumulative value in each category for identified completed pathways. Again the carcinogenic target risks and toxic hazard quotient and hazard indexes are not exceeded onsite, but as indicated on page three of the table, both the property line MCL exposure and potential residential hand dug well exposure target, at a distance of 200 feet, exceed the carcinogenic target risk and toxic hazard quotient and hazard indexes target risks. The only chemical that exceeds these risks is benzene.

Behind these two tables are the complete set of program-generated exposure concentration and intake calculations for each of the complete pathways (outdoor air, indoor air, soil exposure, and groundwater pathways) and the resultant pathway risk calculations which are summarized on the preceding summary tables discussed above. Slight program-generated discrepancies will be noted in the risk calculations between each of these various sets of data. These discrepancies are under one order of magnitude and do not affect the end result (risks significantly below target risk goals). Again, only in the last potentially completed offsite pathway, a groundwater MCL protective goal and a potential hand dug well pathway at a residential unit, have target risks been exceeded. These are very conservative assumptions.

6.4.2 Tier 2 Transient Domenico Analysis

As discussed above, first-order biodegradation was allowed in the modeling effort. As a result the program generated a series of printouts that graphed the impact to groundwater from contaminant concentrations in soil and also in groundwater vs. both distance and time from the source (via groundwater transport). This effort found that the point of exposure (POE) concentration limits (set previously at a property line MCL maximum contaminant exposure at 30 feet, and a residential health-based exposure limit at a distance of 200 feet) were not exceeded from contaminants leaching from the soil. For contaminants currently documented to be in groundwater at the site, only benzene impacted groundwater above targets. At the property line POE (the MCL) and the potential residential exposure locations, exposure was estimated to be in approximately 0.1 and 0.5 years after the initial release. The timing of the release at the site is unknown. This suggests that both locations may have already been exposed; however, there was not a significant indication of this in the other grab groundwater analytical sample (B7W) collected during the investigation. Because the groundwater samples were grab samples it is possible that the samples represent higher than typical groundwater contaminant concentrations. No other contaminants exceeded the MCL at the property line, or target risks at the residential dwelling at a distance of 200 feet from the sump source. The *Tier 2 Domenico Groundwater Modeling Summary* table and the 20 data sheets with the referenced graphs are attached as Appendix M.

6.4.3 Site-Specific Target Level Summary

SSTL calculations were completed by the program and are included in Appendix N. Three summary tables are included in Appendix N. A careful review of the summary table of SSTL values for soil indicates that existing onsite soil concentrations are below program generated SSTL for soil; thus (excluding lead) no COC requires mitigation in onsite soil. Review of the summary table for SSTL values for groundwater indicate that to prevent offsite groundwater quality from exceeding the MCL standard for benzene, maximum concentrations of benzene in groundwater onsite would need to be reduced from 1.7 mg/L to 3.9 micrograms per liter (μg/L). Again the reported groundwater concentration for benzene may be the result of a non-representative grab groundwater sample. A review of the summary table for SSTL values for TPH for soil and groundwater indicates that the appropriate target level for TPH exceeds the residual saturation value for pure product in soil, and also exceeds the solubility for pure product in groundwater; thus reduction of TPH concentrations is not required from a health risk reduction viewpoint.

In support of the summary tables discussed above, and located behind them in Appendix N, are twelve pages of Chemical-Specific Tier 2 Cleanup Summaries, containing further detail relevant to the data summarized in the three summary tables.

6.5 Selection of a Lead SSTL

As discussed previously, the EPA has not promulgated a RfD for lead, required for risk analysis and generation of an SSTL. As a consequence, an alternative remedial SSTL has been relied upon. The SF-RWQCB has promulgated residential and commercial/industrial cleanup goals for lead in soil. The residential and commercial/industrial cleanup goals for lead in soil has recently been revised by the SF-RWQCB (SF-RWQCB, December 2001), based on a Department of Toxic Substance Control (DTSC) screening level of 255 mg/Kg and 750 mg/Kg, respectively (CalEPA, 2001).

According to Dr. Roger Brewer, Associate Engineering Geologist at the SF-RWQCB (personal communication, January 10, 2002), the agency has moved away from the use of a cap at residential sites impacted by lead due to neglect of restrictions on the property deed intended to prohibit removal of caps. The SF-RWQCB may still accept residual lead concentrations at residential sites over these remedial goals, on a site-specific basis, provided the residual contamination is capped by a building. Because the site is intended to be redeveloped as a joint residential/commercial facility, the 255 mg/Kg goal is the appropriate remedial SSTL, unless otherwise negotiated with the SF-RWQCB.

7.0 Conclusions

7.1 Subsurface Investigation Conclusions

The following conclusions can be made from the data generated during the subsurface investigation at the site:

- Five soil bores with temporary groundwater monitoring wells were installed to augment data collected during the initial assessment of contaminants at the site, and to attempt to determine worst-case contaminant concentrations in support of a Tier II risk assessment. Full delineation of the lateral and vertical extent of impacted soil and groundwater at the site were not necessarily a part of this investigation, and were not determined; however worst-case contaminant delineation was achieved.

- Detectable concentrations of TRPH are present in all near surface soil at the site, and appear to extend up to an approximate depth of 3.5 feet bgs. Elevated concentrations of TRPH are present within the stained area of distressed vegetation, and additionally at bore B2.

- Discolored soil is present to a depth of approximately 3.5 feet and again from 10.5 feet bgs to 16.5 feet bgs in bore B7. A zone of relatively non-discolored soil appears to separate the two zones. A similar separation of discolored soil has previously been observed in bores B2, B3, and B4.

- A very soft, potential void was encountered at a shallow depth during the installation of bore B7. A bit of metal and dark oily blobs were also noted at depth in this bore and may also suggest additional fill (or sumps) may have previously been present at the site.

- Except for minor layers, discolored soil is present from the surface to total depth in bore B8b.

- Bore B8a appeared to encounter fill and highly impacted soil to the total explored depth of 12 feet bgs.

- Except for the surface detection of TRPH in bores B5 and B6, and a thin, potentially discolored, water-bearing zone in bore B6, soil from bores B5 and B6 appeared to be largely non-impacted.

- Elevated concentrations of each of the five LUFT metals are present in the vicinity of the depression identified as a sump (B8). These concentrations are above 10X the STLC value or above the TTLC for some of the metals.

- Near surface stained soil (bores B1, B2, B3, B4, B5, B7, and B8) consistently contained lead concentrations over one or more regulatory value (STLC or TTLC).

- Toluene, ethylbenzene, and total xylenes were the only detectable VOCs present in heavily impacted soil samples. This suggests that gasoline or diesel may have been used and disposed of at the site.

- The significant increase in toluene, ethylbenzene, and total xylenes at a depth of 15 feet in bore B8b may suggest a second, petroleum-fuel-related source is impacting the site.

- The only SVOCs detected at the site were 2-methylnaphthalene and naphthalene.

- TRPH was present in all grab groundwater samples submitted for analysis. Elevated concentrations were present in bore B8b. Elevated concentrations of BTEX were present only in the grab groundwater sample collected from bore B8b. These compounds were present above their respective MCLs; however the laboratory noted that the groundwater sample contained over 5% suspended sediment. This may indicate that the higher result is

representative of the suspended sediment rather than dissolved concentrations in groundwater.

- Only cadmium was present in one filtered, non-preserved grab groundwater sample, at a concentration slightly above the MCL. No other metals were detected in the groundwater samples.

- Use of the ORBCA or SF-RWQCB risk assessment programs is inappropriate at this site.

7.2 ASTM RBCA Health Risk Assessment Conclusions

The following conclusions can be made from the data generated from the health risk evaluation of the contaminants at the site:

- Two principal assumptions were employed to generate the risk evaluation:
    - Preclusion of residential soil exposure by remedial actions and/or capping
    - On- or off-site groundwater ingestion is not a complete pathway, except at a relatively unlikely exposure at a hypothetical old hand dug well

- For all modeled contaminants, health-based risks including carcinogenic target risks and toxic hazard quotient and hazard indexes were not exceeded onsite, and are significantly below the appropriate risk goal.

- With first-order biodegradation allowed, only the groundwater source (sump) concentration of benzene exceeded offsite POE limits at the property line (MCL limit) and at the unlikely, but potential, residential hand dug well POE.

- In order to eliminate offsite degradation of groundwater over MCL concentrations, a reduction in groundwater benzene source concentrations from 1.7 mg/L to 3.9 μg/L would

be required. This also eliminates the residential occupant exposure to groundwater via a hand dug well.

- Lead has been excluded from this analysis due to the lack of a published Reference Dose (RfD) for lead by the EPA. The SF-RWQCB promulgated remedial goals have been relied on as an alternative method to define a SSTL for lead. To meet these concentration limits, a reduction in the concentration of lead to 255 mg/Kg at the site would be required, unless otherwise negotiated with the SF-RWQCB.

8.0 Recommendations

Based on the data, Blymyer Engineers recommends the following actions be taken:

- Three permanent groundwater monitoring wells should be installed to monitor downgradient contaminant concentrations. This will allow actual benzene concentrations in groundwater to be monitored. The installation of the wells should be coordinated with future site improvements; in particular with respect to the footprint of the future planned building, and in conjunction with future anticipated remedial efforts.

- A geophysical survey should be conducted to help determine if an UST is present onsite, and to help determine if other sumps or fill areas are present onsite.

- A Feasibility Study should be performed to evaluate remedial alternatives for lead in the near surface soil at the site.

- A copy of this report should be forwarded to the following agency for review:

  Alameda County Health Care Services Agency
  Department of Environmental Health
  1131 Harbor Bay Parkway, 2nd Floor
  Alameda, CA 94502-6577
  Attention: Ms. Eva Chu

- Over excavation of the sump area is required -

9.0 References

American Society for Testing and Materials, Standard PS-104 *Standard Provisional Guide for Risk-Based Corrective Action*, 1998

Basics Environmental, *Phase I Environmental Site Assessment, 823 East 12th Street, Oakland, California*, May 22, 1996

Basics Environmental, *Phase II Environmental Site Investigation, 823 East 12th Street, Oakland, California*, September 25, 1996

Blymyer Engineers, Inc, *Phase II Subsurface Investigation, Workplan, 819-823 East 12th Street, Oakland, California*, June 27, 2001

CalEPA, *Interim Guidance for Evaluating Lead-Based Paint and Asbestos Containing Materials at Proposed School Sites*, California Environmental Protection Agency, Department of Toxic Substance Control, July 23, 2001

Environmental Protection Agency, *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual Supplemental Guidance: Standard Default Exposure Factors*, Interim Final, OSWER Directive 9285.6-03, NTIS No. PB91-921314, 1991

SF-RWQCB, *Application of Risk-Based Screening Levels and Decision Making To Sites With Impacted Soil and Groundwater*, Interim Final, December 2001

Tables

Table I, Results of Soil Sample Hydrocarbon, VOC, and SVOC Analysis
BEI Job No. 201064, Robert Mintz Design Studio
819-823 East 12th Street, Oakland, California

Sample I.D.	Depth (feet)	Sample Date	EPA Method 418.1	VOCs EPA Method 8240[1]				SVOCs EPA Method 8270	TOC EPA Method 9060
			TRPH (mg/Kg)	Benzene (μg/Kg)	Toluene (μg/Kg)	Ethylbenzene (μg/Kg)	Total Xylenes (μg/Kg)	(mg/Kg)	(mg/Kg)
B1-1*	0.5	9/16/96	**600**	NA	NA	NA	NA	NA	NA
B1-2*	5	9/16/96	<10	NA	NA	NA	NA	NA	NA
B1-3*	10	9/16/96	<10	NA	NA	NA	NA	NA	NA
B2-1*	0.5	9/16/96	**4,400**	NA	NA	NA	NA	NA	NA
B2-2*	5	9/16/96	<10	NA	NA	NA	NA	NA	NA
B2-3*	10	9/16/96	**5,300**	NA	NA	NA	NA	NA	NA
B3-1*	0.5	9/16/96	**19,000**	NA	NA	NA	NA	NA	NA
B3-2*	5	9/16/96	<10	NA	NA	NA	NA	NA	NA
B3-3*	10	9/16/96	<10	NA	NA	NA	NA	NA	NA
B4-1*	0.5	9/16/96	**89**	NA	NA	NA	NA	NA	NA
B4-2*	5	9/16/96	<10	NA	NA	NA	NA	NA	NA
B4-3*	10	9/16/96	**340**	NA	NA	NA	NA	NA	NA
B5-0.5	0.5	8/7/01	**32**	NA	NA	NA	NA	NA	NA
B5-5	5	8/7/01	**13**	NA	NA	NA	NA	NA	NA
B5-10	10	8/7/01	<10	NA	NA	NA	NA	NA	NA
B5-15	15	8/7/01	<10	NA	NA	NA	NA	NA	NA

Table I, Results of Soil Sample Hydrocarbon, VOC, and SVOC Analysis
BEI Job No. 201064, Robert Mintz Design Studio
819-823 East 12th Street, Oakland, California

Sample I.D.	Depth (feet)	Sample Date	EPA Method 418.1	VOCs EPA Method 8240[1]				SVOCs EPA Method 8270	TOC EPA Method 9060
			TRPH (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethylbenzene (µg/Kg)	Total Xylenes (µg/Kg)	(mg/Kg)	(mg/Kg)
B6-0.5	0.5	8/7/01	**26**	NA	NA	NA	NA	NA	NA
B6-5	5	8/7/01	<10	NA	NA	NA	NA	NA	715
B6-10	10	8/7/01	<10	NA	NA	NA	NA	NA	NA
B6-15	15	8/7/01	<10	NA	NA	NA	NA	NA	260
B7-0.5	0.5	8/7/01	**330**	NA	NA	NA	NA	NA	NA
B7-2	2	8/7/01	NA	NA	NA	NA	NA	NA	NA
B7-7.5	7.5	8/7/01	<10	NA	NA	NA	NA	NA	NA
B7-10	10	8/7/01	<10	NA	NA	NA	NA	NA	NA
B7-14.5	14.5	8/7/01	**2,400**	NA	NA	NA	NA	NA	NA
B8B-0.5	0.5	8/7/01	**54,000**	<10	**50**	**30**	**240**	<8.0 to 40	NA
B8B-5.5	5.5	8/7/01	**1,100**	NA	NA	NA	NA	NA	NA
B8B-10	10	8/7/01	**600**	<5.0	<5.0	**58**	**110**	<0.33 to 1.6[2]	NA
B8B-15	15	8/7/01	**7,900**	<100	**140**	**1,400**	**11,000**	<1.0 to 5.0[3]	NA
B9-2	2	8/7/01	**54**	NA	NA	NA	NA	NA	NA

Table I, *Results of Soil Sample Hydrocarbon, VOC, and SVOC Analysis*; continued

Notes:

EPA	=	Environmental Protection Agency
mg/Kg	=	milligrams per kilogram (parts per million)
μg/Kg	=	micrograms per kilogram (parts per billion)
VOC	=	Volatile organic compounds
SVOC	=	Semi-volatile organic compounds
TOC	=	Total Organic Carbon
NA	=	Not analyzed
N/A	=	Not applicable
*	=	Collected by Basics Environmental in 1996
B7-15	=	Sample number: e.g. Bore 7 at a depth of 15 feet below grade surface
[1]	=	All other VOC analytes were non-detectable at elevated limits of detection. Please see the laboratory report for details.
[2]	=	2-Methylnaphthalene and Naphthalene detected at **0.36** and **0.38** mg/Kg, respectively. All other SVOC analytes were non-detectable at the indicated elevated limits of detection.
[3]	=	2-Methylnaphthalene and Naphthalene detected at **6.0** and **7.2** mg/Kg, respectively. All other SVOC analytes were non-detectable at the indicated elevated limits of detection.

Results in **bold** indicate detectable concentrations.

Table II, Results of Soil Sample Metal Analysis
BEI Job No. 201064, Robert Mintz Design Studio
819-823 East 12th Street, Oakland, California

Sample I.D.	Depth (feet)	Sample Date	EPA Method 6010				
			Cd (mg/Kg)	Cr (mg/Kg)	Pb (mg/Kg)	Ni (mg/Kg)	Zn (mg/Kg)
B1-1*	0.5	9/16/96	0.72	34	**270**	26	320
B1-2*	5	9/16/96	<0.5	29	6.0	15	20
B1-3*	10	9/16/96	<0.5	31	4.3	36	36
B2-1*	0.5	9/16/96	7.3	40	**870**	39	1,100
B2-2*	5	9/16/96	<0.5	8.1	<3.0	10	6.3
B2-3*	10	9/16/96	<0.5	37	8.2	34	41
B3-1*	0.5	9/16/96	3.8	40	**750**	43	650
B3-2*	5	9/16/96	<0.5	25	10	40	17
B3-3*	10	9/16/96	<0.5	38	5.4	48	40
B4-1*	0.5	9/16/96	0.6	33	**83**	25	77
B4-2*	5	9/16/96	<0.5	27	5.0	17	20
B4-3*	10	9/16/96	<0.5	40	5.5	43	34
B5-0.5	0.5	8/7/01	<0.5	28	16	19	43
B5-5	5	8/7/01	<0.5	26	6.3	26	22
B5-10	10	8/7/01	<0.5	31	7.6	63	37
B5-15	15	8/7/01	<0.5	20	6.0	32	34
B6-0.5	0.5	8/7/01	<0.5	32	9.8	23	19
B6-5	5	8/7/01	<0.5	29	6.9	36	30
B6-10	10	8/7/01	0.70	37	5.8	58	44
B6-15	15	8/7/01	<0.5	25	5.9	48	49
B7-0.5	0.5	8/7/01	0.95	26	**270**	43	220
B7-2	2	8/7/01	<0.5	33	8.4	24	21
B7-7.5	7.5	8/7/01	<0.5	33	7.0	27	15
B7-10	10	8/7/01	<0.5	24	7.9	24	14
B7-14.5	14.5	8/7/01	<0.5	30	6.6	27	33

Table II, Results of Soil Sample Metal Analysis
BEI Job No. 201064, Robert Mintz Design Studio
819-823 East 12th Street, Oakland, California

Sample I.D.	Depth (feet)	Sample Date	EPA Method 6010				
			Cd (mg/Kg)	Cr (mg/Kg)	Pb (mg/Kg)	Ni (mg/Kg)	Zn (mg/Kg)
B8B-0.5	0.5	8/7/01	**52**	**110**	**3,100**	**240**	2,100
B8B-5.5	5.5	8/7/01	<0.5	41	12	15	23
B8B-10	10	8/7/01	<0.5	33	9.8	64	42
B8B-15	15	8/7/01	0.57	35	**74**	28	43
B9-2	2	8/7/01	<0.5	28	11	30	21
STLC	N/A	N/A	1.0	5	5.0	20	250
TTLC	N/A	N/A	100	2,500	1,000	2,000	5,000

Notes:
EPA = Environmental Protection Agency
mg/Kg = milligrams per kilogram (parts per million)
B7-15 = Sample number: e.g. Bore 7 at a depth of 15 feet below grade surface
N/A = Not applicable
STLC = Soluble Threshold Limit Concentration (Title 26, State of California)
TTLC = Total Threshold Limit Concentration (Title 26, State of California)
Cd = Cadmium
Cr = Chromium
Pb = Lead
Ni = Nickel
Zn = Zinc
* = Collected by Basics Environmental in 1996

Results in **bold** indicate concentrations ten times above the respective STLC value.
Shaded results indicate concentrations above the respective TTLC value.

Table III, Results of Grab Groundwater Sample Hydrocarbon, VOC, SVOC and Metals Analysis
BEI Job No. 201064, Robert Mintz Design Studio
819-823 East 12th Street, Oakland, California

Sample I.D.	Sample Date	EPA Method 418.1	VOCs EPA Method 8240[1]				SVOCs EPA Method 8270	EPA Method 6010				
		TRPH (mg/L)	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)	Total Xylenes (μg/L)	(μg/L)	Cd (mg/L)	Cr (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)
B2-W*	9/16/96	**2,000[2, 4]**	NA	NA	NA	NA	NA	<0.005[uf]	<0.005[uf]	0.13[uf]	0.16[uf]	<0.05[uf]
B3-W*	9/16/96	**13[2, 4]**	NA	NA	NA	NA	NA	<0.005[uf]	<0.005[uf]	0.077[uf]	0.060[uf]	0.073[uf]
B4-W*	9/16/96	**<1.0[2]**	NA	NA	NA	NA	NA	0.005[uf]	0.007[uf]	0.082[uf]	0.080[uf]	0.11[uf]
B5W	8/7/01	**41[2]**	NA	NA	NA	NA	NA	<0.005	<0.02	<0.005	<0.05	<0.05
B6W	8/7/01	**1.5**	NA	NA	NA	NA	NA	<0.005	<0.02	<0.005	<0.05	<0.05
B7W	8/7/01	**4.8[2]**	<1.0	<1.0	**7.6**	<1.0	<10 to 50	**0.0061**	<0.02	<0.005	<0.05	<0.05
B8W	8/7/01	**2,000[2]**	**1,700**	**2,500**	**790**	**4,100**	<25 to 125[3]	<0.005	<0.02	<0.005	<0.05	<0.05
MCLs	N/A	N/A	1.0	150	700	1,750	various	0.005	0.05	0.015[5]	0.1	5[6]

Table III Results of Grab Groundwater Sample Hydrocarbon, VOC, SVOC and Metals Analysis; continued

Notes:

EPA	=	Environmental Protection Agency			
VOC	=	Volatile organic compounds			
SVOC	=	Semi-volatile organic compounds	MCLs	=	Maximum Contaminant Level
*	=	Collected by Basics Environmental in 1996			
mg/L	=	milligrams per liter (parts per million)	µg/L	=	micrograms per liter (parts per billion)
N/A	=	Not applicable	NA	=	Not analyzed
Cd	=	Cadmium	Cr	=	Chromium
Co	=	Cobalt	Pb	=	Lead
Ni	=	Nickel	Zn	=	Zinc

uf = Unfiltered groundwater sample

1 = All other VOC analytes were non-detectable at elevated limits of detection. Please see the laboratory report for details.

2 = Laboratory notes that the liquid sample contained greater than approximately 5% by volume sediment.

3 = 2-Methylnaphthalene and Naphthalene detected at **280** and **430** µg/L, respectively. All other SVOC analytes were non-detectable at the indicated elevated limits of detection.

4 = Laboratory notes indicate a lighter than water immiscible sheen is present

5 = Federal level

6 = California Secondary MCL

Results in **bold** indicate detectable concentrations.
Shaded results indicate concentrations above the respective MCL value.

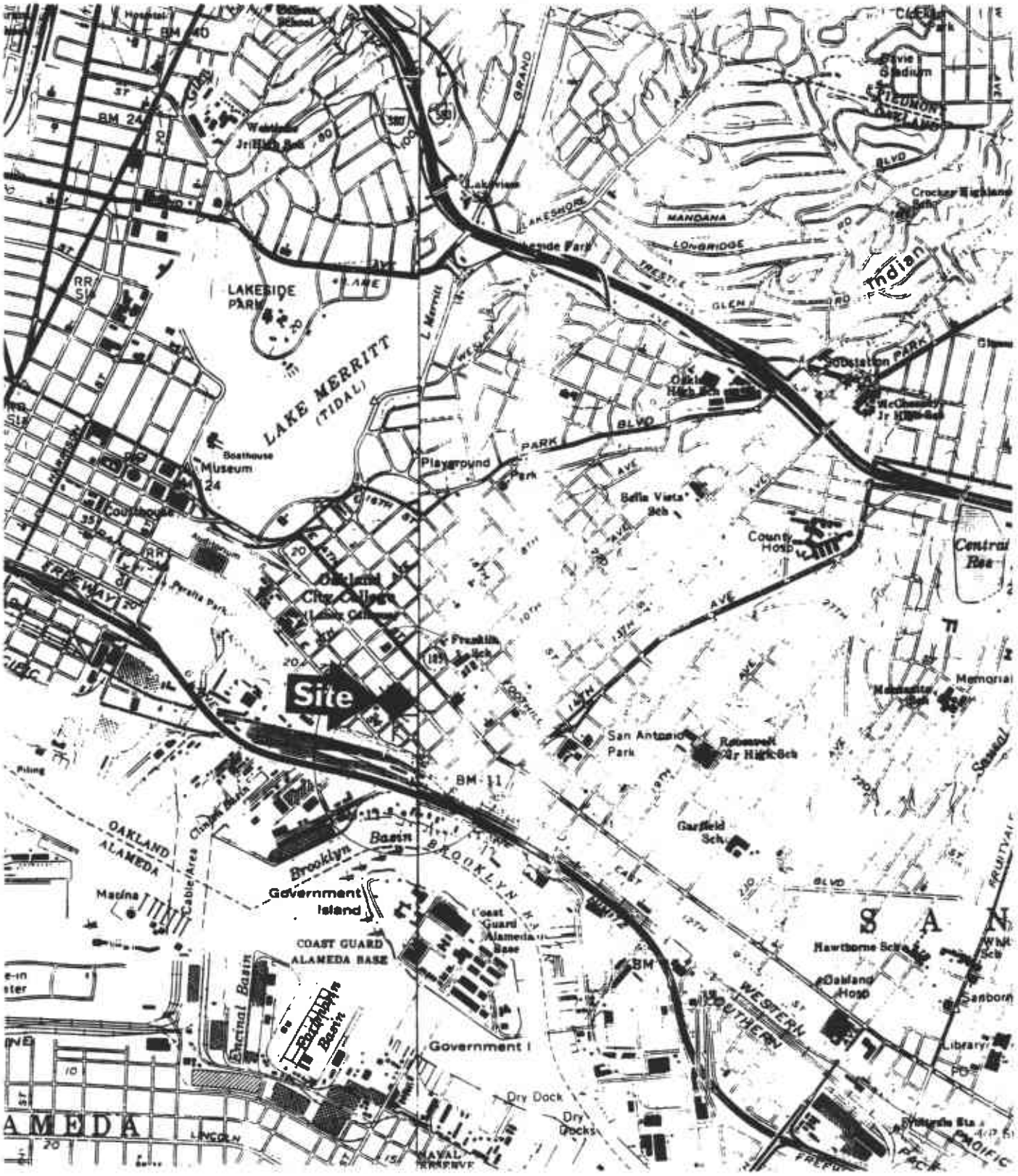
Table IV, Results of Geotechnical Soil Sample Analysis
BEI Job No. 201064, Robert Mintz Design Studio
819-823 East 12th Street, Oakland, California

Sample I.D.	Depth (Feet)	Sample Date	Soil Description	Hydraulic Conductivity	Moisture Density	Porosity	Percent moisture
				cm/sec	pounds/ cubic foot	Percent	Percent
B6-17-18	17 to 18	8/7/01	Brown Clayey Sand to Brown Sandy Silt	NA	105.6	36.9	22.1
B7-16.5-17.5	16.5 to17.5	8/7/01	Brown Clay with sand	8×10^{-8}	NA	NA	NA

Notes:

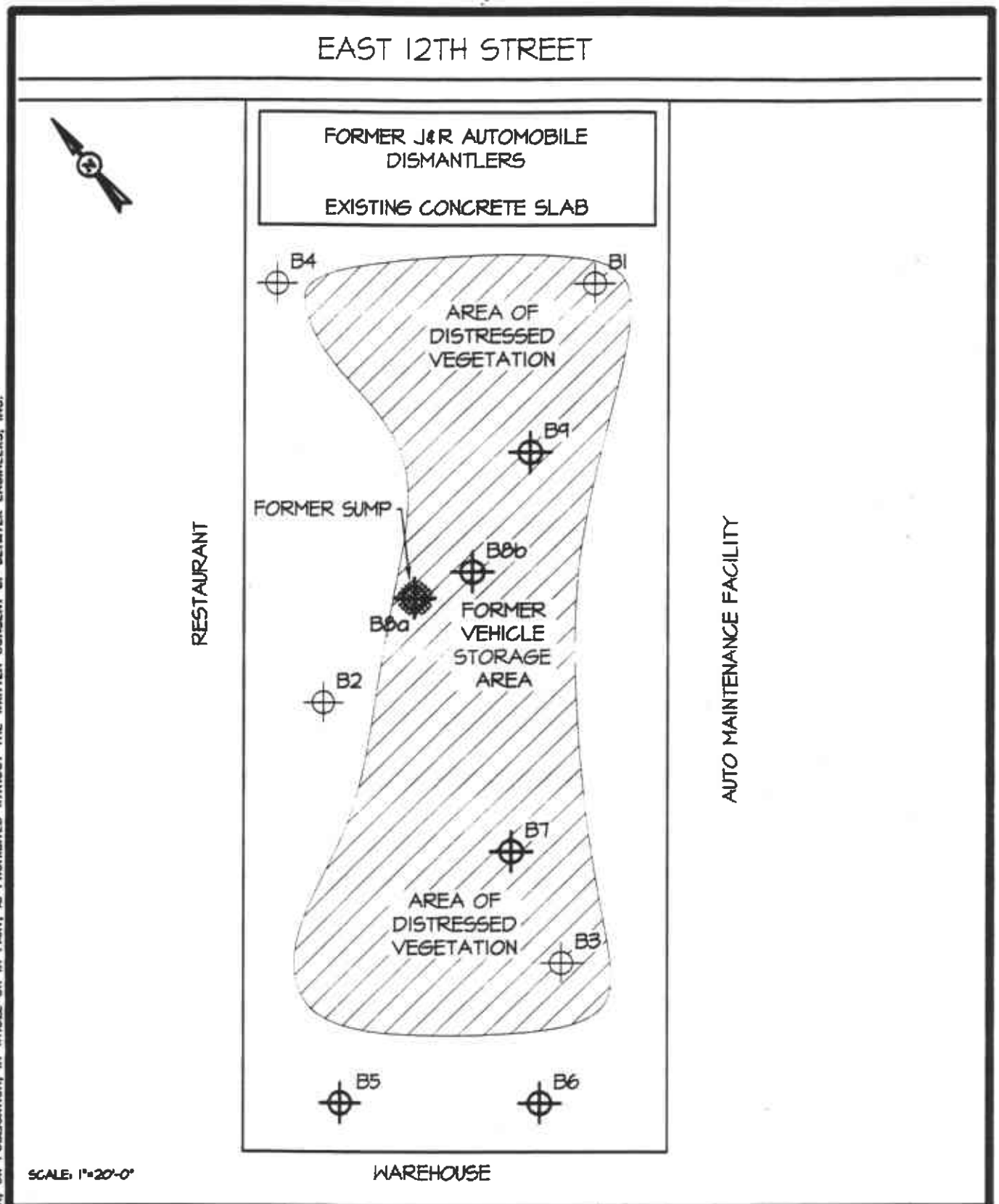
cm/sec	=	centimeters per second
B6- 17-18	=	Bore 6 at a depth of 17 to 18 feet below grade surface
NA	=	Not analyzed

Figures



UNITED STATES GEOLOGICAL SURVEY 7.5' QUAD. "OAKLAND WEST & EAST, CA" PHOTOREVISED 1980.

BLYMYER ENGINEERS INC.	0 1000 2000 SCALE IN FEET	N	SITE LOCATION MAP 823 EAST 12TH STREET OAKLAND, CA	FIGURE 1
BG JOB NO. 201084 / DATE 6/25/01				



SCALE: 1"=20'-0"

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
201064	6-25-01

LEGEND

- BLYMYER ENGINEERS BORES
- PREVIOUS BASICS ENVIRONMENTAL BORES

SITE PLAN

ROBERT MINTZ DESIGN STUDIO
819-823 EAST 12TH STREET
OAKLAND, CA

FIGURE 2

L:\ACAD\2001DWG\201064\201064fig2 6-25-01 KBM

Appendix A

Alameda County Public Works Agency Drilling Permit

JUL-25-2001 08:51

ALAMEDA COUNTY PUBLIC WORKS AGENCY

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

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 519-525 East 12th Street
Oakland, CA

CLIENT
Name Robert Mintz Design Studio
Address 3... Claremont St. Phone 415/...
City San Francisco, CA Zip 941..

APPLICANT
Name Mark Detterman for Blymyer Engineers, Inc.
Fax 510/865-2594
Address 1829 Clement Ave. Phone 510/521-3773
City Alameda, CA Zip 94501

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

PROPOSED WATER SUPPLY WELL USE
New Domestic ☐
Municipal ☐
Industrial ☐
Replacement Domestic ☐
Irrigation ☐
Other (Temp. Well) ☒

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

DRILLER'S NAME Gregg Drilling

DRILLER'S LICENSE NO. 485165

WELL PROJECTS
Drill Hole Diameter 2 in.
Casing Diameter 1 in.
Surface Seal Depth 18 ft.
Maximum Depth 18 ft.
Owner's Well Number B5, B6, B7, B8

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

ESTIMATED STARTING DATE 8/7/01
ESTIMATED COMPLETION DATE 8/7/01

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

APPLICANT'S SIGNATURE [signature] DATE 7/24/01

PLEASE PRINT NAME Mark E. Detterman

Rev.6-5-00

FOR OFFICE USE

PERMIT NUMBER W01-584
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
See attached requirements for destruction of shallow wells. Send a map of work site. A different permit application 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 7-26-01

TOTAL P.02

Appendix B
Soil Bore Logs

Appendix B

Soil Bore Logs

KEY TO BORE/WELL CONSTRUCTION LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN HALF IS LARGER THAN NO. 200 SIEVE)	GRAVEL (MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE)	CLEAN GRAVEL WITH LESS THAN 5% FINES	GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES
		GRAVEL WITH OVER 12% FINES	GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVEL, GRAVEL-SAND-CLAY MIXTURES
	SAND (MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE)	CLEAN SAND WITH LESS THAN 5% FINES	SW	WELL GRADED SAND, GRAVELLY SAND
			SP	POORLY GRADED SAND, GRAVELLY SAND
		SAND WITH OVER 12% FINES	SM	SILTY SAND, SAND-SILT MIXTURES
			SC	CLAYEY SAND, SAND-CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE)	SILT AND CLAY (LIQUID LIMIT LESS THAN 50)		ML	INORGANIC SILT, ROCK FLOUR, SANDY OR CLAYEY SILT OF LOW PLASTICITY
			CL	INORGANIC CLAY OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAY (LEAN)
			OL	ORGANIC SILT AND ORGANIC SILTY CLAY OF LOW PLASTICITY
	SILT AND CLAY (LIQUID LIMIT GREATER THAN 50)		MH	INORGANIC SILT, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOIL, ELASTIC SILT
			CH	INORGANIC CLAY OF HIGH PLASTICITY, GRAVELLY, SANDY OR SILTY CLAY (FAT)
			OH	ORGANIC CLAY, ORGANIC SILT OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

FILL MATERIALS

C	CONCRETE
F	FILL
A	ASPHALT

WELL CONSTRUCTION MATERIALS

CEMENT GROUT	
BENTONITE	
FILTER SAND	SEE ABOVE FOR CONCRETE SYMBOL

SOIL CONSISTENCY FROM DRIVE SAMPLER

NON-COHESIVE SOILS*		COHESIVE SOILS*		UNCONFINED COMPRESSIVE STRENGTH
SANDS & GRAVELS	BLOWS PER FOOT	SILTS AND CLAYS	BLOWS PER FOOT	STRENGTH TONS/SQ. FT.
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 1/4
LOOSE	4 - 10	SOFT	2 - 4	1/4 - 1/2
MED. DENSE	10 - 30	MEDIUM STIFF	4 - 8	1/2 - 1
DENSE	30 - 50	STIFF	8 - 16	1 - 2
VERY DENSE	OVER 50	VERY STIFF	16 - 32	2 - 4
		HARD	OVER 32	OVER 4

* = STANDARD PENETRATION RESISTANCE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2-INCH O.D. (1-3/8-INCH I.D.) SPLIT BARREL SAMPLER 12 INCHES USING A 140-POUND HAMMER FALLING FREELY THROUGH 30 INCHES. THE SAMPLER IS DRIVEN 18 INCHES AND THE NUMBER OF BLOWS ARE RECORDED FOR EACH 6-INCH INTERVAL. THE SUMMATION OF THE FINAL TWO INTERVALS IS THE STANDARD PENETRATION RESISTANCE.

SAMPLE INTERVAL SYMBOLS

CORED/RECOVERED	CORED/RECOVERED/SAMPLED/ANALYZED
CORED/ NO RECOVERY	N/A NON APPLICABLE/NOT AVAILABLE
CORED/RECOVERED/SAMPLED	

BLYMYER
ENGINEERS, INC.

SOIL BORE & WELL CONSTRUCTION LOG: B5

Job No.: 201084
Client: Robert Mintz Design Studio
Site: 189 – 823 12th Avenue
Oakland, California
Date Drilled: August 7, 2001
Logged By: M. Detterman

Drilling Company: Gregg Drilling, Inc.
Driller: Paul
Drilling Equipment: Geoprobe
Sample Method: Macro-core
Soil Bore Diameter: 1.75 inch in.
Total Depth Drilled: 20.0 ft.

Well Completion Depth: ft.
Component Size/Type — Depths in feet From — To

Surface Completion:
Surface Seal:
Annular Seal:
Seal: Grout — .00 — 20.00
Sand Pack:
Bottom Seal:
Blank Casing:
Screened Casing:

Initial Water Depth: ▽ 14.0 ft.
Stabilized Water Depth: ▽

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0		3.0		SILTY CLAY, medium brown, dry 10% 1/8-inch rounded gravel	CL		
5		1.1		Grades light gray			
				CLAYEY GRAVEL, light gray, 20% clay, cherty gravel, 1/8 – 1/4-inch, damp	GC		
10		0.7		GRAVELLY CLAY, light gray, to gravelly silt, 70% fines, moist	CL		
		0.7		CLAYEY SAND, light brown, medium to coarse grained sand, 20% clay, moist to wet	SC		▽ 14.0'
15				CLAYEY GRAVEL, grades orange brown, 1/8 – 1/4 inch, wet	GC		
				SAND, light brown, poorly graded fine sand, flows, wet	SP		
				CLAYEY GRAVEL, light brown, 1/8 – 1/4-inch, subangular, wet	GC		
				SILTY CLAY, light brown, very plastic, wet	CL		
20				SAND, orange brown, poorly graded, fine to medium grained, wet	SP		
				Boring terminated at 20.0 feet			
25							

BLYMYER
ENGINEERS, INC.

SOIL BORE & WELL CONSTRUCTION LOG: B6

Job No.: 201084
Client: Robert Mintz Design Studio
Site: 189 - 823 12th Avenue
Oakland, California
Date Drilled: August 7, 2001
Logged By: M. Detterman

Drilling Company: Gregg Drilling, Inc.
Driller: Paul
Drilling Equipment: Geoprobe
Sample Method: Macro-core
Soil Bore Diameter: 1.75 inch in.
Total Depth Drilled: 20.0 ft.

Well Completion Depth: ft.
Component Size/Type — Depths in feet From To

Surface Completion:
Surface Seal:
Annular Seal:
Seal: Grout .00 20.00
Sand Pack:
Bottom Seal:
Blank Casing:
Screened Casing:

Initial Water Depth: ▽ 14.0 ft.
Stabilized Water Depth: ▽

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0		0.3		SILTY CLAY, medium brown, vegetation rootlets Trace 1/4 inch rounded gravel	CL		
5		0.6		SILTY CLAY, grades light brown, 10% medium grained sand, low plasticity, damp			
				SILTY CLAY, light green brown, moderate plasticity, moist increase in sand content	CL		
10		0.7		SILTY CLAY, black, 50% oyster (?) shell fragments, partings with water	CL		
		0.0		SANDY CLAY, 25% fine to medium grained sand, 10% 1/4 to 1/2-inch soft rock/gravel, angular fragments	CL		
15		0.7		SILTY CLAY, grades orange brown, moist	CL		▽ 14.0'
				CLAYEY SAND, orange brown, 20 - 30% fine grained, moist to wet	SC		
					GC		
				SANDY GRAVEL, light green brown, 1/4-inch angular, 15% fine to coarse sand, wet	SM		
					CL		
				SILTY SAND, light green brown, fine to medium grained, wet	SM		
20				SILTY CLAY, light green brown, wet to moist			
				SILTY SAND, orange brown, fine to medium grained, wet			
				Boring terminated at 20.0 feet			
25							

BLYMYER ENGINEERS, INC.

SOIL BORE & WELL CONSTRUCTION LOG: B7

Job No.: 201084
Client: Robert Mintz Design Studio
Site: 189 – 823 12th Avenue
Oakland, California
Date Drilled: August 7, 2001
Logged By: M. Detterman

Drilling Company: Gregg Drilling, Inc.
Driller: Paul
Drilling Equipment: Geoprobe
Sample Method: Macro-core
Soil Bore Diameter: 1.75 inch in.
Total Depth Drilled: 20.0 ft.

Well Completion Depth: ft.

Component Size/Type	Depths in feet From	To
Surface Completion:		
Surface Seal:		
Annular Seal:		
Seal: Grout	00	20.00
Sand Pack:		
Bottom Seal:		
Blank Casing:		
Screened Casing:		

Initial Water Depth: ▽ 15.5 ft.
Stabilized Water Depth: ▽

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0		21.3		SILTY CLAY, black stained, very oily	CL		
				Grades dark to medium brown, poor recovery			
				Moist at 3.5 feet, 10% fine gravel, plastic clay	CL		
5				Trace recovery 5.5 to 7 feet, void?, (oily?)			
		1.4		SILTY CLAY, black, stained, very moist to wet	CL		
				CLAYEY GRAVEL, gray brown, 40 – 60% fine to medium gravel, trace metal at 8 feet, dragged from above?	GC		
10		0.7		Unknown odor, moist			
				SILTY CLAY, light green, plastic, unknown odor reported by driller	CL		
				CLAYEY GRAVEL, light green, 40 – 60% fine to medium gravel	GC		
				SILTY SAND, dark green, fine grained, moist	SM		
15				CLAYEY GRAVEL, dark green, fine to coarse, with partings and 1-inch blobs of black stained soil (not sticky), moist	GC		▽ 15.5'
				Sweet odor	SP		
				SAND, light green, fine grained, wet	CL		
				SILTY CLAY, light gray brown, plastic			
				SILTY SAND, light orange brown, fine grained, flows, wet	SM		
20				SILTY CLAY, light grey brown, plastic	CL		
				Boring terminated at 20.0 feet			
25							

MARK E. DETTERMAN
5/9/03

BLYMYER
ENGINEERS, INC.

