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SUBSURFACE INVESTIGATION REPORT

900 Central Avenue - 910
Alameda, California

PREPARED FOR:

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ALLWEST PROJECT No. 97217.23
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SUBSURFACE INVESTIGATION

900 Central Avenue
Alameda, California

I. EXECUTIVE SUMMARY

AllWest conducted a subsurface investigation at 900 Central Avenue in Alameda, California on June 30, 1997. The purpose of the investigation was to collect soil and groundwater data for a Risk-Based Corrective Action evaluation. Other associated investigative activities included a search of potential onsite/offsite sources through the review of available historical documents in the form of Sanborn maps, aerial photographs, city directories, and agency files.

A previous site assessment conducted by Lowney Associates in 1994 indicated that the site was occupied by a gas station prior to the current development of an apartment building. Subsurface sampling by Lowney detected gasoline and fuel related volatiles (BTEX) in the soil and groundwater samples from a boring (EB-1) located near the northwest property corner. *Lowney* suggested that the former underground storage tanks (USTs) were located in the northwest quadrant of the subject property.

The investigation program, as outlined in *AllWest's* May 28, 1997 proposal, included the review of historical documents and agency files for potential onsite/offsite sources, the advancement of eight soil borings by the geoprobe process, the collection of soil and groundwater samples from the borings, the chemical analyses of selected samples, and the evaluation of appropriate corrective action, if any, using the ASTM RBCA protocol. Analyses performed during this investigation included total petroleum hydrocarbons as gasoline, diesel, and motor oil (TPH-g, TPH-d, and TPH-m), and fuel related volatile compounds, benzene, toluene, ethylbenzene, and xylene (BTEX).

AllWest's review of historical documents and agency files confirmed the past site use as a gas station prior to the mid-1970s. Even though no historic document provided information on the possible location of the former USTs, a neighbor indicated that the former USTs were located under the sidewalk of Central Avenue, outside of the property boundary. A former gas station, considered a potential offsite source, was found located on the northwest corner of the intersection of Central Avenue and Ninth Street.

The eight soil borings were advanced into the groundwater table, to a maximum depth of 16 feet below the ground surface. Generally, four soil and one groundwater sample were collected from each of the borings. A total of 31 soil and eight groundwater samples were forwarded to a DHS certified laboratory for chemical analyses or archiving. Eleven selected soil and all eight groundwater samples from the borings were analyzed for the presence of TPH-g, BTEX, and/or TPH-d and TPH-m.

No TPH-g, BTEX, TPH-d or TPH-m were detected in any of the soil samples above the groundwater table. TPH-g and BTEX, but not TPH-d or TPH-m, were detected in two saturated soil samples (below the groundwater table) from boring locations P-3 and P-4. TPH-g and BTEX were detected in five of the eight groundwater samples. TPH-d or TPH-m were not detected in any of the soil or groundwater samples. The groundwater samples with higher TPH-g and BTEX concentrations were also from borings P-3 and P-4, located near the northwestern property corner.

The analytical data suggests that no source area (unsaturated soils with contaminants) is located at the subject site. The majority of the contaminated site groundwater is limited to the northwest corner of the subject property, within an area of approximately 30 feet by 30 feet. The extent of the groundwater plume may extend beyond the property boundary and into the city streets.

An evaluation of the investigation data by the ASTM RBCA process suggests that no corrective action is warranted at the subject site. The only complete exposure pathway at the subject site is groundwater volatilization into the atmosphere or enclosed spaces. The chemicals of concern (BTEX) concentrations in the source media (groundwater) were found not exceeding the RBCA generated site-specific cleanup levels.

Based on the results of the investigation, *AllWest* concludes that even though the site groundwater was impacted by historical release of petroleum products, no corrective action is necessary because the contaminant concentrations are less than the site-specific risk-based cleanup values.

II. INTRODUCTION

This report presents the results of a subsurface testing program conducted at 900 Central Avenue in Alameda, California. The purpose of the investigation was to collect soil and groundwater data of the subject site for a risk-based corrective action evaluation. The investigation program included the advancement of eight borings via the geoprobe process to collect soil and groundwater samples, the chemical analyses of selected soil and groundwater samples, and the evaluation of potential onsite/offsite sources through review of available historical documents and agency files. Field sampling activities occurred on June 30, 1997.

A. Site Background

The subject property is located in the central-southern portion of Alameda amidst a predominantly residential area. The property is at the southeast corner of Central Avenue and Ninth Street. The site improvements consist of a two-story wood-frame duplex apartment with surrounding landscaped areas. A site regional location map and a site vicinity map is presented in Figures 1 and 2 of this report, respectively.

In July 1994, *Lowney Associates* conducted a "Soil and Groundwater Quality Reconnaissance" at the subject property. The reconnaissance included a brief site history assessment and limited soil and groundwater sampling. Based on historical documents, *Lowney* concluded that there was a gas station onsite between 1931 and 1975. The former underground storage tanks (USTs) associated with the gas station were reportedly removed in 1975. *Lowney* then advanced three borings and collected soil and groundwater samples. Two of the borings were located at the west side of the property where *Lowney* described as the likely location of former USTs. The third boring was located south of the current apartment building.

Lowney analyzed one soil sample (at the groundwater table depth) and one groundwater sample from each of the three borings. Both the soil and groundwater samples from boring EB-1, located near the northwest corner of the subject property, contained detectable concentrations of gasoline (TPH-g) and fuel related volatiles (BTEX). No TPH-g or BTEX were detected in the samples from the other two borings. The BTEX concentrations in the groundwater sample from boring EB-1 exceeded the maximum contaminant level (MCL) for the protection of groundwater as a drinking water source.

In January 1997, *AllWest* was retained in to review *Lowney's* 1994 findings. Based on the review, *AllWest* concluded that the site's groundwater resources had been impacted by potentially onsite and/or offsite source(s). *AllWest* recommended collecting and analyzing additional soil and groundwater samples to verify *Lowney's* findings, conducting a risk-based corrective action evaluation of the sampling data to determine if corrective action was appropriate, and reviewing available historical documents and agency files to locate potential onsite and/or offsite source(s) of groundwater contamination at the subject property.

B. Purpose and Scope of Work

The purpose of the investigation was to collect soil and groundwater data of the subject site for a risk-based corrective action evaluation and to evaluate potential onsite/offsite sources through the review of historical documents and agency files. The scope of work, as outlined in *AllWest's* proposal to *Ryan, Andrada & Lifter* dated May 28, 1997, consisted of the following tasks:

- 1) Obtain drilling permits from city agencies. Arrange underground utility clearing through USA and a private locator. Engage a licensed drilling contractor to perform boring advancement;
- 2) Advance eight borings to the groundwater table using the geoprobe process. Collect soil and groundwater samples from the borings. Forward collected samples to a California Department of Health Service certified laboratory for chemical analyses or archive;

- 3) Analyze selected soil and groundwater samples for total petroleum hydrocarbons as gasoline, diesel, motor oil (TPH-g, TPH-d, TPH-m), and the fuel related volatile compounds: benzene, toluene, ethylbenzene, and xylene (BTEX);
- 4) Review available historical Sanborn fire insurance maps, aerial photographs, city directories, and agency databases and files for potential onsite/offsite sources;
- 5) Perform a risk-based corrective action evaluation using the American Society for Testing and Materials (ASTM) Standard E-1739-95 Tier I and Tier II protocols; and
- 6) Interpret the investigation data and present the findings in a written report describing the field activities, summarizing the analytical results, and provide conclusions and recommendations.

III. PROJECT ACTIVITIES

A. Potential Onsite/Offsite Sources Research

To research potential onsite and/or offsite sources that may contributed to the contaminants detected in site's soil and groundwater by *Lowney Associates* in 1994, *AllWest* reviewed available historical documents in the form of aerial photographs, Sanborn fire insurance maps, city directories, and agency databases and files.

Historical Aerial Photo Review

Available historical aerial photographs from 1930 to 1996 were reviewed by *AllWest* at the Oakland office of *Pacific Aerial Survey*. The earliest photograph, taken in 1930, depicts the site as vacant. The next available photograph, dated 1947, depicts the site as occupied by a canopy at the northwest quadrant and a small building at the southeast quadrant. It was a configuration typical of a gas station. Subsequent photographs, taken between 1950 and 1977, depict the site in similar conditions as the 1947 photograph. No discernible changes to the structures or parcel configuration were observed in the photographs except for varying numbers of cars parked on the site. A lighter patch of ground surface was noted adjacent to the west side of the canopy in the 1975 photograph. A darker patch of ground surface was noted at the northeast corner of the parcel in the 1950 photograph. The 1979 photograph depicts the site as vacant again with no structures. The 1981 photograph depicts the site as occupied by one large structure at the center of the parcel. The location and configuration of the structure are essentially the same as the current duplex apartment building. Historical aerial photographs indicate a gas station type of site configuration of the subject property between 1947 and 1977.

Historical land use of adjacent properties of the subject site were mostly residential according to the aerial photograph review. The only notable land use of adjacent properties that has the potential of impacting the subject site was a gas station type of development at the parcel on the northwest corner of Central Avenue and Ninth Street between 1947 and 1969.

Historical Sanborn Fire Insurance Map Review

AllWest reviewed historical Sanborn Fire Insurance Maps for the site at the main library of University of California at Berkeley. The earliest available Sanborn map with coverage of the site was dated 1897. The 1897 Sanborn map indicates the site was vacant with no structures on the property. The 1948 Sanborn map depicts the site as occupied by two structures. One of the structures, located at the northwest quadrant of the site, had the label of "GAS & OIL". The other structure, located at the southeast quadrant of the site, had the label of "GREASE GARAGE". The 1987 Sanborn map indicates the site was occupied by a residential structure. The location and configuration of the structure are essentially the same as the current duplex apartment building. The 1948 Sanborn map indicates there is a potential onsite source of groundwater contamination at the subject property.

The 1948 Sanborn map also indicates a "GAS & OIL" facility located across Central Avenue from the subject property. The facility was located at the northwest corner of Central Avenue and Ninth Street with the street address of 841 Central Avenue. This suggests a potential offsite source for the detected groundwater contamination at the subject property. No other potential offsite sources within one block radius of the subject property were discovered based on *AllWest's* review of historical Sanborn maps.

Historical City Directory Review

AllWest attempted to review historical city directories of Alameda at the Alameda City Library. However, there were no historical Alameda city directories available. *AllWest* then reviewed historical Oakland city directories, which include the City of Alameda, in the Oakland City Library. Historical Haines Criss-Cross Directories between 1973 and 1995 were available. The 1973 directory lists the site address (900 Central Avenue) as occupied by *EZ Pickings Gas*. The same listing was noted in the 1974 directory. The 1975 directory indicates the site was occupied by *Holland Service Station No. 1*. No occupant was listed under the site address in the 1976 through 1981 directories. No site address listing was found in the 1982 through 1995 Directories. There were no listing of the site's other address, 1326 Ninth Street, in any of the directories reviewed. The listing of a gas station under the site address between 1973 and 1975 suggests a potential onsite source at the subject property.

Occupants of adjacent addresses listed on the historical city directories were mostly individuals suggesting residential use of those properties. The few commercial names listed under the adjacent addresses included *Central Plumbing* at 901 Central Avenue between 1973 and 1990, *Heaton Furniture* at 905 Central Avenue between 1973 and

1990, *Dino's Appliance Sales & Service* at 845 Central Avenue between 1976 and 1981, *Central Dairy* at 845 Central Avenue between 1973 and 1975, and *Hagy Keenan Mortuary* at 842 Central Avenue between 1973 and 1985. All of the commercial developments listed under adjacent addresses were along Central Avenue, none were along Ninth Street. No fuel dispensing facilities at adjacent properties were indicated in the available city directories.

Agency Database and File Review

AllWest reviewed the U.S. Environmental Protection Agency (EPA) National Priorities List (NPL) sites list, Resource Conservation and Recovery Act Information System (RCRIS) Treatment Storage and Disposal (TSD) facilities, the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) CalSites, and Expenditure Plan for the Hazardous Substance Cleanup Bond Act of 1984 (BEP) list, the U.S. EPA Comprehensive Environmental Response Compensation and Liability Act Information System (CERCLIS) sites list, the Solid Waste Information System (SWIS) Active and Inactive Landfills sites list, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Leaking Underground Storage Tank (LUST) list, The SFBRWQCB South Bay Site Management System (SBSMS) list, the SFBRWQCB Spills, Leaks, Investigations, and Cleanup (SLIC) list, and the Hazardous Waste and Substance Sites List (Cortese list) for recorded sites located within one-half mile of the subject property.

According to the agency databases, the subject property is not a recorded release site. There is one SLIC site, ten LUST sites, and two Cortese sites located within one-half mile of the subject property. The following is a list of the recorded sites found through the agency database review. Their locations in relation to the subject property is graphically presented in Figure 3. The site numbers on the list correspond to the site numbers plotted on Figure 3.

SLIC List

1. *Shell*, 1601 Webster Street

LUST list

1. *Shell*, 1601 Webster Street
2. *Texaco*, 1127 Lincoln Avenue
3. *Alameda Cellars*, 901 Lincoln Avenue
4. *Alameda Fire Station #2*, 635 Pacific Avenue
5. *Templeton Property*, 1200 San Antonio Avenue
6. *Jiffy Lube*, 1435 Webster Street
7. *Bank of America*, 1528 Webster Street
8. *Pacific Properties*, 1628 Webster Street
9. *Duffy Diner*, 1700 Webster Street
10. *Bernita Leskowski Property*, 1701 Webster Street

Cortese List

11. *Bicostal Properties*, 1509 Webster Street
12. *Federal Center*, 620 Central Avenue

The nearest recorded site is *Alameda Cellars* at 901 Lincoln Avenue, a LUST site approximately 1,500 feet north of the subject property. According to files reviewed at Alameda County Environmental Health Department, groundwater impact by petroleum hydrocarbons and fuel volatiles due to leaking tanks was discovered in 1990. There were four groundwater monitoring wells installed at the site and quarterly monitoring is ongoing. Monitoring data indicate contaminant levels in the groundwater fluctuates over time with no definite trend. The predominant groundwater flow direction is to the northwest. Based on the information contained in agency records, this site is cross to down-gradient from the subject property. Considering the site distance, hydraulic gradient, and contamination extent, the *Alameda Cellars* site is an unlikely potential offsite source of groundwater contamination to the subject property.

The next nearest site is a *Texaco* gas station at 1127 Lincoln Avenue, a LUST site approximately 2,000 feet northeast of the subject property. County files indicate *Texaco* completed a dual-phase soil vapor and groundwater extraction remedial program in 1996. According quarterly monitoring data, groundwater flow direction at this site was to the north. This groundwater flow direction makes the *Texaco* site cross-gradient from the subject property. The reported extent of the groundwater contamination at the site was within 100 feet of the tank area. Based on hydraulic gradient and contamination extent information, AllWest concludes that the *Texaco* is unlikely an offsite contamination source of the subject property.

Another LUST site is also located approximately 2,000 feet from the subject property. This site is known as the *Templeton Property* with an address of 1200 San Antonio Avenue and to the southeast of the subject property. County files indicate only soil was impacted by petroleum hydrocarbons at this site. Contaminated soils were excavated and disposed offsite. The site is currently under regulatory review for possible closure status. Considering this site has not reported groundwater contamination and is located 2,000 feet cross-gradient, it is considered unlikely to be a potential offsite contamination source of the subject property.

The remaining nine sites are located along or near Webster Street, approximately between 2,000 feet and one-half mile from the subject property. All are located hydraulically cross to down-gradient from the subject property. Five of the sites received "closure" status from the regulatory agencies. The remaining sites are in various investigation and/or remediation phases. Based on hydraulic gradient, regulatory status, and site distance considerations, none of these sites is a potential offsite contamination source of the subject property.

In summary, *AllWest's* potential onsite/offsite source research through review of aerial photographs, Sanborn maps, city directories, and agency files found one likely onsite and one likely offsite source of groundwater contamination. The potential onsite source is the historical site use as a gas station, most likely between 1947 and 1975. The potential offsite source is the historical land use as a gas station at the property on the northwest corner of Central Avenue and Ninth Street, most likely between 1947 and 1969. However, both onsite and offsite former gas stations are not recorded release sites according to current agency databases.

