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Geological Technics Inc.

REPORT

Dual Phase Pilot Test

Soil Vapor & Groundwater Extraction

**Arrow Rentals Service
187 North L Street
Livermore, CA**

**Project No. 1262.2
November 7, 2006**

**Prepared for:
Tony & Rita Sullins
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November 7, 2006

Project No.: 1262.2
Project Name: Sullins

Tony & Rita Sullins
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RE: Report – Dual Phase Extraction Pilot Test Report
Location- Arrow Rentals Service, 187 North L St., Livermore, CA

Dear Mr. & Ms. Sullins:

Geological Technics Inc. has prepared the following report for the Dual Phase Extraction Pilot Test conducted on October 16 - 20, 2006, at the 187 North L Street property in Livermore, California. If you have any questions, please contact me at (209) 522-4119.

Respectfully submitted,

Raynold I. Kablanow II, Ph.D.
Vice President

cc: Jerry Wickham - ACEH
USTCUF
Chris Davidson, City of Livermore
Matt Katen, Zone #7 Water Agency
Heidi Timken – Timken Johnson Hwang
Jennifer Sedlecheck – Exxon Mobile Corp.

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1.0 INTRODUCTION

Gasoline range petroleum hydrocarbons associated with underground storage tank (UST) systems have been documented in soil and groundwater at the subject site (see Figures 1 and 2 for vicinity and site maps). The site also experienced an environmental impact when a gasoline delivery was introduced into a subsurface vapor/monitoring well rather than the UST fill pipe ("Pitcock Release").

The work performed to date is summarized below*:

- 1972 – Three 1,500 gallon gasoline USTs removed.
- 1984 – A single 1,000 gallon gasoline UST installed.
- 1986 – Two gasoline USTs removed (4,000 & 6,000 gallon).
- June 1985 – Pitcock Petroleum dispenses ~600 gallons into a vapor monitoring well adjacent to the 1,000 gasoline UST (Pitcock Release).
- September 1988 – Three monitoring wells installed (W-1, W-2 and W-3).
- March 1989 – Five soil borings advanced (B-1 through B-5).
- July 1990 – Five monitoring wells installed (W-A through W-E), three soil borings advanced (B-7, B-8 and B-1A), and a soil gas survey was completed.
- March 1991 – A single soil boring advanced (B-F).
- January 1992 - UST pipeline soil excavation and sampling, two soil borings advanced (B-G and B-H).

- March 1994 – Dual Phase Extraction pilot test performed.
- March 1996- Four monitoring wells installed (W-1s, W-Bs, W-3s and W-Es).
- 1988 to present – Intermittent monitoring/sampling of select wells.
- October 2006- five continuous tubing multi-Chambered wells installed (the MW-4/104/204/304/404 series through MW-8/108/208/308).

* Pre-2006 data from Woodward Clyde Consultants and ACEH documentation.

The data compiled during the course of this investigation indicate that the soil and groundwater were impacted with petroleum hydrocarbons from at least two separate sources.

As noted above, a Dual Phase Pilot Test was performed by Woodward Clyde Consultants (WCC) in March 1994. Geological Technics Inc. (GTI) performed a limited file review of the Alameda County Environmental Health's (ACEH) files on April 27, 2006 and copied relevant data from the WCC 1994 pilot test report (December 20, 1995 - portions included as Appendix A). As discussed below, they encountered a problem while performing the test in 1994.

Dual phase extraction involves the use of soil vapor extraction and groundwater extraction simultaneously from one well - extracting groundwater induces a cone of depression that exposes more impacted soil to vapor extraction. The problem encountered by WCC was that groundwater elevation exceeded the screened intervals of the site's wells and therefore soil vapor extraction was not effective and was not evaluated during the pilot test.

WCC did report the following data:

- An extraction rate of 1.7 to 2.0 gallons per minute (gpm) was developed in well W-1.
- An extraction rate of 4 cubic feet per minute (cfm) was developed for vapor extraction in W-1.
- Based on extraction rate and measured drawdown in W-1 they estimated hydraulic conductivity at 6×10^{-4} cm/sec (as a sand aquifer material).
- Potential capture zone as 50 feet from well W-1.

GTI has developed our June 28, 2006 "Feasibility Study Work Plan" and subsequent addendum to evaluate the feasibility of using dual phase extraction to achieve clean up of the soil and groundwater plumes. The work plan included installing a new shallow vapor extraction well to overcome the obstacle of the fluctuating water table as encountered by WWC in 1994. The work plan also included a limited air sparging test in existing well W-1s. The ACEH approved GTI's work plan in their July 27, 2006 letter.

The following sections summarize the field activities that were completed on October 16 – 20, 2006 according to the GTI's June 28, 2006 work plan.

2.0 EXTRACTION WELL

GTI proposed a new shallow vapor extraction well to be screened above the historical range of groundwater. Well EW-1 was installed in the vicinity of the former UST excavation and the most heavily impacted areas of documented soil contamination. See Figure 3 – Site Detail Map for the well location.

2.1 Extraction Well Installation

Prior to commencing work, a soil boring/monitoring well permit was secured from the Zone #7 Water Agency and the ACEH was notified at least 48 hours in advance. The subsurface was cleared of underground utilities by notifying Underground Service Alert.

On October 3, 2006, Cascade Drilling Inc. of Sacramento, California mobilized to the site to install new extraction well EW-1. The boring was drilled using a 10-inch outside diameter continuous flight hollow stem auger. Soil cuttings and drilling decontamination water were placed in DOT-17 approved 55 gallon drums and retained at the site until their disposal can be arranged. The well was free drilled without sampling due to its proximity to existing wells.

The well was constructed using 4-inch diameter PVC casing with flush threads. The following table illustrates the construction details:

Well	Diameter	Screened Interval (ft)	Filter Pack #3 (ft)	Bentonite Annular Seal (ft)	Cement Grout (ft)
EW-1	4"	10 - 25'	9.5 – 25'	7.5 – 9.5	0 – 7.5'

A transition seal of bentonite pellets was installed above the sand (#2/12) filter pack, hydrated and allowed to set for thirty minutes. The surface seal was achieved by pumping a neat cement grout (augmented with <5% bentonite) into the borehole through the augers. The well was secured with a locking watertight cap encased in a flush mounted traffic rated well box.

The well construction details are shown in the boring log included in Appendix B.

2.2 Well Survey

The new extraction well was surveyed at the same time as the existing and new monitoring wells in accordance with GeoTracker requirements by Keir & Wright Civil Engineers of Livermore, California on October 16, 2006. As required under AB2886, GTI submitted the

survey data in accordance with GeoTracker requirements on October 27, 2006 (confirmation #4848341226 & 2452635049).

3.0 PILOT TESTS

Soil vapor and groundwater extraction are two proven technologies for the remediation of gasoline impacted sites. Dual Phase Extraction (DPE) involves the use of both technologies simultaneously from one well - extracting groundwater induces a cone of depression that exposes more impacted soil to vapor extraction. GTI utilized the services of Mako Industries (Mako) of Pleasanton, California to provide equipment for the extraction test. Mako provided a portable trailer comprised of a vacuum blower, a liquid ring pump to separate water/soil vapors, a thermal oxidizer to treat extracted vapors, and manifolds to distribute vacuum among various extraction hoses. A Mako subcontractor provided a propane tank for fuel to operate the thermal oxidizer and American Valley provided a trailer for use as an extracted groundwater holding tank.

The general process for the dual phase extraction was as follows:

- Remove vapors and groundwater from the extraction well(s) using the vacuum pump capable of producing ~20 inches of mercury vacuum. The vapors and water were drawn out of the well(s) through a stinger set at the desired depth for extraction.
- The influent vapors and water were separated in a portable vacuum tank.
- The contaminated vapors were then extracted through a liquid ring pump and oxidized in a thermal oxidizer.
- Collect data for vacuum flow and contaminant concentrations and temperature.
- The captured contaminated groundwater was transferred to a storage tank via a transfer pump. The storage tank was hauled off-site by a licensed hauler (American Valley) for transportation to a waste disposal facility.

On October 12, 2006 the Underground Storage Tank Cleanup Fund Program (USTCFP) staff issued a Cost Pre-Approval letter for the subject pilot test scheduled to commence on October 16, 2006. The letter indicated that GTI was limited to 20 hours of oversight/supervision for the week long test (equivalent of 4 hours per day for five days). GTI communicated this ruling to Mr. Jerry Wickham of ACEH on Friday, October 13, 2006 and it was agreed that the pilot test would be performed as scheduled. In lieu of the USTCFP ruling, GTI limited system monitoring and sampling during the pilot test to achieve as much data collection as possible while minimizing costs. This included performing sounding and sampling of the wells included in the semi-annual groundwater monitoring program on Monday, October 16, 2006. These data could then be used as pre-pilot test baseline levels for contaminant concentrations and groundwater levels (and for the Site Conceptual Model and Groundwater Monitoring Report development).

Pre-test depth to water measurements were conducted on the morning of October 16, 2006 to record groundwater levels. The groundwater level was approximately 34 feet below grade surface. The extraction equipment trailer, propane fuel delivery and water storage tank trailer setup occupied the majority of Monday morning activities. When American Valley delivered the tank trailer, they also used their vacuum truck to remove previously generated well purge water from groundwater monitoring events and well installation decon/purge water generated on October 2 – 10, 2006.

The test was then started with vapor extraction only from well EW-1 to determine vacuum radius of influence and then progressed to other well configurations as discussed in detail below.

Soil vapor samples were periodically collected and submitted to Excelchem Environmental Labs of Rocklin, California (State Certified Laboratory #2119) for the following analysis by EPA Method 8021/8015M:

- Benzene, toluene, ethylbenzene and xylene (BTEX)
- Gasoline range petroleum hydrocarbons (TPH-G)

A Chain of Custody was completed for all samples collected and tracked to ensure sample integrity. The soil vapor laboratory data are included in Appendix C and summarized in Table E1, Appendix E.

Groundwater samples were also taken from select wells and submitted to either Entech Analytical Labs, Inc. of Santa Clara, California (State Certified Laboratory #2346) or California Laboratory Services of Rancho Cordova, California (certification #1233) for the following analyses:

- Benzene, Toluene, Ethylbenzene and Xylene (BTEX) by EPA method 8021B
- Gasoline range petroleum hydrocarbons (TPH-G) by EPA method 8015M
- Diesel by EPA method 8015B

The groundwater laboratory data are included in Appendix D and summarized in Table F1, Appendix F.

As required under AB2886, GTI submitted the laboratory data in accordance with GeoTracker requirements on November 7, 2006 (confirmation #5939904272, 2949748158, 7733956098, 2550662815 & 4453318357).

3.1 Vapor Extraction from Well EW-1

Monday, October 16th

GTI staff installed an extraction hose (stinger) in well EW-1 at a depth of approximately three feet bgs and vacuum applied at approximately 11:00 A.M. Vacuum and flow rate measurements were made in the wells W-1s and W-Bs using equipment provided by Mako at

periodic intervals. Each wells' vacuum was measured by placing a cap over the well and attaching a gauge to the cap's orifice. The field measurements conducted by GTI staff are included in Table E2, Appendix E.

The system was left in this configuration overnight with system readings taken from the surrounding wells at one hour intervals to start. The vacuum and organic vapor meter (OVM) readings had reached asymptotic levels by the following morning.

3.2 Vapor Extraction from Well W-1s

Tuesday, October 17th

GTI staff installed the stinger in well W-1s at a depth of approximately three feet bgs and vacuum applied at approximately 9:05 A.M. Vacuum and flow rate measurements were made as above. At approximately 11:00 A.M., the system was reaching conditions similar to EW-1 vapor extraction so the transition was made to dual phase extraction rather than dedicate a full 24 hours to soil vapor extraction only.

3.3 Dual Phase Extraction from Well W-1s

Tuesday, October 17th

At approximately 11:15 A.M., the stinger was lowered in well W-1s to 34 feet below grade surface (bgs) and dual phase extraction (DPE) began at approximately 11:30 A.M. The stinger was slowly lowered in the well to promote groundwater extraction without deadheading and left at 41 feet bgs for the remainder of the test. The field measurements conducted by GTI staff are included in Table E2, Appendix E.

The system was left in this configuration overnight with system readings taken from the surrounding wells at one hour intervals to start. The vacuum and organic vapor meter (OVM) readings had exhibited slowly increasing levels by the following morning.

GTI recorded the treatment trailer effluent discharge meter to determine the amount of groundwater extracted. The meter readings were then used to calculate groundwater extraction rates that started out 0.2 gallons per minute (gpm) on October 17th. The next morning the pumping rate again was 0.2 gpm. The pumping data are included in Table F2, Appendix F.

3.4 Dual Phase Extraction from Wells EW-1 & W-1s

Wednesday, October 18th

The amount of water generated overnight by DPE in W-1s was only 320 gallons. The system was changed to extract vapor from EW-1 while continuing DPE in W-1s. This configuration commenced at approximately 9:30 A.M. and was continued overnight. The groundwater

extraction rate with the system vacuum divided between EW-1 and W-1s fell to 0.1 gpm and eventually to less than 0.1 gpm overnight.

3.5 Dual Phase Extraction from Well W-1

Thursday, October 19th

Only 471 gallons of groundwater had been extracted by Thursday morning so the system was re-configured to extract groundwater from W-1. The system was intermittently started and stopped during the day to perform sampling of the well and the air sparge test discussed below. Groundwater extraction commenced continuously at 2:30 P.M. and the rate reached 1 gpm by 4:35 P.M. The stinger was left at 40 feet bgs in this well overnight.

3.6 Air Sparging into Well W-1s

Thursday, October 19th

GTI installed a four (4) foot section of ¾" diameter, slotted PVC pipe onto 38 feet of blank PVC pipe and placed the apparatus in the bottom of well W-1s. The W-1s casing was fitted with an adaptor cap and connected to a compressor with an in-line air flow meter and pressure regulator. Air sparging commenced at 10:30 A.M. at a rate of 1.5 cubic feet per minute (cfm) at a pressure of 10 psi. The flow rate was increased to approximately 3.7 cfm at a pressure of 8 psi and left in this configuration overnight.

The air sparging data are included in Table G1, Appendix G.

3.7 Dual Phase Extraction from Well W-A

Thursday, October 19th

In our May 26, 2006 "Additional Site Characterization" work plan GTI stated that well W-A was found and appeared to be serviceable. In fact the well cap was subsequently found to be cracked and storm water may have infiltrated the well. For this reason the W-A well box was replaced during the October 2 – 6, 2006 well installation activities.

On Monday, October 16, 2006, well W-A was sounded. Upon retrieval a viscous black substance coated the sounding tape and it took over fifteen minutes to de-contaminate the tape. The well was not monitored during the first three days of the test for this reason and due to the fact that it was located in the driveway to the facility. With equipment and customers driving over it, well access was problematic and it could not be left open without fear of damage or contaminant ingress.

GTI staff made a decision to re-habilitate the well with available equipment on Thursday night after the Arrow Rentals facility was closed for the night. At 5:30 P.M. staff lowered a DPE stinger into the well and then used an Arrow Rentals pressure washer to flush the well of the black viscous substance. When the fluid was extracted by the vacuum hose, the water

visible in the sight tube on the DPE treatment trailer turned jet black. It is not known if the black material was from surface infiltration into the cracked well cap, extremely weathered petroleum hydrocarbons, biological material or a combination of the three. The combustion chamber of the thermal oxidizer shot up from ~1450°F to over 1800° so the material was presumably organic. The stinger was left in well W-A overnight along with the stinger in W-1 for maximum groundwater extraction. By the following morning the appearance of the extracted water from W-1 was clear but with black flakes in suspension. (The flakes resembled drippings on the side of a paint can as if the black film had dried on the wall of the casing and the pressure washer knocked it off. This suggests that the black material was related to surface infiltration.)