SOIL BORE & WELL CONSTRUCTION LOG: B8a

Job No.: 201084
Client: Robert Mintz Design Studio
Site: 189 - 823 12th Avenue
Oakland, California
Date Drilled: August 7, 2001
Logged By: M. Detterman

Drilling Company: Gregg Drilling, Inc.
Driller: Paul
Drilling Equipment: Geoprobe
Sample Method: Macro-core
Soil Bore Diameter: 1.75 inch in.
Total Depth Drilled: 12.0 ft.

Well Completion Depth: ft.

Component Size/Type	Depths in feet From	To
Surface Completion:		
Surface Seal:		
Annular Seal:		
Seal: Grout	.00	12.00
Sand Pack:		
Bottom Seal:		
Blank Casing:		
Screened Casing:		

Initial Water Depth: ▼
Stabilized Water Depth: ▼

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				In sump, 0.5 foot below grade			
		16.3		FILL, glass, brick ,metal,very oily			
		19.8		Solid red brick, minimal recovery			
5				No recovery, very soft			
				Paper, organics, wood, very black, gooy soil (trace), strong odor	F		
10				No recovery other than liner coating of black goo, nasty odor			
				Driller reports settling under foot			
				Boring terminated at 12.0 feet			
15							
20							
25							

SOIL BORE & WELL CONSTRUCTION LOG: B8b

BLYMYER
ENGINEERS, INC.

Job No.: 201084
Client: Robert Mintz Design Studio
Site: 189 - 823 12th Avenue
Oakland, California
Date Drilled: August 7, 2001
Logged By: M. Detterman

Drilling Company: Gregg Drilling, Inc.
Driller: Paul
Drilling Equipment: Geoprobe
Sample Method: Macro-core
Soil Bore Diameter: 1.75 inch in.
Total Depth Drilled: 24.0 ft.

Well Completion Depth: ft.
Component Size/Type — Depths in feet From — To

Surface Completion:
Surface Seal:
Annular Seal:
Seal: Grout — .00 — 24.00
Sand Pack:
Bottom Seal:
Blank Casing:
Screened Casing:

Initial Water Depth: ▽ 18.5 ft.
Stabilized Water Depth: ▽

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				SILTY CLAY, black stained, very oily	CL		
				Grades medium brown, web-like stingers of black stained soil			
		359		CLAYEY SILT, dark to medium olive green, sweet odor, moist	ML		
5		418					
10		252					
				CLAYEY GRAVEL, dark green, fine to medium gravel, 30% clay, moist	GC		
		345					
15				SILTY CLAY, light tan brown, plastic	CL		
				GRAVELLY CLAY, dark green, fine to medium gravel, 30% gravel, damp	GC		
				SILTY CLAY, light tan brown, plastic	CL		
				CLAYEY SILT, dark green, with increased sand at 18.5 feet, wet, sheen on sample liner	ML		▽ 18.5'
		293					
20				SILTY CLAY, tan to dark green mottled	CL		
				CLAYEY SILT, dark green with trace tan mottling	ML		
				SAND, dark green, fine grained, wet, sheen on sample liner	SP		
				CLAYEY SILT, dark green, wet	ML		
				Shoe tip mottled dark green and tan, with trace fine sand			
25				Boring terminated at 24.0 feet			

REGISTERED GEOLOGIST
MARK E. DETTERMAN
No. 1738
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

BLYMYER
ENGINEERS, INC.

SOIL BORE & WELL CONSTRUCTION LOG: B9

Job No.: 201064
Client: Robert Mintz Design Studio
Site: 189 - 823 12th Avenue
Oakland, California
Date Drilled: August 7, 2001
Logged By: M. Detterman

Drilling Company: Gregg Drilling, Inc.
Driller: Paul
Drilling Equipment: Geoprobe
Sample Method: Macro-core
Soil Bore Diameter: 1.75 inch in.
Total Depth Drilled: 2.5 ft.

Well Completion Depth: ft.
Component Size/Type — Depths in feet From — To

Surface Completion:
Surface Seal:
Annular Seal:
Seal: Grout — 00 — 2.50
Sand Pack:
Bottom Seal:
Blank Casing:
Screened Casing:

Initial Water Depth: ▽
Stabilized Water Depth: ▽

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				SILTY CLAY, dark brown, oil stained	CL		
				Boring terminated at 2.5 feet			
5							
10							
15							
20							
25							

REGISTERED GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
9/9/03

Appendix C

Analytical Laboratory Report, McCampbell Analytical, Inc., dated August 15, and August 17, 2001

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

Blymyer Engineers, Inc.	Client Project ID: #201064	Date Sampled: 08/07/01
1829 Clement Avenue		Date Received: 08/08/01
Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/08/01

08/15/01

Dear Mark:

Enclosed are:

1). the results of **22** samples from your **#201064** project,

2). a QC report for the above samples

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,

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
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http://www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #201064	Date Sampled: 08/07/01
		Date Received: 08/08/01
	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/08/01

Total Recoverable Petroleum Hydrocarbons as Oil & Grease (with Silica Gel Clean-up) by Scanning IR Spectrometry*

EPA method 418.1 or 9073; Standard Methods 5520 C&F

Lab ID	Client ID	Matrix	TRPH+	% Recovery Surrogate
74373	B8B-10	S	600	94
74374	B8B-15	S	7900	---#
74375	B9-2	S	54	92
74376	B5W	W	41,i	91
74377	B6W	W	1.5	90
74378	B7W	W	4.8,i	90
74379	B8W	W	2000,i	---#
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	1.0 mg/L	
		S	10 mg/kg	

* water samples are reported in mg/L , wipe samples in mg/wipe and soils and sludges in mg/kg

surrogate diluted out of range or not applicable to this sample

+ At the client's request or the laboratory's discretion, one or more positive samples may be run by direct injection chromatography with FID detection. The following comments pertain to these GC results: a) gasoline-range compounds (C6-C12) are present; b) diesel range compounds (C10-C23) are present; c) oil-range compounds (>C18) are present; d) other patterned solvent (?); e) isolated peaks; f) GC compounds are absent or insignificant relative to TRPH inferring that complex biologically derived molecules are the source of IR absorption; h) a lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Blymyer Engineers, Inc.	Client Project ID: #201064	Date Sampled: 08/07/01
1829 Clement Avenue		Date Received: 08/08/01
Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/08-08/09/01
	Client P.O:	Date Analyzed: 08/08-08/09/01

Volatile Organics By GC/MS

EPA method 624 or 8240

Lab ID	74378
Client ID	B7W
Matrix	W

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	Concentration*	Reporting Limit W	Reporting Limit S
Acetone [b]	ND	5.0	25	cis-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	trans-1,3-Dichloropropene	ND	1.0	5.0
Bromodichloromethane	ND	1.0	5.0	Ethylbenzene	7.6	1.0	5.0
Bromoform	ND	1.0	5.0	Methyl butyl ketone [d]	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	Methylene Chloride[e]	ND<2.0	1.0	5.0
Carbon Disulfide	ND	1.0	5.0	Methyl ethyl ketone [f]	ND	2.0	10
Carbon Tetrachloride	ND	1.0	5.0	Methyl isobutyl ketone [g]	ND	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Styrene [k]	ND	1.0	5.0
Chloroethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chloroethyl Vinyl Ether[c]	ND	1.0	5.0	Tetrachloroethene	ND<2.0	1.0	5.0
Chloroform	ND	1.0	5.0	Toluene [l]	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Vinyl Acetate [m]	ND	5.0	25
1,1-Dichloroethane	ND	1.0	5.0	Vinyl Chloride [n]	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	Xylenes, total [o]	ND	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	**Surrogate Recoveries (%)**			
cis-1,2-Dichloroethene	ND	1.0	5.0	Dibromofluoromethane		111	
trans-1,2-Dichloroethene	ND	1.0	5.0	Toluene-d8		110	
1,2-Dichloropropane	ND	1.0	5.0	4-Bromofluorobenzene		99	

Comments: i

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #201064	Date Sampled: 08/07/01
		Date Received: 08/08/01
	Client Contact: Mark Detterman	Date Extracted: 08/08-08/09/01
	Client P.O:	Date Analyzed: 08/08-08/09/01

Volatile Organics By GC/MS

EPA method 624 or 8240

Lab ID	74379
Client ID	B8W
Matrix	W

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	Concentration*	Reporting Limit W	Reporting Limit S
Acetone [b]	ND<50	5.0	25	cis-1,3-Dichloropropene	ND<50	1.0	5.0
Benzene	1700	1.0	5.0	trans-1,3-Dichloropropene	ND<50	1.0	5.0
Bromodichloromethane	ND<50	1.0	5.0	Ethylbenzene	790	1.0	5.0
Bromoform	ND<50	1.0	5.0	Methyl butyl ketone [d]	ND<50	1.0	5.0
Bromomethane	ND<50	1.0	5.0	Methylene Chloride[e]	ND<75	1.0	5.0
Carbon Disulfide	ND<50	1.0	5.0	Methyl ethyl ketone [f]	ND<50	2.0	10
Carbon Tetrachloride	ND<50	1.0	5.0	Methyl isobutyl ketone [g]	ND<50	1.0	5.0
Chlorobenzene	ND<50	1.0	5.0	Styrene [k]	ND<50	1.0	5.0
Chloroethane	ND<50	1.0	5.0	1,1,2,2-Tetrachloroethane	ND<50	1.0	5.0
2-Chloroethyl Vinyl Ether[c]	ND<50	1.0	5.0	Tetrachloroethene	ND<50	1.0	5.0
Chloroform	ND<50	1.0	5.0	Toluene [l]	2500	1.0	5.0
Chloromethane	ND<50	1.0	5.0	1,1,1-Trichloroethane	ND<50	1.0	5.0
Dibromochloromethane	ND<50	1.0	5.0	1,1,2-Trichloroethane	ND<50	1.0	5.0
1,2-Dichlorobenzene	ND<50	1.0	5.0	Trichloroethene	ND<50	1.0	5.0
1,3-Dichlorobenzene	ND<50	1.0	5.0	Trichlorofluoromethane	ND<50	1.0	5.0
1,4-Dichlorobenzene	ND<50	1.0	5.0	Vinyl Acetate [m]	ND<50	5.0	25
1,1-Dichloroethane	ND<50	1.0	5.0	Vinyl Chloride [n]	ND<50	1.0	5.0
1,2-Dichloroethane	ND<50	1.0	5.0	Xylenes, total [o]	4100	1.0	5.0
1,1-Dichloroethene	ND<50	1.0	5.0	**Surrogate Recoveries (%)**			
cis-1,2-Dichloroethene	ND<50	1.0	5.0	Dibromofluoromethane	109		
trans-1,2-Dichloroethene	ND<50	1.0	5.0	Toluene-d8	110		
1,2-Dichloropropane	ND<50	1.0	5.0	4-Bromofluorobenzene	100		

Comments: i

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/09-08/10/01

Volatile Organics By GC/MS

EPA method 624 or 8240

Lab ID	74371
Client ID	B8B-0.5
Matrix	S

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	Concentration*	Reporting Limit W	Reporting Limit S
Acetone [b]	ND<120	5.0	25	cis-1,3-Dichloropropene	ND<10	1.0	5.0
Benzene	ND<10	1.0	5.0	trans-1,3-Dichloropropene	ND<10	1.0	5.0
Bromodichloromethane	ND<10	1.0	5.0	Ethylbenzene	30	1.0	5.0
Bromoform	ND<10	1.0	5.0	Methyl butyl ketone [d]	ND<10	1.0	5.0
Bromomethane	ND<10	1.0	5.0	Methylene Chloride[e]	ND<10	1.0	5.0
Carbon Disulfide	ND<10	1.0	5.0	Methyl ethyl ketone [f]	ND<10	2.0	10
Carbon Tetrachloride	ND<10	1.0	5.0	Methyl isobutyl ketone [g]	ND<10	1.0	5.0
Chlorobenzene	ND<10	1.0	5.0	Styrene [k]	ND<10	1.0	5.0
Chloroethane	ND<10	1.0	5.0	1,1,2,2-Tetrachloroethane	ND<10	1.0	5.0
2-Chloroethyl Vinyl Ether[c]	ND<10	1.0	5.0	Tetrachloroethene	ND<10	1.0	5.0
Chloroform	ND<10	1.0	5.0	Toluene [l]	50	1.0	5.0
Chloromethane	ND<10	1.0	5.0	1,1,1-Trichloroethane	ND<10	1.0	5.0
Dibromochloromethane	ND<10	1.0	5.0	1,1,2-Trichloroethane	ND<10	1.0	5.0
1,2-Dichlorobenzene	ND<10	1.0	5.0	Trichloroethene	ND<10	1.0	5.0
1,3-Dichlorobenzene	ND<10	1.0	5.0	Trichlorofluoromethane	ND<10	1.0	5.0
1,4-Dichlorobenzene	ND<10	1.0	5.0	Vinyl Acetate [m]	ND<10	5.0	25
1,1-Dichloroethane	ND<10	1.0	5.0	Vinyl Chloride [n]	ND<10	1.0	5.0
1,2-Dichloroethane	ND<10	1.0	5.0	Xylenes, total [o]	240	1.0	5.0
1,1-Dichloroethene	ND<10	1.0	5.0	**Surrogate Recoveries (%)**			
cis-1,2-Dichloroethene	ND<10	1.0	5.0	Dibromofluoromethane	94		
trans-1,2-Dichloroethene	ND<10	1.0	5.0	Toluene-d8	105		
1,2-Dichloropropane	ND<10	1.0	5.0	4-Bromofluorobenzene	108		

Comments:

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/09-08/10/01

Volatile Organics By GC/MS

EPA method 624 or 8240

Lab ID	74374
Client ID	B8B-15
Matrix	S

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	Concentration*	Reporting Limit W	Reporting Limit S
Acetone [b]	ND<120	5.0	25	cis-1,3-Dichloropropene	ND<100	1.0	5.0
Benzene	ND<100	1.0	5.0	trans-1,3-Dichloropropene	ND<100	1.0	5.0
Bromodichloromethane	ND<100	1.0	5.0	Ethylbenzene	1400	1.0	5.0
Bromoform	ND<100	1.0	5.0	Methyl butyl ketone [d]	ND<100	1.0	5.0
Bromomethane	ND<100	1.0	5.0	Methylene Chloride[e]	ND<100	1.0	5.0
Carbon Disulfide	ND<100	1.0	5.0	Methyl ethyl ketone [f]	ND<100	2.0	10
Carbon Tetrachloride	ND<100	1.0	5.0	Methyl isobutyl ketone [g]	ND<100	1.0	5.0
Chlorobenzene	ND<100	1.0	5.0	Styrene [k]	ND<100	1.0	5.0
Chloroethane	ND<100	1.0	5.0	1,1,2,2-Tetrachloroethane	ND<100	1.0	5.0
2-Chloroethyl Vinyl Ether[c]	ND<100	1.0	5.0	Tetrachloroethene	ND<100	1.0	5.0
Chloroform	ND<100	1.0	5.0	Toluene [l]	140	1.0	5.0
Chloromethane	ND<100	1.0	5.0	1,1,1-Trichloroethane	ND<100	1.0	5.0
Dibromochloromethane	ND<100	1.0	5.0	1,1,2-Trichloroethane	ND<100	1.0	5.0
1,2-Dichlorobenzene	ND<100	1.0	5.0	Trichloroethene	ND<100	1.0	5.0
1,3-Dichlorobenzene	ND<100	1.0	5.0	Trichlorofluoromethane	ND<100	1.0	5.0
1,4-Dichlorobenzene	ND<100	1.0	5.0	Vinyl Acetate [m]	ND<100	5.0	25
1,1-Dichloroethane	ND<100	1.0	5.0	Vinyl Chloride [n]	ND<100	1.0	5.0
1,2-Dichloroethane	ND<100	1.0	5.0	Xylenes, total [o]	11,000	1.0	5.0
1,1-Dichloroethene	ND<100	1.0	5.0	**Surrogate Recoveries (%)**			
cis-1,2-Dichloroethene	ND<100	1.0	5.0	Dibromofluoromethane	91		
trans-1,2-Dichloroethene	ND<100	1.0	5.0	Toluene-d8	101		
1,2-Dichloropropane	ND<100	1.0	5.0	4-Bromofluorobenzene	90		

Comments:

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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1829 Clement Avenue		Date Received: 08/08/01
Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/08/01

Semi-Volatile Organics By GC/MS

EPA method 625 and 3510 or 8270 and 3550

Lab ID	74371
Client ID	B8B-0.5
Matrix	S

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	oncentration	Reporting Limit W	Reporting Limit S
Acenaphthene	ND<8.0	10	0.33	Di-n-octyl Phthalate	ND<8.0	10	0.33
Acenaphthylene	ND<8.0	10	0.33	1,2-Diphenylhydrazine	ND<8.0	10	0.33
Anthracene	ND<8.0	10	0.33	Fluoranthene	ND<8.0	10	0.33
Benzidine	ND<40	50	1.6	Fluorene	ND<8.0	10	0.33
Benzoic Acid	ND<40	50	1.6	Hexachlorobenzene	ND<8.0	10	0.33
Benzo(a)anthracene	ND<8.0	10	0.33	Hexachlorobutadiene	ND<8.0	10	0.33
Benzo(b)fluoranthene	ND<8.0	10	0.33	Hexachlorocyclopentadiene	ND<40	50	1.6
Benzo(k)fluoranthene	ND<8.0	10	0.33	Hexachloroethane	ND<8.0	10	0.33
Benzo(g,h,i)perylene	ND<8.0	10	0.33	Indeno(1,2,3-cd)pyrene	ND<8.0	10	0.33
Benzo(a)pyrene	ND<8.0	10	0.33	Isophorone	ND<8.0	10	0.33
Benzyl Alcohol	ND<16	20	0.66	2-Methylnaphthalene	ND<8.0	10	0.33
Bis(2-chloroethoxy)methane	ND<8.0	10	0.33	2-Methylphenol (o-Cresol)	ND<8.0	10	0.33
Bis(2-chloroethyl) Ether	ND<8.0	10	0.33	3 &/or 4-Methylphenol (m &/or p-Cresol)	ND<8.0	10	0.33
Bis(2-chloroisopropyl)Ether	ND<8.0	10	0.33	Naphthalene	ND<8.0	10	0.33
Bis(2-ethylhexyl) Phthalate	ND<8.0	10	0.33	2-Nitroaniline	ND<40	50	1.6
4-Bromophenyl Phenyl Ether	ND<8.0	10	0.33	3-Nitroaniline	ND<40	50	1.6
Butylbenzyl Phthalate	ND<8.0	10	0.33	4-Nitroaniline	ND<40	50	1.6
4-Chloroanaline	ND<16	20	0.66	2-Nitrophenol	ND<40	50	1.6
4-Chloro-3-methylpheno'	ND<8.0	10	0.33	4-Nitrophenol	ND<40	50	1.6
2-Chloronaphthalene	ND<8.0	10	0.33	Nitrobenzene	ND<8.0	10	0.33
2-Chlorophenol	ND<8.0	10	0.33	N-Nitrosodimethylamine	ND<8.0	10	0.33
4-Chlorophenyl Phenyl Ether	ND<8.0	10	0.33	N-Nitrosodiphenylamine	ND<8.0	10	0.33
Chrysene	ND<8.0	10	0.33	N-Nitrosodi-n-propylamine	ND<8.0	10	0.33
Dibenzo(a,h)anthracene	ND<8.0	10	0.33	Pentachlorophenol	ND<40	50	1.6
Dibenzofuran	ND<8.0	10	0.33	Phenanthrene	ND<8.0	10	0.33
Di-n-butyl Phthalate	ND<8.0	10	0.33	Phenol	ND<8.0	10	0.33
1,2-Dichlorobenzene	ND<8.0	10	0.33	Pyrene	ND<8.0	10	0.33
1,3-Dichlorobenzene	ND<8.0	10	0.33	1,2,4-Trichlorobenzene	ND<8.0	10	0.33
1,4-Dichlorobenzene	ND<8.0	10	0.33	2,4,5-Trichlorophenol	ND<8.0	10	0.33
3,3-Dichlorobenzidine	ND<16	20	0.66	2,4,6-Trichlorophenol	ND<8.0	10	0.33
2,4-Dichlorophenol	ND<8.0	10	0.33	Comments: j			
Diethyl Phthalate	ND<8.0	10	0.33	**Surrogate Recoveries (%)**			
2,4-Dimethylphenol	ND<8.0	10	0.33	2-Fluorophenol	---#		
Dimethyl Phthalate	ND<8.0	10	0.33	Phenol-d5	---#		
4,6-Dinitro-2-methylphenol	ND<40	50	1.6	Nitrobenzene-d5	---#		
2,4-Dinitrophenol	ND<40	50	1.6	2-Fluorobiphenyl	82		
2,4-Dinitrotoluene	ND<8.0	10	0.33	2,4,6-Tribromophenol	---#		
2,6-Dinitrotoluene	ND<8.0	10	0.33	p-Terphenyl-d14	---#		

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range

h) lighter than water immiscible sheen is present; i)liquid sample that contains greater than ~5 vol. % sediment; j) sample diluted due to high organic content

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Blymyer Engineers, Inc.	Client Project ID: #201064	Date Sampled: 08/07/01
1829 Clement Avenue		Date Received: 08/08/01
Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/08/01

Semi-Volatile Organics By GC/MS

EPA method 625 and 3510 or 8270 and 3550

Lab ID	74374
Client ID	B8B-15
Matrix	S

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	oncentration	Reporting Limit W	Reporting Limit S
Acenaphthene	ND<1.0	10	0.33	Di-n-octyl Phthalate	ND<1.0	10	0.33
Acenaphthylene	ND<1.0	10	0.33	1,2-Diphenylhydrazine	ND<1.0	10	0.33
Anthracene	ND<1.0	10	0.33	Fluoranthene	ND<1.0	10	0.33
Benzidine	ND<5.0	50	1.6	Fluorene	ND<1.0	10	0.33
Benzoic Acid	ND<5.0	50	1.6	Hexachlorobenzene	ND<1.0	10	0.33
Benzo(a)anthracene	ND<1.0	10	0.33	Hexachlorobutadiene	ND<1.0	10	0.33
Benzo(b)fluoranthene	ND<1.0	10	0.33	Hexachlorocyclopentadiene	ND<5.0	50	1.6
Benzo(k)fluoranthene	ND<1.0	10	0.33	Hexachloroethane	ND<1.0	10	0.33
Benzo(g,h,i)perylene	ND<1.0	10	0.33	Indeno(1,2,3-cd)pyrene	ND<1.0	10	0.33
Benzo(a)pyrene	ND<1.0	10	0.33	Isophorone	ND<1.0	10	0.33
Benzyl Alcohol	ND<2.0	20	0.66	2-Methylnaphthalene	6.0	10[j]	0.33
Bis(2-chloroethoxy)methane	ND<1.0	10	0.33	2-Methylphenol (o-Cresol)	ND<1.0	10	0.33
Bis(2-chloroethyl) Ether	ND<1.0	10	0.33	3 &/or 4-Methylphenol (m &/or p-Cresol)	ND<1.0	10	0.33
Bis(2-chloroisopropyl)Ether	ND<1.0	10	0.33	Naphthalene	7.2	10	0.33
Bis(2-ethylhexyl) Phthalate	ND<1.0	10	0.33	2-Nitroaniline	ND<5.0	50	1.6
4-Bromophenyl Phenyl Ether	ND<1.0	10	0.33	3-Nitroaniline	ND<5.0	50	1.6
Butylbenzyl Phthalate	ND<1.0	10	0.33	4-Nitroaniline	ND<5.0	50	1.6
4-Chloroanaline	ND<2.0	20	0.66	2-Nitrophenol	ND<5.0	50	1.6
4-Chloro-3-methylpheno[	ND<1.0	10	0.33	4-Nitrophenol	ND<5.0	50	1.6
2-Chloronaphthalene	ND<1.0	10	0.33	Nitrobenzene	ND<1.0	10	0.33
2-Chlorophenol	ND<1.0	10	0.33	N-Nitrosodimethylamine	ND<1.0	10	0.33
4-Chlorophenyl Phenyl Ether	ND<1.0	10	0.33	N-Nitrosodiphenylamine	ND<1.0	10	0.33
Chrysene	ND<1.0	10	0.33	N-Nitrosodi-n-propylamine	ND<1.0	10	0.33
Dibenzo(a,h)anthracene	ND<1.0	10	0.33	Pentachlorophenol	ND<5.0	50	1.6
Dibenzofuran	ND<1.0	10	0.33	Phenanthrene	ND<1.0	10	0.33
Di-n-butyl Phthalate	ND<1.0	10	0.33	Phenol	ND<1.0	10	0.33
1,2-Dichlorobenzene	ND<1.0	10	0.33	Pyrene	ND<1.0	10	0.33
1,3-Dichlorobenzene	ND<1.0	10	0.33	1,2,4-Trichlorobenzene	ND<1.0	10	0.33
1,4-Dichlorobenzene	ND<1.0	10	0.33	2,4,5-Trichlorophenol	ND<1.0	10	0.33
3,3-Dichlorobenzidine	ND<2.0	20	0.66	2,4,6-Trichlorophenol	ND<1.0	10	0.33
2,4-Dichlorophenol	ND<1.0	10	0.33	Comments:			
Diethyl Phthalate	ND<1.0	10	0.33	**Surrogate Recoveries (%)**			
2,4-Dimethylphenol	ND<1.0	10	0.33	2-Fluorophenol	82		
Dimethyl Phthalate	ND<1.0	10	0.33	Phenol-d5	—[#]		
4,6-Dinitro-2-methylphenol	ND<5.0	50	1.6	Nitrobenzene-d5	97		
2,4-Dinitrophenol	ND<5.0	50	1.6	2-Fluorobiphenyl	75		
2,4-Dinitrotoluene	ND<1.0	10	0.33	2,4,6-Tribromophenol	---[#]		
2,6-Dinitrotoluene	ND<1.0	10	0.33	p-Terphenyl-d14	---[#]		

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

[#] surrogate diluted out of range

h) lighter than water immiscible sheen is present; i)liquid sample that contains greater than ~5 vol. % sediment; j) sample diluted due to high organic content

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		Date Received: 08/08/01
	Client Contact: Mark Detterman	Date Extracted: 08/08-08/09/01
	Client P.O:	Date Analyzed: 08/08-08/09/01

Semi-Volatile Organics By GC/MS

EPA method 625 and 3510 or 8270 and 3550

Lab ID	74378
Client ID	B7W
Matrix	W

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	oncentration	Reporting Limit W	Reporting Limit S
Acenaphthene	ND	10	0.33	Di-n-octyl Phthalate	ND	10	0.33
Acenaphthylene	ND	10	0.33	1,2-Diphenylhydrazine	ND	10	0.33
Anthracene	ND	10	0.33	Fluoranthene	ND	10	0.33
Benzidine	ND	50	1.6	Fluorene	ND	10	0.33
Benzoic Acid	ND	50	1.6	Hexachlorobenzene	ND	10	0.33
Benzo(a)anthracene	ND	10	0.33	Hexachlorobutadiene	ND	10	0.33
Benzo(b)fluoranthene	ND	10	0.33	Hexachlorocyclopentadiene	ND	50	1.6
Benzo(k)fluoranthene	ND	10	0.33	Hexachloroethane	ND	10	0.33
Benzo(g,h,i)perylene	ND	10	0.33	Indeno(1,2,3-cd)pyrene	ND	10	0.33
Benzo(a)pyrene	ND	10	0.33	Isophorone	ND	10	0.33
Benzyl Alcohol	ND	20	0.66	2-Methylnaphthalene	ND	10	0.33
Bis(2-chloroethoxy)methane	ND	10	0.33	2-Methylphenol (o-Cresol)	ND	10	0.33
Bis(2-chloroethyl) Ether	ND	10	0.33	3 &/or 4-Methylphenol (m &/or p-Cresol)	ND	10	0.33
Bis(2-chloroisopropyl)Ether	ND	10	0.33	Naphthalene	ND	10	0.33
Bis(2-ethylhexyl) Phthalate	ND	10	0.33	2-Nitroaniline	ND	50	1.6
4-Bromophenyl Phenyl Ether	ND	10	0.33	3-Nitroaniline	ND	50	1.6
Butylbenzyl Phthalate	ND	10	0.33	4-Nitroaniline	ND	50	1.6
4-Chloroanaline	ND	20	0.66	2-Nitrophenol	ND	50	1.6
4-Chloro-3-methylpheno'	ND	10	0.33	4-Nitrophenol	ND	50	1.6
2-Chloronaphthalene	ND	10	0.33	Nitrobenzene	ND	10	0.33
2-Chlorophenol	ND	10	0.33	N-Nitrosodimethylamine	ND	10	0.33
4-Chlorophenyl Phenyl Ether	ND	10	0.33	N-Nitrosodiphenylamine	ND	10	0.33
Chrysene	ND	10	0.33	N-Nitrosodi-n-propylamine	ND	10	0.33
Dibenzo(a,h)anthracene	ND	10	0.33	Pentachlorophenol	ND	50	1.6
Dibenzofuran	ND	10	0.33	Phenanthrene	ND	10	0.33
Di-n-butyl Phthalate	ND	10	0.33	Phenol	ND	10	0.33
1,2-Dichlorobenzene	ND	10	0.33	Pyrene	ND	10	0.33
1,3-Dichlorobenzene	ND	10	0.33	1,2,4-Trichlorobenzene	ND	10	0.33
1,4-Dichlorobenzene	ND	10	0.33	2,4,5-Trichlorophenol	ND	10	0.33
3,3-Dichlorobenzidine	ND	20	0.66	2,4,6-Trichlorophenol	ND	10	0.33
2,4-Dichlorophenol	ND	10	0.33	Comments: i			
Diethyl Phthalate	ND	10	0.33	**Surrogate Recoveries (%)**			
2,4-Dimethylphenol	ND	10	0.33	2-Fluorophenol	41		
Dimethyl Phthalate	ND	10	0.33	Phenol-d5	30		
4,6-Dinitro-2-methylphenol	ND	50	1.6	Nitrobenzene-d5	52		
2,4-Dinitrophenol	ND	50	1.6	2-Fluorobiphenyl	44		
2,4-Dinitrotoluene	ND	10	0.33	2,4,6-Tribromophenol	37		
2,6-Dinitrotoluene	ND	10	0.33	p-Terphenyl-d14	33		

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

* surrogate diluted out of range

h) lighter than water immiscible sheen is present; i)liquid sample that contains greater than ~5 vol. % sediment; j) sample diluted due to high organic content

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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #201064	Date Sampled: 08/07/01
		Date Received: 08/08/01
	Client Contact: Mark Detterman	Date Extracted: 08/08-08/09/01
	Client P.O:	Date Analyzed: 08/08-08/09/01

Semi-Volatile Organics By GC/MS

EPA method 625 and 3510 or 8270 and 3550

Lab ID	74379
Client ID	B8W
Matrix	W

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	oncentration	Reporting Limit W	Reporting Limit S
Acenaphthene	ND<25	10	0.33	Di-n-octyl Phthalate	ND<25	10	0.33
Acenaphthylene	ND<25	10	0.33	1,2-Diphenylhydrazine	ND<25	10	0.33
Anthracene	ND<25	10	0.33	Fluoranthene	ND<25	10	0.33
Benzidine	ND<125	50	1.6	Fluorene	ND<25	10	0.33
Benzoic Acid	ND<125	50	1.6	Hexachlorobenzene	ND<25	10	0.33
Benzo(a)anthracene	ND<25	10	0.33	Hexachlorobutadiene	ND<25	10	0.33
Benzo(b)fluoranthene	ND<25	10	0.33	Hexachlorocyclopentadiene	ND<125	50	1.6
Benzo(k)fluoranthene	ND<25	10	0.33	Hexachloroethane	ND<25	10	0.33
Benzo(g,h,i)perylene	ND<25	10	0.33	Indeno(1,2,3-cd)pyrene	ND<25	10	0.33
Benzo(a)pyrene	ND<25	10	0.33	Isophorone	ND<25	10	0.33
Benzyl Alcohol	ND<50	20	0.66	2-Methylnaphthalene	280	10	0.33
Bis(2-chloroethoxy)methane	ND<25	10	0.33	2-Methylphenol (o-Cresol)	ND<25	10	0.33
Bis(2-chloroethyl) Ether	ND<25	10	0.33	3 &/or 4-Methylphenol (m &/or p-Cresol)	ND<25	10	0.33
Bis(2-chloroisopropyl)Ether	ND<25	10	0.33	Naphthalene	430	10	0.33
Bis(2-ethylhexyl) Phthalate	ND<25	10	0.33	2-Nitroaniline	ND<125	50	1.6
4-Bromophenyl Phenyl Ether	ND<25	10	0.33	3-Nitroaniline	ND<125	50	1.6
Butylbenzyl Phthalate	ND<25	10	0.33	4-Nitroaniline	ND<125	50	1.6
4-Chloroanaline	ND<50	20	0.66	2-Nitrophenol	ND<125	50	1.6
4-Chloro-3-methylpheno[	ND<25	10	0.33	4-Nitrophenol	ND<125	50	1.6
2-Chloronaphthalene	ND<25	10	0.33	Nitrobenzene	ND<25	10	0.33
2-Chlorophenol	ND<25	10	0.33	N-Nitrosodimethylamine	ND<25	10	0.33
4-Chlorophenyl Phenyl Ether	ND<25	10	0.33	N-Nitrosodiphenylamine	ND<25	10	0.33
Chrysene	ND<25	10	0.33	N-Nitrosodi-n-propylamine	ND<25	10	0.33
Dibenzo(a,h)anthracene	ND<25	10	0.33	Pentachlorophenol	ND<125	50	1.6
Dibenzofuran	ND<25	10	0.33	Phenanthrene	ND<25	10	0.33
Di-n-butyl Phthalate	ND<25	10	0.33	Phenol	ND<25	10	0.33
1,2-Dichlorobenzene	ND<25	10	0.33	Pyrene	ND<25	10	0.33
1,3-Dichlorobenzene	ND<25	10	0.33	1,2,4-Trichlorobenzene	ND<25	10	0.33
1,4-Dichlorobenzene	ND<25	10	0.33	2,4,5-Trichlorophenol	ND<25	10	0.33
3,3-Dichlorobenzidine	ND<50	20	0.66	2,4,6-Trichlorophenol	ND<25	10	0.33
2,4-Dichlorophenol	ND<25	10	0.33	Comments: i			
Diethyl Phthalate	ND<25	10	0.33	**Surrogate Recoveries (%)**			
2,4-Dimethylphenol	ND<25	10	0.33	2-Fluorophenol	---#		
Dimethyl Phthalate	ND<25	10	0.33	Phenol-d5	---#		
4,6-Dinitro-2-methylphenol	ND<125	50	1.6	Nitrobenzene-d5	48		
2,4-Dinitrophenol	ND<125	50	1.6	2-Fluorobiphenyl	41		
2,4-Dinitrotoluene	ND<25	10	0.33	2,4,6-Tribromophenol	---#		
2,6-Dinitrotoluene	ND<25	10	0.33	p-Terphenyl-d14	---#		

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range

h) lighter than water immiscible sheen is present; i)liquid sample that contains greater than ~5 vol. % sediment; j) sample diluted due to high organic content

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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #201064	Date Sampled: 08/07/01 Date Received: 08/08/01
	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/08/01

LUFT Metals*

EPA analytical methods 6010/200.7, 239.2#

Lab ID	Client ID	Matrix	Extraction°	Cadmium	Chromium	Lead	Nickel	Zinc	% Recovery Surrogate
74358	B6-0.5	S	TTLC	ND	32	9.8	23	19	103
74359	B6-5	S	TTLC	ND	29	6.9	36	30	104
74360	B6-10	S	TTLC	0.70	37	5.8	58	44	97
74361	B6-15	S	TTLC	ND	25	5.9	48	49	103
74362	B5-0.5	S	TTLC	ND	28	16	19	43	101
74363	B5-5	S	TTLC	ND	26	6.3	26	22	102
74364	B5-10	S	TTLC	ND	31	7.6	63	37	100
74365	B5-15	S	TTLC	ND	20	6.0	32	34	104
74366	B7-0.5	S	TTLC	0.95	26	270	43	220	101
74367	B7-2.0	S	TTLC	ND	33	8.4	24	21	103
74368	B7-7.5	S	TTLC	ND	33	7.0	27	15	102
74369	B7-10	S	TTLC	ND	24	7.9	24	14	103
74370	B7-14.5	S	TTLC	ND	30	6.6	27	33	102
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		S	TTLC	0.5 mg/kg	0.5	3.0	2.0	1.0	
		W	TTLC	0.005 mg/L	0.02	0.005	0.05	0.05	
		—	STLC, TCLP	0.01 mg/L	0.05	0.2	0.05	0.05	

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

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

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

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

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

& reporting limit raised due to matrix interference

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

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Blymyer Engineers, Inc.	Client Project ID: #201064	Date Sampled: 08/07/01
1829 Clement Avenue		Date Received: 08/08/01
Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/08/01
	Client P.O:	Date Analyzed: 08/08/01

LUFT Metals*

EPA analytical methods 6010/200.7, 239.2+

Lab ID	Client ID	Matrix	Extraction°	Cadmium	Chromium	Lead	Nickel	Zinc	% Recovery Surrogate
74371	B8B-0.5	S	TTLC	52	110	3100	240	2100	105
74372	B8B-5.5	S	TTLC	ND	41	12	15	23	102
74373	B8B-10	S	TTLC	ND	33	9.8	64	42	100
74374	B8B-15	S	TTLC	0.57	35	74	28	43	101
74375	B9-2	S	TTLC	ND	28	11	30	21	103
74376	B5W	W	Dissolved	ND	ND	ND	ND	ND	N/A
74377	B6W	W	Dissolved	ND	ND	ND	ND	ND	N/A
74378	B7W	W	Dissolved	0.0061	ND	ND	ND	ND	N/A
74379	B8W	W	Dissolved	ND	ND	ND	ND	ND	N/A
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		S	TTLC	0.5 mg/kg	0.5	3.0	2.0	1.0	
		W	Dissolved	0.005 mg/L	0.02	0.005	0.05	0.05	
		—	STLC, TCLP	0.01 mg/L	0.05	0.2	0.05	0.05	

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

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

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

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

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

& reporting limit raised due to matrix interference

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

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Edward Hamilton, Lab Director

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

QC REPORT

EPA 8015m + 8020

Date: 08/08/01 **Extraction:** EPA 5030 **Matrix:** Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 80801					Instrument:		IR-1
Surrogate1	ND	91.5	90.1	100.00	92	90	1.5
TRPH	ND	19.3	19.4	20.80	93	93	0.5

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

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 200$$

RPD means Relative Percent Deviation

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QC REPORT

VOCs (EPA 8240/8260)

Date: 08/08/01-08/09/01 **Extraction:** EPA 5030 **Matrix:** Soil

Compound	Concentration: ug/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 80701					Instrument:	GC-4	
Surrogate	ND	101.0	105.0	100.00	101	105	3.9
Toluene	ND	51.5	49.5	50.00	103	99	4.0
Benzene	ND	43.5	42.5	50.00	87	85	2.3
Chlorobenzene	ND	44.0	42.0	50.00	88	84	4.7
Trichloroethane	ND	42.5	41.5	50.00	85	83	2.4
1,1-Dichloroethene	ND	59.0	57.5	50.00	118	115	2.6

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

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} \cdot 200$$

RPD means Relative Percent Deviation

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QC REPORT

SVOCs (EPA 8270/625/525)

Date: 08/08/01-08/09/01 **Extraction:** N/A **Matrix:** Soil

Compound	Concentration: ug/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 80801					Instrument:	GC-8	
Surrogate1	ND	980.0	940.0	1000.00	98	94	4.2
Pyrene	ND	590.0	540.0	1000.00	59	54	8.8
Pentachlorophenol	ND	1010.0	1010.0	2000.00	51	51	0.0
2,4-Dinitrotoluene	ND	610.0	570.0	1000.00	61	57	6.8
4-Nitrophenol	ND	1910.0	1930.0	2000.00	96	97	1.0
Acenaphtene	ND	690.0	630.0	1000.00	69	63	9.1
4-Chloro-3-metylphenol	ND	1400.0	1470.0	2000.00	70	74	4.9
1,2,4-trichlorobenzene	ND	650.0	610.0	1000.00	65	61	6.3
N-nitroso-di-n-propyl	ND	800.0	800.0	1000.00	80	80	0.0
1,4-Dichlorobenzene	ND	710.0	670.0	1000.00	71	67	5.8
2-Chlorophenol	ND	1400.0	1370.0	2000.00	70	69	2.2
Phenol	ND	1170.0	1160.0	2000.00	59	58	0.9

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

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 200$$

RPD means Relative Percent Deviation

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QC REPORT

LUFT

Date: 08/08/01-08/09/01 **Extraction:** TTLC **Matrix:** Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 80801					Instrument:	P-1 | AA	
Surrogate1	ND	101.6	103.1	100.00	102	103	1.5
Copper	ND	4.9	5.0	5.00	98	99	1.6
Zinc	ND	5.2	5.2	5.00	104	104	0.2
Lead	ND	4.9	5.1	5.00	99	101	2.4
Nickel	ND	5.0	5.0	5.00	100	99	0.4
Chromium	ND	5.2	5.3	5.00	104	106	2.6
Cadmium	ND	5.3	5.3	5.00	106	106	0.7

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

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

RPD means Relative Percent Deviation

Alpha Analytical Laboratories Inc.
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31 August 2001

McCampbell Analytical
Attn: Ed Hamilton
110 2nd Ave. South, #D7
Pacheco CA, 94553-5560
RE: BEI
Work Order: A108455

Enclosed are the results of analyses for samples received by the laboratory on 08/24/01 11:24. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sheri Speaks

Sheri L. Speaks
Project Manager

Alpha Analytical Laboratories Inc.
860 Waugh Lane, H-1, Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

McCampbell Analytical
110 2nd Ave. South, #D7
Pacheco CA, 94553-5560
Attn: Ed Hamilton

Report Date: 08/31/01 10:59
Project No: -
Project ID: BEI

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A108455	08/24/2001 11:24	MCCLAB	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B6 - 5 (74359)	A108455-01	Soil	08/07/01 09:25	08/24/01 11:24
B6 - 15 (74361)	A108455-02	Soil	08/07/01 09:50	08/24/01 11:24

Sheri Speaks

Sheri L. Speaks
Project Manager

8/31/01

Alpha Analytical Laboratories Inc.
860 Waugh Lane, H-1, Ukiah, California 95482
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CHEMICAL EXAMINATION REPORT

McCampbell Analytical
110 2nd Ave. South, #D7
Pacheco CA, 94553-5560
Attn: Ed Hamilton

Report Date: 08/31/01 10:59
Project No: -
Project ID: BEI

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A108455	08/24/2001 11:24	MCCLAB	

Alpha Analytical Laboratories, Inc.

