aqua science engineers inc.

August 26, 2002

20479

SOIL AND GROUNDWATER ASSESSMENT AND CORRECTIVE ACTION PLAN

at

Lim Family Property
250 8th Street
Oakland, California

Submitted by:
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AUG 30 2002

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1.0 INTRODUCTION

This submittal presents Aqua Science Engineers, Inc. (ASE's) soil and groundwater assessment and corrective action plan (CAP) for the Lim Family property located at 250 8th Street in Oakland, California (Figures 1 and 2). The proposed site assessment activities were designed to further define the extent of soil and groundwater contamination at and downgradient of the site, and to conduct pumping tests at the site to evaluate the feasibility of "pump and treat" as a remediation option. This work was conducted as directed by the Alameda County Health Care Services Agency (ACHCSA) in their letter dated January 8, 2001 (Appendix A).

2.0 BRIEF SITE HISTORY AND BACKGROUND INFORMATION

2.1 May 1992 Underground Storage Tank Removal

A gasoline service station previously occupied the site. In May 1992, ASE removed ten underground fuel storage tanks (USTs) from the site. The USTs consisted of one (1) 10,000-gallon gasoline tank, one (1) 5,000-gallon diesel tank, three (3) 2,000-gallon gasoline tanks, one (1) 2,000-gallon diesel tank, three (3) 500-gallon gasoline tanks and one (1) 250-gallon waste oil tank. Up to 10,000 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G) and 5,900 ppm total petroleum hydrocarbons as diesel (TPH-D) were detected in soil samples collected during the tank removal.

2.2 December 1992 through March 1993 Soil Overexcavation

Between December 1992 and March 1993, All Environmental of San Ramon, California overexcavated 1,762 cubic yards of soil from the site and off-hauled the soil to the BFI Landfill in Livermore, California for disposal (Figure 2). Analytical results show that all on-site soil with hydrocarbon concentrations greater than 10 ppm was removed from the site with the exception of soil along the 8th Street shoring. Up to 1,800 ppm TPH-G and 120 ppm TPH-D were detected in soil samples collected along the shoring indicating that contamination likely extends below 8th Street. This contamination left in place may still be a source for groundwater contamination.

2.3 January 1995 Monitoring Well Installation

In January 1995, ASE installed monitoring wells MW-1 and MW-2 at the site (Figure 2). High hydrocarbon concentrations were detected in monitoring well MW-2, downgradient of the site. Moderate hydrocarbon concentrations were detected in on-site monitoring well MW-1.

2.4 January 1996 Borings and Groundwater Sampling

In July 1996, ASE collected groundwater samples from each monitoring well and drilled borings BH-C and BH-D to further define the width of the hydrocarbon plume downgradient of the site (Figure 2). Relatively high hydrocarbon concentrations were detected in groundwater samples collected from monitoring well MW-2, downgradient of the site. Slightly lower but still very high hydrocarbon concentrations were detected in groundwater samples collected from boring BH-D, west of monitoring well MW-2. Very low hydrocarbon concentrations were detected in groundwater samples collected from monitoring well MW-1, located on the site, and boring BH-C, east of monitoring well MW-2. Based on these findings, the plume appears to be moving to the south of Excavation I.

2.5 Quarterly Groundwater Monitoring

In April 1995, ASE began a quarterly groundwater monitoring program for the site. Since that time, the site has been on either a quarterly or semi-annual sampling schedule. Depth to groundwater data and analytical results for all groundwater sampling periods are tabulated in Tables One through Three in the tables section of this report.

2.6 June 1997 Remedial Action Plan

On June 5, 1997, ASE prepared a remedial action plan (RAP) addressing the need for groundwater remediation at the site, describing the appropriateness of several remedial options and choosing an option. Low flow hydrogen peroxide injection was chosen as the groundwater remediation option of choice for the site in order to raise dissolved oxygen (DO) concentrations in the groundwater to stimulate in-situ bioremediation.

2.7 February 1999 Hydrogen Peroxide Remediation System Installation

On February 2 and 3, 1999, five (5) injection wells were installed at the site (Figure 3). On February 18, 1999, the injection system began

operation. It delivered a water and hydrogen peroxide solution to each injection well on a constant basis. DO concentrations within the injection wells rose to above 20 ppm. Groundwater in downgradient monitoring well MW-2 never showed a measurable increase in DO.

2.8 June 1999 Discovery of Free-Floating Hydrocarbons

On June 22, 1999, while measuring the DO content within the injection wells, ASE discovered that the DO probe had a very strong gasoline odor when removed from injection well IW-5. A clear bailer was inserted into IW-5 to check for the presence of free-floating hydrocarbons. The bailer contained approximately 18-inches of what appeared to be aged gasoline. On June 24, 1999, ASE returned to the site with an interface probe to accurately measure the thickness of the free-floating hydrocarbons. On that day, 1.75-feet of free-floating hydrocarbons was measured on the water surface in IW-5. Injection well IW-4 (15-feet east of IW-5) was measured with the interface probe and did not contain a measurable thickness of floating hydrocarbons. On June 24, 1999, ASE bailed the free-floating hydrocarbons from IW-5 until only a sheen was present on the water surface. Approximately 3 gallons of product was removed from IW-5. ASE continued to measure and bail the floating product within well IW-5 on a bi-weekly basis.

2.9 January 2000 Monitoring Well Installation

In January 2000, ASE installed groundwater monitoring wells MW-3 and MW-4, east of injection well IW-5 and monitoring well MW-2 (Figure 3). High hydrocarbon concentrations were detected in groundwater samples collected from both of these wells, including up to 140,000 parts per billion (ppb) TPH-G, 13,000 ppb TPH-D and 22,000 ppb benzene.

2.10 April 2000 Groundwater Sampling

In April 2000, ASE collected groundwater samples from all four monitoring wells. Elevated hydrocarbon concentrations were detected in groundwater samples collected from monitoring wells MW-2, MW-3 and MW-4, including up to 240,000 ppb TPH-G, 700,000 ppb TPH-D and 35,000 ppb benzene. Monitoring well MW-3 contained free-floating hydrocarbons.

2.11 Hydrogen Peroxide System Discontinuation

On November 27, 2000, with the approval of the Alameda County Health Care Services Agency, ASE turned off the hydrogen peroxide injection system since there was no noticeable DO increase in downgradient monitoring wells MW-2 and MW-4 on the west side of 8th Street. Correct?

2.12 Current Quarterly Groundwater Monitoring Program

The site is currently on a quarterly groundwater monitoring program. Depth to groundwater and analytical results for all historical groundwater sampling events are tabulated in the tables section of this report as Tables One through Three.

3.0 SCOPE OF WORK (SOW)

ASE conducted the following scope of work (SOW) to define the extent of elevated hydrocarbon concentrations on and surrounding the site, and to conduct a pumping test to evaluate the site for potential "pump and treat" groundwater remediation.

1) Obtain a drilling permit from the Alameda County Public Works Agency (ACPWA). Obtain an excavation and encroachment permit from the City of Oakland.

2) Drill five (5) soil borings to groundwater within the area of the former excavation to determine whether soil and/or groundwater contamination exists in this area and to determine the lithology of the backfill material.

3) Analyze one soil sample collected from each soil boring at a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015M, total petroleum hydrocarbons as diesel and motor-oil (TPH-D/MO) by modified EPA Method 3510/8015M, and benzene, toluene, ethyl benzene and total xylenes (collectively known as BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8260.

4) Collect groundwater samples from each boring for analyses.

5) Analyze the groundwater samples at a CAL-EPA certified analytical laboratory for TPH-G, TPH-D, TPH-MO, BTEX, and MTBE. etal.

6) Backfill the borings with neat cement.

7) Drill three (3) soil borings to 30-feet below ground surface (bgs) in 8th Street downgradient of the site. (MWs 5-7)

8) Analyze one soil sample collected from each soil boring at a CAL-EPA certified environmental laboratory for TPH-G, TPH-D, TPH-MO, BTEX, MTBE and O&G.

9) Install 2-inch diameter groundwater monitoring wells in each boring described in task 7.

10) Develop the monitoring wells.

11) Collect groundwater samples from all seven monitoring wells for analyses.

12) Analyze the groundwater samples at a CAL-EPA certified analytical laboratory for TPH-G, TPH-D, TPH-MO, BTEX, MTBE, and O&G.

13) Survey the top of casing elevation of each well, and determine the groundwater flow direction and gradient beneath the site.

14) Conduct a step drawdown pumping test at the site.

15) Conduct a constant rate pumping test at the site.

16) Prepare a comprehensive report presenting the methods and finding of this assessment.

4.0 DRILL SOIL BORINGS IN THE FORMER OVEREXCAVATION AREAS FOR THE COLLECTION OF SOIL AND GROUNDWATER SAMPLES

4.1 Drilling Permit

Prior to drilling, ASE obtained an Alameda County Public Works Agency (ACPWA) drilling permit (Appendix B). ASE also notified Underground Service Alert (USA) to have underground public utilities in the vicinity of the site marked prior to drilling.

4.2 Drill Five Soil Borings for the Collection of Soil and Groundwater Samples

On September 17, 2001, Vironex, Inc. of San Leandro, California drilled soil borings B-A through B-E at the site using a Geoprobe direct-push drill rig (Figure 3). These borings were all drilled in on-site locations to determine the nature of the fill material placed into the excavation following the soil overexcavation and to determine whether there is still significant contamination on-site. The borings were originally labeled BH-A through BH-E, but were renamed B-A through B-E since there were already borings labeled BH-A through BH-D in previous investigations at the site.

Undisturbed soil samples were collected continuously as drilling progressed for lithologic and hydrogeologic description and for possible chemical analysis. The soil samples were collected by driving a sampler lined with acetate tubes using hydraulic direct push methods. Selected soil samples were sealed with Teflon tape and plastic end caps, labeled, and stored with ice for transport to Kiff Analytical, LLC (Kiff) of Davis, California (ELAP #2236) under appropriate chain of custody documentation. Soil from the remaining tubes was described by the site geologist using the Unified Soil Classification System (USCS) and was screened for volatile compounds using an photoionization detector (PID). The soil was screened by emptying soil from one of the sample tubes into a plastic bag. The bag was then sealed and placed in the sun for approximately 10 minutes. After the volatile compounds were allowed to volatilize, the PID measured the vapor in the bag through a small hole punched in the bag. PID readings are used as a screening tool only, since the procedures are not as rigorous as those used in the laboratory. The PID readings are shown on the boring logs presented in Appendix C.

Groundwater samples were collected from borings B-A through B-E using factory-cleaned, unused polyethylene bailers. The groundwater samples were contained in 40-ml volatile organic analysis (VOA) vials, preserved with hydrochloric acid, and sealed without headspace. The samples were then labeled and stored in an ice chest with ice for transport to Kiff under chain of custody.

Drilling equipment was cleaned with a TSP solution between sampling intervals and between borings to prevent potential cross-contamination. Following collection of the soil and groundwater samples, each boring was backfilled with neat cement to the ground surface.

4.3 Soil Sample Analysis

One soil sample collected from each boring was analyzed by Kiff for TPH-G, BTEX, and MTBE by EPA Method 8260 and TPH-D and TPH-MO by modified EPA Method 8015. The soil sample from each boring that appeared to have the highest hydrocarbon concentration based on field indications such as odor, staining, and PID readings was selected for analysis. The analytical results for the selected soil samples are presented in Table Four. The laboratory analytical report and chain of custody documents are presented in Appendix D. The analytical reports list the borings as BH-A through BH-E; however, the borings were renamed B-A through B-E, since previous borings for this project were already labeled BH-A through BH-E. Table Four lists the analytical results with the new boring names.

The soil sample collected from between 13.5 and 14.0-feet bgs in boring B-B contained 1.5 ppm TPH-G, 0.048 ppm benzene, 0.016 ppm toluene, 0.025 ppm ethylbenzene, and 0.058 ppm total xylenes. The soil sample collected from between 17.5 to 18.0-feet bgs in boring B-C contained 9,100 ppm TPH-G, 1,600 ppm TPH-D, 53 ppm benzene, 360 ppm toluene, 98 ppm ethylbenzene, and 660 ppm total xylenes. The soil sample collected 17.5 to 18.0-feet bgs in boring B-D contained 1,200 ppm TPH-G, 1,500 ppm TPH-D, 7.8 ppm benzene, 22 ppm toluene, 18 ppm ethylbenzene, and 71 ppm total xylenes. The soil sample collected from 17.0 to 17.5-feet bgs in boring B-E contained 4.0 ppm TPH-G, 2.2 ppm TPH-D, 0.12 ppm benzene, 0.17 ppm ethylbenzene, and 0.02 ppm total xylenes. No hydrocarbons were detected in the soil sample collected from 14.5 to 15.0-feet bgs in boring B-A. No TPH-MO or MTBE were detected in any of the soil samples analyzed.

The TPH-G, TPH-D, benzene, toluene and total xylene concentrations in the soil sample collected from borings B-C and B-D exceeded Risk-Based Screening Levels (RBSLs) as presented in the "Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater" document prepared by the California Regional Water Quality Control Board, San Francisco Bay Region dated August 2000. The ethylbenzene concentration in the soil sample collected from boring B-C also exceeded the RBSL.

4.4 Groundwater Sample Analysis

The groundwater samples collected from borings B-A through B-E were analyzed by Kiff for TPH-G, BTEX, and MTBE by EPA Method 8260 and TPH-D and TPH-MO by modified EPA Method 8015. Analytical results for these samples are tabulated in Table Five. The laboratory analytical report and chain of custody documents are presented in Appendix D.

The groundwater sample collected from boring B-A contained 760,000 ppb TPH-G, 170 ppb TPH-D, and 43 ppb benzene. The groundwater sample collected from boring B-B contained 490,000 ppb TPH-G, 340,000 ppb TPH-D, 34,000 ppb benzene, 32,000 ppb toluene, 4,200 ppb ethylbenzene, and 18,000 ppb total xylenes. The groundwater sample collected from boring B-C contained 37,000 ppb TPH-G, 12,000 ppb TPH-D, 6,100 ppb benzene, 4,300 ppb toluene, 890 ppb ethylbenzene, and 3,700 ppb total xylenes. The groundwater sample collected from B-D contained 700,000 ppb TPH-G, 130,000 ppb TPH-D, 16,000 ppb benzene, 7,400 ppb toluene, 12,000 ppb ethylbenzene, and 48,000 ppb total xylenes. The groundwater sample collected from B-E contained 200,000 ppb TPH-G, 230,000 ppb TPH-D, 5,600 ppb benzene, 2,200 ppb toluene, 5,500 ppb ethylbenzene, and 22,000 ppb total xylenes. No TPH-MO or MTBE were detected in any of the samples analyzed.

All of these concentrations are considered very high, and most of these concentrations exceeded RBSLs.

5.0 INSTALL THREE ADDITIONAL GROUNDWATER MONITORING WELLS

5.1 Drilling Permit

Prior to drilling, ASE obtained an ACPWA drilling permit. ASE also obtain encroachment and excavation permits from the City of Oakland to allow for the installation of wells in the city right of way. Copies of these permits are presented in Appendix B. USA was also notified at least 48-hours prior to drilling to have underground public utility lines marked in site vicinity prior to drilling.

5.2 Drill Three Soil Borings for the Installation of Groundwater Monitoring Wells

On May 28, 2002, Gregg Drilling of Martinez, California drilled soil borings MW-5, MW-6 and MW-7 in 8th Street using a Mobile B-61 drill rig

equipped with 8-inch diameter hollow-stem augers. ASE associate geologist Erik Paddleford directed the drilling. Monitoring wells MW-5, MW-6 and MW-7 were subsequently constructed in these borings.

Undisturbed soil samples were collected every 5-feet as drilling progressed for lithologic and hydrogeologic description and for possible chemical analysis. The samples were collected by driving a split-barrel sampler lined with 2-inch diameter brass tubes using repeated blows from a 140-lb hammer dropped 30-inches. Selective soil samples were immediately trimmed, sealed with Teflon tape and plastic end caps, labeled, and stored on ice for transport to Severn Trent Services (STL San Francisco) of Pleasanton, California (CA DHS ELAP #2496) under chain of custody. Soil from the remaining tubes was described by the site geologist using the USCS and was screened for volatile compounds using a PID. The soil was screened by emptying soil from one of the sample tubes into a plastic bag. The bag was then sealed and placed in the sun for approximately 10 minutes. After the volatile compounds were allowed to volatilize, the PID measured the vapor in the bag through a small hole punched in the bag. PID readings are used as a screening tool only, since the procedures are not as rigorous as those used in the laboratory. The PID readings are listed on the boring logs presented in Appendix C.

Drilling equipment was cleaned with a TSP solution between sampling intervals to prevent potential cross-contamination.

5.3 Monitoring Well Construction

Monitoring wells MW-5, MW-6 and MW-7 were constructed in the borings using 2-inch diameter, 0.020-inch factory-slotted, flush-threaded, schedule 40 PVC well screen and blank casing. The wells are screened between 10-feet bgs and 30-feet bgs to monitor the first water bearing zone encountered. Lonestar #3 washed sand occupies the annular space between the borehole and the casing from the bottom of the boring to approximately 2-feet above the well screen. A 2-foot thick hydrated bentonite layer separates the sand from the overlying cement surface seal. The wellheads are secured with locking wellplugs beneath at-grade traffic-rated well boxes. Well construction details are shown on the boring logs in Appendix C.

5.4 Monitoring Well Development

On June 4, 2002, ASE associate geologist Erik Paddleford developed monitoring wells MW-5, MW-6 and MW-7 using two episodes of surge-

block agitation and submersible pump evacuation. Over ten well casing volumes of water were removed from the wells during development, and evacuation continued until the water was relatively clear. Well development purge water was contained in sealed and labeled 55-gallon steel drums and left on-site for temporary storage until off-site disposal could be arranged. No free-floating hydrocarbons or sheen were present on the surface of groundwater during well development.

5.5 Monitoring Well Sampling

On June 11, 2002, ASE associate geologist Erik Paddleford collected groundwater samples from monitoring wells MW-1, MW-2, MW-4, MW-5, MW-6 and MW-7 for analysis. Monitoring well MW-3 was not sampled due to the presence of 0.9-feet of free-floating hydrocarbons on the groundwater surface in that monitoring well. Prior to sampling, the wells were purged of four well casing volumes of groundwater. The pH, temperature, and conductivity of the purge water were monitored during evacuation, and samples were not collected until these parameters stabilized. Groundwater samples were removed from the monitoring wells with factory-cleaned, unused polyethylene bailers. The groundwater samples to be analyzed for volatile compounds were contained in 40-ml VOA vials, preserved with hydrochloric acid, and sealed without headspace. The sample to be analyzed for oil and grease were contained in 1-liter amber glass containers. The samples were then labeled and stored with ice for transport to Kiff under chain of custody. Well sampling purge water was contained in sealed and labeled 55-gallon steel drums and left on-site for temporary storage until off-site disposal could be arranged. The well sampling field logs are presented in Appendix E.

During transport, the samples from monitoring wells MW-4 and MW-7 broke, and these two wells had to be resampled. These two wells were resampled on June 25, 2002. All procedures from the original sampling were followed during the June 25 resampling.

5.6 Soil Sample Analysis

The soil samples collected from 14-feet bgs in borings MW-5, MW-6 and MW-7 were analyzed by STL San Francisco for TPH-G, BTEX, and MTBE by modified EPA Method 8015/8021B, TPH-D and TPH-MO by modified EPA Method 3550/8015, and O&G by EPA Method 1664. The analytical results are tabulated in Table Four. The certified analytical report and chain of custody are presented in Appendix F. No compounds were detected in any of the soil samples analyzed above laboratory reporting limits.

5.7 Groundwater Sample Analysis

The groundwater samples collected from the monitoring wells were analyzed by Kiff for TPH-G, BTEX, and MTBE by EPA Method 8260 and TPH-D by modified EPA Method 8015. The groundwater samples collected from monitoring wells MW-2, MW-4, MW-5, MW-6 and MW-7 were also analyzed for the lead scavengers 1,2-dichloroethane (1,2-DCA) and 1,2-dibromoethane by EPA Method 8260. Kiff subcontracted the O&G analysis to Calscience Environmental Laboratories, Inc. of Garden Grove, California for analysis by Standard Method 5520. Analytical results are tabulated in Tables Two and Three. The laboratory analytical report and chain of custody documents are presented in Appendix G.

The groundwater sample collected from monitoring well MW-1 contained 270 ppb TPH-G and 330 ppb TPH-D. The groundwater sample collected from monitoring well MW-2 contained 72,000 ppb TPH-G, 1,100 ppb O&G, 7,300 ppb benzene, 9,600 ppb toluene, 2,500 ppb ethylbenzene, and 12,000 ppb total xylenes. The groundwater sample collected from monitoring well MW-4 contained 110,000 ppb TPH-G, 10,000 ppb benzene, 20,000 ppb toluene, 2,900 ppb ethylbenzene, and 13,000 ppb total xylenes. Groundwater samples collected from monitoring wells MW-5 and MW-6 contained 28 and 1.2 ppb MTBE, respectively. Groundwater samples collected from monitoring well MW-7 contained 38,000 ppb TPH-G, 890 ppb benzene, 5,100 ppb toluene, 1,200 ppb ethylbenzene, and 5,200 ppb total xylenes.

6.0 GROUNDWATER ELEVATIONS

The top of casing elevation, ground surface elevation and longitude and latitude location of each well was surveyed by Mid Coast Engineers of Watsonville, California on June 27, 2002 and July 11, 2002. A copy of the survey is included as Appendix H. Depth to groundwater measurements are presented in Table One. A groundwater elevation (potentiometric surface) contour map for June 11, 2002 is presented as Figure 4. On June 11, 2002, groundwater appeared to flow to the south-southwest beneath the site at a gradient of 0.011 feet/foot.

7.0 SUBSURFACE LITHOLOGY AND HYDROGEOLOGY

The soil beneath the site can generally be described as silty sand, which based on the results of the remediation feasibility tests at this site as well as at a nearby site located at 726 Harrison Street is of relatively low

permeability. Groundwater is encountered at depths ranging from 14 to 18-feet bgs. Gravelly sand fill material was encountered from beneath the asphalt surface to 8-feet bgs in boring B-C and from beneath the asphalt surface to 15-feet bgs in boring B-D. This fill material is apparently in locations where previous overexcavation took place. These locations do not, however, match the overexcavation locations on ASE's map. It is likely that the overexcavation location is actually shifted to the west as shown of Figure 5. It should also be noted that the fill did not extend deeper than 15-feet. Based on the depth of the fill material and the analytical results for borings B-A through B-E, it appears that a large mass of hydrocarbons remains beneath the former overexcavation area and groundwater, and that this mass of hydrocarbons remains as a hydrocarbon source for groundwater contamination. Significant hydrocarbon concentrations were also detected in boring B-D, which is outside of the previous overexcavation area.

8.0 PUMPING TEST

A step drawdown test was conducted on monitoring well MW-4 by Gary D. Lowe, R.G., C.E.G., C.HG. of H_2O Geol of Livermore, California on June 22, 2002. A copy of the report for this test is presented in Appendix I. Monitoring well MW-4 was selected for this test since free-floating hydrocarbons were present in wells IW-5, IW-4, MW-3 and MW-7, and wells MW-2 and MW-5 were inaccessible due to delivery trucks. Pumping rates of 0.25, 0.5 and 0.75 gallons per minute (gpm) were planned. The transient drawdown at a pumping rate of 0.285 gpm was 2.25 feet. At 0.487 gpm the drawdown was 5.10 feet. At a pumping rate of 0.75 gpm, the water level was lowered to the pump within the first three minutes of the test resulting in failure of the third step. Based on the nominal discharge rate of 0.5 gpm, it would not be possible to conduct a long term pumping test to obtain an interpretable response in the other site wells given the distance between wells at the site.

The results from the step drawdown test appear to be similar to the results from the pumping test that took place at a nearby site located at 726 Harrison Street. At the 726 Harrison Street property, the anticipated well yield was also 0.5 gpm. The capture zone at that site was calculated to range from 0.33 to 1.67 feet during the constant rate test. Based on these results, "pump and treat" does not appear to be a potential groundwater remediation technology for this site.

9.0 REMEDIAL OPTIONS

The following lists typical remediation options for soil and groundwater contamination from petroleum-hydrocarbons currently in use in northern California.

9.1 Soil Overexcavation

This remedial option involves the excavation of contaminated soil and either treating the soil on-site or transporting the soil to an off-site treatment or disposal facility. On-site soil treatment is usually by aeration or bioremediation. Advantages of this method is that it is the fastest and most effective method in treating contaminated soil, and removes contaminated soil which could act as a source for groundwater contamination. The disadvantages of this method are that (a) it may cause significant nuisance odors, and (b) it does not directly remediate contaminated groundwater beneath the site.