3.8 Extraction Termination

Friday, October 20th

The process of terminating the test was initiated by taking final system measurements and dismantling the equipment while continuing to use the available propane fuel. Air sparging was stopped in well W-1s at 6:30 A.M. and the stinger from well W-A was removed to facilitate opening the facility for business. The traffic ramps that protect the extraction hoses were reconfigured and extraction from both wells W-A and W-1 commenced at 11:00 A.M. At 1:30 P.M., both stingers were set into well W-A to remove as much contamination as possible from this heavily impacted well. The system was turned off at 2:45 P.M., the stingers removed from the well and de-mobilization activities commenced. Mako staff arrived to pick up their trailer and when informed of the well W-A conditions they used fresh water to cleanout their hoses and the trailer piping by flushing with tap water. This water was also transferred to the storage tank.

During purging and sampling of the site's wells approximately 300 gallons of waste water was generated and stored in 55 gallon poly drums. For water disposal cost savings GTI staff used the extraction system stinger/pump to transfer this water into the holding tank as well. Excluding the washout water generated by Mako and the well purge water, the total gallons of groundwater extracted during the five day test totaled approximately 3,251 gallons. A detailed analysis of the extraction data is presented in the following sections.

4.0 DATA ANALYSIS

In the following sections GTI will discuss data generated by the test that can be used to design a treatment system for full site remediation.

4.1 Vapor Extraction

GTI monitored the soil vapor extraction process by periodically measuring vacuum pressure in wells W-1s, W-Bs and EW-1 during various extraction schemes. (ACEH directed that

vacuum be measured in the new CMT™ wells. GTI attempted to do this in wells MW-4 and MW-5 but it was problematic due to the irregular orifice of the well chambers. Both wells showed zero vacuum and there were no further attempts to measure the wells.) The field measurement data have been converted to inches of mercury vacuum ("Hg) per ACEH directives and are included in Appendix E, Table E2.

Radius of Influence

The amount of pressure necessary for demonstrating vacuum influence in soil vapor extraction technology is generally regarded as at least 0.1 inches of water ("*How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites*", USEPA, May, 1995). This value corresponds to 0.007" Hg vacuum (0.1 divided by 13.6).

Vapor extraction started in well EW-1 and the resulting vacuum influence measured in wells W-1s and W-Bs. These wells are located approximately 12 and 37 feet, respectively, from EW-1. The vacuum influence in well W-1s started at 0.014" Hg and increased to 0.3" Hg after 20.5 hours. The vacuum influence in well W-Bs started at 0.014" Hg and increased to 0.022" Hg after 20.5 hours. These radii of influence data exceed the 0.007" Hg threshold for demonstrating adequate vacuum influence for remediation and are plotted in Appendix E, Figure E1.

Vapor extraction was then switched to well W-1s and the resulting vacuum influence measured in wells EW-1 and W-Bs. These wells are located approximately 12 and 47 feet, respectively, from W-1s. The vacuum influence in well EW-1 started at 0.23" Hg and increased slightly to 0.25" Hg after about 23 hours. The vacuum influence in well W-Bs started at 0.024" Hg and doubled to 0.051" Hg after about 23 hours. These data also exceed the 0.007" Hg threshold for demonstrating vacuum influence and are plotted in Appendix E, Figure E2.

Air Volume

The extraction rate in EW-1 started at 74 cubic feet per minute (cfm) and increased to 196 cfm after 20.5 hours. The extraction rate in W-1s started at 164 cfm and decreased to 135 cfm after 23 hours. When vacuum was applied to both EW-1 and W-1s concurrently, the air flow started at 127 cfm and increased to 156 cfm after 21 hours. This data is included in Appendix E, Table E2,

4.2 Air Sparging

Air sparging was conducted in well W-1s as outlined above in Section 3.5. GTI monitored the process by periodically measuring injection flow rate and pressure in well W-1s, and the system OVM readings from the vapor extracted through well EW-1. This data is presented in the lower portion of Table G1 in Appendix G. The earlier vapor extraction data from EW-1 without air sparging is presented in the upper portion of the same table.

During the initial vapor extraction test without sparging, the air flow increased from 74 cfm to 196 cfm in well EW-1. When air sparging was initiated in W-1s the air flow in EW-1 was a new high value of 211 cfm, but then it started decreasing and finished at 120 cfm. If the injected air in W-1s was being extracted by vacuum applied to EW-1 then the air flow would be expected to increase. Apparently the opposite occurred.

The OVM readings during both portions of the pilot test are included in Table G1 as well. During the initial vapor extraction test without sparging in W-1s the system OVM readings started at a high of 201 parts per million (ppm) and steadily decreased to 41 ppm overnight. When air sparging was started in W-1s, the system OVM readings increased from 92 ppm to 141 ppm after six hours. This was an indication that the air sparging in W-1s was volatilizing additional petroleum hydrocarbons. The system OVM readings increased to 166 ppm by the following morning except that DPE was ongoing in wells W-1 & W-A and this may have affected the OVM readings.

OVM readings were taken directly at the wellhead on EW-1 twice as shown in the far left column in Table G1. The data indicate that the contaminant concentrations went up overnight increasing from 5 ppm to 144 ppm as the air sparging continued in W-1s.

4.3 Groundwater Extraction

The dual phase extraction equipment removed soil vapor and groundwater together through the same stinger hose. In this fashion the water could not be metered directly to measure the extraction rate. The extracted water was contained in a tank on the treatment trailer until the tank's upper limit switch was activated by the rising water level. Upon activation, a pump would transfer the water through a meter and into the 5,200 gallon tank trailer supplied by American Valley. GTI staff monitored the transfer meter and used the data to determine pumping rates by dividing the gallons pumped by the elapsed time. Table F2 in Appendix F contains the groundwater pumping rate data.

The calculated groundwater extraction rate from monitoring well W-1s varied 0.2 – 2.0 gpm during the initial DPE test (average 0.2 gpm without 2 gpm data point skewing the data). This well had an approximate water column of 9 feet at the start of the test and the low extraction rate was expected as the well dewatered.

The second DPE extraction test from W-1 produced an average extraction rate of 0.9 gpm. It is noted that part of the system vacuum was also applied to W-1s for the air sparge test at the same time. If the total system vacuum had been applied to W-1 only then the extraction rate may have been higher such as 1.7 to 2.0 gpm as experienced by WWC in 1994.

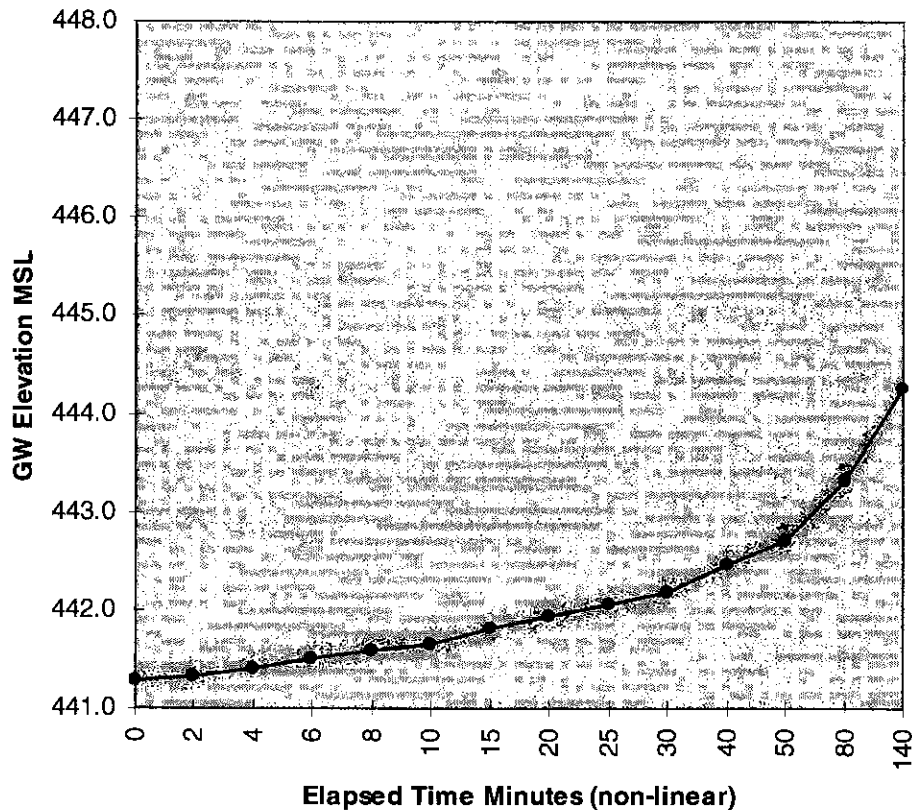
When DPE was applied to wells W-1s (vapor only), W-1 and W-A simultaneously the groundwater extraction rate was 2.2 gpm. When DPE was applied to W-1 and W-A only the

extraction rate climbed to 2.7 gpm. At the conclusion of the test, extraction from well W-A only produced 1.6 gpm.

Depth to water (DTW) measurements were occasionally taken as conditions permitted. Groundwater elevation data are included in Table F3 in Appendix F. GTI notes the following points regarding the data:

- Well MW-105 did not contain enough water to sample on Monday, Tuesday and Friday of the subject week. In each sampling attempt the pumping tube would contain stagnant water and air pockets. The well screen may be clogged and therefore the data from the well in the table may not reflect actual conditions.
- After DPE was started in well W-1s on Tuesday morning the groundwater elevation increased in wells W-1 and MW-107 while the water level decreased in well W-B. The three wells are located 7, 36 and 60 feet from W-1s, respectively. Using the data in distance-drawdown plots to define a cone of depression is problematic because of the groundwater mounding in the wells and due to the fact that the extraction and observation wells are screened at different depths (see Figure 4).
- The end of test DTW measurements on Friday afternoon (10/20/06) reflect the drop in those wells last pumped (extracted from). Well W-B is located over 50 feet from all of the extraction wells and it experienced a decrease of 0.08 feet between Tuesday and Friday. But during the week when different DPE extraction schemes were used the well saw decreases of 0.01 – 0.2 feet. This suggests that a radius of influence from the extraction wells reached to at least 50 feet.
- It was also noted that the weather was hot and sunny on Monday – Tuesday, but the weather was having a cooling trend toward the end of the week. Barometric pressure changes could have affected the background water levels in the wells.

GTI also conducted DTW measurements in W-1s after extraction was stopped in the well in preparation for the sparging test on Thursday morning. The graph below shows that the recovery rate in W-1s was approximately half of the static level (~447.81') in 140 minutes. This is a fairly rapid rate considering the clayey gravels in which the well is screened.



Well W-1s recovery (10/19/06)

5.0 DISCUSSION

The following sections will summarize the results of the pilot test efforts.

5.1 Vapor Extraction

The pressure necessary for demonstrating vacuum influence is generally regarded as at least 0.1 inches of water (*"How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites"*, USEPA, May, 1995). As stated above this value corresponds to 0.007" Hg vacuum (0.1 divided by 13.6).

The influence detected in monitoring wells W-1s and W-Bs during extraction from EW-1 exceeded the 0.007" Hg minimum. The 0.3" and 0.022" Hg, respectively, in the wells indicate that soil vapor extraction technology is viable at the site (see Table E2, Appendix E). Well W-Bs is located approximately 37 feet from EW-1 and this distance is used as a conservative estimate as the radius of influence in shallow soils.

When the extraction was applied to well W-1s and the resulting vacuum measured in W-Bs, the value of 0.051” Hg exceeded the 0.022” Hg when vacuum was applied to well EW-1. Shallow well EW-1 is screened from 10 – 25 feet bgs while wells W-1s and W-Bs are both screened from 20 – 45 feet bgs. This well screen and vacuum data suggests that the pneumatic conductivity is restricted when applying vacuum vertically through the soil column (from EW-1 to W-Bs) and the pneumatic conductivity is greater when applied laterally along the sedimentary deposits (from W-1s to W-Bs). The relevant well screen intervals and this situation is illustrated in Figure E3 in Appendix E. Well W-Bs is located approximately 47 feet from W-1s and this distance is used as a conservative estimate as the radius of influence in intermediate soils at the site.

A problem was encountered during the pilot test. A pump of sufficient vacuum was not available at the start of the test to sample directly at the well heads. For this reason the vapor samples were obtained from a piping port installed on the outlet side of the oil ring separator pump of the treatment trailer. The samples taken in this location were a combination of the actual well vapor and vapor separated from extracted groundwater in the oil ring pump. When an appropriate vacuum pump was available samples were obtained at the wellhead.

The laboratory analyses of the soil vapor samples obtained during the test are summarized in Table E1 in Appendix E, and abbreviated in the following table:

Well	Date	Time	TPH-G mg/m ³ (=ug/l)	Field OVM
EW-1	10/16/06	11:30	3750	144
	10/16/06	15:15	1230	68
→	10/18/06	17:40	232	35
→	10/19/06	6:48	533	33
	10/19/06	11:30	1710	
→	10/19/06	14:12	20.4	
	10/19/06	14:14	1410	
W-1s	10/17/06	9:50	4510	212
	10/17/06	13:50	4890	246
→	10/18/06	17:38	33.8	7
→	10/19/06	6:45	ND<20	1

“→” = wellhead sample

The samples from EW-1 on October 19 at 14:12 & 14:14 are from the wellhead and trailer port, respectively. The value from the wellhead, 20.4 ug/l TPH-G, is much less than the 1410 ug/l measured at the trailer port. Since the well is screened above the water table the increase

at the trailer port is not likely to be from groundwater volatilization. This suggests that the oil ring separator and associated piping retains contaminant mass that is continually released. Additional monitoring/sampling could have clarified the issue, but as noted above, the USTCFP placed financial restrictions on the pilot test.

In spite of the sample location problem the laboratory data does provide relevant data for the pilot test. The data indicate that as vapor extraction progressed in EW-1 the amount of contaminant mass declined during the first three days of the test. The historical soil laboratory data indicates that more TPH-G mass is present at depths lower than the 10 – 25 feet of screened interval of the well. Therefore the drop off in concentrations is not unexpected. Conversely, the already elevated TPH-G concentrations increased in magnitude during the first uninterrupted day of extraction from W-1s. This was also expected as the historical data indicate that a large slug of free product was present in this location at depths of 40 – 45 feet bgs in 1989.

GTI performed mass balance calculations for the amount of TPH-G extracted in wells EW-1 and W-1s (the extraction from the other wells had too many variable factors to estimate the mass removed). The calculations are shown in Appendix E, Table E3. The overnight vapor extraction in well EW-1 resulted in the removal of approximately 12 kg of TPH-G mass. This equates to 13.7 kg or 5 gallons per day. The overnight vapor extraction in well W-1s resulted in the removal of approximately 28 kg of TPH-G mass that equates to 29 kg or 10 gallons per day. Combining these data, the extraction from these wells during the first portion of the pilot test resulted in the removal of 14 gallons of TPH-G mass as shown in Table E3. It is noted that this amount includes some TPH-G separated (volatilized) out of groundwater by the liquid oil ring pump process.

5.2 Groundwater Extraction

The groundwater extraction rates using DPE varied from 0.6 gpm in well W-1s to 2.7 gpm when extraction occurred simultaneously from wells W-1 and W-A. Table F2 in Appendix F contains the groundwater pumping rate data.