	METHOD	BATCH	PREPARED	ANALYZED	DILUTION	RESULT	PQL	NOTE
B6 - 5 (74359) (A108455-01)			**Sample Type: Soil**			**Sampled: 08/07/01 09:25**		
Organic Carbon by 9060								
Total Organic Carbon	EPA 9060	AH12709	08/27/01	08/30/01	1	**715 mg/kg**	**1.00**	
B6 - 15 (74361) (A108455-02)			**Sample Type: Soil**			**Sampled: 08/07/01 09:50**		
Organic Carbon by 9060								
Total Organic Carbon	EPA 9060	AH12709	08/27/01	08/30/01	1	**260 mg/kg**	**1.00**	

Sheri Speaks

Sheri L. Speaks
Project Manager

8/31/01

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CHEMICAL EXAMINATION REPORT

McCampbell Analytical
110 2nd Ave. South, #D7
Pacheco CA, 94553-5560
Attn: Ed Hamilton

Report Date: 08/31/01 10:59
Project No: -
Project ID: BEI

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A108455	08/24/2001 11:24	MCCLAB	

Organic Carbon by 9060 - Quality Control

Analyte(s)	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AH12709 - EPA 3060A Cr6Digest										
Blank (AH12709-BLK1)				Prepared: 08/27/01 Analyzed: 08/30/01						
Total Organic Carbon	ND	1.00	mg/kg							
LCS (AH12709-BS1)				Prepared: 08/27/01 Analyzed: 08/30/01						
Total Organic Carbon	5900	1.00	mg/kg	6250		94.4	85-115			
LCS Dup (AH12709-BSD1)				Prepared: 08/27/01 Analyzed: 08/30/01						
Total Organic Carbon	5670	1.00	mg/kg	6250		90.7	85-115	3.98	20	
Duplicate (AH12709-DUP1)		**Source: A108455-01**		Prepared: 08/27/01 Analyzed: 08/30/01						
Total Organic Carbon	630	1.00	mg/kg		715			12.6	20	

Sheri Speaks

Sheri L. Speaks
Project Manager

8/31/01

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CHEMICAL EXAMINATION REPORT

McCampbell Analytical
110 2nd Ave. South, #D7
Pacheco CA, 94553-5560
Attn: Ed Hamilton

Report Date: 08/31/01 10:59
Project No: -
Project ID: BEI

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A108455	08/24/2001 11:24	MCCLAB	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
PQL	Practical Quantitation Limit

[redacted]

CHAIN OF CUSTODY RECORD

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

Report To: Gina A Butler **Bill To:** MAI

Project #: 27173 **Project Name:** BEI

Project Location:

SAMPLE ID	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other
B6-5	8/9/01	09:25	1	VOA		X				X			
B6-15	↓	09:50	↓	↓		X				X			

ANALYSIS REQUEST

Asbestos	BOD	Sulfide	Cyanide	96hr Static % Survival Fish BioAssay Flat Headminnows & 3 Spine Sticklebacks	DOC	TOC	Ammonia	TKN	Alkalinity	Turbidity	Nitrate	Fish Bioassay	Fluoride	Coliform	Chloride	General Minerals	EPA
						X											
						X											

COMMENTS

☐ *36 hr hold time please dechlorinate

Relinquished By: Gina A Butler	**Date:** 8/21/01	**Time:**	**Received By:** Cal overnight
Relinquished By:	**Date:** 8/21/01	**Time:** 11:24	**Received By:** [signature]
Relinquished By:	**Date:**	**Time:**	**Received By:**

Remarks:

Time per client - per phone 8/21.

74359

74361

27173
ZBEI20

BLYMYER ENGINEERS, INC.
1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

CHAIN OF CUSTODY RECORD

PAGE 1 OF 2

JOB #: 201064

PROJECT NAME/LOCATION: Robert Mintz Design

SAMPLERS (SIGNATURE): [signature]

TURNAROUND TIME: 5/Std DAY(S)

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	LUFT Metals (5)		REMARKS
8/7/01	925		X	B6-0.5	1 liner					X		X	74363	(*)
↓	925		↓	B6-5	↓					X		↑	74364	2 Highest values for TRPH
	940			B6-10						X			74365	in soil ~~..~~
	950			B6-15						X			74366	(4 total samples) to be
	1010			B5-0.5						X			74367	analyzed for
	1015			B5-5						X			74368	VOC's by 8240 +
	1020			B5-10						X			74369	SVOC's by 8270
	1025			B5-15						X			74370	
	1035			B7-0.5						X			74371	Run groundwater
	1045			B7-2.0									74372	Samples as marked
	1050			B7-7.5						X				(including 8240/8270)
	1055			B7-10						X				
	1105			B7-14.5						X				
	1150			B8B-0.5				(*)	(*)	X				
↓	1200		↓	B8B-5.5	↓					X		X		

74358
74359
74360
74361
74362

REQUESTED BY: Mark Detterman

RESULTS AND INVOICE TO: Mark Detterman / Blymyer Engineers

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark [signature]	8/8/01 1221PM	[signature] X233	[signature] X233	8/8/01 1436	Maria Venegas
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE / TIME	REMARKS:	

BLYMYER
ENGINEERS, INC.
BEI
1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

CHAIN OF CUSTODY RECORD

JOB #: 201061
PROJECT NAME/LOCATION: Robert Mintz Design
SAMPLERS (SIGNATURE): Mark [signature]

TURNAROUND TIME: 5/std DAY(S)
REMARKS: ⊛ See pg 1 for special instructions

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	LUFT Metals (5)			HOLD	
8/7/01	1215		X	B8B-10	1 liner					X		X				74373
↓	1225		↓	B8B-15	↓			⊛	⊛	↓		↓				74374
	1255			B9-2												74375
+5	1000			B5W	⊛ 2 VOA, 1 Amber, 2 poly											74376
+	1030			B6W	4											74377
+5	1115			B7W	4			X	X							74378
+5	1245		↓	B8W	↓4			X	X	↓		↓				
↓	1130		X	B8-0.5											Hold	74379
↓	1140		X	B8-7.5											Hold	74380H
																74381H

REQUESTED BY: Mark [signature]

RESULTS AND INVOICE TO: Mark [signature] @ Blymyer Engineers

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark [signature]	8/8/01 122PM	[signature] X233	[signature] X233		[signature]

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE / TIME	REMARKS:

... Voa's Received

McCAMPBELL ANALYTICAL INC.
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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #201064	Date Sampled: 08/07/01
		Date Received: 08/08/01
	Client Contact: Mark Detterman	Date Extracted: 08/17/01
	Client P.O:	Date Analyzed: 08/17/01

Volatile Organics By GC/MS

EPA method 624 or 8240

Lab ID	74373
Client ID	B8B-10
Matrix	S

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	Concentration*	Reporting Limit W	Reporting Limit S
Acetone [b]	ND<35	5.0	25	cis-1,3-Dichloropropene	ND	1.0	5.0
Benzene	ND	1.0	5.0	trans-1,3-Dichloropropene	ND	1.0	5.0
Bromodichloromethane	ND	1.0	5.0	Ethylbenzene	58	1.0	5.0
Bromoform	ND	1.0	5.0	Methyl butyl ketone [d]	ND	1.0	5.0
Bromomethane	ND	1.0	5.0	Methylene Chloride[e]	ND	1.0	5.0
Carbon Disulfide	ND	1.0	5.0	Methyl ethyl ketone [f]	ND	2.0	10
Carbon Tetrachloride	ND	1.0	5.0	Methyl isobutyl ketone [g]	ND	1.0	5.0
Chlorobenzene	ND	1.0	5.0	Styrene [k]	ND	1.0	5.0
Chloroethane	ND	1.0	5.0	1,1,2,2-Tetrachloroethane	ND	1.0	5.0
2-Chloroethyl Vinyl Ether[c]	ND	1.0	5.0	Tetrachloroethene	ND	1.0	5.0
Chloroform	ND	1.0	5.0	Toluene [l]	ND	1.0	5.0
Chloromethane	ND	1.0	5.0	1,1,1-Trichloroethane	ND	1.0	5.0
Dibromochloromethane	ND	1.0	5.0	1,1,2-Trichloroethane	ND	1.0	5.0
1,2-Dichlorobenzene	ND	1.0	5.0	Trichloroethene	ND	1.0	5.0
1,3-Dichlorobenzene	ND	1.0	5.0	Trichlorofluoromethane	ND	1.0	5.0
1,4-Dichlorobenzene	ND	1.0	5.0	Vinyl Acetate [m]	ND	5.0	25
1,1-Dichloroethane	ND	1.0	5.0	Vinyl Chloride [n]	ND	1.0	5.0
1,2-Dichloroethane	ND	1.0	5.0	Xylenes, total [o]	110	1.0	5.0
1,1-Dichloroethene	ND	1.0	5.0	**Surrogate Recoveries (%)**			
cis-1,2-Dichloroethene	ND	1.0	5.0	Dibromofluoromethane	103		
trans-1,2-Dichloroethene	ND	1.0	5.0	Toluene-d8	100		
1,2-Dichloropropane	ND	1.0	5.0	4-Bromofluorobenzene	98		

Comments:

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(b) 2-propanone or dimethyl ketone; (c) (2-chloroethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethenylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Blymyer Engineers, Inc.	Client Project ID: #201064	Date Sampled: 08/07/01
1829 Clement Avenue		Date Received: 08/08/01
Alameda, CA 94501	Client Contact: Mark Detterman	Date Extracted: 08/17/01
	Client P.O:	Date Analyzed: 08/17/01

Semi-Volatile Organics By GC/MS

EPA method 625 and 3510 or 8270 and 3550

Lab ID	74373
Client ID	B8B-10
Matrix	S

Compound	Concentration*	Reporting Limit W	Reporting Limit S	Compound	Concentration	Reporting Limit W	Reporting Limit S
Acenaphthene	ND	10	0.33	Di-n-octyl Phthalate	ND	10	0.33
Acenaphthylene	ND	10	0.33	1,2-Diphenylhydrazine	ND	10	0.33
Anthracene	ND	10	0.33	Fluoranthene	ND	10	0.33
Benzidine	ND	50	1.6	Fluorene	ND	10	0.33
Benzoic Acid	ND	50	1.6	Hexachlorobenzene	ND	10	0.33
Benzo(a)anthracene	ND	10	0.33	Hexachlorobutadiene	ND	10	0.33
Benzo(b)fluoranthene	ND	10	0.33	Hexachlorocyclopentadiene	ND	50	1.6
Benzo(k)fluoranthene	ND	10	0.33	Hexachloroethane	ND	10	0.33
Benzo(g,h,i)perylene	ND	10	0.33	Indeno(1,2,3-cd)pyrene	ND	10	0.33
Benzo(a)pyrene	ND	10	0.33	Isophorone	ND	10	0.33
Benzyl Alcohol	ND	20	0.66	2-Methylnaphthalene	0.36	10	0.33
Bis(2-chloroethoxy)methane	ND	10	0.33	2-Methylphenol (o-Cresol)	ND	10	0.33
Bis(2-chloroethyl) Ether	ND	10	0.33	3 &/or 4-Methylphenol (m &/or p-Cresol)	ND	10	0.33
Bis(2-chloroisopropyl)Ether	ND	10	0.33	Naphthalene	0.38	10	0.33
Bis(2-ethylhexyl) Phthalate	ND	10	0.33	2-Nitroaniline	ND	50	1.6
4-Bromophenyl Phenyl Ether	ND	10	0.33	3-Nitroaniline	ND	50	1.6
Butylbenzyl Phthalate	ND	10	0.33	4-Nitroaniline	ND	50	1.6
4-Chloroanaline	ND	20	0.66	2-Nitrophenol	ND	50	1.6
4-Chloro-3-methylpheno'	ND	10	0.33	4-Nitrophenol	ND	50	1.6
2-Chloronaphthalene	ND	10	0.33	Nitrobenzene	ND	10	0.33
2-Chlorophenol	ND	10	0.33	N-Nitrosodimethylamine	ND	10	0.33
4-Chlorophenyl Phenyl Ether	ND	10	0.33	N-Nitrosodiphenylamine	ND	10	0.33
Chrysene	ND	10	0.33	N-Nitrosodi-n-propylamine	ND	10	0.33
Dibenzo(a,h)anthracene	ND	10	0.33	Pentachlorophenol	ND	50	1.6
Dibenzofuran	ND	10	0.33	Phenanthrene	ND	10	0.33
Di-n-butyl Phthalate	ND	10	0.33	Phenol	ND	10	0.33
1,2-Dichlorobenzene	ND	10	0.33	Pyrene	ND	10	0.33
1,3-Dichlorobenzene	ND	10	0.33	1,2,4-Trichlorobenzene	ND	10	0.33
1,4-Dichlorobenzene	ND	10	0.33	2,4,5-Trichlorophenol	ND	10	0.33
3,3-Dichlorobenzidine	ND	20	0.66	2,4,6-Trichlorophenol	ND	10	0.33
2,4-Dichlorophenol	ND	10	0.33	Comments:			
Diethyl Phthalate	ND	10	0.33	**Surrogate Recoveries (%)**			
2,4-Dimethylphenol	ND	10	0.33	2-Fluorophenol	98		
Dimethyl Phthalate	ND	10	0.33	Phenol-d5	97		
4,6-Dinitro-2-methylphenol	ND	50	1.6	Nitrobenzene-d5	101		
2,4-Dinitrophenol	ND	50	1.6	2-Fluorobiphenyl	104		
2,4-Dinitrotoluene	ND	10	0.33	2,4,6-Tribromophenol	91		
2,6-Dinitrotoluene	ND	10	0.33	p-Terphenyl-d14	117		

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range

h) lighter than water immiscible sheen is present; i)liquid sample that contains greater than ~5 vol. % sediment; j) sample diluted due to high organic content

DHS Certification No. 1644

Edward Hamilton, Lab Director

BLYMYER ENGINEERS, INC. (BEI)

1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

27173

CHAIN OF CUSTODY RECORD

JOB # 201069 | PROJECT NAME/LOCATION: Robert Minty Design

SAMPLERS (SIGNATURE): Mark Sellerman

TURNAROUND TIME: 5/3 Hr DAY(S)

REMARKS: See pg 1 for special instructions

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240) added 8/17/01	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	LUFT Metals (5)	HOLD	
8/7/01	1215		X	B8B-10	11			X	X	X		X		74373
	1225			B8B-15				*	*					74374
	1255			B9-2										74375
+5	1000			B5W	4									74376
+5	1030			B6W	4			Y	Y					74377
+5	1115			B7W	4			Y	Y					74378
+5	1245			B8W										Hold
	1130		X	B8-0.5										Hold
	1140		X	B8-7.5										74379
														74380H
														74381H

REQUESTED BY: Mark Sellerman

RESULTS AND INVOICE TO: Mark Sellerman c/o Blymyer Engineers.

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark Sellerman	8/8/01 1220 PM	X233
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
X233		
	DATE / TIME	REMARKS:

All samples received

Appendix D

Geotechnical Laboratory Report, Cooper Testing Laboratory, dated September 18, 2001

COOPER

COOPER TESTING LABORATORY

1951 Colony St., Unit X, Mountain View, CA 94043

Tel: 650 968-9472 Fax: 650 968-4228

1360-D Industrial Ave., Petaluma, CA 94952

Tel: 707 765-2589 Fax: 707 765-1227

email: cooper@coopertestinglabs.com

www.coopertestinglabs.com

LETTER OF TRANSMITTAL

TO: Blymyer Engineers Inc.,
1829 Clement Ave.,
Alameda, CA 94501
Attn: Mark

DATE: September 18, 2001

PROJECT: 201064 / Robert Mintz

CTL #: 176-003

ENCLOSED: Laboratory soil test data.

REMARKS:

David R. Coore

COOPER TESTING LABS

176-003 8-31

BLYMYER
ENGINEERS, INC.
BEI
1829 Clement Avenue
Alameda, CA 94501 (415) 521-3773

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

JOB #: 201064

PROJECT NAME/LOCATION: Robert Mintz

SAMPLERS (SIGNATURE): Mark E. [signature]

TURNAROUND TIME: ______ DAY(S)

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)		Permeability	Porosity + Grain size		HOLD	REMARKS
8/7/01	945		X	B6-10.5-12	1 liner												
	950			B6-14-15									~~X~~ ND				Silty clay
	955			B6-17-18										X			Silty sand portion only ⊗
				B7-11-12													
				B7-11.5-12.75													
				B7-16.5-17.5									X				Silty clay
	1225			B8-15-16.5													

REQUESTED BY: Mark Jotterman

RESULTS AND INVOICE TO: Mark E. Blymyer Eng.

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark E. [signature]	8/30/01 1145 am				

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE / TIME	REMARKS:

WHITE: Accompany Sample YELLOW: BEI, After Lab Signs PINK: Original Sampler

Hydraulic Conductivity
ASTM D 5084
Cooper Testing Lab, Inc.

Job No:	176-003	**Sample:**	B-7	**Date:**	09/14/01
Client:	Blymyer	**Depth,ft:**	16.5-17.5'	**By:**	DC
Project:	20164	**Soil:**	brown CLAY w/sand		
Remolded To:					

Sample Pressures: **Max. Hydraulic**
Cell: 63.5 psi **Bot. Cap:** 59 psi **Top Cap:** 58 psi **Gradient:** 13

Method C: Falling Head / Rising Tailwater

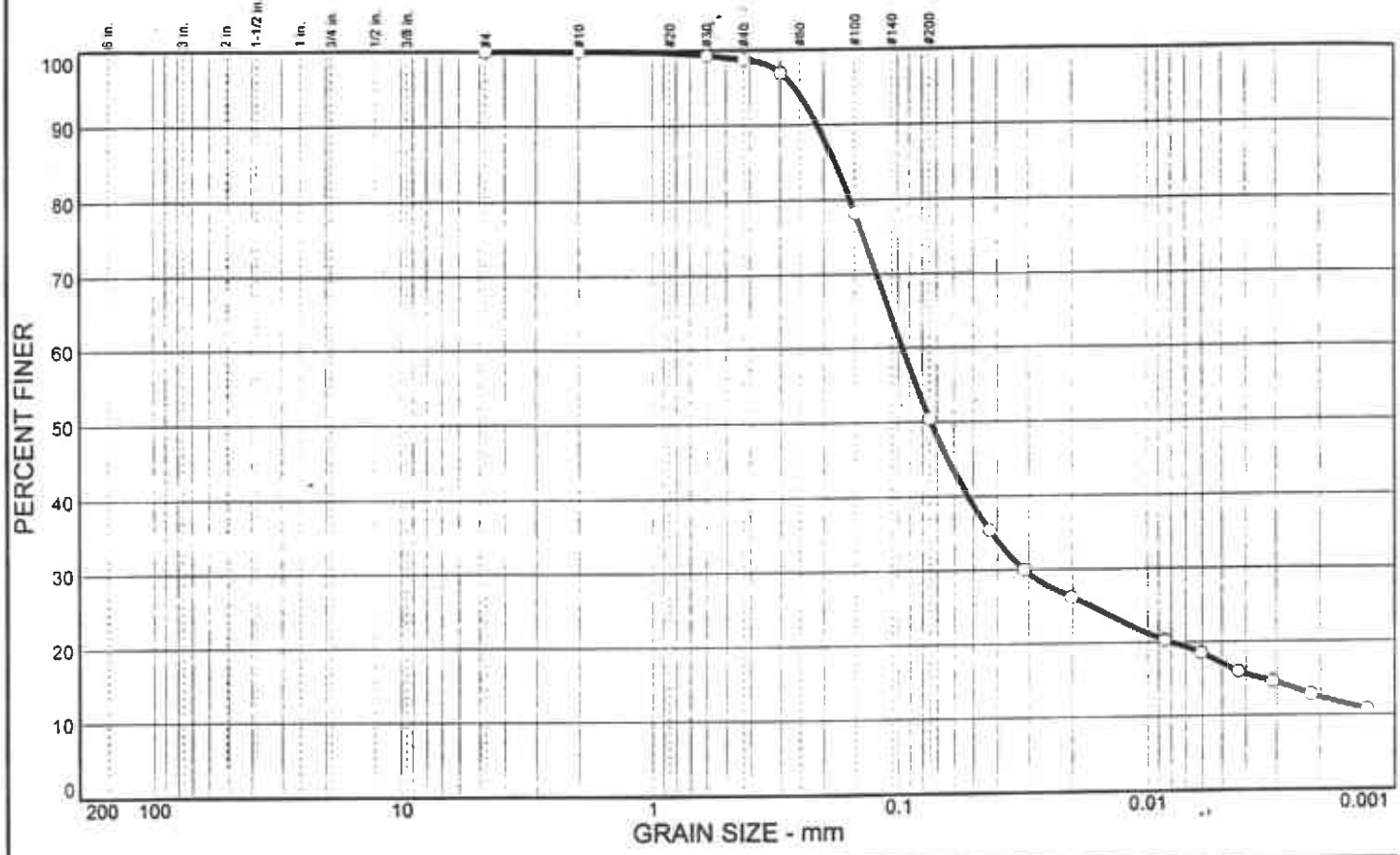
Date / Elapsed Min		Head, (cm)	K,cm/sec	*B: = 1.0
9/9	0	98.33	Start of Test	
9/10	1029	96.53	7.0 x 10E-8	
	1456	95.33	8.3 x 10E-8	
	1759	94.33	9.0 x 10E-8	
9/11	2459	93.33	8.4 x 10E-8	
	2813	92.73	8.3 x 10E-8	
9/12	3677	91.33	7.5 x 10E-8	
	3905	90.93	7.8 x 10E-8	

Average Permeability: 8 x 10E-8 **cm/sec**

Sample Data:	Initial		Final
Height, in	2.97		2.96
Diameter, in	1.64		1.64
Area, in2	2.11		2.11
Volume in3	6.27		6.25
Total Volume, cc	102.71		102.46
Volume Solids, cc	54.30		54.30
Volume Voids, cc	48.41		48.17
Void Ratio	0.89		0.89
Porosity, %	47.13		47.01
Saturation, %	96.88		97.16
Specific Gravity	2.70	Assumed	2.70
Wet Weight, gm	193.5		193.4
Dry Weight, gm	146.6		146.6
Tare, gm	0.00		0.00
Moisture, %	32.0		31.9
Dry Density, pcf	89.1		89.3

Remarks: *B=Delta Pore Press/Delta Cell Press (indication of saturation).

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	% FINES	USCS	AASHTO	PL	LL
○			49.6	33.4	17.0	50.4	ML			

SIEVE inches size	PERCENT FINER		
	○		
	GRAIN SIZE		
D_{60}	0.0964		
D_{30}	0.0313		
D_{10}			
	COEFFICIENTS		
C_C			
C_U			

SIZE	PERCENT FINER		
	○		
#4	100.0		
#10	99.9		
#30	99.3		
#40	98.7		
#50	96.9		
#100	78.2		
#200	50.4		
0.0430 mm.	35.4		
0.0313 mm.	30.0		
0.0202 mm.	26.3		
0.0085 mm.	20.3		
0.0061 mm.	18.5		
0.0043 mm.	16.0		
0.0031 mm.	14.6		
0.0022 mm.	12.8		
0.0013 mm.	10.8		

SOIL DESCRIPTION

○ brown sandy CLAY

REMARKS:

○

○ Source: Bulk Sample No.: B6 Elev./Depth: 17-18'

COOPER TESTING LABORATORY

Project: Blymyer / 201064

Feature:

Project No.: 176-003

COOPER TESTING LABS

MOISTURE DENSITY - POROSITY DATA SHEET

Job #	176-003
Client	Blymyer
Project/Location	201064
Date	09/11/01

Boring #	B6				
Depth (ft)	17-18				
Soil Type	brown clayey SAND				
Specific Gravity	2.68				
Volume Total cc	104.768				
Volume of Solids	66.101				
Volume of Voids	38.667				
Void Ratio	0.585				
Porosity %	36.9%				
Saturation %	101.2%				
Moisture %	22.1%				
Dry Density (pcf)	105.6				

Remarks

Appendix E

Oakland RBCA Eligibility Checklist form

Oakland RBCA Eligibility Checklist

The Oakland Tier 1 RBSLs and Tier 2 SSTLs are intended to address human health concerns at the majority of sites in Oakland where commonly-found contaminants are present. Complicated sites—especially those with continuing releases, ecological concerns or unusual subsurface conditions—will likely require a Tier 3 analysis. The following checklist is designed to assist you in determining your site's eligibility for the Oakland RBCA levels.

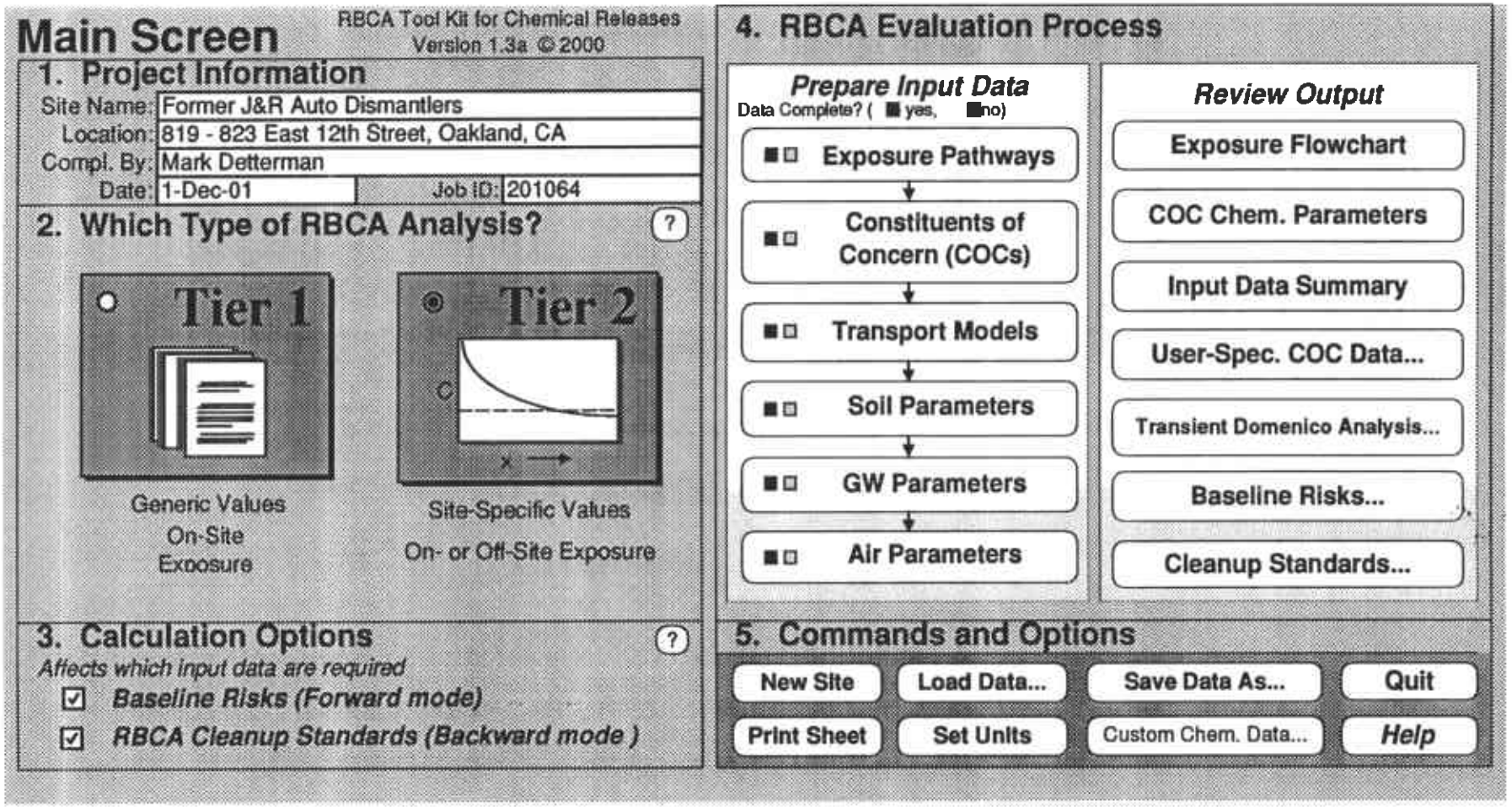
CRITERIA	YES	NO
1. Is there a continuing, *primary* source of a chemical of concern, such as a leaking container, tank or pipe? (This does *not* include residual sources.)	☐	☒
2. Is there any mobile or potentially-mobile free product?	☒	☐
3. Are there more than five chemicals of concern at the site at a concentration greater than the lowest applicable Oakland RBCA level?	☒	☐
4. Are there any preferential vapor migration pathways—such as gravel channels or utility corridors—that are potential conduits for the migration, on-site or off-site, of a volatilized chemical of concern?	☒	☐
5. Do both of the following conditions exist? (a) Groundwater is at depths less than 300 cm (10 feet) (b) Inhalation of volatilized chemicals of concern from groundwater in indoor or outdoor air is a pathway of concern but groundwater ingestion is *not**	☐	☒
6. Are there any existing on-site or off-site structures intended for future use where exposure to indoor air vapors from either soil or groundwater is of concern *and* one of the following three conditions is present? (a) A slab-on-grade foundation that is less than 15 cm (6 inches) thick (b) An enclosed, below-grade space (e.g., a basement) that has floors or walls less than 15 cm (6 inches) thick (c) A crawl space that is not ventilated	☐	☒
7. Are there any immediate, acute health risks to humans associated with contamination at the site, including explosive levels of a chemical?	☐	☒
8. Are there any complete exposure pathways to nearby ecological receptors, such as endangered species, wildlife refuge areas, wetlands, surface water bodies or other protected areas?	☐	☒

*If groundwater ingestion *is* a pathway of concern, the associated Oakland RBCA levels will be more stringent than those for any groundwater-related inhalation scenario, rendering depth to groundwater irrelevant in the risk analysis.

If you answer "no" to all questions, your site is eligible for the Oakland RBCA levels. If you answer "yes" to any of the questions, your site is *not* eligible for the Oakland RBCA levels at this time.

Appendix F

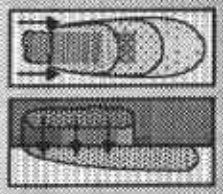
Printouts: Main Screen, Exposure Pathway Identification, and Exposure Pathway Flowchart


Main Screen
RBCA Tool Kit for Chemical Releases
Version 1.3a © 2000
1. Project Information
Site Name: Former J&R Auto Dismantlers
Location: 819 - 823 East 12th Street, Oakland, CA
Compl. By: Mark Detterman
Date: 1-Dec-01
Job ID: 201064
2. Which Type of RBCA Analysis?
Tier 1
Generic Values
On-Site
Exposure
Tier 2
Site-Specific Values
On- or Off-Site Exposure
3. Calculation Options
Affects which input data are required
Baseline Risks (Forward mode)
RBCA Cleanup Standards (Backward mode)
4. RBCA Evaluation Process
Prepare Input Data
Data Complete? (yes, no)
Exposure Pathways
Constituents of Concern (COCs)
Transport Models
Soil Parameters
GW Parameters
Air Parameters
Review Output
Exposure Flowchart
COC Chem. Parameters
Input Data Summary
User-Spec. COC Data...
Transient Domenico Analysis...
Baseline Risks...
Cleanup Standards...
5. Commands and Options
New Site
Load Data...
Save Data As...
Quit
Print Sheet
Set Units
Custom Chem. Data...
Help

Exposure Pathway Identification

Site Name: Former J&R Auto Dismantlers
Location: 819 - 823 East 12th Street, Oakland, CA
Compl. By: Mark Detterman
Job ID: 201064 Date: 1-Dec-01

1. Groundwater Exposure



Groundwater Ingestion/ Surface Water Impact

Receptor Type:	None	MCL	Res.
	On-site	Off-site1	Off-site2

Source Media:

- [x] Affected Groundwater
- [x] Affected Soils Leaching to Groundwater

Distance to GW receptors (cm)

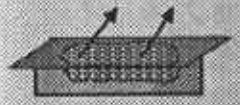
On-site	Off-site1	Off-site2
0	915	6100
0	915	6100

GW Discharge to Surface Water Exposure

- [ ] Swimming
- [ ] Fish Consumption
- [ ] Aquatic Life Protection

Enter ALP Criteria

2. Surface Soil Exposure

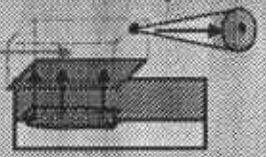


Direct Ingestion and Dermal Contact

Receptor Type:	Com.	No off-site receptors
	On-site	

Construction Worker [x]

3. Air Exposure



Volatilization and Particulates to Outdoor Air Inhalation

Receptor Type:	Res.	Com.	None
	On-site	Off-site1	Off-site2
	0	765	0 (cm)

Construction worker [ ]

- [x] Affected Soils--Volatilization to Ambient Outdoor Air
- [x] Affected Groundwater--Volatilization to Ambient Outdoor Air
- [x] Affected Surface Soils--Particulates to Ambient Outdoor Air

Volatilization to Indoor Air Inhalation

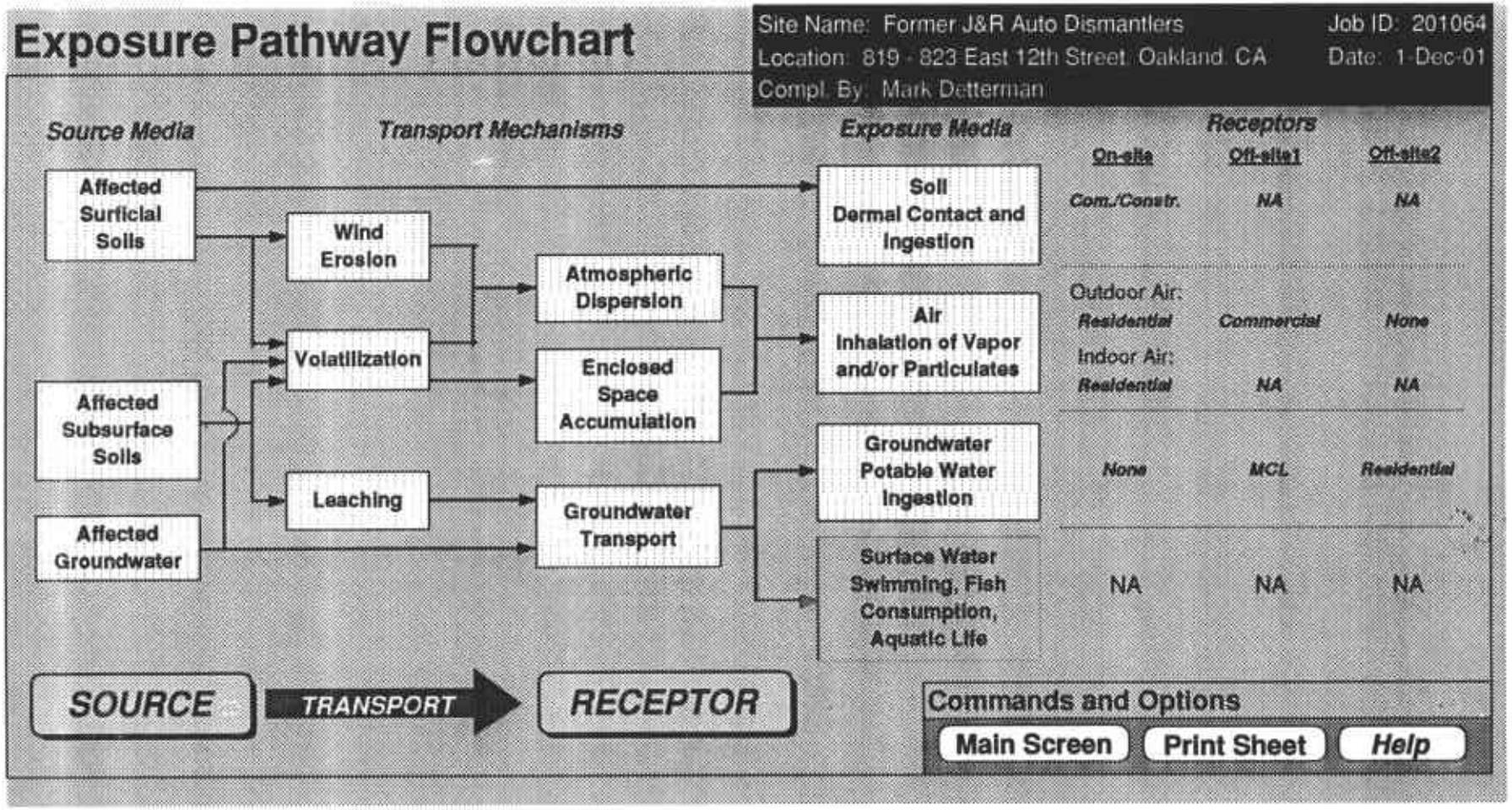
Receptor Type:	Res.	No off-site receptors
	On-site	

- [x] Affected Soils--Volatilization to Enclosed Space
- [x] Affected Groundwater--Volatilization to Enclosed Space

4. Commands and Options

Main Screen | Print Sheet | Set Units | Help

Exposure Factors & Target Risks | Exposure Flowchart


Exposure Pathway Flowchart
Site Name: Former J&R Auto Dismantlers
Location: 819 - 823 East 12th Street, Oakland, CA
Compl. By: Mark Detterman
Job ID: 201064
Date: 1-Dec-01
Source Media
Transport Mechanisms
Exposure Media
Receptors
On-site
Off-site1
Off-site2
Affected Surficial Soils
Affected Subsurface Soils
Affected Groundwater
Wind Erosion
Volatilization
Leaching
Atmospheric Dispersion
Enclosed Space Accumulation
Groundwater Transport
Soil Dermal Contact and Ingestion
Air Inhalation of Vapor and/or Particulates
Groundwater Potable Water Ingestion
Surface Water Swimming, Fish Consumption, Aquatic Life
Com./Constr.
NA
NA
Outdoor Air:
Residential
Commercial
None
Indoor Air:
Residential
NA
NA
None
MCL
Residential
NA
NA
NA
SOURCE
TRANSPORT
RECEPTOR
Commands and Options
Main Screen
Print Sheet
Help

Appendix G

Printouts: Exposure Factors and Target Risk Limits, User-Specified Custom Chemical Database, and Chemical data for Selected COCs

Exposure Factors and Target Risk Limits

Site Name: Former J&R Auto Dismantlers
Location: 819 - 823 East 12th Street, Oakland, CA
Compl. By: Mark Detterman
Job ID: 201064 Date: 1-Dec-01

1. Exposure Parameters

	Age Adjustment?	Residential			Commercial	
		Adult	(Age 0-6)	(Age 0-16)	Chronic	Construc.
Averaging time, carcinogens (yr)		70				
Averaging time, non-carcinogens (yr)		30			25	1
Body weight (kg)		70	15	35	70	
Exposure duration (yr)		30	6	16	25	1
Exposure frequency (days/yr)		350			250	180
Dermal exposure frequency (days/yr)		350			250	
Skin surface area, soil contact (cm^2)	☐	5800		2023	5800	5800
Soil dermal adherence factor ($mg/cm^2/day$)		1				
Water ingestion rate (L/day)		2			1	
Soil ingestion rate (mg/day)	☐	100	200		50	100
Swimming exposure time (hr/event)		3				
Swimming event frequency (events/yr)		12	12	12		
Swimming water ingestion rate (L/hr)	☐	0.05	0.5			
Skin surface area, swimming (cm^2)	☐	23000		8100		
Fish consumption rate (kg/day)		0.025				
Contaminated fish fraction (unitless)		1				

2. Risk Goal Calculation Options

- ○ Individual Constituent Risk Goals Only
- ◉ Individual and Cumulative Risk Goals

3. Target Health Risk Limits

	Individual	Cumulative
Target Risk (Class A/B carcins.)	1.0E-6	1.0E-5
Target Risk (Class C carcinogens)	1.0E-5	
Target Hazard Quotient	1.0E+0	
Target Hazard Index		1.0E+0