Significant overexcavation has previously taken place at the site, although it appears that some deeper contamination was left in place. Soil was also left in place at the property line along 8th Street. Due to the location of the street and the high hydrocarbon concentrations in soil off-site (under 8th Street), too much hydrocarbon mass would have to be left in place to make overexcavation worth the high cost of this method.

For this reason, ASE recommends that overexcavation not be considered as a remediation alternative for the site.

9.2 Air Sparge and Soil Vapor Extraction

Soil vapor extraction remediation entails the removal of hydrocarbons from the ground in-situ. These vapors are removed through vapor extraction wells placed in contaminated areas. The vapors are removed through wells by a vacuum source and abated by one of several methods such as an internal combustion (IC) engine, a thermal oxidizer or carbon absorption.

Vapor extraction technology is often used in conjunction with air sparging. Air sparging is the injection of air beneath the water table, generally at the bottom of an unconfined aquifer. Air bubbles rise through the saturated zone volatilizing hydrocarbons and forcing the hydrocarbons into the vadose (unsaturated) zone. The hydrocarbons are then subsequently removed from the vadose zone using soil vapor

extraction. The addition of air through air sparging may also stimulate bioremediation.

However, the lithology at the site is very similar to the lithology at 726 Harrison Street where air sparging and vapor extraction test showed that it would not be possible to achieve sufficient flow for either air sparging or vapor extraction to be a feasible remediation alternative. In addition, it is ASE's understanding that air sparging/soil vapor extraction was used on a nearby property located at 706 Harrison Street with only very limited success. (Some)

Based on the feasibility test results at the nearby 726 Harrison Street property, as well as the similar lithology as that site, air sparging and soil vapor extraction should be eliminated for consideration as a remediation alternative for the site.

9.3 Groundwater "Pump and Treat"

Groundwater "pump and treat" is a method in which contaminated groundwater is pumped from a pumping well to the surface and then treated in one of several ways such as air stripping, carbon absorption, ultraviolet (UV) peroxidation, etc. prior to disposal. Historically, "pump and treat" has had limited success in groundwater remediation for several reasons, particularly that hydrocarbons have a high affinity to soil, that soil in the capillary zone often goes untreated, and that it takes long periods of time to remove significant volumes of hydrocarbons when the hydrocarbon concentrations in groundwater are in the parts per billion range. "Pump and treat" is, however, considered an effective method of containing a plume and preventing further migration of contamination downgradient. This is because the water table is drawn down and groundwater surrounding the pumping wells flow toward the pumping well.

Based on the pumping test at the site, as well as the results of the (Sheet) pumping test at 726 Harrison Street, the capture zone at the site is estimated to be between only 0.67 and 3.33-feet, depending on the assumed effective porosity used in the calculation. This means that in order to capture all water flowing across the site, wells would have to be spaced less than 3-feet apart, which is unreasonable. Even with this spacing, it would still not effectively remediate the site without source treatment, and would be a very expensive option with very little benefit.

Based on the feasibility test results, "pump and treat" should be eliminated for consideration as a remediation alternative for the site.

9.4 In-Situ Bioremediation

In-situ bioremediation was considered as a remedial option at the site. There are several options to achieve this form of remediation, which involves increasing the amount of dissolved oxygen in the groundwater to enhance naturally occurring aerobic bacterial degradation of petroleum hydrocarbons in-situ. It has been known for some time that naturally occurring bacteria readily degrade (digest) petroleum hydrocarbons into harmless byproducts. Although anaerobic bacteria will degrade petroleum hydrocarbons, the rate is much slower than with aerobic bacteria. Depleted levels of oxygen appear to be the primary limiting factor for aerobic bacterial activity. Two common methods of increasing dissolved oxygen in groundwater are injection of hydrogen peroxide and one-time application of Oxygen Releasing Compound (ORC). Advantages for this type of remediation include (a) it is very low cost, (b) it is a passive, unintrusive method for groundwater remediation, (c) there is little or no equipment to maintain, and (d) it often works very quickly. Disadvantages include (a) it is not effective at all sites since it is very dependent on groundwater flow rates, (b) soil remediation is also required using these methods, (c) in-situ bioremediation is not typically as effective on MTBE as on other hydrocarbons, and (d) additional applications may be required if using ORC.

Based on pumping test data for this site, soil beneath the site has very low permeability. Unfortunately, for any in-situ bioremediation project to work, dissolved oxygen must be dispersed through the aquifer. **The low permeability soils beneath the site will limit the effectiveness of this technology**. It should be noted that ASE previously attempted a hydrogen peroxide **injection remediation project at this site, and the remediation was not successful.** This is likely due to several reasons, including (a) the low permeability soils beneath the site, (b) the presence of free-phase hydrocarbons at the site, and (c) the higher than expected hydrocarbon mass still present in soil beneath the site, which will act as a continual source for groundwater contamination unless treated.

For these reasons, ASE is not considering the use of in-situ bioremediation for remediation of this site at this time.

9.5 In-Situ Chemical Oxidation

In-situ chemical oxidation/reduction has been considered as a remedial option for the site. This method involves injecting an oxidant to the subsurface, which will destroy organic hydrocarbons. The three most common oxidants are peroxide, permanganate and ozone. Oxidation using liquid hydrogen peroxide in the presence of ferrous iron (native or supplemental) produces Fenton's Reagent, which yields free hydroxyl radicals, which is a strong oxidizer. These strong oxidants can rapidly degrade a variety of organic compounds. Permanganate can participate in numerous complex reactions to destroy organic compounds. However, using either peroxide or permanganate requires the injection of liquid into the water-bearing zone. Based on the pumping test data, the soils beneath the site have low permeability, which will restrict the distribution of any compound injected into the water-bearing zone. This would make this remediation using these methods difficult at this site. There would also be very little effect on the vadose zone still leaving a source of hydrocarbons in the unsaturated zone.

Ozone, however, is injected as a gas into sparging wells. Ozone can oxidize contaminants directly or through the formation of hydroxyl radicals, much the same way as peroxide. In situ decomposition of ozone can also lead to beneficial oxygenation and biostimulation. However, the lithology at the site is very similar to the lithology at 726 Harrison Street where an air sparging test showed that it would not be possible to achieve sufficient flow for ozone sparging to be a feasible remediation alternative.

In addition, to the reasons listed above, any type of in-situ chemical oxidation will only be effective where no free-floating hydrocarbons are present beneath the site. Since free-phase hydrocarbons are present beneath the site, any attempt at in-situ chemical oxidation would first require the removal of the free-floating hydrocarbons.

For these reasons, ASE is not considering the use of in-situ chemical oxidation for remediation of this site at this time.

10.0 SELECTION OF REMEDIATION TECHNOLOGY

Based on the location of significant hydrocarbon mass in soil off-site, soil overexcavation would not be a reasonable remediation strategy. Without removing the hydrocarbon mass in soil off-site, which would not appear to be possible, it would not be cost effective to remove what soil contamination remains on-site since too large a mass of hydrocarbons

would remain in areas which cannot be reached by overexcavation. In addition, soil conditions at the site will limit the effectiveness of "pump and treat," air sparging and soil vapor extraction. The soil conditions will also limit the effectiveness of in-situ bioremediation and in-situ chemical oxidation, as will the presence of free-phase hydrocarbons.

It is ASE's opinion that the initial focus of remediation should be the removal of the free-phase hydrocarbons beneath the site. ASE recommends that a 7–day dual-phase extraction event be performed at the site to evaluate dual-phase extraction as a possible remediation strategy at the site. Dual-phase remediation combines the lowering of the water table and the extraction of vapors simultaneously. This allows for the simultaneous treatment of both the saturated and unsaturated zone at the site. Unfortunately, it appears that the effectiveness of this treatment will likely be limited based on the results of the pumping test and the vapor extraction test at 726 Harrison Street; however, it may be possible that this technology may have some effectiveness in removing the mass of free-phase hydrocarbons at the site, at least in the short term. Based on the results of this test, ASE may recommend further usage of dual-phase extraction at the site.

11.0 REPORT LIMITATIONS

The results of this assessment represent conditions at the time of the soil and groundwater sampling, at the specific locations where the samples were collected, and for the specific parameters analyzed by the laboratory.

It does not fully characterize the site for contamination resulting from unknown sources, or for parameters not analyzed by the laboratory. All of the laboratory work cited in this report was prepared under the direction of an independent CAL-EPA certified laboratory. The independent laboratory is solely responsible for the contents and conclusions of the chemical analysis data.

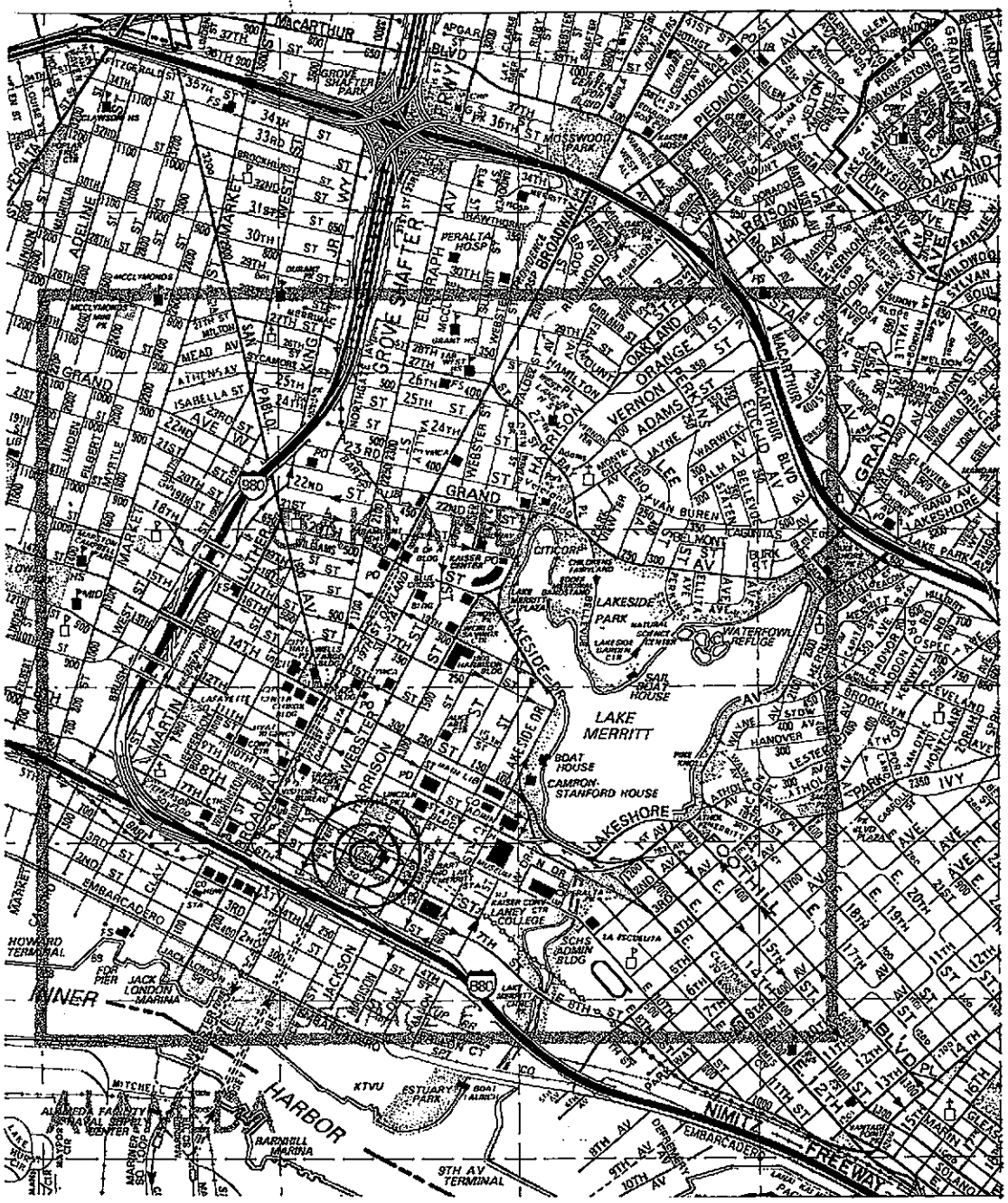
The pumping test in this report was prepared by H_2O Geol of Livermore, California. H_2O Geol is solely responsible for the contents and conclusions of the pump test report.

Should you have any questions or comments, please call us at (925) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

Robert E. Kitay, R.G., R.E.A.
Senior Geologist

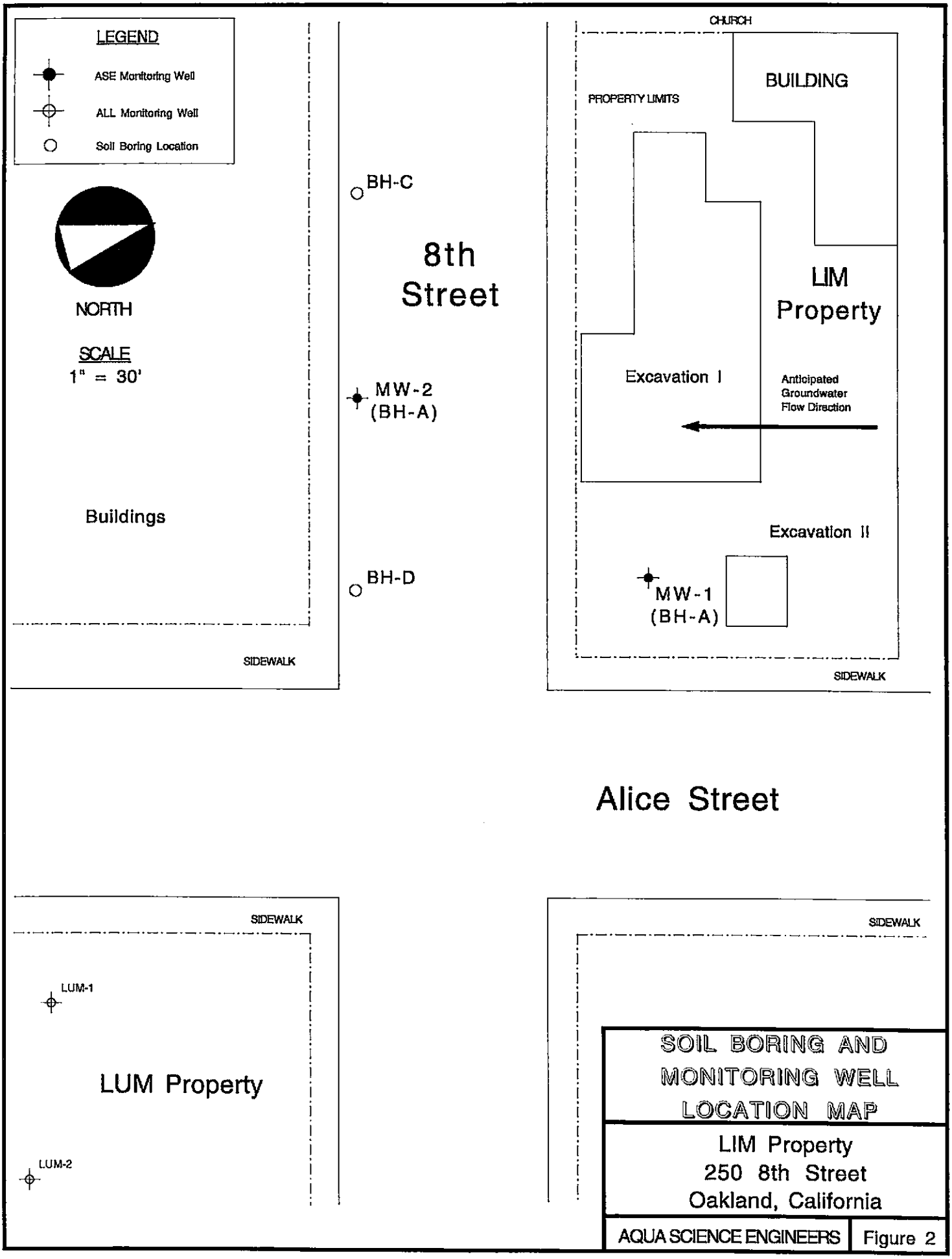


SITE LOCATION MAP

Lim Property
250 8th Street
Oakland, California

Aqua Science Engineers | Figure 1

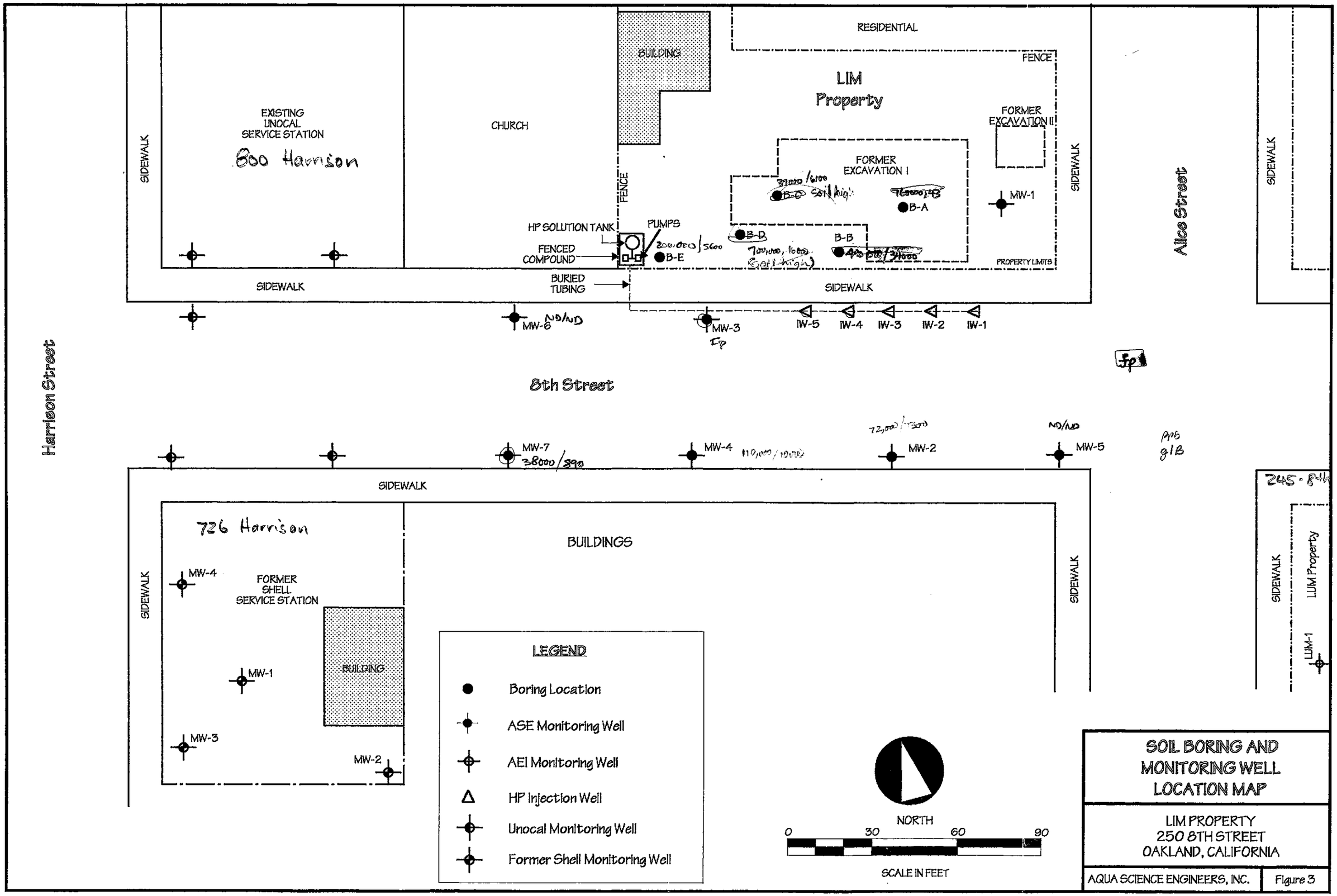
BASE: The Thomas Guide, Alameda and Contra Costa Counties Street Guide & Directory, 1990



SOIL BORING AND MONITORING WELL LOCATION MAP

LIM Property
250 8th Street
Oakland, California

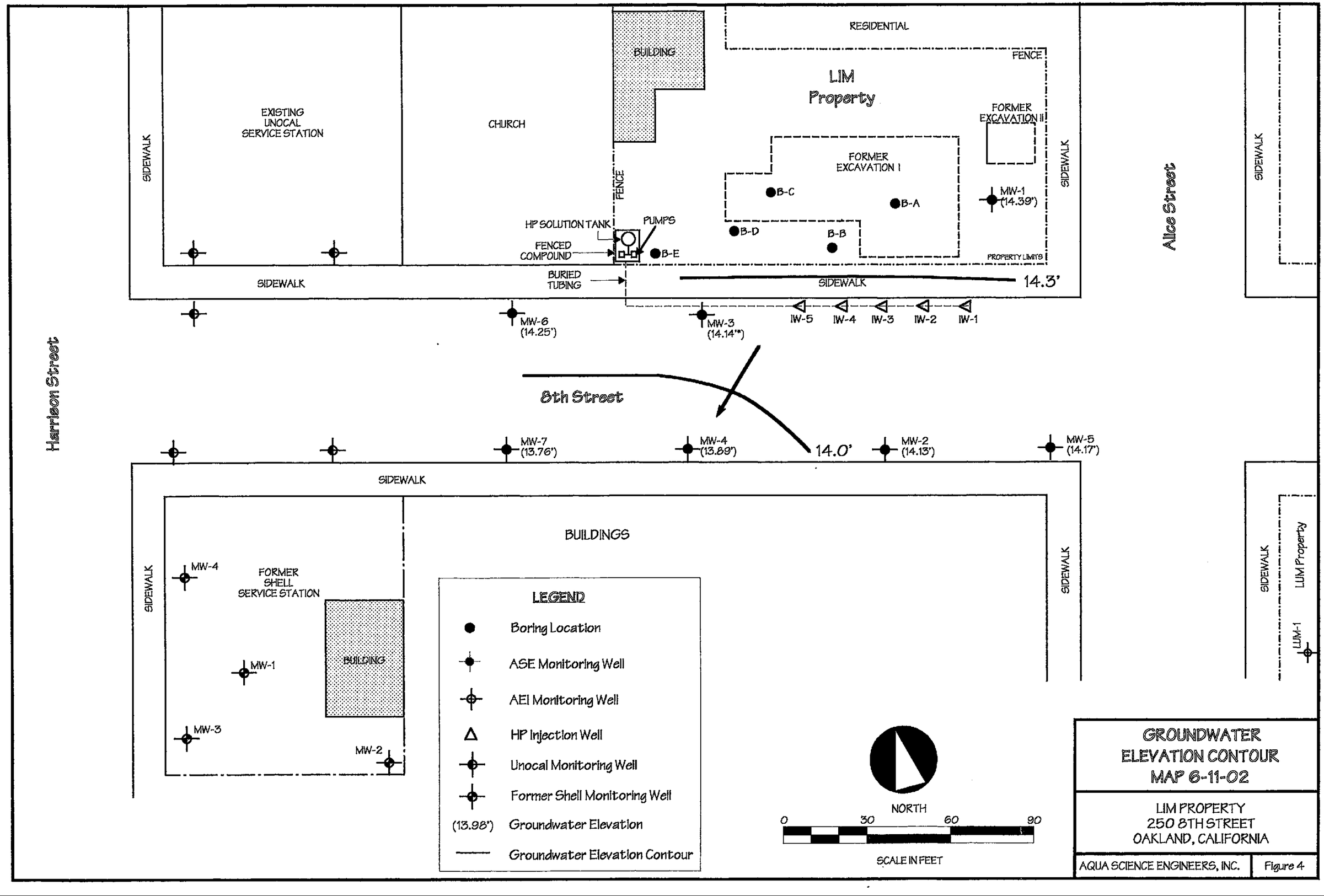
AQUA SCIENCE ENGINEERS | Figure 2



SOIL BORING AND MONITORING WELL LOCATION MAP

LIM PROPERTY
250 8TH STREET
OAKLAND, CALIFORNIA

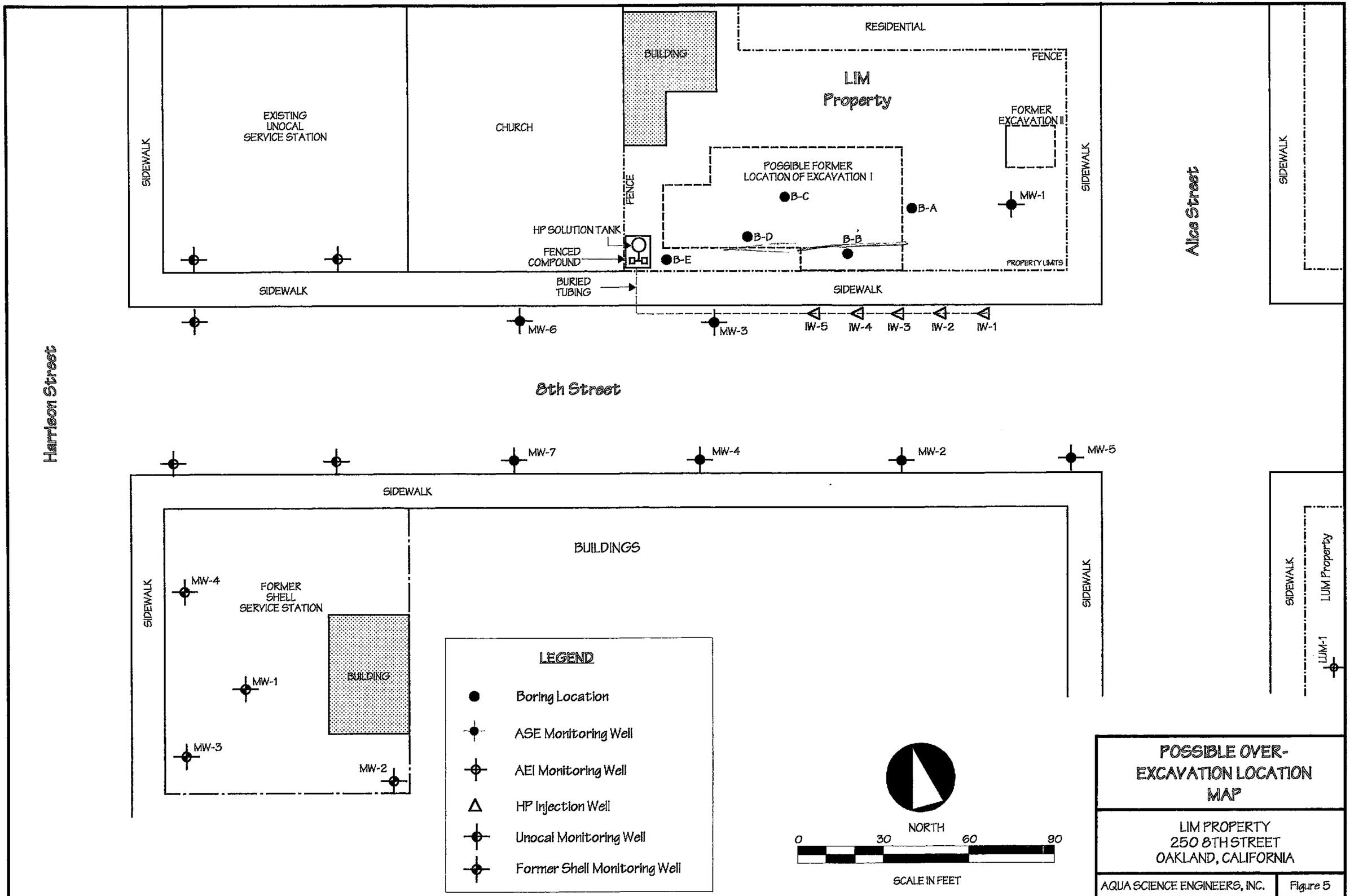
AQUA SCIENCE ENGINEERS, INC. | Figure 3



GROUNDWATER ELEVATION CONTOUR MAP 6-11-02

LIM PROPERTY
250 8TH STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | Figure 4