In their July 27, 2006 letter the ACEH directed that groundwater samples be obtained from select wells before and after the pilot test to evaluate contaminant rebound after groundwater extraction. But depth to groundwater fell from approximately 27 feet bgs in July 2006 to approximately 34 feet bgs in October 2006. New shallow CMT™ wells MW-4 through MW-7 were unable to be sampled because the water table was lower than the screened intervals (27 – 30 feet bgs) of the wells. In spite of this situation several wells were sampled during the week to provide relevant data as shown in the following table:

Wells	Date	TPH	TPH	Benzene	Toluene	Ethyl	Total
		Gasoline ug/L	Diesel ug/L	ug/L	ug/L	Benzene ug/L	Xylenes ug/L
W-1	1989	210,000	300,000	29,000	30,000	5,400	24,000
	10/19/2006	77,000	-	9,700	11,000	2,000	10,000
	10/20/2006	110,000	-	4,600	7,200	3,900	11,000
W-A	1990	10,000	2,400	6,800	5,500	620	3,400
	10/20/2006	450	-	40	19	21	33
W-1s	10/17/2006	35,000	<470	5,000	1,300	1,500	3,500
	10/19/2006	40,000	-	6,000	3,800	1,300	4,400
	10/20/2006	32,000	-	2,100	2,700	1,200	3,600
W-Bs	10/17/2006	6,500	<47	1,000	37	410	83
	10/20/2006	630	<47	39	8.5	1.7	20
MW-205	10/16/2006	<2000	-	880	63	<20	54
	10/17/2006	5,100	-	2,000	190	52	220

pre- 2006 data adapted from *Environmental Sampling Services 5/27/04 Groundwater Monitoring Report*

"-" = not analyzed

- Well W-1 experienced an increase in TPH-G concentrations from 77,000 ug/l on Monday to 110,000 ug/l on Friday. This suggests that the extraction process mobilized contaminant mass entrained in the silty/clayey soils present at the 45 – 55 feet screened interval of the well.
- Well W-A contained a black substance as noted above and the well was not sampled prior to the test. The only other data was from 1990 as shown in the table. After the well was cleaned out on Thursday night, and several hundred gallons removed, the well contained only 450 ug/l TPH-G on Friday. This evidence suggests that significant natural attenuation has taken place between 1990 and 2006.
- Well W-1s was sampled three times during the pilot test. The TPH-G concentrations varied during the week but ended on a decreasing trend.
- Well W-Bs displayed a decreasing trend at the end of the week.
- New CMT™ well MW-205 is location adjacent to the Pitcock release (see Figure 3) and is screened within in the same aquifer level as wells W-1 and W-A. It experienced an increase in concentrations but this was before groundwater extraction commenced in W-1 and W-A. It is possible that vapor extraction from EW-1 and W-1s on Monday/Tuesday caused groundwater mounding and the associated rise in MW-205 concentrations.

GTI has not attempted to determine contaminant mass from the groundwater extraction due to the multiple configurations, pumping rates, etc. utilized during the test.

6.0 CONCLUSIONS & RECOMMENDATIONS

Based on our interpretation of the data collected over the course of this subsurface investigation, GTI have reached several conclusions. These conclusions are based on the premise that the data we considered, although incomplete, are representative of actual site conditions. We acknowledge that there may be undiscovered conditions, which would upon their consideration, change our interpretation and thus our conclusions.

Geological Technics Inc. has made the following conclusions:

1. Soil vapor extraction is a viable technology for reducing contaminant concentrations in the subsurface at the site. The pilot test demonstrated that up to 0.1 inches of water (0.007 inches of mercury) vacuum could be achieved at a distance of 47 feet from the extraction point (the distance from extraction well W-1s to monitoring well W-Bs).
2. GTI estimated that approximately 40 kg or 17 gallons of gasoline range petroleum hydrocarbons were removed by vapor extraction during the week long test. This amount includes hydrocarbons removed from groundwater during the liquid ring pump separation process. The levels of mass removal were higher in the soils below 25 feet and the historical data confirm that the majority of the documented soil contamination is below this depth.
3. A sustained pumping rate of over 2 gpm was achieved when groundwater extraction occurred simultaneously from wells W-1 and W-A (2.2 gpm actual). Woodward Clyde Consultants Inc. reported similar rates when they conducted a similar extraction test in 1994. This demonstrates that the site's soils are conducive to groundwater extraction technology but at low rates. If the pumping was continued then the drawdown would produce a cone of depression further exposing soil to be influenced by vapor extraction.
4. Although confirmation data was limited, air sparging was also shown to be a viable technology at the site.

Our recommendations are based on our knowledge of site conditions, and on the state and limitations of subsurface investigative technology.

The following recommendations are made by GTI:

1. The ACEH has directed that a Site Conceptual Model (SCM) be developed for the site (December 27, 2005 and previous correspondence). The data obtained from the installation of five CMT™ well on October 2 – 10, 2006, and the performance of the DPE test detailed above should be used to complete the SCM as directed by ACEH. GTI believes that sufficient information has been gathered to complete the SCM and this work is currently in progress.

2. In their September 7, 2006 letter correspondence the ACEH directed that a Corrective Action Plan (CAP) be submitted within 60 days after comment by ACEH on this DPE pilot test report. A CAP will be developed by GTI, in accordance with regulatory mandates and USTCFP requirements for three remedial alternatives pending ACEH comments on this report.

7.0 LIMITATIONS

This report was prepared in accordance with the generally accepted standard of care and practice in effect at the time Services were rendered. It should be recognized that definition and evaluation of environmental conditions is an inexact science and that the state or practice of environmental geology/hydrology is changing and evolving and that standards existing at the present time may change as knowledge increases and the state of the practice continues to improve. Further, that differing subsurface soil characteristics can be experienced within a small distance and therefore cannot be known in an absolute sense. All conclusions and recommendations are based on the available data and information.

The tasks proposed and completed during this project were reviewed and approved by the local regulatory agency for compliance with the law. No warranty, expressed or implied, is made.

8.0 SIGNATURES AND CERTIFICATION

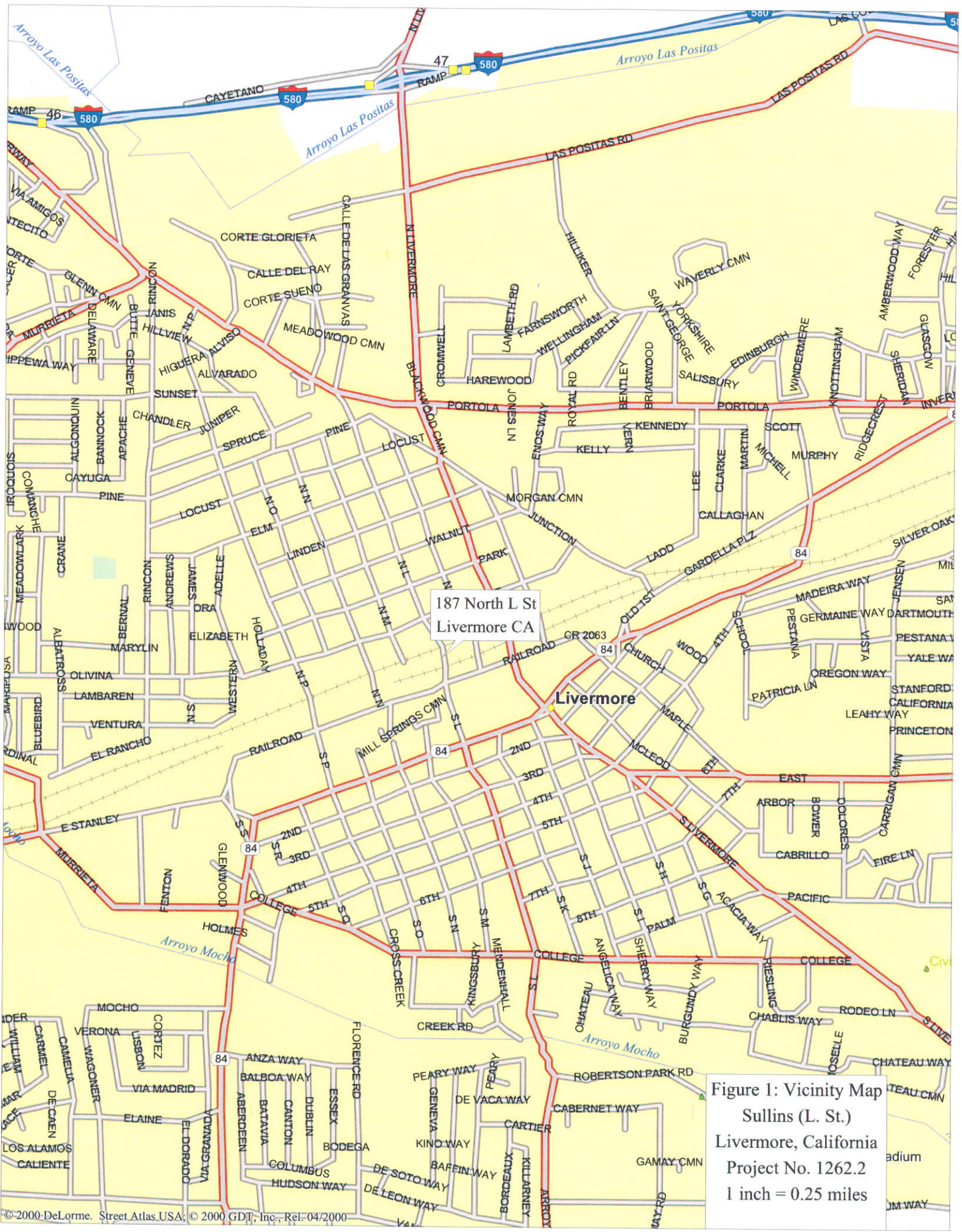
If you have any questions or if we can be of further assistance, please do not hesitate to contact our office at 209-522-4119.

This report was prepared by:

Joseph D. Angulo
Project Geologist

Raynold Kablanow II, Ph.D.
California Professional Geologist #5234
Certified Hydrogeologist #442





187 North L St
Livermore CA

Figure 1: Vicinity Map
Sullins (L. St.)
Livermore, California
Project No. 1262.2
1 inch = 0.25 miles

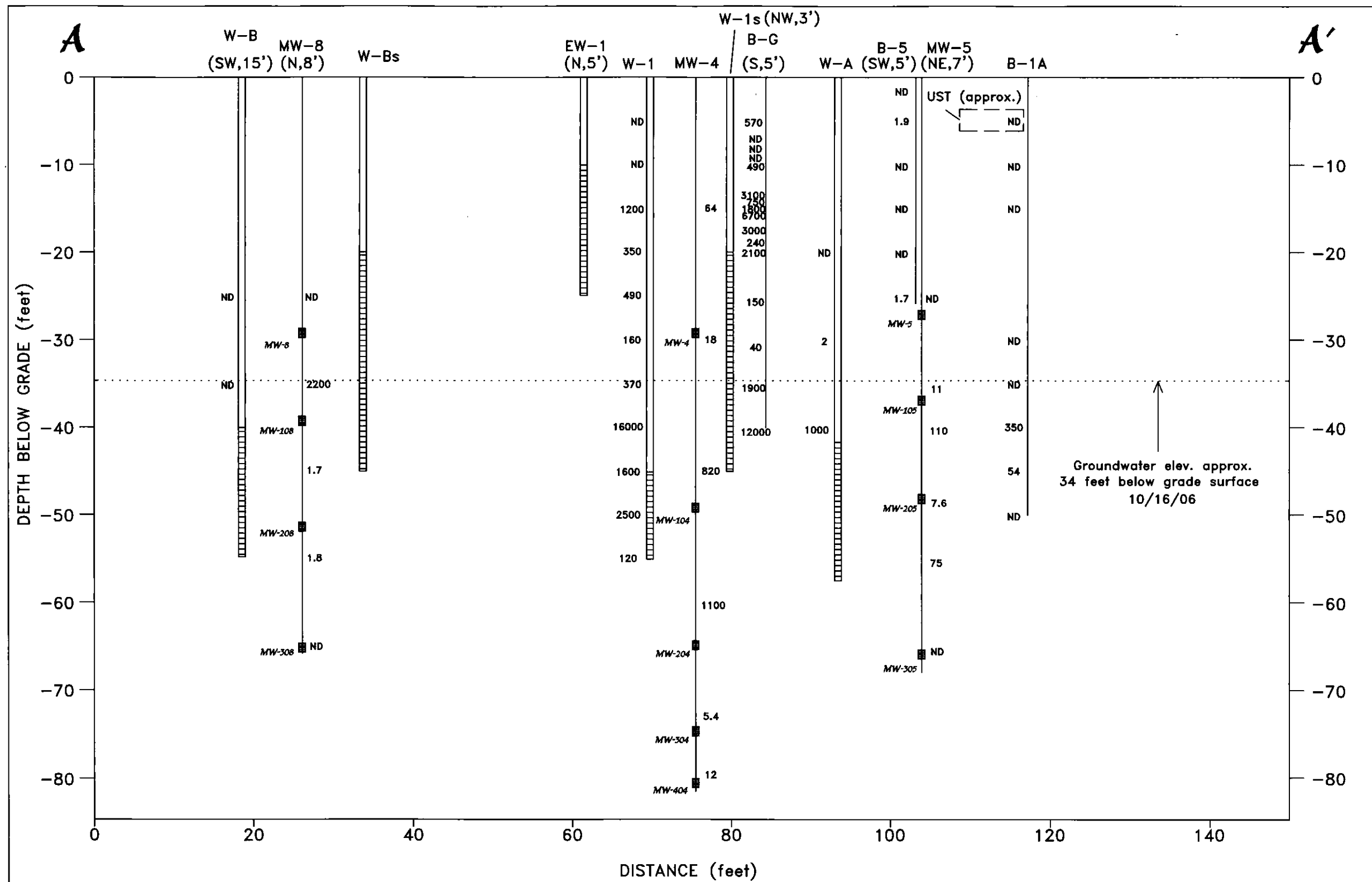


Figure 4
 Cross Section A - A'
 With Soil TPH-Gasoline
 Arrow Rentals
 187 N L Street
 Livermore, CA
 Project No.: 1262.2

Geological Technics Inc. 10/24/06

LEGEND

Scale as Indicated.