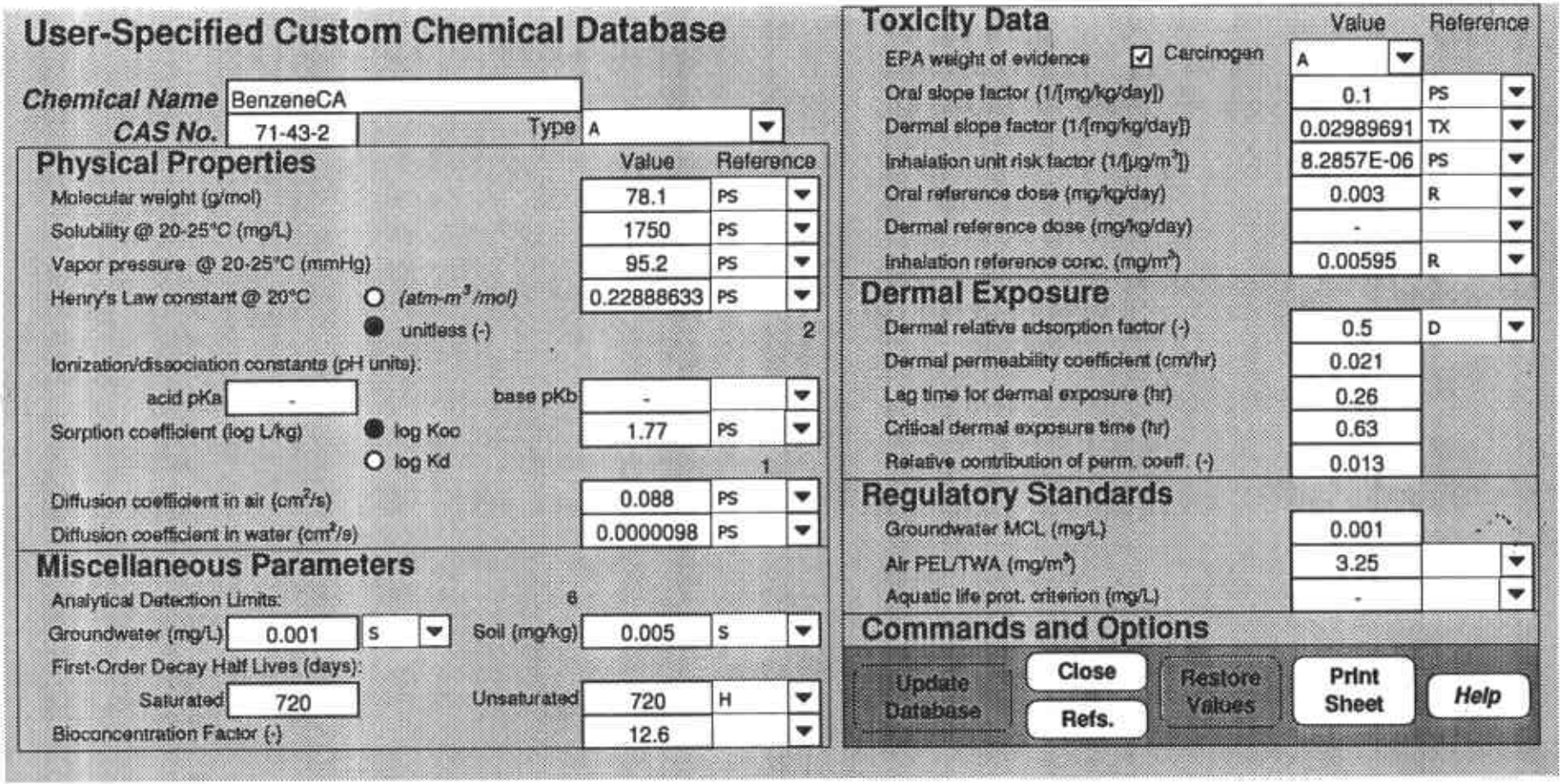
4. Commands and Options

Return to Exposure Pathways

Use Default Values

Print Sheet

Help



User-Specified Custom Chemical Database

Chemical Name BenzeneCA
CAS No. 71-43-2 Type A

Physical Properties

		Value	Reference
Molecular weight (g/mol)		78.1	PS
Solubility @ 20-25°C (mg/L)		1750	PS
Vapor pressure @ 20-25°C (mmHg)		95.2	PS
Henry's Law constant @ 20°C	○ (atm-m³/mol)	0.22888633	PS
	● unitless (-)		2
Ionization/dissociation constants (pH units):			
acid pKa -	base pKb	-	
Sorption coefficient (log L/kg)	● log Koc	1.77	PS
	○ log Kd		1
Diffusion coefficient in air (cm²/s)		0.088	PS
Diffusion coefficient in water (cm²/s)		0.0000098	PS

Miscellaneous Parameters

Analytical Detection Limits: 6

Groundwater (mg/L) 0.001 S — Soil (mg/kg) 0.005 S

First-Order Decay Half Lives (days):

Saturated 720 — Unsaturated 720 H

Bioconcentration Factor (-) 12.6

Toxicity Data

	Value	Reference
EPA weight of evidence ☑ Carcinogen	A	
Oral slope factor (1/[mg/kg/day])	0.1	PS
Dermal slope factor (1/[mg/kg/day])	0.02989691	TX
Inhalation unit risk factor (1/[µg/m³])	8.2857E-06	PS
Oral reference dose (mg/kg/day)	0.003	R
Dermal reference dose (mg/kg/day)	-	
Inhalation reference conc. (mg/m³)	0.00595	R

Dermal Exposure

Dermal relative adsorption factor (-)	0.5	D
Dermal permeability coefficient (cm/hr)	0.021	
Lag time for dermal exposure (hr)	0.26	
Critical dermal exposure time (hr)	0.63	
Relative contribution of perm. coeff. (-)	0.013	

Regulatory Standards

Groundwater MCL (mg/L)	0.001	
Air PEL/TWA (mg/m³)	3.25	
Aquatic life prot. criterion (mg/L)	-	

Commands and Options

Update Database | Close | Refs. | Restore Values | Print Sheet | Help

CHEMICAL DATA FOR SELECTED COCs

Physical Property Data

Constituent	CAS Number	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	Diffusion Coefficients in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(L/kg) partition		ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3/mol)	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
BenzeneCA*	71-43-2	A	78.1	PS	8.80E-02	PS	9.80E-06	PS	1.77	Koc	PS	5.55E-03	2.29E-01	PS	9.52E+01	PS	1.75E+03	PS	-	-	-
Toluene	108-88-3	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	Koc	A	6.30E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29	-	-	-
Ethylbenzene	100-41-4	A	106.2	PS	7.50E-02	PS	7.80E-06	PS	2.56	Koc	PS	7.88E-03	3.25E-01	PS	1.00E+01	PS	1.69E+02	PS	-	-	-
Xylene (mixed isomers)	1330-20-7	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	Koc	A	7.03E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5	-	-	-
TPH - Aliph >C21-C34	0-00-0	T	400	-	1.00E-01	-	1.00E-05	-	8.80	Koc	-	1.76E+02	7.26E+03	-	8.36E-04	-	2.50E-06	-	-	-	-
Naphthalene	91-20-3	PAH	128.2	PS	5.90E-02	PS	7.50E-06	PS	3.30	Koc	PS	4.83E-04	1.99E-02	PS	2.30E-01	PS	3.10E+01	PS	-	-	-
Cadmium	7440-43-9	N	112.41	PS	0.00E+00	-	0.00E+00	-	1.88	Kd	PS	0.00E+00	0.00E+00	PS	0.00E+00	PS	6.51E+05	27	-	-	-
Chromium (III)	16065-83-1	N	52	-	0.00E+00	-	0.00E+00	-	f(pH)	Kd	30	0.00E+00	0.00E+00	-	0.00E+00	-	1.67E+05	27	-	-	-
Lead*	7439-92-1	-	207.2	A	-	-	-	-	-	Koc	-	0.00E+00	0.00E+00	A	0.00E+00	-	8.00E-01	A	-	-	-
Nickel	7440-02-0	N	58.69	-	0.00E+00	-	0.00E+00	-	f(pH)	Kd	30	0.00E+00	0.00E+00	-	0.00E+00	14	1.73E+05	27	-	-	-
Zinc	7440-66-6	N	65.39	14	0.00E+00	-	0.00E+00	-	f(pH)	Kd	30	0.00E+00	0.00E+00	-	0.00E+00	14	6.06E+05	27	-	-	-

* = Chemical with user-specified data

Site Name: Former J&R Auto Dismantlers

Completed By: Mark Detterman

Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA

Date Completed: 1-Dec-01

CHEMICAL DATA FOR SELECTED COCs

Toxicity Data

Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Reference Dose (mg/kg/day) Dermal RfD_dermal	ref	Reference Conc (mg/m3) Inhalation RfC_Inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Slope Factors 1/(mg/kg/day) Dermal SF_dermal	ref	Unit Risk Factor 1/(µg/m3) Inhalation URF_Inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
BenzeneCA*	3.00E-03	R	-	-	5.95E-03	R	1.00E-01	PS	2.99E-02	TX	8.29E-06	PS	A	TRUE
Toluene	2.00E-01	A,R	1.60E-01	TX	4.00E-01	A,R	-	-	-	-	-	-	D	FALSE
Ethylbenzene	1.00E-01	PS	9.70E-02	TX	1.00E+00	PS	-	-	-	-	-	-	D	FALSE
Xylene (mixed isomers)	2.00E+00	A,R	1.84E+00	TX	7.00E+00	A	-	-	-	-	-	-	D	FALSE
TPH - Aliph >C21-C34	2.00E+00	T	-	-	-	T	-	-	-	-	-	-	D	FALSE
Naphthalene	4.00E-01	PS	3.56E-01	TX	1.40E+00	PS	-	-	-	-	-	-	D	FALSE
Cadmium	5.00E-04	PS	-	-	2.20E+01	31	-	-	-	-	1.80E-03	PS	B1	TRUE
Chromium (III)	1.50E+00	R	1.95E-02	TX	-	-	-	-	-	-	-	-	-	FALSE
Lead*	-	-	-	-	-	-	-	-	-	-	-	-	D	FALSE
Nickel	2.00E-02	R	-	-	-	-	-	-	-	-	4.80E-04	31	A	TRUE
Zinc	3.00E-01	R	6.00E-02	TX	-	-	-	-	-	-	-	-	D	FALSE

* = Chemical with user-specified

Site Name: Former J&R Auto Di

Site Location: 819 - 823 East

Miscellaneous Chemical Data

Constituent	MCL (mg/L)	Maximum Contaminant Level ref	Time-Weighted Average Workplace Criteria TWA (mg/m3)	ref	Aquatic Life Prot. Criteria AQL (mg/L)	ref	Biocon-centration Factor (L-wet/kg-fish)
BenzeneCA*	1.00E-03	-	3.25E+00	-	-	-	12.6
Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	-	-	70
Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.35E+02	PS	-	-	1
Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	-	-	1
TPH - Aliph >C21-C34	-	-	-	-	-	-	1
Naphthalene	-	-	5.00E+01	PS	-	-	430
Cadmium	5.00E-03	56 FR 3526 (30 Jan 91)	2.00E-01	PS	3.70E-03	33	1
Chromium (III)	1.00E-01	56 FR 3526 (30 Jan 91)	5.00E-01	NIOSH	5.50E-01	33	1
Lead*	1.50E-02	-EPA	5.00E-02	OSHA	-	-	-
Nickel	1.00E-01	57 FR 31776 (17 Jul 92)	5.00E-02	ACGIH	1.40E+00	33	1
Zinc	5.00E+00	Secondary MCL	-	-	1.10E-01	33	1

* = Chemical with user-specified

Site Name: Former J&R Auto Di

Site Location: 819 - 823 East

CHEMICAL DATA FOR SELECTED COCs

Miscellaneous Chemical Data

Constituent	Dermal Relative Absorp. Factor (unitless)	Water Dermal Permeability Data: Dermal Permeability Coeff. (cm/hr)	Lag time for Dermal Exposure (hr)	Critical Exposure Time (hr)	Relative Contr of Derm Perm Coeff (unitless)	Water/Skin Derm Adsorp Factor (cm/event)	ref	Detection Limits: Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days): Saturated	Unsaturated	ref
BenzeneCA*	0.5	0.021	0.26	0.83	0.013	7.3E-2	D	0.001	S	0.005	S	720	720	H
Toluene	0.5	0.045	0.32	0.77	0.054	1.6E-1	D	0.002	S	0.005	S	28	28	H
Ethylbenzene	0.5	0.074	0.39	1.3	0.14	2.7E-1	D	0.002	S	0.005	S	228	228	H
Xylene (mixed isomers)	0.5	0.08	0.39	1.4	0.16	2.9E-1	D	0.005	S	0.005	S	360	360	H
TPH - Aliph >C21-C34	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	0.05	0.069	0.53	2.2	0.2	2.7E-1	D	0.01	32	0.01	32	258	258	H
Cadmium	0	0.001	-	-	-	3.0E-3	D	0.001	S	0.004	S	-	-	-
Chromium (III)	0	0.001	-	-	-	3.0E-3	D	0.01	S	0.007	S	-	-	-
Lead*	-	0.000004	-	-	-	-	-	0.005	-	3	-	-	-	-
Nickel	0	0.0001	-	-	-	3.0E-4	D	0.05	S	0.015	S	-	-	-
Zinc	0	0.0006	-	-	-	1.8E-3	D	0.005	S	0.002	S	-	-	-

* = Chemical with user-specified

Site Name: Former J&R Auto Di

Site Location: 819 - 823 East

Appendix H

Printouts: Representative COC Concentrations in Source Media (Groundwater)

RBCA SITE ASSESSMENT | **User-Specified COC Data**

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

CONSTITUENT	Representative COC Concentration			
	Groundwater		Soils (0 - 730 cm)	
	value (mg/L)	note	value (mg/kg)	note
BenzeneCA*	1.7E+0		2.5E-3	
Toluene	2.5E+0		2.6E-2	
Ethylbenzene	7.9E-1		1.3E-1	
Xylene (mixed isomers)	4.1E+0		6.6E-1	
TPH - Aliph >C21-C34	2.0E+3		7.3E+1	
Naphthalene	7.1E-1		3.1E+0	
Cadmium	0.0E+0	4 unfiltered gw samples	4.3E-1	
Chromium (III)	0.0E+0	4 unfiltered gw samples	3.3E+1	
Lead*	0.0E+0	unfilter. samples excluded	1.7E+1	
Nickel	0.0E+0	4 unfiltered gw samples	3.2E+1	
Zinc	0.0E+0	4 unfiltered gw samples	4.7E+1	

*** = Chemical with user-specified data**

Site Name: Former J&R Auto Dismantlers

Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman

Date Completed: 1-Dec-01

Job ID: 201064

RBCA SITE ASSESSMENT

Site Name: Former J&R Auto Dismantlers Completed By: Mark Detterman
Site Location: 819 - 823 East 12th Street, Oaklanc Date Completed: 1-Dec-01

TIER 2 GROUNDWATER CONCENTRATION DATA SUMMARY

CONSTITUENTS DETECTED		Analytical Method			Detected Concentrations		
CAS No.	Name	Typical Detection Limit (mg/L)	No. of Samples	No. of Detects	Maximum Conc. (mg/L)	Mean Conc. (mg/L)	UCL on Mean Conc. (mg/L)
71-43-2	BenzeneCA*	1.0E-03	1	1	1.7E+00	1.7E+00	NA
108-88-3	Toluene	1.0E-03	1	1	2.5E+00	2.5E+00	NA
100-41-4	Ethylbenzene	1.0E-03	1	1	7.9E-01	7.9E-01	NA
1330-20-7	Xylene (mixed isomers)	1.0E-03	1	1	4.1E+00	4.1E+00	NA
0-00-0	TPH - Aliph >C21-C34	1.0E+00	1	1	2.0E+03	2.0E+03	NA
91-20-3	Naphthalene	1.0E-02	1	1	7.1E-01	7.1E-01	NA
7440-43-9	Cadmium	5.0E-03	1	0	0.0E+00	0.0E+00	NA
16065-83-1	Chromium (III)	2.0E-02	1	0	0.0E+00	0.0E+00	NA
7439-92-1	Lead*	5.0E-03	1	0	0.0E+00	0.0E+00	NA
7440-02-0	Nickel	5.0E-02	1	0	0.0E+00	0.0E+00	NA
7440-66-6	Zinc	5.0E-02	1	0	0.0E+00	0.0E+00	NA

* = Chemical with user-specified data

Site Name: Former J&R Auto Dismantlers
Location: 819 - 823 East 12th Street, Oakland, CA
Compl. By: Mark Detterman
Job ID: 201064
Date: 1-Dec-01

Commands and Options

Main Screen | Print Sheet | *Help*

Source Media Constituents of Concern (COCs)

☐ Apply Raoult's Law (?)

Selected COCs

COC Select: Sort List: (?)

Add/Insert | Top | MoveUp
Delete | Bottom | MoveDown

Representative COC Concentration (?)

Selected COCs	Groundwater Source Zone		Soil Source Zone		Mole Fraction in Source Material
	Enter Directly / ■□ Enter Site Data		Enter Directly / ■□ Enter Site Data		
	(mg/L)	note	*(mg/kg)*	note	*(-)*
BenzeneCA*	1.7E+0		2.5E-3		
Toluene	2.5E+0		2.6E-2		
Ethylbenzene	7.9E-1		1.3E-1		
Xylene (mixed isomers)	4.1E+0		6.6E-1		
TPH - Aliph >C21-C34	2.0E+3		7.3E+1		
Naphthalene	7.1E-1		3.1E+0		
Cadmium	0.0E+0	4 unfiltered gw samples	4.3E-1		
Chromium (III)	0.0E+0	4 unfiltered gw samples	3.3E+1		
Lead*	0.0E+0	unfilter. samples excluded	1.7E+1		
Nickel	0.0E+0	4 unfiltered gw samples	3.2E+1		
Zinc	0.0E+0	4 unfiltered gw samples	4.7E+1		

* = Chemical with user-specified data

Commands and Options

Return | Print Sheet | *Help*

Site Name: Former J&R Auto Dismantlers Job ID: 201064
Location: 819 - 823 East 12th Street, Oakland, DAte: 1-Dec-01
Compl. By: Mark Detterman

Groundwater Source Zone Concentration Calculator

Paste Defaults

UCL Percentile: 95%

Mean Option

Constituent	Detection Limit (mg/L)	No. of Samples	No. of Detects	Estimated Distribution of Data	Max. Conc. (mg/L)	Mean Conc. (mg/L)	UCL on Mean (mg/L)
BenzeneCA*	1.0E-3	1	1	-	1.7E+0	1.7E+0	NA
Toluene	1.0E-3	1	1	-	2.5E+0	2.5E+0	NA
Ethylbenzene	1.0E-3	1	1	-	7.9E-1	7.9E-1	NA
Xylene (mixed isomers)	1.0E-3	1	1	-	4.1E+0	4.1E+0	NA
TPH - Aliph >C21-C34	1.0E+0	1	1	-	2.0E+3	2.0E+3	NA
Naphthalene	1.0E-2	1	1	-	7.1E-1	7.1E-1	NA
Cadmium	5.0E-3	1	0	-	0.0E+0	0.0E+0	NA
Chromium (III)	2.0E-2	1	0	-	0.0E+0	0.0E+0	NA
Lead*	5.0E-3	1	0	-	0.0E+0	0.0E+0	NA
Nickel	5.0E-2	1	0	-	0.0E+0	0.0E+0	NA
Zinc	5.0E-2	1	0	-	0.0E+0	0.0E+0	NA

* = Chemical with user-specified data

Enter Analytical Data from Groundwater Source Zone (up to 50 Data Points)

Analytical Data

	1	2	3	4	5	6	7	8	9	10	11	12	13
ID	B2-W	B3-W	B4-W	B5W	B6W	B7W	B8W						
Date	16-Sep-96	16-Sep-96	16-Sep-96	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01						
	(mg/L)	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*
							1.70E+0						
							2.50E+0						
							7.90E-1						
							4.10E+0						
							2.00E+3						
							7.10E-1						
							<0.005						
							<0.02						
							<0.005						
							<0.05						
							<0.05						

Analytical Data

14	15	16	17	18	19	20	21	22	23	24	25	26
(mg/L)	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*

Analytical Data

27	28	29	30	31	32	33	34	35	36	37	38	39
(mg/L)	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*

40	41	42	43	44	45	46	47	48	49	50

(mg/L)	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*	*(mg/L)*

Appendix I

Printouts: Representative COC Concentrations in Source Media (Soil)

RBCA SITE ASSESSMENT | **User-Specified COC Data**

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

CONSTITUENT	Representative COC Concentration			
	Groundwater		Soils (0 - 730 cm)	
	value (mg/L)	note	value (mg/kg)	note
BenzeneCA*	1.7E+0		2.5E-3	
Toluene	2.5E+0		2.6E-2	
Ethylbenzene	7.9E-1		1.3E-1	
Xylene (mixed isomers)	4.1E+0		6.6E-1	
TPH - Aliph >C21-C34	2.0E+3		7.3E+1	
Naphthalene	7.1E-1		3.1E+0	
Cadmium	0.0E+0	4 unfiltered gw samples	4.3E-1	
Chromium (III)	0.0E+0	4 unfiltered gw samples	3.3E+1	
Lead*	0.0E+0	unfilter. samples excluded	1.7E+1	
Nickel	0.0E+0	4 unfiltered gw samples	3.2E+1	
Zinc	0.0E+0	4 unfiltered gw samples	4.7E+1	

*** = Chemical with user-specified data**

Site Name: Former J&R Auto Dismantlers

Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman

Date Completed: 1-Dec-01

Job ID: 201064

RBCA SITE ASSESSMENT

Site Name: Former J&R Auto Dismantlers Completed By: Mark Detterman
Site Location: 819 - 823 East 12th Street, Oaklan Date Completed: 1-Dec-01

TIER 2 SOIL CONCENTRATION DATA SUMMARY

CONSTITUENTS DETECTED		Analytical Method			Detected Concentrations		
CAS No.	Name	Typical Detection Limit (mg/kg)	No. of Samples	No. of Detects	Maximum Conc. (mg/kg)	Mean Conc. (mg/kg)	UCL on Mean Conc. (mg/kg)
71-43-2	BenzeneCA*	5.0E-03	3	0	0.0E+00	2.5E-03	2.5E-03
108-88-3	Toluene	5.0E-03	3	2	1.4E-01	2.6E-02	8.8E-01
100-41-4	Ethylbenzene	5.0E-03	3	3	1.4E+00	1.3E-01	4.3E+00
1330-20-7	Xylene (mixed isomers)	5.0E-03	3	3	1.1E+01	6.6E-01	4.2E+01
0-00-0	TPH - Aliph >C21-C34	1.0E+01	29	16	5.4E+04	7.3E+01	1.9E+02
91-20-3	Naphthalene	3.3E-01	2	2	1.3E+01	3.1E+00	NA
7440-43-9	Cadmium	5.0E-01	30	8	5.2E+01	4.3E-01	6.3E-01
16065-83-1	Chromium (III)	5.0E-01	30	30	1.1E+02	3.3E+01	3.8E+01
7439-92-1	Lead*	3.0E+00	30	29	3.1E+03	1.7E+01	3.1E+01
7440-02-0	Nickel	2.0E+00	30	30	2.4E+02	3.2E+01	3.9E+01
7440-66-6	Zinc	1.0E+00	30	30	2.1E+03	4.7E+01	7.1E+01

* = Chemical with user-specified data

Site Name: Former J&R Auto Dismantlers
Location: 819 - 823 East 12th Street, Oakland, CA
Compl. By: Mark Detterman
Job ID: 201064
Date: 1-Dec-01

Commands and Options

Main Screen | Print Sheet | *Help*

Source Media Constituents of Concern (COCs)

Apply Raoult's Law ?

Selected COCs

COC Select: Sort List: ?

Add/Insert | Top | MoveUp
Delete | Bottom | MoveDown

Representative COC Concentration ?

Selected COCs	Groundwater Source Zone (Enter Directly / Enter Site Data) (mg/L)	note	Soil Source Zone (Enter Directly / Enter Site Data) (mg/kg)	note	Mole Fraction in Source Material (-)
BenzeneCA*	1.7E+0		2.5E-3		
Toluene	2.5E+0		2.6E-2		
Ethylbenzene	7.9E-1		1.3E-1		
Xylene (mixed isomers)	4.1E+0		6.6E-1		
TPH - Aliph >C21-C34	2.0E+3		7.3E+1		
Naphthalene	7.1E-1		3.1E+0		
Cadmium	0.0E+0	4 unfiltered gw samples	4.3E-1		
Chromium (III)	0.0E+0	4 unfiltered gw samples	3.3E+1		
Lead*	0.0E+0	unfilter. samples excluded	1.7E+1		
Nickel	0.0E+0	4 unfiltered gw samples	3.2E+1		
Zinc	0.0E+0	4 unfiltered gw samples	4.7E+1		

* = Chemical with user-specified data

Commands and Options

Return | Print Sheet | *Help*

Site Name: Former J&R Auto Dismantlers Job ID: 201064
Location: 819 - 823 East 12th Street, Oakland DOA: 1-Dec-01
Compl. By: Mark Detterman

Soil Source Zone Concentration Calculator

UCL Percentile: 95%

Paste Defaults | Mean Option

Constituent	Detection Limit (mg/kg)	No. of Samples	No. of Detects	Estimated Distribution of Data	Max. Conc. (mg/kg)	Mean Conc. (mg/kg)	UCL on Mean (mg/kg)
BenzeneCA*	5.0E-3	3	0	Normal	0.0E+0	2.5E-3	2.5E-3
Toluene	5.0E-3	3	2	Lognormal	1.4E-1	2.6E-2	8.8E-1
Ethylbenzene	5.0E-3	3	3	Lognormal	1.4E+0	1.3E-1	4.3E+0
Xylene (mixed isomers)	5.0E-3	3	3	Lognormal	1.1E+1	6.6E-1	4.2E+1
TPH - Aliph >C21-C34	1.0E+1	29	16	Lognormal	5.4E+4	7.3E+1	1.9E+2
Naphthalene	3.3E-1	2	2	Lognormal	1.3E+1	3.1E+0	NA
Cadmium	5.0E-1	30	8	Lognormal	5.2E+1	4.3E-1	6.3E-1
Chromium (III)	5.0E-1	30	30	Normal	1.1E+2	3.3E+1	3.8E+1
Lead*	3.0E+0	30	29	Lognormal	3.1E+3	1.7E+1	3.1E+1
Nickel	2.0E+0	30	30	Lognormal	2.4E+2	3.2E+1	3.9E+1
Zinc	1.0E+0	30	30	Lognormal	2.1E+3	4.7E+1	7.1E+1

* = Chemical with user-specified data

Enter Analytical Data from Soil Source Zone (up to 50 Data Points)

Analytical Data

	1	2	3	4	5	6	7	8	9	10	11	12	13
ID	B1-1	B1-2	B1-3	B2-1	B2-2	B2-3	B3-1	B3-2	B3-3	B4-1	B4-2	B4-3	B5-0.5
Date	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	16-Sep-96	7-Aug-01
	(mg/kg)	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
TPH	6.00E+2	<10	<10	4.40E+3	<10	5.30E+3	1.90E+4	<10	<10	8.90E+1	<10	3.40E+2	3.20E+1
Cd	7.20E-1	<0.5	<0.5	7.30E+0	<0.5	<0.5	3.80E+0	<0.5	<0.5	6.00E-1	<0.5	<0.5	<0.5
Cr	3.40E+1	2.90E+1	3.10E+1	4.00E+1	8.10E+0	3.70E+1	4.00E+1	2.50E+1	3.80E+1	3.30E+1	2.70E+1	4.00E+1	2.80E+1
Pb	2.70E+2	6.00E+0	4.30E+0	8.70E+2	<3.0	8.20E+0	7.50E+2	1.00E+1	5.40E+0	8.30E+1	5.00E+0	5.50E+0	1.60E+1
Ni	2.60E+1	1.50E+1	3.60E+1	3.90E+1	1.00E+1	3.40E+1	4.30E+1	4.00E+1	4.80E+1	2.50E+1	1.70E+1	4.30E+1	1.90E+1
Zn	3.20E+2	2.00E+1	3.60E+1	1.10E+3	6.30E+0	4.10E+1	6.50E+2	1.70E+1	4.00E+1	7.70E+1	2.00E+1	3.40E+1	4.30E+1

Analytical Data

14	15	16	17	18	19	20	21	22	23	24	25	26
B5-5	B5-10	B5-15	B6-0.5	B6-5	B6-10	B6-15	B7-0.5	B7-2	B7-7.5	B7-10	B7-14.5	B8B-0.5
7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01
(mg/kg)	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
												<0.010
												5.00E-2
												3.00E-2
												2.40E-1
1.30E+1	<10	<10	2.60E+1	<10	<10	<10	3.30E+2		<10	<10	2.40E+3	5.40E+4
<0.5	<0.5	<0.5	<0.5	<0.5	7.00E-1	<0.5	9.50E-1	<0.5	<0.5	<0.5	<0.5	5.20E+1
2.60E+1	3.10E+1	2.00E+1	3.20E+1	2.90E+1	3.70E+1	2.50E+1	2.60E+1	3.30E+1	3.30E+1	2.40E+1	3.00E+1	1.10E+2
6.30E+0	7.60E+0	6.00E+0	9.80E+0	6.90E+0	5.80E+0	5.90E+0	2.70E+2	8.40E+0	7.00E+0	7.90E+0	6.60E+0	3.10E+3
2.60E+1	6.30E+1	3.20E+1	2.30E+1	3.60E+1	5.80E+1	4.80E+1	4.30E+1	2.40E+1	2.70E+1	2.40E+1	2.70E+1	2.40E+2
2.20E+1	3.70E+1	3.40E+1	1.90E+1	3.00E+1	4.40E+1	4.90E+1	2.20E+2	2.10E+1	1.50E+1	1.40E+1	3.30E+1	2.10E+3

Analytical Data

27	28	29	30	31	32	33	34	35	36	37	38	39
B8B-5.5	B8B-10	B8B-15	B9-2									
7-Aug-01	7-Aug-01	7-Aug-01	7-Aug-01									
(mg/kg)	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*
	<0.005	<0.100										
	<0.005	1.40E-1										
	5.80E-2	1.40E+0										
	1.10E-1	1.10E+1										
1.10E+3	6.00E+2	7.90E+3	5.40E+1									
	7.40E-1	1.32E+1										
<0.5	<0.5	5.70E-1	<0.5									
4.10E+1	3.30E+1	3.50E+1	2.80E+1									
1.20E+1	9.80E+0	7.40E+1	1.10E+1									
1.50E+1	6.40E+1	2.80E+1	3.00E+1									
2.30E+1	4.20E+1	4.30E+1	2.10E+1									

40	41	42	43	44	45	46	47	48	49	50

(mg/kg)	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*	*(mg/kg)*

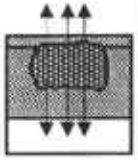
Appendix J

Printouts: Transport Modeling Options

Transport Modeling Options

Site Name: Former J&R Auto Dismantlers — Job ID: 201064
Location: 819 - 823 East 12th Street, Oakland, CA — Date: 1-Dec-01
Compl. By: Mark Detterman

1. Vertical Transport, Surface Soil Column



Outdoor Air Volatilization Factors (?)

- ○ Surface soil volatilization model only
- ◉ Combination surface soil/Johnson & Ettinger models
  - Thickness of surface soil zone: 300 *(cm)*
- ○ User-specified VF from other model — Enter VF Values

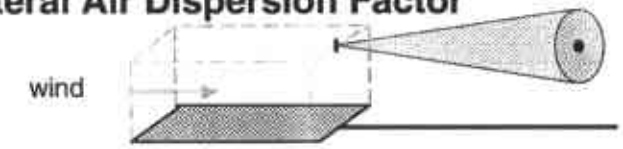
Indoor Air Volatilization Factors (?)

- ◉ Johnson & Ettinger model
- ○ User-specified VF from other model — Enter VF Values

Soil-to-Groundwater Leaching Factor

- ◉ ASTM Model (?)
  - ☐ Apply Soil Attenuation Model (SAM)
  - ☐ Allow first-order biodecay — Enter Decay Rates
- ○ User-specified LF from other model — Enter LF Values

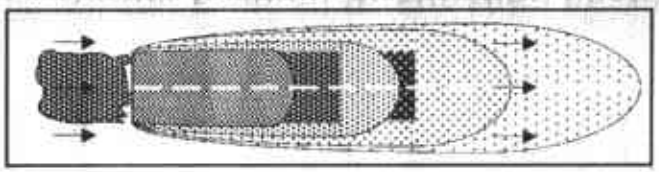
2. Lateral Air Dispersion Factor



(?)

	Off-site 1	Off-site 2	
◉ 3-D Gaussian dispersion model			
○ User-Specified ADF	1.00E+0	1.00E+0	*(-)*

3. Groundwater Dilution Attenuation Factor



Calculate DAF using Domenico Model (?)

- ○ Domenico equation with dispersion only (no biodegradation)
- ◉ Domenico equation first-order decay — ■□ Enter Decay Rates
- ○ Modified Domenico equation using electron acceptor superposition — Enter Site Data

Enter Directly — Biodegradation Capacity: NC *(mg/L)*

— or —

User-Specified DAF Values

- ○ DAF values from other model or site data — Enter DAF Values

n *o*

4. Commands and Options

Main Screen | Print Sheet | *Help*

RBCA Tool Kit for Chemical Releases, Version 1.3a

Site Name: Former J&R Auto Dismantlers
Location: 819 - 823 East 12th Street, Oakland, CA
Compl. By: Mark Detterman

Job ID: 201064
Date: 1-Dec-01

Commands and Options

Return | Print Sheet | Paste Default Values | *Help*

Constituent Half-Life Values

Constituent	Saturated Zone Half-Life (day)	Saturated Zone First-Order Decay Coeffecient (1/day)	Unsaturated Zone Half-Life (day)	Unsaturated Zone First-Order Decay Coeffecient (1/day)
BenzeneCA*	7.2E+2	9.6E-4	7.2E+2	9.6E-4
Toluene	2.8E+1	2.5E-2	2.8E+1	2.5E-2
Ethylbenzene	2.3E+2	3.0E-3	2.3E+2	3.0E-3
Xylene (mixed isomers)	3.6E+2	1.9E-3	3.6E+2	1.9E-3
TPH - Aliph >C21-C34	1.0E+6	6.9E-7	1.0E+6	6.9E-7
Naphthalene	2.6E+2	2.7E-3	2.6E+2	2.7E-3
Cadmium	1.0E+6	6.9E-7	1.0E+6	6.9E-7
Chromium (III)	1.0E+6	6.9E-7	1.0E+6	6.9E-7
Lead*	1.0E+6	6.9E-7	1.0E+6	6.9E-7
Nickel	1.0E+6	6.9E-7	1.0E+6	6.9E-7
Zinc	1.0E+6	6.9E-7	1.0E+6	6.9E-7

RBCA SITE ASSESSMENT | User-Specified COC Data

CONSTITUENT HALF-LIFE VALUES

CONSTITUENT	Saturated Zone Half-Life (days)	Unsaturated Zone Half-Life (days)
BenzeneCA*	720	720
Toluene	28	28
Ethylbenzene	228	228
Xylene (mixed isomers)	360	360
TPH - Aliph >C21-C34	1000000	1000000
Naphthalene	258	258
Cadmium	1000000	1000000
Chromium (III)	1000000	1000000
Lead*	1000000	1000000
Nickel	1000000	1000000
Zinc	1000000	1000000

*** = Chemical with user-specified data**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

Appendix K

Printouts: Site-Specific Soil Parameters, Site-Specific Groundwater Parameters, Site-Specific Air Parameters, Preliminary Building Layout, and Input Parameter Summary Sheet

Site-Specific Soil Parameters

Site Name: Former J&R Auto Dismantlers | Job ID: 201064
Location: 819 - 823 East 12th Street, Oakland, CA | Date: 1-Dec-01
Compl. By: Mark Detterman

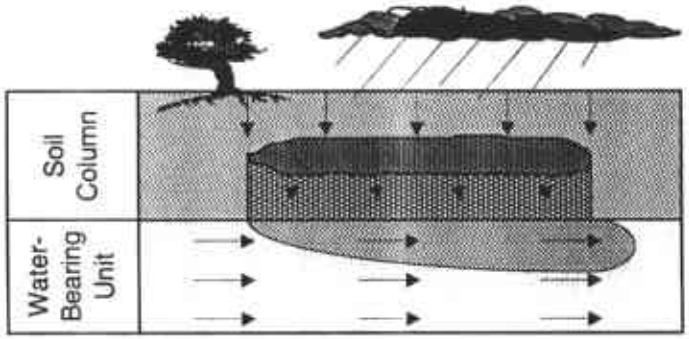
1. Soil Source Zone Characteristics

Hydrogeology

	General Case Construction	
Depth to water-bearing unit	457	(cm)
Capillary zone thickness	29	(cm)
Soil column thickness	428	(cm)

Affected Soil Zone

Depth to top of affected soils	0		(cm)
Depth to base of affected soils	730		(cm)
Affected soil area	4E+06	4E+06	(cm^2)
Length of affected soil parallel to assumed wind direction	3505	3505	(cm)
Length of affected soil parallel to assumed GW flow direction	3505		(cm)



2. Surface Soil Column

	Vadose Zone	Capillary Fringe	
Predominant USCS Soil Type	CL: Silty Clay		
or Enter Directly	or		
Total porosity	0.36		(-)
Volumetric water content	0.34	0.35	(-)
Volumetric air content	0.02	0.010	(-)
Dry bulk density	1.7		(kg/L)
Vertical hydraulic conductivity	8.6E-3		(cm/d)
Vapor permeability	1.0E-13		(cm^2)
Capillary zone thickness	2.9E+1		(cm)

Net Rainfall Infiltration

Net infiltration estimate	0.62658	(cm/yr)
or Enter Directly	or	
Average annual precipitation	59	(cm/yr)

Partitioning Parameters

Fraction organic carbon	0.01	(-)
Soil/water pH	6.8	(-)

3. Commands and Options

Main Screen | Use Default Values | Print Sheet
Set Units | | Help

Site-Specific Groundwater Parameters

Site Name: Former J&R Auto Dismantlers — Job ID: 201064
Location: 819 - 823 East 12th Street, Oakland, CA — Date: 1-Dec-01
Compl. By: Mark Detterman

1. Water-Bearing Unit

Hydrogeology

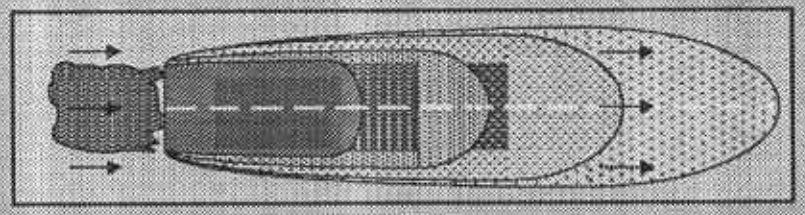
Groundwater Darcy velocity	3.6E-2	(cm/d)
Groundwater seepage velocity	9.5E-2	(cm/d)
or Enter Directly	or	
Hydraulic conductivity	3.6E+0	(cm/d)
Hydraulic gradient	1.0E-2	(-)
Effective porosity	0.38	(-)

Sorption

Fraction organic carbon--saturated zone	0.001	(-)
Groundwater pH	6.20	(-)

2. Groundwater Source Zone

Groundwater plume width at source	610	(cm)
Plume (mixing zone) thickness at source	200	(cm)
or Calculate	or	
Saturated thickness	304.8	(cm)
Length of source zone		(cm)



3. Groundwater Dispersion

Model: ASTM Default

	GW Ingestion		Soil Leaching to GW		
	Off-site 1	Off-site 2	Off-site 1	Off-site 2	
Distance to GW receptors	915	6100	915	6100	(cm)
or Enter Directly	or	or	or	or	
Longitudinal dispersivity	91.5	610	91.5	610	(cm)
Transverse dispersivity	30.2	201.3	30.2	201.3	(cm)
Vertical dispersivity	4.575	30.5	4.575	30.5	(cm)

4. Groundwater Discharge to Surface Water

	Off-site 2	
Distance to GW/SW disharge point	NA	(cm)
Plume width at GW/SW discharge	0	(cm)
Plume thickness at GW/SW discharge	0	(cm)
Surface water flowrate at GW/SW discharge	0.0E+0	(cm^3/s)

5. Commands and Options

Main Screen | Use Default Values | Print Sheet
Set Units | | Help

Site-Specific Air Parameters

Site Name: Former J&R Auto Dismantlers | Job ID: 201064
Location: 819 - 823 East 12th Street, Oakland, CA | Date: 1-Dec-01
Compl. By: Mark Detterman

1. Outdoor Air Pathway

Dispersion in Air

	Off-site 1	Off-site 2	
Distance to offsite air receptor	765	0	(cm)
or Enter Directly	↓ or	↓	
Horizontal dispersivity	93.44	0	(cm)
Vertical dispersivity	64.44	0	(cm)

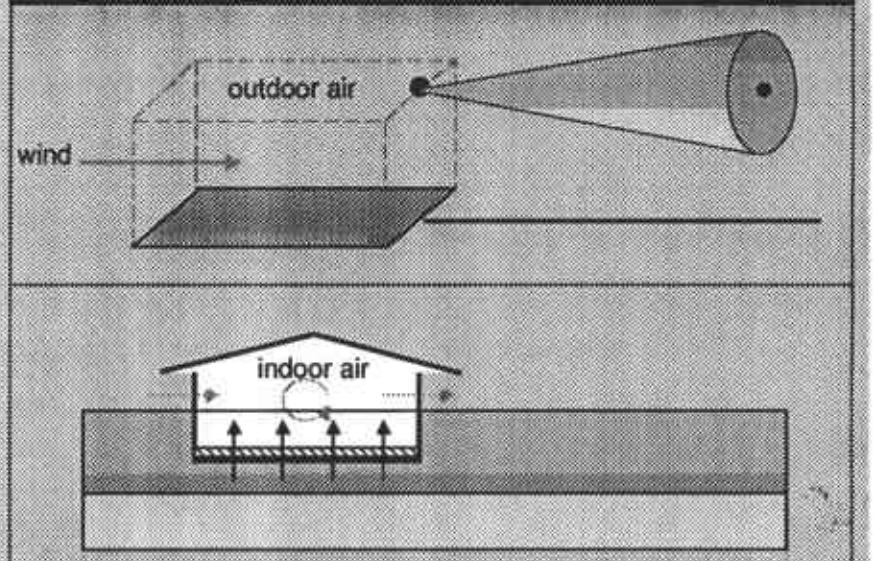
Air Source Zone

Air mixing zone height	200	(cm)
Ambient air velocity in mixing zone	225	(cm/s)
Areal particulate emission flux	6.9E-14	(g/cm^2/s)