B. Underground Utility Clearing and Permit Application

To avoid damage to underground utility installations during the course of the subsurface investigation, *AllWest* contacted *Underground Service Alert (USA)*, an organization for public utility information, on the pending subsurface investigation on June 19, 1997. USA then notified each of the public and private entities that maintained underground utilities within the vicinity of the site to locate and mark their installations for field identification. An USA notification number of 169122 was assigned to the project.

A private underground utility locator, *California Utility Survey (CUS)* of San Ramon, California, was also employed by *AllWest* to conduct a magnetometer sweep of the proposed boring areas to verify the marked and locate unmarked underground utilities. CUS conducted the utility locating on June 16, 1997. The final sampling locations were cleared of known underground utilities.

In addition to utility clearing, *AllWest* also requested CUS to scan the open area of the site for potential underground storage tanks during the magnetometer sweep. No indications of existing tanks were found by CUS. During field sampling, a neighbor of the subject property informed *AllWest* that the location of the former tanks was under the sidewalk of Central Avenue near the intersection with Ninth Street.

AllWest submitted a drilling permit application to the Alameda County Zone 7 Water District for the pending soil and groundwater sampling activities on June 9, 1997. Zone 7 approved the drilling permit on June 26, 1997. A copy of the permit is included in Appendix A.

C. Soil Sampling Through Geoprobe

A total of eight borings were advanced by the geoprobe method during this subsurface investigation. Five borings (P-1 through P-5) were located in the lawn area along the northern and western property boundary. One boring P-6 was located in the western drive way while the remaining two borings (P-7 and P-8) were located in the backyard along the southern property line. The boring locations are graphically presented in Figure 4.

The boring advancement was performed by *Environmental Control Associates (ECA)*, a licensed drilling contractor of Aptos, California, on June 30, 1997. The standard geoprobe sampling procedures, as presented in Appendix B, were followed. During the boring advancement operation, a field engineer from *AllWest* was present to collect soil samples, to conduct field screening, and to maintain a log of the drilling activities.

The boring logs contained pertinent information on boring advancement and soil conditions, in particular the lithology of site soils and physical characteristics that suggest potential contamination. A copy of the boring logs as well as the log legends is included in Appendix B of this report. Generally, four discrete soil samples were collected from each boring at intervals of five feet or less. Only 3 discrete soil samples were collected from borings P-7 and P-8 due to work space and sampling equipment limitations. A total of 31 discrete soil samples were collected during this investigation. No visible discoloration or notable petroleum/organic odor was detected in the soil samples except those below the groundwater table at boring locations P-2, P-3, and P-4. All collected soil samples were forwarded to a state certified laboratory at the completion of field sampling under chain-of-custody.

D. Groundwater Sampling Through Geoprobe

After soil sampling was completed, a groundwater sampling probe consisting of a 4-foot perforated sampling screen was extended into the saturation zone to collect a representative groundwater sample. The standard geoprobe groundwater sampling procedures, as presented in Appendix B, were followed. Very moist to wet soil conditions were generally encountered in the boring between the depths of 12 to 13 feet below the ground surface. Therefore, the groundwater sampler was extended to depths between 14 and 16 feet below the ground surface for groundwater sampling attempts. After sufficient free groundwater was accumulated in the sampler, a groundwater sample was collected from each of the borings. Generally, two 40-ml and one 1-liter samples were collected from each boring. However, at boring P-7 location, only the 40-ml samples were collected due to very slow groundwater recharging. Slight petroleum/organic odors were noted in groundwater samples from boring locations P-2, P-3, and P-4.

E. Laboratory Analyses

All samples collected during this investigation were forwarded to *Chromalab, Inc.* in Pleasanton, California for chemical analyses or archiving. *Chromalab* is a California Department of Health Services (DHS) certified analytical laboratory. All of the groundwater samples and 11 selected soil samples were analyzed. The remaining soil samples were archived in the laboratory.

Analyses performed on the samples included modified USEPA method 8015 to detect the presence of total petroleum hydrocarbons as gasoline (TPH-g) and USEPA method

8020/602 to detect the presence of fuel additives benzene, toluene, ethylbenzene, and xylenes (BTEX). In addition, samples from borings P-2 through P-4 were analyzed by modified USEPA method 8015 to detect the presence of total petroleum hydrocarbons as diesel and motor oil (TPH-d and TPH-m). These analyses were selected based on the potential onsite and offsite contamination sources and contaminants detected during the 1994 Lowney investigation. Laboratory analyses were performed on the standard one-week turn-around time schedule.

F. Risk-Based Corrective Action (RBCA) Evaluation Procedures

The American Society for Testing and Materials (ASTM) published a Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites in 1995 with the ASTM designation of E-1739-95. This standard guide, also known as the ASTM RBCA protocol, provides a consistent decision-making process for the assessment and response to a petroleum release. The use of ASTM RBCA process has been encouraged by the San Francisco Bay Regional Water Quality Control Board and the Alameda County Environmental Health Department.

The ASTM RBCA process is a three-tier assessment with increasing reliance on site-specific data at the higher tiers. The Tier I evaluation involves first identifying the complete exposure pathway. The incomplete pathways are excluded from the evaluation process. Then the highest contaminant concentration is used as the representative site condition and compared with a corresponding value in a generic Tier I Screening Level Lookup Table. Both the selection of the highest contaminant concentration and the use of a generic screening level represent the most conservative evaluation. Tier II and III evaluations allow the use of more representative and site-specific data to model contaminant transport and fate, the selection of alternative point(s) of compliance, and the generation of site-specific target levels.

Both the RBCA Tier I and Tier II evaluations were performed during this investigation. The Tier I evaluation was conducted using the highest BTEX concentrations detected in the site groundwater samples and the ASTM E-1739-95 Table X2.1 (the Tier I lookup table). The benzene target level listed in Table X2.1 was modified with a 0.29 multiplier to reflect the higher Cancer Potency Factor (CPF) recommended by the California EPA. (The California EPA uses a CPF of 0.1 mg/kg-day⁻¹ for benzene while the US EPA uses 0.029 mg/kg-day⁻¹)

The Tier II evaluation was conducted using the full groundwater data set obtained in this investigation and a RBCA Tier II Spreadsheet System Version 1.01 computer software published by Groundwater Services, Inc. The benzene entry in the toxicity database of the software was also modified to account for the Cal-EPA CPF. For site representative concentrations of the chemicals of concern, namely BTEX, the 95% upper confidence level (UCL) of the mean concentrations, instead of the highest or average concentrations, were selected. Other site specific parameters, such as depth to groundwater and building volume to area ratio were also used in the software input data.

IV. INVESTIGATION FINDINGS

A. Subsurface Conditions

Field observations indicated that shallow site soils are mostly brown silty fine sands. The sands in the upper strata, approximately 4 feet in thickness, were generally loose, slightly moist, and poorly graded. The lower sand strata, from approximately 4 feet to the maximum boring termination depth of 16 feet, generally graded medium dense, moist, and with fine to medium grains. Discoloration (grading to greenish brown) and petroleum odors were encountered in soils at and below the groundwater table at boring locations P-2 through P-3. These borings were located near the northwest corner of the subject property, adjacent to the approximate locations of former canopy, pump island, and underground tanks.

Free groundwater was first encountered in the borings at depths between 12 and 13 feet below the ground surface. Site specific groundwater gradient and flow direction can not be determined based on geoprobe groundwater sampling data. The regional groundwater flow, based on review of agency files, is generally in the north to northwest direction. A review of the topographic map indicates that the subject property is situated near the high topographic area of Alameda. It is possible that the groundwater surface mimics the topographic feature of the site area and causing a radial flow pattern. Therefore, a southwesterly groundwater flow at the subject property is also likely.

B. Analytical Results

The laboratory reports indicate no detectable concentrations of gasoline-range petroleum hydrocarbons (TPH-g) or volatile organic compounds (BTEX) in any of the analyzed soil samples collected above the groundwater table (approximately 13 feet). The two soil samples with detectable TPH-g and BTEX concentrations were from borings P-3 and P-4, and below the groundwater table (14.5 to 15.5 feet). The detected concentrations ranged from 1.1 to 4600 mg/kg (equivalent to parts per million [ppm]) for TPH-g and from 0.011 to 590 ppm for BTEX. *wmg!*

No TPH-g or BTEX were detected in groundwater samples from boring locations P-1, P-5, and P-6. Very low concentrations of TPH-g and BTEX, between 1.7 and 66 $\mu\text{g/L}$ (equivalent to parts per billion [ppb]), were detected in groundwater samples from borings P-7 and P-8, which were located along the southern property boundary near the former station building and garage. Elevated levels of TPH-g and BTEX, up to 92000 ppb for TPH-g and 610 ppb for benzene, were detected in groundwater samples from borings P-2, P-3, and P-4. All detected benzene concentrations exceed the maximum contaminant level (MCL) of 1 ppb for groundwater as a potential drinking water source. A summary of the analytical results is presented on Table 1. A copy of the laboratory analytical reports and chain-of-custody records are presented in Appendix C.

A review of laboratory internal quality assurance/quality control (QA/QC) report indicates the sample spike data are within the laboratory recovery limits. The samples were also analyzed within the acceptable EPA holding time. Therefore, the data from *Chromalab* are considered to be of good quality.

C. RBCA Evaluation Results

The ASTM RBCA Tier I evaluation identified two complete exposure pathways at the subject site. The pathways are groundwater volatilization to outdoor air and groundwater volatilization to enclosed space (indoor air). The incomplete exposure pathways include surface soil ingestion and dermal contact, subsurface soil volatilization to indoor and outdoor air, and groundwater ingestion and dermal contact. This is based on the non-detect results of unsaturated site soil samples and the fact that shallow site groundwater is not developed for drinking or irrigation purposes. Based on current and potential future site use, a residential receptor scenario was selected. The benzene target level in the Lookup Table (Table X2.1) for exposure pathway was modified to 3.19 mg/L and 0.0069 mg/L for outdoor air and indoor air, respectively.

Comparing the highest BTEX concentrations detected in the groundwater samples (0.61 mg/L, 5 mg/L, 4.6 mg/L, and 24 mg/L, respectively) to the modified Tier I Lookup Table, the benzene concentration was found exceeding the target level for indoor air exposure pathway. All other contaminant concentrations were found below their respective target levels. The Tier I evaluation results suggest that either corrective action to reduce benzene exposure due to potential groundwater vapor intrusion into the building should be taken or a Tier II evaluation should be performed. Since the Tier I Lookup Table values are based on most conservative assumption and do not consider any site-specific information, any corrective action based on Tier I evaluation results is unrealistic and inappropriate. *AtWest* considered a Tier II evaluation the more appropriate course of action and continued the RBCA evaluation process.

The Tier II evaluation was performed with the full groundwater sampling data and other site-specific parameters as the input data for the computer software. Instead of the highest detected BTEX concentrations, a 95% upper confidence level (UCL) of mean value for BTEX concentrations was selected as the representative contaminant concentrations for site groundwater conditions. The 95% UCL concentration of benzene in site groundwater was calculated to be 0.026 mg/L (26 ppb). The site specific target level (SSTL) for benzene in groundwater under the groundwater volatilization into indoor air exposure pathway was calculated to be 0.032 mg/L (32 ppb). Since the UCL benzene concentration is less than the SSTL, no corrective action is necessary for this exposure pathway. A copy of the Tier I and Tier II evaluation worksheet is included as Appendix D.

D. Discussion of Findings

Based on review of historical documents and agency files, the subject property was occupied by a gas station from at least the 1940s to the early 1970s. Reportedly the gas station ceased operation in the early 1970s, the station structures, canopy and building, were not demolished until the late 1970s. The former USTs were reportedly removed in 1975. The most likely location of the former USTs is beneath the sidewalk of Central Avenue near the intersection of Ninth Street. There were no records of release from the former USTs and the subject property is not listed in any of the agency databases as a recorded release site.

One potential offsite contamination source was also identified through historical document review. This potential offsite source is a former gas station located at the property on the northwest corner of Central Avenue and Ninth Street. Similar to the subject property, this former gas station was in operation between the 1950s and 1960s but closed down in the 1970s. This site is not on any of the agency databases as a recorded release site, either. Considering the similarity of site histories, it is likely that groundwater contamination exists beneath this site, too.

Analytical results indicate site soils were not impacted by gasoline and fuel volatiles. The two soil samples detected the presence of TPH-g and BTEX were saturated samples collected below the groundwater table. The contaminants in the two soil samples reflects the contamination in the site groundwater. This soil sampling result suggests that no source area of groundwater contamination, the zone of unsaturated soils with contaminants that may leach into the underlying groundwater, exists within the investigation area. This opinion is further supported by the fact that a neighbor of the subject property identified the former tank location was at the sidewalk of Central Avenue near the intersection of Ninth Street. Therefore, the suspect source area is most likely beneath the sidewalk of Central Avenue, not on the subject property.

Groundwater sampling results indicate most of the gasoline and BTEX impact is limited to the northwest corner of the subject property, the area where AllWest's borings P-2, P-3, and P-4, and Lowney's boring EB-1 were located. This area is also the location of the former pump island and canopy and adjacent to the suspect former UST site. Based on the "non-detect" groundwater results of AllWest's borings P-1 and P-5 and Lowney's boring EB-2, the extent of groundwater impact within the boundary of the subject site appears to be limited to within 30 feet of the northwest property corner. However, the elevated concentrations of TPH-g and BTEX in groundwater samples from P-3, P-4, and EB-1 suggest the full extent of the groundwater plume may extend beyond the property line of the subject property in the northwesterly direction.

Even though low concentrations of TPH-g and BTEX were detected in groundwater samples from borings P-7 and P-8, the presence of these contaminants is more likely due to past operations in the former garage rather than associated with the former USTs. This opinion is based on the "non-detect" results of Lowney's boring EB-3 and the projected on-site extent of the main groundwater contamination plume at the

northwest quadrant of the subject property. The location of the former gas station building and garage is currently occupied by an in-ground hot tub and associated water heater. This site feature precludes further soil and groundwater sampling at this location. Considering that no target contaminants were detected in the soil samples and only minor concentrations of contaminants were detected in the groundwater samples from this locations, it is unlikely that any significant subsurface contamination may exist beneath the former garage area.

Based on the spatial distributions of the sampling points and the analytical results of collected samples, the potential of an undiscovered subsurface hydrocarbon contamination plume beneath the site building is considered low. Due to the sandy nature of site soils, contaminants in the subsurface of the subject property is considered to be able to migrate relatively unimpeded and with less natural attenuation. This may account for the currently elevated concentrations of TPH-g and BTEX in groundwater at the northwest corner of the subject property after the former gas station had ceased operation more than 20 years ago.

Although the BTEX concentrations detected in groundwater samples from P-3 and P-4 exceeded their respective MCLs, the site groundwater has no current beneficial use and will unlikely be a drinking water source. Therefore, evaluating the groundwater BTEX concentrations under the ASTM RBCA protocol is more appropriate than comparing the BTEX concentrations against the MCLs.

The results of ASTM RBCA evaluation indicate the only complete exposure pathway is groundwater volatilization to either indoor or outdoor air. The Tier I evaluation indicated all but one contaminant under one pathway as below the target level (no corrective action required). The exception was benzene concentration in the groundwater under the groundwater volatilization to indoor air pathway. The Tier II evaluation results indicate the representative benzene concentration (95% UCL mean value) is below the site specific benzene target level. Therefore, no corrective action is required at the subject property based on ASTM RBCA Tier II results.

The results of this investigation suggest that even though the site groundwater had been impacted by petroleum hydrocarbons and fuel related volatile organic compounds, the groundwater contamination does not increase the health risk to site occupants and corrective action at the site is not warranted. Investigation results also indicate no source area (unsaturated soils with contaminants) exists within the boundary of the subject property. The suspect former tank location and the potential source area, if exists, is likely beneath the sidewalk of Central Avenue near the intersection of Ninth Street. Further investigation of that area would require permission from the City of Alameda.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the investigation data, *AllWest* concludes that no primary source area of groundwater contamination exists at the subject property. The suspect primary source area is likely located offsite beneath the sidewalk of Central Avenue. A secondary source of groundwater contamination may be located at the former garage area, near the southeast property corner. However, this potential source area appeared to be limited in extent. Further investigation of the former garage area is not warranted at this time. Even though the shallow site groundwater has been impacted by historic release of petroleum products, the resulting groundwater contamination plume has a limited onsite extent and poses no health threat to site occupants. No corrective action at the subject property is warranted.