2300 = Soil TPH-G Concentration (mg/kg)
 ND = Soil TPH-G non-detect

(N,5') = Boring projection onto section (direction, distance)

MW-108 = CMT well screen section

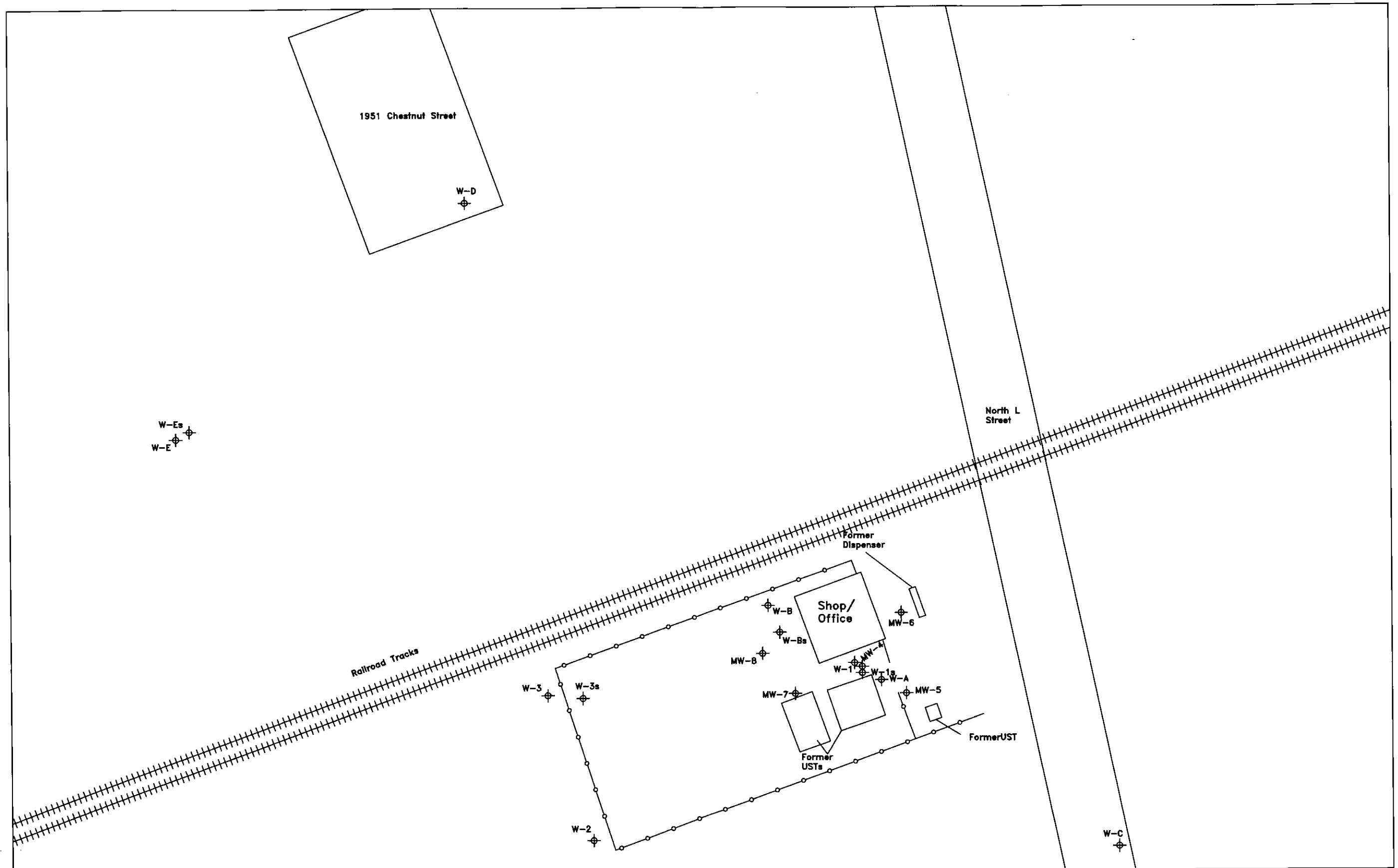
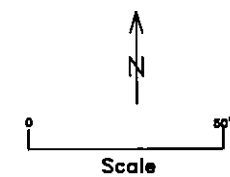


Fig 2: Site Map

Arrow Rentals
187 North L Street
Livermore, CA

Legend

- ⊕ Monitoring Well
- Soil Boring



Appendix A

Woodward Clyde Consultants Data

96 JAN 17 PM 2:17

December 20, 1995
93C0276A② add'l mw dg of well W-3
needed (~60' dg) near well W-EMs. Rita Sullins
Don-Sul, Inc.
187 North L Street
Livermore, CA 94550**Subject: Report of Remedial Activities since January 1994, 187 North L Street,
Livermore, California**

Dear Ms. Sullins:

This report is in response to a request by Ms. Eva Chu, of the Alameda County Health Care Services Agency (ACHCSA), in a letter dated June 29, 1995. Ms. Chu requested that the results of a Dual-Phase Pilot Test be presented in a report, along with groundwater monitoring results. The following report presents the results of the work performed by WCC as outlined in our proposal to you dated August 17, 1995.

SCOPE OF WORK

The scope of work included sampling groundwater from existing monitoring wells W-1, W-2, W-3 and W-E, and performing laboratory analyses on groundwater samples for TPH as gasoline and for BTEX. The work scope also included presentation of the results of the Dual Phase Pilot Test performed on March 15-16, 1994. Following the installation of new groundwater monitoring wells and analyses of groundwater samples, the site could be evaluated for closure using the ASTM Risk Based Corrective Action method (RCBA).

GROUNDWATER MONITORING

Groundwater levels were measured and groundwater samples were collected from wells W-1, W-2, W-3 and W-E on September 13, 1995. The results of laboratory analyses were presented in a report to you dated October 6, 1995. Table 1 presents the groundwater depths and the laboratory analysis results. The depth to the top of the screened section in these wells is about 40 feet. The depth to the groundwater level in these wells ranged from about 28.7 feet in well W-1 to 30.7 feet in well W-2. Since the groundwater levels are about 10 feet higher than the screened section these wells have a low potential for sampling floating product.

J:\CXHUNTE\93C0276A.0041

12/20/95 8:47 AM

Woodward-Clyde Consultants • A subsidiary of Woodward-Clyde Group, Inc.
500 12th Street, Suite 100 • Oakland, California 94607-4014
510-893-3600 Fax 510-874-3268

83125

Ms. Rita Sullins
December 20, 1995
Page 2

The highest concentration of benzene (65,000 ug/L) and TPH as gasoline (660,000 ug/L) were detected in groundwater from well W-1. This has been the location historically where the highest concentrations of these compounds were found. BTEX was not detected above the laboratory detection limit in groundwater from well W-2. Only 90 ug/L TPH as gasoline was detected in the groundwater sample from well W-2. The laboratory reported 5,600 ug/L benzene, 290 ug/L toluene, 460 ug/L ethylbenzene, and 280 ug/L total xylenes, and 27,000 ug/L TPH gasoline for groundwater from well W-3. Only 4 ug/L benzene and 95 ug/L TPH gasoline were reported in groundwater from well W-E. MTBE was not detected in groundwater from wells W-1, W-2, and W-3, but was detected at 18 ug/L in groundwater from well W-E. Copies of the laboratory reports are attached for your reference.

Groundwater elevations were calculated using the top of casing elevations shown on Figure 2 of our June 12, 1991 report. The groundwater gradient is towards the west northwest and ranges from an elevation of 70.44 feet in well W-1, to 64.62 feet in well W-E. Calculated elevations of groundwater are 67.45 in well W-2 and 68.31 in well W-3. Figure 2 is attached, and has been modified to show the current groundwater elevations and estimated groundwater elevation contours.

DUAL-PHASE PILOT TEST RESULTS

The Dual-Phase pilot test was conducted on the 14th and 15th of March 1994. A WCC portable trailer unit (see attached description) was used to perform the pilot test. The blower unit was attached to a small pipe that was inserted into well W-1 and about 24 inches of mercury vacuum and about 4 cfm soil gas flow was developed. About 1.7 to 2.0 gpm groundwater extraction rate was developed. Because the groundwater levels were above the top of the well screens in the observation wells, W-A, W-B, W-C, and W-2 no vacuum could be observed in the casing for those wells.

After about 17 hours of extraction a stabilized drawdown of about 1.87 feet was measured in well W-A, and about 0.67 feet was measured in well W-B. Using this information and the approximate extraction rate of 1.7 gpm the estimated conductivity was calculated at about 6×10^{-4} cm/sec, which is consistent with a sand aquifer material. Since well W-B is about 50 feet north of the pumping well (W-1) the radius of groundwater elevation influence, and potential capture zone, appears to be at least 50 feet. The approximate total volume of groundwater removed was 3,600 gallons. This water was temporarily stored in Baker Tanks, and later disposed of properly at Gibson Environmental in Redwood City, California. A copy of the disposal invoice is attached.

Ms. Rita Sullins
December 20, 1995
Page 3

The effectiveness of this method for soil vapor extraction could not be evaluated since the groundwater level in the extraction well, and the observation wells was above the screened section of the well casings.

OPTIONAL CORRECTIVE MEASURES

Construction of New Wells

As shown on Figure 2, we recommend construction of four new groundwater wells with screened sections located above the current groundwater level. One new 6-inch diameter well could be constructed between W-A and W-1. This well should be constructed with sufficient well screen to continue to function with vertical variations of groundwater elevation of at least ten feet. The top of the new well screen should extend at least 10 feet above the current groundwater level. A second 6-inch diameter well should be constructed just south of well W-B.

Because of the rise in groundwater elevations above the screened interval, existing monitoring wells W-2 and W-3 need to be replaced. Adjacent to existing well W-3, a groundwater extraction well with a 6-inch diameter well casing should be constructed. Adjacent to well W-2 a new 4-inch diameter well should be constructed with a screened section set at elevation at least 10 feet above the current groundwater level and extending down below the top of the existing monitoring well screens, at a depth of about 40 feet. The existing 2-inch diameter wells W-2 and W-3 would remain in place to provide for monitoring groundwater levels.

We recommend that each of the four new groundwater wells be properly developed and groundwater samples collected for analysis. Laboratory results of analytes for TPH gasoline and BTEX from these new wells should be compared to previous results of analyses of groundwater from adjacent monitoring wells.

Re-Evaluation of Dual-Phase Extraction

We recommend that a dual-phase extraction pilot test be conducted on the newly constructed 6-inch well between W-1 and W-A. The radius of influence of a vacuum applied to this well could be evaluated by measuring pressure changes in the new well near W-B. If the pilot test shows that the method could be effective, these two new wells, along with the new wells near W-2 and W-3 could be utilized as dual-phase extraction wells.

Ms. Rita Sullins
December 20, 1995
Page 4

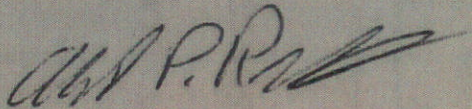
RBCA Evaluation

Following the construction of new monitoring wells and evaluation of the results of laboratory analyses of groundwater samples from these new wells, this site can be evaluated for closure using the ASTM Risk Based Corrective Action method. This method is supported by a recent study Rice et al., 1995 (see references).

DISCUSSION

We can provide a schedule and cost for installation of the four new wells, and sampling and analysis of groundwater from the wells. We assume that you will forward a copy of this report to Ms. Eva Chu, at the Alameda County Health Care Services Agency.

Sincerely,



Albert P. Ridley, CEG
Senior Associate

- Attachments:
- Table 1 Laboratory Analysis Results and Groundwater Depths
 - Table 2 Dual-Phase Extraction Pilot Test Data, MW-1
 - Table 3 Water Levels in Wells Measured During DPE Pilot Test
 - Table 4 Summary of Analytical Test Results for Hydrocarbon Vapors
 - Table 5 DPE Pilot Vacuum Response Data
 - Figure 1 Groundwater Elevation Contours
 - Figure 2 Alternate Remediation Plan
 - Vacuum Extraction Pilot (TEST) Trailer Specifications
 - H&H Environmental Services Invoice
 - Analytical Laboratory Reports

- References:
- Rice et al., 1995, Recommendations to Improve the Cleanup Process for California's Leaking Underground Fuel Tanks (LUFTs), Lawrence Livermore National Laboratory, University of California, Livermore, California, October 16, UCRL-AR-121762.



TABLE 1
LABORATORY ANALYSIS RESULTS AND GROUNDWATER DEPTHS

Wells	Date sampled	Groundwater depths (feet)	Compounds (µg/L)						
			MtBE	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline	
W-1	9/13/95	28.78	ND	65,000	78,000	6,400	36,000	660,000	
W-2	9/13/95	30.76	ND	ND	ND	ND	ND	90	
W-3	9/13/95	30.58	ND	5,600	290	460	280	27,000	
W-E	9/13/95	29.67	18	4	ND	ND	ND	95	

ND Not Detected at or above the reporting limit for the method.

TABLE 2
DUAL-PHASE EXTRACTION UNIT PILOT TEST DATA
MW-1 EXTRACTION TEST
ARROW RENTALS, LIVERMORE, CALIFORNIA

Date	Time	Elapsed Time (hrs)	Applied Vacuum (In. Hg)	Inlet Temp. (Deg F)	Out Temp. (Deg F)	Vapor Flow (CFM)	Average Groundwater Extraction Rate (GPM)	Cumulative Volume Extracted Groundwater (gal)	Comments
3/15/94	10:45	0.00	25.50	64	82		0.00	88.8	System Startup
3/15/94	11:00	0.15	25.80	67	84		2.61	128.0	
3/15/94	11:15	0.30	26.00	70	86		NA	NA	Well closed Well open
3/15/94	11:30	0.45	26.20	71	87		NA	NA	
3/15/94	11:43	0.58	26.50	72	88	4	2.65	226.0	
3/15/94	12:00	1.15	26.50	74	88		NA	NA	
3/15/94	12:15	1.30	26.50	73	89		1.84	285.0	
3/15/94	12:45	2.00	26.50	72	90		2.47	359.0	
3/15/94	13:00	2.15	26.50	72	91		2.40	395.0	
3/15/94	13:40	2.55	26.00	70	91		2.38	490.0	
3/15/94	14:09	3.24	26.00	69	90		2.04	549.3	
3/15/94	14:31	3.46	26.00	68	90		2.15	596.5	
3/15/94	15:05	4.20	25.50	65	87		1.93	662.2	
3/15/94	16:04	5.19	25.50	64	87		2.04	782.6	
3/15/94	17:02	6.17	24.75	62	85		2.00	898.8	
3/15/94	18:03	7.18	24.60	61	82		1.89	1014.0	
3/15/94	19:03	8.18	24.50	61	80		1.91	1128.5	
3/15/94	20:01	9.16	24.25	60	86		1.97	1242.7	
3/16/94	7:29	11.28	24.00	59	77		1.85	2515.3	
3/16/94	8:30	12.29	24.00	59	78		1.79	2624.4	
3/16/94	9:32	13.31	24.20	60	80		1.77	2733.9	
3/16/94	10:35	14.34	24.30	60	80		1.75	2844.0	
3/16/94	11:32	15.31	24.30	61	80		1.73	2942.4	
3/16/94	12:37	16.36	24.30	60	80		1.67	3050.7	
3/16/94	13:31	17.30	24.30	60	80		1.81	3148.6	
3/16/94	14:46	18.45	24.40	61	81		1.73	3278.4	
3/16/94	15:50	19.49	24.40	61	81		1.69	3386.7	
3/16/94	16:40	20.39	NA	NA	NA		NA	NA	Switched to 1/2" straw
3/16/94	17:06	21.05	24.70	63	81		1.54	3504.1	
3/16/94	17:50	21.49	24.70	62	79		1.39	3565.3	
3/16/94	18:16	22.15	NA	NA	NA		NA	NA	
3/16/94	18:21	22.20	NA	NA	NA		NA	NA	End pilot DPE test
3/16/94	18:25	22.24	24.50	60	77		1.46	3616.5	
3/16/94	18:26	22.25	NA	NA	NA		NA	NA	

Legend

NA Not Available

GPM Gallons per minute

CFM Cubic feet per minute

**TABLE 3
WATER LEVELS IN WELLS MEASURED DURING DPE PILOT TEST
MW-1 EXTRACTION TEST
ARROW RENTALS, LIVERMORE, CALIFORNIA**

Date	Time	Elapsed Time (hr)	Extraction Well	Groundwater Elevation (feet from mean sea level)							Comments
				W-A	W-B	W-C	W-D	W-E	W-2	W-3	
3/15/94	9:23	0.00	MW1	67.17	65.91	68.66	64.80	62.62	65.53	64.99	Start
3/15/94	10:45	1.22	MW1	67.03	65.91						
3/15/94	11:00	1.37	MW1	66.84	65.89				65.55	64.99	
3/15/94	11:15	1.52	MW1	66.59	65.88						
3/15/94	11:30	2.07	MW1	66.44	65.86						
3/15/94	11:45	2.22	MW1	66.32	65.84						
3/15/94	12:00	2.37	MW1	66.23	65.83						
3/15/94	12:15	2.52	MW1	66.19	65.82						
3/15/94	12:30	3.07	MW1	66.13	65.81						
3/15/94	12:45	3.22	MW1	NA	65.80						
3/15/94	13:00	3.37	MW1	65.99	65.79						
3/15/94	13:42	4.19	MW1	65.92	65.76						
3/15/94	14:07	4.44	MW1	65.88	65.74						
3/15/94	14:30	5.07	MW1	65.86	65.73						
3/15/94	15:00	5.37	MW1	65.83	65.71	68.81			65.62		
3/15/94	16:00	6.37	MW1	65.80	65.69						
3/15/94	17:00	7.37	MW1	65.76	65.65						
3/15/94	18:00	8.37	MW1	65.69	65.62	68.79			65.61		
3/15/94	19:00	9.37	MW1	65.65	65.58						
3/15/94	20:00	10.37	MW1	65.60	65.56						
3/16/95	7:48	22.25	MW1	65.39	65.39						
3/16/95	8:45	23.22	MW1	65.36	65.36						
3/16/95	9:45	24.22	MW1	65.33	65.33						
3/16/95	10:35	25.12	MW1	65.31	65.32						
3/16/95	11:35	26.12	MW1	65.30	65.31						
3/16/95	12:30	27.07	MW1	65.30	65.30	68.69			65.48		
3/16/95	13:30	28.07	MW1	65.24	65.30						
3/16/95	14:43	29.20	MW1	65.32	65.30						
3/16/95	15:49	30.26	MW1	NA	65.30						
3/16/95	17:09	31.46	MW1	NA	65.28						
3/16/95	18:02	32.39	MW1	NA	65.24	68.69			65.49		