2. Indoor Air Pathway

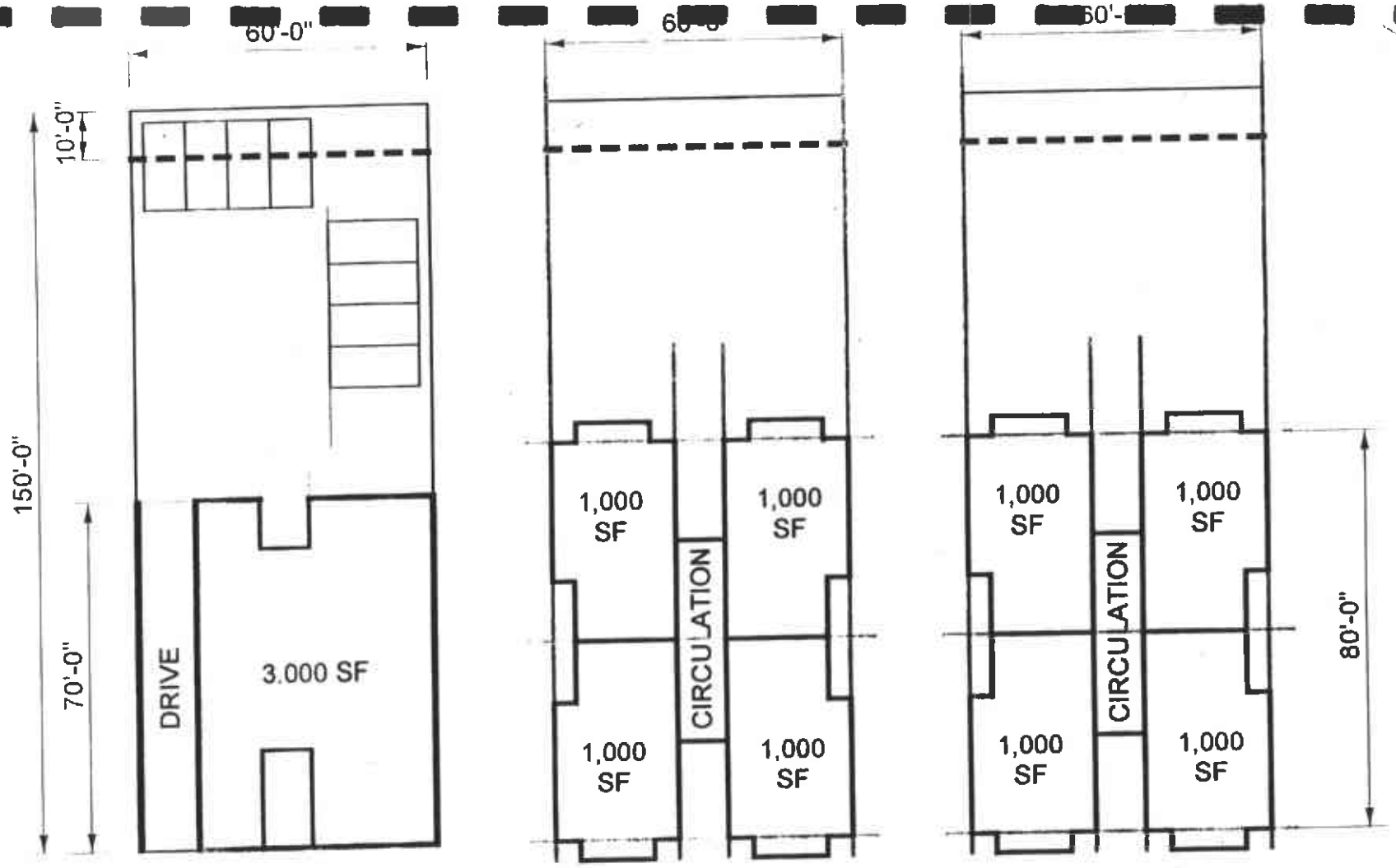
Building Parameters

	Residential	Commercial	
Building volume/area ratio	244	300	(cm)
Foundation area	929030	700000	(cm^2)
Foundation perimeter	3962	3400	(cm)
Building air exchange rate	1.4E-4	2.3E-4	(1/s)
Depth to bottom of foundation slab	15	15	(cm)
Convective air flow through cracks	0.0E+0	0.0E+0	(cm^3/s)
Foundation thickness	15		(cm)
Foundation crack fraction	0.01		(-)
Volumetric water content of cracks	0.12		(-)
Volumetric air content of cracks	0.26		(-)
Indoor/Outdoor differential pressure	0		(g/cm/s^2)



3. Commands and Options

Main Screen | Use Default Values | Print Sheet
Set Units | | Help



GROUND FLOOR

GROSS AREA (INCL . DRIVE)
60' x 70' = 4,200 SF

SECOND FLOOR

GROSS AREA
60' x 80' = 4,800 SF

THIRD FLOOR

GROSS AREA
60' x 80' = 4,800 SF

SUM GROSS AREA = 4,200 + 4,800 + 4,800 = 13,800 SF

EIGHT 3 BR UNITS (SMALL BEDROOMS) OVER 3,000 SF COMMERCIAL SPACE

819 EAST 12TH STREET, OAKLAND, CALIFORNIA

ROBERT MINTZ DESIGN STUDIO
MARCH 21, 2001

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman
Date Completed: 1-Dec-01

Job ID: 201064

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			25	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	25	1
τ	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure frequency (days/yr)	350			250	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		50	100
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0 05	0 5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	Commercial	Residential
Soil Leaching to Groundwater Ingestion	None	Commercial	Residential
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	Com /Constr		
Outdoor Air:			
Particulates from Surface Soils	Residential	Commercial	None
Volatilization from Soils	Residential	Commercial	None
Volatilization from Groundwater	Residential	Commercial	None
Indoor Air:			
Volatilization from Subsurface Soils	Residential	NA	NA
Volatilization from Groundwater	Residential	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	915	6100	(cm)
Soil leaching to groundwater receptor	NA	915	6100	(cm)
Outdoor air inhalation receptor	0	765	NA	(cm)

Target Health Risk Values		Individual	Cumulative
TR_w	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 2
Outdoor air volatilization model	Surface & subsurface models
Indoor air volatilization model	Johnson & Ettinger model
Soil leaching model	ASTM leaching model
Use soil attenuation model (SAM) for leachate?	No
Air dilution factor	3-D Gaussian dispersion
Groundwater dilution-attenuation factor	Domenico model w/ biodeg

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	3.7E+6	NA	(cm^2)
W	Length of source-zone area parallel to wind	3 5E+3	NA	(cm)
W_{gw}	Length of source-zone area parallel to GW flow	3 5E+3		(cm)
U_{air}	Ambient air velocity in mixing zone	2 3E+2		(cm/s)
δ_{air}	Air mixing zone height	2 0E+2		(cm)
P_a	Areal particulate emission rate	6 9E-14		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	3.0E+2		(cm)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	2.9E+1			(cm)
h_v	Vadose zone thickness	4.3E+2			(cm)
ρ_b	Soil bulk density	1 7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1 0E-2			(-)
θ_T	Soil total porosity	3 6E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8 6E-3			(cm/d)
k_v	Vapor permeability	1.0E-13			(cm^2)
L_{gw}	Depth to groundwater	4 6E+2			(cm)
L_s	Depth to top of affected soils	0 0E+0			(cm)
L_{base}	Depth to base of affected soils	7 3E+2			(cm)
L_{subs}	Thickness of affected soils	7 3E+2			(cm)
pH	Soil/groundwater pH	6 8E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.35	0.34	0.12	(-)
θ_a	Volumetric air content	0.01	0.02	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	2 44E+2	NA	(cm)
A_b	Foundation area	9 29E+5	NA	(cm^2)
X_{crk}	Foundation perimeter	3 96E+3	NA	(cm)
ER	Building air exchange rate	1 40E-4	NA	(1/s)
L_{crk}	Foundation thickness	1.50E+1	NA	(cm)
Z_{crk}	Depth to bottom of foundation slab	1.50E+1	NA	(cm)
η	Foundation crack fraction	1.00E-2	NA	(-)
dP	Indoor/outdoor differential pressure	0 00E+0	NA	(g/cm/s^2)
Q_s	Convective air flow through slab	0 00E+0	NA	(cm^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	2.0E+2	(cm)
I_f	Net groundwater infiltration rate	6 3E-1	(cm/yr)
U_{gw}	Groundwater Darcy velocity	6.9E+0	(cm/d)
V_{gw}	Groundwater seepage velocity	1.8E+1	(cm/d)
K_s	Saturated hydraulic conductivity	6.9E+2	(cm/d)
i	Groundwater gradient	1.0E-2	(-)
S_w	Width of groundwater source zone	6 1E+2	(cm)
S_d	Depth of groundwater source zone	2 0E+2	(cm)
θ_{ae}	Effective porosity in water-bearing unit	3 6E-1	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	1 0E-3	(-)
pH_{sat}	Groundwater pH	6.2E+0	(-)
	Biodegradation considered?	1st Order	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	9 2E+1	6 1E+2	9 2E+1	6 1E+2	(cm)
α_y	Transverse dispersivity	3 0E+1	2 0E+2	3 0E+1	2 0E+2	(cm)
α_z	Vertical dispersivity	4 6E+0	3 1E+1	4 6E+0	3 1E+1	(cm)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	8.3E+1	NA	8.3E+1	NA	(cm)
σ_z	Vertical dispersion coefficient	6.4E+1	NA	6.4E+1	NA	(cm)
ADF	Air dispersion factor	1.0E+0	NA	1.0E+0	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(cm^3/s)
W_{gw}	Width of GW plume at SW discharge	NA	(cm)
h_{gw}	Thickness of GW plume at SW discharge	NA	(cm)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

Appendix L

Printouts: Baseline Risk Summary- All Pathways, Cumulative Risk Worksheet, Outdoor Air Exposure Pathways, Indoor Air Exposure Pathways, Soil Exposure Pathway, and Groundwater Exposure Pathways

RBCA SITE ASSESSMENT | **Baseline Risk Summary-All Pathways**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman
Date Completed: 1-Dec-01

TIER 2 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK: Individual COC Risk – Maximum Value	Individual COC Risk – Target Risk	Cumulative COC Risk – Total Value	Cumulative COC Risk – Target Risk	Risk Limit(s) Exceeded?	BASELINE TOXIC EFFECTS: Hazard Quotient – Maximum Value	Hazard Quotient – Applicable Limit	Hazard Index – Total Value	Hazard Index – Applicable Limit	Toxicity Limit(s) Exceeded?
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.3E-9	1.0E-6	1.4E-9	1.0E-5	☐	2.2E-4	1.0E+0	3.1E-4	1.0E+0	☐
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	9.4E-7	1.0E-6	9.4E-7	1.0E-5	☐	4.4E-2	1.0E+0	4.6E-2	1.0E+0	☐
SOIL EXPOSURE PATHWAYS										
Complete:	8.0E-10	1.0E-6	8.0E-10	1.0E-5	☐	1.1E-3	1.0E+0	2.1E-3	1.0E+0	☐
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	4.4E-4	1.0E-6	4.4E-4	1.0E-5	■	4.1E+0	1.0E+0	4.2E+0	1.0E+0	■
SURFACE WATER EXPOSURE PATHWAYS										
Complete:	NA	NA	NA	NA	☐	NA	NA	NA	NA	☐
CRITICAL EXPOSURE PATHWAY (Maximum Values From Complete Pathways)										
	4.4E-4	***1.0E-6***	***4.4E-4***	***1.0E-5***	■	***4.1E+0***	***1.0E+0***	***4.2E+0***	***1.0E+0***	■
	Groundwater		***Groundwater***			***Groundwater***		***Groundwater***		

RBCA SITE ASSESSMENT | **Cumulative Risk Worksheet**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

CUMULATIVE RISK WORKSHEET

CONSTITUENTS OF CONCERN		Representative Concentration		Proposed CRF		Resultant Target Concentration	
CAS No.	Name	Soil (mg/kg)	Groundwater (mg/L)	Soil	GW	Soil (mg/kg)	Groundwater (mg/L)
71-43-2	BenzeneCA*	2.5E-3	1.7E+0			2.5E-3	1.7E+0
108-88-3	Toluene	2.6E-2	2.5E+0			2.6E-2	2.5E+0
100-41-4	Ethylbenzene	1.3E-1	7.9E-1			1.3E-1	7.9E-1
1330-20-7	Xylene (mixed isomers)	6.6E-1	4.1E+0			6.6E-1	4.1E+0
0-00-0	TPH - Aliph >C21-C34	7.3E+1	2.0E+3			7.3E+1	2.0E+3
91-20-3	Naphthalene	3.1E+0	7.1E-1			3.1E+0	7.1E-1
7440-43-9	Cadmium	4.3E-1	0.0E+0			4.3E-1	0.0E+0
16065-83-1	Chromium (III)	3.3E+1	0.0E+0			3.3E+1	0.0E+0
7439-92-1	Lead*	1.7E+1	0.0E+0			1.7E+1	0.0E+0
7440-02-0	Nickel	3.2E+1	0.0E+0			3.2E+1	0.0E+0
7440-66-6	Zinc	4.7E+1	0.0E+0			4.7E+1	0.0E+0

Cumulative Values:

RBCA SITE ASSESSMENT | **Cumulative Risk Worksheet**

Site Name: Former J&R Auto Dismantlers Site Name: Former J&R Auto Dismantlers Completed By: Mark Detterman Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, (Site Location: 819 - 823 East 12th Street, Oakland, C/ Date Completed: 1-Dec-01

CUMULATIVE RISK WORKSHEET

Cumulative Target Risk: 1.0E-5 Target Hazard Index: 1.0E+0

ON-SITE RECEPTORS

CONSTITUENTS OF CONCERN		Outdoor Air Exposure: Residential Target Risk: 1.0E-6 / 1.0E-5		Indoor Air Exposure: Residential Target Risk: 1.0E-6 / 1.0E-5		Soil Exposure: Commercial Target Risk: 1.0E-6 / 1.0E-5		Groundwater Exposure: None Target Risk: 1.0E-6 / 1.0E-5	
		Target HQ: 1.0E+0		Target HQ: 1.0E+0		Target HQ: 1.0E+0		Target HQ: 1.0E+0	
CAS No.	Name	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient
71-43-2	BenzeneCA*	1.3E-9	6.3E-5	9.4E-7	4.4E-2	8.0E-10	2.4E-5		
108-88-3	Toluene		7.1E-6		1.1E-3		4.7E-6		
100-41-4	Ethylbenzene		1.4E-5		2.2E-4		4.0E-5		
1330-20-7	Xylene (mixed isomers)		9.6E-6		2.1E-4		1.0E-5		
0-00-0	TPH - Aliph >C21-C34						1.2E-4		
91-20-3	Naphthalene		2.2E-4		1.7E-4		2.9E-5		
7440-43-9	Cadmium	1.7E-12	1.0E-13	0.0E+0	0.0E+0		4.2E-4		
16065-83-1	Chromium (III)						1.1E-5		
7439-92-1	Lead*								
7440-02-0	Nickel	3.4E-11		0.0E+0			7.9E-4		
7440-66-6	Zinc						7.6E-5		
Cumulative Values:		**1.4E-9**	**3.1E-4**	**9.4E-7**	**4.6E-2**	**8.0E-10**	**1.5E-3**	**0.0E+0**	**0.0E+0**

■ indicates risk level exceeding target risk

RBCA SITE ASSESSMENT | **Cumulative Risk Worksheet**

Site Name: Former J&R Auto Dismantlers Site Name: Former J&R Auto Dismantlers Completed By: Mark Detterman Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, (Site Location: 819 - 823 East 12th Street, Oakland, CA Date Completed: 1-Dec-01 *3 OF 3*

CUMULATIVE RISK WORKSHEET

Cumulative Target Risk: 1.0E-5 Target Hazard Index: 1.0E+0

Groundwater DAF Option: Domenico - First Order

OFF-SITE RECEPTORS

CONSTITUENTS OF CONCERN		Outdoor Air Exposure: Commercial (765 cm) Target Risk: 1.0E-6 / 1.0E-5		Outdoor Air Exposure: None Target Risk: 1.0E-6 / 1.0E-5		Groundwater Exposure: Commercial (915 cm) Target Risk: 1.0E-6 / 1.0E-5		Groundwater Exposure: Residential (6100 cm) Target Risk: 1.0E-6 / 1.0E-5	
		Target HQ: 1.0E+0		Target HQ: 1.0E+0		Target HQ: 1.0E+0		Target HQ: 1.0E+0	
CAS No.	Name	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient
71-43-2	BenzeneCA*	9.0E-10	5.1E-5			4.4E-4	4.1E+0	5.3E-5	4.1E-1
108-88-3	Toluene		6.0E-6				1.7E-2		6.6E-6
100-41-4	Ethylbenzene		1.2E-5				4.1E-2		9.4E-4
1330-20-7	Xylene (mixed isomers)		8.2E-6				1.3E-2		6.7E-4
0-00-0	TPH - Aliph >C21-C34						1.6E-11		6.4E-34
91-20-3	Naphthalene		1.9E-4				4.1E-3		6.2E-6
7440-43-9	Cadmium	1.0E-12	7.3E-14				3.8E-4		5.0E-5
16065-83-1	Chromium (III)						2.6E-19		1.1E-37
7439-92-1	Lead*								
7440-02-0	Nickel	2.1E-11					8.3E-4		1.1E-4
7440-66-6	Zinc						8.3E-5		1.1E-5
	Cumulative Values:	**9.3E-10**	**2.7E-4**	**0.0E+0**	**0.0E+0**	**4.4E-4** ■	**4.2E+0** ■	**5.3E-5** ■	**4.2E-1**

■ indicates risk level exceeding target risk

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS (0 - 300 cm):
VAPOR AND DUST INHALATION

Constituents of Concern	1) Source Medium: Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-site (0 cm) Residential	On-site (0 cm) Construction Worker	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None	3) Exposure Medium: Outdoor Air POE Conc. (mg/m^3) (1) / (2): On-site (0 cm) Residential	On-site (0 cm) Construction Worker	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None
BenzeneCA*	2.5E-3	1.5E+5		1.4E+5		1.6E-8		1.8E-8	
Toluene	2.6E-2	2.2E+5		2.0E+5		1.2E-7		1.3E-7	
Ethylbenzene	1.3E-1	3.7E+5		3.3E+5		3.7E-7		4.0E-7	
Xylene (mixed isomers)	6.6E-1	2.9E+5		2.7E+5		2.2E-6		2.5E-6	
TPH - Aliph >C21-C34	7.3E+1	6.1E+6		5.5E+6		1.2E-5		1.3E-5	
Naphthalene	3.1E+0	9.5E+5		8.7E+5		3.3E-6		3.6E-6	
Cadmium	4.3E-1	1.9E+11		1.9E+11		2.3E-12		2.3E-12	
Chromium (III)	3.3E+1	1.9E+11		1.9E+11		1.8E-10		1.8E-10	
Lead*	1.7E+1	1.9E+11		1.9E+11		9.4E-11		9.4E-11	
Nickel	3.2E+1	1.9E+11		1.9E+11		1.7E-10		1.7E-10	
Zinc	4.7E+1	1.9E+11		1.9E+11		2.5E-10		2.5E-10	

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

SURFACE SOILS (0 - 300 cm):
VAPOR AND DUST INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)				5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4)			
	On-site (0 cm)		Off-site 1 (765 cm)	Off-site 2 (0 cm)	On-site (0 cm)		Off-site 1 (765 cm)	Off-site 2 (0 cm)
	Residential	Construction Worker	Commercial	None	Residential	Construction Worker	Commercial	None
BenzeneCA*	4.1E-1		2.4E-1		6.7E-9		4.4E-9	
Toluene	9.6E-1		6.8E-1		1.1E-7		9.0E-8	
Ethylbenzene	9.6E-1		6.8E-1		3.5E-7		2.8E-7	
Xylene (mixed isomers)	9.6E-1		6.8E-1		2.2E-6		1.7E-6	
TPH - Aliph >C21-C34	9.6E-1		6.8E-1		1.2E-5		9.1E-6	
Naphthalene	9.6E-1		6.8E-1		3.2E-6		2.5E-6	
Cadmium	4.1E-1		2.4E-1		9.6E-13		5.7E-13	
Chromium (III)	9.6E-1		6.8E-1		1.7E-10		1.2E-10	
Lead*	9.6E-1		6.8E-1		9.0E-11		6.4E-11	
Nickel	4.1E-1		2.4E-1		7.2E-11		4.3E-11	
Zinc	9.6E-1		6.8E-1		2.4E-10		1.7E-10	

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
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RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS (300 - 730 cm):

VAPOR INHALATION

Constituents of Concern	1) Source Medium	2) NAF Value (m^3/kg) Receptor			3) Exposure Medium Outdoor Air: POE Conc (mg/m^3) (1) / (2)		
	Soil Conc. (mg/kg)	On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None	On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None
BenzeneCA*	2.5E-3	9.8E+3	8.2E+3		2.6E-7	3.1E-7	
Toluene	2.6E-2	9.8E+3	8.2E+3		2.7E-6	3.2E-6	
Ethylbenzene	1.3E-1	9.8E+3	8.2E+3		1.4E-5	1.6E-5	
Xylene (mixed isomers)	6.6E-1	9.8E+3	8.2E+3		6.8E-5	8.1E-5	
TPH - Aliph >C21-C34	7.3E+1	9.8E+3	8.2E+3		7.5E-3	9.0E-3	
Naphthalene	3.1E+0	9.8E+3	8.2E+3		3.2E-4	3.8E-4	
Cadmium	4.3E-1	NA	NA				
Chromium (III)	3.3E+1	NA	NA				
Lead*	1.7E+1	NA	NA				
Nickel	3.2E+1	NA	NA				
Zinc	4.7E+1	NA	NA				

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

SUBSURFACE SOILS (300 - 730 cm):

VAPOR INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EF*ED)/(ATx365) (unitless)			5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4)		
	On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None	On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None
BenzeneCA*	4.1E-1	2.4E-1		1.0E-7	7.5E-8	
Toluene	9.6E-1	6.8E-1		2.5E-6	2.2E-6	
Ethylbenzene	9.6E-1	6.8E-1		1.3E-5	1.1E-5	
Xylene (mixed isomers)	9.6E-1	6.8E-1		6.5E-5	5.6E-5	
TPH - Aliph >C21-C34	9.6E-1	6.8E-1		7.2E-3	6.2E-3	
Naphthalene	9.6E-1	6.8E-1		3.1E-4	2.6E-4	
Cadmium	4.1E-1	2.4E-1				
Chromium (III)	9.6E-1	6.8E-1				
Lead*	9.6E-1	6.8E-1				
Nickel	4.1E-1	2.4E-1				
Zinc	9.6E-1	6.8E-1				

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None	3) Exposure Medium Outdoor Air POE Conc. (mg/m^3) (1) / (2): On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None
BenzeneCA*	1.7E+0	1.4E+7	1.4E+7		1.2E-7	1.2E-7	
Toluene	2.5E+0	1.4E+7	1.4E+7		1.8E-7	1.8E-7	
Ethylbenzene	7.9E-1	1.6E+7	1.6E+7		4.8E-8	4.8E-8	
Xylene (mixed isomers)	4.1E+0	1.6E+7	1.6E+7		2.6E-7	2.6E-7	
TPH - Aliph >C21-C34	2.0E+3	4.3E+3	4.3E+3		4.6E-1	4.6E-1	
Naphthalene	7.1E-1	2.1E+7	2.1E+7		3.4E-8	3.4E-8	
Cadmium	0.0E+0	NA	NA				
Chromium (III)	0.0E+0	NA	NA				
Lead*	0.0E+0	NA	NA				
Nickel	0.0E+0	NA	NA				
Zinc	0.0E+0	NA	NA				

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

GROUNDWATER: VAPOR INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)			5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4)		
	On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None	On-site (0 cm) Residential	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None
BenzeneCA*	4.1E-1	2.4E-1		5.0E-8	3.0E-8	
Toluene	9.6E-1	6.8E-1		1.7E-7	1.2E-7	
Ethylbenzene	9.6E-1	6.8E-1		4.6E-8	3.3E-8	
Xylene (mixed isomers)	9.6E-1	6.8E-1		2.5E-7	1.8E-7	
TPH - Aliph >C21-C34	9.6E-1	6.8E-1		4.5E-1	3.2E-1	
Naphthalene	9.6E-1	6.8E-1		3.3E-8	2.3E-8	
Cadmium	4.1E-1	2.4E-1				
Chromium (III)	9.6E-1	6.8E-1				
Lead*	9.6E-1	6.8E-1				
Nickel	4.1E-1	2.4E-1				
Zinc	9.6E-1	6.8E-1				

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

TOTAL PATHWAY EXPOSURE (mg/m^3)
(Sum average expsosure concentrations from soil and groundwater routes.)

Constituents of Concern	On-site (0 cm) Residential	On-site (0 cm) Construction Worker	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None
BenzeneCA*	1.6E-7		1.1E-7	
Toluene	2.8E-6		2.4E-6	
Ethylbenzene	1.4E-5		1.2E-5	
Xylene (mixed isomers)	6.7E-5		5.7E-5	
TPH - Aliph >C21-C34	4.5E-1		3.2E-1	
Naphthalene	3.1E-4		2.6E-4	
Cadmium	9.6E-13		5.7E-13	
Chromium (III)	1.7E-10		1.2E-10	
Lead*	9.0E-11		6.4E-11	
Nickel	7.2E-11		4.3E-11	
Zinc	2.4E-10		1.7E-10	

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
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RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Exposure (mg/m^3)				(3) Inhalation Unit Risk Factor (µg/m^3)^-1	(4) Individual COC Risk (2) x (3) x 1000			
		On-site (0 cm)		Off-site 1 (765 cm)	Off-site 2 (0 cm)		On-site (0 cm)		Off-site 1 (765 cm)	Off-site 2 (0 cm)
		Residential	Construction Worker	Commercial	None		Residential	Construction Worker	Commercial	None
BenzeneCA*	A	1.6E-7		1.1E-7		8.3E-6	1.3E-9		9.0E-10	
Toluene	D									
Ethylbenzene	D									
Xylene (mixed isomers)	D									
TPH - Aliph >C21-C34	D									
Naphthalene	D									
Cadmium	B1	9.6E-13		5.7E-13		1.8E-3	1.7E-12		1.0E-12	
Chromium (III)	-									
Lead*	D									
Nickel	A	7.2E-11		4.3E-11		4.8E-4	3.4E-11		2.1E-11	
Zinc	D									
Total Pathway Carcinogenic Risk =							**1.4E-9**		**9.3E-10**	

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman
Date Completed: 1-Dec-01

Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ **(CHECKED IF PATHWAYS ARE ACTIVE)**

TOXIC EFFECTS

Constituents of Concern	(5) Total Toxicant Exposure (mg/m^3) On-site (0 cm) Residential	On-site (0 cm) Construction Worker	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None	(6) Inhalation Reference Conc. (mg/m^3)	(7) Individual COC Hazard Quotient (5) / (6) On-site (0 cm) Residential	On-site (0 cm) Construction Worker	Off-site 1 (765 cm) Commercial	Off-site 2 (0 cm) None
BenzeneCA*	3.8E-7		3.1E-7		6.0E-3	6.3E-5		5.1E-5	
Toluene	2.8E-6		2.4E-6		4.0E-1	7.1E-6		6.0E-6	
Ethylbenzene	1.4E-5		1.2E-5		1.0E+0	1.4E-5		1.2E-5	
Xylene (mixed isomers)	6.7E-5		5.7E-5		7.0E+0	9.6E-6		8.2E-6	
TPH - Aliph >C21-C34									
Naphthalene	3.1E-4		2.6E-4		1.4E+0	2.2E-4		1.9E-4	
Cadmium	2.2E-12		1.6E-12		2.2E+1	1.0E-13		7.3E-14	
Chromium (III)									
Lead*									
Nickel									
Zinc									
Total Pathway Hazard Index =						**3.1E-4**		**2.7E-4**	

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman
Date Completed: 1-Dec-01

Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SOILS (0 - 730 cm): VAPOR INTRUSION INTO ON-SITE BUILDINGS

Constituents of Concern	1) Source Medium Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor Residential	3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) Residential	4) Exposure Multiplier (EFxED)/(ATx365) (unitless) Residential	5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4) Residential
BenzeneCA*	2.5E-3	1.9E+2	1.3E-5	4.1E-1	5.3E-6
Toluene	2.6E-2	3.8E+2	6.8E-5	9.6E-1	6.5E-5
Ethylbenzene	1.3E-1	1.1E+3	1.3E-4	9.6E-1	1.2E-4
Xylene (mixed isomers)	6.6E-1	7.0E+2	9.5E-4	9.6E-1	9.1E-4
TPH - Aliph >C21-C34	7.3E+1	2.7E+5	2.7E-4	9.6E-1	2.6E-4
Naphthalene	3.1E+0	1.8E+4	1.8E-4	9.6E-1	1.7E-4
Cadmium	4.3E-1	NA		4.1E-1	
Chromium (III)	3.3E+1	NA		9.6E-1	
Lead*	1.7E+1	NA		9.6E-1	
Nickel	3.2E+1	NA		4.1E-1	
Zinc	4.7E+1	NA		9.6E-1	

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INTRUSION INTO ON-SITE BUILDINGS

Constituents of Concern	Exposure Concentration 1) Source Medium Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor Residential	3) Exposure Medium Indoor Air POE Conc. (mg/m^3) (1) / (2) Residential	4) Exposure Multiplier (EFxED)/(ATx365) (unitless) Residential	5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4) Residential
BenzeneCA*	1.7E+0	6.5E+3	2.6E-4	4.1E-1	1.1E-4
Toluene	2.5E+0	6.6E+3	3.8E-4	9.6E-1	3.6E-4
Ethylbenzene	7.9E-1	7.6E+3	1.0E-4	9.6E-1	9.9E-5
Xylene (mixed isomers)	4.1E+0	7.3E+3	5.6E-4	9.6E-1	5.4E-4
TPH - Aliph >C21-C34	2.0E+3	2.0E+0	1.0E+3	9.6E-1	9.6E+2
Naphthalene	7.1E-1	1.0E+4	7.0E-5	9.6E-1	6.7E-5
Cadmium	0.0E+0	NA		4.1E-1	
Chromium (III)	0.0E+0	NA		9.6E-1	
Lead*	0.0E+0	NA		9.6E-1	
Nickel	0.0E+0	NA		4.1E-1	
Zinc	0.0E+0	NA		9.6E-1	

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

Constituents of Concern	TOTAL PATHWAY EXPOSURE (mg/m^3) (Sum average exposure concentrations from soil and groundwater routes.) Residential
BenzeneCA*	1.1E-4
Toluene	4.3E-4
Ethylbenzene	2.2E-4
Xylene (mixed isomers)	1.4E-3
TPH - Aliph >C21-C34	9.6E+2
Naphthalene	2.4E-4
Cadmium	
Chromium (III)	
Lead*	
Nickel	
Zinc	

Site Name: Former J&R Auto Dismantlers Date Completed: 1-Dec-01
Site Location: 819 - 823 East 12th Street, Oaklanc Job ID: 201064
Completed By: Mark Detterman

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ **(CHECKED IF PATHWAYS ARE ACTIVE)**

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Exposure (mg/m^3) Residential	(3) Inhalation Unit Risk Factor (ug/m^3)^-1	(4) Individual COC Risk (2) x (3) x 1000 Residential
		CARCINOGENIC RISK		
BenzeneCA*	A	1.1E-4	8.3E-6	9.4E-7
Toluene	D			
Ethylbenzene	D			
Xylene (mixed isomers)	D			
TPH - Aliph >C21-C34	D			
Naphthalene	D			
Cadmium	B1		1.8E-3	
Chromium (III)	-			
Lead*	D			
Nickel	A		4.8E-4	
Zinc	D			

Total Pathway Carcinogenic Risk = **9.4E-7**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(5) Total Toxicant Exposure (mg/m^3) Residential	(6) Inhalation Reference Concentration (mg/m^3) TOXIC EFFECTS	(7) Individual COC Hazard Quotient (5) / (6) Residential
BenzeneCA*	2.6E-4	6.0E-3	4.4E-2
Toluene	4.3E-4	4.0E-1	1.1E-3
Ethylbenzene	2.2E-4	1.0E+0	2.2E-4
Xylene (mixed isomers)	1.4E-3	7.0E+0	2.1E-4
TPH - Aliph >C21-C34			
Naphthalene	2.4E-4	1.4E+0	1.7E-4
Cadmium	0.0E+0	2.2E+1	0.0E+0
Chromium (III)			
Lead*			
Nickel			
Zinc			

Total Pathway Hazard Index = **4.6E-2**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAY ■ (CHECKED IF PATHWAY IS ACTIVE)

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)				(3) Slope Factor (mg/kg/day)^-1		(4) Individual COC Risk	
		(a) via Ingestion	(b) via Dermal Contact	(c) via Ingestion	(d) via Dermal Contact	(a) Oral	(b) Dermal	(2a)x(3a) + (2b)x(3b)	(2c)x(3a) + (2d)x(3b)
		Commercial		Construction Worker				Commercial	Construction Worker
BenzeneCA*	A	4.4E-10	2.5E-8	2.5E-11	1.0E-9	1.0E-1	3.0E-2	8.0E-10	3.3E-11
Toluene	D								
Ethylbenzene	D								
Xylene (mixed isomers)	D								
TPH - Aliph >C21-C34	D								
Naphthalene	D								
Cadmium	B1								
Chromium (III)	-								
Lead*	D								
Nickel	A								
Zinc	D								

* No dermal slope factor available--oral slope factor used

Total Pathway Carcinogenic Risk = **8.0E-10** **3.3E-11**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAY ■ (CHECKED IF PATHWAY IS ACTIVE)

TOXIC EFFECTS

Constituents of Concern	(5) Total Toxicant Intake Rate (mg/kg/day) (a) via Ingestion	(b) via Dermal Contact	(c) via Ingestion	(d) via Dermal Contact	(6) Oral Reference Dose (mg/kg-day) (a) Oral	(b) Dermal	(7) Individual COC Hazard Quotient (5a)/(6a) + (5b)/(6b)	(5c)/(6a) + (5d)/(6b)
	Commercial		Construction Worker				Commercial	Construction Worker
BenzeneCA*	1.2E-9	7.1E-8	1.8E-9	7.1E-8	3.0E-3	3.0E-3*	2.4E-5	2.4E-5
Toluene	1.3E-8	7.4E-7	1.8E-8	7.4E-7	2.0E-1	1.6E-1	4.7E-6	4.7E-6
Ethylbenzene	6.6E-8	3.8E-6	9.5E-8	3.8E-6	1.0E-1	9.7E-2	4.0E-5	4.0E-5
Xylene (mixed isomers)	3.2E-7	1.9E-5	4.7E-7	1.9E-5	2.0E+0	1.8E+0	1.0E-5	1.0E-5
TPH - Aliph >C21-C34	3.6E-5	2.1E-4	5.2E-5	2.1E-4	2.0E+0	2.0E+0*	1.2E-4	1.3E-4
Naphthalene	1.5E-6	8.9E-6	2.2E-6	8.9E-6	4.0E-1	3.6E-1	2.9E-5	3.0E-5
Cadmium	2.1E-7	0.0E+0	3.1E-7	0.0E+0	5.0E-4	5.0E-4*	4.2E-4	6.1E-4
Chromium (III)	1.6E-5	0.0E+0	2.4E-5	0.0E+0	1.5E+0	2.0E-2	1.1E-5	1.6E-5
Lead*								
Nickel	1.6E-5	0.0E+0	2.3E-5	0.0E+0	2.0E-2	2.0E-2*	7.9E-4	1.1E-3
Zinc	2.3E-5	0.0E+0	3.3E-5	0.0E+0	3.0E-1	6.0E-2	7.6E-5	1.1E-4

* No dermal reference dose available--oral reference dose used.

Total Pathway Hazard Index = **1.5E-3** **2.1E-3**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ **(CHECKED IF PATHWAY IS ACTIVE)**

SOILS (0 - 730 cm): **LEACHING TO GROUNDWATER INGESTION**

Constituents of Concern	1) Source Medium	2) NAF Value (L/kg) Receptor			3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2)		
	Soil Conc. (mg/kg)	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential
BenzeneCA*	2.5E-3		2.5E+2	6.8E+3		1.0E-5	3.7E-7
Toluene	2.6E-2		2.5E+3	1.8E+7		1.0E-5	1.4E-9
Ethylbenzene	1.3E-1		1.7E+3	2.0E+5		8.1E-5	6.7E-7
Xylene (mixed isomers)	6.6E-1		9.3E+2	5.0E+4		7.1E-4	1.3E-5
TPH - Aliph >C21-C34	7.3E+1		9.0E+20	6.2E+43		8.2E-20	1.2E-42
Naphthalene	3.1E+0		2.0E+4	3.6E+7		1.6E-4	8.7E-8
Cadmium	4.3E-1		2.3E+4	4.8E+5		1.9E-5	9.1E-7
Chromium (III)	3.3E+1		8.4E+17	5.6E+36		4.0E-17	6.0E-36
Lead*	1.7E+1		NA	NA			
Nickel	3.2E+1		1.9E+4	3.9E+5		1.7E-3	8.2E-5
Zinc	4.7E+1		1.8E+4	3.8E+5		2.6E-3	1.2E-4

* = Chemical with user-specified data

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

SOILS (0 - 730 cm): LEACHING TO GROUNDWATER INGESTION (cont'd)

Constituents of Concern	4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg-day)			5) Average Daily Intake Rate (mg/kg/day) (3) x (4)		
	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential
BenzeneCA*		3.5E-3	1.2E-2		3.5E-8	4.3E-9
Toluene		9.8E-3	2.7E-2		1.0E-7	3.9E-11
Ethylbenzene		9.8E-3	2.7E-2		7.9E-7	1.8E-8
Xylene (mixed isomers)		9.8E-3	2.7E-2		7.0E-6	3.6E-7
TPH - Aliph >C21-C34		9.8E-3	2.7E-2		8.0E-22	3.2E-44
Naphthalene		9.8E-3	2.7E-2		1.6E-6	2.4E-9
Cadmium		9.8E-3	2.7E-2		1.9E-7	2.5E-8
Chromium (III)		9.8E-3	2.7E-2		3.9E-19	1.6E-37
Lead*		9.8E-3	2.7E-2			
Nickel		9.8E-3	2.7E-2		1.7E-5	2.3E-6
Zinc		9.8E-3	2.7E-2		2.5E-5	3.4E-6

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) BW = Body weight (kg) ED = Exposure duration (yr) EF = Exposure frequency (days/yr) IR = Ingestion rate (mg/day)

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman
Date Completed: 1-Dec-01

Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: INGESTION

	1) Source Medium	2) NAF Value (unitless) Receptor			3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2)		
Constituents of Concern	Groundwater Conc. (mg/L)	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential
BenzeneCA*	1.7E+0		1.4E+0	3.7E+1		1.3E+0	4.5E-2
Toluene	2.5E+0		7.1E+0	5.2E+4		3.5E-1	4.9E-5
Ethylbenzene	7.9E-1		1.9E+0	2.3E+2		4.2E-1	3.4E-3
Xylene (mixed isomers)	4.1E+0		1.6E+0	8.4E+1		2.6E+0	4.9E-2
TPH - Aliph >C21-C34	2.0E+3		6.2E+11	4.3E+34		3.2E-9	4.6E-32
Naphthalene	7.1E-1		4.3E+0	7.8E+3		1.7E-1	9.1E-5
Cadmium	0.0E+0		1.3E+0	2.7E+1		0.0E+0	0.0E+0
Chromium (III)	0.0E+0		2.0E+9	1.3E+28		0.0E+0	0.0E+0
Lead*	0.0E+0		1.3E+0	2.5E+1		0.0E+0	0.0E+0
Nickel	0.0E+0		1.3E+0	2.6E+1		0.0E+0	0.0E+0
Zinc	0.0E+0		1.3E+0	2.6E+1		0.0E+0	0.0E+0

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

GROUNDWATER INGESTION (cont'd)

Constituents of Concern	4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg/day)			5) Average Daily Intake Rate (mg/kg/day) (3) x (4)		
	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	On-site (0 cm) None	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential
BenzeneCA*		3.5E-3	1.2E-2		4.4E-3	5.3E-4
Toluene		9.8E-3	2.7E-2		3.4E-3	1.3E-6
Ethylbenzene		9.8E-3	2.7E-2		4.1E-3	9.4E-5
Xylene (mixed isomers)		9.8E-3	2.7E-2		2.6E-2	1.3E-3
TPH - Aliph >C21-C34		9.8E-3	2.7E-2		3.2E-11	1.3E-33
Naphthalene		9.8E-3	2.7E-2		1.6E-3	2.5E-6
Cadmium		9.8E-3	2.7E-2		0.0E+0	0.0E+0
Chromium (III)		9.8E-3	2.7E-2		0.0E+0	0.0E+0
Lead*		9.8E-3	2.7E-2		0.0E+0	0.0E+0
Nickel		9.8E-3	2.7E-2		0.0E+0	0.0E+0
Zinc		9.8E-3	2.7E-2		0.0E+0	0.0E+0

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) ED = Exposure duration (yr) IR = Ingestion rate (mg/day)
BW = Body weight (kg) EF = Exposure frequency (days/yr)

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman
Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

MAXIMUM PATHWAY INTAKE (mg/kg/day)
(Maximum intake of active pathways soil leaching & groundwater routes.)