POSSIBLE OVER-EXCAVATION LOCATION MAP

LIM PROPERTY
250 8TH STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS, INC. | Figure 5

TABLE ONE

Groundwater Elevation Data
Lim Family Property
250 8th Street
Oakland, CA

Well I.D.	Date of Measurement	Top of Casing Elevation (msl)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (msl)
MW-1	01/30/95	25.51	16.21		9.30
	04/12/95		15.71		9.80
	07/14/95		16.71		8.80
	10/17/95		17.72		7.79
	01/12/96		18.03		7.48
	07/25/96		16.82		8.69
	01/06/97		15.60		9.91
	07/08/97		17.31		8.20
	01/26/98		15.21		10.30
	07/23/98		15.38		10.13
	01/05/99		16.82		8.69
	07/13/99		15.89		9.62
	01/12/00		17.44		8.07
	04/24/00		16.37		9.14
	07/20/00		16.30		9.21
	10/24/00		17.25		8.26
	01/18/01		17.29		8.22
	04/05/01		15.88		9.63
	07/17/01		16.54		8.97
	10/25/01		16.89		8.62
	01/21/02		14.92		10.59
	04/11/02		14.02		11.49
	06/11/02	**29.72**	**15.33**		**14.39**
MW-2	01/30/95	23.99	15.02		8.97
	04/12/95		14.75		9.24
	07/14/95		16.02		7.97
	10/17/95		16.94		7.05
	01/12/96		17.05		6.94
	07/25/96		16.02		7.97
	01/06/97		14.34		9.65
	07/08/97		16.52		7.47
	01/26/98		14.10		9.89
	07/23/98		14.70		9.29
	01/05/99		16.01		7.98
	07/13/99		15.40		8.59
	01/12/00		16.76		7.23
	04/24/00		15.67		8.32
	07/20/00		15.70		8.29
	10/24/00		16.56		7.43
	01/18/01		16.47		7.52
	04/05/01		15.88		8.11
	07/17/01		15.35		8.64
	10/25/01		15.63		8.36
	01/21/02		13.55		10.44
	04/11/02		13.74		10.25
	06/11/02	**28.19**	**14.06**		**14.13**

TABLE ONE
Groundwater Elevation Data
Lim Family Property
250 8th Street
Oakland, CA

Well I.D.	Date of Measurement	Top of Casing Elevation (msl)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (msl)
MW-3	01/12/00	24.25	16.68	0.01	7.58*
	04/24/00		15.58	0.15	8.79*
	07/20/00		16.01	0.41	8.57*
	10/24/00		16.95	0.21	7.47*
	01/18/01		16.63	0.21	7.79*
	04/05/01		15.16	0.23	9.27*
	07/17/01		15.92	0.39	8.64*
	10/25/01		16.26	0.38	8.29*
	01/21/02		14.08	0.16	10.30*
	04/11/02		14.59	0.54	10.09*
	06/11/02	**28.58**	**15.16**	**0.90**	14.14*
MW-4	01/12/00	23.71	17.24		6.47
	04/24/00		16.18		7.53
	07/20/00		16.18		7.53
	10/24/00		17.03		6.68
	01/18/01		16.87		6.84
	04/05/01		15.28		8.43
	07/17/01		15.92		7.79
	10/25/01		16.23		7.48
	01/21/01		14.14		9.57
	04/11/02		14.43		9.28
	06/11/02	**28.61**	**14.72**		**13.89**
MW-5	**06/11/02**	**28.40**	**14.23**		**14.17**
MW-6	**06/11/02**	**29.20**	**14.95**		**14.25**
MW-7	**06/11/02**	**28.95**	**15.19**	[redacted] ?	**13.76**
IW-1	07/13/99	24.05	14.75		9.30
	06/11/02	**28.33**			
IW-2	07/13/99	24.21	15.10		9.11
	06/11/02	**28.50**			
IW-3	07/13/99	23.93	15.00		8.93
	06/11/02	**28.14**			
IW-4	07/13/99	23.83	Unknown		Unknown
	06/11/02	**28.24**			

TABLE ONE
Groundwater Elevation Data
Lim Family Property
250 8th Street
Oakland, CA

Well I.D.	Date of Measurement	Top of Casing Elevation (msl)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (msl)
IW-5	07/13/99	24.00	15.50	1.00	9.55*
	07/23/99		15.52	1.05	9.32*
	08/03/99		15.58	0.64	8.93*
	08/17/99		15.62	0.86	9.07*
	08/27/99		15.92	0.77	8.70*
	09/10/99		15.82	0.56	8.63*
	09/24/99		15.57	0.26	8.64*
	10/08/99		15.56	0.23	8.62*
	11/02/99		15.59	0.22	8.59*
	11/19/99		15.64	0.07	8.42*
	12/16/99		16.12	0.64	8.39*
	01/12/00		16.54	0.28	7.68*
	06/11/02	**28.32**			

Notes:

* = Adjusted for the presence of free-floating oil by the equation: Top of Casing Elevation - Depth to Water + (0.8 x Floating Hydrocarbon Thickness) = Groundwater Elevation (Adjusted).

Top of casing elevations resurveyed by Mid Coast Engineers on 6/27/02 and 7/11/02.

TABLE TWO

Summary of Chemical Analysis of Groundwater Samples
Petroleum Hydrocarbon Concentrations
All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-1							
01/30/95	740	200	3	5	1	4	--
04/12/95	400	500	< 0.5	< 0.5	3	< 2	--
07/14/95	520	400	1	< 0.5	2	3	--
10/17/95	400	200	0.5	1	3	< 2	--
01/12/96	120	890	< 0.5	< 0.5	< 0.5	< 1.0	< 2.0
07/08/96	320	300	0.52	2.7	1.2	2.3	< 5.0
01/06/97	110	75	< 0.5	0.68	< 0.5	< 0.5	< 5.0
07/08/97	380	290	< 0.5	1.5	1.4	1.9	< 5.0
01/26/98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
07/23/98	190	< 50	0.54	2.8	2	1.8	< 5.0
01/05/99	200	< 50	1.8	1.6	3.3	< 0.5	< 5.0
07/13/99	340	<50	<0.5	<0.5	2.6	<0.5	< 5.0
01/12/00	300	1,000	22	36	5.5	24	< 5.0
04/24/00	360	280*	< 0.5	< 0.5	< 0.5	2.1	< 5.0
07/20/00	290	150*	1.8	< 0.5	< 0.5	< 0.5	< 5.0
10/24/00	170**	280*	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
01/18/01	170**	150*	< 0.5	<0.5	< 0.5	2.1	< 5.0
04/05/01	350**	190*	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
07/17/01	310	570	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
10/25/01	250	260	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
01/22/02	200	250	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
04/11/02	260	300	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
06/11/02	**270**	**330**	**< 0.5**	**< 0.5**	**< 0.5**	**< 0.5**	**< 5.0**

TABLE TWO

Summary of Chemical Analysis of Groundwater Samples
Petroleum Hydrocarbon Concentrations
All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-2							
01/30/95	88,000	800	19,000	18,000	2,400	10,000	--
04/12/95	110,000	990	21,000	28,000	2,800	14,000	--
07/14/95	120,000	5,000	20,000	25,000	3,200	15,000	--
10/17/95	190,000	4,000	15,000	26,000	4,900	23,000	--
01/12/96	32,000	2,600	10,000	8,000	1,100	4,800	< 2
07/08/96	110,000	2,500	20,000	18,000	2,500	12,000	< 500
01/06/97	230,000	37,000	11,000	19,000	4,300	20,000	< 1,200
07/08/97	91,000	35,000	16,000	20,000	2,700	13,000	< 1,000
01/26/98	50,000	11,000	12,000	12,000	1,600	6,700	< 250
07/23/98	50,000	8,100#	11,000	8,300	1,800	7,000	1,100
01/05/99	50,000	7,600#	12,000	12,000	2,300	9,600	1,300
07/13/99	73,000	8,500	11,000	13,000	2,200	9,800	< 500
01/12/00	63,000	11,000	10,000	12,000	1,800	7,800	< 500
04/24/00	76,000	23,000*	7,100	14,000	2,000	9,400	< 500
07/20/00	68,000	5,300#	11,000	14,000	2,300	11,000	< 1,000
10/24/00	48,000	6,400*	11,000	9,400	1,500	7,300	< 500
01/18/01	37,000	4,600*	6,900	5,600	1,200	5,300	< 500
04/05/01	59,000	4,600*	7,100	9,800	1,600	7,600	< 500
07/17/01	90,000	< 10,000	9,200	14,000	2,700	11,000	< 50
10/25/01	79,000	< 3,800	9,200	14,000	2,400	11,000	< 50
01/22/02	76,000	< 2,300	7,000	13,000	2,200	9,600	< 50
04/11/02	76,000	< 1,500	7,800	11,000	2,900	12,000	< 50
06/11/02	**72,000**	**< 2,500**	**7,300**	**9,600**	**2,500**	**12,000**	**< 50**

TABLE TWO

Summary of Chemical Analysis of Groundwater Samples
Petroleum Hydrocarbon Concentrations
All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-3							
01/12/00	140,000	13,000*	22,000	19,000	2,400	11,000	< 500
04/24/00	240,000	700,000*	33,000/ 35,000	52,000/ 87,000	5,700/ 18,000	28,000/ 84,000	< 5,000
07/20/00	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
10/24/00	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
01/18/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
04/05/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
07/17/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
10/25/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
01/22/02	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
04/11/02	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
06/11/02	**NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS**						
MW-4							
01/12/00	99,000	7,900*	16,000	20,000	2,100	12,000	< 2,500
04/24/00	54,000	44,000*	3,400/ 4,500	13,000/ 20,000	1,800/ 2,800	8,800/ 14,000	< 1,300
07/20/00	8,000	3,500	9,200/ 11,000	20,000 22,000	2,500 3,400	12,000/ 13,000	< 1,000
10/24/00	98,000	8,000*	21,000	29,000	2,700	15,000	< 1,000
01/18/01	91,000	12,000	17,000/ 15,000	21,000/ 21,000	2,500/ 2,800	13,000/ 11,000	<1,000 <5,000
04/05/01	88,000	7,500*	6,900/ 3,200	18,000/ 9,000	2,500/ 1,300	12,000/ 6,400	< 1,000 < 500
07/17/01	95,000	< 3,000	8,000	16,000	2,900	11,000	49
10/25/01	89,000	< 2,200	9,300	18,000	2,400	12,000	66
01/22/02	80,000	< 2,300	4,600	15,000	2,500	11,000	< 50
04/11/02	90,000	< 900	6,600	18,000	2,800	12,000	55
06/25/02	**110,000**	**< 3,000**	**10,000**	**20,000**	**2,900**	**13,000**	**< 100**
MW-5							
06/11/02	**< 50**	**< 50**	**< 0.5**	**< 0.5**	**< 0.5**	**< 0.5**	**28**
MW-6							
06/11/02	**< 50**	**< 50**	**< 0.5**	**< 0.5**	**< 0.5**	**< 0.5**	**1.2**

TABLE TWO

Summary of Chemical Analysis of Groundwater Samples
Petroleum Hydrocarbon Concentrations
All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-7							
06/25/02	38,000	<2,000	890	5,100	1,200	5,200	<20
RBSL	500	640	46	130	290	13	1,800

Notes:

* = Hydrocarbons reported are in the early diesel range, and do not match the laboratory standard.

** = Hydrocarbons reported do not match the laboratory gasoline standard.

= Estimated concentration reported due to overlapping fuel patterns.

/ = Results separated by a slash represent results from two different laboratory methods (8020/8260).

Non-detectable concentrations noted by the less than sign (<) followed by the detection limit.

Most recent data in bold.

RBSL is the California Regional Water Quality Control Board, San Francisco Bay Region Risk-Based Screening Level for Groundwater where groundwater is not a current or potential source of drinking water.

TABLE THREE
Groundwater Analytical Results
Oil & Grease and Volatile Organic Compounds
All results are in parts per billion

Date Sampled & Compound Analyzed	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
7/8/97							
Hydrocarbon Oil and Grease	-	< 1,000	-	-	-	-	-
Tetrachloroethane (PCE)	0.9	< 0.5	-	-	-	-	-
Other VOCs	< 0.5 - < 3	< 0.5 - < 3	-	-	-	-	-
1/26/98							
Hydrocarbon Oil and Grease	-	< 1,000	-	-	-	-	-
Trichloroethene	0.7	< 5.0	-	-	-	-	-
Tetrachloroethene	10	< 5.0	-	-	-	-	-
1,2-Dichloroethane	< 0.5	11	-	-	-	-	-
Other VOCs	< 0.5 - < 50	< 0.5 - < 50	-	-	-	-	-
7/23/98							
Hydrocarbon Oil and Grease	-	< 1,000	-	-	-	-	-
Tetrachloroethene	4	4.6	-	-	-	-	-
1,2-Dichloroethane	< 2	9.9	-	-	-	-	-
Other VOCs	< 2 - < 10	< 0.5 - < 5.0	-	-	-	-	-
1/5/99							
Hydrocarbon Oil and Grease	-	< 1,000	-	-	-	-	-
Tetrachloroethene	5.1	< 50	-	-	-	-	-
Trichloroethene	0.52	< 50	-	-	-	-	-
1,1,2,2-Tetrachloroethane	0.58	< 50	-	-	-	-	-
Chloroform	8.2	< 50	-	-	-	-	-
Other VOCs	< 0.5 - < 5	< 50 - < 500	-	-	-	-	-
7/13/99							
Hydrocarbon Oil and Grease	-	< 1,000	-	-	-	-	-
Tetrachloroethene	1.5	0.68	-	-	-	-	-
Chloroform	4.6	< 50	-	-	-	-	-
1,2-Dichloroethane	<0.50	7.7	-	-	-	-	-
Other VOCs	< 0.5 - < 5	< 0.5 - < 500	-	-	-	-	-
1/12/00							
Hydrocarbon Oil and Grease	-	< 1,000	< 1,000	< 1,000	-	-	-
Tetrachloroethene	0.8	< 1.0	< 100	< 50	-	-	-
Chloroform	3.2	< 1.0	< 100	< 50	-	-	-
1,2-Dichloroethane	<0.50	8.8	120	140	-	-	-
Acetone	-	-	25,000	6,400	-	-	-
Naphthalene	-	-	550	540	-	-	-
Isopropylbenzene	-	-	120	89	-	-	-
Other VOCs	< 0.5 - < 5.0	< 1.0 - < 4.0	< 100 - < 10,000	< 50 - < 5,000	-	-	-

TABLE THREE
Groundwater Analytical Results
Oil & Grease and Volatile Organic Compounds
All results are in parts per billion

Date Sampled & Compound Analyzed	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
4/24/00							
Hydrocarbon Oil and Grease	-	<1,000	4,100	< 1,000	-	-	-
1,2-Dichloroethane	< 0.5	5.9	< 1,000	< 250	-	-	-
Naphthalene	-	-	3,800	590	-	-	-
Isopropylbenzene	-	-	1,200	< 250	-	-	-
Other VOCs	< 0.5 - < 5.0	< 5.0 - < 20	1,000 - < 100,000	< 250 - < 25,000	-	-	-
7/20/00							
Hydrocarbon Oil and Grease	-	< 1,000		< 1,000	-	-	-
Tetrachloroethene	0.59	< 5.0	FREE	< 200	-	-	-
Chloroform	2.1	< 5.0	PRODUCT	< 200	-	-	-
1,2-Dichloroethane	< 0.5	6.7	---	< 200	-	-	-
Acetone	-	-	NOT	< 20,000	-	-	-
Naphthalene	-	-	SAMPLED	730	-	-	-
Other VOCs	< 0.5 - < 20	< 5.0 - < 20		< 250 - < 20,000	-	-	-
10/24/00			FREE				
Hydrocarbon Oil and Grease	-	< 1,000	PRODUCT	< 1,000	-	-	-
Tetrachloroethene	< 0.5	< 5.0	---	< 250	-	-	-
Chloroform	1.0	< 5.0	NOT	< 250	-	-	-
Other VOCs	< 0.5 - < 20	< 5.0 - < 20	SAMPLED	< 250 - < 25,000	-	-	-
1/18/01			FREE				
Hydrocarbon Oil and Grease	-	2,100	PRODUCT	1,300	-	-	-
Tetrachloroethene	1.3	< 5.0	---	< 250	-	-	-
Chloroform	6.4	< 5.0	NOT	< 250	-	-	-
Other VOCs	< 0.5 - < 20	< 5.0 - < 20	SAMPLED	< 250 - < 25,000	-	-	-
4/5/01							
Hydrocarbon Oil and Grease	-	< 1.0	FREE	1,100.0	-	-	-
Tetrachloroethene	< 0.5	1.1	PRODUCT	< 50	-	-	-
1,2 dichloroethane	< 0.5	4.6	---	< 50	-	-	-
Trichloroethene	< 0.5	0.58	NOT	< 50	-	-	-
Naphthalene	-	-	---	320	-	-	-
Other VOCs	< 0.5 - < 2.0	< 5.0 - < 20	SAMPLED	< 50 - < 5,000	-	-	-
7/17/01							
Hydrocarbon Oil and Grease	-	< 500	FREE	< 500	-	-	-
Tetrachloroethene	-	-	PRODUCT	-	-	-	-
1,2 dichloroethane	< 0.5	< 50	---	69.0	-	-	-
Trichloroethene	-	-	NOT	-	-	-	-
Naphthalene	-	-	---	-	-	-	-
Other VOCs	-	-	SAMPLED	-	-	-	-

TABLE THREE

Groundwater Analytical Results
Oil & Grease and Volatile Organic Compounds
All results are in parts per billion

Date Sampled & Compound Analyzed	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
10/25/01							
Hydrocarbon Oil and Grease	-	<5,000	FREE	<5,000	-	-	-
1,2 dichloroethane	-	<50	PRODUCT	72	-	-	-
1,2 dibromoethane	-	<50	NOT	<50	-	-	-
Other VOCs	-	-	SAMPLED	---	-	-	-
1/22/02							
Hydrocarbon Oil and Grease	-	<5,000	FREE	<5,000	-	-	-
1,2 dichloroethane	-	<50	PRODUCT	<50	-	-	-
1,2 dibromoethane	-	<50	NOT	<50	-	-	-
Other VOCs	-	-	SAMPLED	---	-	-	-
6/11/02							
Oil and Grease	-	1,100	FREE	-	<1,000	<1,000	-
1,2 dichloroethane	-	<50	PRODUCT	-	<0.5	<0.5	-
1,2 dibromoethane	-	<50	NOT	-	<0.5	<0.5	-
Other VOCs	-	-	SAMPLED	-	-	-	-
6/25/02							
Oil and Grease	-	-	FREE	1,400	-	-	<1,000
1,2 dichloroethane	-	-	PRODUCT	<100	-	-	<20
1,2 dibromoethane	-	-	NOT	<100	-	-	<20
Other VOCs	-	-	SAMPLED	-	-	-	-

TABLE FOUR
Summary of Chemical Analysis of SOIL Samples
All results are in parts per million

Boring	Sample Depth	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE
B-A	14.5-15.0'	< 1.0	< 1.0	< 10	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
B-B	13.5-14.0'	**1.5**	< 1.0	< 10	**0.048**	**0.016**	**0.025**	**0.058**	< 0.0050
B-C	17.5-18.0'	**9,100**	**1,600**	< 10	**53**	**360**	**98**	**660**	< 0.25
B-D	17.5-18.0'	**1,200**	**1,500**	< 10	**7.8**	**22**	**18**	71	< 0.25
B-E	17.0-17.5'	**4.0**	**2.2**	< 10	**0.12**	< 0.0050	**0.17**	**0.020**	< 0.0050
RBSL		400	500	500	0.39	37	24	1.0	1.0

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in bold.

RBSL is the California Regional Water Quality Control Board, San Francisco Bay Region Risk-Based Screening Level for Subsurface Soil where groundwater is not a current or potential source of drinking water (Industrial and Commercial Land Use Permitted)

TABLE FIVE
Summary of Chemical Analysis of GROUNDWATER Samples From Soil Borings
All results are in parts per billion

Boring	TPH Gasoline	TPH Diesel	TPH Motor Oil	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE
B-A	760,000	170,000	< 5,000	43	< 25	< 25	< 50	< 250
B-B	490,000	340,000	< 10,000	34,000	32,000	4,200	18,000	< 250
B-C	37,000	12,000	< 100	6,100	4,300	890	3,700	< 250
B-D	700,000	130,000	< 1,000	16,000	7,400	12,000	48,000	< 250
B-E	200,000	230,000	< 100	5,600	2,200	5,500	22,000	< 1,000
RBSL	1,500	640	640	46	130	290	13	1,800

Notes:

Non-detectable concentrations are noted by the less than symbol (<) followed by the detection limit.

Detectable concentrations are in bold.

RBSL is the California Regional Water Quality Control Board, San Francisco Bay Region Risk-Based Screening Level for Groundwater where groundwater is not a current or potential source of drinking water.

APPENDIX A

Letters from the ACHCSA

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

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

January 8, 2001
StID # 1585

Mr. Russell Lim
601 Brush St.
Oakland CA 94607

Re: Lim Family Property, 250 8th St., Oakland CA 94607

Dear Mr. Lim:

This letter recounts our conversation today at your site with you and your consultant, Aqua Science Engineers. In order to provide sufficient information for potential future development of this site and eventual site closure, it was decided that we should proceed with the following:

- Installation of the previously proposed and approved three off-site wells to further characterize the site
- Perform additional on-site groundwater investigation via borings within the former underground tank pit to determine if groundwater contamination exists and
- Perform a groundwater extraction pump test to determine the viability of groundwater extraction from the existing injection and monitoring wells. This was deemed the most reasonable remediation approach. In addition, our office concurs with ASE's recommendation to install a passive hydrocarbon recovery skimmer in MW-3 and IW-5, those wells currently exhibiting free product.