Appendix B

Borings Logs

Sullins 187 North L Street Livermore, CA		LOG OF BORING EW-1 (Page 1 of 3)	Boring Dia.	: 10"	
Project No.: 1262.2			Tot. Depth	: 25.5'	
<i>Geological Technics Inc.</i>		Date	: 10/3/06	Casing Depth	: 25'
		Drilling Method	: HSA	Casing Dia.	: 4"
		Driller	: Cascade	Screen Interval	: 10-25'
		Logged By	: J. Angulo	Slot Size	: 0.010"
				Filter Pack	: 9.5-25'
				Annular Seal	: 7.5-9.5'
				Grout	: 0-7.5'
				Water Depth	: ~34'

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)	Well: EW-1 Elev.:
0				Free drilled to total depth.				<p>A vertical schematic diagram of the well EW-1. It shows a casing extending from the surface down to a depth of approximately 10 feet. Below the casing, there is a section labeled 'GROUT' (stippled pattern) extending to about 12 feet. Below the grout is a 'SEAL' (hatched pattern) at approximately 12.5 feet. Below the seal is a 'SCREEN' (vertical bars) extending from about 13 feet to the bottom of the well at 25.5 feet.</p>
5								
10								
15								
20								
25								
30								

11-06-2006 k:\jobs\jobs-1\sullin-1\12\12622\graphics\borolog\ew-1.bar

Appendix C

Laboratory Analytical Soil Vapor Data

Jenny Weese

COPY

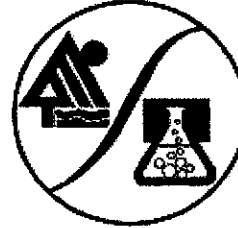
From: Laura Wilt [Laura@excelchem.net]
Sent: Friday, October 20, 2006 10:30 AM
To: GTI
Subject: Report and EDF for Sullins
Attachments: 0610103.zip; 0610103 FINAL 10 19 06 1616.PDF

Here is the report for the project "Sullins" sampled 10/16/06. Please let me know if you have any questions.

Laura Wilt
QA/QC Officer / LIMs Administration
Excelchem Environmental Labs
ph: 916-543-4445
fx: 916-543-4449

EXCELCHEM
Environmental Labs

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449



ELAP Certificate No. : 2119

19 October 2006

Eric Price

Geological Technics

1101 7th Street

Modesto, CA 95354

RE: Sullins

Workorder number:0610103

Enclosed are the results of analyses for samples received by the laboratory on 10/17/06 15:03. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

John Somers, Lab Director

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Project Number: Project Manager:	Sullins 1262.2 Eric Price	Date Reported: 10/19/06 16:16
---	---	---------------------------------	----------------------------------

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-1	0610103-01	Air	10/16/06 11:30	10/17/06 15:03
EW-1	0610103-02	Air	10/16/06 15:15	10/17/06 15:03
SYS EFF	0610103-03	Air	10/16/06 15:10	10/17/06 15:03

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Project Number: Project Manager:	Sullins 1262.2 Eric Price	Date Reported: 10/19/06 16:16
---	---	---------------------------------	----------------------------------

**EW-1
0610103-01 (Air)**


Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	2.5	mg/m ³ Air	APJ0080	10/17/06	10/18/06	EPA 8021B/8015m	
Toluene	17.6	2.5	"	"	"	"	"	
Ethylbenzene	33.6	2.5	"	"	"	"	"	
Xylenes (total)	98.3	2.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	3750	100	"	"	"	"	"	
<i>Surrogate: Chlorobenzene</i>		126 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Project Number: Project Manager:	Sullins 1262.2 Eric Price	Date Reported: 10/19/06 16:16
---	---	---------------------------------	----------------------------------

**EW-1
0610103-02 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	2.5	mg/m ³ Air	API0080	10/17/06	10/18/06	EPA 8021B/8015m	
Toluene	6.6	2.5	"	"	"	"	"	
Ethylbenzene	15.5	2.5	"	"	"	"	"	
Xylenes (total)	51.1	2.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	1230	100	"	"	"	"	"	
<i>Surrogate: Chlorobenzene</i>		110 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/19/06 16:16
---	---	----------------------------------

**SYS EFF
0610103-03 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	0.5	mg/m ³ Air	APJ0080	10/17/06	10/18/06	EPA 8021B/8015m	
Toluene	ND	0.5	"	"	"	"	"	
Ethylbenzene	ND	0.5	"	"	"	"	"	
Xylenes (total)	0.5	0.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	20.0	"	"	"	"	"	
<i>Surrogate: Chlorobenzene</i>		99.2 %	% Recovery Limits		70-130			

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Project Number: Project Manager:	Sullins 1262.2 Eric Price	Date Reported: 10/19/06 16:16
---	---	---------------------------------	----------------------------------

BTEX/TPHG by PID/FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch APJ0080 - EPA 8021B/8015m

Blank (APJ0080-BLK1)

Prepared: 10/16/06 Analyzed: 10/17/06

<i>Surrogate: Chlorobenzene</i>	13.4		ug/l	12.5		107	70-130			
Methyl-t-butyl ether	ND	1.2	mg/m ³ Air							
Benzene	ND	1.2	"							
Toluene	ND	1.2	"							
Ethylbenzene	ND	1.2	"							
Xylenes (total)	ND	1.2	"							
Gasoline Range Hydrocarbons	ND	50.0	"							

LCS (APJ0080-BS1)

Prepared: 10/16/06 Analyzed: 10/17/06

<i>Surrogate: Chlorobenzene</i>	13.5		mg/m ³ Air	12.5		108	80-120			
Benzene	13.2	1.2	"	12.5		106	80-120			
Toluene	13.3	1.2	"	12.5		106	80-120			
Ethylbenzene	13.7	1.2	"	12.5		110	80-120			
Xylenes (total)	41.3	1.2	"	37.5		110	80-120			

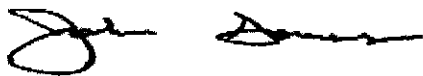
LCS Dup (APJ0080-BSD1)

Prepared: 10/16/06 Analyzed: 10/17/06

<i>Surrogate: Chlorobenzene</i>	13.2		mg/m ³ Air	12.5		106	80-120			
Benzene	13.5	1.2	"	12.5		108	80-120	2.25	20	
Toluene	13.4	1.2	"	12.5		107	80-120	0.749	20	
Ethylbenzene	13.8	1.2	"	12.5		110	80-120	0.727	20	
Xylenes (total)	41.5	1.2	"	37.5		111	80-120	0.483	20	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics
1101 7th Street
Modesto, CA 95354

Project: Sullins
Project Number: 1262.2
Project Manager: Eric Price

Date Reported:
10/19/06 16:16

Notes and Definitions

ND - Analyte not detected at reporting limit.

NR - Not reported

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



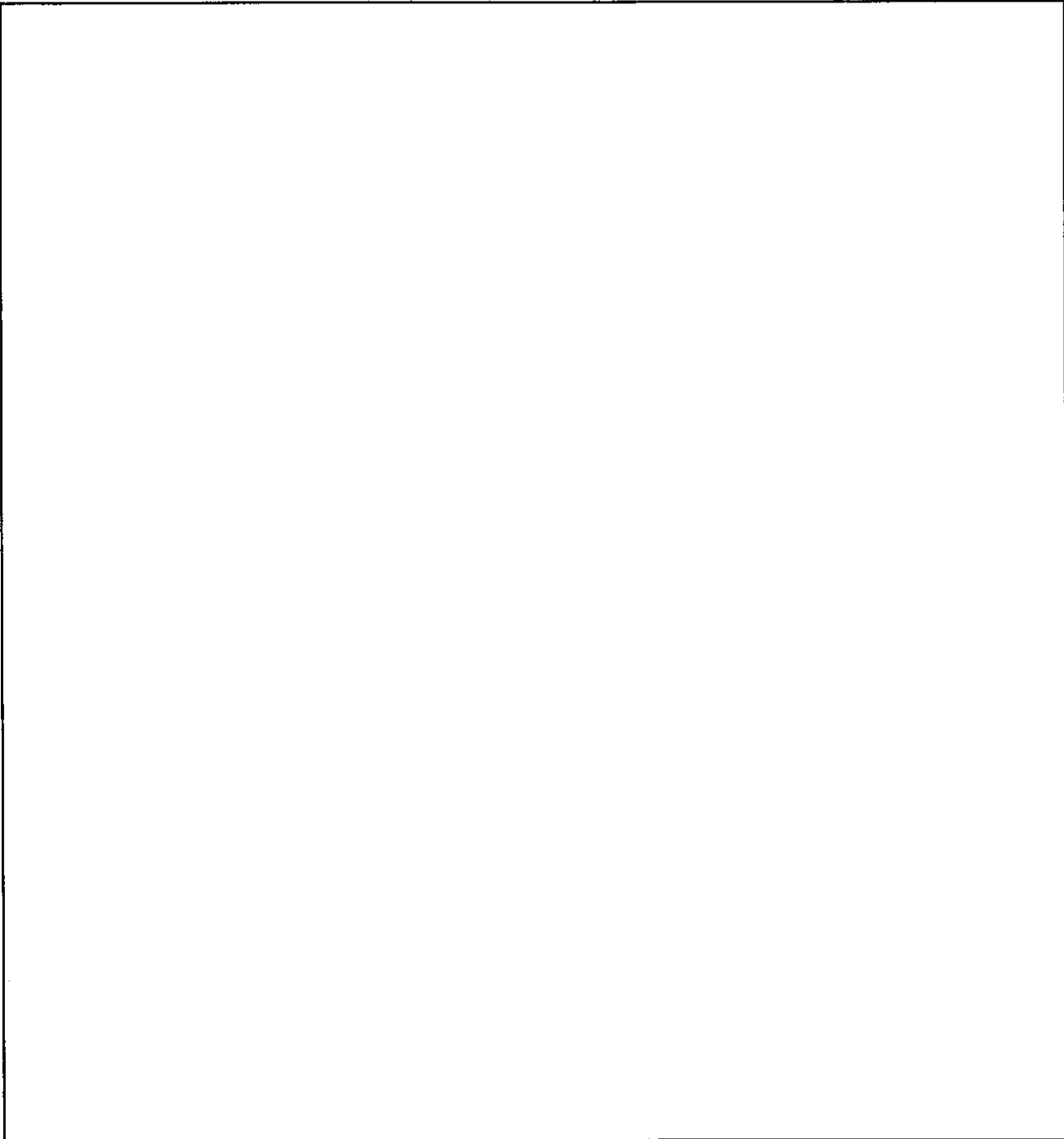
Laboratory Representative

Excelchem Environmental Labs

Geological Technics
1101 7th Street
Modesto, CA 95354

Project: Sullins
Project Number: 1262.2
Project Manager: Eric Price

Date Reported:
10/19/06 16:16



Jenny Weese

COPY

From: Laura Wilt [Laura@excelchem.net]
Sent: Monday, October 23, 2006 4:44 PM
To: GTI
Subject: Report and EDF for Sullins
Attachments: 0610114.zip; 0610114 FINAL 10 23 06 1547.PDF

Here is the report and zipped EDF for the project "Sullins" sampled 10/17/06. Please let me know if you have any questions.

Laura Wilt
QA/QC Officer / LIMs Administration
Excelchem Environmental Labs
ph: 916-543-4445
fx: 916-543-4449

EXCELCHEM
Environmental Labs

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449



ELAP Certificate No. : 2119

23 October 2006

Eric Price

Geological Technics

1101 7th Street

Modesto, CA 95354

RE: Sullins

Workorder number:0610114

Enclosed are the results of analyses for samples received by the laboratory on 10/18/06 15:00. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

John Somers, Lab Director

Excelchem Environmental Labs

Geological Technics
1101 7th Street
Modesto, CA 95354

Project: Sullins
Project Number: 1262.2
Project Manager: Eric Price

Date Reported:
10/23/06 15:47

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W-1s VAPOR	0610114-01	Air	10/17/06 09:50	10/18/06 15:00
SYS EFF	0610114-02	Air	10/17/06 09:55	10/18/06 15:00
W-1s VAPOR	0610114-03	Air	10/17/06 13:50	10/18/06 15:00

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/23/06 15:47
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**W-1s VAPOR
0610114-01 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	2.5	mg/m ³ Air	APJ0080	10/18/06	10/19/06	EPA 8021B/8015m	
Toluene	20.5	2.5	"	"	"	"	"	
Ethylbenzene	36.6	2.5	"	"	"	"	"	
Xylenes (total)	112	2.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	4510	100	"	"	"	"	"	

Surrogate: Chlorobenzene

126 % % Recovery Limits

70-130

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/23/06 15:47
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**SYS EFF
0610114-02 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	0.5	mg/m ³ Air	APJ0080	10/18/06	10/19/06	EPA 8021B/8015m	
Toluene	0.9	0.5	"	"	"	"	"	
Ethylbenzene	0.9	0.5	"	"	"	"	"	
Xylenes (total)	4.3	0.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	34.8	20.0	"	"	"	"	"	

Surrogate: Chlorobenzene

102 %

% Recovery Limits

70-130

"

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Project Number: Project Manager:	Sullins 1262.2 Eric Price	Date Reported: 10/23/06 15:47
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**W-1s VAPOR
0610114-03 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	2.5	mg/m ³ Air	APJ0080	10/18/06	10/19/06	EPA 8021B/8015m	
Toluene	23.5	2.5	"	"	"	"	"	
Ethylbenzene	40.0	2.5	"	"	"	"	"	
Xylenes (total)	124	2.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	4890	100	"	"	"	"	"	
<i>Surrogate: Chlorobenzene</i>		<i>130 %</i>	<i>% Recovery Limits</i>		<i>70-130</i>		<i>"</i>	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Project Number: Project Manager:	Sullins 1262.2 Eric Price	Date Reported: 10/23/06 15:47
---	---	---------------------------------	----------------------------------

BTEX/TPHG by PID/FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch APJ0080 - EPA 8021B/8015m

Blank (APJ0080-BLK1)

Prepared: 10/16/06 Analyzed: 10/17/06

Surrogate: Chlorobenzene	13.4		ug/l	12.5		107	70-130			
Methyl-t-butyl ether	ND	1.2	mg/m ³ Air							
Benzene	ND	1.2	"							
Toluene	ND	1.2	"							
Ethylbenzene	ND	1.2	"							
Xylenes (total)	ND	1.2	"							
Gasoline Range Hydrocarbons	ND	50.0	"							

LCS (APJ0080-BS1)

Prepared: 10/16/06 Analyzed: 10/17/06

Surrogate: Chlorobenzene	13.5		mg/m ³ Air	12.5		108	80-120			
Benzene	13.2	1.2	"	12.5		106	80-120			
Toluene	13.3	1.2	"	12.5		106	80-120			
Ethylbenzene	13.7	1.2	"	12.5		110	80-120			
Xylenes (total)	41.3	1.2	"	37.5		110	80-120			

LCS Dup (APJ0080-BSD1)

Prepared: 10/16/06 Analyzed: 10/17/06

Surrogate: Chlorobenzene	13.2		mg/m ³ Air	12.5		106	80-120			
Benzene	13.5	1.2	"	12.5		108	80-120	2.25	20	
Toluene	13.4	1.2	"	12.5		107	80-120	0.749	20	
Ethylbenzene	13.8	1.2	"	12.5		110	80-120	0.727	20	
Xylenes (total)	41.5	1.2	"	37.5		111	80-120	0.483	20	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics
1101 7th Street
Modesto, CA 95354

Project: Sullins
Project Number: 1262.2
Project Manager: Eric Price

Date Reported:
10/23/06 15:47

Notes and Definitions

ND - Analyte not detected at reporting limit.