Constituents of Concern	On-site (0 cm) None	Off-site 1 Commercial	Off-site 2 Residential
BenzeneCA*		4.4E-3	5.3E-4
Toluene		3.4E-3	1.3E-6
Ethylbenzene		4.1E-3	9.4E-5
Xylene (mixed isomers)		2.6E-2	1.3E-3
TPH - Aliph >C21-C34		3.2E-11	1.3E-33
Naphthalene		1.6E-3	2.5E-6
Cadmium		1.9E-7	2.5E-8
Chromium (III)		3.9E-19	1.6E-37
Lead*			
Nickel		1.7E-5	2.3E-6
Zinc		2.5E-5	3.4E-6

* = Chemical with user-specified data

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ **(CHECKED IF PATHWAYS ARE ACTIVE)**

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Maximum Carcinogenic Intake Rate (mg/kg/day)			(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3)		
		On-site (0 cm) None	Off-site 1 Commercial	Off-site 2 Residential		On-site (0 cm) None	Off-site 1 Commercial	Off-site 2 Residential
BenzeneCA*	A		4.4E-3	5.3E-4	1.0E-1		4.4E-4	5.3E-5
Toluene	D							
Ethylbenzene	D							
Xylene (mixed isomers)	D							
TPH - Aliph >C21-C34	D							
Naphthalene	D							
Cadmium	B1							
Chromium (III)	-							
Lead*	D							
Nickel	A							
Zinc	D							
Total Pathway Carcinogenic Risk =							**4.4E-4**	**5.3E-5**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	TOXIC EFFECTS						
	(5) Maximum Toxicant Intake Rate (mg/kg/day)			(6) Oral Reference Dose (mg/kg/day)	(7) Individual COC Hazard Quotient (5) / (6)		
Constituents of Concern	On-site (0 cm) None	Off-site 1 Commercial	Off-site 2 Residential		On-site (0 cm) None	Off-site 1 Commercial	Off-site 2 Residential
BenzeneCA*		1.2E-2	1.2E-3	3.0E-3		4.1E+0	4.1E-1
Toluene		3.4E-3	1.3E-6	2.0E-1		1.7E-2	6.6E-6
Ethylbenzene		4.1E-3	9.4E-5	1.0E-1		4.1E-2	9.4E-4
Xylene (mixed isomers)		2.6E-2	1.3E-3	2.0E+0		1.3E-2	6.7E-4
TPH - Aliph >C21-C34		3.2E-11	1.3E-33	2.0E+0		1.6E-11	6.4E-34
Naphthalene		1.6E-3	2.5E-6	4.0E-1		4.1E-3	6.2E-6
Cadmium		1.9E-7	2.5E-8	5.0E-4		3.8E-4	5.0E-5
Chromium (III)		3.9E-19	1.6E-37	1.5E+0		2.6E-19	1.1E-37
Lead*							
Nickel		1.7E-5	2.3E-6	2.0E-2		8.3E-4	1.1E-4
Zinc		2.5E-5	3.4E-6	3.0E-1		8.3E-5	1.1E-5
Total Pathway Hazard Index =						**4.2E+0**	**4.2E-1**

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman

Date Completed: 1-Dec-01
Job ID: 201064

Appendix M

Printouts: Domenico Groundwater Modeling Summary

RBCA SITE ASSESSMENT | **Tier 2 Domenico Groundwater Modeling Summary**

Site Name: Former J&R Auto Dism Site Location: 819 - 823 East 12th Street, Oal Completed By: Mark Detterman Date Completed: 1-Dec-01

DOMENICO GROUNDWATER MODELING SUMMARY

OFF-SITE GROUNDWATER EXPOSURE PATHWAYS ■ **(CHECKED IF PATHWAY IS ACTIVE)**

SOILS LEACHING TO GROUNDWATER:

INGESTION

Constituents of Concern	1) Source Medium	2) Steady-state Exposure Concentration Groundwater: POE Conc. (mg/L)		3) POE Concentration Limit Groundwater: POE Conc. (mg/L)		4) Time to Reach POE Conc. Limit Conc. limit reached? ("■" if yes) ; Time (yr)	
	Soil Conc. (mg/kg)	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential
BenzeneCA*	2.5E-3	1.0E-5	3.7E-7	2.9E-3	8.5E-4	□ NA	□ NA
Toluene	2.6E-2	1.0E-5	1.4E-9	2.0E+1	7.3E+0	□ NA	□ NA
Ethylbenzene	1.3E-1	8.1E-5	6.7E-7	1.0E+1	3.7E+0	□ NA	□ NA
Xylene (mixed isomers)	6.6E-1	7.1E-4	1.3E-5	2.0E+2	7.3E+1	□ NA	□ NA
TPH - Aliph >C21-C34	7.3E+1	8.2E-20	1.2E-42	2.0E+2	7.3E+1	□ NA	□ NA
Naphthalene	3.1E+0	1.6E-4	8.7E-8	4.1E+1	1.5E+1	□ NA	□ NA
Cadmium	4.3E-1	1.9E-5	9.1E-7	5.1E-2	1.8E-2	□ NA	□ NA
Chromium (III)	3.3E+1	4.0E-17	6.0E-36	1.5E+2	5.5E+1	□ NA	□ NA
Lead*	1.7E+1					NA	NA
Nickel	3.2E+1	1.7E-3	8.2E-5	2.0E+0	7.3E-1	□ NA	□ NA
Zinc	4.7E+1	2.6E-3	1.2E-4	3.1E+1	1.1E+1	□ NA	□ NA

NOTE: POE = Point of exposure

RBCA SITE ASSESSMENT | **Tier 2 Domenico Groundwater Modeling Summary**

Site Name: Former J&R Auto Dism Site Location: 819 - 823 East 12th Street, Oal Completed By: Mark Detterman Date Completed: 1-Dec-01

DOMENICO GROUNDWATER MODELING SUMMARY

OFF-SITE GROUNDWATER EXPOSURE PATHWAYS ■ **(CHECKED IF PATHWAY IS ACTIVE)**

GROUNDWATER:
INGESTION

Constituents of Concern	1) Source Medium	2) Steady-state Exposure Concentration Groundwater: POE Conc. (mg/L)		3) POE Concentration Limit Groundwater: POE Conc. (mg/L)		4) Time to Reach POE Conc. Limit Conc reaches limit? ("■" if yes) ; Time (yr)	
	Groundwater Conc. (mg/L)	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential	Off-site 1 (915 cm) Commercial	Off-site 2 (6100 cm) Residential
BenzeneCA*	1.7E+0	1.3E+0	4.5E-2	2.9E-3	8.5E-4	■ 5.3E-2	■ 4.6E-1
Toluene	2.5E+0	3.5E-1	4.9E-5	2.0E+1	7.3E+0	□ NA	□ NA
Ethylbenzene	7.9E-1	4.2E-1	3.4E-3	1.0E+1	3.7E+0	□ NA	□ NA
Xylene (mixed isomers)	4.1E+0	2.6E+0	4.9E-2	2.0E+2	7.3E+1	□ NA	□ NA
TPH - Aliph >C21-C34	2.0E+3	3.2E-9	4.6E-32	2.0E+2	7.3E+1	□ NA	□ NA
Naphthalene	7.1E-1	1.7E-1	9.1E-5	4.1E+1	1.5E+1	□ NA	□ NA
Cadmium	0.0E+0	0.0E+0	0.0E+0	5.1E-2	1.8E-2	□ NA	□ NA
Chromium (III)	0.0E+0	0.0E+0	0.0E+0	1.5E+2	5.5E+1	□ NA	□ NA
Lead*	0.0E+0	0.0E+0	0.0E+0	9.0E+99	9.0E+99	□ NA	□ NA
Nickel	0.0E+0	0.0E+0	0.0E+0	2.0E+0	7.3E-1	□ NA	□ NA
Zinc	0.0E+0	0.0E+0	0.0E+0	3.1E+1	1.1E+1	□ NA	□ NA

NOTE: POE = Point of exposure

RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman
Date Completed: 1-Dec-01
Job ID: 201064

Constiuent: BenzeneCA*
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

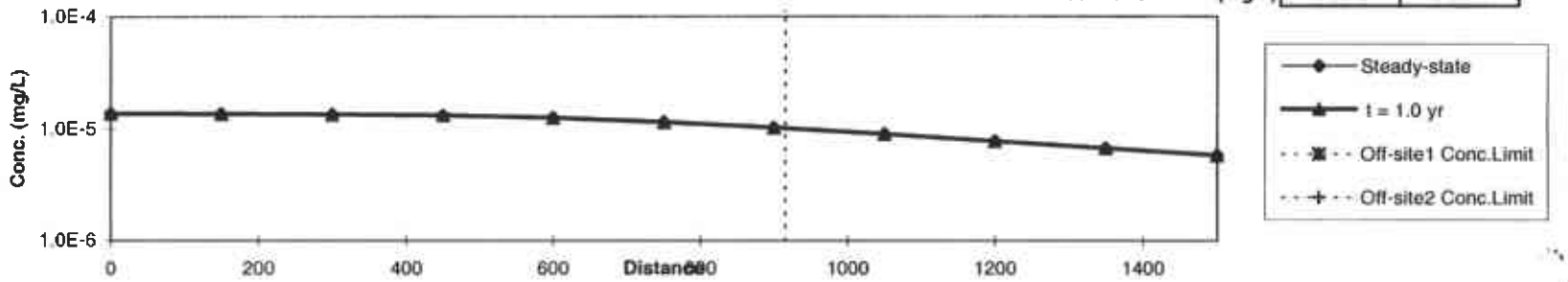
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc. (mg/L)	1.4E-5	1.4E-5	1.4E-5	1.3E-5	1.3E-5	1.2E-5	1.0E-5	9.0E-6	7.8E-6	6.7E-6	5.8E-6
Steady-state		1.4E-5	1.4E-5	1.4E-5	1.3E-5	1.3E-5	1.2E-5	1.0E-5	9.0E-6	7.8E-6	6.7E-6	5.8E-6

Off-site1	Off-site2
Commercial	Residential
915	6100
1.0E-5	1.6E-7
1.0E-5	3.7E-7
2.9E-3	8.5E-4

POE Concentration Limit (mg/L)

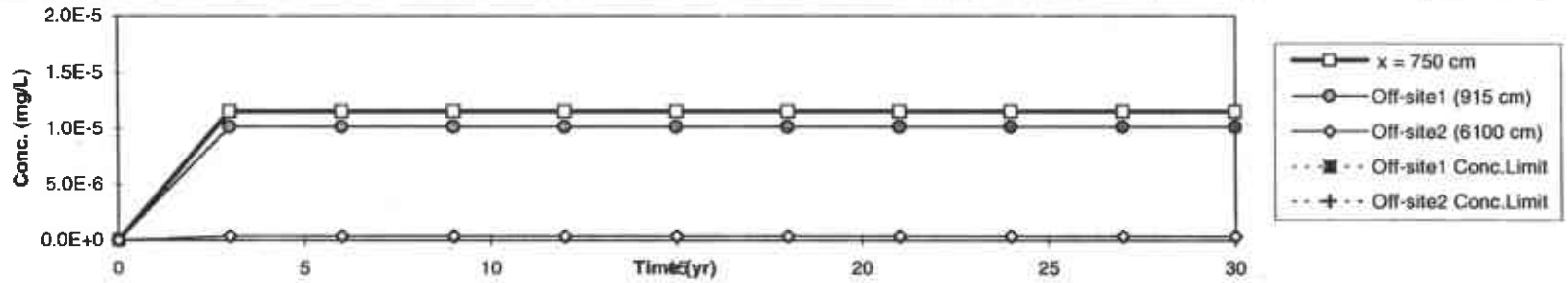


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc. (mg/L)	0.0E+0	1.2E-5	1.2E-5	1.2E-5	1.2E-5	1.2E-5	1.2E-5	1.2E-5	1.2E-5	1.2E-5	1.2E-5
Off-site1 (915 cm)		0.0E+0	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5
Off-site2 (6100 cm)		0.0E+0	3.7E-7	3.7E-7	3.7E-7	3.7E-7	3.7E-7	3.7E-7	3.7E-7	3.7E-7	3.7E-7	3.7E-7

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

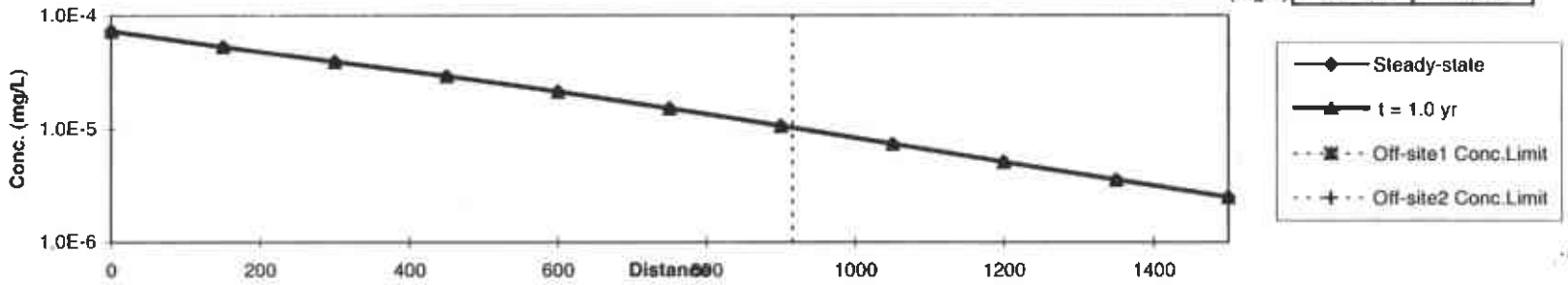
Constiuent: Toluene
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	7.3E-5	5.3E-5	3.9E-5	2.9E-5	2.1E-5	1.5E-5	1.1E-5	7.4E-6	5.1E-6	3.6E-6	2.5E-6
Steady-state		7.3E-5	5.3E-5	3.9E-5	2.9E-5	2.1E-5	1.5E-5	1.1E-5	7.4E-6	5.1E-6	3.6E-6	2.5E-6

	Off-site1 Commercial	Off-site2 Residential
POE Concentration Limit (mg/L)	915	6100
	1.0E-5	1.4E-9
	1.0E-5	1.4E-9
	2.0E+1	7.3E+0

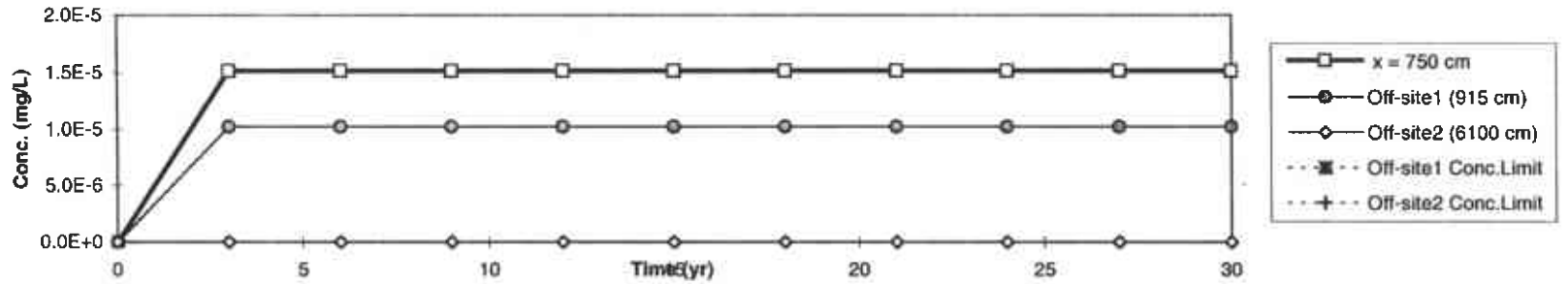


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	1.5E-5	1.5E-5	1.5E-5	1.5E-5	1.5E-5	1.5E-5	1.5E-5	1.5E-5	1.5E-5	1.5E-5
Off-site1 (915 cm)		0.0E+0	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5
Off-site2 (6100 cm)		0.0E+0	1.4E-9	1.4E-9	1.4E-9	1.4E-9	1.4E-9	1.4E-9	1.4E-9	1.4E-9	1.4E-9	1.4E-9

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT | **TIER 2 TRANSIENT DOMENICO ANALYSIS**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constituent: Ethylbenzene

Source Medium: Affected Soils Leaching to Groundwater

Biodegredation: 1st Order

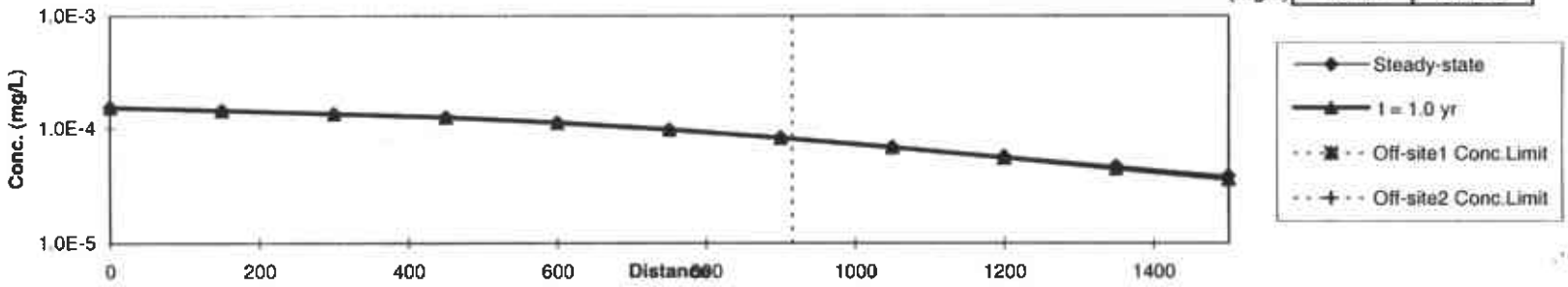
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	1.5E-4	1.4E-4	1.3E-4	1.3E-4	1.1E-4	9.8E-5	8.2E-5	6.8E-5	5.5E-5	4.5E-5	3.6E-5
Steady-state		1.5E-4	1.4E-4	1.3E-4	1.3E-4	1.1E-4	9.8E-5	8.3E-5	6.9E-5	5.7E-5	4.7E-5	3.8E-5

Off-site1 Commercial	Off-site2 Residential
915	6100
8.1E-5	5.2E-8
8.1E-5	6.7E-7
1.0E+1	3.7E+0

POE Concentration Limit (mg/L)



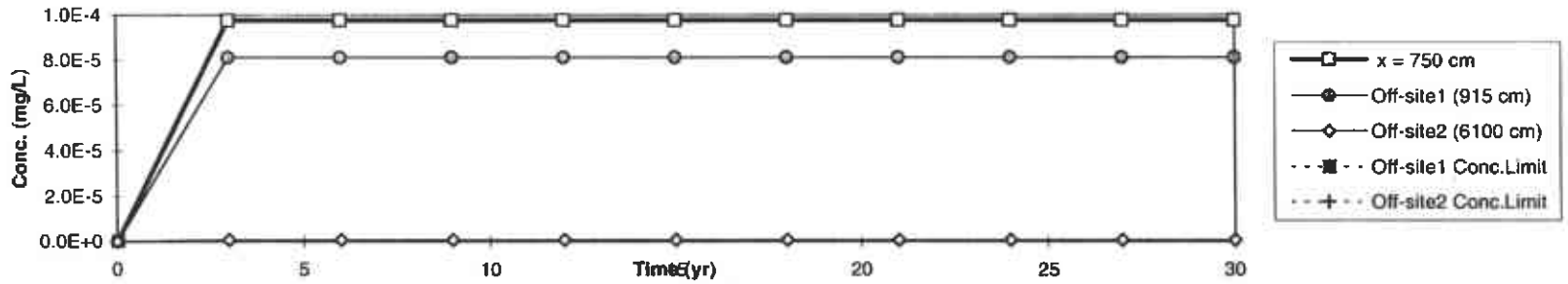
Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	9.8E-5	9.8E-5	9.8E-5	9.8E-5	9.8E-5	9.8E-5	9.8E-5	9.8E-5	9.8E-5	9.8E-5
Off-site1 (915 cm)		0.0E+0	8.1E-5	8.1E-5	8.1E-5	8.1E-5	8.1E-5	8.1E-5	8.1E-5	8.1E-5	8.1E-5	8.1E-5
Off-site2 (6100 cm)		0.0E+0	6.3E-7	6.7E-7	6.7E-7	6.7E-7	6.7E-7	6.7E-7	6.7E-7	6.7E-7	6.7E-7	6.7E-7

Time to Reach Conc. Limit (yr)

Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

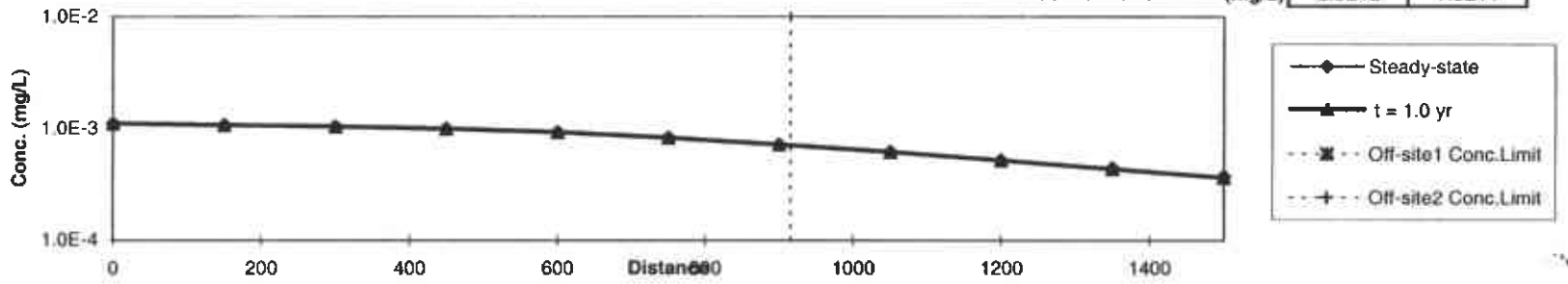
Constiuent: Xylene (mixed isomers)
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	1.1E-3	1.1E-3	1.0E-3	1.0E-3	9.3E-4	8.3E-4	7.2E-4	6.2E-4	5.2E-4	4.4E-4	3.7E-4
Steady-state		1.1E-3	1.1E-3	1.0E-3	1.0E-3	9.3E-4	8.3E-4	7.2E-4	6.2E-4	5.3E-4	4.4E-4	3.8E-4

	Off-site1 Commercial	Off-site2 Residential
POE Concentration Limit (mg/L)	915	6100
	7.1E-4	1.8E-6
	7.1E-4	1.3E-5
	2.0E+2	7.3E+1

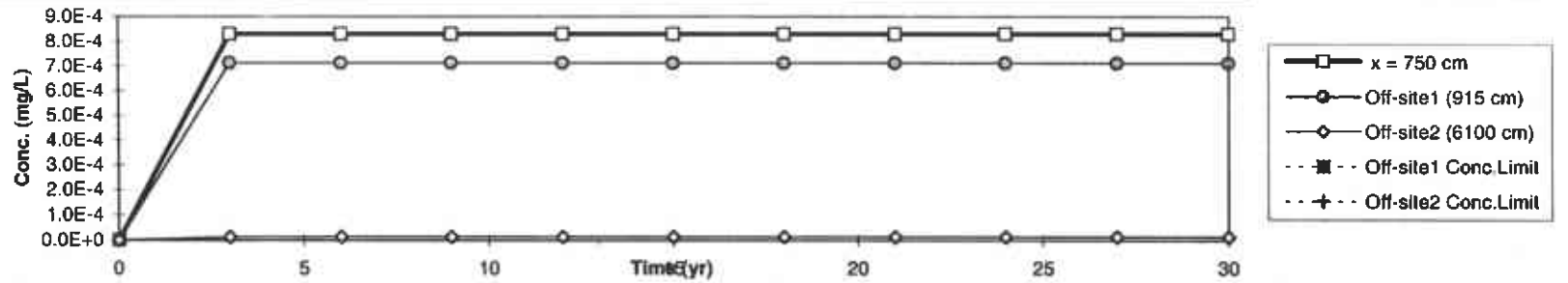


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	8.3E-4	8.3E-4	8.3E-4	8.3E-4	8.3E-4	8.3E-4	8.3E-4	8.3E-4	8.3E-4	8.3E-4
Off-site1 (915 cm)		0.0E+0	7.1E-4	7.1E-4	7.1E-4	7.1E-4	7.1E-4	7.1E-4	7.1E-4	7.1E-4	7.1E-4	7.1E-4
Off-site2 (6100 cm)		0.0E+0	1.3E-5	1.3E-5	1.3E-5	1.3E-5	1.3E-5	1.3E-5	1.3E-5	1.3E-5	1.3E-5	1.3E-5

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constiuent: TPH - Aliph >C21-C34
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

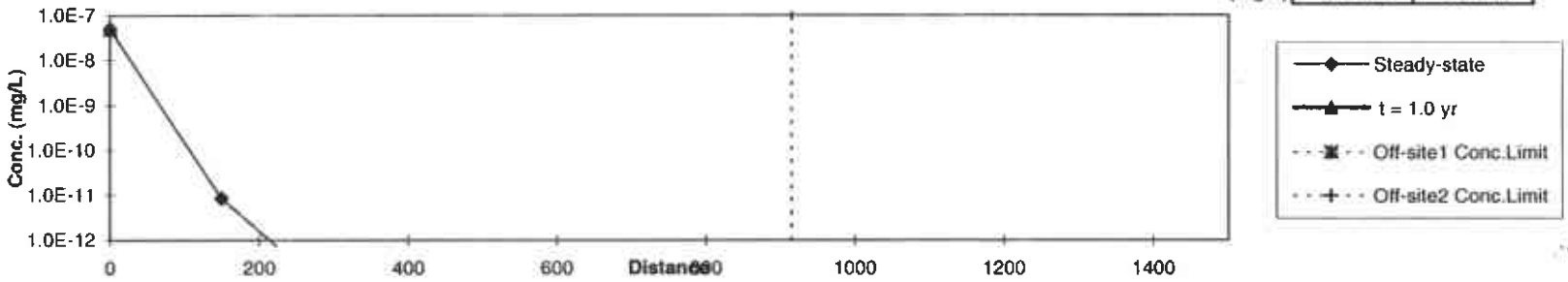
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc. (mg/L)	5.1E-8	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		5.1E-8	8.4E-12	5.6E-14	1.1E-15	3.7E-17	1.7E-18	1.1E-19	8.0E-21	6.9E-22	6.9E-23	7.8E-24

Off-site1 Commercial	Off-site2 Residential
915	6100
0.0E+0	0.0E+0
8.2E-20	1.2E-42
2.0E+2	7.3E+1

POE Concentration Limit (mg/L)

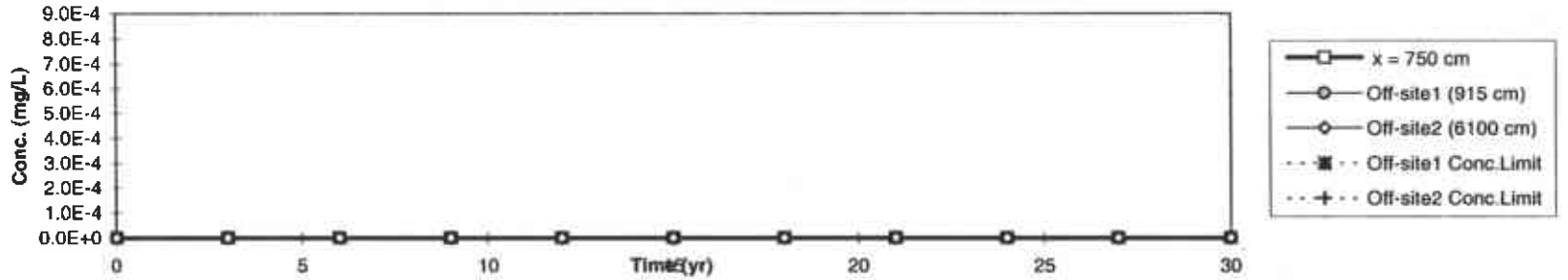


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc. (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site1 (915 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

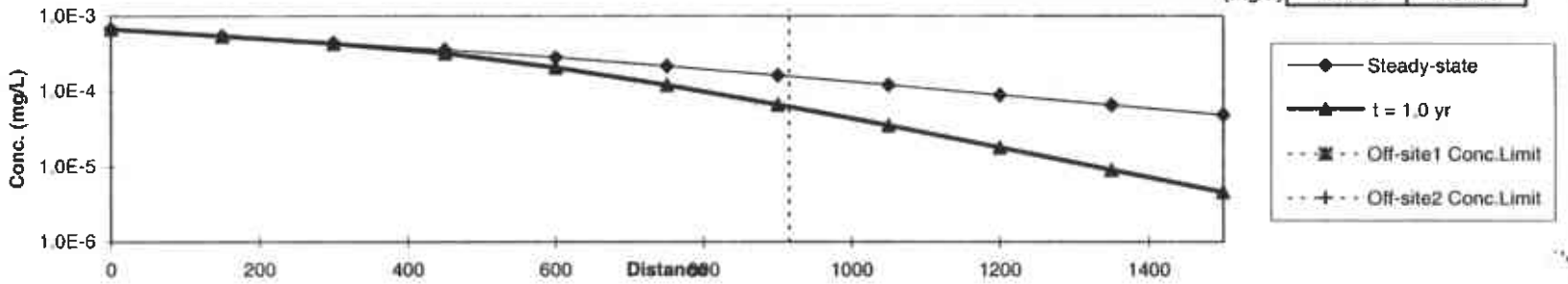
Constituent: Naphthalene
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	6.8E-4	5.5E-4	4.3E-4	3.2E-4	2.1E-4	1.2E-4	6.7E-5	3.5E-5	1.8E-5	9.1E-6	4.6E-6
Steady-state		6.8E-4	5.5E-4	4.4E-4	3.6E-4	2.8E-4	2.2E-4	1.6E-4	1.2E-4	8.9E-5	6.6E-5	4.9E-5

	Off-site1 Commercial	Off-site2 Residential
POE Concentration Limit (mg/L)	915	6100
	6.3E-5	8.8E-15
	1.6E-4	8.7E-8
	4.1E+1	1.5E+1

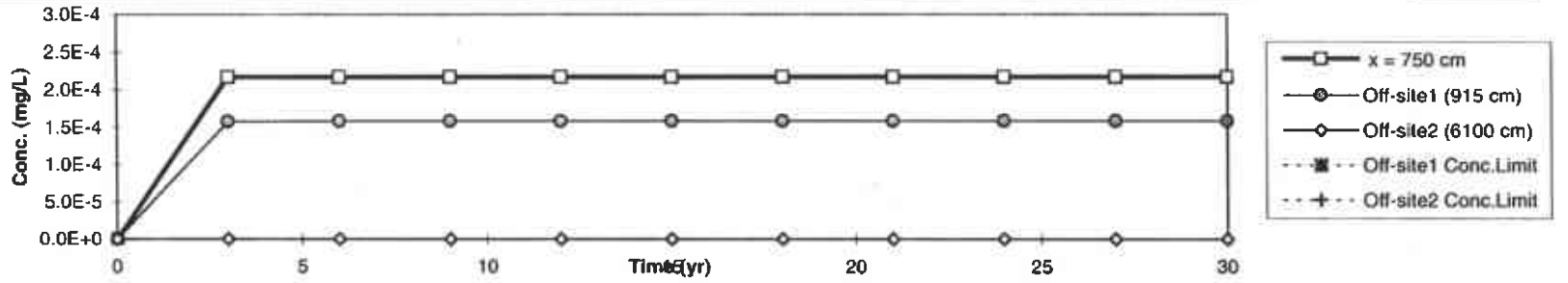


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	2.2E-4	2.2E-4	2.2E-4	2.2E-4	2.2E-4	2.2E-4	2.2E-4	2.2E-4	2.2E-4	2.2E-4
Off-site1 (915 cm)		0.0E+0	1.6E-4	1.6E-4	1.6E-4	1.6E-4	1.6E-4	1.6E-4	1.6E-4	1.6E-4	1.6E-4	1.6E-4
Off-site2 (6100 cm)		0.0E+0	1.0E-8	7.5E-8	8.6E-8	8.7E-8	8.7E-8	8.7E-8	8.7E-8	8.7E-8	8.7E-8	8.7E-8

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 | *7 of 11*

Constituent: Cadmium

Source Medium: Affected Soils Leaching to Groundwater

Biodegredation: 1st Order

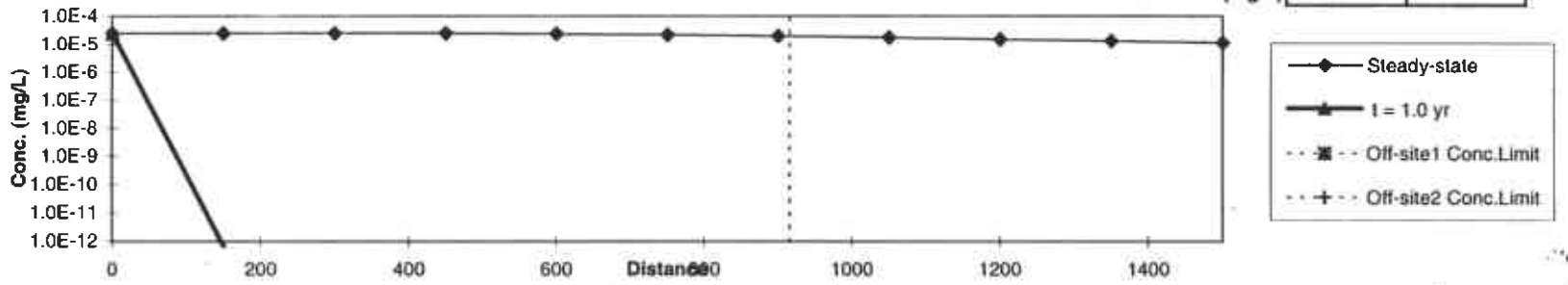
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	2.5E-5	7.3E-13	2.8E-21	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		2.5E-5	2.5E-5	2.5E-5	2.5E-5	2.4E-5	2.2E-5	2.0E-5	1.7E-5	1.5E-5	1.3E-5	1.1E-5

Off-site1 Commercial	Off-site2 Residential
915	6100
0.0E+0	0.0E+0
1.9E-5	9.1E-7
5.1E-2	1.8E-2

POE Concentration Limit (mg/L)



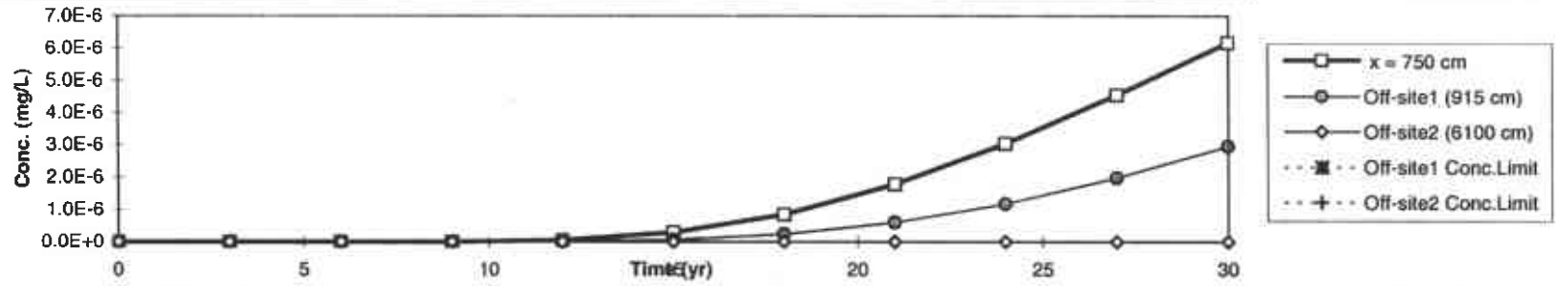
Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	1.3E-18	1.7E-11	4.0E-9	6.0E-8	3.0E-7	8.6E-7	1.8E-6	3.0E-6	4.5E-6	6.2E-6
Off-site1 (915 cm)		0.0E+0	1.1E-21	4.1E-13	3.2E-10	9.0E-9	6.5E-8	2.4E-7	6.0E-7	1.2E-6	2.0E-6	3.0E-6
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	3.0E-22	3.4E-20	1.4E-18	2.6E-17

Time to Reach Conc. Limit (yr)

Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

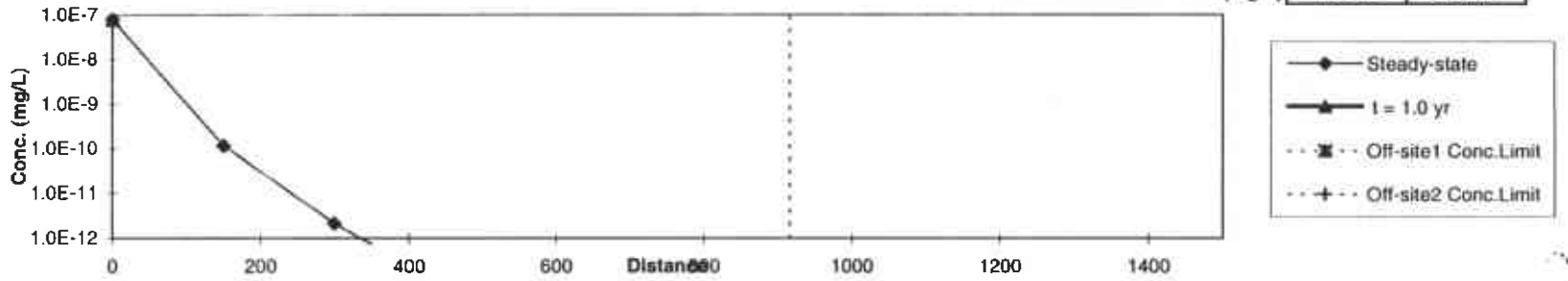
Constiuent: Chromium (III)
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source (for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	8.0E-8	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		8.0E-8	1.2E-10	2.1E-12	8.9E-14	5.7E-15	4.8E-16	5.0E-17	5.9E-18	7.9E-19	1.2E-19	2.0E-20

	Off-site1 Commercial	Off-site2 Residential
	915	6100
	0.0E+0	0.0E+0
	4.0E-17	6.0E-36
POE Concentration Limit (mg/L)	1.5E+2	5.5E+1

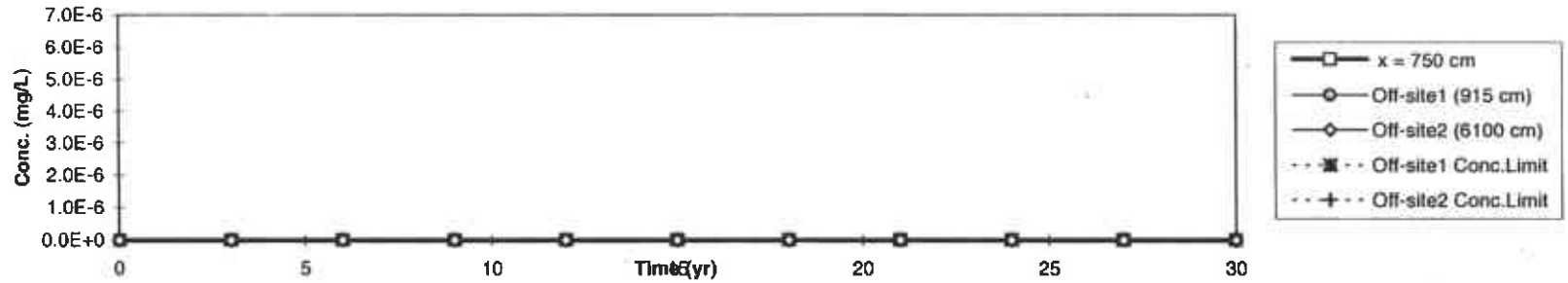


Concentration vs. Time (for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site1 (915 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 | *10 of 11*

Constiuent: Nickel
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

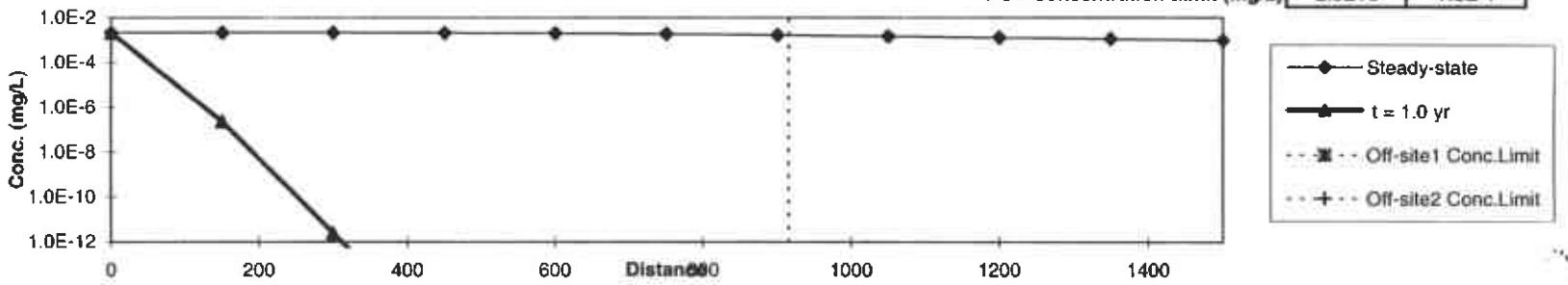
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	2.2E-3	2.4E-7	2.5E-12	2.7E-17	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		2.2E-3	2.2E-3	2.2E-3	2.1E-3	2.1E-3	1.9E-3	1.7E-3	1.5E-3	1.3E-3	1.2E-3	1.0E-3

Off-site1 Commercial	Off-site2 Residential
915	6100
0.0E+0	0.0E+0
1.7E-3	8.2E-5
2.0E+0	7.3E-1

POE Concentration Limit (mg/L)

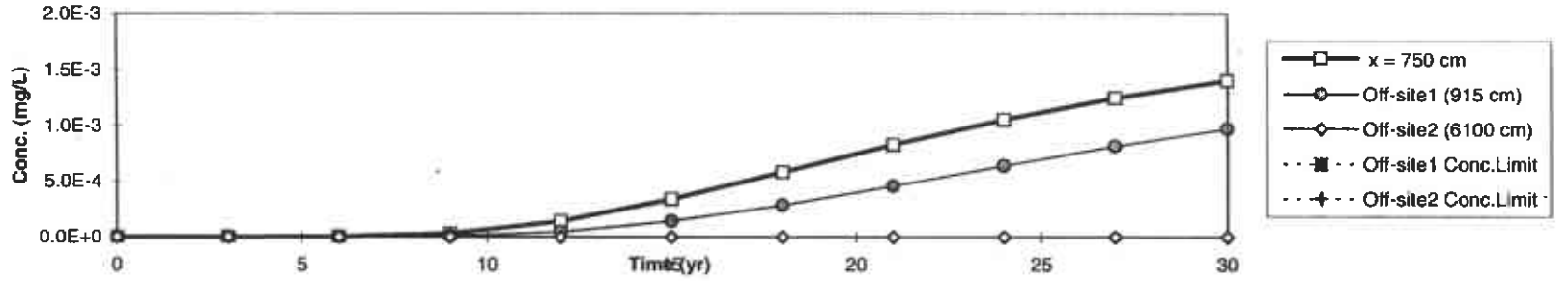


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	1.0E-10	1.4E-6	3.2E-5	1.4E-4	3.4E-4	5.8E-4	8.3E-4	1.1E-3	1.2E-3	1.4E-3
Off-site1 (915 cm)		0.0E+0	1.3E-12	1.5E-7	7.2E-6	4.7E-5	1.4E-4	2.9E-4	4.6E-4	6.4E-4	8.2E-4	9.7E-4
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	1.4E-20	2.9E-17	5.1E-15	2.0E-13	3.3E-12	2.8E-11	1.6E-10