Please provide a work plan to perform the borings and pump test to our office within 30 days or no later than February 9, 2001.

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

Sincerely,

Barney M. Chan

Barney M. Chan
Hazardous Materials Specialist

C: B/Chan, files
Mr. R. Kitay, ASE Inc., 208 W. El Pintado, Danville, CA 94526
Mr. M. Owens, SWRCB , Underground Storage Tank Cleanup Fund, 1001 I St., 17th Floor, Sacramento, CA 95814-2828

250 8thSt

APPENDIX B

Permits

CITY OF OAKLAND • Community and Economic Development Agency
250 Frank H. Ogawa Plaza, 2nd Floor, Oakland, CA 94612 • Phone (510) 238-3443 • FAX (510) 238-2263

Job Site 250 8TH ST Parcel# 001 -0185-011-00 Appl# X0200494

Descr INSTALL THREE(3) MON.WELLS ADJACENT TO ABOVE ADDRESS W/ APPROVED ENCR.PERMIT

Permit Issued 05/14/02

Work Type EXCAVATION-PRIVATE P

USA #

Util Co. Job #

Util Fund #:

Acctg#:

	Applcnt	Phone#	Lic#	--License Classes--
Owner	LIM MAY L TR & ALICE TR			
Contractor	AQUA SCIENCE ENGINEERS, INC.	X (925)820-9391	487000 A	C57
Arch/Engr				
Agent				

Applic Addr 208 WEST EL PINTADO, DANVILLE, CA., 94526

$250.00 TOTAL FEES PAID AT ISSUANCE

$45.00 Applic	$205.00 Permit
$.00 Process	$.00 Rec Mgmt
$.00 Gen Plan	$.00 Invstg
$.00 Other	

ADDRESS:

DIST:

Date: 05/14/02 Amt Paid: $250.00
By: ESL Register R02 Receipt# 037815

CITY OF OAKLAND
Office of Planning and Building

3 MONITORING WELL INSTALLATION

$ 250.00

EXCAVATION PERMIT

TO EXCAVATE IN STREETS OR OTHER SPECIFIED WORK

CIVIL ENGINEERIN(

PERMIT NUMBER	SITE ADDRESS/LOCATION
X 0 2 0 0 4 9 4	250 8th St.
APPROX. START DATE / APPROX. END DATE	24-HOUR EMERGENCY PHONE NUMBER (Permit not valid without 24-Hour number)
CONTRACTOR'S LICENSE # AND CLASS: 487000	CITY BUSINESS TAX #

ATTENTION:

1- State law requires that the contractor/owner call Underground Service Alert (USA) two working days before excavating. This permit is not valid unless applicant has secured an inquiry identification number issued by USA. The USA telephone number is 1-800-642-2444. Underground Service Alert (USA) # _____

2- 48 hours prior to starting work, you MUST CALL (510) 238-3651 to schedule an inspection.

3- 48 hours prior to re-paving, a compaction certificate is required (waived for approved slurry backfill).

OWNER/BUILDER

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5 Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than $500):

☐ I, as an owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).

☐ I, as owner of the property, am exempt from the sale requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will be performed prior to sale, (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption on this subdivision on more than two structures more than once during any three-year period. (Sec. 7044 Business and Professions Code).

☐ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project, (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License law).

☐ I am exempt under Sec. _____, B&PC for this reason _____

WORKER'S COMPENSATION

☐ I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Worker's Compensation Insurance, or a certified copy thereof (Sec. 3700, Labor Code).

Policy # _____ Company Name _____

☐ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation Laws of California (not required for work valued at one hundred dollars ($100) or less).

NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Worker's Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked. This permit is issued pursuant to all provisions of Title 12 Chapter 12.12 of the Oakland Municipal Code. It is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims, or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance. This permit is void 90 days from the date of issuance unless an extension is granted by the Director of the Office of Planning and Building.

I hereby affirm that I am licensed under provisions of Chapter 9 of Division 3 of the Business and Professions Code and my license is in full force and effect (if contractor), that I have read this permit and agree to its requirements, and that the above information is true and correct under penalty of law.

a E [illegible] 5-13-02

Signature of Permittee ☐ Agent for ☒ Contractor ☐ Owner Date

DATE STREET LAST RESURFACED	SPECIAL PAVING DETAIL REQUIRED? ☐ YES ☒ NO	HOLIDAY RESTRICTION? (NOV 1 - JAN 1) ☒ YES ☐ NO	LIMITED OPERATION AREA? (7AM-9AM & 4PM-6PM) ☒ YES ☐ NO
ISSUED BY		DATE ISSUED 5-13-02	

IR-11

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510)782-1939

APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 250 8th street Oakland CA 94607

CLIENT
Name Alice + May Lim c/o Russell Lim
Address 3100 W. Playa Ct. Phone
City Lafayette, CA. Zip 94549

APPLICANT
Name Aqua Science Engineers Fax 925-837-4853
Address 208 W. El Pintado Phone 925-820-9391
City Danville, CA Zip 94526

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

PROPOSED WATER SUPPLY WELL USE
New Domestic ( ) — Replacement Domestic ( )
Municipal ( ) — Irrigation ( )
Industrial ( ) — Other ____ ( )

DRILLING METHOD:
Mud Rotary ( ) — Air Rotary ( ) — Auger X
Cable ( ) — Other ( )

DRILLER'S NAME Gregg Drilling

DRILLER'S LICENSE NO. C57-485165

WELL PROJECTS
Drill Hole Diameter 8 in. — Maximum
Casing Diameter 2 in. — Depth 30 ft.
Surface Seal Depth 8 ft. — Owner's Well Number MW-05

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

ESTIMATED STARTING DATE 5/28/02
ESTIMATED COMPLETION DATE 5/28/02

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

APPLICANT'S SIGNATURE [signature] DATE 5/23/02

PLEASE PRINT NAME Erik Paddleford

Rev.3-04-02

FOR OFFICE USE

PERMIT NUMBER W02-0550
WELL NUMBER ____
APN ____

PERMIT CONDITIONS
Circled Permit Requirements Apply

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

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

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

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

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

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

G. SPECIAL CONDITIONS ← SCA-1 Attached

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

APPROVED [signature] DATE 5-28-02

ALAMEDA COUNTY PUBLIC WORKS AGENCY

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

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 250 8th street Oakland CA 94607

CLIENT
Name Alice + May Lim c/o Russell Lim
Address 3100 La Playa Ct. Phone
City Lafayette, CA Zip 94549

APPLICANT
Name Aqua Science Engineers Fax 925-837-4853
Address 208 W El Pintado Phone 925-820-9391
City Danville, CA Zip 94526

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE

New Domestic		Replacement Domestic	
Municipal		Irrigation	
Industrial		Other	

DRILLING METHOD:

Mud Rotary		Air Rotary	Auger X
Cable		Other	

DRILLER'S NAME Gregg Drilling
DRILLER'S LICENSE NO. C57-485165

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 4 in. Depth 30 ft.
Surface Seal Depth 8 ft. Owner's Well Number MW-6

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

ESTIMATED STARTING DATE 5/24/02
ESTIMATED COMPLETION DATE 5/24/02

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.
APPLICANT'S SIGNATURE E Paddleford DATE 5/23/02
PLEASE PRINT NAME Erik Paddleford

FOR OFFICE USE
PERMIT NUMBER W02-0551
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

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

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

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

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

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

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

G. SPECIAL CONDITIONS - SC #1 Attached.

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

APPROVED DATE 5-28-02

Rev. 3-04-02

ALAMEDA COUNTY PUBLIC WORKS AGENCY

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

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 250 8th street Oakland CA 94607

CLIENT
Name Alice + My Lim c/o Russell Lim
Address 3100 Is. Playa Ct. Phone
City Lafayette, CA. Zip 94549

APPLICANT
Name Aqua Science Engineers Fax 925-837-4853
Address 208 W. El Pintado Phone 925-820-9391
City Danville, CA Zip 94526

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

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

DRILLING METHOD:
Mud Rotary Air Rotary Auger X
Cable Other

DRILLER'S NAME Gregg Drilling
DRILLER'S LICENSE NO. C57-485165

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum Depth 30 ft
Casing Diameter 2 in. Owner's Well Number MW-1
Surface Seal Depth 8 ft.

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

ESTIMATED STARTING DATE 5/28/02
ESTIMATED COMPLETION DATE 5/28/02

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

APPLICANT'S SIGNATURE E Paddleford DATE 5/23/02
PLEASE PRINT NAME Erik Paddleford

Rev.3-04-02

FOR DEVICE USE
PERMIT NUMBER W02-0552
WELL NUMBER
APN

PERMIT CONDITIONS
Circled Permit Requirements Apply

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

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

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

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

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

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

G. SPECIAL CONDITIONS – Sch 1 Attached.

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

APPROVED [signature] DATE 5-28-02

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD, CA. 94544-1395
PHONE (510) 670-6633 James Yoo FAX (510) 782-1939

PERMIT NO. W02-0550-0552

WATER RESOURCES SECTION
GROUNDWATER PROTECTION ORDINANCE
G. SPECIAL CONDITIONS #1
PLACEMENT OF MONITORING WELLS IN PUBLIC RIGHT-OF-WAY

1. Prior to installation of any monitoring wells into any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permits(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

2. Wells in the public right-of-way shall have a minimum surface seal depth of five (5) feet or the maximum depth practicable or twenty (20) feet.

3. Wells in the Public right-of-way shall have a Christy box or similar structure (flush with the road), with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or road construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

4. Drilling Permit(s) can be voided/ canceled only in writing. It is the applicants responsibilities to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

5. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days.

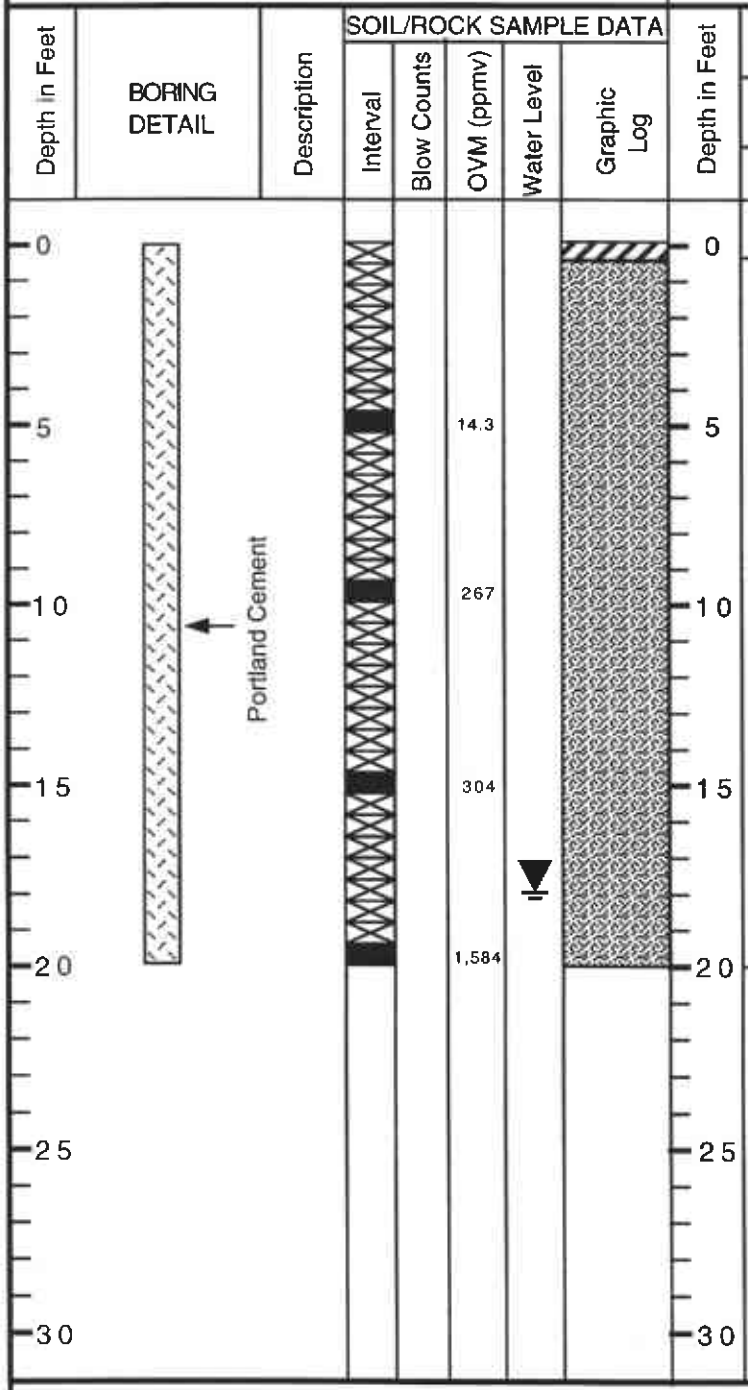
6. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, property damage, personal injury and wrongful death.

APPENDIX C

Boring Logs
And
Well Construction Details

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: B-A
Project Name: Lim Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Vironex Drilling	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: September 17, 2001	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 18'	Total Depth of Well Completed: NA
Static Depth of Water in Well: NA	Well Screen Type and Diameter: NA
Total Depth of Boring: 20'	Well Screen Slot Size: NA
	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

Asphalt — nature ?

Silty SAND (SM); yellow-brown; medium dense; damp; 80% fine to medium sand; 15% silt; 5% gravel to 0.25" diameter; non-plastic; medium estimated K; no odor

olive brown, moist, slight odor

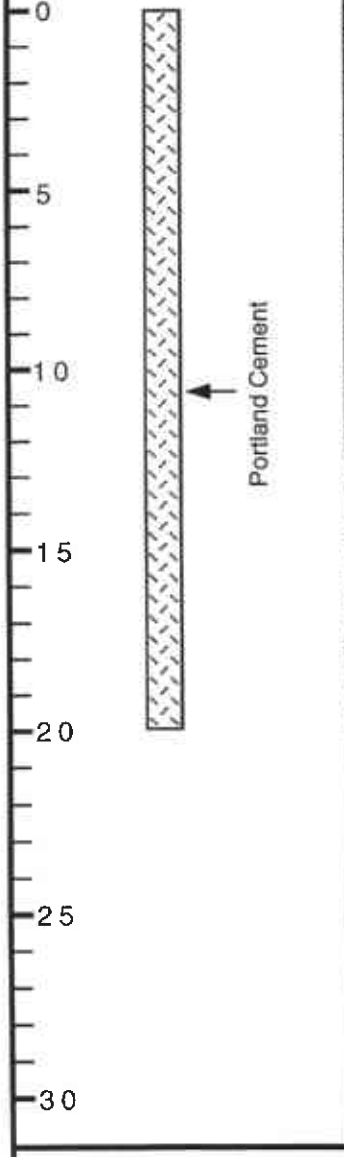
wet at 18 feet

End of Boring at 20'

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: B-B
Project Name: Lim Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Vironex Drilling	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: September 17, 2001	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 18'	Total Depth of Well Completed: NA
	Well Screen Type and Diameter: NA
Static Depth of Water in Well: NA	Well Screen Slot Size: NA
Total Depth of Boring: 20'	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler

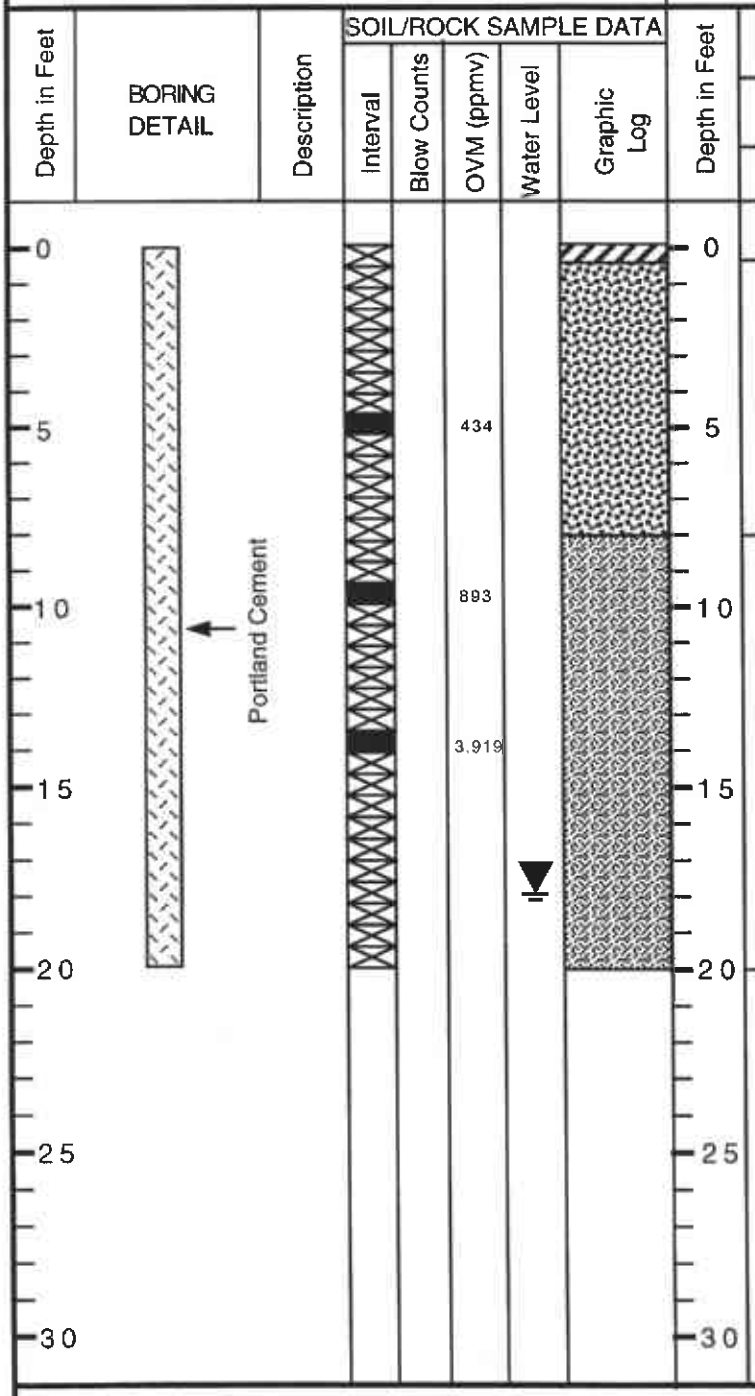


Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	Asphalt Nature
	Silty SAND (SM); yellow-brown; medium dense; damp; 80% fine sand; 20% silt; non-plastic; medium estimated K; no odor
	brown
5	
	olive gray; slight to moderate odor
10	
	moist
15	strong odor
	wet at 18 feet
20	End of Boring at 20'
25	
30	

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: B-C
Project Name: Lim Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Vironex Drilling	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: September 17, 2001	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 18'	Total Depth of Well Completed: NA
	Well Screen Type and Diameter: NA
Static Depth of Water in Well: NA	Well Screen Slot Size: NA
Total Depth of Boring: 20'	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

Asphalt

Gravelly SAND (SW); gray to brown; loose; damp; 75% fine to coarse sand; 20% subrounded gravel to 0.25" diameter; 5% silt; non-plastic; high estimated K; no odor

Silty SAND (SM); olive gray; medium dense; damp; 80% fine sand; 20% silt; non-plastic; medium estimated K; strong odor

olive brown; moderate odor

brown; moderate odor

wet at 18 feet

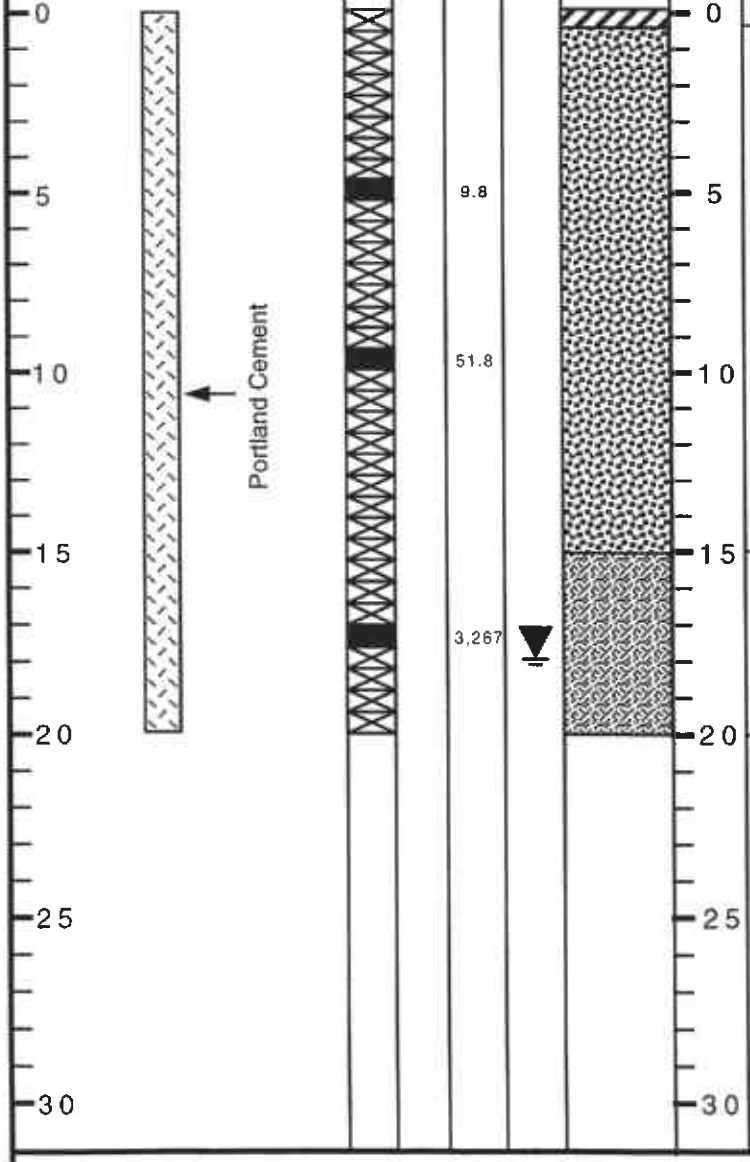
strong odor

End of Boring at 20'

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: B-D
Project Name: Lim Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Vironex Drilling	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: September 17, 2001	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 18'	Total Depth of Well Completed: NA
	Well Screen Type and Diameter: NA
Static Depth of Water in Well: NA	Well Screen Slot Size: NA
Total Depth of Boring: 20'	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler

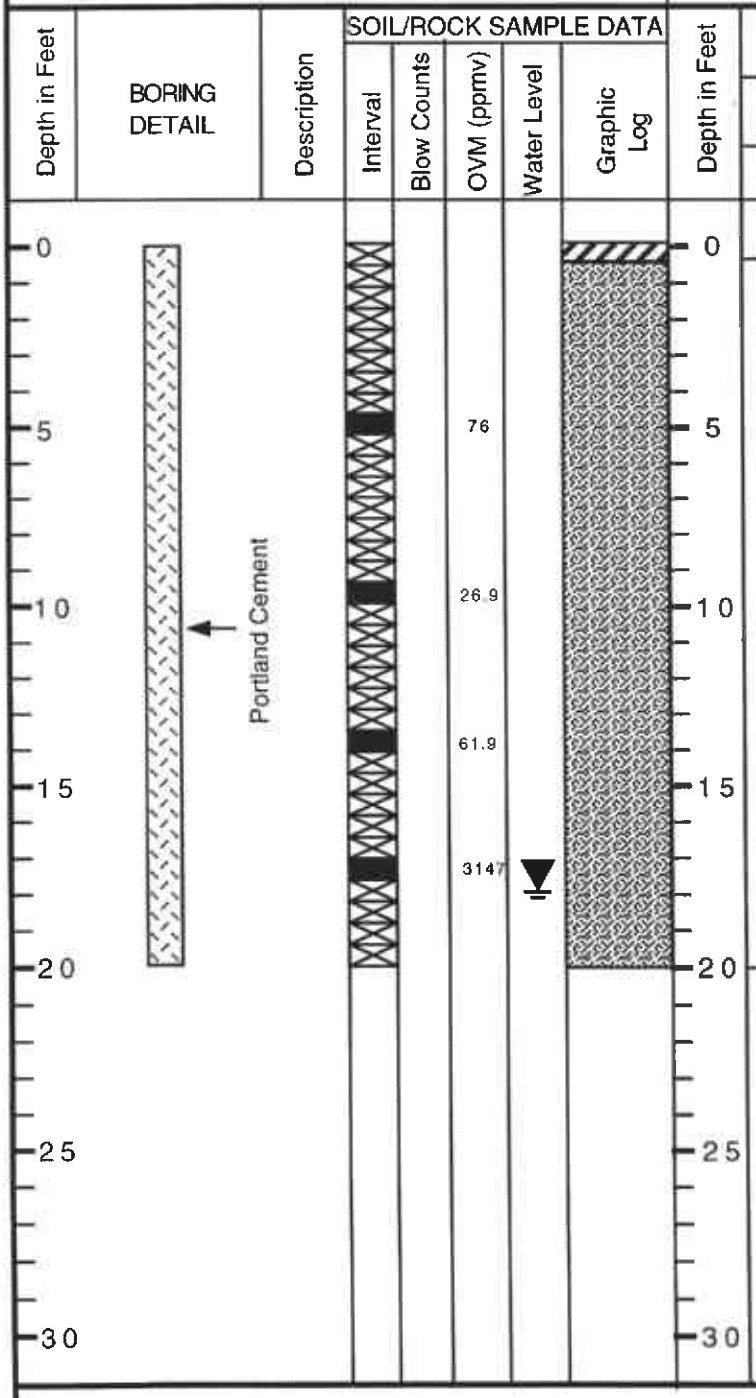


Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	Asphalt
	Gravelly SAND (SW); gray to brown; loose; damp; 75% fine to coarse sand; 20% subrounded gravel to 0.50" diameter; 5% silt; non-plastic; high estimated K; no odor
15	Silty SAND (SM); olive gray; medium dense; damp; 80% fine sand; 20% silt; non-plastic; medium estimated K; strong odor wet at 18 feet
20	End of Boring at 20'

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Boring: B-E
Project Name:Lim Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Vironex Drilling	Type of Rig: Geoprobe	Size of Drill: 2.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: September 17, 2001	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 18'	Total Depth of Well Completed: NA
	Well Screen Type and Diameter: NA
Static Depth of Water in Well: NA	Well Screen Slot Size: NA
Total Depth of Boring: 20'	Type and Size of Soil Sampler: 2.0" I.D. Split-Barrel Sampler



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

0 Asphalt

Silty SAND (SM); yellow-brown; medium dense; damp; 80% fine sand; 20% silt; non-plastic; medium estimated K; moderate odor

brown

5

olive gray; slight to moderate odor

10

moist

olive; strong odor

15

dark gray; strong odor

wet at 18 feet

brown; moderate odor

20

End of Boring at 20'

25

30

AQUA SCIENCE ENGINEERS, INC.