AllWest recommends that a copy of this report be submitted to Alameda County Water District Zone 7 to fulfill permit requirements. If a formal agency closure is desired, a copy of this report along with an unauthorized release form may be submitted to Alameda County Environmental Health Department and the San Francisco Bay Regional Water Quality Control Board. Once the subject property is listed on the leaking underground storage Tank site tracking system, a site closure request may be submitted to obtain agency closure. However, additional investigation and/or monitoring may be required by the regulatory agencies before agency closure can be granted.

VI. REPORT LIMITATIONS

The work described in this report is performed in accordance with the Environmental Consulting Agreement between *Ryan, Andrada & Lifter* and *AllWest Environmental*, dated May 28, 1997. *AllWest* has prepared this report for the exclusive use of *Ryan, Andrada & Lifter* for this particular project and in accordance with generally accepted practices at the time of the work. No other warranties, certifications or representation, either expressed or implied are made as to the professional advice offered. The services provided for *Ryan, Andrada & Lifter* were limited to their specific requirements; the limited scope allows for *AllWest* to form no more than *an opinion* of the actual site conditions. No matter how much research and sampling may be performed the only way to know about the actual composition and condition of the subsurface of a site is through excavation. The conclusions and recommendations contained in this report are made based on observed conditions existing at the site, laboratory test results of the submitted samples, and interpretation of a limited data set. It must be recognized that changes can occur in subsurface conditions due to site use or other reasons. Furthermore, the distribution of chemical concentrations in the subsurface can vary spatially and over time. The results of chemical analysis are valid as of the date and at the sampling location only. *AllWest* cannot be held accountable for the accuracy of the test data from an independent laboratories nor for any analyte quantities falling below the recognized standard detection limits for the method utilized by the independent laboratories.

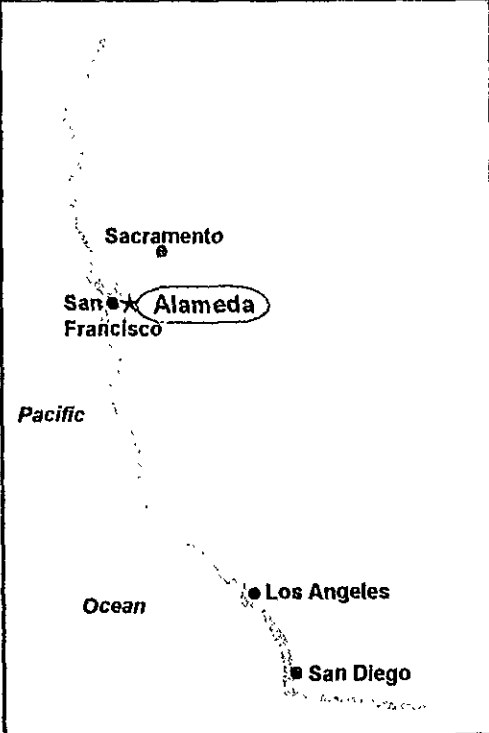
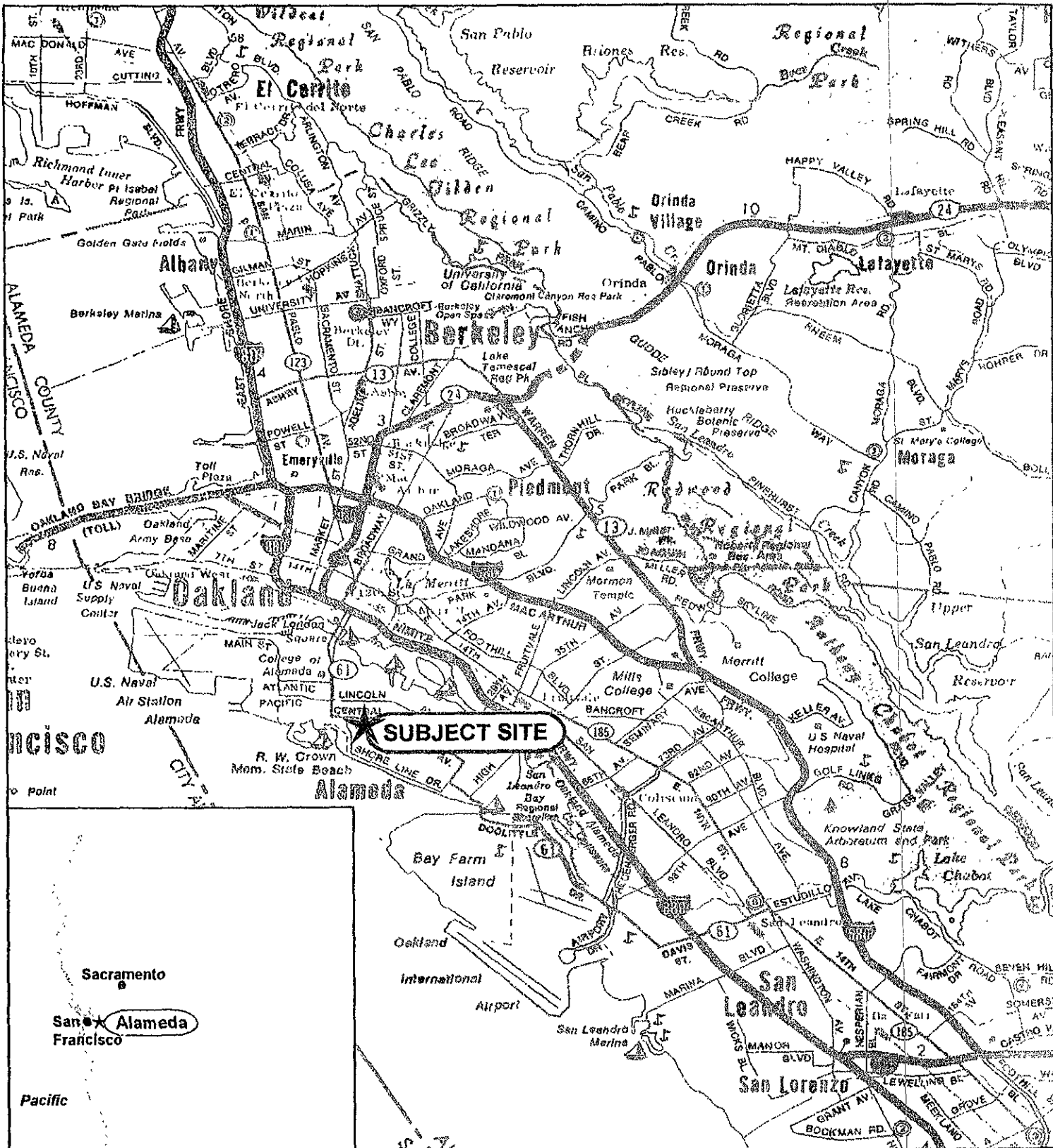
TABLE 1
SUMMARY OF ANALYTICAL RESULTS

900 Central Avenue
Alameda, California

Sample Number	Sample Type	TPH-g	Benzene	Toluene	Ethyl-benzene	Xylene	TPH-d	TPH-m
P-1-11	Soil	ND	ND	ND	ND	ND	na	na
P-1-W	Water	ND	ND	ND	ND	ND	na	na
P-2-10.5	Soil	ND	ND	ND	ND	ND	ND	ND
P-2-12.5	Soil	ND	ND	ND	ND	ND	ND	ND
P-2-W	Water	290	2.4 ✓	2.1	1.4	3.1	ND	ND
P-3-11	Soil	ND	ND	ND	ND	ND	ND	ND
P-3-14.5	Soil	4600	ND	(15)	(110)	590	ND	ND
P-3-W	Water	92000	190 ✓	5000	4600	24000	ND	ND
P-4-13	Soil	ND	ND	ND	ND	ND	ND	ND
P-4-15.5	Soil	1.1	0.011 ✓	0.0092	0.03	0.066	ND	ND
P-4-W	Water	17000	610 ✓	720	940	3800	ND	ND
P-5-11.5	Soil	ND	ND	ND	ND	ND	na	na
P-5-W	Water	ND	ND	ND	ND	ND	na	na
P-6-10.5	Soil	ND	ND	ND	ND	ND	na	na
P-6-W	Water	ND	ND	ND	ND	ND	na	na
P-7-9.5	Soil	ND	ND	ND	ND	ND	na	na
P-7-W	Water	66	2.3	6.5	0.8	4.7	na	na
P-8-9.5	Soil	ND	ND	ND	ND	ND	na	na
P-8-W	Water	51	1.7	5.1	0.55	2.4	na	na

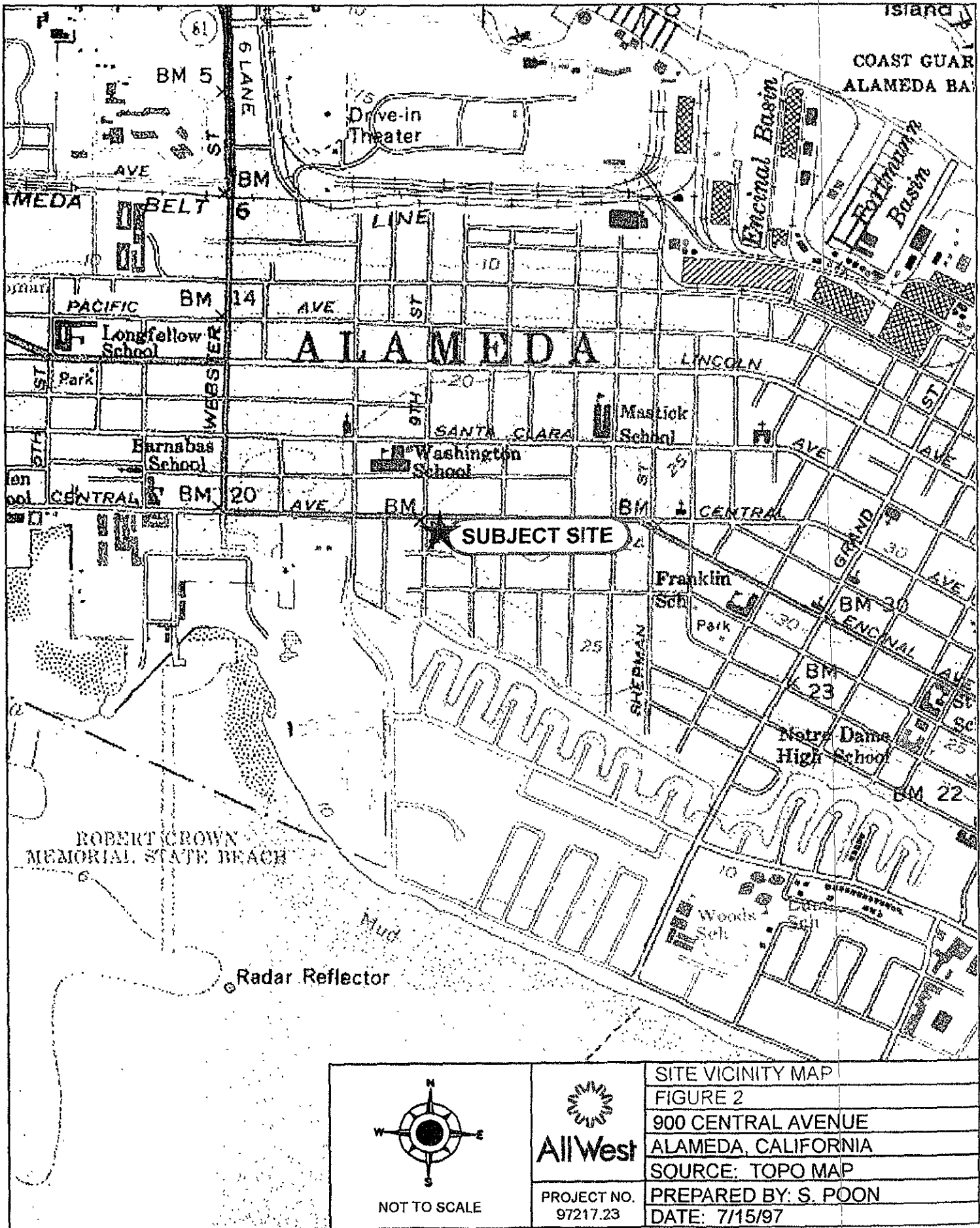
Notes:

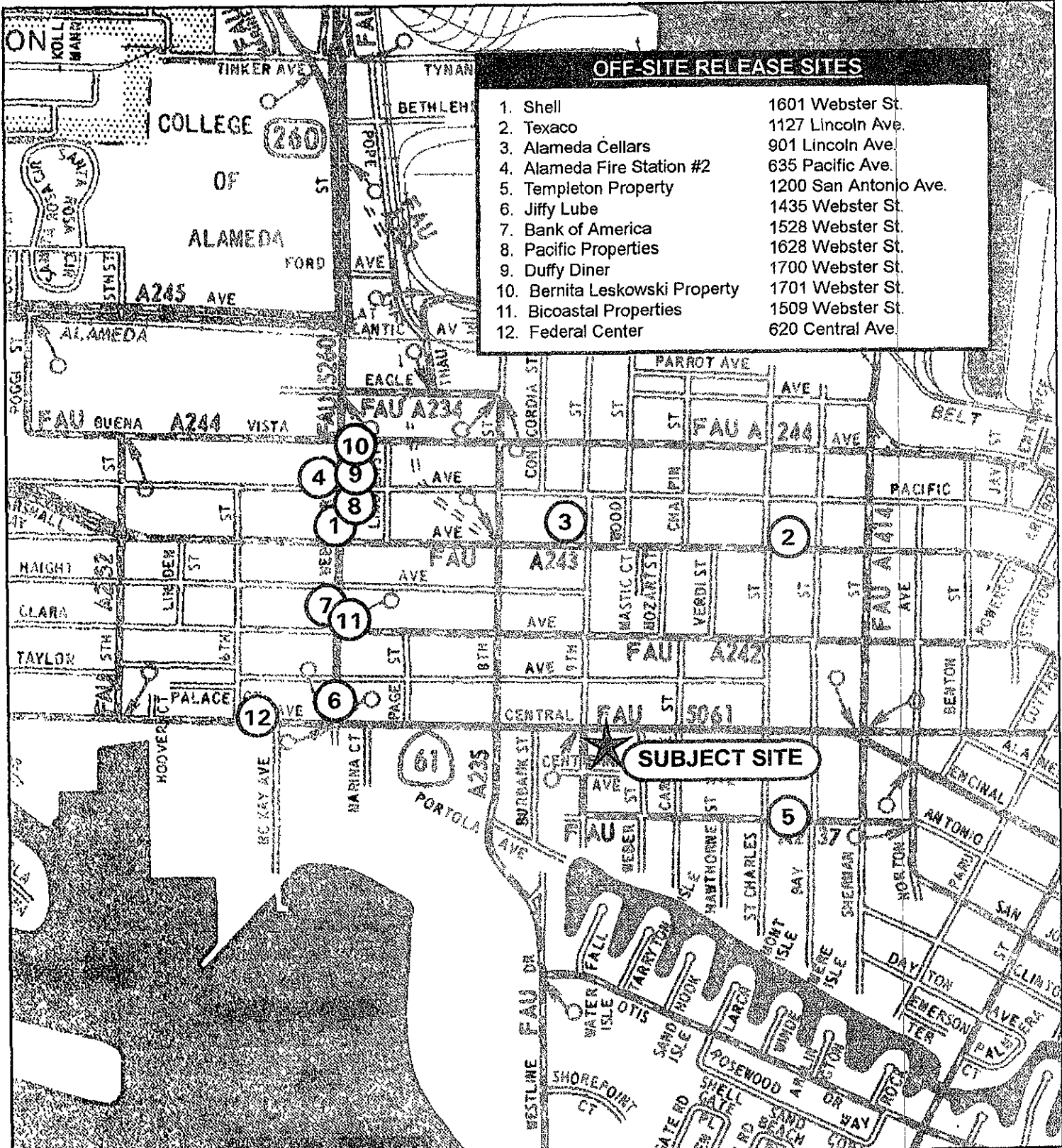
1. na stands for "not analyzed" for the listed analyses.
2. ND stands for "non-detected" at or above the laboratory reporting limits.
3. The reporting limit for TPH-g, TPH-d, TPH-mo, and BTEX in soil sample is 1 mg/kg (ppm), 1 ppm, 50 ppm, and 0.005 ppm, respectively.
4. The reporting limit for TPH-g, TPH-d, TPH-mo, and BTEX in groundwater sample is 50 µg/L (ppb), 100 ppb, 1000 ppb, and 0.5 ppb, respectively.
5. Concentrations shown for soil and groundwater samples are in units of ppm and ppb, respectively.
6. Analytical results were reported by Chromalab.