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT

TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman
Date Completed: 1-Dec-01
Job ID: 201064

Constituent: Zinc
Source Medium: Affected Soils Leaching to Groundwater
Biodegredation: 1st Order

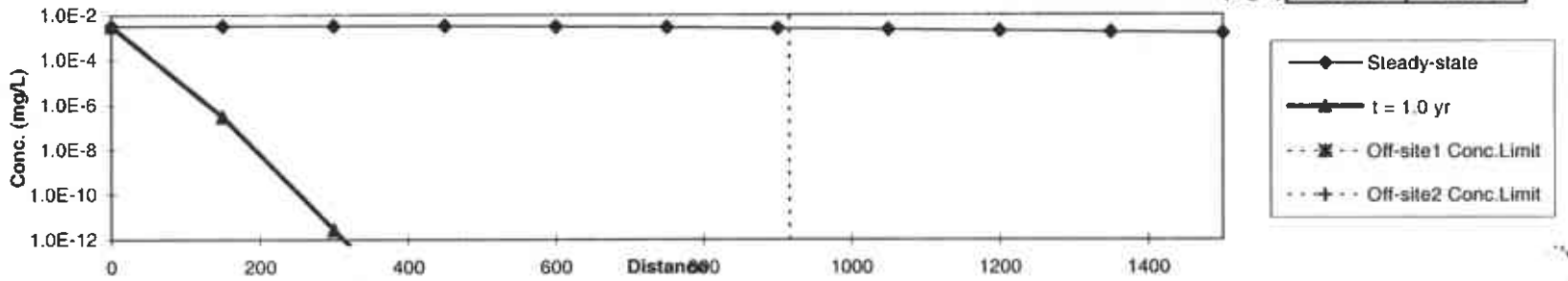
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc. (mg/L)	3.3E-3	3.1E-7	2.8E-12	2.6E-17	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		3.3E-3	3.3E-3	3.3E-3	3.3E-3	3.1E-3	2.9E-3	2.6E-3	2.3E-3	2.0E-3	1.7E-3	1.5E-3

Off-site1	Off-site2
Commercial	Residential
915	6100
0.0E+0	0.0E+0
2.6E-3	1.2E-4
3.1E+1	1.1E+1

POE Concentration Limit (mg/L)

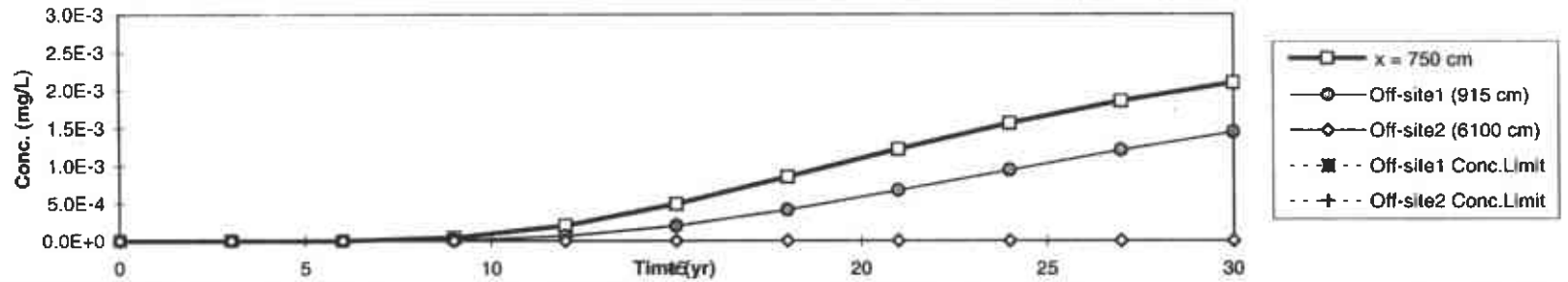


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc. (mg/L)	0.0E+0	1.2E-10	1.8E-6	4.4E-5	2.1E-4	4.9E-4	8.5E-4	1.2E-3	1.6E-3	1.9E-3	2.1E-3
Off-site1 (915 cm)		0.0E+0	1.5E-12	2.0E-7	9.8E-6	6.7E-5	2.0E-4	4.1E-4	6.7E-4	9.4E-4	1.2E-3	1.4E-3
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	1.4E-20	2.9E-17	5.4E-15	2.3E-13	3.8E-12	3.4E-11	1.9E-10

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT

TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman
Date Completed: 1-Dec-01
Job ID: 201064

Constituent: BenzeneCA*
Source Medium: Affected Groundwater
Biodegredation: 1st Order

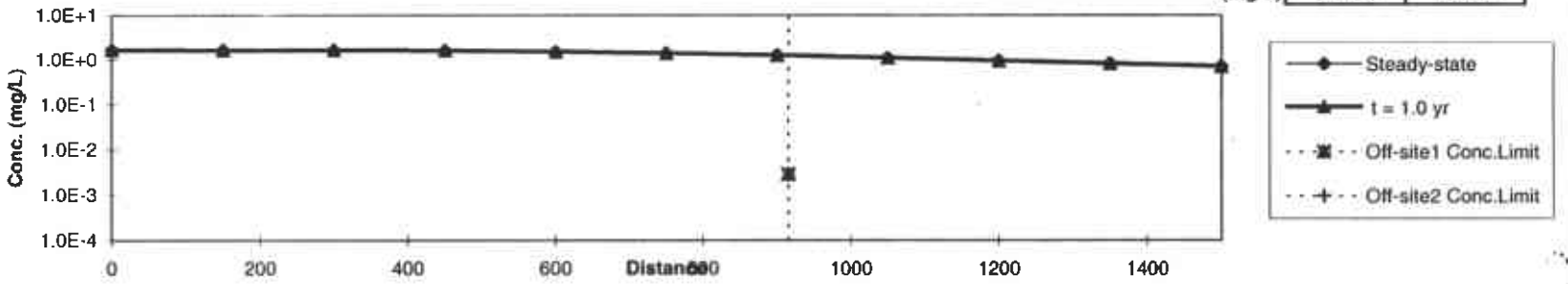
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	1.7E+0	1.7E+0	1.7E+0	1.6E+0	1.6E+0	1.4E+0	1.3E+0	1.1E+0	9.6E-1	8.3E-1	7.2E-1
Steady-state		1.7E+0	1.7E+0	1.7E+0	1.6E+0	1.6E+0	1.4E+0	1.3E+0	1.1E+0	9.6E-1	8.3E-1	7.2E-1

Off-site1 Commercial	Off-site2 Residential
915	6100
1.3E+0	1.9E-2
1.3E+0	4.5E-2
2.9E-3	8.5E-4

POE Concentration Limit (mg/L)



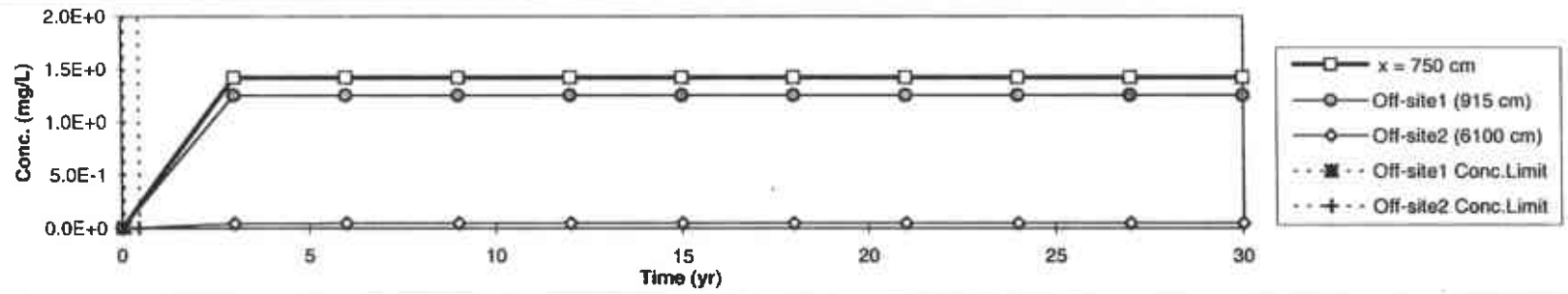
Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	1.4E+0	1.4E+0	1.4E+0	1.4E+0	1.4E+0	1.4E+0	1.4E+0	1.4E+0	1.4E+0	1.4E+0
Off-site1 (915 cm)		0.0E+0	1.3E+0	1.3E+0	1.3E+0	1.3E+0	1.3E+0	1.3E+0	1.3E+0	1.3E+0	1.3E+0	1.3E+0
Off-site2 (6100 cm)		0.0E+0	4.5E-2	4.5E-2	4.5E-2	4.5E-2	4.5E-2	4.5E-2	4.5E-2	4.5E-2	4.5E-2	4.5E-2

Time to Reach Conc. Limit (yr)

Off-site1	0.1
Off-site2	0.5



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constiuent: Toluene
Source Medium: Affected Groundwater
Biodegredation: 1st Order

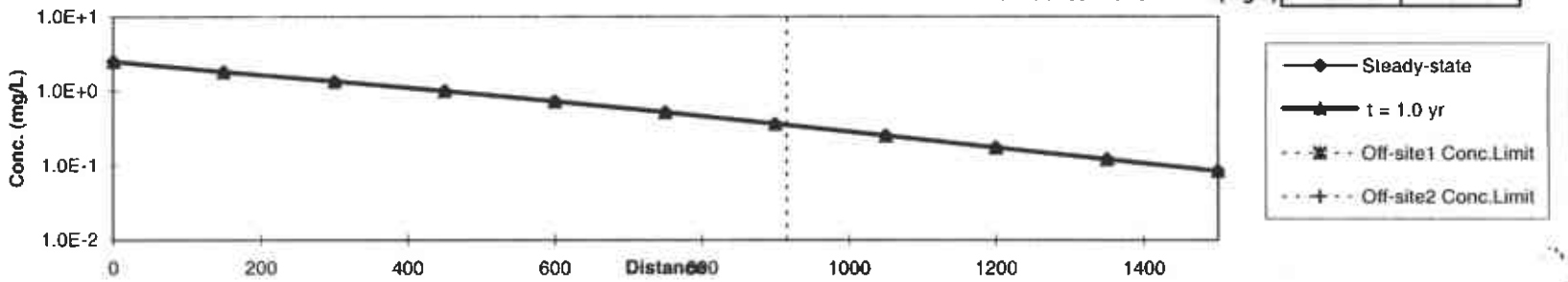
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	2.5E+0	1.8E+0	1.3E+0	1.0E+0	7.3E-1	5.2E-1	3.6E-1	2.5E-1	1.7E-1	1.2E-1	8.5E-2
Steady-state		2.5E+0	1.8E+0	1.3E+0	1.0E+0	7.3E-1	5.2E-1	3.6E-1	2.5E-1	1.7E-1	1.2E-1	8.5E-2

Off-site1 Commercial	Off-site2 Residential
915	6100
3.5E-1	4.7E-5
3.5E-1	4.9E-5
2.0E+1	7.3E+0

POE Concentration Limit (mg/L)

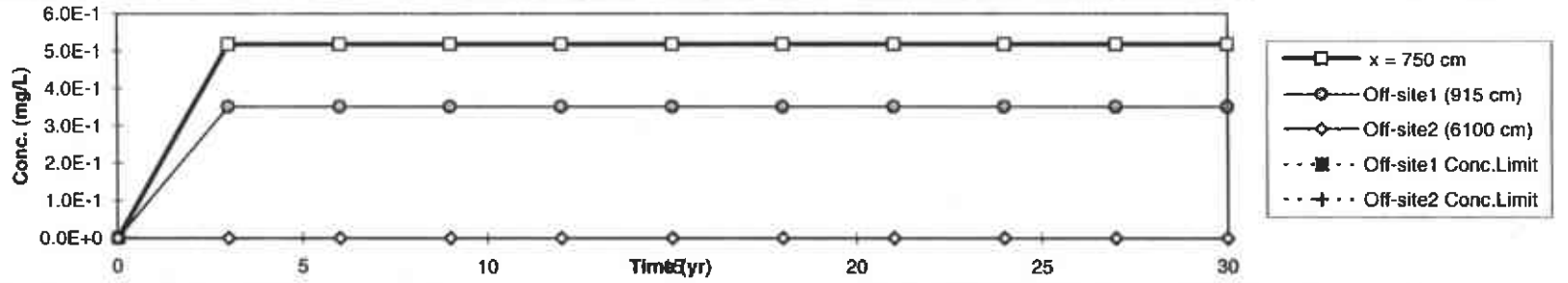


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	5.2E-1	5.2E-1	5.2E-1	5.2E-1	5.2E-1	5.2E-1	5.2E-1	5.2E-1	5.2E-1	5.2E-1
Off-site1 (915 cm)		0.0E+0	3.5E-1	3.5E-1	3.5E-1	3.5E-1	3.5E-1	3.5E-1	3.5E-1	3.5E-1	3.5E-1	3.5E-1
Off-site2 (6100 cm)		0.0E+0	4.9E-5	4.9E-5	4.9E-5	4.9E-5	4.9E-5	4.9E-5	4.9E-5	4.9E-5	4.9E-5	4.9E-5

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constiuent: Ethylbenzene
Source Medium: Affected Groundwater
Biodegredation: 1st Order

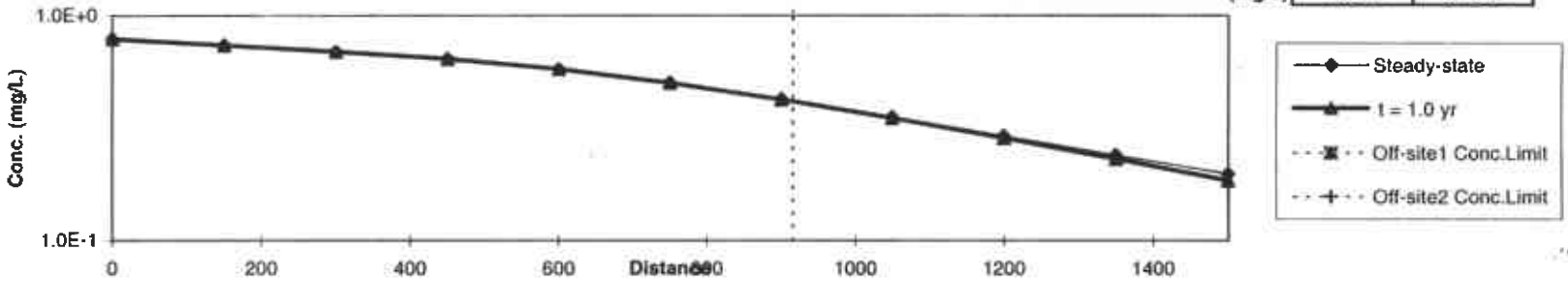
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	7.9E-1	7.4E-1	6.9E-1	6.4E-1	5.8E-1	5.0E-1	4.2E-1	3.5E-1	2.9E-1	2.3E-1	1.8E-1
Steady-state		7.9E-1	7.4E-1	6.9E-1	6.4E-1	5.8E-1	5.0E-1	4.3E-1	3.5E-1	2.9E-1	2.4E-1	2.0E-1

Off-site1 Commercial	Off-site2 Residential
915	6100
4.2E-1	2.7E-4
4.2E-1	3.4E-3
1.0E+1	3.7E+0

POE Concentration Limit (mg/L)



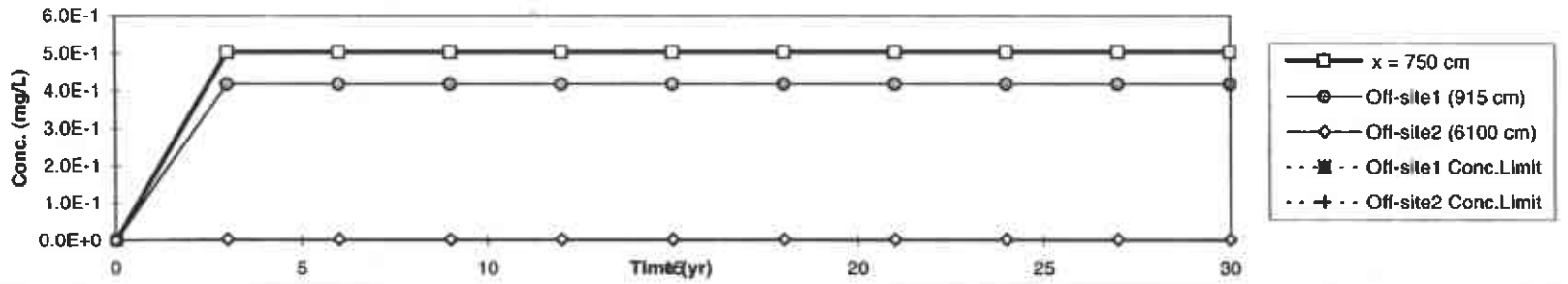
Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	5.0E-1	5.0E-1	5.0E-1	5.0E-1	5.0E-1	5.0E-1	5.0E-1	5.0E-1	5.0E-1	5.0E-1
Off-site1 (915 cm)		0.0E+0	4.2E-1	4.2E-1	4.2E-1	4.2E-1	4.2E-1	4.2E-1	4.2E-1	4.2E-1	4.2E-1	4.2E-1
Off-site2 (6100 cm)		0.0E+0	3.2E-3	3.4E-3	3.4E-3	3.4E-3	3.4E-3	3.4E-3	3.4E-3	3.4E-3	3.4E-3	3.4E-3

Time to Reach Conc. Limit (yr)

Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

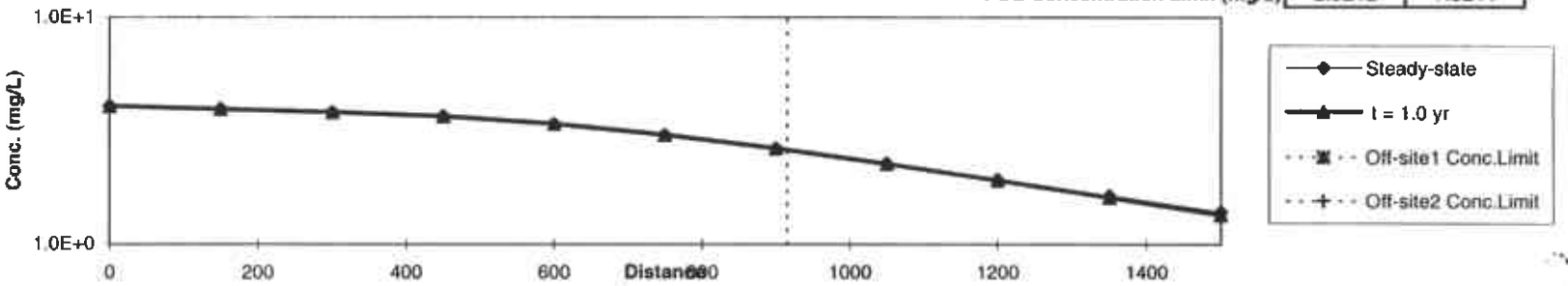
Constiuent: Xylene (mixed isomers)
Source Medium: Affected Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	4.1E+0	4.0E+0	3.8E+0	3.7E+0	3.4E+0	3.1E+0	2.7E+0	2.3E+0	1.9E+0	1.6E+0	1.4E+0
Steady-state		4.1E+0	4.0E+0	3.8E+0	3.7E+0	3.4E+0	3.1E+0	2.7E+0	2.3E+0	1.9E+0	1.6E+0	1.4E+0

	Off-site1 Commercial	Off-site2 Residential
POE Concentration Limit (mg/L)	915	6100
	2.6E+0	6.6E-3
	2.6E+0	4.9E-2
	2.0E+2	7.3E+1

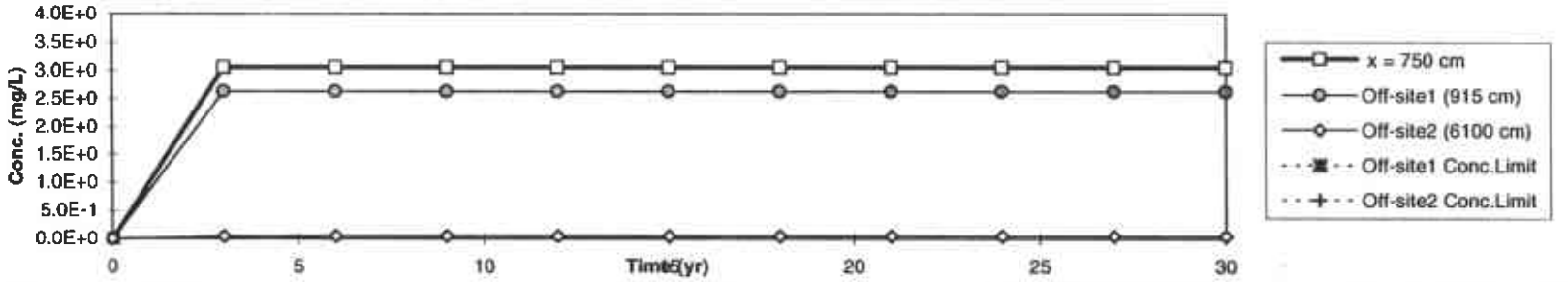


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	3.1E+0	3.1E+0	3.1E+0	3.1E+0	3.1E+0	3.1E+0	3.1E+0	3.1E+0	3.1E+0	3.1E+0
Off-site1 (915 cm)		0.0E+0	2.6E+0	2.6E+0	2.6E+0	2.6E+0	2.6E+0	2.6E+0	2.6E+0	2.6E+0	2.6E+0	2.6E+0
Off-site2 (6100 cm)		0.0E+0	4.6E-2	4.9E-2	4.9E-2	4.9E-2	4.9E-2	4.9E-2	4.9E-2	4.9E-2	4.9E-2	4.9E-2

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

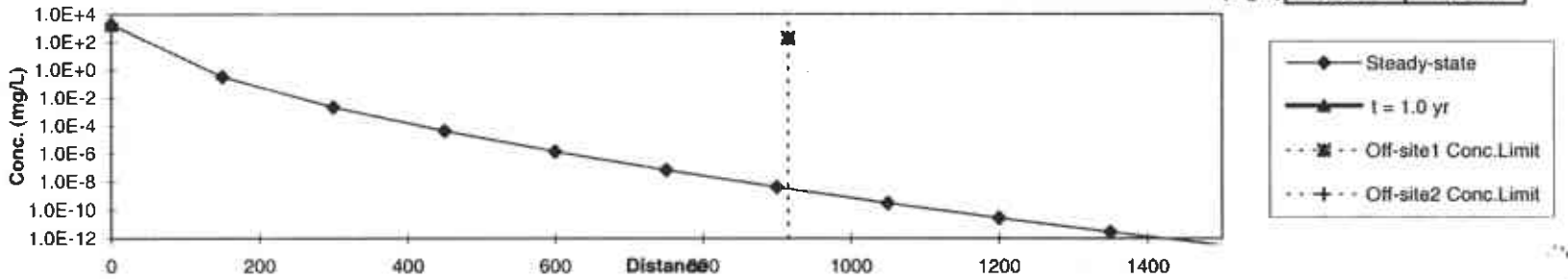
Constiuent: TPH - Aliph >C21-C34
Source Medium: Affected Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc. (mg/L)	2.0E+3	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		2.0E+3	3.3E-1	2.2E-3	4.2E-5	1.4E-6	6.9E-8	4.2E-9	3.1E-10	2.7E-11	2.7E-12	3.1E-13

Off-site1 Commercial	Off-site2 Residential
915	6100
0.0E+0	0.0E+0
3.2E-9	4.6E-32
POE Concentration Limit (mg/L)	
2.0E+2	7.3E+1

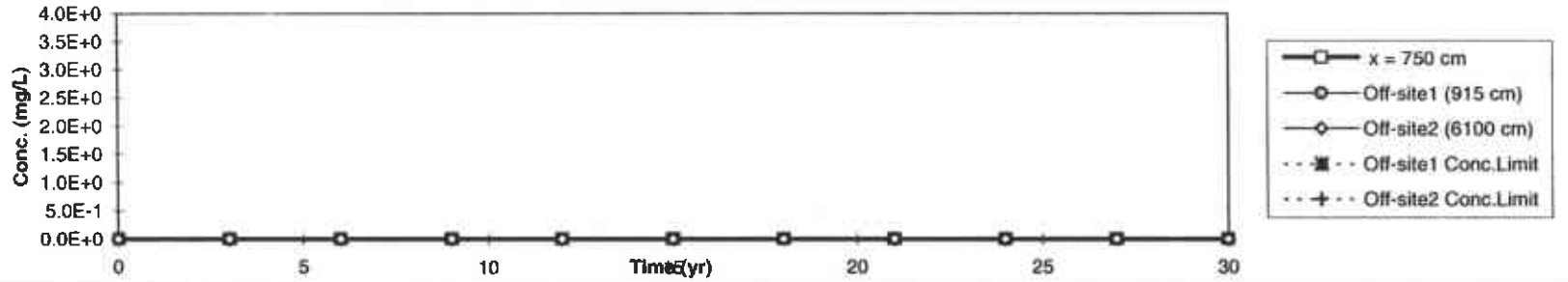


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc. (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site1 (915 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT | **TIER 2 TRANSIENT DOMENICO ANALYSIS**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constiuent: Naphthalene

Source Medium: Affected Groundwater

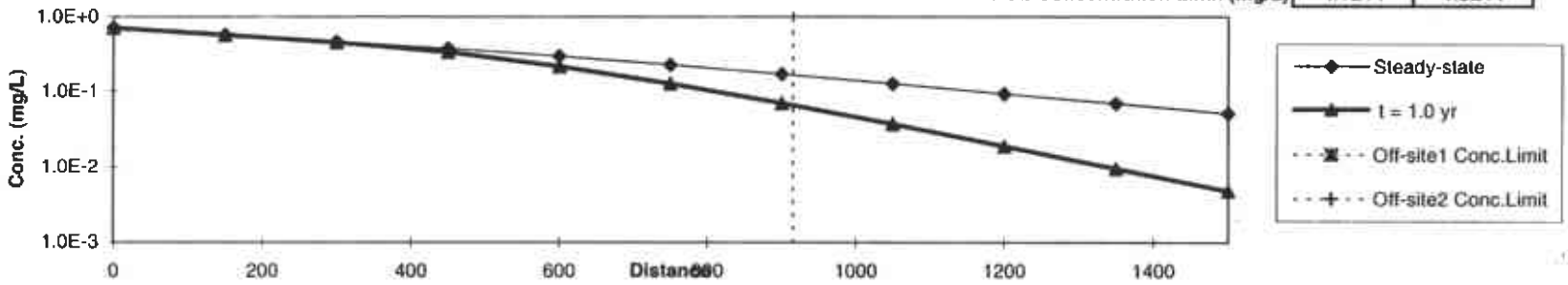
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	7.1E-1	5.7E-1	4.6E-1	3.3E-1	2.2E-1	1.3E-1	7.0E-2	3.7E-2	1.9E-2	9.5E-3	4.8E-3
Steady-state		7.1E-1	5.7E-1	4.6E-1	3.8E-1	3.0E-1	2.3E-1	1.7E-1	1.3E-1	9.3E-2	6.9E-2	5.1E-2

	Off-site1 Commercial	Off-site2 Residential
POE Concentration Limit (mg/L)	915	6100
	6.6E-2	9.2E-12
	1.7E-1	9.1E-5
	4.1E+1	1.5E+1

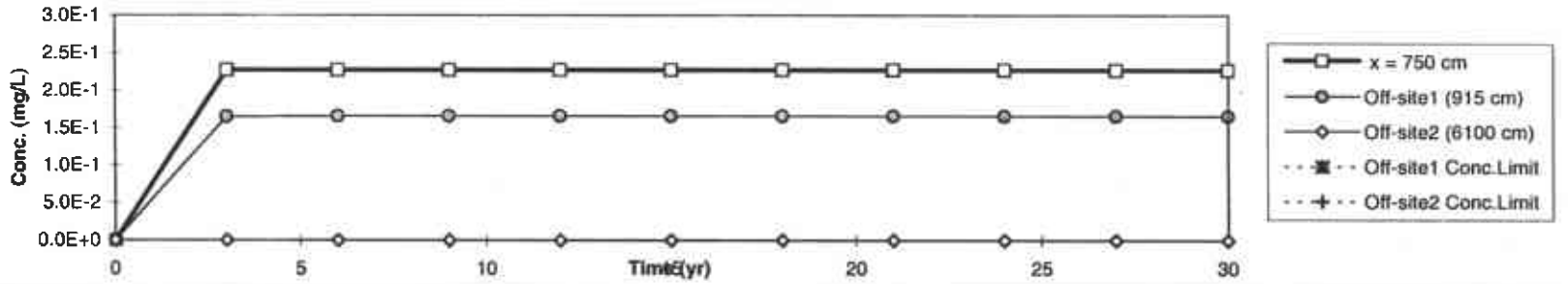


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	2.3E-1	2.3E-1	2.3E-1	2.3E-1	2.3E-1	2.3E-1	2.3E-1	2.3E-1	2.3E-1	2.3E-1
Off-site1 (915 cm)		0.0E+0	1.7E-1	1.7E-1	1.7E-1	1.7E-1	1.7E-1	1.7E-1	1.7E-1	1.7E-1	1.7E-1	1.7E-1
Off-site2 (6100 cm)		0.0E+0	1.1E-5	7.9E-5	9.0E-5	9.1E-5	9.1E-5	9.1E-5	9.1E-5	9.1E-5	9.1E-5	9.1E-5

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

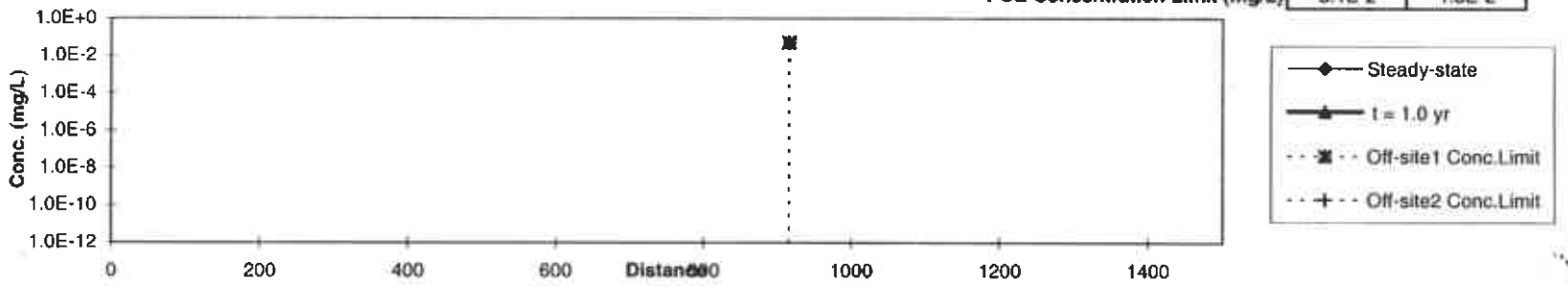
Constiuent: Cadmium
Source Medium: Affected Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc. (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Off-site1 Commercial	Off-site2 Residential
915	6100
0.0E+0	0.0E+0
0.0E+0	0.0E+0
POE Concentration Limit (mg/L)	
5.1E-2	1.8E-2

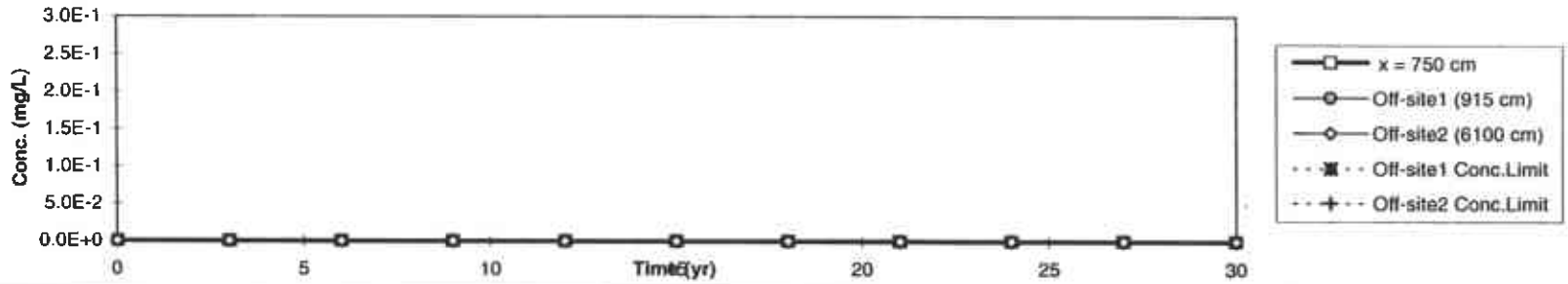


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc. (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site1 (915 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

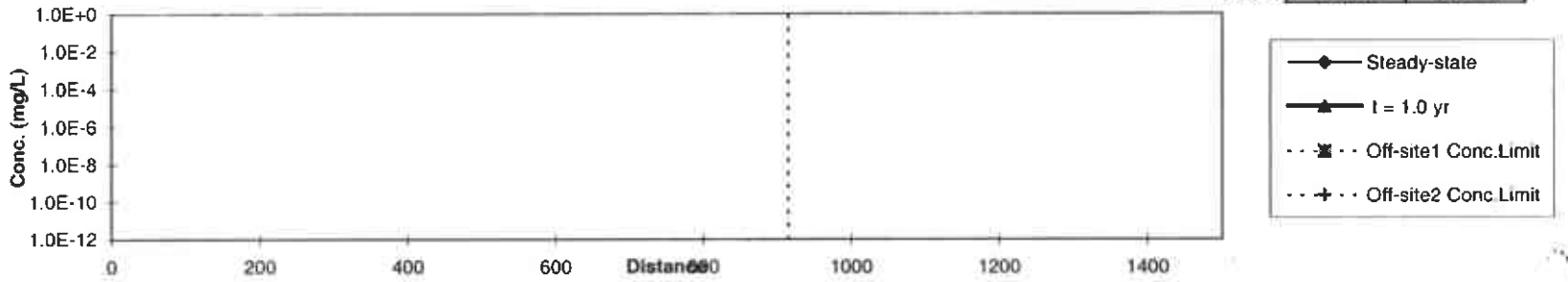
Constituent: Chromium (III)
Source Medium: Affected Groundwater
Biodegredation: 1st Order

Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

	Off-site1 Commercial	Off-site2 Residential
	915	6100
	0.0E+0	0.0E+0
	0.0E+0	0.0E+0
POE Concentration Limit (mg/L)	1.5E+2	5.5E+1

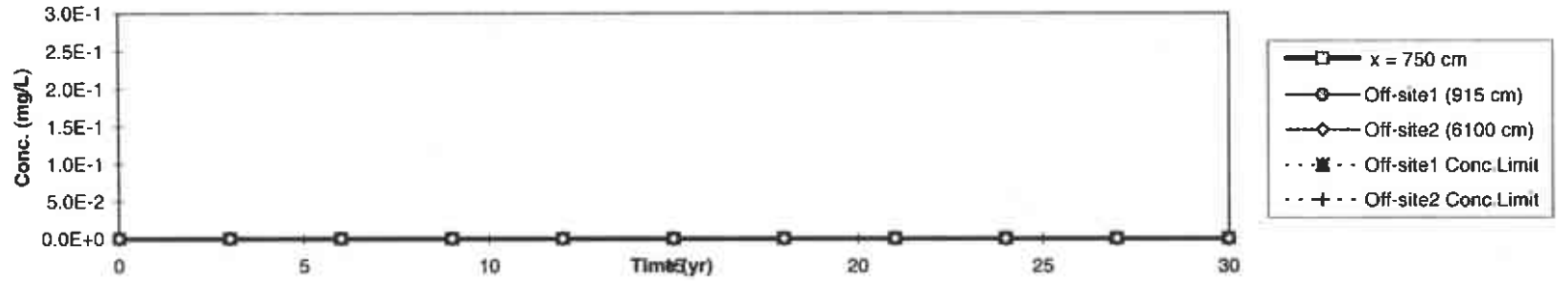


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site1 (915 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT — TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constiuent: Nickel

Source Medium: Affected Groundwater

Biodegredation: 1st Order

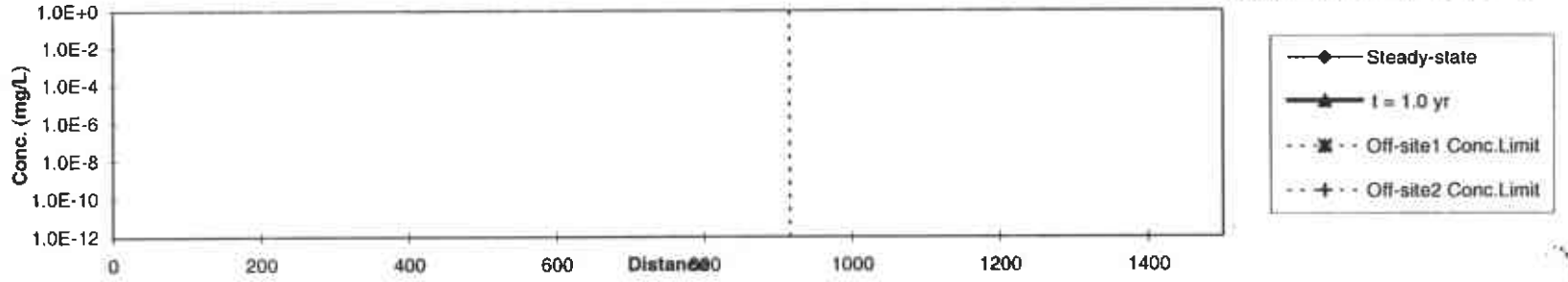
Concentration vs. Distance from Source
(for given time)

Time (yr) 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Off-site1 Commercial	Off-site2 Residential
915	6100
0.0E+0	0.0E+0
0.0E+0	0.0E+0
2.0E+0	7.3E-1

POE Concentration Limit (mg/L)



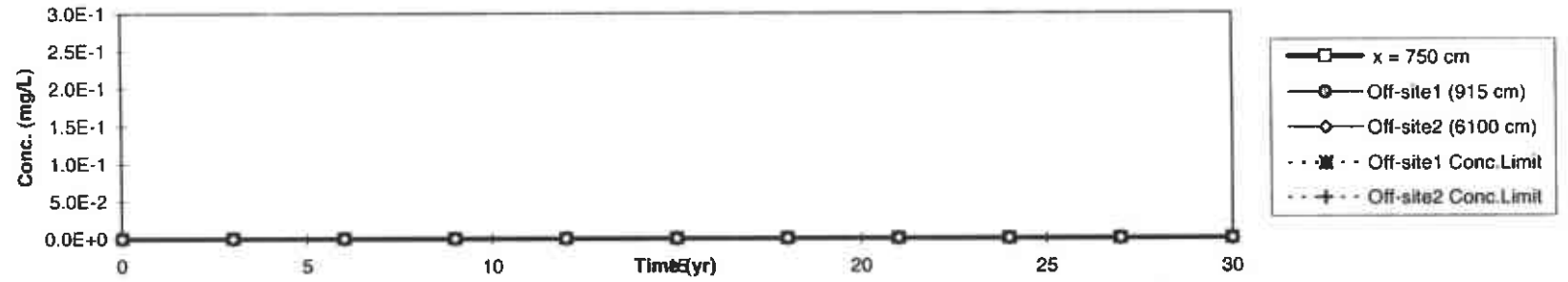
Concentration vs. Time
(for given distance from source)

Distance (cm) 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site1 (915 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time to Reach Conc. Limit (yr)

Off-site1	NA
Off-site2	NA



RBCA SITE ASSESSMENT

TIER 2 TRANSIENT DOMENICO ANALYSIS

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman
Date Completed: 1-Dec-01
Job ID: 201064

Constituent: Zinc
Source Medium: Affected Groundwater
Biodegredation: 1st Order

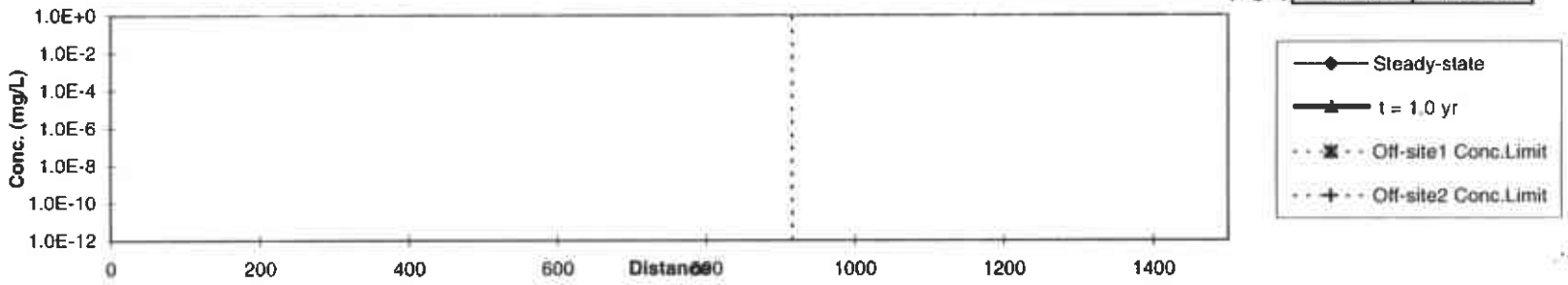
Concentration vs. Distance from Source
(for given time)

Time (yr): 1.0

Distance (cm)		0	150	300	450	600	750	900	1050	1200	1350	1500
t = 1.0 yr	Conc (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Steady-state		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Off-site1 Commercial	Off-site2 Residential
915	6100
0.0E+0	0.0E+0
0.0E+0	0.0E+0
3.1E+1	1.1E+1

POE Concentration Limit (mg/L)