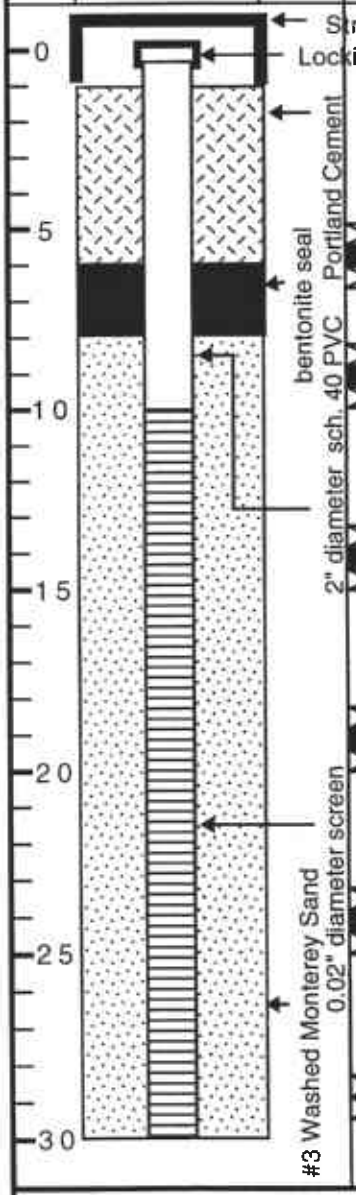
SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS

Well: MW-5

Project Name: Lim Family Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Hollow-Stem Auger	Size of Drill: 8.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: May 28, 2002	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA

Depth of Water First Encountered: 17'	Total Depth of Well Completed: 30'
Static Depth of Water in Well: 14.2'	Well Screen Type and Diameter: 2" diameter sch. 40 PVC
Total Depth of Boring: 30'	Well Screen Slot Size: 0.020" diameter
	Type and Size of Soil Sampler: 2.0" I.D. Split-barrel



Interval	Blow Counts	OVM (ppmv)	Water Level	Graphic Log	Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
					0	Concrete
						Silty SAND (SM); light brown; damp; medium dense; 70% fine sand; 25% silt; 5% medium to coarse sand; non-plastic; medium estimated K; no odor
	4 12 16	< 1			5	green to brown; dense; 60% fine sand; 40% silt
	17 20 27	< 1			10	
	16 26 25	< 1	▽		15	olive gray; 80% fine sand; 20% silt; non-plastic; slight hydrocarbon odor
			▼			wet
	12 21 43	1.1			20	gray; wet; stiff; 60% fine sand; 40% silt; slight hydrocarbon odor
	10 23 50/6"	< 1			25	90% fine sand; 10% silt; no odor
	38 50/6"	1.8			30	80% fine sand; 20% silt
						End of boring at 30'

AQUA SCIENCE ENGINEERS, INC.

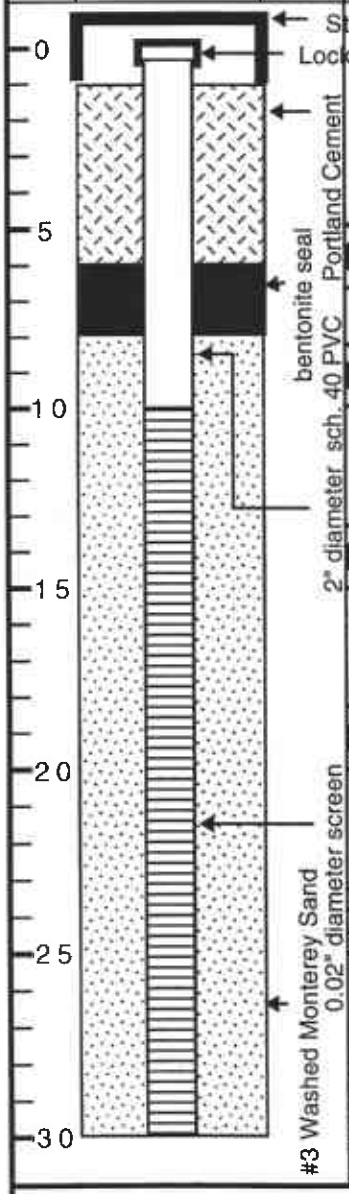
SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS

Well: MW-6

Project Name: Lim Family Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Hollow-Stem Auger	Size of Drill: 8.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: May 28, 2002	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA

Depth of Water First Encountered: 17'	Total Depth of Well Completed: 30'
	Well Screen Type and Diameter: 2" diameter sch. 40 PVC
Static Depth of Water in Well: 15.0'	Well Screen Slot Size: 0.020" diameter
Total Depth of Boring: 30'	Type and Size of Soil Sampler: 2.0" I.D. Split-barrel



SOIL/ROCK SAMPLE DATA

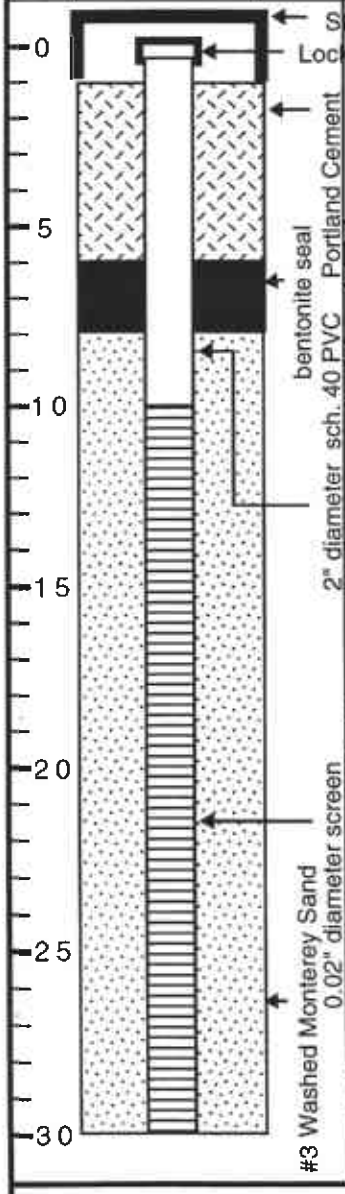
Interval	Blow Counts	OVM (ppmv)	Water Level	Graphic Log
	16 27 43	< 1		
	12 15 16	< 1		
	13 15 23	< 1	▽	
			▼	
	12 25 27	< 1		
	18 26 29	< 1		
	21 25 43	< 1		

Depth in Feet	DESCRIPTION OF LITHOLOGY standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0	Concrete
	Silty SAND (SM); light brown; damp; dense; 60% fine sand; 40% silt; non-plastic; medium estimated K; no odor
5	trace clay; very low plasticity
15	wet
	gray; 75% fine sand; 25% silt; very dense; non-plastic
20	
25	light brown
	90% fine sand; 10% silt
30	End of boring at 30'

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL COMPLETION DETAILS		Well: MW-7
Project Name: Lim Family Property	Project Location: 250 8th Street, Oakland, CA	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Hollow-Stem Auger	Size of Drill: 8.0" Diameter
Logged By: Erik H. Paddleford	Date Drilled: May 28, 2002	Checked By: Robert E. Kitay, R.G.

WATER AND WELL DATA	
Depth of Water First Encountered: 17'	Total Depth of Well Completed: 30'
	Well Screen Type and Diameter: 2" diameter sch. 40 PVC
Static Depth of Water in Well: 15.2'	Well Screen Slot Size: 0.020" diameter
Total Depth of Boring: 30'	Type and Size of Soil Sampler: 2.0" I.D. Split-barrel



SOIL/ROCK SAMPLE DATA					Depth in Feet	DESCRIPTION OF LITHOLOGY
Interval	Blow Counts	OVM (ppmv)	Water Level	Graphic Log		standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
					0	Concrete
	5 17 20	< 1			5	Silty SAND (SM); brown; damp; dense; 70% fine sand; 30% silt; non-plastic; medium estimated K; no odor
	7 13 18	1.3			10	
	8 12 22	63	▽		15	gray; dense; 60% fine sand; 35% silt; 5% clay; very low plasticity; slight hydrocarbon odor
			▼			wet
	17 22 23	889			20	gray; 75% fine sand; 25% silt; non-plastic; moderate to strong hydrocarbon odor
	38 50/6"	37.1			25	90% fine sand; 10% silt
	23 50/6"	1.9			30	dark brown to black
						End of boring at 30'

AQUA SCIENCE ENGINEERS, INC.

APPENDIX D

Analytical Results
and
Chain of Custody Documentation
for
Soil and Groundwater Samples
Collected from On-Site Soil Borings

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Eric Paddleford
Aqua Science Engineers, Inc.
208 West El Pintado Rd.
Danville, CA 94526

Subject : 5 Water Samples and 18 Soil Samples
Project Name : Lim Property
Project Number : 2808

Dear Mr. Paddleford,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-A** Matrix : Water Lab Number : 22373-01
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**43**	25	ug/L	EPA 8260B	10/1/2001
Toluene	**< 25**	25	ug/L	EPA 8260B	10/1/2001
Ethylbenzene	**< 25**	25	ug/L	EPA 8260B	10/1/2001
Total Xylenes	**< 50**	50	ug/L	EPA 8260B	10/1/2001
Methyl-t-butyl ether (MTBE)	**< 250**	250	ug/L	EPA 8260B	10/1/2001
TPH as Gasoline	**760000**	5000	ug/L	EPA 8260B	10/1/2001
Toluene - d8 (Surr)	106		% Recovery	EPA 8260B	10/1/2001
4-Bromofluorobenzene (Surr)	107		% Recovery	EPA 8260B	10/1/2001
TPH as Diesel	**170000**	2500	ug/L	M EPA 8015	10/3/2001
TPH as Motor Oil	**< 5000**	5000	ug/L	M EPA 8015	10/3/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-B** Matrix : Water Lab Number : 22373-02
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**34000**	250	ug/L	EPA 8260B	10/1/2001
Toluene	**32000**	250	ug/L	EPA 8260B	10/1/2001
Ethylbenzene	**4200**	25	ug/L	EPA 8260B	9/30/2001
Total Xylenes	**18000**	25	ug/L	EPA 8260B	9/30/2001
Methyl-t-butyl ether (MTBE)	**< 250**	250	ug/L	EPA 8260B	9/30/2001
TPH as Gasoline	**490000**	50000	ug/L	EPA 8260B	10/1/2001
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	9/30/2001
4-Bromofluorobenzene (Surr)	99.6		% Recovery	EPA 8260B	9/30/2001
TPH as Diesel	**340000**	5000	ug/L	M EPA 8015	9/30/2001
TPH as Motor Oil	**< 10000**	10000	ug/L	M EPA 8015	9/30/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-C** Matrix : Water Lab Number : 22373-03
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**6100**	25	ug/L	EPA 8260B	10/1/2001
Toluene	**4300**	25	ug/L	EPA 8260B	10/1/2001
Ethylbenzene	**890**	25	ug/L	EPA 8260B	10/1/2001
Total Xylenes	**3700**	25	ug/L	EPA 8260B	10/1/2001
Methyl-t-butyl ether (MTBE)	**< 250**	250	ug/L	EPA 8260B	10/1/2001
TPH as Gasoline	**37000**	5000	ug/L	EPA 8260B	10/1/2001
Toluene - d8 (Surr)	97.7		% Recovery	EPA 8260B	10/1/2001
4-Bromofluorobenzene (Surr)	98.6		% Recovery	EPA 8260B	10/1/2001
TPH as Diesel	**12000**	50	ug/L	M EPA 8015	9/28/2001
TPH as Motor Oil	**< 100**	100	ug/L	M EPA 8015	9/28/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-D** Matrix : Water Lab Number : 22373-04
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**16000**	25	ug/L	EPA 8260B	9/30/2001
Toluene	**7400**	25	ug/L	EPA 8260B	9/30/2001
Ethylbenzene	**12000**	25	ug/L	EPA 8260B	9/30/2001
Total Xylenes	**48000**	25	ug/L	EPA 8260B	9/30/2001
Methyl-t-butyl ether (MTBE)	**< 250**	250	ug/L	EPA 8260B	9/30/2001
TPH as Gasoline	**700000**	5000	ug/L	EPA 8260B	9/30/2001
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	9/30/2001
4-Bromofluorobenzene (Surr)	98.9		% Recovery	EPA 8260B	9/30/2001
TPH as Diesel	**130000**	500	ug/L	M EPA 8015	10/3/2001
TPH as Motor Oil	**< 1000**	1000	ug/L	M EPA 8015	10/3/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-E** Matrix : Water Lab Number : 22373-05
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**5600**	100	ug/L	EPA 8260B	10/3/2001
Toluene	**2200**	100	ug/L	EPA 8260B	10/3/2001
Ethylbenzene	**5500**	100	ug/L	EPA 8260B	10/3/2001
Total Xylenes	**22000**	100	ug/L	EPA 8260B	10/3/2001
Methyl-t-butyl ether (MTBE)	**< 1000**	1000	ug/L	EPA 8260B	10/3/2001
TPH as Gasoline	**200000**	10000	ug/L	EPA 8260B	10/3/2001
Toluene - d8 (Surr)	98.9		% Recovery	EPA 8260B	10/3/2001
4-Bromofluorobenzene (Surr)	98.6		% Recovery	EPA 8260B	10/3/2001
TPH as Diesel	**230000**	1000	ug/L	M EPA 8015	10/3/2001
TPH as Motor Oil	**< 100**	100	ug/L	M EPA 8015	9/28/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-A-14.5-15.0** Matrix : Soil Lab Number : 22373-08
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/28/2001
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/28/2001
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/28/2001
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/28/2001
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/28/2001
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	9/28/2001
Toluene - d8 (Surr)	99.2		% Recovery	EPA 8260B	9/28/2001
4-Bromofluorobenzene (Surr)	96.1		% Recovery	EPA 8260B	9/28/2001
TPH as Diesel	**< 1.0**	1.0	mg/Kg	M EPA 8015	10/1/2001
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	10/1/2001
1-Chlorooctadecane (Diesel Surrogate)	113		% Recovery	M EPA 8015	10/1/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-B-13.5-14.0** Matrix : Soil Lab Number : 22373-12
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.048**	0.0050	mg/Kg	EPA 8260B	9/30/2001
Toluene	**0.016**	0.0050	mg/Kg	EPA 8260B	9/30/2001
Ethylbenzene	**0.025**	0.0050	mg/Kg	EPA 8260B	9/30/2001
Total Xylenes	**0.058**	0.0050	mg/Kg	EPA 8260B	9/30/2001
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/30/2001
TPH as Gasoline	**1.5**	1.0	mg/Kg	EPA 8260B	9/30/2001
Toluene - d8 (Surr)	99.8		% Recovery	EPA 8260B	9/30/2001
4-Bromofluorobenzene (Surr)	94.5		% Recovery	EPA 8260B	9/30/2001
TPH as Diesel	**< 1.0**	1.0	mg/Kg	M EPA 8015	10/1/2001
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	10/1/2001
1-Chlorooctadecane (Diesel Surrogate)	113		% Recovery	M EPA 8015	10/1/2001

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-C-17.5-18.0** Matrix : Soil Lab Number : 22373-16
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**53**	0.25	mg/Kg	EPA 8260B	9/28/2001
Toluene	**360**	2.5	mg/Kg	EPA 8260B	9/30/2001
Ethylbenzene	**98**	0.25	mg/Kg	EPA 8260B	9/28/2001
Total Xylenes	**660**	5.0	mg/Kg	EPA 8260B	9/30/2001
Methyl-t-butyl ether (MTBE)	**< 0.25**	0.25	mg/Kg	EPA 8260B	9/28/2001
TPH as Gasoline	**9100**	200	mg/Kg	EPA 8260B	9/30/2001
Toluene - d8 (Surr)	96.5		% Recovery	EPA 8260B	9/28/2001
4-Bromofluorobenzene (Surr)	107		% Recovery	EPA 8260B	9/28/2001
TPH as Diesel	**1600**	1.0	mg/Kg	M EPA 8015	10/1/2001
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	10/1/2001
1-Chlorooctadecane (Diesel Surrogate)	116		% Recovery	M EPA 8015	10/1/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-D-17.5-18.0** Matrix : Soil Lab Number : 22373-19
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**7.8**	0.25	mg/Kg	EPA 8260B	9/28/2001
Toluene	**22**	0.25	mg/Kg	EPA 8260B	9/28/2001
Ethylbenzene	**18**	0.25	mg/Kg	EPA 8260B	9/28/2001
Total Xylenes	**71**	1.0	mg/Kg	EPA 8260B	9/28/2001
Methyl-t-butyl ether (MTBE)	**< 0.25**	0.25	mg/Kg	EPA 8260B	9/28/2001
TPH as Gasoline	**1200**	50	mg/Kg	EPA 8260B	9/28/2001
Toluene - d8 (Surr)	98.2		% Recovery	EPA 8260B	9/28/2001
4-Bromofluorobenzene (Surr)	107		% Recovery	EPA 8260B	9/28/2001
TPH as Diesel	**1500**	1.0	mg/Kg	M EPA 8015	10/1/2001
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	10/1/2001
1-Chlorooctadecane (Diesel Surrogate)	112		% Recovery	M EPA 8015	10/1/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 22373
Date : 10/7/2001

Project Name : **Lim Property**
Project Number : **2808**

Sample : **BH-E-17.0-17.5** Matrix : Soil Lab Number : 22373-23
Sample Date :9/17/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.12**	0.0050	mg/Kg	EPA 8260B	9/28/2001
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/28/2001
Ethylbenzene	**0.17**	0.0050	mg/Kg	EPA 8260B	9/28/2001
Total Xylenes	**0.020**	0.010	mg/Kg	EPA 8260B	9/28/2001
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/28/2001
TPH as Gasoline	**4.0**	1.0	mg/Kg	EPA 8260B	9/28/2001
Toluene - d8 (Surr)	98.4		% Recovery	EPA 8260B	9/28/2001
4-Bromofluorobenzene (Surr)	96.7		% Recovery	EPA 8260B	9/28/2001
TPH as Diesel	**2.2**	1.0	mg/Kg	M EPA 8015	10/1/2001
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	10/1/2001
1-Chlorooctadecane (Diesel Surrogate)	116		% Recovery	M EPA 8015	10/1/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 22373

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

22373 Quality Control Data - Method Blank

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/27/2001
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/27/2001
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/27/2001
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/27/2001
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/27/2001
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	9/27/2001
Toluene - d8 (Surr)	96.4		% Recovery	EPA 8260B	9/27/2001
4-Bromofluorobenzene (Surr)	94.1		% Recovery	EPA 8260B	9/27/2001

Approved By: Joel Kiff

Report Number : 22373

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Spike Recovery Data														
Benzene	22491-34	<0.0050	0.0371	0.0395	0.00722	0.0127	mg/Kg	EPA 8260B	9/29/2001	19.4	32.2	49.2	70-130	25
Toluene	22491-34	<0.0050	0.0371	0.0395	0.0157	0.0250	mg/Kg	EPA 8260B	9/29/2001	42.2	63.2	39.7	70-130	25
Tert-Butanol	22491-34	<0.0050	0.186	0.198	0.161	0.176	mg/Kg	EPA 8260B	9/29/2001	87.0	89.3	2.62	70-130	25
Methyl-t-Butyl Ether	22491-34	<0.0050	0.0371	0.0395	0.0347	0.0377	mg/Kg	EPA 8260B	9/29/2001	93.4	95.4	2.09	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 22373

Date : 10/7/2001

QC Report : Laboratory Control Sample (LCS)

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	0.0385	mg/Kg	EPA 8260B	9/27/2001	88.9	70-130
Toluene	0.0385	mg/Kg	EPA 8260B	9/27/2001	87.6	70-130
Tert-Butanol	0.193	mg/Kg	EPA 8260B	9/27/2001	92.0	70-130
Methyl-t-Butyl Ether	0.0385	mg/Kg	EPA 8260B	9/27/2001	90.8	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 22373

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

22373 Quality Control Data - Method Blank

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	10/2/2001
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	10/2/2001
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	10/2/2001
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	10/2/2001
Methyl-t-butyl ether (MTBE)	**< 5.0**	5.0	ug/L	EPA 8260B	10/2/2001
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	10/2/2001
Toluene - d8 (Surr)	99.9		% Recovery	EPA 8260B	10/2/2001
4-Bromofluorobenzene (Surr)	97.1		% Recovery	EPA 8260B	10/2/2001

Approved By: Joel Kiff

Report Number : 22373

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Spike Recovery Data														
Benzene	22406-01	<0.50	19.4	19.3	19.9	20.1	ug/L	EPA 8260B	10/2/2001	102	104	1.89	70-130	25
Toluene	22406-01	<0.50	19.4	19.3	19.7	19.8	ug/L	EPA 8260B	10/2/2001	101	103	1.34	70-130	25
Tert-Butanol	22406-01	<5.0	97.3	96.3	74.5	91.6	ug/L	EPA 8260B	10/2/2001	76.6	95.1	21.6	70-130	25
Methyl-t-Butyl Ether	22406-01	<0.50	19.4	19.3	19.0	19.2	ug/L	EPA 8260B	10/2/2001	97.5	99.8	2.26	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

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Report Number : 22373

QC Report : Laboratory Control Sample (LCS)

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	20.0	ug/L	EPA 8260B	9/28/2001	106	70-130
Toluene	20.0	ug/L	EPA 8260B	9/28/2001	106	70-130
Tert-Butanol	100	ug/L	EPA 8260B	9/28/2001	109	70-130
Methyl-t-Butyl Ether	20.0	ug/L	EPA 8260B	9/28/2001	99.6	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

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Report Number : 22373

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

22373 Quality Control Data - Method Blank

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	**< 1.0**	1.0	mg/Kg	M EPA 8015	9/30/2001
TPH as Motor Oil	**< 10**	10	mg/Kg	M EPA 8015	9/30/2001
1-Chlorooctadecane (Diesel Surrogate)	107		% Recovery	M EPA 8015	9/30/2001

Approved By: Joel Kiff

Report Number : 22373

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Spike Recovery Data														
TPH as Diesel	22373-08	<1.0	20.0	20.0	22.2	22.0	mg/Kg	M EPA 8015	9/30/2001	111	110	0.793	60-140	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

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Report Number : 22373

QC Report : Laboratory Control Sample (LCS)

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
TPH as Diesel	20.0	mg/Kg	M EPA 8015	9/30/2001	111	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

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Report Number : 22373

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

22373 Quality Control Data - Method Blank

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	**< 50**	50	ug/L	M EPA 8015	9/26/2001
TPH as Motor Oil	**< 100**	100	ug/L	M EPA 8015	9/26/2001

Approved By: Joel Kiff

Report Number : 22373

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/7/2001

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Spike Recovery Data														
TPH as Diesel	Blank	<50	1000	1000	1280	1280	ug/L	M EPA 8015	9/26/2001	128	128	0.00	70-130	25

Approved By: Joel Kiff

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208 W. El Pintado Road
Danville, CA 94526
(925) 820-9391
FAX (925) 837-4853

Chain of Custody 22373

SAMPLER (SIGNATURE) E Riddleford (PHONE NO.)