NOT TO SCALE

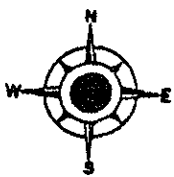
 AllWest	SITE REGIONAL LOCATION MAP FIGURE 1 900 CENTRAL AVENUE ALAMEDA, CALIFORNIA SOURCE: RAND MCNALLY
	PROJECT NO. 97217.23 PREPARED BY: S. POON DATE: 7/15/97





OFF-SITE RELEASE SITES	
1. Shell	1601 Webster St.
2. Texaco	1127 Lincoln Ave.
3. Alameda Cellars	901 Lincoln Ave.
4. Alameda Fire Station #2	635 Pacific Ave.
5. Templeton Property	1200 San Antonio Ave.
6. Jiffy Lube	1435 Webster St.
7. Bank of America	1528 Webster St.
8. Pacific Properties	1628 Webster St.
9. Duffy Diner	1700 Webster St.
10. Bernita Leskowski Property	1701 Webster St.
11. Bicoastal Properties	1509 Webster St.
12. Federal Center	620 Central Ave.

SUBJECT SITE



SCALE: 1" = 1,000'



PROJECT NO.
97217.23

OFF-SITE RELEASE SITE LOCATION MAP

FIGURE 3

900 CENTRAL AVENUE

ALAMEDA, CALIFORNIA

SOURCE: ALLWEST

PREPARED BY: S. POON

DATE: 7/15/97

CENTRAL AVENUE

SIDEWALK

SUSPECT
FORMER
UST

EB-1

P-3

*4600 S
97000 W*

P-2

P-1

P-4
300

FORMER
CANOPY

EB-2

P-5

APARTMENT
BUILDING

FENCE LINE

EB-3

FORMER
STATION/GARAGE

*Inground pipe
and equip*

P-6

P-7

P-8

NINTH STREET

SIDEWALK

LEGEND



- SUSPECT LOCATION OF FORMER UNDERGROUND TANKS



- APPROXIMATE LOCATION OF FORMER STRUCTURE



- ALLWEST BORINGS (6/97)

P-6



- LOWNEY BORINGS (6/94)

EB-3



AllWest

GENERALIZED SITE PLAN & BORING LOCATION MAP

FIGURE 4

900 CENTRAL AVENUE

ALAMEDA, CALIFORNIA

SOURCE: ALLWEST

PROJECT NO.
97217.23

DRAWN BY: S. POON

DATE: 7/15/97



APPROXIMATE SCALE

0 5 10 15

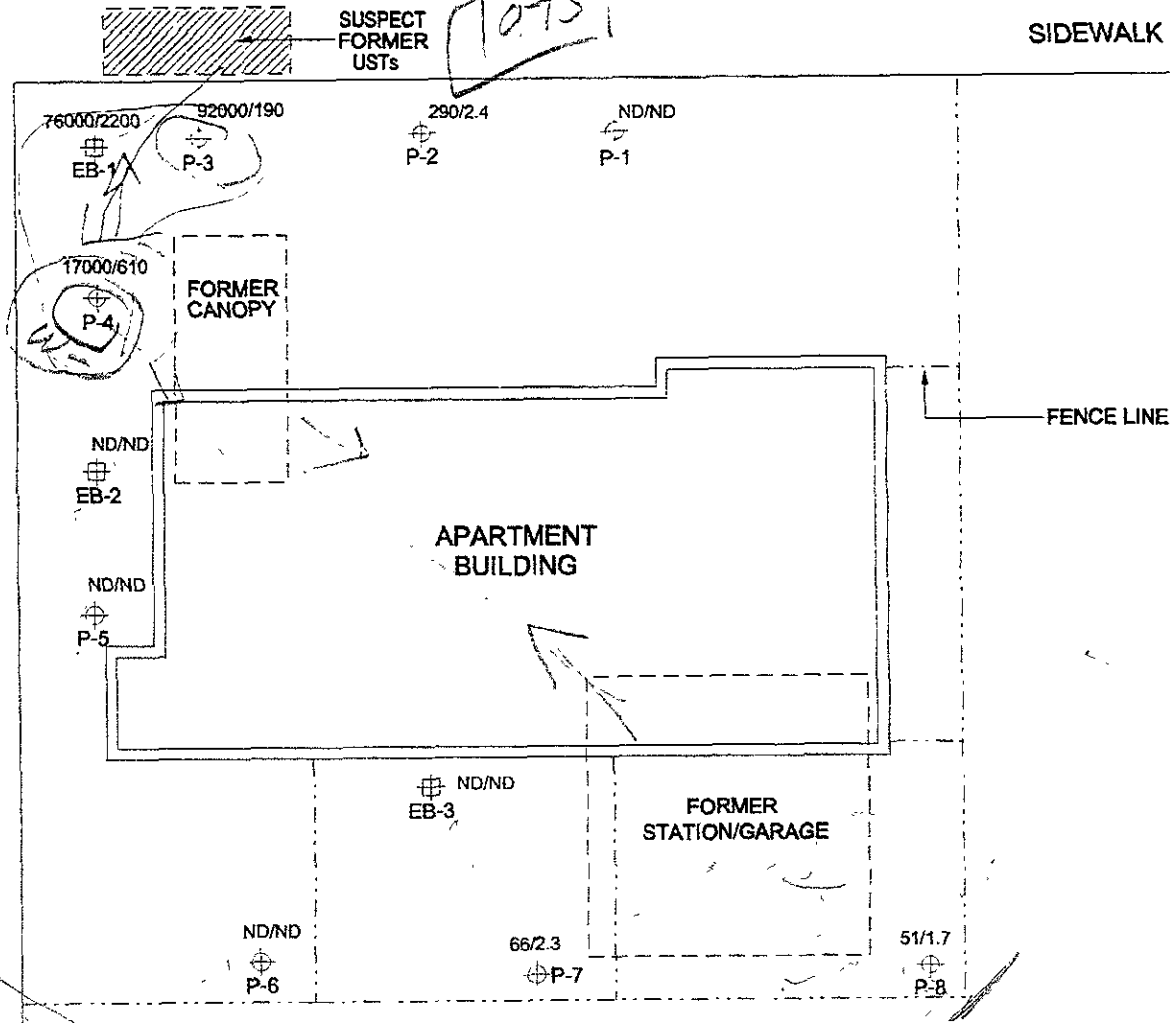


NINTH STREET





SIDEWALK


CENTRAL AVENUE

SIDEWALK



LEGEND

-  - SUSPECT LOCATION OF FORMER UNDERGROUND TANKS
-  - APPROXIMATE LOCATION OF FORMER STRUCTURE
-  - ALLWEST BORINGS (6/97)
- P-6
-  - LOWNEY BORINGS (6/94)
- EB-3
- 51/1.7 - GROUNDWATER TPH-g/BTEX CONCENTRATIONS (µg/L)

 AllWest	GROUNDWATER TPH-g/BTEX CONCENTRATION MAP
	FIGURE 5
	900 CENTRAL AVENUE
	ALAMEDA, CALIFORNIA
	SOURCE: ALLWEST
PROJECT NO. 97217.23	DRAWN BY: S. POON
	DATE: 7/15/97

INFORMATION SOURCES

A. AERIAL PHOTOGRAPHS

Pacific Aerial Surveys, Oakland, California

- AV-5200-9-30, 8-16-1996, 1:12,000 scale
- AV-4230-9-28&29, 4-8-1992, 1:12,000 scale
- AV-3845-8-31, 6-12-1990, 1:12,000 scale
- AV-3268-4-8&9, 3-30-1988, 1:12,000 scale
- AV-2640-4-8&9, 5-15-1985, 1:12,000 scale
- AV-2300-4-8&9, 6-21-1983, 1:12,000 scale
- AV-2040-4-9&10, 6-22-1981, 1:12,000 scale
- AV-1750-4-7&8, 9-14-1979, 1:12,000 scale
- AV-1377-4-10&11, 7-18-1977, 1:12,000 scale
- AV-1193-7-7&8, 6-27-1975, 1:12,000 scale
- AV-1100-4-8&9, 4-24-1973, 1:12,000 scale
- AV-995-2-8&9, 5-19-1971, 1:12,000 scale
- AV-902-4-7&8, 5-19-1969, 1:12,000 scale
- AV-710-9-26&27, 4-20-1966, 1:36,000 scale
- AV-550-38-22&23, 7-9-1963, 1:36,000 scale
- AV-337-5-31&32, 7-3-1959, 1:9,600 scale
- AV-253-8-27&28, 5-3-1957, 1:10,000 scale
- AV-119-10-38&39, 8-14-1953, 1:10,000 scale
- AV-28-13-47&48, 4-14-1950, 1:7,200 scale
- AV-11-7-7&8, 3-24-1947, 1:20,000 scale
- GY-30-45&46, 1930, 1:9,500 scale

B. SANBORN FIRE INSURANCE MAPS

Main Library, University of California at Berkeley, Berkeley, California

- 1897, 1948, 1987

C. CITY DIRECTORIES

Haines Criss-Cross Directory, Oakland City Library, Oakland, California

- 1995, 1990, 1985, 1981, 1977, 1976, 1975, 1974, 1973

D. AGENCY DATABASES

- National Priorities List, May 1997, United States Environmental Protection Agency (U.S. EPA).
- Comprehensive Environmental Response, Compensation and Liability Act

- (CERCLA) Information System, May 1997, U.S. EPA.
- Resource Conservation and Recovery Act (RCRA) Information System, Treatment Storage and Disposal (TSD) facilities list, November 1996, U.S. EPA
- Resource Conservation and Recovery Act (RCRA) Information System, Hazardous Waste Generator list, May 1997, U.S. EPA
- Emergency Response Notification System (ERNS) Incident list, 1986-1996, U.S. EPA
- CalSites, October 1996, California Department of Toxic Substances Control (DTSC)
- Active and Inactive/Closed Landfills List, May 1997, State of California Integrated Waste Management Board (CIWMB)
- The Hazardous Waste and Substances Site List, December 1994, California Office of Planning and Research
- Fuel Leaks List, April 1997, Regional Water Quality Control Board, San Francisco Bay Region
- Spills, Leaks, Investigations, and Cleanup List, May 1997, Regional Water Quality Control Board, San Francisco Bay Region
- South Bay Site Management System, September 1996, Regional Water Quality Control Board, San Francisco Bay Region

E. ENVIRONMENTAL STUDIES

- Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, E-1739-95, September 1995, American Society for Testing and Materials (ASTM)
- Spreadsheet System for Risk-Based Corrective Action, Version 1.01, 1995-1997, Groundwater Services, Inc.
- Soil and Groundwater Quality Reconnaissance, Central Avenue and Ninth Street, Alameda, California, July 1994, Lowney Associates
- Oakland West Quadrangle, 7.5 minute series topographic map, 1959, photorevised 1980, US Geological Survey



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588-5127 PHONE (510) 484-2600 FAX (510) 462-3914

TELEFAX TRANSMITTAL

DATE: 26 Jun 97

DELIVER TO: _____

NAME OF FIRM: Allwest

FAX NUMBER: (415) 391 2008

FROM: Hyman Hong

NUMBER OF PAGES: 2
(Including transmittal)

FOR VOICE CONTACT CALL: (510) 484-2600
FOR RETURN FAX: (510) 462-3914

REMARKS: Drilling permit 97397 for a
contamination investigation at 900 Central Ave
in Alameda.



ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588

VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 900 CENTRAL AVENUE
ALAMEDA, CALIFORNIA

PERMIT NUMBER 97397
LOCATION NUMBER _____

CLIENT
Name RYAN, ANDRADA & LIFTER
Address 300 LAKESIDE DRIVE Phone 510-763-6510
City OAKLAND Zip 94612

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT
Name ALLWEST ENVIRONMENTAL
Address ONE SUTTER ST., #600 Phone 415-391-2510
City SAN FRANCISCO Zip 94104

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

PROPOSED WATER SUPPLY WELL USE
Domestic _____ Industrial _____ Other _____
Municipal _____ Irrigation _____

DRILLING METHOD:
Mud Rotary _____ Air Rotary _____ Auger _____
Cable _____ Other GEOPROBE

DRILLER'S LICENSE NO. C57-705927

WELL PROJECTS
Drill Hole Diameter _____ in. Maximum _____
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number _____

GEOTECHNICAL PROJECTS
Number of Borings 8 Maximum _____
Hole Diameter 1 in. Depth 20 ft.

ESTIMATED STARTING DATE 6-24-97
ESTIMATED COMPLETION DATE 6-25-97

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

APPLICANT'S SIGNATURE [Signature] Date 6-9-97

A. GENERAL

1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS

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. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved [Signature] Date 26 Jun 97
Wyman Hong

GEOPROBE SAMPLING PROCEDURES

Soil Sampling

The geoprobe soil sampling process involves the driving into the subsurface a decontaminated two-foot geoprobe soil sampler connected to 4-foot geoprobe extension rods. The sampler is an 1-inch inside diameter (ID) stainless steel pipe that can accommodate four 6-inch long sampling liners to retain subsurface soils. The sampler is blocked at the bottom end with a locking driving tip until the desired sampling depth is reached.

The entire sampling assembly, the sampler and the steel extension rods, is driven into the subsurface by a truck-mounted hydraulic percussion hammer. The sampler with liners are driven to the desired depth as additional rods are connected. At the desired sampling depth, the sampler is opened by running special thin rods down the center of the geoprobe extension rods to unlock the driving tip and open the sampler. A soil sample is collected by driving the assembly for another two feet. All of the sample liners are protected from cross contamination by the outer casing of the sampler. By adding sections of the extension rods, and repeating the driving process, soil cores are generated from the desired depths.

At each sampling interval, a decontaminated sampler and sample liners are used to avoid cross contamination. After each sampling drive, the sampler is retrieved and the brass sample liners are removed. The soils contained in the sample liners are then classified according to the Uniform Soil Classification System and recorded on the soil boring logs.

Each sample liner selected for laboratory analyses are sealed with teflon sheets, plastic end caps, and silicon tape. The sealed sample liner is then labeled, sealed in a plastic bag, and placed in an ice chest cooled to 4°C with crushed ice for temporary field storage and transportation. The standard chain-of-custody protocol is maintained for all soil samples from the time of collection to arrival at the laboratory.

Groundwater Sampling

To collect a groundwater sample through the geoprobe process, a decontaminated 4-foot long groundwater sampler is attached to the geoprobe rods. The groundwater sampler has an internal stainless steel screen that acts as a temporary well casing. The sampler/rod assembly is driven into the saturation zone with the same process as described above. The outer sampler casing is then retracted to expose the inner screen. The inner screen allows groundwater flow into the center of the sampler. After sufficient groundwater flow has established, a 0.75-inch diameter stainless steel bailer is lowered into the sampler through the center of the geoprobe rod to bring the accumulated groundwater to the ground surface.


After the retrieval of the bailer, groundwater samples contained in the bailer are decanted into laboratory provided containers. The containers are then sealed with teflon coated caps with no headspace, labeled, and placed in an ice chest for field storage and transportation to a state certified analytical laboratory. The standard chain-of-custody protocols are followed from sample collection to delivery to the laboratory. A new bailer is used for each groundwater sampling location to avoid cross contamination.


UNIFIED SOIL CLASSIFICATION SYSTEM

PRIMARY DIVISIONS		GROUP SYMBOLS	SECONDARY DIVISIONS
C O A R S E G R A I N E D S O I L	GRAVELS	Clean gravels (less than 5% of fines)	GW Well graded gravel-sand mixtures, little or no fines.
	More than half of course fraction is larger than No. 4 sieve.	Gravel with fines	GP Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM Silty gravels or gravel-sand silt mixtures, with plastic fines.
	SANDS	Clean sands (less than 5% of fines)	SW Well graded sands or gravelly sands, little or no fines.
			SP Poorly graded sands or gravelly sands, little or no fines.
		Sands with fines	SM Silty sands or sand-silt mixtures, with non-plastic fines.
			SC Clayey sands or sand-clay mixtures, with plastic fines.
	F I N E G R A I N E D S O I L	SILTS AND CLAYS	
Liquid Limit less than 50%		CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	
		OL Organic silts and organic silty clays of low plasticity.	
		MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	
SILTS AND CLAYS		CH Inorganic clays of high plasticity, fat clays.	
		OH Organic clays of medium to high plasticity, organic silts.	
		PT Peat and other highly organic soils.	
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils.