NR - Not reported

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Geological Technics Inc.

1101 7th Street
 Modesto, CA
 (209) 522-4119 Fax 522-4227
 E-mail: gti@geologicaltechnics.com



Chain of Custody

Project #: 1262.2		Client/Project Name: SULLINS		No. of Containers Matrix (Soil, Water, Gas, Other) Turnaround Time BTEX / TPH - G (SUL/11/06)	Analysis Requested				Laboratory Name and Address: EXCELCHEN (1612 WOOD)																									
Site Address: 187 NORTH L ST., LIVEWATER					<table border="1"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																												Purchase Order # 1262-8443	
Global ID No.: T 060 0100116				EDF Report: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Turnaround Time: S = Standard 1 day, 2 day, 5 day		Remarks																										
Sampled By: (print and sign name) JOSEPH D. ANGLIN <i>Joseph D. Anglin</i>								DUE 10-25-06																										
Date	Time	Field I.D.	Sample No.	No. of Containers	Matrix (Soil, Water, Gas, Other)	Turnaround Time	BTEX / TPH - G	(SUL/11/06)																										
10/17/06	09:50	W-1s	W-1s VAPOR	1	G	S	X		06010114-01																									
10/17/06	09:55	SYS EFF	SYS EFF	1	G	S	X		1-0																									
10/17/06	13:50	W-1s	W-1s VAPOR	1	G	S	X		W-0																									
Relinquished by: (signature) <i>Joseph D. Anglin</i>				Date:	Time:	Received by: (signature) <i>[Signature]</i>				Date:	Time:																							
Relinquished by: (signature)				10/17/06	1603					10/17/06	1603																							



Geological Technics
 1101 7th Street
 Modesto, CA 95354

Project: Sullins
 Project Number: 1262.2
 Project Manager: Eric Price

Excelchem Environmental Labs

Date Reported:
 10/23/06 15:47

COPY

Jenny Weese

From: Laura Wilt [Laura@excelchem.net]
Sent: Tuesday, October 24, 2006 4:21 PM
To: GTI
Subject: Report and EDF for Sullins
Attachments: 0610123 FINAL 10 24 06 1555.PDF; 0610123.zip

Here is the report and zipped EDF for the project "Sullins" sampled 10/18/06. Please let me know if you have any questions.

Laura Wilt
QA/QC Officer / LIMs Administration
Excelchem Environmental Labs
ph: 916-543-4445
fx: 916-543-4449

EXCELCHEM
Environmental Labs

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449



ELAP Certificate No. : 2119

24 October 2006

Eric Price

Geological Technics

1101 7th Street

Modesto, CA 95354

RE: Sullins

Workorder number:0610123

Enclosed are the results of analyses for samples received by the laboratory on 10/20/06 08:30. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

John Somers, Lab Director

Excelchem Environmental Labs

Geological Technics
1101 7th Street
Modesto, CA 95354

Project: Sullins
Project Number: 1262.2
Project Manager: Eric Price

Date Reported:
10/24/06 15:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W-1s VAPOR	0610123-01	Air	10/18/06 17:38	10/20/06 08:30
EW-1 VAPOR	0610123-02	Air	10/18/06 17:40	10/20/06 08:30
W-1s VAPOR	0610123-03	Air	10/19/06 06:45	10/20/06 08:30
EW-1 VAPOR	0610123-04	Air	10/19/06 06:48	10/20/06 08:30
EW-1 VAPOR	0610123-05	Air	10/19/06 11:30	10/20/06 08:30
EW-1 VAPOR	0610123-06	Air	10/19/06 14:12	10/20/06 08:30
EW-1 VAPOR	0610123-07	Air	10/19/06 14:14	10/20/06 08:30

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

**W-1s VAPOR
0610123-01 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	0.5	mg/m ³ Air	AP0080	10/20/06	10/20/06	EPA 8021B/8015m	
Toluene	1.1	0.5	"	"	"	"	"	
Ethylbenzene	1.0	0.5	"	"	"	"	"	
Xylenes (total)	5.8	0.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	33.8	20.0	"	"	"	"	"	
Surrogate: Chlorobenzene		99.2 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

**EW-1 VAPOR
0610123-02 (Air)**

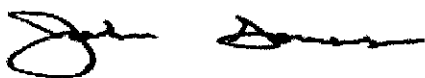
Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	0.5	mg/m ³ Air	APJ0080	10/20/06	10/20/06	EPA 8021B/8015m	
Toluene	1.0	0.5	"	"	"	"	"	
Ethylbenzene	2.8	0.5	"	"	"	"	"	
Xylenes (total)	10.3	0.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	232	20.0	"	"	"	"	"	
<i>Surrogate: Chlorobenzene</i>		106 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

**W-1s VAPOR
0610123-03 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	0.5	mg/m ³ Air	APJ0080	10/20/06	10/20/06	EPA 8021B/8015m	
Toluene	0.6	0.5	"	"	"	"	"	
Ethylbenzene	0.6	0.5	"	"	"	"	"	
Xylenes (total)	2.7	0.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	20.0	"	"	"	"	"	
Surrogate: Chlorobenzene		99.2 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

**EW-1 VAPOR
0610123-04 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	1.2	mg/m ³ Air	APJ0080	10/20/06	10/20/06	EPA 8021B/8015m	
Toluene	1.9	1.2	"	"	"	"	"	
Ethylbenzene	6.3	1.2	"	"	"	"	"	
Xylenes (total)	22.9	1.2	"	"	"	"	"	
Gasoline Range Hydrocarbons	533	50.0	"	"	"	"	"	
Surrogate: Chlorobenzene		105 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

**EW-1 VAPOR
0610123-05 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	1.2	mg/m ³ Air	API0080	10/20/06	10/20/06	EPA 8021B/8015m	
Toluene	10.8	1.2	"	"	"	"	"	
Ethylbenzene	16.5	1.2	"	"	"	"	"	
Xylenes (total)	62.7	1.2	"	"	"	"	"	
Gasoline Range Hydrocarbons	1710	50.0	"	"	"	"	"	
<i>Surrogate: Chlorobenzene</i>		<i>119 %</i>	<i>% Recovery Limits</i>		<i>70-130</i>			

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

**EW-1 VAPOR
0610123-06 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	0.5	mg/m ³ Air	APJ0080	10/20/06	10/23/06	EPA 8021B/8015m	
Toluene	ND	0.5	"	"	"	"	"	
Ethylbenzene	0.6	0.5	"	"	"	"	"	
Xylenes (total)	1.6	0.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	20.4	20.0	"	"	"	"	"	
<i>Surrogate: Chlorobenzene</i>		104 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

**EW-1 VAPOR
0610123-07 (Air)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

BTEX/TPHG by PID/FID

Benzene	ND	0.5	mg/m ³ Air	APJ0080	10/20/06	10/23/06	EPA 8021B/8015m	
Toluene	10.0	0.5	"	"	"	"	"	
Ethylbenzene	15.2	0.5	"	"	"	"	"	
Xylenes (total)	54.6	0.5	"	"	"	"	"	
Gasoline Range Hydrocarbons	1410	20.0	"	"	"	"	"	
Surrogate: Chlorobenzene		128 %	% Recovery Limits		70-130		"	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics 1101 7th Street Modesto, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Eric Price	Date Reported: 10/24/06 15:55
---	---	----------------------------------

BTEX/TPHG by PID/FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch APJ0080 - EPA 8021B/8015m

Blank (APJ0080-BLK1)

Prepared: 10/16/06 Analyzed: 10/17/06

<i>Surrogate: Chlorobenzene</i>	13.4		ug/l	12.5		107	70-130			
Benzene	ND	1.2	mg/m ³ Air							
Toluene	ND	1.2	"							
Ethylbenzene	ND	1.2	"							
Xylenes (total)	ND	1.2	"							
Gasoline Range Hydrocarbons	ND	50.0	"							

LCS (APJ0080-BS1)

Prepared: 10/16/06 Analyzed: 10/17/06

<i>Surrogate: Chlorobenzene</i>	13.5		mg/m ³ Air	12.5		108	80-120			
Benzene	13.2	1.2	"	12.5		106	80-120			
Toluene	13.3	1.2	"	12.5		106	80-120			
Ethylbenzene	13.7	1.2	"	12.5		110	80-120			
Xylenes (total)	41.3	1.2	"	37.5		110	80-120			

LCS Dup (APJ0080-BSD1)

Prepared: 10/16/06 Analyzed: 10/17/06

<i>Surrogate: Chlorobenzene</i>	13.2		mg/m ³ Air	12.5		106	80-120			
Benzene	13.5	1.2	"	12.5		108	80-120	2.25	20	
Toluene	13.4	1.2	"	12.5		107	80-120	0.749	20	
Ethylbenzene	13.8	1.2	"	12.5		110	80-120	0.727	20	
Xylenes (total)	41.5	1.2	"	37.5		111	80-120	0.483	20	

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Excelchem Environmental Labs

Geological Technics	Project:	Sullins	Date Reported:
1101 7th Street	Project Number:	1262.2	10/24/06 15:55
Modesto, CA 95354	Project Manager:	Eric Price	

Notes and Definitions

ND - Analyte not detected at reporting limit.

NR - Not reported

Excelchem Environmental Lab.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Laboratory Representative

Geological Technics Inc.

1181 7th Street
Modesto, CA
(209) 522-4119 Fax: 522-4227
E-mail: gtl@geologicaltechnics.com



Chain of Custody

Project #: 1262.2		Client/Project Name: SULLINS		No. of Containers Matrix (Soil, Water, Gas, Other) Turnaround Time	Analysis Requested					Laboratory Name and Address: EXCELCHEM		
Site Address: 187 NORTH L STREET, LIVERMORE					1	G	S	X				Purchase Order # 1262 - 8443
Global ID No.: T0600100116												1
Sampled By: (Print and sign name) JOSEPH D. AUGUST <i>JD August</i>				1	G	S	X				Turnaround Time: <input checked="" type="checkbox"/> Standard 1 day, 2 day, 5 day	
Date	Time	Field I.D.	Sample I.D.								1	G
10/13/06	1739	W-1S	W-1S VAPOR	1	G	S	X					
10/18/06	1740	EW-1	EW-1 VAPOR	1	G	S	X					
10/19/06	0645	W-1S	W-1S VAPOR	1	G	S	X					
10/19/06	0648	EW-1	EW-1 VAPOR	1	G	S	X					
10/19/06	1130	EW-1	EW-1 VAPOR	1	G	S	X					
10/19/06	1412	EW-1	EW-1 VAPOR	1	G	S	X				dry ft	
10/19/06	1414	EW-1	EW-1 VAPOR	1	G	S	X				dry ft - 7 samples from	
Relinquished by: (signature) <i>JD August</i>				Date: 10/19/06	Time: 14:30	Received By: (signature) <i>KA Hill</i>				Date: 10/19/06	Time: 14:20	
Relinquished by: (signature) <i>JD August</i>				Date: 10/19/06	Time: 15:47	Received By: (signature) <i>Vanessa B. Jik</i>				Date: 10/19/06	Time: 15:47	



Geological Technics
1101 7th Street
Modesto, CA 95354

Project: Sullins
Project Number: 1262.2
Project Manager: Eric Price

Excelchem Environmental Labs

Date Reported: 10/24/06 15:55

Appendix D

Laboratory Analytical Groundwater Data

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

November 02, 2006

CLS Work Order #: CPJ0957
COC #:

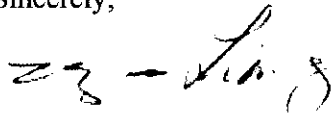
Joe Angulo
GEOLOGICAL TECHNICS INC.
1101 7th St.
MODESTO, CA 95354

Project Name: Sullins

Enclosed are the results of analyses for samples received by the laboratory on 10/23/06 21:20. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,



James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

GEOLOGICAL TECHNICS INC. 1101 7th St. MODESTO, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Joe Angulo	CLS Work Order #: CPJ0957 COC #:
---	---	-------------------------------------

Geological Technics Inc.

1101 7th Street
 Modesto, CA
 (209) 521-4119 Fax 522-4227

E-mail: gti@geologicaltechnics.com

Page 1 of 1



Chain of Custody

Project # 1262.2		Client/Project Name Sullins		Analysis Requested		Laboratory Name and Address CLS	
Site Address 187 North W Street Modesto, CA		Global ID No T66010116		Matrix (S, W, G, O) S		Purchase Order # 1262 9414	
Sampled By Joe Angulo		Date/Time 11/2/06 12:15		Turnaround Time 1 day, 2 day, 5 day		EDR Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Date		Time		Field I.D.		Sample I.D.	
11/2/06		12:15		W-15		W-15	
		13:50		W-1		W-1	
		14:00		W-10		W-10	
		15:25		W-4		W-4	
Relinquished by signature [Signature]		Date 11/2/06		Time 12:15		Received by signature [Signature]	
Relinquished by signature [Signature]		Date 11/2/06		Time 13:50		Received by signature [Signature]	
Relinquished by signature [Signature]		Date		Time		Received by signature [Signature]	

Please return cooler/ice chest to Geological Technics Inc.