PROJECT NAME Lim Property JOB NO. 2808

ADDRESS 250 8th street, Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/7 OXY'S / HVOCS (EPA 8260)	Hold		COMPOSITE	
BH-A	9/17	840	Water	5	X		X																-01
BH-B	9/17	919	Water	5	X		X																-02
BH-C	9/17	1015	Water	6	X		X																-03
BH-D	9/17		Water	6	X		X																-04
BH-E	9/17	1230	Water	5	X		X																-05
BH-A-4.5-5.0	9/17	806	Soil	1																X			-06
BH-A-9.5-10.0	9/17	810	Soil	1																X			-07
BH-A-14.5-15.0	9/17	814	Soil	1	X		X																-08
BH-A-19.5-20.0	9/17	820	Soil	1																X			-09
BH-B-4.5-5.0	9/17	857	Soil	1																X			-10
BH-B-9.5-10	9/17	901	Soil	1																X			-11

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY LABORATORY:	COMMENTS:
(signature) Riddleford (time) 10:30	(signature) (time)	(signature) (time)	(signature) John Cuttle (time) 1025	
(printed name) Riddleford (date) 9/18/01	(printed name) (date)	(printed name) (date)	(printed name) JOHN CUTTLE (date) 091801	TURN AROUND TIME: STANDARD (circled) 24Hr 48Hr 72Hr
Company- ASE	Company-	Company-	Company- Kiff Analytical	OTHER:

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Danville, CA 94526
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FAX (925) 837-4853

Chain of Custody 22373

SAMPLER (SIGNATURE) (PHONE NO.)

PROJECT NAME Lim Property JOB NO. 2808

ADDRESS 250 8th street, Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/7 OXY'S / HVOCS (EPA 8260)	Hold		COMPOSITE	
BH-B-13.5-14.0	9/17	906	Soil	1	X		X																12
BH-C-4.5-5.0	9/17	~~1102~~ 942	Soil	1																X			13
BH-C-9.5-10.0	9/17	950	Soil	1																X			14
BH-C-14.5-15.0	9/17	954	Soil	1																X			15
BH-C-17.5-15.0	9/17	1000	Soil	1	X		X																16
BH-D-4.5-5.0	9/17	1108	Soil	1																X			17
BH-D-9.5-10.0	9/17	1112	Soil	1																X			18
BH-D-17.5-18.0	9/17	1120	Soil	1	X		X																19
BH-E-4.5-5.0	9/17	1152	Soil	1																X			20
BH-E-9.5-10.0	9/17	1155	Soil	1																X			21
BH-E-13.5-14.0	9/17	1159	Soil	1																X			22

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY LABORATORY:	COMMENTS:
(signature) 10:25 (time)	(signature) (time)	(signature) (time)	(signature) 1025 (time)	
(printed name) 9/18/01 (date)	(printed name) (date)	(printed name) (date)	JOHN CUTTLE / 091801 (printed name) (date)	TURN AROUND TIME: STANDARD 24Hr 48Hr 72Hr
Company-	Company-	Company-	Company- Kiff Analytical	OTHER:

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Chain of Custody 22373

PAGE 3 OF 3

SAMPLER (SIGNATURE) E [signature] (PHONE NO.)

PROJECT NAME Lin Property JOB NO. 2808

ADDRESS 250 8th Street, Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/7 OXY'S / HVOCS (EPA 8260)			COMPOSITE
BH-E-17.0-17.5	9/17	1202	Soil	1	X		X															-23

RELINQUISHED BY: E [signature] 10:25
(signature) (time)
E [signature] 9/18/01
(printed name) (date)
Company- [illegible]

RECEIVED BY:
(signature) (time)
(printed name) (date)
Company-

RELINQUISHED BY:
(signature) (time)
(printed name) (date)
Company-

RECEIVED BY LABORATORY: John Cuttle/1025
(signature) (time)
JOHN CUTTLE/091801
(printed name) (date)
Company- Kiff Analytical

COMMENTS:

TURN AROUND TIME
STANDARD 24Hr 48Hr 72Hr
OTHER:

APPENDIX E

Well Sampling Field Log

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: Lim Property
Job #: 2802 Date of sampling: 6/11/02
Well Name: MW-1 Sampled by: EP
Total depth of well (feet): 26.78 Well diameter (inches): 2
Depth to water before sampling (feet): 15.33
Thickness of floating product if any: —
Depth of well casing in water (feet): 11.45
Number of gallons per well casing volume (gallons): 1.8
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 5.4
Equipment used to purge the well: bailer
Time Evacuation Began: 1030 Time Evacuation Finished: 1050
Approximate volume of groundwater purged:
Did the well go dry?: NO After how many gallons: —
Time samples were collected: 1100
Depth to water at time of sampling: —
Percent recovery at time of sampling: —
Samples collected with: bailer
Sample color: clear/brown Odor: none
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	66.9	6.43	836
2	66.3	6.49	830
3	65.9	6.51	827

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-1	5	40ml VOA	x	x	
	1	1 liter amber		x	

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aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: Lim Property
Job #: 2808 Date of sampling: 6/11/02
Well Name: MW-2 Sampled by: EP
Total depth of well (feet): 26.78 Well diameter (inches): 2
Depth to water before sampling (feet): 14.06
Thickness of floating product if any: —
Depth of well casing in water (feet): 12.76
Number of gallons per well casing volume (gallons): 2
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 6
Equipment used to purge the well: bailer
Time Evacuation Began: 910 Time Evacuation Finished: 930
Approximate volume of groundwater purged: 6
Did the well go dry?: no After how many gallons: -
Time samples were collected: 935
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/gray Odor: moderate
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	71.9	6.32	929
2	69.3	6.30	934
3	68.2	6.29	939

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-2	5	40 ml VOAs	x	x	
	1	1 liter amber		x	

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aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: Lim Property
Job #: 2808 Date of sampling: 6/11/02
Well Name: MW-3 Sampled by: EP
Total depth of well (feet): — Well diameter (inches): 2
Depth to water before sampling (feet): 15.16
Thickness of floating product if any: 0.9
Depth of well casing in water (feet):
Number of gallons per well casing volume (gallons):
Number of well casing volumes to be removed:
Req'd volume of groundwater to be purged before sampling (gallons):
Equipment used to purge the well:
Time Evacuation Began: Time Evacuation Finished:
Approximate volume of groundwater purged:
Did the well go dry?: After how many gallons:
Time samples were collected:
Depth to water at time of sampling:
Percent recovery at time of sampling:
Samples collected with:
Sample color: Odor:
Description of sediment in sample:

SAMPLED

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis

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aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: Lim
Job #: 2808 Date of sampling: 6/11/02
Well Name: MW-4 Sampled by: EP
Total depth of well (feet): 21.80 Well diameter (inches): 2
Depth to water before sampling (feet): 14.72
Thickness of floating product if any: -
Depth of well casing in water (feet): 7.08
Number of gallons per well casing volume (gallons): 1.1
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 3.3
Equipment used to purge the well: bailer
Time Evacuation Began: 840 Time Evacuation Finished: 855
Approximate volume of groundwater purged: 3.5
Did the well go dry?: no After how many gallons: -
Time samples were collected: 900
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/brown/gray Odor: moderate
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	68.5	6.53	748
2	68.7	6.52	740
3	70.5	6.52	737

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-4	5	40 ml VOA's	X	X	
	1	1 liter amber		X	

aqua science engineers inc.

WELL SAMPLING FIELD LOG

Project Name and Address: Lim
Job #: 2808 Date of sampling: 6/11
Well Name: MW-5 Sampled by: EI
Total depth of well (feet): 29.58 Well diameter (inches): 2
Depth to water before sampling (feet): 14.23
Thickness of floating product if any: -
Depth of well casing in water (feet): 15.35
Number of gallons per well casing volume (gallons): 2.4
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 7.2
Equipment used to purge the well: bailer
Time Evacuation Began: 950 Time Evacuation Finished: 1016
Approximate volume of groundwater purged: 7.2
Did the well go dry?: no After how many gallons: -
Time samples were collected: 1020
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/brown Odor: silty
Description of sediment in sample: none

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	69.2	6.93	833
2	69.1	6.90	826
3	69.0	6.87	822

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-5	5	40ml VIA	x	x	
	1	1 liter amber		x	

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WELL SAMPLING FIELD LOG

Project Name and Address: Lim
Job #: 2908 Date of sampling: 6/11/02
Well Name: MW-6 Sampled by: EP
Total depth of well (feet): 29.~~5~~48 Well diameter (inches):
Depth to water before sampling (feet): 14.95
Thickness of floating product if any: -
Depth of well casing in water (feet): 14.53
Number of gallons per well casing volume (gallons): 2.3
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 7
Equipment used to purge the well: bailer
Time Evacuation Began: 7:30 Time Evacuation Finished: 745
Approximate volume of groundwater purged: 7
Did the well go dry?: no After how many gallons: -
Time samples were collected: 755
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/brown Odor: none
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	65.3	6.93	608
2	65.4	6.92	598
3	65.5	6.95	591

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-6	5	40 ml VOA	x	x	
	1	1 Liter amber		x	

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WELL SAMPLING FIELD LOG

Project Name and Address: Lim
Job #: 2808 Date of sampling: 6/11
Well Name: MW-7 Sampled by: EP
Total depth of well (feet): 29.42 Well diameter (inches): 2
Depth to water before sampling (feet): 15.19
Thickness of floating product if any: -
Depth of well casing in water (feet): 14.23
Number of gallons per well casing volume (gallons): 2.3
Number of well casing volumes to be removed: 3
Req'd volume of groundwater to be purged before sampling (gallons): 7
Equipment used to purge the well: bailer
Time Evacuation Began: 810 Time Evacuation Finished: 825
Approximate volume of groundwater purged: 7
Did the well go dry?: no After how many gallons: -
Time samples were collected: 835
Depth to water at time of sampling: -
Percent recovery at time of sampling: -
Samples collected with: bailer
Sample color: clear/brown Odor: ~~none~~ slight
Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	67.8	6.78	771
2	67.3	6.875	722
3	67.0	6.73	706

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-7	5	40 ml VOA	x	x	
	1	1 l.ter amber		x	

APPENDIX F

Analytical Results
and
Chain of Custody Documentation
for
Soil Samples Collected from Borings
For Monitoring Wells

Submission #: 2002-05-0454

Date: June 4, 2002

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com
CA DHS ELAP#2496

Aqua Science Engineers, Inc.
208 West El Pintado Road
Danville, CA 94526

Attn: Mr. Robert Kitay

Project: 2808
Lim Property

Dear Mr. Kitay,

Attached is our report for your samples received on Wednesday May 29, 2002
This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after July 13, 2002 unless you have requested otherwise.
We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919.
You can also contact me via email. My email address is: vvancil@chromalab.com

Sincerely,

Vincent Vancil
Project Manager

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

Oil & Grease (Total) by EPA 1664

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www.chromalab.com

CA DHS ELAP#2496

Aqua Science Engineers, Inc.	☒ 208 West El Pintado Road Danville, CA 94526
Attn: Robert Kitay	Phone: (925) 820-9391 Fax: (925) 837-4853
2808	Project: Lim Property

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW-5-14`	Soil	05/28/2002 08:44	3
MW-6-14`	Soil	05/28/2002 10:23	7
MW-7-14`	Soil	05/28/2002 12:36	11

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

Oil & Grease (Total) by EPA 1664

Aqua Science Engineers, Inc.
Attn: Robert Kitay

Test Method: 1664
Prep Method: 1664

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1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www stl-inc.com
www.chromalab.com

CA DHS ELAP#2496

Sample ID:	**MW-5-14**	Lab Sample ID:	2002-05-0454-003
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/29/2002
Sampled:	05/28/2002 08:44	QC-Batch:	2002/05/29-01.23
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Oil & Grease (total)	ND	50	mg/Kg	1.00	05/29/2002	

Submission #: 2002-05-0454

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Oil & Grease (Total) by EPA 1664

Aqua Science Engineers, Inc.
Attn: Robert Kitay

Test Method: 1664
Prep Method: 1664

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www.chromalab.com

CA DHS ELAP#2496

Sample ID:	**MW-6-14**	Lab Sample ID:	2002-05-0454-007
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/29/2002
Sampled:	05/28/2002 10:23	QC-Batch:	2002/05/29-01.23
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Oil & Grease (total)	ND	50	mg/Kg	1.00	05/29/2002	

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Oil & Grease (Total) by EPA 1664

Aqua Science Engineers, Inc.
Attn: Robert Kitay

Test Method: 1664
Prep Method: 1664

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CA DHS ELAP#2496

Sample ID:	**MW-7-14**	Lab Sample ID:	2002-05-0454-011
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/29/2002
Sampled:	05/28/2002 12:36	QC-Batch:	2002/05/29-01.23
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Oil & Grease (total)	ND	50	mg/Kg	1.00	05/29/2002	

Submission #: 2002-05-0454

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Oil & Grease (Total) by EPA 1664

Batch QC report

Test Method: 1664 Prep Method: 1664

Method Blank **Soil** **QC Batch # 2002/05/29-01.23**

MB: 2002/05/29-01.23-001 Date Extracted: 05/29/2002

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Oil & Grease (total)	ND	50	mg/Kg	05/30/2002	

Submission #: 2002-05-0454

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CA DHS ELAP#2496

Oil & Grease (Total) by EPA 1664

Batch QC report

Test Method: 1664 Prep Method: 1664

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2002/05/29-01.23**

LCS: 2002/05/29-01.23-002 Extracted: 05/29/2002 Analyzed: 05/30/2002

LCSD: 2002/05/29-01.23-003 Extracted: 05/29/2002 Analyzed: 05/30/2002

Compound	Conc. [mg/Kg]		Exp.Conc. [mg/Kg]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Oil & Grease (total)	788	764	800	800	98.5	95.5	3.1	79-114	20		

Submission #: 2002-05-0454

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CA DHS ELAP#2496

Oil & Grease (Total) by EPA 1664

Batch QC Report

Test Method: 1664 Prep Method: 1664

Matrix Spike (MS / MSD)	**Soil**	**QC Batch # 2002/05/29-01.23**
Sample ID: **MW-6-14` >> MS**		Lab ID: 2002-05-0454-007
MS: 2002/05/29-01.23-004	Extracted: 05/29/2002	Analyzed: 05/30/2002
		Dilution: 1
MSD: 2002/05/29-01.23-005	Extracted: 05/29/2002	Analyzed: 05/30/2002
		Dilution: 1

Compound	Conc. [mg/Kg]			Exp.Conc.		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD	[%]	Recovery	RPD	MS	MSD
Oil & Grease	728	733	ND	798	799	91.2	91.7	0.5	79-114	20		

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

Gas/BTEX Compounds by 8015M/8021

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Aqua Science Engineers, Inc.	✉ 208 West El Pintado Road Danville, CA 94526
Attn: Robert Kitay	Phone: (925) 820-9391 Fax: (925) 837-4853
2808	Project: Lim Property

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW-5-14`	Soil	05/28/2002 08:44	3
MW-6-14`	Soil	05/28/2002 10:23	7
MW-7-14`	Soil	05/28/2002 12:36	11

Submission #: 2002-05-0454

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Gas/BTEX Compounds by 8015M/8021

Aqua Science Engineers, Inc.

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www.chromalab.com

CA DHS ELAP#2496

Test Method: 8015M 8021B

Prep Method: 5035

Sample ID:	**MW-5-14**	Lab Sample ID:	2002-05-0454-003
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/30/2002 15:21
Sampled:	05/28/2002 08:44	QC-Batch:	2002/05/30-01.03
Matrix:	Soil		

Compound	Result	Rep Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	1.00	05/30/2002 15:21	
Benzene	ND	0.0050	mg/Kg	1.00	05/30/2002 15:21	
Toluene	ND	0.0050	mg/Kg	1.00	05/30/2002 15:21	
Ethyl benzene	ND	0.0050	mg/Kg	1.00	05/30/2002 15:21	
Xylene(s)	ND	0.0050	mg/Kg	1.00	05/30/2002 15:21	
MTBE	ND	0.0050	mg/Kg	1.00	05/30/2002 15:21	
Surrogate(s)						
Trifluorotoluene	105.4	53-125	%	1.00	05/30/2002 15:21	
4-Bromofluorobenzene-FID	84.8	58-124	%	1.00	05/30/2002 15:21	

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

Gas/BTEX Compounds by 8015M/8021

Aqua Science Engineers, Inc.

Test Method: 8015M 8021B

Attn: Robert Kitay

Prep Method: 5035

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CA DHS ELAP#2496

Sample ID:	**MW-6-14**	Lab Sample ID:	2002-05-0454-007
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/30/2002 15:52
Sampled:	05/28/2002 10:23	QC-Batch:	2002/05/30-01.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	1.00	05/30/2002 15:52	
Benzene	ND	0.0050	mg/Kg	1.00	05/30/2002 15:52	
Toluene	ND	0 0050	mg/Kg	1.00	05/30/2002 15:52	
Ethyl benzene	ND	0.0050	mg/Kg	1.00	05/30/2002 15:52	
Xylene(s)	ND	0.0050	mg/Kg	1.00	05/30/2002 15:52	
MTBE	ND	0.0050	mg/Kg	1.00	05/30/2002 15:52	
Surrogate(s)						
Trifluorotoluene	102.4	53-125	%	1.00	05/30/2002 15:52	
4-Bromofluorobenzene-FID	81.8	58-124	%	1.00	05/30/2002 15:52	

Submission #: 2002-05-0454

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Gas/BTEX Compounds by 8015M/8021

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CA DHS ELAP#2496

Test Method: 8015M
8021B

Prep Method: 5035

Sample ID:	**MW-7-14**	Lab Sample ID:	2002-05-0454-011
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/30/2002 18.30
Sampled:	05/28/2002 12:36	QC-Batch:	2002/05/30-01.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	1.00	05/30/2002 18:30	
Benzene	ND	0.0050	mg/Kg	1.00	05/30/2002 18:30	
Toluene	ND	0.0050	mg/Kg	1.00	05/30/2002 18:30	
Ethyl benzene	ND	0.0050	mg/Kg	1.00	05/30/2002 18:30	
Xylene(s)	ND	0.0050	mg/Kg	1.00	05/30/2002 18:30	
MTBE	ND	0.0050	mg/Kg	1.00	05/30/2002 18:30	
Surrogate(s)						
Trifluorotoluene	96.6	53-125	%	1.00	05/30/2002 18:30	
4-Bromofluorobenzene-FID	85.7	58-124	%	1.00	05/30/2002 18:30	

Submission #: 2002-05-0454

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CA DHS ELAP#2496

Gas/BTEX Compounds by 8015M/8021

Batch QC report

Test Method: 8015M
8021B

Prep Method: 5035

Method Blank **Soil** **QC Batch # 2002/05/30-01.03**

MB: 2002/05/30-01.03-003 Date Extracted: 05/30/2002 09:09

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	05/30/2002 09:09	
Benzene	ND	0.0050	mg/Kg	05/30/2002 09:09	
Toluene	ND	0.0050	mg/Kg	05/30/2002 09:09	
Ethyl benzene	ND	0.0050	mg/Kg	05/30/2002 09:09	
Xylene(s)	ND	0.0050	mg/Kg	05/30/2002 09:09	
MTBE	ND	0.0050	mg/Kg	05/30/2002 09:09	
Surrogate(s)					
Trifluorotoluene	100.2	53-125	%	05/30/2002 09:09	
4-Bromofluorobenzene-FID	78.9	58-124	%	05/30/2002 09:09	

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

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Gas/BTEX Compounds by 8015M/8021

Batch QC report

Test Method: 8015M Prep Method: 5035

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2002/05/30-01.03**

LCS: 2002/05/30-01.03-006 Extracted: 05/30/2002 10:42 Analyzed: 05/30/2002 10:42

LCSD: 2002/05/30-01.03-007 Extracted: 05/30/2002 11:13 Analyzed: 05/30/2002 11:13

Compound	Conc. [mg/Kg]		Exp.Conc. [mg/Kg]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Gasoline	0.569	0.531	0.500	0.500	113.8	106.2	6.9	75-125	35		
Surrogate(s)											
4-Bromofluorobenzene	416	403	500	500	83.2	80.6		58-124			

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

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CA DHS ELAP#2496

Gas/BTEX Compounds by 8015M/8021

Batch QC report

Test Method: 8021B Prep Method: 5035

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2002/05/30-01.03**

LCS: 2002/05/30-01.03-004 Extracted: 05/30/2002 09:40 Analyzed: 05/30/2002 09:40

LCSD: 2002/05/30-01.03-005 Extracted: 05/30/2002 10:11 Analyzed: 05/30/2002 10:11

Compound	Conc. [mg/Kg]		Exp.Conc. [mg/Kg]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Benzene	0.102	0.0962	0.1000	0.1000	102.0	96.2	5.9	77-123	35		
Toluene	0.0984	0.0934	0.1000	0.1000	98.4	93.4	5.2	78-122	35		
Ethyl benzene	0.0967	0.0938	0.1000	0.1000	96.7	93.8	3.0	70-130	35		
Xylene(s)	0.287	0.280	0.300	0.300	95.7	93.3	2.5	75-125	35		
Surrogate(s)											
Trifluorotoluene	511	468	500	500	102.2	93.6		53-125			

Submission #: 2002-05-0454

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Gas/BTEX Compounds by 8015M/8021

Batch QC Report

Test Method: 8021B Prep Method: 5035

Matrix Spike (MS / MSD) **Soil** **QC Batch # 2002/05/30-01.03**

Sample ID: **MW-6-14` >> MS** Lab ID: 2002-05-0454-007

MS: 2002/05/30-01.03-016 Extracted: 05/30/2002 16:24 Analyzed: 05/30/2002 16:24
Dilution: 1

MSD: 2002/05/30-01.03-017 Extracted: 05/30/2002 16:55 Analyzed: 05/30/2002 16:55
Dilution: 1

Compound	Conc. [mg/Kg]			Exp.Conc.		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD	[%]	Recovery	RPD	MS	MSD
Benzene	0.0945	0.0921	ND	0.0975	0.0973	96.9	94.7	2.3	65-135	35		
Toluene	0.0925	0.0913	ND	0.0975	0.0973	94.9	93.8	1.2	65-135	35		
Ethyl benzene	0.0907	0.0914	ND	0.0975	0.0973	93.0	93.9	1.0	65-135	35		
Xylene(s)	0.270	0.274	ND	0.2925	0.292	92.3	93.8	1.6	65-135	35		
Surrogate(s)												
Trifluorotoluene	468	465		500	500	93.6	93.0		53-125			

Submission #: 2002-05-0454

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Gas/BTEX Compounds by 8015M/8021

Batch QC Report

Test Method: 8015M Prep Method: 5035

Matrix Spike (MS / MSD) **Soil** **QC Batch # 2002/05/30-01.03**

Sample ID: **MW-6-14` >> MS** Lab ID: 2002-05-0454-007

MS: 2002/05/30-01.03-018 Extracted: 05/30/2002 17:27 Analyzed: 05/30/2002 17:27
Dilution: 1

MSD: 2002/05/30-01.03-019 Extracted: 05/30/2002 17:58 Analyzed: 05/30/2002 17:58
Dilution: 1

Compound	Conc. [mg/Kg]			Exp.Conc.		Recovery [%]		RPD	Ctrl.Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD	[%]	Recovery	RPD	MS	MSD
Gasoline	0.514	0.513	ND	0.497	0.494	103.	103.8	0.4	65-135	35		
Surrogate(s)												
4-Bromofluoroben	371	388		500	500	74.2	77.6		58-124			

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

Total Extractable Petroleum Hydrocarbons (TEPH)

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CA DHS ELAP#2496

Aqua Science Engineers, Inc.	✉ 208 West El Pintado Road Danville, CA 94526
Attn: Robert Kitay	Phone: (925) 820-9391 Fax: (925) 837-4853
2808	Project: Lim Property

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW-5-14`	Soil	05/28/2002 08:44	3
MW-6-14`	Soil	05/28/2002 10:23	7
MW-7-14`	Soil	05/28/2002 12:36	11

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

Total Extractable Petroleum Hydrocarbons (TEPH)

Aqua Science Engineers, Inc.
Attn: Robert Kitay

Test Method: 8015M
Prep Method: 3550/8015M

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#2496

Sample ID:	**MW-5-14`**	Lab Sample ID:	2002-05-0454-003
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/30/2002 08:44
Sampled:	05/28/2002 08:44	QC-Batch:	2002/05/30-01.10
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	1.0	mg/Kg	1.00	05/30/2002 20:22	
Motor Oil	ND	50	mg/Kg	1.00	05/30/2002 20:22	
Surrogate(s)						
o-Terphenyl	81.0	60-130	%	1.00	05/30/2002 20:22	

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

Total Extractable Petroleum Hydrocarbons (TEPH)