BORING LOG LEGEND

 Sampler Drive Interval

 Relatively Undisturbed Sample Recovered and Preserved

 Sampler Driven, No Sample Recovery

 Disturbed Sample Recovered and Preserved



AllWest

AllWest Environmental, Inc.

Log of Boring: P - 1

Project Address: 900 Central Avenue, Alameda, CA

Project Number: 97217.23

Drilling Date: 6/30/97

Drilling Contractor: ECA

Drill Rig: Geoprobe

Auger: N/A

Sampler: 2" x 4' macro core

Hammer: pneumatic hammer

Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1 -		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
			2 -			
ND	P-1-3		3 -			
			4 -		SM	Brown, silty sand, fine to medium grain, moist, loose to medium dense, non-plastic; Grades very moist to wet below 10'; Groundwater encountered at 12';
			5 -			
			6 -			
ND	P-1-7		7 -			
			8 -			
			9 -			
			10 -			
ND	P-1-11		11 -			
			12 -			
			13 -			
ND	P-1-14		14 -			
			15 -		Borehole terminated at 14'; Groundwater first encountered at 12'; Temporary 1" I.D. PVC casing installed to 14'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.	
			16 -			
			17 -			
			18 -			
			19 -			
			20 -			
			21 -			

Notes:

Reviewed By:
L. Ching

Drawn By:
S. Poon



Log of Boring: P - 2
 Project Address: 900 Central Avenue, Alameda, CA
 Project Number: 97217.23
 Drilling Date: 6/30/97

Drilling Contractor: ECA
 Drill Rig: Geoprobe
 Auger: N/A
 Sampler: 2" x 4' macro core
 Hammer: pneumatic hammer
 Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
			2			
			3			
ND	P-2-3.5		4		SM	Brown, silty sand, fine to medium grain, moist, loose to medium dense, non-plastic;
			5			
			6			
ND	P-2-7.5		7			
			8			
			9			
			10			
ND	P-2-10.5		11		Grades very moist below 10';	
			12			
			13		Grades greenish brown, slight hydrocarbon odor at 12'; Groundwater encountered at 12'.5;	
10	P-2-12.5		14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
						Borehole terminated at 14'; Groundwater first encountered at 12.5'; Temporary 1" I.D. PVC casing installed to 14'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.

Notes: _____ Reviewed By: L. Ching Drawn By: S. Poon



Log of Boring: P - 3
 Project Address: 900 Central Avenue, Alameda, CA
 Project Number: 97217.23
 Drilling Date: 6/30/97

Drilling Contractor: ECA
 Drill Rig: Geoprobe
 Auger: N/A
 Sampler: 2" x 4' macro core
 Hammer: pneumatic hammer
 Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1 -		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
			2 -			
			3 -			
ND	P-3-3.5		4 -			
			5 -		SM/SP	Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
			6 -			
ND	P-3-7.5		7 -			Grades olive brown below 7.5'
			8 -			
			9 -			
			10 -			
10	P-3-11		11 -			Grades very moist to wet below 11', with hydrocarbon odor;
			12 -			Groundwater encountered at 12'.5;
			13 -			
			14 -			
15	P-3-14.5		15 -			
			16 -			Borehole terminated at 15'; Groundwater first encountered at 12'; Temporary 1" I.D. PVC casing installed to 15'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
			17 -			
			18 -			
			19 -			
			20 -			
			21 -			

Notes:

Reviewed By:
L. Ching

Drawn By:
S. Poon



Log of Boring: P - 4
 Project Address: 900 Central Avenue, Alameda, CA
 Project Number: 97217.23
 Drilling Date: 6/30/97

Drilling Contractor: ECA
 Drill Rig: Geoprobe
 Auger: N/A
 Sampler: 2" x 4' macro core
 Hammer: pneumatic hammer
 Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
ND	P-4-3.5		1 - 2 - 3 - 4 -		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
ND	P-4-7.5		5 - 6 - 7 - 8 - 9 -		SM	Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
ND	P-4-10.5		10 - 11 -			Grades olive brown to greenish brown below 12'; Groundwater encountered at 12'.5 to 13', with hydrocarbon odor;
10	P-4-13		12 - 13 - 14 -			
20	P-4-15.5		15 - 16 -			
			17 - 18 - 19 - 20 - 21 -			Borehole terminated at 16'; Groundwater first encountered at 13'; Temporary 1" I.D. PVC casing installed to 16'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.

Notes: Reviewed By: L. Ching
Drawn By: S. Poon



Log of Boring: P - 5
 Project Address: 900 Central Avenue, Alameda, CA
 Project Number: 97217.23
 Drilling Date: 6/30/97

Drilling Contractor: ECA
 Drill Rig: Geoprobe
 Auger: N/A
 Sampler: 2" x 4' macro core
 Hammer: pneumatic hammer
 Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
ND	P-5-3.5		1 - 2 - 3 - 4 -		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
ND	P-5-7.5		5 - 6 - 7 - 8 - 9 - 10 -		SM	Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
ND	P-5-11.5		11 - 12 - 13 - 14 - 15 -			Groundwater encountered at 11'.5;
ND	P-5-15.5		16 - 17 - 18 - 19 - 20 - 21 -			Borehole terminated at 16'; Groundwater first encountered at 11.5'; Temporary 1" I.D. PVC casing installed to 16'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.

Notes: Reviewed By: L. Ching
 Drawn By: S. Poon



Log of Boring: P - 6
 Project Address: 900 Central Avenue, Alameda, CA
 Project Number: 97217.23
 Drilling Date: 6/30/97

Drilling Contractor: ECA
 Drill Rig: Geoprobe
 Auger: N/A
 Sampler: 2" x 4' macro core
 Hammer: pneumatic hammer
 Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1		SW	Concrete ground surface (driveway); Dark brown, gravelly sand, medium to coarse grain, slightly moist, medium dense, non-plastic;
			2		SM/SP	Brown, silty sand, fine grain, slightly moist, loose, non-plastic;
			3			
ND	P-6-3.5		4			
			5		SM	Brown, silty sand, fine with some medium grain, moist, loose to medium dense, non-plastic;
			6			
ND	P-6-7.5		7			
			8			
			9			
			10			
ND	P-6-10.5		11			Groundwater encountered at 11'.5;
			12			
			13			
ND	P-6-13.5		14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
						Borehole terminated at 14'; Groundwater first encountered at 11.5'; Temporary 1" I.D. PVC casing installed to 14'; 2 x 40-ml and 1 x 1-liter groundwater samples collected.

Notes: _____ Reviewed By: L. Ching Drawn By: S. Poon



Log of Boring: P - 7
 Project Address: 900 Central Avenue, Alameda, CA
 Project Number: 97217.23
 Drilling Date: 6/30/97

Drilling Contractor: ECA
 Drill Rig: Geoprobe
 Auger: N/A
 Sampler: 1" x 2' geoprobe
 Hammer: pneumatic hammer
 Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
ND	P-7-4.5		1 - 2 - 3 - 4 - 5 - 6 - 7 -		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
ND	P-7-9.5		8 - 9 - 10 - 11 -			Grades moist below 8';
ND	P-7-13.5		12 - 13 - 14 -			Groundwater encountered at 12;
			15 - 16 - 17 - 18 - 19 - 20 - 21 -			Borehole terminated at 14'; Groundwater first encountered at 12'; Temporary 1" I.D. steel casing installed to 14', very slow recharge; 2 x 40-ml groundwater samples collected.

Notes:

Reviewed By:
L. Ching

Drawn By:
S. Poon



AllWest

AllWest Environmental, Inc.

Log of Boring: P - 8
 Project Address: 900 Central Avenue, Alameda, CA
 Project Number: 97217.23
 Drilling Date: 6/30/97

Drilling Contractor: ECA
 Drill Rig: Geoprobe
 Auger: N/A
 Sampler: 1" x 2' geoprobe
 Hammer: pneumatic hammer
 Logged By: Long Ching

OVM Reading	Sample Number	Sample Interval	Depth in Feet	Well Profile	USCS Code	Soil Description
			1 -		SM/SP	Grassy ground surface (lawn); Brown, silty sand, fine grain, poorly graded, slightly moist, loose, non-plastic;
			2 -			
			3 -			
ND	P-8-4		4 -		SM	Brown, silty sand, fine to medium grain, moist, medium dense, non-plastic; Grades moist below 8'; Groundwater encountered at 12';
			5 -			
			6 -			
			7 -			
			8 -			
ND	P-8-9.5		9 -			
			10 -			
			11 -			
			12 -			
			13 -		SM	Borehole terminated at 15'; Groundwater first encountered at 12'; Temporary 1" I.D. steel casing installed to 15', slow recharge; 2 x 40-ml and 1 x 1-liter groundwater samples collected.
ND	P-8-14		14 -			
			15 -			
			16 -			
			17 -			
			18 -			
			19 -			
			20 -			
			21 -			

Notes:

Reviewed By:
L. Ching

Drawn By:
S. Poon

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-1-W

Spl#: 137982

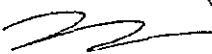
Sampled: June 30, 1997

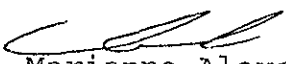
Matrix: WATER

Run#: 7669

Analyzed: July 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	108	1
BENZENE	N.D.	0.50	N.D.	94	1
TOLUENE	N.D.	0.50	N.D.	97	1
ETHYL BENZENE	N.D.	0.50	N.D.	100	1
XYLENES	N.D.	0.50	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-1-11

Spl#: 137981


Sampled: June 30, 1997


Matrix: SOIL

Run#: 7652

Analyzed: July 9, 1997

<u>ANALYTE</u>	<u>RESULT</u> (mg/Kg)	<u>REPORTING</u> <u>LIMIT</u> (mg/Kg)	<u>BLANK</u> <u>RESULT</u> (mg/Kg)	<u>BLANK</u> <u>SPIKE</u> (%)	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	N.D.	1.0	N.D.	90	1
BENZENE	N.D.	0.0050	N.D.	90	1
TOLUENE	N.D.	0.0050	N.D.	92	1
ETHYL BENZENE	N.D.	0.0050	N.D.	91	1
XYLENES	N.D.	0.0050	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-2-10.5

Spl#: 137983

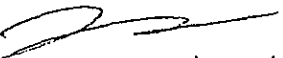
Matrix: SOIL


Sampled: June 30, 1997

Run#: 7652

Analyzed: July 8, 1997

<u>ANALYTE</u>	<u>RESULT</u> (mg/Kg)	<u>REPORTING</u> <u>LIMIT</u> (mg/Kg)	<u>BLANK</u> <u>RESULT</u> (mg/Kg)	<u>BLANK</u> <u>SPIKE</u> (%)	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	N.D.	1.0	N.D.	90	1
BENZENE	N.D.	0.0050	N.D.	90	1
TOLUENE	N.D.	0.0050	N.D.	92	1
ETHYL BENZENE	N.D.	0.0050	N.D.	91	1
XYLENES	N.D.	0.0050	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-2-12.5

Spl#: 137984

Matrix: SOIL

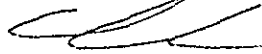
Sampled: June 30, 1997

Run#: 7668

Analyzed: July 9, 1997

<u>ANALYTE</u>	<u>RESULT</u> (mg/Kg)	<u>REPORTING</u> <u>LIMIT</u> (mg/Kg)	<u>BLANK</u> <u>RESULT</u> (mg/Kg)	<u>BLANK</u> <u>SPIKE</u> (%)	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	N.D.	1.0	N.D.	86	1
BENZENE	N.D.	0.0050	N.D.	96	1
TOLUENE	N.D.	0.0050	N.D.	100	1
ETHYL BENZENE	N.D.	0.0050	N.D.	107	1
XYLENES	N.D.	0.0050	N.D.	109	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-2-W

Spl#: 137985

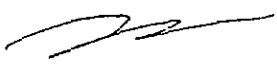
Sampled: June 30, 1997

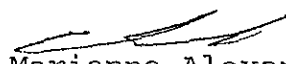
Matrix: WATER

Run#: 7669

Analyzed: July 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	290	50	N.D.	108	1
BENZENE	2.4	0.50	N.D.	94	1
TOLUENE	2.1	0.50	N.D.	97	1
ETHYL BENZENE	1.4	0.50	N.D.	100	1
XYLENES	3.1	0.50	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-3-11

Spl#: 137986

Sampled: June 30, 1997

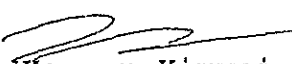
Matrix: SOIL

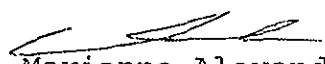
Run#: 7622

Analyzed: July 9, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	120	N.D.	--	1
BENZENE	N.D.	0.62	N.D.	102	1
TOLUENE	N.D.	0.62	N.D.	95	1
ETHYL BENZENE	N.D.	0.62	N.D.	94	1
XYLENES	N.D.	0.62	N.D.	96	1

Note: Surrogate Recoveries biased high due to Hydrocarbon co-elution.
Reporting Limits Increased Due To Sample Interference.


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-3-14.5

Spl#: 137987

Matrix: SOIL

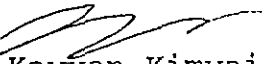
Sampled: June 30, 1997

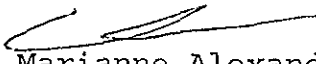
Run#: 7622

Analyzed: July 8, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	4600	2400	N.D.	--	20
BENZENE	N.D.	12	N.D.	102	20
TOLUENE	15	12	N.D.	95	20
ETHYL BENZENE	110	12	N.D.	94	20
XYLENES	590	12	N.D.	96	20

Note: Surrogate Recoveries biased high due to Hydrocarbon co-elution.
Reporting Limits Increased Due To Sample Interference.