REV. 4/2004

CALIFORNIA LABORATORY SERVICES

GEOLOGICAL TECHNICS INC. 1101 7th St. MODESTO, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Joe Angulo	CLS Work Order #: CPJ0957 COC #:
---	---	-------------------------------------

Gas/BTEX by GC PID/FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CP08374 - EPA 5030 Water GC

Blank (CP08374-BLK1)										
Prepared & Analyzed: 10/26/06										
Gasoline	ND	50	µg/L							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	1.0	"							
Surrogate: o-Chlorotoluene (BTEX)	24.1		"	20.0		120	65-135			
Surrogate: o-Chlorotoluene (Gas)	24.6		"	20.0		123	65-135			

LCS (CP08374-BS1)										
Prepared & Analyzed: 10/26/06										
Gasoline	328	50	µg/L	500		65.6	65-135		30	
Surrogate: o-Chlorotoluene (Gas)	25.9		"	20.0		130	65-135			

LCS Dup (CP08374-BSD1)										
Prepared & Analyzed: 10/26/06										
Gasoline	341	50	µg/L	500		68.2	65-135	3.89	30	
Surrogate: o-Chlorotoluene (Gas)	19.0		"	20.0		95.0	65-135			

Batch CP08392 - EPA 5030 Water GC										
Blank (CP08392-BLK1)										
Prepared & Analyzed: 10/26/06										
Gasoline	ND	50	µg/L							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	1.0	"							
Surrogate: o-Chlorotoluene (BTEX)	19.4		"	20.0		97.0	65-135			
Surrogate: o-Chlorotoluene (Gas)	20.1		"	20.0		100	65-135			

CALIFORNIA LABORATORY SERVICES

GEOLOGICAL TECHNICS INC. 1101 7th St. MODESTO, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Joe Angulo	CLS Work Order #: CPJ0957 COC #:
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Gas/BTEX by GC PID/FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch CP08392 - EPA 5030 Water GC

LCS (CP08392-BS1)		Prepared & Analyzed: 10/26/06								
Gasoline	525	50	µg/L	500		105	65-135		30	
Surrogate: o-Chlorotoluene (Gas)	19.7		"	20.0		98.5	65-135			
LCS Dup (CP08392-BSD1)		Prepared & Analyzed: 10/26/06								
Gasoline	500	50	µg/L	500		100	65-135	4.88	30	
Surrogate: o-Chlorotoluene (Gas)	19.4		"	20.0		97.0	65-135			
Matrix Spike (CP08392-MS1)		Source: CPJ0957-05		Prepared & Analyzed: 10/26/06						
Gasoline	537	50	µg/L	500	ND	107	65-135		30	
Surrogate: o-Chlorotoluene (Gas)	19.4		"	20.0		97.0	65-135			
Matrix Spike Dup (CP08392-MSD1)		Source: CPJ0957-05		Prepared & Analyzed: 10/26/06						
Gasoline	503	50	µg/L	500	ND	101	65-135	6.54	30	
Surrogate: o-Chlorotoluene (Gas)	19.5		"	20.0		97.5	65-135			

Batch CP08409 - EPA 5030 Water GC

Blank (CP08409-BLK1)		Prepared & Analyzed: 10/27/06								
Gasoline	ND	50	µg/L							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	1.0	"							
Surrogate: o-Chlorotoluene (BTEX)	21.4		"	20.0		107	65-135			
Surrogate: o-Chlorotoluene (Gas)	19.4		"	20.0		97.0	65-135			
LCS (CP08409-BS1)		Prepared & Analyzed: 10/27/06								
Gasoline	508	50	µg/L	500		102	65-135		30	
Surrogate: o-Chlorotoluene (Gas)	19.2		"	20.0		96.0	65-135			

CALIFORNIA LABORATORY SERVICES

GEOLOGICAL TECHNICS INC. 1101 7th St. MODESTO, CA 95354	Project: Sullins Project Number: 1262.2 Project Manager: Joe Angulo	CLS Work Order #: CPJ0957 COC #:
---	---	-------------------------------------

Gas/BTEX by GC PID/FID - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CP08409 - EPA 5030 Water GC										
LCS Dup (CP08409-BSD1)				Prepared & Analyzed: 10/27/06						
Gasoline	494	50	µg/L	500		98.8	65-135	2.79	30	
Surrogate: <i>o</i> -Chlorotoluene (Gas)	19.4		"	20.0		97.0	65-135			
Matrix Spike (CP08409-MS1)				Source: CPJ1079-03		Prepared & Analyzed: 10/27/06				
Gasoline	507	50	µg/L	500	ND	101	65-135		30	
Surrogate: <i>o</i> -Chlorotoluene (Gas)	19.6		"	20.0		98.0	65-135			
Matrix Spike Dup (CP08409-MSD1)				Source: CPJ1079-03		Prepared & Analyzed: 10/27/06				
Gasoline	534	50	µg/L	500	ND	107	65-135	5.19	30	
Surrogate: <i>o</i> -Chlorotoluene (Gas)	19.6		"	20.0		98.0	65-135			

CALIFORNIA LABORATORY SERVICES

Page 10 of 10

11/02/06 11:34

GEOLOGICAL TECHNICS INC.
1101 7th St.
MODESTO, CA 95354

Project: Sullins
Project Number: 1262.2
Project Manager: Joe Angulo

CLS Work Order #: CPJ0957
COC #:

Notes and Definitions

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

CA DOHS ELAP Accreditation/Registration Number 1233

3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com 916-638-7301 Fax: 916-638-4510

Jenny Weese

COPY

From: Erin Cunniffe [ecunniffe@entechlabs.com]
Sent: Thursday, October 26, 2006 5:25 PM
To: GTI
Subject: Emailing: 51995_EDF.zip, 51995.pdf (1262.2/Sullins)
Attachments: 51995_EDF.zip; 51995.pdf



51995_EDF.zip (4 51995.pdf (365 KB)
KB)

Attached is your certificate of analysis and EDF file. No hard copy will be mailed unless you specifically request it.

if you have any questions, please feel free to contact me.

Thank you,

Erin

Erin Cunniffe
Entech Analytical Labs, INC
408.588.0200 ext 238

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054

Phone: (408) 588-0200

Fax: (408) 588-0201

**Jenny Wees
Geological Technics, Inc.
1101 7th Street
Modesto, CA 95354**

Lab Certificate Number: 51995

Issued: 10/26/2006

**Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore**

**P.O. Number: 7536MP
Global ID: T0600100116**

Certificate of Analysis - Final Report

On October 19, 2006, samples were received under chain of custody for analysis.
Entech analyzes samples "as received" unless otherwise noted. The following results are included:

<u>Matrix</u>	<u>Test</u>	<u>Comments</u>
Liquid	Electronic Deliverables for Geotracker TPH-Extractable: EPA 3510C / EPA 8015B(M) TPH-Purgeable: EPA 5030C / EPA 8015B VOCs: EPA 5030C / EPA 8021B	

Entech Analytical Labs, Inc. is certified for environmental analyses by the State of California (#2346).
If you have any questions regarding this report, please call us at 408-588-0200 ext. 225.

Sincerely,



Erin Cunniffe
Operations Manager

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054

Phone: (408) 588-0200

Fax: (408) 588-0201

Geological Technics, Inc.
1101 7th Street
Modesto, CA 95354
Attn: Jenny Wees

Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore
GlobalID: T0600100116
P.O. Number: 7536MP
Samples Received: 10/19/2006
Sample Collected by: Client

Certificate of Analysis - Data Report

Lab # : 51995-001 Sample ID: MW-106

Matrix: Liquid Sample Date: 10/16/2006 2:09 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	2.2		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Ethyl Benzene	0.57		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Xylenes, Total	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 114 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	56		1.0	50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 129 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

Lab # : 51995-002 Sample ID: MW-108

Matrix: Liquid Sample Date: 10/16/2006 5:22 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	790		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020
Toluene	46		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020
Ethyl Benzene	ND		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020
Xylenes, Total	65		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 100 65 - 135

Analyzed by: MaiChiTu
Reviewed by: EricKum

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	3400		40	2000	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 102 65 - 135

Analyzed by: MaiChiTu
Reviewed by: EricKum

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054

Phone: (408) 588-0200

Fax: (408) 588-0201

Geological Technics, Inc.
1101 7th Street
Modesto, CA 95354
Attn: Jenny Wees

Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore
GlobalID: T0600100116
P.O. Number: 7536MP
Samples Received: 10/19/2006
Sample Collected by: Client

Certificate of Analysis - Data Report

Lab # : 51995-003 Sample ID: MW-205

Matrix: Liquid Sample Date: 10/16/2006 5:40 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	880		40	20	µg/L	N/A	N/A	10/24/2006	WGC061023
Toluene	63		40	20	µg/L	N/A	N/A	10/24/2006	WGC061023
Ethyl Benzene	ND		40	20	µg/L	N/A	N/A	10/24/2006	WGC061023
Xylenes, Total	54		40	20	µg/L	N/A	N/A	10/24/2006	WGC061023

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 98.9 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	ND		40	2000	µg/L	N/A	N/A	10/24/2006	WGC061023

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 96.5 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

Lab # : 51995-004 Sample ID: MW-206

Matrix: Liquid Sample Date: 10/16/2006 1:53 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	0.72		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Ethyl Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Xylenes, Total	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 95.2 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	ND		1.0	50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 93.3 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

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Modesto, CA 95354
Attn: Jenny Wees

Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore
GlobalID: T0600100116
P.O. Number: 7536MP
Samples Received: 10/19/2006
Sample Collected by: Client

Certificate of Analysis - Data Report

Lab # : 51995-005 Sample ID: MW-305

Matrix: Liquid Sample Date: 10/16/2006 4:40 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	1.8		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Ethyl Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Xylenes, Total	0.67		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 100 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	ND		1.0	50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 98.4 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

Lab # : 51995-006 Sample ID: MW-306

Matrix: Liquid Sample Date: 10/16/2006 1:14 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Ethyl Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Xylenes, Total	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 95.4 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	ND		1.0	50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 90.9 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

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Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore
GlobalID: T0600100116
P.O. Number: 7536MP
Samples Received: 10/19/2006
Sample Collected by: Client

Certificate of Analysis - Data Report

Lab #: 51995-007 Sample ID: MW-308

Matrix: Liquid Sample Date: 10/16/2006 2:51 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Ethyl Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Xylenes, Total	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 99.2 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	ND		1.0	50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 92.6 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

Lab #: 51995-008 Sample ID: W-E-3

Matrix: Liquid Sample Date: 10/17/2006 9:55 AM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Ethyl Benzene	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019
Xylenes, Total	ND		1.0	0.50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 97.8 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	ND		1.0	50	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 91.4 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Extractable: EPA 3510C / EPA 8015B(M)

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Diesel	ND		1.0	50	µg/L	10/20/2006	WD061020A	10/24/2006	WD061020A

Surrogate Surrogate Recovery Control Limits (%)
o-Terphenyl 40.3 22 - 133

Analyzed by: JHsiang
Reviewed by: LGlantz

Detection Limit = Detection Limit for Reporting.

ND = Not Detected at or above the Detection Limit.

D/P-F = Dilution and/or Prep Factor includes sample volume adjustments.

Qual = Data Qualifier

10/26/2006 10:35:03 AM - ECunniff

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Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore
GlobalID: T0600100116
P.O. Number: 7536MP
Samples Received: 10/19/2006
Sample Collected by: Client

Certificate of Analysis - Data Report

Lab #: 51995-009 Sample ID: W-B-3

Matrix: Liquid Sample Date: 10/17/2006 2:09 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	1000		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020
Toluene	37		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020
Ethyl Benzene	410		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020
Xylenes, Total	83		40	20	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)

4-Bromofluorobenzene 150 *** 65 - 135

Analyzed by: MaiChiTu

Reviewed by: EricKum

*** Surrogate recovery was outside the QC limits due to matrix interference.

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	6500		40	2000	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)

4-Bromofluorobenzene 251 *** 65 - 135

Analyzed by: MaiChiTu

Reviewed by: EricKum

*** Surrogate recovery was outside the QC limits due to matrix interference.

TPH-Extractable: EPA 3510C / EPA 8015B(M)

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Diesel	ND		0.94	47	µg/L	10/20/2006	WD061020A	10/24/2006	WD061020A

810ppb higher boiling Gasoline compounds in the Diesel range (C8-C18). No Diesel pattern present.

Surrogate Surrogate Recovery Control Limits (%)

o-Terphenyl 33.5 22 - 133

Analyzed by: JHsiang

Reviewed by: LGlantz

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Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore
GlobalID: T0600100116
P.O. Number: 7536MP
Samples Received: 10/19/2006
Sample Collected by: Client

Certificate of Analysis - Data Report

Lab #: 51995-010 Sample ID: W-3-3

Matrix: Liquid Sample Date: 10/17/2006 11:25 AM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	95		4.0	2.0	µg/L	N/A	N/A	10/20/2006	WGC061019
Toluene	ND		4.0	2.0	µg/L	N/A	N/A	10/20/2006	WGC061019
Ethyl Benzene	2.0		4.0	2.0	µg/L	N/A	N/A	10/20/2006	WGC061019
Xylenes, Total	ND		4.0	2.0	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 133 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	1300		4.0	200	µg/L	N/A	N/A	10/20/2006	WGC061019

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 490 *** 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

*** Surrogate recovery was outside the QC limits due to matrix interference.

TPH-Extractable: EPA 3510C / EPA 8015B(M)

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Diesel	ND		1.0	50	µg/L	10/20/2006	WD061020A	10/24/2006	WD061020A

1000 ppb higher boiling Gasoline compounds and Oil range organics (C8-C36). No Diesel pattern present.

Surrogate Surrogate Recovery Control Limits (%)
o-Terphenyl 42.6 22 - 133

Analyzed by: JHsiang
Reviewed by: LGlantz

Lab #: 51995-011 Sample ID: MW-205

Matrix: Liquid Sample Date: 10/17/2006 3:00 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	2000		100	50	µg/L	N/A	N/A	10/24/2006	WGC061023
Toluene	190		100	50	µg/L	N/A	N/A	10/24/2006	WGC061023
Ethyl Benzene	52		100	50	µg/L	N/A	N/A	10/24/2006	WGC061023
Xylenes, Total	220		100	50	µg/L	N/A	N/A	10/24/2006	WGC061023

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 101 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	5100		100	5000	µg/L	N/A	N/A	10/24/2006	WGC061023

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 104 65 - 135

Analyzed by: MaiChiTu
Reviewed by: TFulton

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Project Number: 1262.2
Project Name: Sullins
Project Location: 187 N. L Street/Livermore
GlobalID: T0600100116
P.O. Number: 7536MP
Samples Received: 10/19/2006
Sample Collected by: Client

Certificate of Analysis - Data Report

Lab # : 51995-012 Sample ID: MW-208

Matrix: Liquid Sample Date: 10/17/2006 3:50 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	520		20	10	µg/L	N/A	N/A	10/21/2006	WGC061020
Toluene	39		20	10	µg/L	N/A	N/A	10/21/2006	WGC061020
Ethyl Benzene	ND		20	10	µg/L	N/A	N/A	10/21/2006	WGC061020
Xylenes, Total	100		20	10	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 97.0 65 - 135

Analyzed by: MaiChiTu
Reviewed by: EricKum

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	1500		20	1000	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 98.1 65 - 135

Analyzed by: MaiChiTu
Reviewed by: EricKum

Lab # : 51995-013 Sample ID: W-I-3

Matrix: Liquid Sample Date: 10/17/2006 2:40 PM

VOCs: EPA 5030C / EPA 8021B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	5000		200	100	µg/L	N/A	N/A	10/21/2006	WGC061020
Toluene	1300		200	100	µg/L	N/A	N/A	10/21/2006	WGC061020
Ethyl Benzene	1500		200	100	µg/L	N/A	N/A	10/21/2006	WGC061020
Xylenes, Total	3500		200	100	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 115 65 - 135

Analyzed by: MaiChiTu
Reviewed by: EricKum

TPH-Purgeable: EPA 5030C / EPA 8015B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	35000		200	10000	µg/L	N/A	N/A	10/21/2006	WGC061020

Surrogate Surrogate Recovery Control Limits (%)
4-Bromofluorobenzene 156 *** 65 - 135

Analyzed by: MaiChiTu
Reviewed by: EricKum

*** Surrogate recovery was outside the QC limits due to matrix interference.

TPH-Extractable: EPA 3510C / EPA 8015B(M)

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Diesel	ND		9.4	470	µg/L	10/20/2006	WD061020A	10/25/2006	WD061020A

8000 ppb higher boiling Gasoline compounds in the Diesel range (C8-C18). No Diesel pattern present.