Aqua Science Engineers, Inc.
Attn: Robert Kitay

Test Method: 8015M
Prep Method: 3550/8015M

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#2496

Sample ID:	**MW-6-14`**	Lab Sample ID:	2002-05-0454-007
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/30/2002 08:44
Sampled:	05/28/2002 10:23	QC-Batch:	2002/05/30-01.10
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	1.0	mg/Kg	1.00	05/30/2002 18:58	
Motor Oil	ND	50	mg/Kg	1.00	05/30/2002 18:58	
Surrogate(s)						
o-Terphenyl	92.9	60-130	%	1.00	05/30/2002 18:58	

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#2496

Total Extractable Petroleum Hydrocarbons (TEPH)

Aqua Science Engineers, Inc.
Attn: Robert Kitay

Test Method: 8015M
Prep Method: 3550/8015M

Sample ID:	**MW-7-14`**	Lab Sample ID:	2002-05-0454-011
Project:	2808 Lim Property	Received:	05/29/2002 13:25
		Extracted:	05/30/2002 08:44
Sampled:	05/28/2002 12:36	QC-Batch:	2002/05/30-01.10
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	1.0	mg/Kg	1.00	05/30/2002 19:44	
Motor Oil	ND	50	mg/Kg	1.00	05/30/2002 19:44	
Surrogate(s)						
o-Terphenyl	78.0	60-130	%	1.00	05/30/2002 19:44	

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

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1220 Quarry Lane
Pleasanton, CA 94566

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www.chromalab.com

CA DHS ELAP#2496

Total Extractable Petroleum Hydrocarbons (TEPH)

Batch QC report

Test Method: 8015M

Prep Method: 3550/8015 M

Method Blank	**Soil**	**QC Batch # 2002/05/30-01.10**
MB: 2002/05/30-01.10-001		Date Extracted: 05/30/2002 08:44

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Diesel	ND	1	mg/Kg	05/30/2002 18:22	
Motor Oil	ND	50	mg/Kg	05/30/2002 18:22	
Surrogate(s)					
o-Terphenyl	86.9	60-130	%	05/30/2002 18:22	

Submission #: 2002-05-0454

SEVERN TRENT SERVICES

STL San Francisco
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Pleasanton, CA 94566

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Fax 925 484 1096
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www.chromalab.com

CA DHS ELAP#2496

Total Extractable Petroleum Hydrocarbons (TEPH)

Batch QC report

Test Method: 8015M Prep Method: 3550/8015M

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2002/05/30-01.10**

LCS: 2002/05/30-01.10-002 Extracted: 05/30/2002 08:44 Analyzed: 05/30/2002 17:10

LCSD: 2002/05/30-01.10-003 Extracted: 05/30/2002 08:44 Analyzed: 05/30/2002 17:46

Compound	Conc. [mg/Kg]		Exp.Conc. [mg/Kg]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Diesel	31.7	32.3	41.7	41.7	76.0	77.5	2.0	60-130	25		
Surrogate(s)											
o-Terphenyl	18.8	18.7	20.0	20.0	93.8	93.3		60-130	0		

2002-05-0454

66579

Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526
(925) 820-9391
FAX (925) 837-4853

Chain of Custody

SAMPLER (SIGNATURE)

PROJECT NAME Lim Property JOB NO. 2515

ADDRESS 250 8th Street, Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520) ____	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/ 7 OXY'S / LEAD SCAVANGERS/ 1,2-DCP (EPA 8260)	TOTAL DISSOLVED SOLIDS (TDS)	HOLD
MW-5-5'	5/21/02	810	Soil	1																	X
MW-5-9'		820																			X
MW-5-14'		544			X		X				X										
MW-5-19'		554																			X
MW-6-5'		1013																			X
MW-6-9'		1014																			X
MW-6-14'		1023			X		X				X										
MW-6-19'		1030																			X
MW-7-5'		1225																			X
MW-7-9'		1228																			X
MW-7-14'	↓	1236	↓	↓	X		X				X										

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY LABORATORY:
S. Padilla 1325 (signature) (time)	(signature) (time)	(signature) (time)	D. Harrington 1325 (signature) (time)
E. Padilla 5/23/02 5/24/02 (printed name) (date)	(printed name) (date)	(printed name) (date)	D. Harrington 5/24/02 (printed name) (date)
Company- ASE	Company-	Company-	Company- STL-SF

COMMENTS:
1,2-DCP = 1,2-dichloropropane

TURN AROUND TIME
STANDARD 24Hr 48Hr 72Hr
~~OTHER:~~

2002-05-0454

66579

Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526
(925) 820-9391
FAX (925) 837-4853

Chain of Custody

PAGE 2 OF 2

SAMPLER (SIGNATURE)

PROJECT NAME Lim Property JOB NO. 2805

ADDRESS 250 8th St. Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/ 7 OXY'S / LEAD SCAVANGERS/ 1,2-DCP (EPA 8260)		Hold
MW-7-19'	5/29/02	1243	Soil	1																	X

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY LABORATORY:	COMMENTS:
[signature] 1325 (signature) (time)	(signature) (time)	(signature) (time)	D. Harrington 1325 (signature) (time)	1,2-DCP = 1,2-dichloropropane
E. Pickellefield ~~5/25/02~~ 5/29/02 (printed name) (date)	(printed name) (date)	(printed name) (date)	D. Harrington 5/29/02 (printed name) (date)	TURN AROUND TIME: **STANDARD** (circled) 24Hr 48Hr 72Hr
Company- ASE	Company-	Company-	Company- STL-SF	OTHER:

66579

SEVERN TRENT SERVICES

STL San Francisco

Sample Receipt Checklist

Submission #: 2002- 05 - 0454

Checklist completed by: (initials) CR Date: 05/29/02

Courier name: ☐ STL San Francisco ☒ Client _____

Custody seals intact on shipping container/samples	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 (4^{o} C ± 2)?	Temp: 23.1 °C	Yes____ No ✓ (1)
Water - VOA vials have zero headspace?	No VOA vials submitted____	Yes____ No____

(if bubble is present, refer to approximate bubble size and itemize in comments as **S** (small ~O), **M** (medium ~ O) or **L** (large ~ O)

Water - **pH acceptable upon receipt?** ☐ Yes ☐ No

☐ **pH adjusted**– Preservative used: ☐ HNO_3 ☐ HCl ☐ H_2SO_4 ☐ NaOH ☐ ZnOAc

For any item check-listed "No", provided detail of discrepancy in comment section below:

Comments: (1) no ice

Project Management [Routing for instruction of indicated discrepancy(ies)]

Project Manager: (initials) _____ Date: ____/____/02

Client contacted: ☐ Yes ☐ No

Summary of discussion:

Corrective Action (per PM/Client):

APPENDIX G

Analytical Results
and
Chain of Custody Documentation
for
Groundwater Samples Collected
From Monitoring Wells

KIFF ANALYTICAL LLC

Report Number : 26914
Date : 6/24/2002

Eric Paddleford
Aqua Science Engineers, Inc.
208 West El Pintado Rd.
Danville, CA 94526

Subject : 4 Water Samples
Project Name : Lim Property
Project Number : 2808

Dear Mr. Paddleford,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 26914
Date : 6/24/2002

Subject : 4 Water Samples
Project Name : Lim Property
Project Number : 2808

Case Narrative

The Method Reporting Limit for TPH as Diesel is increased due to interference from Gasoline-Range Hydrocarbons for sample MW-2. Matrix Spike/Matrix Spike Duplicate Results associated with sample MW-2 for the analytes Benzene, Methyl-t-butyl ether were affected by the analyte concentrations already present in the un-spiked sample.

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 916-297-4800

KIFF ANALYTICAL LLC

Report Number : 26914
Date : 6/24/2002

Project Name : **Lim Property**
Project Number : **2808**

Sample : **MW-1** Matrix : Water Lab Number : 26914-01
Sample Date :6/11/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	6/19/2002
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	6/19/2002
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	6/19/2002
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	6/19/2002
Methyl-t-butyl ether (MTBE)	**< 5.0**	5.0	ug/L	EPA 8260B	6/19/2002
TPH as Gasoline	**270**	50	ug/L	EPA 8260B	6/19/2002
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	6/19/2002
4-Bromofluorobenzene (Surr)	89.8		% Recovery	EPA 8260B	6/19/2002
TPH as Diesel	**330**	50	ug/L	M EPA 8015	6/23/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 26914
Date : 6/24/2002

Project Name : **Lim Property**
Project Number : **2808**

Sample : **MW-2** Matrix : Water Lab Number : 26914-02
Sample Date :6/11/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**7300**	50	ug/L	EPA 8260B	6/20/2002
Toluene	**9600**	50	ug/L	EPA 8260B	6/20/2002
Ethylbenzene	**2500**	50	ug/L	EPA 8260B	6/20/2002
Total Xylenes	**12000**	50	ug/L	EPA 8260B	6/20/2002
Methyl-t-butyl ether (MTBE)	**< 50**	50	ug/L	EPA 8260B	6/20/2002
TPH as Gasoline	**72000**	5000	ug/L	EPA 8260B	6/20/2002
1,2-Dichloroethane	**< 50**	50	ug/L	EPA 8260B	6/20/2002
1,2-Dibromoethane	**< 50**	50	ug/L	EPA 8260B	6/20/2002
Toluene - d8 (Surr)	94.1		% Recovery	EPA 8260B	6/20/2002
4-Bromofluorobenzene (Surr)	105		% Recovery	EPA 8260B	6/20/2002
Dibromofluoromethane (Surr)	102		% Recovery	EPA 8260B	6/20/2002
1,2-Dichloroethane-d4 (Surr)	98.9		% Recovery	EPA 8260B	6/20/2002
TPH as Diesel	**< 2500**	2500	ug/L	M EPA 8015	6/23/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 26914
Date : 6/24/2002

Project Name : **Lim Property**
Project Number : **2808**

Sample : **MW-5** Matrix : Water Lab Number : 26914-03
Sample Date :6/11/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Methyl-t-butyl ether (MTBE)	**28**	0.50	ug/L	EPA 8260B	6/17/2002
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	6/17/2002
1,2-Dichloroethane	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
1,2-Dibromoethane	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	6/17/2002
4-Bromofluorobenzene (Surr)	95.3		% Recovery	EPA 8260B	6/17/2002
Dibromofluoromethane (Surr)	97.6		% Recovery	EPA 8260B	6/17/2002
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	6/17/2002
TPH as Diesel	**< 50**	50	ug/L	M EPA 8015	6/23/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 26914
Date : 6/24/2002

Project Name : **Lim Property**
Project Number : **2808**

Sample : **MW-6** Matrix : Water Lab Number : 26914-04
Sample Date :6/11/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Methyl-t-butyl ether (MTBE)	**1.2**	0.50	ug/L	EPA 8260B	6/17/2002
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	6/17/2002
1,2-Dichloroethane	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
1,2-Dibromoethane	**< 0.50**	0.50	ug/L	EPA 8260B	6/17/2002
Toluene - d8 (Surr)	104		% Recovery	EPA 8260B	6/17/2002
4-Bromofluorobenzene (Surr)	94.1		% Recovery	EPA 8260B	6/17/2002
Dibromofluoromethane (Surr)	92.9		% Recovery	EPA 8260B	6/17/2002
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	EPA 8260B	6/17/2002
TPH as Diesel	**< 50**	50	ug/L	M EPA 8015	6/23/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 26914

Date : 6/24/2002

QC Report : Method Blank Data

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	< 50	50	ug/L	M EPA 8015	6/23/2002
Benzene	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Toluene	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	6/19/2002
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Toluene - d8 (Surr)	98.1		%	EPA 8260B	6/19/2002
4-Bromofluorobenzene (Surr)	102		%	EPA 8260B	6/19/2002
Dibromofluoromethane (Surr)	98.5		%	EPA 8260B	6/19/2002
1,2-Dichloroethane-d4 (Surr)	103		%	EPA 8260B	6/19/2002
Benzene	< 0.50	0.50	ug/L	EPA 8260B	6/17/2002
Toluene	< 0.50	0.50	ug/L	EPA 8260B	6/17/2002
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	6/17/2002
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	6/17/2002
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	6/17/2002
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	6/17/2002
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	6/17/2002
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	6/17/2002
Toluene - d8 (Surr)	103		%	EPA 8260B	6/17/2002
4-Bromofluorobenzene (Surr)	95.7		%	EPA 8260B	6/17/2002
Dibromofluoromethane (Surr)	93.2		%	EPA 8260B	6/17/2002
1,2-Dichloroethane-d4 (Surr)	99.6		%	EPA 8260B	6/17/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Toluene	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	6/19/2002
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	6/19/2002
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	6/19/2002
Toluene - d8 (Surr)	92.4		%	EPA 8260B	6/19/2002
4-Bromofluorobenzene (Surr)	84.0		%	EPA 8260B	6/19/2002

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 26914

Date : 6/24/2002

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
TPH as Diesel	Blank	<50	1000	1000	916	897	ug/L	M EPA 8015	6/23/02	91.6	89.7	2.08	70-130	25
Benzene	26921-32	65	39.8	38.8	88.9	95.2	ug/L	EPA 8260B	6/19/02	61.0	78.6	25.3	70-130	25
Toluene	26921-32	7.9	39.8	38.8	44.3	44.4	ug/L	EPA 8260B	6/19/02	91.5	94.1	2.79	70-130	25
Tert-Butanol	26921-32	14	199	194	213	212	ug/L	EPA 8260B	6/19/02	100	102	1.85	70-130	25
Methyl-t-Butyl Ether	26921-32	41	39.8	38.8	65.6	60.8	ug/L	EPA 8260B	6/19/02	61.5	50.6	19.5	70-130	25
Benzene	26909-02	0.69	40.0	40.0	38.8	38.0	ug/L	EPA 8260B	6/17/02	95.2	93.3	2.04	70-130	25
Toluene	26909-02	<0.50	40.0	40.0	37.2	35.9	ug/L	EPA 8260B	6/17/02	93.0	89.7	3.53	70-130	25
Tert-Butanol	26909-02	14	200	200	205	206	ug/L	EPA 8260B	6/17/02	95.7	96.3	0.588	70-130	25
Methyl-t-Butyl Ether	26909-02	<0.50	40.0	40.0	28.7	28.1	ug/L	EPA 8260B	6/17/02	71.8	70.3	2.00	70-130	25
Benzene	26914-01	<0.50	40.0	40.0	44.4	43.4	ug/L	EPA 8260B	6/19/02	111	108	2.32	70-130	25
Toluene	26914-01	<0.50	40.0	40.0	40.6	39.6	ug/L	EPA 8260B	6/19/02	101	99.1	2.32	70-130	25
Tert-Butanol	26914-01	<5.0	200	200	199	199	ug/L	EPA 8260B	6/19/02	99.4	99.7	0.311	70-130	25
Methyl-t-Butyl Ether	26914-01	<0.50	40.0	40.0	39.5	39.7	ug/L	EPA 8260B	6/19/02	98.8	99.2	0.454	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 26914

QC Report : Laboratory Control Sample (LCS)

Date : 6/24/2002

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	6/19/02	101	70-130
Toluene	40.0	ug/L	EPA 8260B	6/19/02	96.1	70-130
Tert-Butanol	200	ug/L	EPA 8260B	6/19/02	98.6	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	6/19/02	85.2	70-130
Benzene	40.0	ug/L	EPA 8260B	6/17/02	105	70-130
Toluene	40.0	ug/L	EPA 8260B	6/17/02	107	70-130
Tert-Butanol	200	ug/L	EPA 8260B	6/17/02	104	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	6/17/02	101	70-130
Benzene	40.0	ug/L	EPA 8260B	6/19/02	112	70-130
Toluene	40.0	ug/L	EPA 8260B	6/19/02	98.8	70-130
Tert-Butanol	200	ug/L	EPA 8260B	6/19/02	104	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	6/19/02	92.6	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Calscience
Environmental
Laboratories, Inc.

June 21, 2002

Joel Kiff
Kiff Analytical
720 Olive Drive, Suite D1
Davis, CA 95616-4740

Subject: **Calscience Work Order No.: 02-06-0576**
Client Reference: Lim Property

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 6/17/02 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Stephen Nowak
Project Manager

Michael J. Crisostomo
Quality Assurance Manager

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Kiff Analytical
720 Olive Drive, Suite D1
Davis, CA 95616-4740

Date Received: 06/17/02
Work Order No.: 02-06-0576
Preparation: N/A
Method: SM 5520

Project: Lim Property

Client Sample Number:	Lab Sample Number:	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
MW-2	02-06-0576-1	Aqueous	06/11/02	N/A	06/20/02	0620OGMB1

Parameter	Result	RL	DF	Qual	Units
Oil and Grease	1.1	1.0	1		mg/L

Client Sample Number:	Lab Sample Number:	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
MW-5	02-06-0576-2	Aqueous	06/11/02	N/A	06/20/02	0620OGMB1

Parameter	Result	RL	DF	Qual	Units
Oil and Grease	ND	1.0	1		mg/L

Client Sample Number:	Lab Sample Number:	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
MW-6	02-06-0576-3	Aqueous	06/11/02	N/A	06/20/02	0620OGMB1

Parameter	Result	RL	DF	Qual	Units
Oil and Grease	ND	1.0	1		mg/L

Client Sample Number:	Lab Sample Number:	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	099-05-085-1,006	Aqueous	N/A	N/A	06/20/02	0620OGMB1

Parameter	Result	RL	DF	Qual	Units
Oil and Grease	ND	1.0	1		mg/L

Note: Sample volume was insufficient for duplicate analysis.

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

GLOSSARY OF TERMS AND QUALIFIERS

Work Order Number: 02-06-0576

Qualifier	Definition
ND	Not detected at indicated reporting limit.

7440 Lincoln Way, Garden Grove, CA 92841-1432 • TEL: (714) 895-5494 • FAX: (714) 894-7501

CALSCIENCE ENVIRONMENTAL LABORATORIES, INC.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 • FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

Date 061402

Page 1 of 1

LABORATORY CLIENT: Kiff Analytical, LLC		CLIENT PROJECT NAME / NUMBER: Lim Property	P.O. NO.: COC# 26914
ADDRESS: 720 Olive Drive Suite D		PROJECT CONTACT: Joel Kiff	LAB USE ONLY 06-0576
CITY: Davis	STATE: CA ZIP: 95616	SAMPLER(S): (SIGNATURE)	COOLER RECEIPT TEMP = °C
TEL: 530-297-4800	FAX: 530-297-4803 E-MAIL		

TURNAROUND TIME: Due June 21, 2002
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___ / ___ / ___.

SPECIAL INSTRUCTIONS

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	LOCATION/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT	TPH (G)	TPH (D) or ___	BTEX / MTBE (8021B)	HALOCARBONS (8021B)	VOCs (8260B)	VOCs (5035 / 8260B) EnCore	SVOCs (8270C)	PEST (8081A)	PCBs (8082)	EDB / DBCP (504.1) or (8011)	CAC, T22 METALS (6010B)	PNAs (8310)	VOCs (TO-14A) or (TO-15)	CH_4 / TGNMO (25.1)	FIXED GASES (25.1) or (D1946)	D.I. Grab 5520				
	MW-2		061102	0935	W	1																X				
	MW-5		061102	1020	W	1																X				
	MW-6		061102	0755	W	1																X				

Relinquished by: (Signature) Michelle Woodward / Kiff Analytical	Received by: (Signature)	Date: 061402	Time: 1450
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature) Ultra Ex	Received for Laboratory by: (Signature)	Date: 6/17/02	Time: 0940

DISTRIBUTION: White with final report, Green to File, Yellow and Pink to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Yellow and Pink copies respectively.

10/01/00 Revision

Q&Q Graphic (714) 898-9702

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 02-[0][6]-[0][5][7][6]

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: Kiff Analytical DATE: 6/17/02

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.
_____ °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
4 °C IR thermometer.
_____ Ambient temperature.

Initial: BH

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A): ✓

Initial: BH

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers for analyses requested	✓		
Proper preservation noted on sample label(s)	✓		
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: BH

COMMENTS:

Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526
(925) 820-9391
FAX (925) 837-4853

Chain of Custody 26914

PAGE 1 OF 1

SAMPLER (SIGNATURE) E Paddleford

PROJECT NAME Lim Property JOB NO. 2808

ADDRESS 250 8th Street, Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520) 1664 ok	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/7 OXY'S / LEAD SCAVANGERS/ 1,2-DCP (EPA 8260)	Lead Scavengers	
01 MW-1	6/11/02	1100	water	5	X	X														X	
02 MW-2		935		6	X	X					X									X	
MW-4		900			X	X					X									X	
03 MW-5		1020			X	X					X									X	
04 MW-6		755			X	X					X									X	
05 MW-7		835			X	X					X									X	

01 MW-1 02 MW-2 03 MW-5 04 MW-6 05 MW-7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY LABORATORY:	COMMENTS:
E Paddleford (signature) (time)	(signature) (time)	(signature) (time)	John Cuttle / 0950 (signature) (time)	1,2-DCP = 1,2-dichloropropane
E. Paddleford (printed name) (date)	(printed name) (date)	(printed name) (date)	JOHN CUTTLE / 061302 (printed name) (date)	TURN AROUND TIME: STANDARD 24Hr 48Hr 72Hr
Company- Aqua Science Engineers	Company-	Company-	Company- KIFF ANALYTICAL	OTHER:

KIFF ANALYTICAL LLC

Report Number : 27161
Date : 7/2/2002

Eric Paddleford
Aqua Science Engineers, Inc.
208 West El Pintado Rd.
Danville, CA 94526

Subject : 2 Water Samples
Project Name : Lim Property
Project Number : 2808

Dear Mr. Paddleford,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 27161
Date : 7/2/2002

Subject : 2 Water Samples
Project Name : Lim Property
Project Number : 2808

Case Narrative

The Method Blank associated with samples MW-4and MW-7 contained 2.2 ug/L Toluene. Since Toluene was not detected above the reporting limit in the samples, or was reported at a concentration greater than 5 times this value, no data were flagged. The Method Blank associated with samples MW-4and MW-7 contained 0.66 ug/L Total Xylenes. Since Total Xylenes was not detected above the reporting limit in the samples, or was reported at a concentration greater than 5 times this value, no data were flagged. The Method Reporting Limit for TPH as Diesel is increased due to interference from Gasoline-Range Hydrocarbons for samples MW-4 and MW-7.

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 916-297-4800

KIFF ANALYTICAL LLC

Report Number : 27161
Date : 7/2/2002

Project Name : **Lim Property**
Project Number : **2808**

Sample : **MW-4** Matrix : Water Lab Number : 27161-01
Sample Date :6/25/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**10000**	100	ug/L	EPA 8260B	6/30/2002
Toluene	**20000**	100	ug/L	EPA 8260B	6/30/2002
Ethylbenzene	**2900**	100	ug/L	EPA 8260B	6/30/2002
Total Xylenes	**13000**	100	ug/L	EPA 8260B	6/30/2002
Methyl-t-butyl ether (MTBE)	**< 100**	100	ug/L	EPA 8260B	6/30/2002
TPH as Gasoline	**110000**	10000	ug/L	EPA 8260B	6/30/2002
1,2-Dichloroethane	**< 100**	100	ug/L	EPA 8260B	6/30/2002
1,2-Dibromoethane	**< 100**	100	ug/L	EPA 8260B	6/30/2002
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	6/30/2002
4-Bromofluorobenzene (Surr)	96.7		% Recovery	EPA 8260B	6/30/2002
Dibromofluoromethane (Surr)	101		% Recovery	EPA 8260B	6/30/2002
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	6/30/2002
TPH as Diesel	**< 3000**	3000	ug/L	M EPA 8015	6/28/2002

Joel Kiff

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 27161
Date : 7/2/2002

Project Name : **Lim Property**
Project Number : **2808**

Sample : **MW-7** Matrix : Water Lab Number : 27161-02
Sample Date :6/25/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**890**	20	ug/L	EPA 8260B	7/2/2002
Toluene	**5100**	20	ug/L	EPA 8260B	7/2/2002
Ethylbenzene	**1200**	20	ug/L	EPA 8260B	7/2/2002
Total Xylenes	**5200**	20	ug/L	EPA 8260B	7/2/2002
Methyl-t-butyl ether (MTBE)	**< 20**	20	ug/L	EPA 8260B	7/2/2002
TPH as Gasoline	**38000**	2000	ug/L	EPA 8260B	7/2/2002
1,2-Dichloroethane	**< 20**	20	ug/L	EPA 8260B	7/2/2002
1,2-Dibromoethane	**< 20**	20	ug/L	EPA 8260B	7/2/2002
Toluene - d8 (Surr)	99.9		% Recovery	EPA 8260B	7/2/2002
4-Bromofluorobenzene (Surr)	94.8		% Recovery	EPA 8260B	7/2/2002
Dibromofluoromethane (Surr)	101		% Recovery	EPA 8260B	7/2/2002
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	EPA 8260B	7/2/2002
TPH as Diesel	**< 2000**	2000	ug/L	M EPA 8015	6/28/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 27161

Date : 7/2/2002

QC Report : Method Blank Data

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	< 50	50	ug/L	M EPA 8015	6/28/2002
Benzene	< 0.50	0.50	ug/L	EPA 8260B	6/28/2002
Toluene	2.2	0.50	ug/L	EPA 8260B	6/28/2002
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	6/28/2002
Total Xylenes	0.66	0.50	ug/L	EPA 8260B	6/28/2002
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	6/28/2002
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	6/28/2002
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	6/28/2002
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	6/28/2002
Toluene - d8 (Surr)	99.5		%	EPA 8260B	6/28/2002
4-Bromofluorobenzene (Surr)	105		%	EPA 8260B	6/28/2002
Dibromofluoromethane (Surr)	102		%	EPA 8260B	6/28/2002
1,2-Dichloroethane-d4 (Surr)	100		%	EPA 8260B	6/28/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 27161

Date : 7/2/2002

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
TPH as Diesel	Blank	<50	1000	1000	914	857	ug/L	M EPA 8015	6/28/02	91.4	85.7	6.43	70-130	25
Benzene	27163-02	<0.50	20.0	20.0	21.1	20.9	ug/L	EPA 8260B	6/28/02	106	104	0.999	70-130	25
Toluene	27163-02	2.0	20.0	20.0	23.3	21.5	ug/L	EPA 8260B	6/28/02	107	97.5	9.03	70-130	25
Tert-Butanol	27163-02	140	100	100	242	245	ug/L	EPA 8260B	6/28/02	105	108	2.99	70-130	25
Methyl-t-Butyl Ether	27163-02	110	20.0	20.0	127	126	ug/L	EPA 8260B	6/28/02	77.0	73.1	5.16	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 27161

Date : 7/2/2002

QC Report : Laboratory Control Sample (LCS)

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	20.0	ug/L	EPA 8260B	6/28/02	103	70-130
Toluene	20.0	ug/L	EPA 8260B	6/28/02	121	70-130
Tert-Butanol	100	ug/L	EPA 8260B	6/28/02	106	70-130
Methyl-t-Butyl Ether	20.0	ug/L	EPA 8260B	6/28/02	101	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Calscience
Environmental
Laboratories, Inc.