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-3-W

Spl#: 137988


Sampled: June 30, 1997

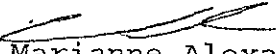
Matrix: WATER

Run#: 7669

Analyzed: July 9, 1997

<u>ANALYTE</u>	<u>RESULT</u> <u>(ug/L)</u>	<u>REPORTING</u> <u>LIMIT</u> <u>(ug/L)</u>	<u>BLANK</u> <u>RESULT</u> <u>(ug/L)</u>	<u>BLANK</u> <u>SPIKE</u> <u>(%)</u>	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	92000	10000	N.D.	108	200
BENZENE	190	100	N.D.	94	200
TOLUENE	5000	100	N.D.	97	200
ETHYL BENZENE	4600	100	N.D.	100	200
XYLENES	24000	100	N.D.	91	200


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SOB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-4-13

Spl#: 137989


Sampled: June 30, 1997

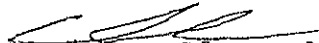
Matrix: SOIL

Run#: 7668

Analyzed: July 9, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	1.0	N.D.	86	1
BENZENE	N.D.	0.0050	N.D.	96	1
TOLUENE	N.D.	0.0050	N.D.	100	1
ETHYL BENZENE	N.D.	0.0050	N.D.	107	1
XYLENES	N.D.	0.0050	N.D.	109	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-4-15.5

Spl#: 137990


Matrix: SOIL

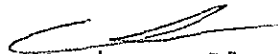
Sampled: June 30, 1997

Run#: 7652

Analyzed: July 9, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	1.1	1.0	N.D.	90	1
BENZENE	0.011	0.0050	N.D.	90	1
TOLUENE	0.0092	0.0050	N.D.	92	1
ETHYL BENZENE	0.030	0.0050	N.D.	91	1
XYLENES	0.066	0.0050	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-4-W

Spl#: 137991

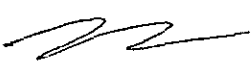
Sampled: June 30, 1997


Matrix: WATER

Run#: 7669

Analyzed: July 9, 1997

<u>ANALYTE</u>	<u>RESULT</u> <u>(ug/L)</u>	<u>REPORTING</u> <u>LIMIT</u> <u>(ug/L)</u>	<u>BLANK</u> <u>RESULT</u> <u>(ug/L)</u>	<u>BLANK</u> <u>SPIKE</u> <u>(%)</u>	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	17000	1000	N.D.	108	20
BENZENE	610	10	N.D.	94	20
TOLUENE	720	10	N.D.	97	20
ETHYL BENZENE	940	10	N.D.	100	20
XYLENES	3800	10	N.D.	91	20


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-5-11.5

Spl#: 137992

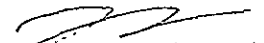
Matrix: SOIL


Sampled: June 30, 1997

Run#: 7652

Analyzed: July 9, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	1.0	N.D.	90	1
BENZENE	N.D.	0.0050	N.D.	90	1
TOLUENE	N.D.	0.0050	N.D.	92	1
ETHYL BENZENE	N.D.	0.0050	N.D.	91	1
XYLENES	N.D.	0.0050	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-5-W

Spl#: 137993

Sampled: June 30, 1997


Matrix: WATER

Run#: 7669

Analyzed: July 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	108	1
BENZENE	N.D.	0.50	N.D.	94	1
TOLUENE	N.D.	0.50	N.D.	97	1
ETHYL BENZENE	N.D.	0.50	N.D.	100	1
XYLENES	N.D.	0.50	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-6-10.5

Spl#: 137994

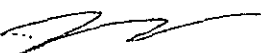
Matrix: SOIL

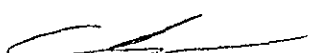
Sampled: June 30, 1997

Run#: 7652

Analyzed: July 8, 1997

<u>ANALYTE</u>	<u>RESULT</u> (mg/Kg)	<u>REPORTING</u> <u>LIMIT</u> (mg/Kg)	<u>BLANK</u> <u>RESULT</u> (mg/Kg)	<u>BLANK</u> <u>SPIKE</u> (%)	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	N.D.	1.0	N.D.	90	1
BENZENE	N.D.	0.0050	N.D.	90	1
TOLUENE	N.D.	0.0050	N.D.	92	1
ETHYL BENZENE	N.D.	0.0050	N.D.	91	1
XYLENES	N.D.	0.0050	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-6-W

Spl#: 137995

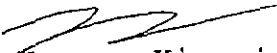
Sampled: June 30, 1997

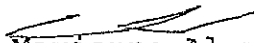
Matrix: WATER

Run#: 7669

Analyzed: July 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	108	1
BENZENE	N.D.	0.50	N.D.	94	1
TOLUENE	N.D.	0.50	N.D.	97	1
ETHYL BENZENE	N.D.	0.50	N.D.	100	1
XYLENES	N.D.	0.50	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-7-9.5

Spl#: 137996

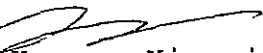
Matrix: SOIL


Sampled: June 30, 1997

Run#: 7652

Analyzed: July 9, 1997

<u>ANALYTE</u>	<u>RESULT</u> <u>(mg/Kg)</u>	<u>REPORTING</u> <u>LIMIT</u> <u>(mg/Kg)</u>	<u>BLANK</u> <u>RESULT</u> <u>(mg/Kg)</u>	<u>BLANK</u> <u>SPIKE</u> <u>(%)</u>	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	N.D.	1.0	N.D.	90	1
BENZENE	N.D.	0.0050	N.D.	90	1
TOLUENE	N.D.	0.0050	N.D.	92	1
ETHYL BENZENE	N.D.	0.0050	N.D.	91	1
XYLENES	N.D.	0.0050	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-7-W

Spl#: 137997

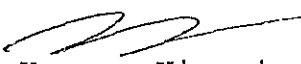
Sampled: June 30, 1997

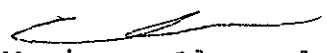
Matrix: WATER

Run#: 7669

Analyzed: July 8, 1997

<u>ANALYTE</u>	<u>RESULT</u> <u>(ug/L)</u>	<u>REPORTING</u> <u>LIMIT</u> <u>(ug/L)</u>	<u>BLANK</u> <u>RESULT</u> <u>(ug/L)</u>	<u>BLANK</u> <u>SPIKE</u> <u>(%)</u>	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	66	50	N.D.	108	1
BENZENE	2.3	0.50	N.D.	94	1
TOLUENE	6.5	0.50	N.D.	97	1
ETHYL BENZENE	0.80	0.50	N.D.	100	1
XYLENES	4.7	0.50	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-8-9.5

Spl#: 137998

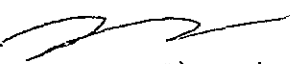
Matrix: SOIL


Sampled: June 30, 1997

Run#: 7652

Analyzed: July 7, 1997

<u>ANALYTE</u>	<u>RESULT</u> <u>(mg/Kg)</u>	<u>REPORTING</u> <u>LIMIT</u> <u>(mg/Kg)</u>	<u>BLANK</u> <u>RESULT</u> <u>(mg/Kg)</u>	<u>BLANK</u> <u>SPIKE</u> <u>(%)</u>	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	N.D.	1.0	N.D.	90	1
BENZENE	N.D.	0.0050	N.D.	90	1
TOLUENE	N.D.	0.0050	N.D.	92	1
ETHYL BENZENE	N.D.	0.0050	N.D.	91	1
XYLENES	N.D.	0.0050	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA

Received: July 1, 1997

re: One sample for Gasoline BTEX analysis.

Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: P-8-W

Spl#: 137999

Sampled: June 30, 1997


Matrix: WATER

Run#: 7669

Analyzed: July 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	51	50	N.D.	108	1
BENZENE	1.7	0.50	N.D.	94	1
TOLUENE	5.1	0.50	N.D.	97	1
ETHYL BENZENE	0.55	0.50	N.D.	100	1
XYLENES	2.4	0.50	N.D.	91	1


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997

re: 2 samples for TEPH analysis.
Method: EPA 8015M

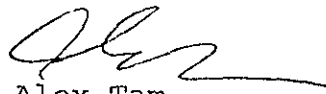
Sampled: June 30, 1997

Matrix: SOIL
Run#: 7598

Extracted: July 3, 1997
Analyzed: July 4, 1997

Spl#	CLIENT SPL ID	Diesel (mg/Kg)	Motor Oil (mg/Kg)
137983	P-2-10.5	N.D.	N.D.
137984	P-2-12.5	N.D.	N.D.
Reporting Limits		1.0	50
Blank Result		N.D.	
Blank Spike Result (%)		106	--


Bruce Havlik
Chemist


Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL


Atten: Long Ching


Project: ALAMEDA
Received: July 1, 1997

re: 1 sample for TEPH analysis.
Method: EPA 8015M

Sampled: June 30, 1997 Matrix: WATER Extracted: July 8, 1997
Run#: 7654 Analyzed: July 9, 1997

Spl#	CLIENT SPL ID	Diesel (ug/L)	Motor Oil (ug/L)
137985	P-2-W	N.D.	N.D.
Reporting Limits		53	530
Blank Result		N.D.	
Blank Spike Result (%)		83.0	--


Bruce Havlik
Chemist


Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching


Project: ALAMEDA
Received: July 1, 1997


re: 2 samples for TEPH analysis.
Method: EPA 8015M

Sampled: June 30, 1997
Matrix: SOIL
Run#: 7598

Extracted: July 3, 1997
Analyzed: July 5, 1997

Spl#	CLIENT SPL ID	Diesel (mg/Kg)	Motor Oil (mg/Kg)
137986	P-3-11	N.D.	N.D.
137987	P-3-14.5	N.D.	N.D.
Reporting Limits		1.0	50
Blank Result		N.D.	
Blank Spike Result (%)		106	--


Bruce Havlik
Chemist


Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997


re: 1 sample for TEPH analysis.
Method: EPA 8015M

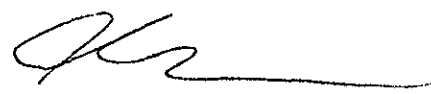
Sampled: June 30, 1997 Matrix: WATER Extracted: July 8, 1997
Run#: 7654 Analyzed: July 9, 1997

Spl#	CLIENT SPL ID	Diesel (ug/L)	Motor Oil (ug/L)
137988	P-3-W	N.D.	N.D.

Note: Reporting limit raised due to matrix interference.

Reporting Limits	10000	100000
Blank Result	N.D.	
Blank Spike Result (%)	83.0	--


Bruce Havlik
Chemist


Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL

Atten: Long Ching

Project: ALAMEDA
Received: July 1, 1997


re: 2 samples for TEPH analysis.
Method: EPA 8015M


Sampled: June 30, 1997

Matrix: SOIL
Run#: 7598

Extracted: July 3, 1997
Analyzed: July 5, 1997

<u>Spl#</u>	<u>CLIENT SPL ID</u>	<u>Diesel (mg/Kg)</u>	<u>Motor Oil (mg/Kg)</u>
137989	P-4-13	N.D.	N.D.
137990	P-4-15.5	N.D.	N.D.
Reporting Limits		1.0	50
Blank Result		N.D.	
Blank Spike Result (%)		106	--


Bruce Havlik
Chemist


Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

July 9, 1997

Submission #: 9707025

ALLWEST ENVIRONMENTAL


Atten: Long Ching

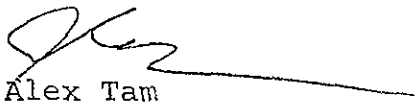
Project: ALAMEDA
Received: July 1, 1997

re: 1 sample for TEPH analysis.
Method: EPA 8015M

Sampled: June 30, 1997 Matrix: WATER Extracted: July 8, 1997
Run#: 7654 Analyzed: July 8, 1997

Spl#	CLIENT SPL ID	Diesel (ug/L)	Motor Oil (ug/L)
137991	P-4-W	N.D.	N.D.
Reporting Limits		100	1000
Blank Result		N.D.	
Blank Spike Result (%)		83.0	--


Bruce Havlik
Chemist


Alex Tam
Semivolatiles Supervisor

CLIENT NAME: **ALLWEST ENVIRONMENTAL**
 ADDRESS: **ONE SUTTER ST. #600**
SAN FRANCISCO, CA 94104
 PROJECT NAME: **900 CENTRAL AVE**
 PROJECT MANAGER: **LONG CHING** PHONE #: **415-391-2510**
 SAMPLED BY: **L. CHING**
 JOB DESCRIPTION:
 SITE LOCATION: **ALAMEDA**

CLIENT JOB NUMBER: **9721723**
 DESTINATION LABORATORY:
 GE
 4118 Clipper Court
 Fremont, CA 94538
 Other
CHROMALAB
510-484-1919

ANALYSIS REQUESTED
 PRESERVATIVES
TPH-G/BTEX
TPH-D & TPH-MO

FIELD CONDITIONS
 URM #: 9707025 REP: PM
 CLIENT: ALLWEST
 JE: 07/09/97
 EF #: 34458
 SPECIAL INSTRUCTIONS:
 TURN AROUND TIME
 NOTE/FIELD READINGS

DATE	TIME	IDENTIFICATION	METHOD	MATRIX	CONTAINER		PRESERVATIVES	TPH-G/BTEX	TPH-D	TPH-MO	OTHERS	24 HOURS	48 HOURS	1 WEEK	OTHERS	
					NO.	SIZE										
6/30/97		P-1-3		SOIL	1	2"φ	3									
		P-1-7		SOIL	1	2"φ										
		P-1-11		SOIL	1	2"φ		X						X		
		P-1-14		SOIL	1	2"φ										
		P-1-W		WATER	3	40/1		X						X		
		P-2-3.5		SOIL	1	2"φ										
		P-2-7.5		SOIL	1	2"φ										
		P-2-10.5		SOIL	1	2"φ		X	X					X		
		P-2-12.5		SOIL	1	2"φ		X	X							
		P-2-W		WATER	3	40/1		X	X					X		
		P-3-3.5		SOIL	1	2"φ										
		P-3-7.5		SOIL	1	2"φ										
6/30/97		P-3-11		SOIL	1	2"φ	3	X	X					X		

SUSPECTED CONSTITUENTS: _____ SAMPLE RETENTION TIME: _____ PRESERVATIVES: (1) HCL (2) HNO₃ (3) - COLD (4)

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
<i>Long Ching</i>	LONG CHING / ALLWEST	6-1-97 10:20 AM	<i>B. Marmor</i>	B. Marmor / Environmental
<i>Chris Rowley</i>	Chris Rowley / Environmental	7-1-97 1926	<i>Chris Rowley</i>	Chris Rowley / Environmental

REC'D AT LAB BY: _____ DATE / TIME: _____ CONDITIONS / COMMENTS: _____

SHIPPED VIA: FED X UPS OTHER _____ AIR BILL # _____

9707025

PG. 2/3

CLIENT NAME ALLWEST ENVIRONMENTAL	CLIENT JOB NUMBER 9721723	PRESERVATIVES TPH-G / BTEX TPH-D & TPH-MO	ANALYSIS REQUESTED	FIELD CONDITIONS
ADDRESS	DESTINATION LABORATORY <input type="checkbox"/> GE 4118 Clipper Court Fremont, CA 94538 <input checked="" type="checkbox"/> Other CHROMALAB			COMPOSITE:
PROJECT NAME 900 CENTRAL	PROJECT MANAGER LONG CHING PHONE # 415-391-2510			SPECIAL INSTRUCTIONS:
SAMPLED BY L. CHING	JOB DESCRIPTION			
SITE LOCATION ALAMEDA				

DATE	TIME	IDENTIFICATION	METHOD	MATRIX	CONTAINER NO.	PRESERVATIVE	1	2	3	4	5	6	7	8	9	10	TURN AROUND TIME				NOTE / FIELD READINGS
																	24 HOURS	48 HOURS	1 WEEK	OTHERS	
6/30/97		P-3-14.5		SOIL	1	2"φ	3	X	X												
		P-3-W		WATER	3	40/1	1	X	X												
		P-4-3.5		SOIL	1	2"φ															
		P-4-7.5		SOIL	1																
		P-4-10.5		SOIL	1																
		P-4-13		SOIL	1	↓		X	X												
		P-4-15.5		SOIL	1	2"φ		X	X												
		P-4-W		WATER	3	40/1		X	X												
		P-5-3.5		SOIL	1	2"φ															
		P-5-7.5		SOIL	1																
		P-5-11.5		SOIL	1	↓		X													
		P-5-15.5		SOIL	1	2"φ															
6/30/97		P-5-W		WATER	3	40/1	3	X													

SUSPECTED CONSTITUENTS	SAMPLE RETENTION TIME	PRESERVATIVES	(1) HCL (2) HNO ₃	(3) - COLD (4)
RELINQUISHED BY (SIGN) <i>Long Ching</i>	PRINT NAME / COMPANY LONG CHING / ALLWEST	DATE / TIME 7-1-97 10:17	RECEIVED BY (SIGN) <i>Chris Rowley</i>	PRINT NAME / COMPANY Chris Rowley
<i>B. Moran</i>	B. Moran Universal	7-1-97 19:26	<i>Chris Rowley</i>	Chris Rowley
			7/1/97 19:26	
REC'D AT LAB BY:	DATE / TIME:	CONDITIONS / COMMENTS		
SHIPPED VIA	<input type="checkbox"/> FED X	<input type="checkbox"/> UPS	<input type="checkbox"/> OTHER	AIR BILL #

CLIENT NAME ALLWEST ENVIRONMENTAL		CLIENT JOB NUMBER 97217.23		ANALYSIS REQUESTED		FIELD CONDITIONS	
ADDRESS		DESTINATION LABORATORY		PRESERVATIVES TPH-G / BITEX TPH-D & TPH-MD		COMPOSITE:	
PROJECT NAME 900 CENTRAL		<input type="checkbox"/> GE 4118 Clipper Court Fremont, CA 94538				SPECIAL INSTRUCTIONS	
PROJECT MANAGER LONG CHING PHONE # 415-391-2510		<input checked="" type="checkbox"/> Other CHROMALAB					
SAMPLED BY L. CHING							
JOB DESCRIPTION							
SITE LOCATION ALAMEDA							

DATE	TIME	IDENTIFICATION	METHOD	MATRIX	CONTAINER		PRESERVATIVES	TURN AROUND TIME				NOTE / FIELD READINGS
					NO.	SIZE		24 HOURS	48 HOURS	1 WEEK	OTHERS	
6/30/97		P-6-3.5		SOIL	1	2" φ	3					
		P-6-7.5		SOIL	1	2" φ						
		P-6-10.5		SOIL	1	2" φ		X				
		P-6-13.5		SOIL	1	2" φ						
		P-6-W		WATER	3	40/1		X				
		P-7-4.5		SOIL	1	1" φ						
		P-7-9.5		SOIL	1	1" φ		X				
		P-7-13.5		SOIL	1	1" φ						
		P-7-W		WATER	2	40ML		X				
		P-8-4		SOIL	1	1" φ						
		P-8-9.5		SOIL	1	1" φ		X				
		P-8-14		SOIL	1	1" φ						
6/30/97		P-8-W		WATER	3	40/1	3	X				

SUSPECTED CONSTITUENTS		SAMPLE RETENTION TIME		PRESERVATIVES		(1) HCL	(3) - COLD
						(2) HNO ₃	(4)
RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY			
<i>Long Ching</i>	LONG CHING / ALLWEST	7-1-97 1619	<i>Chris Rowley</i>	<i>B. Moran Chromalab</i>			
<i>B. Moran</i>	B. Moran Chromalab	7-1-97 1926	<i>Chris Rowley</i>				
REC'D AT LAB BY		DATE / TIME	CONDITIONS / COMMENTS				
SHIPPED VIA		<input type="checkbox"/> FED X	<input type="checkbox"/> UPS	<input type="checkbox"/> OTHER	AIR BILL #		

CHROMALAB, INC.