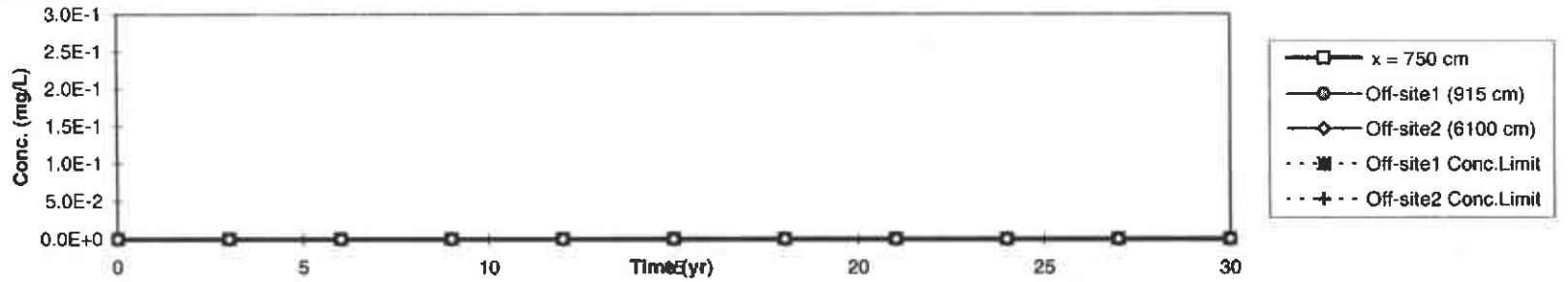


Concentration vs. Time
(for given distance from source)

Distance (cm): 750

Time (yr)		0	3	6	9	12	15	18	21	24	27	30
x = 750 cm	Conc. (mg/L)	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site1 (915 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0
Off-site2 (6100 cm)		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time to Reach Conc. Limit (yr)	
Off-site1	NA
Off-site2	NA



Appendix N

Printouts: Soil SSTL Values, Groundwater SSTL Values, Calculation of SSTL Values for TPH, Chemical-Specific Tier 2 Cleanup Summary (10 chemicals)

RBCA SITE ASSESSMENT

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201054

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01

SOIL (0 - 730 cm) SSTL VALUES

Target Risk (Class A & B): 1.0E-6
Target Risk (Class C): 1.0E-5
Target Hazard Quotient: 1.0E+0

Groundwater DAF Option: Domenico - First Order (One-directional vert. dispersion)

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

CONSTITUENTS OF CONCERN		Representative Concentration	X	Soil Leaching to Groundwater Ingestion			X	Soil Vol. to Indoor Air	X	Soil Volatilization and Surface Soil Particulates to Outdoor Air				X	Surface Soil Inhalation, Ingestion,Dermal Contact		Applicable SSTL	SSTL Exceeded ?	Required CRF
				On-site (0 cm)	Off-site 1 (915 cm)	Off-site 2 (6100 cm)		On-site (0 cm)		On-site (0 cm)			Off-site 1 (765 cm)	Off-site 2 (0 cm)	On-site (0 cm)				Only if "yes" left
CAS No.	Name	(mg/kg)		None	Commercial	Residential		Residential		Residential	Construction Worker		Commercial	None	Commercial	Construction Worker	(mg/kg)	"■" if yes	
71-43-2	BenzeneCA*	2.5E-3		NA	7.0E-1	5.8E+0		5.7E-2		2.9E+0	NA		4.0E+0	NA	3.0E+0	7.6E+1	5.7E-2	☐	<1
108-88-3	Toluene	2.8E-2		NA	>8.0E+2	>8.0E+2		1.6E+2		>8.0E+2	NA		>8.0E+2	NA	5.3E+3	5.5E+3	1.6E+2	☐	<1
100-41-4	Ethylbenzene	1.3E-1		NA	>6.5E+2	>6.5E+2		>6.5E+2		>6.5E+2	NA		>6.5E+2	NA	3.3E+3	3.3E+3	3.3E+3	☐	<1
1330-20-7	Xylene (mixed isomers)	6.6E-1		NA	>5.2E+2	>5.2E+2		>5.2E+2		>5.2E+2	NA		>5.2E+2	NA	6.2E+4	6.3E+4	6.2E+4	☐	<1
0-00-0	TPH - Aliph >C21-C34	7.3E+1		NA	>1.6E+1	>1.6E+1		NC		NC	NA		NC	NA	NC	NC	>1.6E+1	☐	NA
91-20-3	Naphthalene	3.1E+0		NA	>6.2E+2	>6.2E+2		>6.2E+2		>6.2E+2	NA		>6.2E+2	NA	1.0E+5	1.0E+5	1.0E+5	☐	<1
7440-43-9	Cadmium	4.3E-1		NA	1.2E+3	8.7E+3		>4.9E+7		2.5E+5	NA		4.2E+5	NA	1.0E+3	7.1E+2	7.1E+2	☐	<1
16065-83-1	Chromium (III)	3.3E+1		NA	>3.0E+11	>3.0E+11		NC		NC	NA		NC	NA	NC	NC	>3.0E+11	☐	NA
7439-92-1	Lead*	1.7E+1		NA	NC	NC		NC		NC	NA		NC	NA	NC	NC	NC	☐	NA
7440-02-0	Nickel	3.2E+1		NA	3.9E+4	2.9E+5		>1.1E+7		9.4E+5	NA		1.6E+6	NA	NC	NC	3.9E+4	☐	<1
7440-66-6	Zinc	4.7E+1		NA	5.6E+5	4.1E+6		NC		NC	NA		NC	NA	NC	NC	5.6E+5	☐	<1

* = Chemical with user-specified data

">" indicates risk-based target concentration greater than constituent residual saturation value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA

Completed By: Mark Detterman
Date Completed: 1-Dec-01

Job ID: 201064

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

Groundwater DAF Option: Domenico - First Order (One-directional vert. dispersion)

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

CONSTITUENTS OF CONCERN		Representative Concentration	X	Groundwater Ingestion			X	GW Vol. to Indoor Air	X	Groundwater Volatilization to Outdoor Air			Applicable SSTL	SSTL Exceeded ?	Required CRF
				On-site (0 cm)	Off-site 1 (915 cm)	Off-site 2 (6100 cm)		On-site (0 cm)		On-site (0 cm)	Off-site 1 (765 cm)	Off-site 2 (0 cm)			Only if "yes" left
CAS No.	Name	(mg/L)		None	Commercial	Residential		Residential		Residential	Commercial	None	(mg/L)	"■" if yes	
71-43-2	BenzeneCA*	1.7E+0		NA	3.9E-3	3.2E-2		1.9E+0		>1.8E+3	>1.8E+3	NA	3.9E-3	■	4.4E+2
108-88-3	Toluene	2.5E+0		NA	1.5E+2	>5.2E+2		>5.2E+2		>5.2E+2	>5.2E+2	NA	1.5E+2	☐	<1
100-41-4	Ethylbenzene	7.9E-1		NA	1.9E+1	>1.7E+2		>1.7E+2		>1.7E+2	>1.7E+2	NA	1.9E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	4.1E+0		NA	>2.0E+2	>2.0E+2		>2.0E+2		>2.0E+2	>2.0E+2	NA	>2.0E+2	☐	NA
0-00-0	TPH - Aliph >C21-C34	2.0E+3		NA	>2.5E-6	>2.5E-6		NC		NC	NC	NA	>2.5E-6	☐	NA
91-20-3	Naphthalene	7.1E-1		NA	>3.1E+1	>3.1E+1		>3.1E+1		>3.1E+1	>3.1E+1	NA	>3.1E+1	☐	NA
7440-43-9	Cadmium	0.0E+0		NA	6.6E-2	5.0E-1		>6.5E+5		>6.5E+5	>6.5E+5	NA	6.6E-2	☐	<1
16065-83-1	Chromium (III)	0.0E+0		NA	>1.7E+5	>1.7E+5		NC		NC	NC	NA	>1.7E+5	☐	NA
7439-92-1	Lead*	0.0E+0		NA	NC	NC		NC		NC	NC	NA	NC	☐	NA
7440-02-0	Nickel	0.0E+0		NA	2.6E+0	1.9E+1		>1.7E+5		>1.7E+5	>1.7E+5	NA	2.6E+0	☐	<1
7440-66-6	Zinc	0.0E+0		NA	3.9E+1	2.9E+2		NC		NC	NC	NA	3.9E+1	☐	<1

* = Chemical with user-specified data

">" indicates risk-based target concentration greater than constituent solubility value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT | **TPH Criteria SSTL Worksheet**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01

CALCULATION OF SSTL VALUES FOR TPH

CONSTITUENTS OF CONCERN		Mass Fractions		Representative Concentrations		Calculated Concentration Limits		Applicable SSTL Values	
		Soil	Groundwater	Soil	Groundwater	Residual Soil Concentration	Solubility	Soils (0 - 730 cm)	Groundwater
CAS No.	Name	(-)	(-)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)
0-00-0	TPH - Aliph >C21-C34	1.0E+0	1.0E+0	7.3E+1	2.0E+3	1.6E+1	2.5E-6	>1.6E+1	>2.5E-6
Total		1.0E+0	1.0E+0	7.3E+1	2.0E+3	Total TPH SSTL value		>Res	>Sol

* = Chemical with user-specified data

">" indicates risk-based target concentration greater than constituent residual saturation value. NC = Not calculated.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01

Constituent: BenzeneCA* **CAS No.: 71-43-2**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	4.2E-1	4.1E+0
	TR = 1e-6	NA	3.9E-3	3.2E-2
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	7.5E+1	7.4E+2
	TR = 1e-6	NA	7.0E-1	5.8E+0
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	9.6E+1		
	TR = 1e-6	3.0E+0		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	6.2E+0	8.7E+0	NA
	TR = 1e-6	2.9E-1	4.9E-1	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	6.1E+1	7.1E+1	NA
	TR = 1e-6	2.9E+0	4.0E+0	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>1.8E+3	>1.8E+3	NA
	TR = 1e-6	>1.8E+3	>1.8E+3	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	6.2E+0		
	TR = 1e-6	2.9E-1		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	1.2E+0		
	TR = 1e-6	5.7E-2		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	4.0E+1		
	TR = 1e-6	1.9E+0		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	6.5E-6	7.1E-6	NA
VF_{samb}	(kg-soil/m3-air)	1.0E-4	1.2E-4	NA
VF_{wamb}	(m3-wat/m3-air)	7.2E-8	7.2E-8	NA
VF_{asap}	(kg-soil/m3-air)	5.2E-3	NA	NA
VF_{wsp}	(m3-wat/m3-air)	1.5E-4	NA	NA
LF	(kg-soil/L-wat)	All exposures: 5.5E-3		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	1.4E+0	3.7E+1
DAFs/gw	(-)	NA	1.4E+0	3.7E+1

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	7.8E+1	PS
Sol	(mg/L)	1.8E+3	PS
P_{vap}	(mmHg)	9.5E+1	PS
H_{atm}	(atm-m^3/mol)	5.6E-3	PS
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$\log(K_{oc})$	(log[L/kg])	1.8E+0	PS
D_{air}	(cm^2/sec)	8.8E-2	PS
D_{wat}	(cm^2/sec)	9.8E-6	PS
Toxicity Data			
Wt of Evd.		A	
SF_o	(1/[mg/kg/day])	1.0E-1	PS
SF_d	(1/[mg/kg/day])	3.0E-2	TX
URF_i	(1/[$\mu g/m^3$])	8.3E-6	PS
RfD_o	(mg/kg/day)	3.0E-3	R
RfD_d	(mg/kg/day)	-	-
RfC_i	(mg/m^3)	6.0E-3	R
Dermal Exposure Parameters			
RAF_d	(mg/mg)	5.0E-1	D
K_p	(cm/hr)	2.1E-2	
tau_d	(hr/event)	2.6E-1	
t_{cm}	(hr)	6.3E-1	
B	(-)	1.3E-2	
Regulatory Standards			
MCL	(mg/L)	1.0E-3	*
TWA	(mg/m^3)	3.3E+0	-
AQL	(mg/L)	-	-
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	1.0E-3	S
ADL_s	(mg/kg)	5.0E-3	S
$t_{1/2,sat}$	(d)	7.2E+2	H
$t_{1/2,unsat}$	(d)	7.2E+2	H

* MCL ref = -

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	2.3E-1
K_{sw}	(L-wat/kg-soil)	1.3E+0
C_{sat}	(mg/kg-soil)	1.4E+3
$C_{sat,vap}$	($\mu g/m^3$-air)	4.0E+8
$D_{eff,s}$	(cm^2/sec)	1.1E-5
$D_{eff,crk}$	(cm^2/sec)	6.9E-3
$D_{eff,cap}$	(cm^2/sec)	1.0E-5
$D_{eff,ws}$	(cm^2/sec)	1.1E-5
R_{sat}	(-)	1.3E+0
R_{unsat}	(-)	3.9E+0
Z	(cm/event)	7.3E-2

Notes: 1) NA = Not applicable; NC = Not calculated.

2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constituent: Toluene **CAS No.: 108-88-3**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	1.5E+2	>5.2E+2
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	>8.0E+2	>8.0E+2
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	5.3E+3		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	4.2E+2	5.8E+2	NA
	TR = 1e-6	NC	NC	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	>8.0E+2	>8.0E+2	NA
	TR = 1e-6	NC	NC	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>5.2E+2	>5.2E+2	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	4.2E+2		
	TR = 1e-6	NC		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	1.6E+2		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>5.2E+2		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	4.6E-6	5.0E-6	NA
VF_{samb}	(kg-soil/m3-air)	1.0E-4	1.2E-4	NA
VF_{wamb}	(m3-wat/m3-air)	7.0E-8	7.0E-8	NA
VF_{ssap}	(kg-soil/m3-air)	2.6E-3	NA	NA
VF_{wsap}	(m3-wat/m3-air)	1.5E-4	NA	NA
LF	(kg-soil/L-wat)	All exposures: 2.8E-3		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	7.1E+0	5.2E+4
DAFs/gw	(-)	NA	7.1E+0	5.2E+4

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	9.2E+1	5
Sol	(mg/L)	5.2E+2	29
P_{vap}	(mmHg)	3.0E+1	4
H_{atm}	(atm-m^3/mol)	6.3E-3	A
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$\log(K_{oc})$	(log[L/kg])	2.1E+0	A
D_{air}	(cm^2/sec)	8.5E-2	A
D_{wat}	(cm^2/sec)	9.4E-6	A
Toxicity Data			
Wt of Evd		D	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	-	-
RfD_o	(mg/kg/day)	2.0E-1	A,R
RfD_d	(mg/kg/day)	1.6E-1	TX
RfC_i	(mg/m^3)	4.0E-1	A,R
Dermal Exposure Parameters			
RAF_d	(mg/mg)	5.0E-1	D
K_p	(cm/hr)	4.5E-2	
tau_d	(hr/event)	3.2E-1	
t_{cri}	(hr)	7.7E-1	
B	(-)	5.4E-2	
Regulatory Standards			
MCL	(mg/L)	1.0E+0	*
TWA	(mg/m^3)	1.5E+2	ACGIH
AQL	(mg/L)	-	-
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	2.0E-3	S
ADL_s	(mg/kg)	5.0E-3	S
$t_{1/2,sat}$	(d)	2.8E+1	H
$t_{1/2,unsat}$	(d)	2.8E+1	H

* MCL ref = 56 FR 3526 (30 Jan 91)

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	2.6E-1
K_{sw}	(L-wat/kg-soil)	6.4E-1
C_{sat}	(mg/kg-soil)	8.0E+2
$C_{sat,vap}$	($\mu g/m^3$-air)	1.5E+8
$D_{eff,s}$	(cm^2/sec)	9.1E-6
$D_{eff,crk}$	(cm^2/sec)	6.6E-3
$D_{eff,cap}$	(cm^2/sec)	8.6E-6
$D_{eff,ws}$	(cm^2/sec)	9.1E-6
R_{sat}	(-)	1.6E+0
R_{unsat}	(-)	7.7E+0
Z	(cm/event)	1.6E-1

Notes: 1) NA = Not applicable; NC = Not calculated.
2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT

Chemical-Specific Tier 2 Cleanup Summary

Site Name: Former J&R Auto Dismantlers
Site Location: 819 - 823 East 12th Street, Oakland, CA
Completed By: Mark Detterman
Date Completed: 1-Dec-01
Job ID: 201064

Constituent: Ethylbenzene **CAS No.: 100-41-4**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	1.9E+1	>1.7E+2
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	>6.5E+2	>6.5E+2
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	3.3E+3		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	1.0E+3	1.5E+3	NA
	TR = 1e-6	NC	NC	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_a$ (mg/kg)	THQ = 1e+0	>6.5E+2	>6.5E+2	NA
	TR = 1e-6	NC	NC	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>1.7E+2	>1.7E+2	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	1.0E+3		
	TR = 1e-6	NC		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_a$ (mg/kg)	THQ = 1e+0	>6.5E+2		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>1.7E+2		
	TR = 1e-6	NC		

Chemical Parameters

		Units	Value	Reference
Physical Properties				
MW		(g/mol)	1.1E+2	PS
Sol		(mg/L)	1.7E+2	PS
P_{vap}		(mmHg)	1.0E+1	PS
H_{atm}		(atm-m^3/mol)	7.9E-3	PS
pK_a		(log[mol/mol])	-	-
pK_b		(log[mol/mol])	-	-
$\log(K_{oc})$		(log[L/kg])	2.6E+0	PS
D_{air}		(cm^2/sec)	7.5E-2	PS
D_{wat}		(cm^2/sec)	7.8E-6	PS
Toxicity Data				
Wt of Evd.			D	
SF_o		(1/[mg/kg/day])	-	-
SF_d		(1/[mg/kg/day])	-	-
URF_i		(1/[$\mu g/m^3$])	-	-
RfD_o		(mg/kg/day)	1.0E-1	PS
RfD_d		(mg/kg/day)	9.7E-2	TX
RfC_i		(mg/m^3)	1.0E+0	PS
Dermal Exposure Parameters				
RAF_d		(mg/mg)	5.0E-1	D
K_p		(cm/hr)	7.4E-2	
tau_d		(hr/event)	3.9E-1	
t_{crit}		(hr)	1.3E+0	
B		(-)	1.4E-1	
Regulatory Standards				
MCL		(mg/L)	7.0E-1	*
TWA		(mg/m^3)	4.4E+2	PS
AQL		(mg/L)	-	-
Miscellaneous Parameters				
ADL_{gw}		(mg/L)	2.0E-3	S
ADL_s		(mg/kg)	5.0E-3	S
$t_{1/2,sat}$		(d)	2.3E+2	H
$t_{1/2,unsat}$		(d)	2.3E+2	H

* MCL ref = 56 FR 3526 (30 Jan 91)

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	2.7E-6	3.0E-6	NA
VF_{samb}	(kg-soil/m3-air)	1.0E-4	1.2E-4	NA
VF_{wamb}	(m3-wat/m3-air)	6.1E-8	6.1E-8	NA
VF_{sesp}	(kg-soil/m3-air)	9.5E-4	NA	NA
VF_{wesp}	(m3-wat/m3-air)	1.3E-4	NA	NA
LF	(kg-soil/L-wat)	All exposures: 1.1E-3		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	1.9E+0	2.3E+2
DAFs/gw	(-)	NA	1.9E+0	2.3E+2

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	3.2E-1
K_{sw}	(L-wat/kg-soil)	2.6E-1
C_{sat}	(mg/kg-soil)	6.5E+2
$C_{sat,vap}$	($\mu g/m^3$-air)	5.8E+7
$D_{eff,a}$	(cm^2/sec)	6.4E-6
$D_{eff,crk}$	(cm^2/sec)	5.9E-3
$D_{eff,cap}$	(cm^2/sec)	5.7E-6
$D_{eff,ws}$	(cm^2/sec)	6.3E-6
R_{sat}	(-)	2.6E+0
R_{unsat}	(-)	1.9E+1
Z	(cm/event)	2.7E-1

Notes: 1) NA = Not applicable; NC = Not calculated.

2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constituent: Xylene (mixed isomers) **CAS No.: 1330-20-7**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	>2.0E+2	>2.0E+2
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	>5.2E+2	>5.2E+2
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	6.2E+4		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	7.3E+3	1.0E+4	NA
	TR = 1e-6	NC	NC	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	>5.2E+2	>5.2E+2	NA
	TR = 1e-6	NC	NC	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>2.0E+2	>2.0E+2	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	7.3E+3		
	TR = 1e-6	NC		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	>5.2E+2		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>2.0E+2		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	3.4E-6	3.7E-6	NA
VF_{samb}	(kg-soil/m3-air)	1.0E-4	1.2E-4	NA
VF_{wamb}	(m3-wat/m3-air)	6.4E-8	6.4E-8	NA
VF_{sesp}	(kg-soil/m3-air)	1.4E-3	NA	NA
VF_{wesp}	(m3-wat/m3-air)	1.4E-4	NA	NA
LF	(kg-soil/L-wat)	All exposures: 1.7E-3		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	1.6E+0	8.4E+1
DAFs/gw	(-)	NA	1.6E+0	8.4E+1

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	1.1E+2	5
Sol	(mg/L)	2.0E+2	5
P_{vap}	(mmHg)	7.0E+0	4
H_{atm}	(atm-m^3/mol)	7.0E-3	A
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$log(K_{oc})$	(log[L/kg])	2.4E+0	A
D_{air}	(cm^2/sec)	7.2E-2	A
D_{wat}	(cm^2/sec)	8.5E-6	A
Toxicity Data			
Wt of Evd		D	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	-	-
RfD_o	(mg/kg/day)	2.0E+0	A,R
RfD_d	(mg/kg/day)	1.8E+0	TX
RfC_i	(mg/m^3)	7.0E+0	A
Dermal Exposure Parameters			
RAF_d	(mg/mg)	5.0E-1	D
K_p	(cm/hr)	8.0E-2	
tau_d	(hr/event)	3.9E-1	
t_{crit}	(hr)	1.4E+0	
B	(-)	1.6E-1	
Regulatory Standards			
MCL	(mg/L)	1.0E+1	*
TWA	(mg/m^3)	4.3E+2	ACGIH
AQL	(mg/L)	-	-
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	5.0E-3	S
ADL_s	(mg/kg)	5.0E-3	S
$t_{1/2,sat}$	(d)	3.6E+2	H
$t_{1/2,unsat}$	(d)	3.6E+2	H

* MCL ref = 56 FR 3526 (30 Jan 91)

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	2.9E-1
K_{sw}	(L-wat/kg-soil)	3.8E-1
C_{sat}	(mg/kg-soil)	5.2E+2
$C_{sat,vap}$	($\mu g/m^3$-air)	4.0E+7
$D_{eff,s}$	(cm^2/sec)	7.4E-6
$D_{eff,crk}$	(cm^2/sec)	5.6E-3
$D_{eff,csp}$	(cm^2/sec)	7.0E-6
$D_{eff,ws}$	(cm^2/sec)	7.4E-6
R_{sat}	(-)	2.1E+0
R_{unsat}	(-)	1.3E+1
Z	(cm/event)	2.9E-1

Notes: 1) NA = Not applicable; NC = Not calculated.
2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01

Constituent: TPH - Aliph >C21-C34 **CAS No.: 0-00-0**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	>2.5E-6	>2.5E-6
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	>1.6E+1	>1.6E+1
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	5.6E+5		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	1.6E-7	1.8E-7	NA
VF_{samb}	(kg-soil/m3-air)	1.0E-4	1.2E-4	NA
VF_{wamb}	(m3-wat/m3-air)	2.3E-4	2.3E-4	NA
VF_{seep}	(kg-soil/m3-air)	3.7E-6	NA	NA
VF_{wsp}	(m3-wat/m3-air)	5.0E-1	NA	NA
LF	(kg-soil/L-wat)	All exposures: 6.9E-10		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	6.2E+11	4.3E+34
DAFs/gw	(-)	NA	6.2E+11	4.3E+34

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	4.0E+2	-
Sol	(mg/L)	2.5E-6	-
P_{vap}	(mmHg)	8.4E-4	-
H_{atm}	(atm-m^3/mol)	1.8E+2	-
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
log(K_{oc})	(log[L/kg])	8.8E+0	-
D_{air}	(cm^2/sec)	1.0E-1	-
D_{wat}	(cm^2/sec)	1.0E-5	-
Toxicity Data			
Wt of Evd		D	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	-	-
RfD_o	(mg/kg/day)	2.0E+0	T
RfD_d	(mg/kg/day)	-	-
RfC_i	(mg/m^3)	-	T
Dermal Exposure Parameters			
RAF_d	(mg/mg)	5.0E-2	-
K_p	(cm/hr)	-	
tau_d	(hr/event)	-	
t_{crit}	(hr)	-	
B	(-)	-	
Regulatory Standards			
MCL	(mg/L)	-	*
TWA	(mg/m^3)	-	-
AQL	(mg/L)	-	-
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	-	-
ADL_s	(mg/kg)	-	-
$t_{1/2,sat}$	(d)	-	-
$t_{1/2,unsat}$	(d)	-	-

* MCL ref = -

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	7.3E+3
K_{sw}	(L-wat/kg-soil)	1.6E-7
C_{sat}	(mg/kg-soil)	1.6E+1
$C_{sat,vap}$	($\mu g/m^3$-air)	1.8E+4
$D_{eff,a}$	(cm^2/sec)	1.7E-6
$D_{eff,crk}$	(cm^2/sec)	7.8E-3
$D_{eff,cap}$	(cm^2/sec)	1.7E-7
$D_{eff,ws}$	(cm^2/sec)	1.1E-6
R_{sat}	(-)	2.8E+6
R_{unsat}	(-)	3.2E+7
Z	(cm/event)	-

Notes: 1) NA = Not applicable; NC = Not calculated.

2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constituent: Naphthalene **CAS No.: 91-20-3**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	>3.1E+1	>3.1E+1
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	>6.2E+2	>6.2E+2
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	1.0E+5		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	1.5E+3	2.0E+3	NA
	TR = 1e-6	NC	NC	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	>6.2E+2	>6.2E+2	NA
	TR = 1e-6	NC	NC	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>3.1E+1	>3.1E+1	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	1.5E+3		
	TR = 1e-6	NC		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	>6.2E+2		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	>3.1E+1		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	1.1E-6	1.2E-6	NA
VF_{samb}	(kg-soil/m3-air)	1.0E-4	1.2E-4	NA
VF_{wamb}	(m3-wat/m3-air)	4.8E-8	4.8E-8	NA
VF_{sesp}	(kg-soil/m3-air)	5.7E-5	NA	NA
VF_{wesp}	(m3-wat/m3-air)	9.8E-5	NA	NA
LF	(kg-soil/L-wat)	All exposures: 2.2E-4		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	4.3E+0	7.8E+3
DAFs/gw	(-)	NA	4.3E+0	7.8E+3

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	1.3E+2	PS
Sol	(mg/L)	3.1E+1	PS
P_{vap}	(mmHg)	2.3E-1	PS
H'_{atm}	(atm-m^3/mol)	4.8E-4	PS
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$\log(K_{oc})$	(log[L/kg])	3.3E+0	PS
D_{air}	(cm^2/sec)	5.9E-2	PS
D_{wat}	(cm^2/sec)	7.5E-6	PS
Toxicity Data			
Wt of Evd.		D	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	-	-
RfD_o	(mg/kg/day)	4.0E-1	PS
RfD_d	(mg/kg/day)	3.6E-1	TX
RfC_i	(mg/m^3)	1.4E+0	PS
Dermal Exposure Parameters			
RAF_d	(mg/mg)	5.0E-2	D
K_p	(cm/hr)	6.9E-2	
tau_d	(hr/event)	5.3E-1	
t_{crit}	(hr)	2.2E+0	
B	(-)	2.0E-1	
Regulatory Standards			
MCL	(mg/L)	-	*
TWA	(mg/m^3)	5.0E+1	PS
AQL	(mg/L)	-	-
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	1.0E-2	32
ADL_s	(mg/kg)	1.0E-2	32
$t_{1/2,sat}$	(d)	2.6E+2	H
$t_{1/2,unsat}$	(d)	2.6E+2	H

* MCL ref = -

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	2.0E-2
K_{sw}	(L-wat/kg-soil)	5.0E-2
C_{sat}	(mg/kg-soil)	6.2E+2
$C_{sat,vap}$	($\mu g/m^3$-air)	1.6E+6
$D_{eff,s}$	(cm^2/sec)	8.1E-5
$D_{eff,crk}$	(cm^2/sec)	4.6E-3
$D_{eff,cap}$	(cm^2/sec)	8.8E-5
$D_{eff,ws}$	(cm^2/sec)	8.1E-5
R_{sat}	(-)	9.9E+0
R_{unsat}	(-)	1.0E+2
Z	(cm/event)	2.7E-1

Notes: 1) NA = Not applicable; NC = Not calculated.
2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constituent: Cadmium **CAS No.: 7440-43-9**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	6.6E-2	5.0E-1
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	1.2E+3	8.7E+3
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	7.1E+2		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	>0.0E+0	>0.0E+0	NA
	TR = 1e-6	>0.0E+0	>0.0E+0	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	>4.9E+7	>4.9E+7	NA
	TR = 1e-6	2.5E+5	4.2E+5	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	>0.0E+0		
	TR = 1e-6	>0.0E+0		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	NC	NC	NA
VF_{samb}	(kg-soil/m3-air)	NC	NC	NA
VF_{wamb}	(m3-wat/m3-air)	NC	NC	NA
VF_{sesp}	(kg-soil/m3-air)	NC	NA	NA
VF_{wesp}	(m3-wat/m3-air)	NC	NA	NA
LF	(kg-soil/L-wat)	All exposures: 5.7E-5		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	1.3E+0	2.7E+1
DAFs/gw	(-)	NA	1.3E+0	2.7E+1

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	1.1E+2	PS
Sol	(mg/L)	6.5E+5	27
P_{vap}	(mmHg)	0.0E+0	PS
H_{atm}	(atm-m^3/mol)	0.0E+0	PS
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$\log(K_d)$	(log[L/kg])	1.9E+0	PS
D_{air}	(cm^2/sec)	0.0E+0	-
D_{wat}	(cm^2/sec)	0.0E+0	-
Toxicity Data			
Wt of Evd.		B1	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	1.8E-3	PS
RfD_o	(mg/kg/day)	5.0E-4	PS
RfD_d	(mg/kg/day)	-	-
RfC_i	(mg/m^3)	2.2E+1	31
Dermal Exposure Parameters			
RAF_d	(mg/mg)	0.0E+0	D
K_p	(cm/hr)	1.0E-3	
tau_d	(hr/event)	-	
t_{crit}	(hr)	-	
B	(-)	-	
Regulatory Standards			
MCL	(mg/L)	5.0E-3	*
TWA	(mg/m^3)	2.0E-1	PS
AQL	(mg/L)	3.7E-3	33
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	1.0E-3	S
ADL_s	(mg/kg)	4.0E-3	S
$t_{1/2,sat}$	(d)	-	-
$t_{1/2,unsat}$	(d)	-	-

* MCL ref = 56 FR 3526 (30 Jan 91)

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	0.0E+0
K_{sw}	(L-wat/kg-soil)	1.3E-2
C_{sat}	(mg/kg-soil)	4.9E+7
$C_{sat,vap}$	($\mu g/m^3$-air)	0.0E+0
$D_{eff,s}$	(cm^2/sec)	#DIV/0!
$D_{eff,crk}$	(cm^2/sec)	#DIV/0!
$D_{eff,cap}$	(cm^2/sec)	#DIV/0!
$D_{eff,ws}$	(cm^2/sec)	#DIV/0!
R_{sat}	(-)	3.4E+2
R_{unsat}	(-)	3.8E+2
Z	(cm/event)	3.0E-3

Notes: 1) NA = Not applicable; NC = Not calculated.

2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT — Chemical-Specific Tier 2 Cleanup Summary

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064
Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constituent: Chromium (III) **CAS No.: 16065-83-1**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	>1.7E+5	>1.7E+5
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	>3.0E+11	>3.0E+11
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com /Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	2.1E+6		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	NC	NC	NA
VF_{samb}	(kg-soil/m3-air)	NC	NC	NA
VF_{wamb}	(m3-wat/m3-air)	NC	NC	NA
VF_{sesp}	(kg-soil/m3-air)	NC	NA	NA
VF_{wesp}	(m3-wat/m3-air)	NC	NA	NA
LF	(kg-soil/L-wat)	All exposures: 2.4E-9		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	2.0E+9	1.3E+28
DAFs/gw	(-)	NA	2.0E+9	1.3E+28

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	5.2E+1	-
Sol	(mg/L)	1.7E+5	27
P_{vap}	(mmHg)	0.0E+0	-
H_{alm}	(atm-m^3/mol)	0.0E+0	-
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$\log(K_d)$	(log[L/kg])	f(pH)	30
D_{air}	(cm^2/sec)	0.0E+0	-
D_{wat}	(cm^2/sec)	0.0E+0	-
Toxicity Data			
Wt of Evd.		-	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	-	-
RfD_o	(mg/kg/day)	1.5E+0	R
RfD_d	(mg/kg/day)	2.0E-2	TX
RfC_i	(mg/m^3)	-	-
Dermal Exposure Parameters			
RAF_d	(mg/mg)	0.0E+0	D
K_p	(cm/hr)	1.0E-3	
tau_d	(hr/event)	-	
t_{cnt}	(hr)	-	
B	(-)	-	
Regulatory Standards			
MCL	(mg/L)	1.0E-1	*
TWA	(mg/m^3)	5.0E-1	NIOSH
AQL	(mg/L)	5.5E-1	33
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	1.0E-2	S
ADL_s	(mg/kg)	7.0E-3	S
$t_{1/2,sat}$	(d)	-	-
$t_{1/2,unsat}$	(d)	-	-

* MCL ref = 56 FR 3526 (30 Jan 91)

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	0.0E+0
K_{sw}	(L-wat/kg-soil)	5.5E-7
C_{sat}	(mg/kg-soil)	3.0E+11
$C_{sat,vap}$	($\mu g/m^3$-air)	0.0E+0
$D_{eff,a}$	(cm^2/sec)	#DIV/0!
$D_{eff,crk}$	(cm^2/sec)	#DIV/0!
$D_{eff,cap}$	(cm^2/sec)	#DIV/0!
$D_{eff,ws}$	(cm^2/sec)	#DIV/0!
R_{sat}	(-)	1.9E+6
R_{unsat}	(-)	2.1E+6
Z	(cm/event)	3.0E-3

Notes: 1) NA = Not applicable; NC = Not calculated.
2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 | *10 of 12*

Constituent: Nickel **CAS No.: 7440-02-0**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	2.6E+0	1.9E+1
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	3.9E+4	2.9E+5
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	2.8E+4		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	>0.0E+0	>0.0E+0	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	9.4E+5	1.6E+6	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC		
	TR = 1e-6	>0.0E+0		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	NC	NC	NA
VF_{samb}	(kg-soil/m3-air)	NC	NC	NA
VF_{wamb}	(m3-wat/m3-air)	NC	NC	NA
VF_{seso}	(kg-soil/m3-air)	NC	NA	NA
VF_{wesp}	(m3-wat/m3-air)	NC	NA	NA
LF	(kg-soil/L-wat)	All exposures: 6.7E-5		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	1.3E+0	2.6E+1
DAFs/gw	(-)	NA	1.3E+0	2.6E+1

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	5.9E+1	-
Sol	(mg/L)	1.7E+5	27
P_{vap}	(mmHg)	0.0E+0	14
H_{atm}	(atm-m^3/mol)	0.0E+0	-
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$log(K_d)$	(log[L/kg])	f(pH)	30
D_{air}	(cm^2/sec)	0.0E+0	-
D_{wat}	(cm^2/sec)	0.0E+0	-
Toxicity Data			
Wt of Evd.		A	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	4.8E-4	31
RfD_o	(mg/kg/day)	2.0E-2	R
RfD_d	(mg/kg/day)	-	-
RfC_i	(mg/m^3)	-	-
Dermal Exposure Parameters			
RAF_d	(mg/mg)	0.0E+0	D
K_p	(cm/hr)	1.0E-4	
tau_d	(hr/event)	-	
t_{cnl}	(hr)	-	
B	(-)	-	
Regulatory Standards			
MCL	(mg/L)	1.0E-1	*
TWA	(mg/m^3)	5.0E-2	ACGIH
AQL	(mg/L)	1.4E+0	33
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	5.0E-2	S
ADL_s	(mg/kg)	1.5E-2	S
$t_{1/2,sat}$	(d)	-	-
$t_{1/2,unsat}$	(d)	-	-

* MCL ref = 57 FR 31776 (17 Jul 92)

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	0.0E+0
K_{sw}	(L-wat/kg-soil)	1.5E-2
C_{sat}	(mg/kg-soil)	1.1E+7
$C_{sat,vap}$	($\mu g/m^3$-air)	0.0E+0
$D_{eff,s}$	(cm^2/sec)	#DIV/0!
$D_{eff,crk}$	(cm^2/sec)	#DIV/0!
$D_{eff,cap}$	(cm^2/sec)	#DIV/0!
$D_{eff,ws}$	(cm^2/sec)	#DIV/0!
R_{sat}	(-)	2.0E+2
R_{unsat}	(-)	2.2E+2
Z	(cm/event)	3.0E-4

Notes: 1) NA = Not applicable; NC = Not calculated.

2) Definitions and references presented on page 12 of 12.

RBCA SITE ASSESSMENT | **Chemical-Specific Tier 2 Cleanup Summary**

Site Name: Former J&R Auto Dismantlers | Completed By: Mark Detterman | Job ID: 201064

Site Location: 819 - 823 East 12th Street, Oakland, CA | Date Completed: 1-Dec-01 |

Constituent: Zinc **CAS No.: 7440-66-6**

Site-Specific Target Level (SSTL) Concentrations

		On-site	Off-site1	Off-site2
Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NA	3.9E+1	2.9E+2
	TR = 1e-6	NA	NC	NC
Soil Leaching to Groundwater Ingestion				
Receptor Type / Distance (cm)		None	Commercial / 915	Residential / 6100
$SSTL_s$ (mg/kg)	THQ = 1e+0	NA	5.6E+5	4.1E+6
	TR = 1e-6	NA	NC	NC
Surface Soil Inhalation, Ingestion,Dermal Contact				
Receptor Type / Distance (cm)		Com./Constr. / 0	No Off-site Receptors	
$SSTL_{ss}$ (mg/kg)	THQ = 1e+0	4.3E+5		
	TR = 1e-6	NC		
Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Soil Volatilization/Particulates to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Groundwater Volatilization to Outdoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	Commercial / 765	None
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC	NC	NA
	TR = 1e-6	NC	NC	NA
Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$RBEL_{air}$ ($\mu g/m^3$)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Soil Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_s$ (mg/kg)	THQ = 1e+0	NC		
	TR = 1e-6	NC		
Groundwater Volatilization to Indoor Air Inhalation				
Receptor Type / Distance (cm)		Residential / 0	No Off-site Receptors	
$SSTL_{gw}$ (mg/L)	THQ = 1e+0	NC		
	TR = 1e-6	NC		

	Units	Residential	Commercial	Construction
Cross-Media Transfer Factors				
VF_{ss}	(kg-soil/m3-air)	NC	NC	NA
VF_{samb}	(kg-soil/m3-air)	NC	NC	NA
VF_{wamb}	(m3-wat/m3-air)	NC	NC	NA
VF_{ssesp}	(kg-soil/m3-air)	NC	NA	NA
VF_{wesp}	(m3-wat/m3-air)	NC	NA	NA
LF	(kg-soil/L-wat)	All exposures: 7.0E-5		NA

	Units	On-Site	Off-Site1	Off-Site2
Lateral Transport Factors				
DAFgw	(-)	NA	1.3E+0	2.6E+1
DAFs/gw	(-)	NA	1.3E+0	2.6E+1

Chemical Parameters

	Units	Value	Reference
Physical Properties			
MW	(g/mol)	6.5E+1	14
Sol	(mg/L)	6.1E+5	27
P_{vap}	(mmHg)	0.0E+0	14
H_{atm}	(atm-m^3/mol)	0.0E+0	-
pK_a	(log[mol/mol])	-	-
pK_b	(log[mol/mol])	-	-
$\log(K_d)$	(log[L/kg])	f(pH)	30
D_{air}	(cm^2/sec)	0.0E+0	-
D_{wat}	(cm^2/sec)	0.0E+0	-
Toxicity Data			
Wt of Evd.		D	
SF_o	(1/[mg/kg/day])	-	-
SF_d	(1/[mg/kg/day])	-	-
URF_i	(1/[$\mu g/m^3$])	-	-
RfD_o	(mg/kg/day)	3.0E-1	R
RfD_d	(mg/kg/day)	6.0E-2	TX
RfC_i	(mg/m^3)	-	-
Dermal Exposure Parameters			
RAF_d	(mg/mg)	0.0E+0	D
K_p	(cm/hr)	6.0E-4	
tau_d	(hr/event)	-	
t_{cnt}	(hr)	-	
B	(-)	-	
Regulatory Standards			
MCL	(mg/L)	5.0E+0	*
TWA	(mg/m^3)	-	-
AQL	(mg/L)	1.1E-1	33
Miscellaneous Parameters			
ADL_{gw}	(mg/L)	5.0E-3	S
ADL_s	(mg/kg)	2.0E-3	S
$t_{1/2,sat}$	(d)	-	-
$t_{1/2,unsat}$	(d)	-	-

* MCL ref = Secondary MCL

	Units	Value
Derived Parameters		
H	(L-wat/L-air)	0.0E+0
K_{sw}	(L-wat/kg-soil)	1.6E-2
C_{sat}	(mg/kg-soil)	3.8E+7
$C_{sat,vap}$	($\mu g/m^3$-air)	0.0E+0
$D_{eff,s}$	(cm^2/sec)	#DIV/0!
$D_{eff,crk}$	(cm^2/sec)	#DIV/0!
$D_{eff,cap}$	(cm^2/sec)	#DIV/0!
$D_{eff,ws}$	(cm^2/sec)	#DIV/0!
R_{sat}	(-)	2.0E+2
R_{unsat}	(-)	2.2E+2
Z	(cm/event)	1.8E-3

Notes: 1) NA = Not applicable; NC = Not calculated.

2) Definitions and references presented on page 12 of 12.