July 01, 2002

Joel Kiff
Kiff Analytical
720 Olive Drive, Suite D1
Davis, CA 95616-4740

Subject: **Calscience Work Order No.: 02-06-1093**
Client Reference: Lim Property

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 6/27/02 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Stephen Nowak
Project Manager

Michael J. Crisostomo
Quality Assurance Manager

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

Kiff Analytical
720 Olive Drive, Suite D1
Davis, CA 95616-4740

Date Received: 06/27/02
Work Order No: 02-06-1093
Preparation: N/A
Method: EPA 1664A

Project: Lim Property

Client Sample Number	Lab Sample Number	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
MW-4	02-06-1093-1	Aqueous	06/25/02	N/A	06/27/02	0627HEMMB1

Parameter	Result	RL	DF	Qual	Units
Hexane Extractable Material	1.4	1.0	1		mg/L

Client Sample Number	Lab Sample Number	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
MW-7	02-06-1093-2	Aqueous	06/25/02	N/A	06/27/02	0627HEMMB1

Parameter	Result	RL	DF	Qual	Units
Hexane Extractable Material	ND	1.0	1		mg/L

Client Sample Number	Lab Sample Number	Matrix	Date Collected	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	099-05-119-168	Aqueous	N/A	N/A	06/27/02	0627HEMMB1

Parameter	Result	RL	DF	Qual	Units
Hexane Extractable Material	ND	1.0	1		mg/L

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Kiff Analytical
720 Olive Drive, Suite D1
Davis, CA 95616-4740

Project: Lim Property

Date Received: 06/27/02
Work Order No: 02-06-1093
Preparation: N/A
Method: EPA 1664A

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
02-06-1035-1	Aqueous	NA	N/A	06/27/02	0627HEMMS1

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Hexane Extractable Material	86	89	78-114	2	0-18	

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Kiff Analytical
720 Olive Drive, Suite D1
Davis, CA 95616-4740

Project: Lim Property

Date Received: 06/27/02
Work Order No: 02-06-1093
Preparation: N/A
Method: EPA 1664A

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-05-119-168	Aqueous	NA	06/27/02	NONE	0627HEMMB1

Parameter	Conc Added	Conc Recovered	%Rec	%Rec CL	Qualifiers
Hexane Extractable Material	40	35	88	78-114	

Calscience Environmental Laboratories, Inc.

GLOSSARY OF TERMS AND QUALIFIERS

Work Order Number: 02-06-1093

Qualifier	Definition
ND	Not detected at indicated reporting limit.

CALSCIENCE ENVIRONMENTAL LABORATORIES, INC.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 • FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

Date 062602

Page 1 of 1

LABORATORY CLIENT: Kiff Analytical, LLC		CLIENT PROJECT NAME / NUMBER: Lim Property	P.O. NO.: 27161
ADDRESS: 720 Olive Drive Suite D		PROJECT CONTACT: Joel Kiff	LAB USE ONLY 96-1093
CITY: Davis	STATE: CA ZIP: 95616	SAMPLER(S): (SIGNATURE)	COOLER RECEIPT TEMP = °C
TEL: 530-297-4800	FAX: 530-297-4803 E-MAIL		

TURNAROUND TIME Due July 3, 2002
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___ / ___ / ___.

SPECIAL INSTRUCTIONS

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT	TPH (G)	TPH (D) or ___	BTEX / MTBE (8021B)	HALOCARBONS (8021B)	VOCs (8260B)	VOCs (5035 / 8260B) EnCore	SVOCs (8270C)	PEST (8081A)	PCBs (8082)	EOB / OBCP (504.1) or (8011)	CAC, T22 METALS (6010B)	PNAs (8310)	VOCs (TO-14A) or (TO-15)	CH_4 / TGNMO (25.1)	FIXED GASES (25.1) or (D1946)		Oil & Grease 1664			
1	MW-4	062502	805	WA	1																	X			
2	MW-7	062502	740	WA	1																	X			

Relinquished by: (Signature) Kurt A. Kiff / KIFF ANALYTICAL	Received by: (Signature)	Date: 062602	Time: 1840
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received for Laboratory by: (Signature) Brian C Hemmer	Date: 6/27/02	Time: 10:15

DISTRIBUTION: White with final report, Green to File, Yellow and Pink to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Yellow and Pink copies respectively.

10/01/00 Revision

Q&Q Graphic (714) 898-9702

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 02- 0 6 - 1 0 9 3

Cooler 1 **of** 1

SAMPLE RECEIPT FORM

CLIENT: Kiff Analytical **DATE:** 6/27/02

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.
_____ °C Temperature blank.

LABORATORY (Other than Calscience Courier):

4 °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial: BH

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A): ✓

Initial: BH

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers for analyses requested	✓		
Proper preservation noted on sample label(s)	✓		
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: BH

COMMENTS:

Aqua Science Engineers, inc.
208 W. El Pintado Road
Danville, CA 94526
(925) 820-9391
FAX (925) 837-4853

Chain of Custody 27161

PAGE 1 OF 1

SAMPLER (SIGNATURE) E. Paddleford

PROJECT NAME Lim Property JOB NO. 2808

ADDRESS 250 8th Street, Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 5030/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520) ____	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/ 7 OXY'S / LEAD SCAVANGERS/ 1,2-DCP (EPA 8260)	Lead Scavengers	
MW-4	6/25/02	805	water	6	X	X					X									X	01
MW-7	6/25/02	740	water	6	X	X					X									X	02

RELINQUISHED BY: E. Paddleford (signature) (time) 9:14 am

E Paddleford (printed name) 6/26/02 (date)

Company- TSE

RECEIVED BY: (signature) (time)

(printed name) (date)

Company-

RELINQUISHED BY: (signature) (time)

(printed name) (date)

Company-

RECEIVED BY LABORATORY: Harold Brewer 915 (signature) (time)

Harold Brewer 062602 (printed name) (date)

Company- KIFF

COMMENTS:
1,2-DCP = 1,2-dichloropropane

TURN AROUND TIME

STANDARD 24Hr 48Hr 72Hr

OTHER:

APPENDIX H

Survey Report

Mid Coast Engineers

Civil Engineers and Land Surveyors

70 Penny Lane, Suite A - Watsonville, CA 95076
phone: (831) 724-2580
fax: (831) 724-8025
e-mail: lee@midcoastengineers.com

Richard A. Wadsworth
Civil Engineer

Stanley O. Nielsen
Land Surveyor

Lee D. Vaage
Land Surveyor

Jeff S. Nielsen
Land Surveyor

LETTER OF TRANSMITTAL

To: Eric Paddleford
Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526

Date: *July 15, 2002*

Job No.: 02142

Re: 250 8th St., Oakland

We are transmitting herewith:

Coordinate listings

Letter

Copy To:

Signed: *Lee Vaage, Land Surveyor*

If enclosures are not as noted, kindly notify us at once.

Mid Coast Engineers
Civil Engineers and Land Surveyors
70 Penny Lane, Suite A - Watsonville, CA 95076
phone: (831) 724-2580
fax: (831) 724-8025
e-mail: lee@midcoastengineers.com

Richard A. Wadsworth
Civil Engineer
Stanley O. Nielsen
Land Surveyor
Lee D. Vaage
Land Surveyor
Jeff S. Nielsen
Land Surveyor

July 15, 2002

Eric Paddleford
Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526

Re: **Lim Property, 250 8th Street, Oakland, California;** MCE Job No. 02142

Dear Mr. Paddleford,

As you requested, on June 27 and July 11 we surveyed twelve groundwater wells located at the referenced site. Our findings are shown on the attached sheets, expressed in State Plane Coordinates and Latitude/Longitude.

A notch was cut in the north rim of the PVC casing (TOC) and a cross chiseled in the north rim of the box (TOB).

Measurements were obtained from conventional survey techniques in combination with GPS techniques (Code CGPS), using control points H016 and H031 as shown on the map entitled "Record of Survey No. 990, "Monumentation System for the Port of Oakland", filed in Book 18 of Surveys at Pages 50-60, Alameda County Records. Latitude and Longitude as shown were determined from the California Coordinate System, Zone 3, NAD 83 Datum. The accuracy range of the reported information is +/- 5mm. GPS equipment is the Trimble 5700 system (Code T57).

The benchmark used for this survey is City of Oakland BM 25A, a brass pin in monument box in the sidewalk at the northeast corner of the intersection of 7th Street and Harrison. Elevation =25.812, City of Oakland Datum.

Please let me know if you have questions or need additional information.

Yours truly,

Lee D. Vaage

LIM PROPERTY
250 8th Street
Oakland, California

Aqua Science Engineers

Project : 02142
User name MCE Date & Time 11:04:25 AM 07/15/2002
Coordinate System US State Plane 1983 Zone California Zone 3 0403
Project Datum NAD 1983 (Conus)
Vertical Datum NGVD29
Coordinate Units US survey feet
Distance Units US survey feet
Elevation Units US survey feet

Point listing

Name	Northing	Easting	Elevation	Description
103	2118058.22	6050380.25	28.95	MW-7toc
104	2118058.38	6050380.24	29.22	MW-7tob
105	2118036.08	6050423.01	28.61	MW-4toc
106	2118036.39	6050422.90	29.01	MW-4tob
107	2118004.48	6050484.94	28.19	MW-2toc
108	2118004.72	6050485.00	28.74	MW-2tob
109	2117983.69	6050524.13	28.40	MW-5toc
110	2117983.83	6050524.07	28.62	MW-5tob
111	2118032.03	6050534.39	28.33	IW-1toc
112	2118032.50	6050534.12	28.75	IW-1tob
113	2118038.79	6050520.66	28.50	IW-2toc
114	2118039.22	6050520.45	28.96	IW-2tob
115	2118052.42	6050495.31	28.24	IW-4toc
116	2118052.93	6050495.21	28.79	IW-4tob
117	2118061.72	6050477.55	28.32	IW-5toc
118	2118062.21	6050477.31	28.85	IW-5tob
119	2118077.66	6050448.14	28.58	MW-3toc
120	2118077.98	6050447.95	28.91	MW-3tob
121	2118102.62	6050396.95	28.94	MW-6toc
122	2118102.77	6050396.90	29.20	MW-6tob
123	2118064.84	6050560.54	29.72	MW-1toc
124	2118065.17	6050560.43	30.12	MW-1tob
128	2118045.66	6050507.79	28.14	IW-3toc
129	2118046.09	6050507.55	28.69	IW-3tob

LIM PROPERTY
250 8th Street
Oakland, California

Aqua Science Engineers

Project : 02142
User name MCE Date & Time 11:04:25 AM 07/15/2002
Coordinate System US State Plane 1983 Zone California Zone 3 0403
Project Datum NAD 1983 (Conus)
Vertical Datum NGVD29
Coordinate Units US survey feet
Distance Units US survey feet
Elevation Units US survey feet

Point listing

Name	Latitude	Longitude	Elevation	Description
103	37.798527640°N	122.269691991°W	28.95	MW-7toc
104	37.798528082°N	122.269692031°W	29.21	MW-7tob
105	37.798469056°N	122.269542554°W	28.61	MW-4toc
106	37.798469925°N	122.269542978°W	29.01	MW-4tob
107	37.798385515°N	122.269326213°W	28.19	MW-2toc
108	37.798386183°N	122.269326019°W	28.74	MW-2tob
109	37.798330475°N	122.269189239°W	28.40	MW-5toc
110	37.798330848°N	122.269189428°W	28.62	MW-5tob
111	37.798463731°N	122.269156892°W	28.33	IW-1toc
112	37.798464995°N	122.269157852°W	28.75	IW-1tob
113	37.798481575°N	122.269204847°W	28.50	IW-2toc
114	37.798482753°N	122.269205589°W	28.96	IW-2tob
115	37.798517698°N	122.269293459°W	28.24	IW-4toc
116	37.798519079°N	122.269293822°W	28.79	IW-4tob
117	37.798542300°N	122.269355514°W	28.32	IW-5toc
118	37.798543643°N	122.269356390°W	28.85	IW-5tob
119	37.798584537°N	122.269458320°W	28.58	MW-3toc
120	37.798585406°N	122.269459019°W	28.91	MW-3tob
121	37.798650427°N	122.269637091°W	28.94	MW-6toc
122	37.798650828°N	122.269637285°W	29.20	MW-6tob
123	37.798555188°N	122.269068549°W	29.72	MW-1toc
124	37.798556092°N	122.269068949°W	30.11	MW-1tob
128	37.798499764°N	122.269249829°W	28.14	IW-3toc
129	37.798500945°N	122.269250684°W	28.69	IW-3tob

	A	B	C	D	E	F	G	H	I	J	K	L
1		IW-1	MW	06/27/2002	37.7984637	-122.2691569	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
2		IW-2	MW	06/27/2002	37.7984816	-122.2692048	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
3		IW-3	MW	07/11/2002	37.7984998	-122.2692498	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
4		IW-4	MW	06/27/2002	37.7985177	-122.2692935	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
5		IW-5	MW	06/27/2002	37.7985423	-122.2693555	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
6		MW-1	MW	06/27/2002	37.7985552	-122.2690685	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
7		MW-2	MW	06/27/2002	37.7983855	-122.2693262	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
8		MW-3	MW	06/27/2002	37.7985845	-122.2694583	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
9		MW-4	MW	06/27/2002	37.7984691	-122.2695426	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
10		MW-5	MW	06/27/2002	37.7983305	-122.2691892	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
11		MW-6	MW	06/27/2002	37.7986504	-122.2696371	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing
12		MW-7	MW	06/27/2002	37.7985276	-122.2696920	CGPS	NAD83	0.05	Mid Coast Engineers	T57	top of casing

	A	B	C	D	E	F	G	H	I	J
1		IW-1	06/27/2002	28.33	CGPS	29		Mid Coast Engineers		top of casing
2		IW-2	06/27/2002	28.50	CGPS	29		Mid Coast Engineers		top of casing
3		IW-3	07/11/2002	28.14	CGPS	29		Mid Coast Engineers		top of casing
4		IW-4	06/27/2002	28.24	CGPS	29		Mid Coast Engineers		top of casing
5		IW-5	06/27/2002	28.32	CGPS	29		Mid Coast Engineers		top of casing
6		MW-1	06/27/2002	29.72	CGPS	29		Mid Coast Engineers		top of casing
7		MW-2	06/27/2002	28.19	CGPS	29		Mid Coast Engineers		top of casing
8		MW-3	06/27/2002	28.58	CGPS	29		Mid Coast Engineers		top of casing
9		MW-4	06/27/2002	28.61	CGPS	29		Mid Coast Engineers		top of casing
10		MW-5	06/27/2002	28.40	CGPS	29		Mid Coast Engineers		top of casing
11		MW-6	06/27/2002	28.94	CGPS	29		Mid Coast Engineers		top of casing
12		MW-7	06/27/2002	28.95	CGPS	29		Mid Coast Engineers		top of casing

APPENDIX I

Pump Tests Report
From
H_2OGEOL

H2OGEOL

A GROUND WATER CONSULTANCY

Mr. Robert E. Kitay, R.G.
Aqua Science Engineers, Inc.
208 West El Pintado Road
Danville, California 94526

July 16, 2002

RE: Well Performance Test, Monitoring Well MW-4 Lim Property, 250 8th Street, Oakland, California.

Dear Mr. Kitay;

The monitoring wells associated with the Lim Property, 250 8th Street in Oakland, California were inspected for purposes of hydraulic testing in the early morning hours of June 22, 2002. The IW series wells were found not to be assessable due to wellhead configuration and approximately 0.5 feet of gasoline on the water in IW-5 and a trace of gasoline on the water on IW-4. MW-3 was found to have about 0.9 feet of floating gasoline and MW-7 about 0.08 feet. MW-5 and MW-2 were inaccessible for test setup by 06:30 hours due to delivery trucks.

MW-4 was selected for well hydraulic testing. Water levels were also monitored in MW-2, MW-5, MW-6, and MW-7 though no response was observed (as anticipated due to the distances from MW-4).

The depth to water in MW-4 was measured at 14.85 feet below the top of the casing at 07:15 hours. The total well depth was about 23 feet as compared to the borehole log recorded total depth of 28 feet. A Grundfos Redi-Flo 2 pump was used to conduct the well performance test. Consequently, with the pump sitting on the bottom of the well, the total available drawdown was 7.15 feet.

A three step step drawdown test was planned. Based on test results of well EW-1 at 726 Harrison Street (approximately 185 feet from monitoring well MW-4 associated with the Lim property) nominal discharge rates were to be 0.25, 0.5, and 0.75 gallons per minute.

Under the test configuration head conditions the 0.25 GPM nominal rate was 0.285 GPM and the 0.5 GPM nominal rate was 0.487 GPM. The transient state drawdown at 0.285 GPM was 2.25 feet and the 5.10 feet at 0.487 GPM. At the 0.75 GPM nominal rate the water level was lowered to the pump within the first three minutes resulting in failure of the third step.

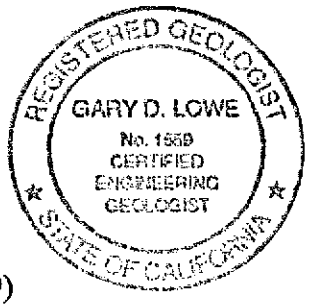
The well performance test results for MW-4 are portrayed in attached Figure 1. The nominal discharge rate from MW-4 is 0.5 GPM, though this may not be sustainable due to dewatering and other factors, etc.

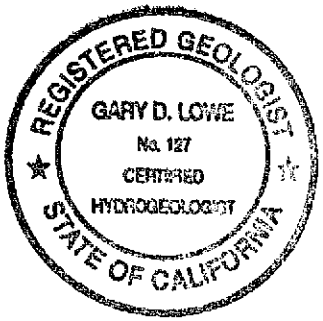
It will not be possible to conduct a long tern test of well MW-4 (or any of the other monitoring wells) for the length of time necessary to record an interpretable response in and of the monitoring wells. The closest, MW-3, is about 50 feet away and the water level response in this well will be obscured by floating gasoline hydraulics. Well MW-7 is some 64 feet away, MW- 2 70 feet, and MW-6 78 feet. The other monitoring wells are even further distant. Observation wells would be required at distances of about 3, 6, and 12 feet to yield an interpretable response from a long term test of well MW-4 (or any of the other existing monitoring wells).

From this well performance test one can conclude that there is no reason to suspect a meaningful difference in groundwater hydraulics between the Lim property at 250 8th Street and the Chan property at 726 Harrison Street. The proximity of these two properties is such that the plume from the Lim property is adjacent to if not commingled with the upgradient end of the plume form the Chan property. At the Chan property the anticipated well yield was also 0.5 GPM and the calculated capture zone ranged from 0.33 to 1.67 feet in width.

Please do not hesitate to email h2ogeol@attbi.com or call the undersigned at 925-373-9211 and/or telefax at 925-373-9222 should you have any questions.

Sincerely,





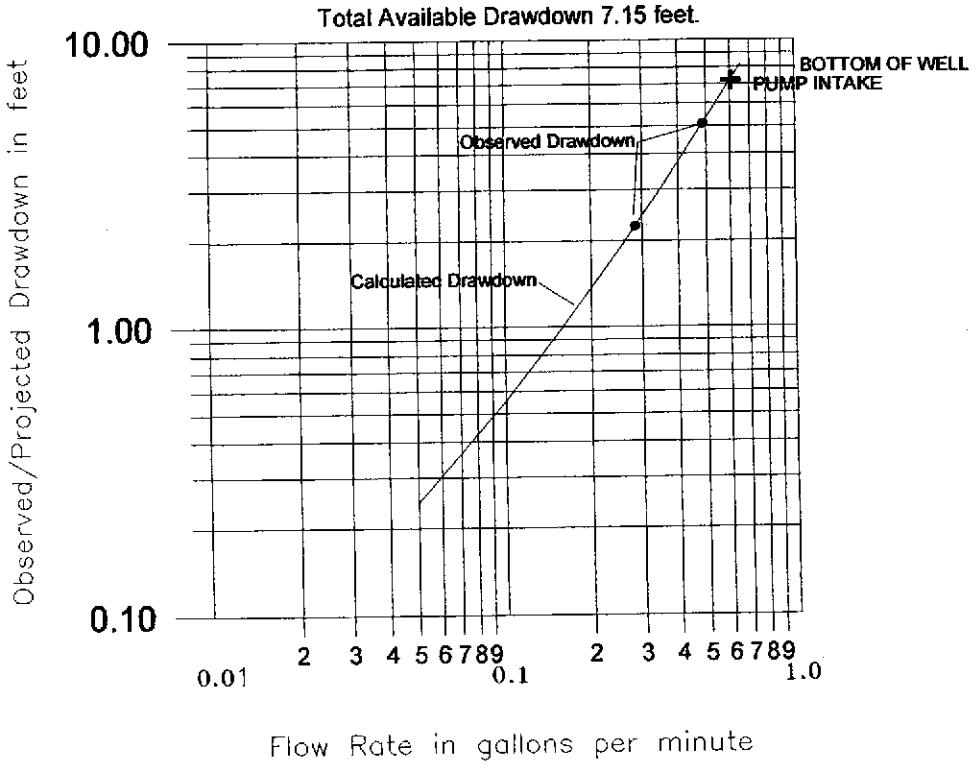
Gary D. Lowe, R.G. (3768), C.E.G. (1559)
C.HG. (127)
Principal, Hydrogeologist
H_2OGEOL A GroundWater Consultancy

Two-inch Monitoring Well MW-4 associated with 250 8th Street, Oakland, Alameda County, California. Variable rate well performance test conducted June 22, 2002 between 07:00 and 10:00 hours. Depth to static water was 14.85 feet below casing top at 07:15 hours on 06/22/02 (14.45 feet below ground surface).

The graph below shows controlled nominal flow rates and observed drawdowns at transient condition times during the test. Projections based on the polynomial $D = BQ + CQ^P$.

D = Drawdown, feet
Q = Flow Rate, GPM
B,C,P are coefficients

For observed data:
B = 4.2632
C = 12.7849
P = 2.000



- **Step Drawdown Test Data**

This test represents aquifer-well system conditions at the time it was conducted and those imposed by the equipment employed. Yield is a function of aquifer characteristics near the well, including storage features, both in the well and in the aquifer (e.g., dewatering), and the well design. Performance over time is a function of pumping-plant operation features and history, screen and filter pack condition, and groundwater/aquifer matrix geochemistry and geochemical (and biogeochemical) reactions to the change in conditions imposed by the well system. All of these factors change through time, therefore, performance will also vary over time.

H2OGEOL
A GROUNDWATER CONSULTANCY

MONITORING WELL MW-4
STEP TEST OF JUNE 22, 2002
250 8th STREET
OAKLAND, CALIFORNIA

FIGURE
1