Environmental Service (SDB)

Sample Receipt Checklist

Client Name: ALLWEST ENVIRONMENTAL

Date/Time Received: 07/01/97 | 1617

Reference/Submis: 34458 | 9707025

Received by: BM

Checklist completed by: Chris Rowley

Date: 7/2/97

Reviewed by: W 7-2-97

Matrix: Soil/H₂O

Carrier name: Client - C/L

Shipping container/cooler in good condition?

Yes No Not Present

Custody seals intact on shipping container/cooler?

Yes No Not Present

Custody seals intact on sample bottles?

Yes No Not Present

Chain of custody present?

Yes No

Chain of custody signed when relinquished and received?

Yes No

Chain of custody agrees with sample labels?

Yes No

Samples in proper container/bottle?

Yes No

Sample containers intact?

Yes No

Sufficient sample volume for indicated test?

Yes No

All samples received within holding time?

Yes No

Container/Temp Blank temperature in compliance?

Temp 60 °C Yes No

Water - VOA vials have zero headspace?

No VOA vials submitted Yes No

Water - pH acceptable upon receipt? YES

Adjusted? Checked by CR chemist for VOAs

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted: _____

Contacted by: _____ Regarding: _____

Comments: * LIMITED SAMPLE FOR DIESEL ANALYSIS

Corrective Action: _____

Site Name: 900 CENTRAL AVENUE
 Site Location: ALAMEDA, CALIFORNIA

Date Completed: 8-4-97
 Completed By: LONG CHING

TIER 1 EXECUTIVE SUMMARY CHECKLIST

VISUAL/HISTORICAL ASSESSMENT

Site size (acres)	<input checked="" type="checkbox"/> <1	<input type="checkbox"/> <10	<input type="checkbox"/> >10
Site setting	<input type="checkbox"/> undeveloped	<input type="checkbox"/> industrial	<input checked="" type="checkbox"/> residential
Site access	<input type="checkbox"/> capped	<input checked="" type="checkbox"/> fenced-in	<input type="checkbox"/> open
Visual evidence of environmental impact	<input checked="" type="checkbox"/> none	<input type="checkbox"/> limited	<input type="checkbox"/> extensive
Current site land use	<input type="checkbox"/> undeveloped	<input type="checkbox"/> indust./comm.	<input checked="" type="checkbox"/> residential
Contaminant sources	<input checked="" type="checkbox"/> tanks/spills	<input type="checkbox"/> trench/drums	<input type="checkbox"/> ponds/pits
Affected environmental media	<input type="checkbox"/> soil (>3 ft BGS)	<input checked="" type="checkbox"/> groundwater	<input type="checkbox"/> surficial soil (<3 ft BGS)
Types of compounds likely to be present	<input checked="" type="checkbox"/> petroleum hydrocarbons	<input type="checkbox"/> metals	<input type="checkbox"/> inorganic (nitrates)
		<input type="checkbox"/> other:(pesticides)	

BASELINE RECEPTOR IDENTIFICATION

Reasonable potential receptors (greatest concern)	<input type="checkbox"/> none	<input type="checkbox"/> ecological	<input checked="" type="checkbox"/> human
Distance from fence line to nearest off-site receptor (ft)	<input type="checkbox"/> >500	<input type="checkbox"/> 100 - 500	<input checked="" type="checkbox"/> <100
Travel time to closest groundwater receptor (yr)	<input type="checkbox"/> >10	<input checked="" type="checkbox"/> 2 - 10	<input type="checkbox"/> <2
Depth to first encountered groundwater (ft)	<input type="checkbox"/> >150	<input type="checkbox"/> 50 - 150	<input checked="" type="checkbox"/> <50
Complete exposure pathways	<input type="checkbox"/> none	<input type="checkbox"/> ingestion	<input checked="" type="checkbox"/> inhalation
	<input type="checkbox"/> ecological	<input type="checkbox"/> dermal	<input type="checkbox"/> absorption

TIER 1 TASKS COMPLETED

<input checked="" type="checkbox"/> Visual / historical assessment	<input checked="" type="checkbox"/> Initial (screening) site assessment	<input type="checkbox"/> Site prioritization / classification
<input type="checkbox"/> Detailed site characterization	<input type="checkbox"/> RBSL comparison	<input type="checkbox"/> Initial ecological assessment
<input type="checkbox"/> Corrective action planned or implemented		

TIER 1 CLASSIFICATION EVALUATION

Classification No.	Scenario Description	Prescribed Interim Action	Date Implemented
CLASS 3	FUTURE THREAT	MONITOR / INVESTIGATE	7-97

TIER 1 CORRECTIVE ACTION CRITERIA

Affected Medium	Screening Level Criteria Exceeded? (<input checked="" type="checkbox"/> if yes)						None Exceeded
	Risk-Based	Other (MCL)	Others: (specify)				
• Surface Soil (< 3ft BGS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Subsurface Soil (> 3ft BGS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Groundwater (potable/nonpotable)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Surface waters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

NOTES: (List and discuss chemicals for which a Tier 1 exceedance is found.)

PROPOSED TIER 1 ACTION

- No Action** : Site does not exceed Tier 1 criteria. - Apply for closure.
- Interim Corrective Action** : Site exceeds some Tier 1 criteria. - Propose interim corrective action and reprioritize site.
- Final Corrective Action** : Site exceeds some Tier 1 criteria. - Propose corrective action to achieve Tier 1 criteria.
- Tier 2 Evaluation** : Site exceeds some Tier 1 criteria. - Re-evaluate corrective action goals per Tier 2 risk assessment.

NOTE:
 Rationale for proposed action documented on Worksheets 1.3 and 10.1-10.3.

ALL WORKSHEETS ENCLOSED IN THIS REPORT ARE IDENTIFIED ON THE TABLE OF CONTENTS FORM.

Site Name: 900 CENTRAL AVENUE
 Site Location: ALAMEDA, CALIFORNIA

Date Completed: 8-4-97
 Completed By: LONG CHING

TIER 2 EXECUTIVE SUMMARY CHECKLIST

TIER 2 SSTL CALCULATION METHOD

SSTL Calculation Option

- Option 1: Site-Specific Screening Levels
- Option 2: Individual Constituent SSTL Values
- Option 3: Cumulative Constituent SSTL Values

NAF Calculation Method

- Fate and Transport Modeling:
 - RBCA Spreadsheet System
 - Other Model(s)
- Empirical NAF Calculation

SITE DATA INVENTORY

Source Zone Investigation Complete:

- Surface Soil (e.g., ≤ 3 ft BGS)
- Subsurface Soil (e.g., > 3 ft BGS)
- Groundwater

Exposure Pathway Information Compiled:

- Air Pathway
- Groundwater Pathway
- Soil Pathway
- Surface Water Pathway
- Land Use Classification (on-site and off-site)

TIER 1 WORKSHEETS 1.3 - 4.2 AND 5.2 - 5.6 HAVE BEEN UPDATED TO INCLUDE NEW TIER 2 INFORMATION.

TASKS COMPLETED

- Tier 1 Evaluation
- Tier 2 Evaluation
- Tier 2 Final Corrective Action
- Tier 1 Interim Corrective Action
- Tier 2 Interim Corrective Action
- Tier 3 Evaluation

CURRENT SITE CLASSIFICATION

Classification No.	Scenario Description	Prescribed Interim Action	Date Implemented
CLASS 4	NO CURRENT RISK		

TIER 2 CORRECTIVE ACTION CRITERIA

Affected Medium	Tier 2 SSTL Exceeded?		Applicable Excess Risk Limits (specify value)				Other Applicable Exposure Limit
	Yes	No	Indiv. Risk	Total Risk	Hazard Index	Hazard Quotient	(specify, if any)
• Surface Soil (≤ 3ft BGS)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____	_____	_____	_____	_____
• Subsurface Soil (> 3ft BGS)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____	_____	_____	_____	_____
• Groundwater	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____	_____	_____	_____	_____

PROPOSED ACTION

- No Action: Tier 2 SSTLs not exceeded. Apply for closure.
- Interim Corrective Action: Address principal, near-term risks sources.
- Final Corrective Action: Remediate/control site to meet Tier 2 criteria.
- Tier 3 Evaluation: Improve baseline risk and SSTL estimates.

NOTE:
 Rationale for proposed action documented on Worksheets 1.3 and 10.1-10.3.

ALL WORKSHEETS ENCLOSED IN THIS REPORT ARE IDENTIFIED ON THE TABLE OF CONTENTS FORM

Site Name:

Date Completed:

Site Location:

Completed By:

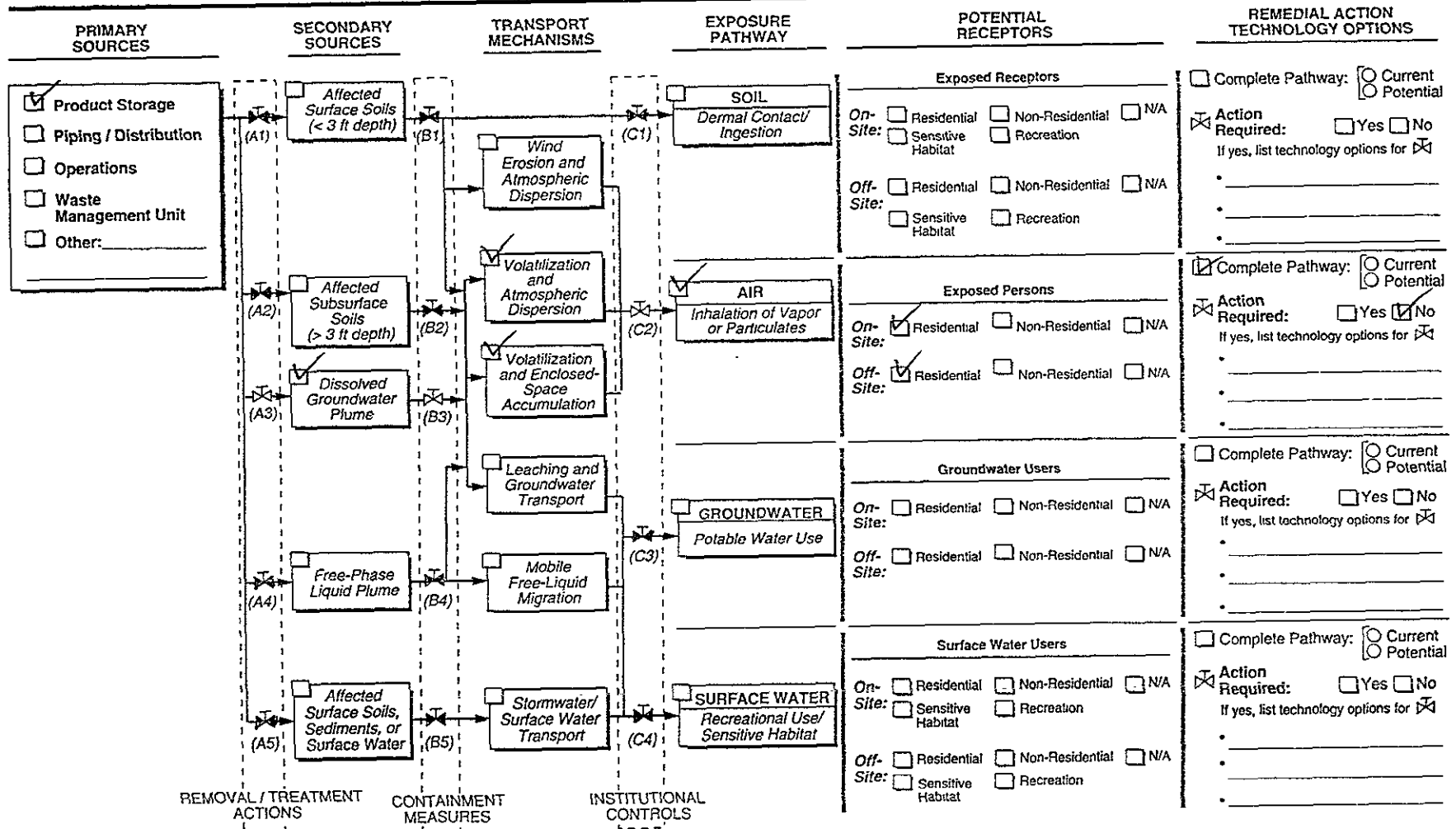
EXPOSURE CONTROL FLOWCHART

Instructions: Identify remedial measures to be implemented to prevent exposure, as follows:

- Step 1- Baseline Exposure: Identify applicable sources, transport mechanisms, and receptors as shown on Worksheet 4.2 (☑ = applicable to site).

- Step 2- Remedial Measures: Fill in shut-off valves (☒) to indicate removal / treatment action, containment measure, or institutional controls to be used to "shut off" exposure pathway.

- Step 3- Remedial Technology Options: For each complete pathway, identify category of corrective measure to be applied and list possible technology options in space provided (see options list in RBCA Guidance Manual).



RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: 900 Central Avenue
Site Location: Alameda, California

Job Identification: 97217.23
Date Completed: 8/4/97
Completed By: Long Ching

Software: GSI RBCA Spreadsheet
Version: 1.0.1

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

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

Surface Parameters	Definition (Units)	Residential	Constrctn
		Value	Value
A	Contaminated soil area (cm ²)	2.2E+06	1.0E+06
W	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
W.gw	Length of affect. soil parallel to groundwater (cm)	1.5E+03	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)	1.0E+02	
Pe	Particulate areal emission rate (g/cm ² /s)	6.9E-14	

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

Soil Parameters	Definition (Units)	Residential	Commercial/Industrial
		Chronic	Constrctn
hc	Capillary zone thickness (cm)	<u>3.0E+01</u>	
hw	Vadose zone thickness (cm)	<u>3.7E+02</u>	
rho	Soil density (g/cm ³)	1.7	
foc	Fraction of organic carbon in vadose zone	0.01	
phi	Soil porosity in vadose zone	0.38	
Igw	Depth to groundwater (cm)	<u>4.0E+02</u>	
Ls	Depth to top of affected subsurface soil (cm)	1.0E+02	
Lsubs	Thickness of affected subsurface soils (cm)	2.0E+02	
pH	Soil/groundwater pH	6.5	
phi.w	Volumetric water content	0.342	0.12
phi.a	Volumetric air content	0.038	0.26

Building Parameters	Definition (Units)	Residential	Commercial
		Value	Value
Lb	Building volume/area ratio (cm)	<u>2.7E+02</u>	3.0E+02
ER	Building air exchange rate (s ⁻¹)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

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

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

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

Matrix of Target Risks	Definition	Individual	Cumulative
		Value	Value
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	1	
Tier	RBCA Tier	2	

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight		Diffusion Coefficients				log (Koc) or log(Kd)		Henry's Law Constant		Vapor Pressure		Solubility		acid pKa	base pKb	ref
			(g/mole)	ref	in air (cm2/s)	ref	in water (cm2/s)	ref	log(l/kg)	ref	(@ 20 - 25 C) (atm-m3)	(unitless)	ref	(@ 20 - 25 C) (mm Hg)	ref	(@ 20 - 25 C) (mg/L)			
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A		
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5		
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29		
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5		

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

Software version: 1.0.1

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RBCA CHEMICAL DATABASE

Toxicity Data

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

Software version: 1.0.1

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RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level		Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors		Detection Limits			Half Life (First-Order Decay) (days)			
		MCL (mg/L)	reference			Oral	Dermal	Groundwater (mg/L)	Soil (mg/kg)	ref	Saturated	Unsaturated	ref	
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
100-41-4	Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
108-88-3	Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

Software version: 1.0.1

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Site Name: 900 Central Avenue
 Site Location: Alameda, California

Completed By: Long Ching
 Date Completed: 8/4/1997

TIER 2 GROUNDWATER CONCENTRATION DATA SUMMARY

CONSTITUENTS DETECTED		Analytical Method	Detected Concentrations				
		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	Benzene	5.0E-04	8	5	6.1E-01	3.4E-03	2.6E-02
100-41-4	Ethylbenzene	5.0E-04	8	5	4.6E+00	3.8E-03	5.4E-02
108-88-3	Toluene	5.0E-04	8	5	5.0E+00	6.7E-03	8.3E-02
1330-20-7	Xylene (mixed isomers)	5.0E-04	8	5	2.4E+01	9.2E-03	1.8E-01

Serial: G-465-DNX-

Software: GSI RBCA Spreadsheet
 Version: 1.0.1

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

1 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS: VAPOR AND

DUST INHALATION

Constituents of Concern	Exposure Concentration		3) Exposure Medium Outdoor Air: POE Conc. (mg/m ³) (1) / (2)	4) Exposure Multiplier (IR x EF x ED) / (BW x AT) (m ³ /kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) X (4)
	1) Source Medium Surface Soil Conc. (mg/kg)	2) NAF Value (m ³ /kg) Receptor			
Benzene	0.0E+0				
Ethylbenzene	0.0E+0				
Toluene	0.0E+0				
Xylene (mixed isomers)	0.0E+0				

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

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

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

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

Site Name: 900 Central Avenue Site Location: Alameda, California Completed By: Long Ching Date Completed: 8/4/1997 2 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

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

SUBSURFACE SOILS: VAPOR INHALATION	Exposure Concentration		3) Exposure Medium		4) Exposure Multiplier		5) Average Daily Intake Rate	
	1) Source Medium	2) NAF Value (m ³ /kg) Receptor	Outdoor Air: POE Conc. (mg/m ³) (1) / (2)		(IR x EF x ED) / (BW x AT) (m ³ /kg-day)		(mg/kg-day) (3) x (4)	
Constituents of Concern	Subsurface Soil Conc. (mg/kg)							
Benzene	0.0E+0							
Ethylbenzene	0.0E+0							
Toluene	0.0E+0							
Xylene (mixed isomers)	0.0E+0							

NOTE	ABS = Dermal absorption factor (dim)	BW = Body weight (kg)	EF = Exposure frequency (days/yr)	POE = Point of exposure
	AF = Adherence factor (mg/cm ²)	CF = Units conversion factor	ET = Exposure time (hrs/day)	SA = Skin exposure area (cm ² /day)
	AT = Averaging time (days)	ED = Exposure duration (yrs)	IR = Inhalation rate (m ³ /day)	

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

3 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INHALATION	Exposure Concentration					TOTAL PATHWAY INTAKE (mg/kg-day)	
	1) Source Medium	2) NAF Value (m ³ /L) Receptor		3) Exposure Medium Outdoor Air: POE Conc. (mg/m ³) (1) / (2)	4) Exposure Multiplier (IRxExEDY)(BWxAT) (m ³ /kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) X (4)	
	Groundwater Conc. (mg/L)	On-Site Residential		On-Site Residential	On-Site Residential	On-Site Residential	
Constituents of Concern							
Benzene	2.6E-2	2.0E+5		1.3E-7	1.2E-1	1.5E-8	
Ethylbenzene	5.4E-2	2.0E+5		2.7E-7	2.7E-1	7.5E-8	
Toluene	8.3E-2	2.0E+5		4.1E-7	2.7E-1	1.1E-7	
Xylene (mixed isomers)	1.8E-1	2.2E+5		8.5E-7	2.7E-1	2.3E-7	

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

4 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS:

VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration		3) Exposure Medium Indoor Air POE Conc. (mg/m ³) (1) / (2)	4) Exposure Multiplier (IR x EF x ED) / (BW x AT) (m ³ /kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) X (4)
	1) Source Medium Subsurface Soil Conc. (mg/kg)	2) NAF Value (m ³ /kg) Receptor			
Benzene	0.0E+0				
Ethylbenzene	0.0E+0				
Toluene	0.0E+0				
Xylene (mixed isomers)	0.0E+0				

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

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TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER:
VAPOR INTRUSION TO BUILDINGS

Exposure Concentration

TOTAL PATHWAY INTAKE (mg/kg-day)

(Sum Intake values from subsurface & groundwater routes.)

Constituents of Concern	1) Source Medium		2) NAF Value (m ³ /L) Receptor		3) Exposure Medium Indoor Air: POE Conc (mg/m ³) (1) / (2)		4) Exposure Multiplier (IR×EF×ED)/(BW×AT) (m ³ /kg-day)		5) Average Daily Intake Rate (mg/kg-day) (3) X (4)		TOTAL PATHWAY INTAKE (mg/kg-day)	
	Groundwater Conc. (mg/L)	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	
Benzene	2.6E-2	2.9E+2		9.0E-5		8.8E-2		7.9E-6		7.9E-6		
Ethylbenzene	5.4E-2	2.8E+2		1.9E-4		2.1E-1		4.0E-5		4.0E-5		
Toluene	8.3E-2	2.9E+2		2.9E-4		2.1E-1		6.0E-5		6.0E-5		
Xylene (mixed isomers)	1.8E-1	3.1E+2		6.0E-4		2.1E-1		1.2E-4		1.2E-4		

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

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

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

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

Site Name: 900 Central Avenue Site Location: Alameda, California

Completed By: Long Chin Date Completed: 8/4/1997

6 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS:

Exposure Concentration

DERMAL CONTACT	1) Source Medium		2) Exposure Multiplier (SA _u AF _u ABS _u CF _u EF _u ED _u)/(BW _u AT)		3) Average Daily Intake Rate (mg/kg-day) (1) x (2)	
	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial	
Constituents of Concern						
Benzene	0.0E+0					
Ethylbenzene	0.0E+0					
Toluene	0.0E+0					
Xylene (mixed isomers)	0.0E+0					

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

7 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS <input checked="" type="checkbox"/> (CHECKED IF PATHWAY IS ACTIVE)						
SURFACE SOILS OR SEDIMENTS: INGESTION	Exposure Concentration				TOTAL PATHWAY INTAKE (mg/kg-day)	
	1) Source Medium	2) Exposure Multiplier (IR _s CF _s EF _s ED _s /BW _s AT) (kg/kg-day)		3) Average Daily Intake Rate (mg/kg-day) (1) x (2)		(Sum Intake values from dermal & ingestion routes.)
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial	On-Site Residential On-Site Commercial
Benzene	0.0E+0					
Ethylbenzene	0.0E+0					
Toluene	0.0E+0					
Xylene (mixed isomers)	0.0E+0					

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

8 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS (CHECKED IF PATHWAY IS ACTIVE)

SOIL: LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION	Exposure Concentration				
	1) Source Medium Soil Concentration (mg/kg)	2) NAF Value (L/kg) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2)	4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (L/kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) x (4)
Constituents of Concern					
Benzene	0.0E+0				
Ethylbenzene	0.0E+0				
Toluene	0.0E+0				
Xylene (mixed isomers)	0.0E+0				

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

9 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: INGESTION

Exposure Concentration

Constituents of Concern	1) Source Medium	2) NAF Value (dim) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2)	4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (L/kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) x (4)	MAX. PATHWAY INTAKE (mg/kg-day) (Maximum Intake of active pathways soil leaching & groundwater routes.)
	Groundwater Conc. (mg/L)					
Benzene	1.5E-2					
Ethylbenzene	2.7E-2					
Toluene	4.4E-2					
Xylene (mixed isomers)	8.6E-2					

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

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

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

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

1 OF 4

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK			TOXIC EFFECTS		
		(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential	(3) Inhalation Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3) On-Site Residential	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential	(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential
Benzene	A	1.5E-8	1.0E-1	1.5E-9	3.6E-8	1.7E-3	2.1E-5
Ethylbenzene	D				7.5E-8	2.9E-1	2.6E-7
Toluene	D				1.1E-7	1.1E-1	9.9E-7
Xylene (mixed isomers)	D				2.3E-7	2.0E+0	1.2E-7
Total Pathway Carcinogenic Risk =				1.5E-9	0.0E+0	Total Pathway Hazard Index =	
						2.2E-5	0.0E+0

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

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TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAYS ARE ACTIVE)

CARCINOGENIC RISK

TOXIC EFFECTS

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene	A	7.9E-6		1.0E-1	7.9E-7		1.9E-5		1.7E-3	1.1E-2	
Ethylbenzene	D						4.0E-5		2.9E-1	1.4E-4	
Toluene	D						6.0E-5		1.1E-1	5.2E-4	
Xylene (mixed isomers)	D						1.2E-4		2.0E+0	6.2E-5	

Total Pathway Carcinogenic Risk = 7.9E-7 0.0E+0

Total Pathway Hazard Index = 1.2E-2 0.0E+0

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

3 OF 4

TIER 2 PATHWAY RISK CALCULATION

~~SOIL EXPOSURE PATHWAYS~~

(CHECKED IF PATHWAYS ARE ACTIVE)

CARCINOGENIC RISK

TOXIC EFFECTS

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Oral Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)	
		On-Site Residential	On-Site Commercial		On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial		On-Site Residential	On-Site Commercial
Benzene	A			1.0E-1							
Ethylbenzene	D								1.0E-1		
Toluene	D								2.0E-1		
Xylene (mixed isomers)	D								2.0E+0		

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

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

Site Name: 900 Central Avenue

Site Location: Alameda, California

Completed By: Long Ching

Date Completed: 8/4/1997

4 OF 4

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

(CHECKED IF PATHWAYS ARE ACTIVE)

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

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.3

Site Name: 900 Central Avenue
 Site Location: Alameda, California

Completed By: Long Ching
 Date Completed: 8/4/1997

1 of 1

TIER 2 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.5E-9	1.0E-6	1.5E-9	N/A	<input type="checkbox"/>	2.1E-5	1.0E+0	2.2E-5	N/A	<input type="checkbox"/>
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	7.9E-7	1.0E-6	7.9E-7	N/A	<input type="checkbox"/>	1.1E-2	1.0E+0	1.2E-2	N/A	<input type="checkbox"/>
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	<input checked="" type="checkbox"/>	NC	1.0E+0	NC	N/A	<input checked="" type="checkbox"/>
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	<input checked="" type="checkbox"/>	NC	1.0E+0	NC	N/A	<input checked="" type="checkbox"/>
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	7.9E-7	1.0E-6	7.9E-7	N/A	<input type="checkbox"/>	1.1E-2	1.0E+0	1.2E-2	N/A	<input type="checkbox"/>

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.1

Site Name: 900 Central Avenue
 Site Location: Alameda, California

Completed By: Long Ching
 Date Completed: 8/4/1997

1 OF 1

**SURFACE SOIL SSSL VALUES
 (< 3.3 FT BGS)**

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

MCL exposure limit?
 PEL exposure limit?

Calculation Option: 1

SSSL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration (mg/kg)	Soil Leaching to Groundwater			Ingestion, Inhalation and Dermal Contact		Construction Worker	Applicable SSSL	SSSL Exceeded?	Required CRF
CAS No.	Name		Residential (on-site)	Commercial (on-site)	Regulatory (MCL) (on-site)	Residential (on-site)	Commercial (on-site)	Commercial (on-site)	(mg/kg)	* If yes	Only if "yes" left
71-43-2	Benzene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1
108-88-3	Toluene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1

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

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: 900 Central Avenue
 Site Location: Alameda, California

Completed By: Long Ching
 Date Completed: 8/4/1997

1 OF 1

**SUBSURFACE SOIL SSTL VALUES
 (> 3.3 FT BGS)**

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

Calculation Option: 1

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

CONSTITUENTS OF CONCERN		Representative Concentration (mg/kg)	Soil Leaching to Groundwater			Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL (mg/kg)	SSTL Exceeded? <input type="checkbox"/> If yes	Required CRF
			Residential (on-site)	Commercial (on-site)	Regulatory(MCL) (on-site)	Residential (on-site)	Commercial (on-site)	Residential (on-site)	Commercial (on-site)			
71-43-2	Benzene	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1
108-88-3	Toluene	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	<input type="checkbox"/>	<1

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

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: 900 Central Avenue
 Site Location: Alameda, California

Completed By: Long Ching
 Date Completed: 8/4/1997

1 OF 1

GROUNDWATER SSTL VALUES

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

Calculation Option: 1

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

CONSTITUENTS OF CONCERN		Representative Concentration (mg/L)	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL (mg/L)	SSTL Exceeded? <input type="checkbox"/> If yes	Required CRF Only if "yes" left
CAS No.	Name		Residential (on-site)	Commercial (on-site)	Regulatory (MCL) (on-site)	Residential (on-site)	Commercial (on-site)	Residential (on-site)	Commercial (on-site)			
71-43-2	Benzene	2.6E-2	NA	NA	NA	3.2E-2	NA	1.7E+1	NA	3.2E-2	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	5.4E-2	NA	NA	NA	>Sol	NA	>Sol	NA	>Sol	<input type="checkbox"/>	<1
108-88-3	Toluene	8.3E-2	NA	NA	NA	1.6E+2	NA	>Sol	NA	1.6E+2	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	1.8E-1	NA	NA	NA	>Sol	NA	>Sol	NA	>Sol	<input type="checkbox"/>	<1

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



ALLWEST
PHASE II REPORT REVIEW QA/QC

AllWest Environmental, Inc.

Specialists in Environmental Due
Diligence and Remedial Services

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San Francisco, CA 94104
Tel 415 391.2510
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Project #: 97217.23 Prepared by: LONG CHING

Project Address: 900 CENTRAL AVENUE Date: 8-5-97

ALAMEDA, CALIFORNIA

- A. To be completed by report writer and submitted with report to reviewer.
- B. To be independently verified by reviewer and filed in contract file.

Reviewer

1. Reason for investigation? NO
 Acquisition ___ Acquisition/Development ___ Disposition ___
 Refinance ___ Management

2. Has the scope of work as outlined in the project contract been met? yes no ___ NO
 If no, explain why:

3. Is the report properly formatted? yes no ___ NO
 - 3A. Are page numbers on TOC correct? yes no ___ NO
 - 3B. Do headings in TOC correspond to report? yes no ___ NO
 - 3C. Are all appendices included? yes no ___ NO

4. Is the data presentation consistent and correct?
 - 4A. Do soil sampling results stated in text correspond exactly with laboratory results?
 (quantity) yes no ___ NO
 (units) yes no ___ NO
 - 4B. Do groundwater results stated in text correspond exactly with laboratory results?
 (quantity) yes no ___ NO
 (units) yes no ___ NO

4C. Does contaminant data presented in figures correspond exactly with those cited in text and in laboratory report?

(quantity)
(units)

yes no ___
yes no ___

NO
NO

5. Does the report's conclusions comment on the following:

5A. Identification of contamination source.

yes no ___

NO

If no, why not?

5B. Definition of soil/groundwater plume.

yes no ___

NO

If no, why not?

5C. Migration of soil/groundwater plume across site boundaries.

yes no ___

NO

If no, why not?

5D. Contaminant concentration levels vis a vis cleanup standards?

yes no ___

NO

If no, why not?

5E. Potential contaminant migration generally promoted or impeded by site soils?

yes no ___

NO

If no, why not?

5F. Beneficial use of groundwater (if impacted)?

yes no ___

NO

If no, why not?

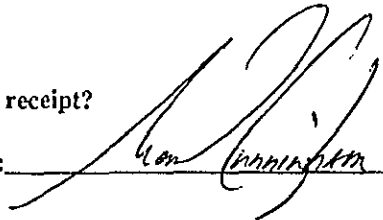
6. What is the potential of undiscovered contamination or more contamination than indicated by the investigation data? Low Medium ___ High ___

6A. Has the client been informed of the potential? yes no ___ AD ←

If yes, method of transmittal? Report Letter ___ Verbally ___

If no, why not?

Approved for client receipt?

Reviewer Signature:  Date: 