Surrogate Surrogate Recovery Control Limits (%)
o-Terphenyl 48.9 22 - 133

Analyzed by: JHsiang
Reviewed by: ECunniffe

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Method Blank - Liquid - TPH-Extractable: EPA 3510C / EPA 8015B(M)

QC/Prep Batch ID: WD061020A

Validated by: LGlantz - 10/24/06

QC/Prep Date: 10/20/2006

Parameter	Result	DF	PQLR	Units
TPH as Diesel	ND	1	50	µg/L

Surrogate for Blank	% Recovery	Control Limits
o-Terphenyl	50.1	22 - 133

LCS / LCSD - Liquid - TPH-Extractable: EPA 3510C / EPA 8015B(M)

QC Batch ID: WD061020A

Reviewed by: LGlantz - 10/24/06

QC/Prep Date: 10/20/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
TPH as Diesel	<50	1000	554	µg/L	55.4	40 - 138
TPH as Motor Oil	<200	1000	640	µg/L	64.0	40 - 138

Surrogate	% Recovery	Control Limits
o-Terphenyl	50.1	22 - 133

LCSD

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
TPH as Diesel	<50	1000	596	µg/L	59.6	7.2	25.0	40 - 138
TPH as Motor Oil	<200	1000	717	µg/L	71.7	11	25.0	40 - 138

Surrogate	% Recovery	Control Limits
o-Terphenyl	55.2	22 - 133

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Method Blank - Liquid - TPH-Purgeable: EPA 5030C / EPA 8015B

QC Batch ID: WGC061019

Validated by: TFulton - 10/20/06

QC Batch Analysis Date: 10/19/2006

Parameter	Result	DF	PQLR	Units
TPH as Gasoline	ND	1	50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	94.5	65 - 135

Method Blank - Liquid - VOCs: EPA 5030C / EPA 8021B

QC Batch ID: WGC061019

Validated by: TFulton - 10/20/06

QC Batch Analysis Date: 10/19/2006

Parameter	Result	DF	PQLR	Units
Benzene	ND	1	0.50	µg/L
Ethyl Benzene	ND	1	0.50	µg/L
Toluene	ND	1	0.50	µg/L
Xylenes, Total	ND	1	0.50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	98.7	65 - 135

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LCS / LCS D - Liquid - TPH-Purgeable: EPA 5030C / EPA 8015B

QC Batch ID: WGC061019

Reviewed by: TFulton - 10/20/06

QC Batch ID Analysis Date: 10/19/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
TPH as Gasoline	<50	120	111	µg/L	89.0	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	105.0	65 - 135

LCS D

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
TPH as Gasoline	<50	120	122	µg/L	98.0	9.6	25.0	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	123.0	65 - 135

LCS / LCS D - Liquid - VOCs: EPA 5030C / EPA 8021B

QC Batch ID: WGC061019

Reviewed by: TFulton - 10/20/06

QC Batch ID Analysis Date: 10/19/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
Benzene	<0.50	4.0	4.05	µg/L	101	65 - 135

Ethyl Benzene	<0.50	4.0	4.30	µg/L	108	65 - 135
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Toluene	<0.50	4.0	4.15	µg/L	104	65 - 135
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Xylenes, total	<0.50	12	13.0	µg/L	109	65 - 135
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Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	97.2	65 - 135

LCS D

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
Benzene	<0.50	4.0	4.23	µg/L	106	4.3	25.0	65 - 135

Ethyl Benzene	<0.50	4.0	4.50	µg/L	112	4.5	25.0	65 - 135
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Toluene	<0.50	4.0	4.37	µg/L	109	5.2	25.0	65 - 135
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Xylenes, total	<0.50	12	13.6	µg/L	113	4.1	25.0	65 - 135
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Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	98.7	65 - 135

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MS / MSD - Liquid - VOCs: EPA 5030C / EPA 8021B

QC Batch ID: WGC061019

Reviewed by: EricKum - 10/23/06

QC Batch ID Analysis Date: 10/19/2006

MS Sample Spiked: 51995-007

Parameter	Sample Result	Spike Amount	Spike Result	Units	Analysis Date	% Recovery	Recovery Limits
Benzene	ND	4.0	4.05	µg/L	10/19/2006	101	65 - 135
Ethyl Benzene	ND	4.0	4.26	µg/L	10/19/2006	106	65 - 135
Toluene	ND	4.0	4.07	µg/L	10/19/2006	102	65 - 135
Xylenes, total	ND	12	12.8	µg/L	10/19/2006	106	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	94.7	65 - 135

MSD Sample Spiked: 51995-007

Parameter	Sample Result	Spike Amount	Spike Result	Units	Analysis Date	% Recovery	RPD	RPD Limits	Recovery Limits
Benzene	ND	4.0	4.07	µg/L	10/19/2006	102	0.49	25.0	65 - 135
Ethyl Benzene	ND	4.0	4.30	µg/L	10/19/2006	108	0.93	25.0	65 - 135
Toluene	ND	4.0	4.14	µg/L	10/19/2006	104	1.7	25.0	65 - 135
Xylenes, total	ND	12	12.9	µg/L	10/19/2006	108	1.0	25.0	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	94.7	65 - 135

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MS / MSD - Liquid - TPH-Purgeable: EPA 5030C / EPA 8015B

QC Batch ID: WGC061019

Reviewed by: Erickum - 10/23/06

QC Batch ID Analysis Date: 10/19/2006

MS Sample Spiked: 51995-007

Parameter	Sample Result	Spike Amount	Spike Result	Units	Analysis Date	% Recovery	Recovery Limits
TPH as Gasoline	ND	120	119	µg/L	10/19/2006	95.1	65 - 135
Surrogate	% Recovery	Control Limits					
4-Bromofluorobenzene	121.0	65 - 135					

MSD Sample Spiked: 51995-007

Parameter	Sample Result	Spike Amount	Spike Result	Units	Analysis Date	% Recovery	RPD	RPD Limits	Recovery Limits
TPH as Gasoline	ND	120	120	µg/L	10/19/2006	95.6	0.55	25.0	65 - 135
Surrogate	% Recovery	Control Limits							
4-Bromofluorobenzene	119.0	65 - 135							

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Method Blank - Liquid - TPH-Purgeable: EPA 5030C / EPA 8015B

QC Batch ID: WGC061020

Validated by: EricKum - 10/23/06

QC Batch Analysis Date: 10/20/2006

Parameter	Result	DF	PQLR	Units
TPH as Gasoline	ND	1	50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	94.9	65 - 135

Method Blank - Liquid - VOCs: EPA 5030C / EPA 8021B

QC Batch ID: WGC061020

Validated by: EricKum - 10/23/06

QC Batch Analysis Date: 10/20/2006

Parameter	Result	DF	PQLR	Units
Benzene	ND	1	0.50	µg/L
Ethyl Benzene	ND	1	0.50	µg/L
Toluene	ND	1	0.50	µg/L
Xylenes, Total	ND	1	0.50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	102	65 - 135

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

LCS / LCSD - Liquid - TPH-Purgeable: EPA 5030C / EPA 8015B

QC Batch ID: WGC061020

Reviewed by: EricKum - 10/23/06

QC Batch ID Analysis Date: 10/20/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
TPH as Gasoline	<50	120	117	µg/L	93.9	65 - 135
Surrogate	% Recovery	Control Limits				
4-Bromofluorobenzene	121.0	65 - 135				

LCSD

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
TPH as Gasoline	<50	120	118	µg/L	94.1	0.16	25.0	65 - 135
Surrogate	% Recovery	Control Limits						
4-Bromofluorobenzene	120.0	65 - 135						

LCS / LCSD - Liquid - VOCs: EPA 5030C / EPA 8021B

QC Batch ID: WGC061020

Reviewed by: EricKum - 10/23/06

QC Batch ID Analysis Date: 10/20/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
Benzene	<0.50	4.0	4.18	µg/L	104	65 - 135
Ethyl Benzene	<0.50	4.0	4.40	µg/L	110	65 - 135
Toluene	<0.50	4.0	4.21	µg/L	105	65 - 135
Xylenes, total	<0.50	12	13.4	µg/L	112	65 - 135
Surrogate	% Recovery	Control Limits				
4-Bromofluorobenzene	102.0	65 - 135				

LCSD

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
Benzene	<0.50	4.0	4.04	µg/L	101	3.4	25.0	65 - 135
Ethyl Benzene	<0.50	4.0	4.28	µg/L	107	2.8	25.0	65 - 135
Toluene	<0.50	4.0	4.14	µg/L	104	1.7	25.0	65 - 135
Xylenes, total	<0.50	12	13.0	µg/L	108	3.4	25.0	65 - 135
Surrogate	% Recovery	Control Limits						
4-Bromofluorobenzene	99.0	65 - 135						

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

Method Blank - Liquid - TPH-Purgeable: EPA 5030C / EPA 8015B

QC Batch ID: WGC061023

Validated by: TFulton - 10/24/06

QC Batch Analysis Date: 10/23/2006

Parameter	Result	DF	PQLR	Units
TPH as Gasoline	ND	1	50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	97.2	65 - 135

Method Blank - Liquid - VOCs: EPA 5030C / EPA 8021B

QC Batch ID: WGC061023

Validated by: TFulton - 10/24/06

QC Batch Analysis Date: 10/23/2006

Parameter	Result	DF	PQLR	Units
Benzene	ND	1	0.50	µg/L
Ethyl Benzene	ND	1	0.50	µg/L
Toluene	ND	1	0.50	µg/L
Xylenes, Total	ND	1	0.50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	101	65 - 135

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

LCS / LCSD - Liquid - TPH-Purgeable: EPA 5030C / EPA 8015B

QC Batch ID: WGC061023

Reviewed by: TFulton - 10/24/06

QC Batch ID Analysis Date: 10/23/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
TPH as Gasoline	<50	120	121	µg/L	96.8	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	124.0	65 - 135

LCSD

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
TPH as Gasoline	<50	120	123	µg/L	98.4	1.6	25.0	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	124.0	65 - 135

LCS / LCSD - Liquid - VOCs: EPA 5030C / EPA 8021B

QC Batch ID: WGC061023

Reviewed by: TFulton - 10/24/06

QC Batch ID Analysis Date: 10/23/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
Benzene	<0.50	4.0	4.12	µg/L	103	65 - 135
Ethyl Benzene	<0.50	4.0	4.33	µg/L	108	65 - 135
Toluene	<0.50	4.0	4.18	µg/L	104	65 - 135
Xylenes, total	<0.50	12	13.1	µg/L	110	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	101.0	65 - 135

LCSD

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
Benzene	<0.50	4.0	4.19	µg/L	105	1.7	25.0	65 - 135
Ethyl Benzene	<0.50	4.0	4.41	µg/L	110	1.8	25.0	65 - 135
Toluene	<0.50	4.0	4.26	µg/L	106	1.9	25.0	65 - 135
Xylenes, total	<0.50	12	13.4	µg/L	111	1.6	25.0	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	103.0	65 - 135

Geological Technics Inc.

1101 7th Street
 Modesto, CA
 (209) 522-4119 Fax 522-4227
 E-mail: gti@geologicaltechnics.com

51995



Chain of Custody

Project #: 12622		Client/Project Name: Sullins		No. of Containers	Matrix (Soil, Water, Gas, Other)	Turnaround Time	Analysis Requested										Laboratory Name and Address: Entech			
Site Address: 187 North "L" Street Livermore							BTEX 8015m	TPH-G 8015m											Purchase Order # 7536MP	
Global ID No.: T0600100116																			EDF Report: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sampled By: (print and sign name) Mark Pearson M. Pearson																			Turnaround Time: S = Standard 1 day, 2 day, 5 day	
Date	Time	Field I.D.	Sample I.D.													Remarks				
10/16/06	1409	001	MW-106	3	W	S	X	X												
	1722	002	MW-108																	
	1740	003	MW-205																	
	1353	004	MW-206																	
	1640	005	MW-305																	
	1314	006	MW-306																	
	1451	007	MW-308																	
Relinquished by: (signature) M. Pearson		Date: 10/19/06	Time: 1010	Received by: (signature) SAS MIKE - WORLD COURIER		Date: 10/19/06	Time: 1010													
Relinquished by: (signature) SAS MIKE		Date: 10/19/06	Time:	Received by: (signature) [Signature]		Date: 10/19/06	Time: 1153													
Relinquished by: (signature)		Date:	Time:	Received by: (signature)		Date:	Time:													

Please return cooler/ice chest to Geological Technics Inc.

Geological Technics Inc.

1101 7th Street
 Modesto, CA
 (209) 522-4119 Fax 522-4227
 E-mail: gti@geologicaltechnics.com



Chain of Custody

51995

Project #:				Client/Project Name:				Analysis Requested										Laboratory Name and Address:							
1262.2				Sullins				No. of Containers	Matrix (Soil, Water, Gas, Other)	Turnaround Time	BTEX 8015 m	TPH-G 8015 m	TPH-D											Entech	
Site Address:				187 North "L" Street Livermore																				Purchase Order # 75361MP	
Global ID No.:				T0600100116																				EDF Report: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sampled By: (print and sign name)				Raymond Rodriguez <i>[Signature]</i>																				Turnaround Time: <input checked="" type="checkbox"/> Standard 1 day, 2 day, 5 day	
Date	Time	Field I.D.	Sample I.D.	No. of Containers	Matrix (Soil, Water, Gas, Other)	Turnaround Time	BTEX 8015 m	TPH-G 8015 m	TPH-D												Remarks				
10/17/06	0955	008	W-Es ✓	4	WS		X	X	X																
	1409	009	W-Bs ✓	4	WS		X	X	X																
	1125	010	W-3s ✓	4	WS		X	X	X																
	1500	011	MW-205 ✓	3	WS		X	X																	
	1550	012	MW-208 ✓	3	WS		X	X																	
	1440	013	W-1s ✓	4	WS		X	X	X																
Relinquished by: (signature)				Date:	Time:	Received by: (signature)				Date:	Time:														
<i>[Signature]</i>				10/19/06	1010	SAGMIRE-WORLD CARRIER				10/19/06	1010														
Relinquished by: (signature)				Date:	Time:	Received by: (signature)				Date:	Time:														
SAS MIKE				10/19/06		<i>[Signature]</i>				10/19/06	1153														
Relinquished by: (signature)				Date:	Time:	Received by: (signature)				Date:	Time:														

Please return cooler/ice chest to Geological Technics Inc.

Appendix E

Soil Vapor Extraction Data

Table E1: Summary of Soil Vapor Analytical Data

Sullins
187 North L Street
Livermore, CA
Project No. 1262.2

Well	Date	Time	TPH-G mg/m ³ (=ug/l)	Benzene mg/m ³ (=ug/l)	Toluene mg/m ³ (=ug/l)	Ethyl mg/m ³ (=ug/l)	Xylene mg/m ³ (=ug/l)	Notes
EW-1	10/16/06	11:30	3750	ND<2.5	17.6	33.6	98.3	sample from pipe after oil pump
	10/16/06	15:15	1230	ND<2.5	6.60	15.5	51.1	"
	10/18/06	17:40	232	ND<0.5	1.0	2.8	10.3	sample from well
	10/19/06	6:48	533	ND<1.2	1.9	6.3	22.9	"
	10/19/06	11:30	1710	ND<1.2	10.8	16.5	62.7	sample from pipe after oil pump
	10/19/06	14:12	20.4	ND<0.5	ND<0.5	0.6	1.6	sample from well
	10/19/06	14:14	1410	ND<0.5	10.0	15.2	54.6	sample from pipe after oil pump
W-1s	10/17/06	9:50	4510	ND<2.5	20.5	36.6	112	sample from pipe after oil pump
	10/17/06	13:50	4890	ND<2.5	23.5	40.0	124	"
	10/18/06	17:38	33.8	ND<0.5	1.1	1.0	5.8	sample from well
	10/19/06	6:45	ND<20	ND<0.5	0.6	0.6	2.7	"
System Effluent	10/16/06	15:10	ND<20	ND<0.5	ND<0.5	ND<0.5	0.5	sample from port on exhaust stack
	10/17/06	9:55	34.8	ND<0.5	0.9	0.9	4.3	"

Table E2: Summary of Soil Vapor Vacuum Data

Sullins
187 North L Street
Livermore, California

Date	Time	System (vac. In. Hg)	Extraction Point		Vacuum Measuring Point (vac. In. Hg)				OVM
			(vac. In. Hg)	cfm	W-1s	W-Bs	MW-4	MW-5	
			EW-1						
10/16/2006	11:00	17	6.25	74					201
(extract vapor only)	11:30	17	7	79	0.014	0.014			144
	12:00	17	6.5	87	0.22	0.022			104
	13:00	17	6	101	0.24	0.023	0		76
	14:00	17	6	124	0.25	0.023			56
	15:00	16.5	6	152	0.25	0.022			68
	16:00	16.5	6	179	0.25	0.022			59
	18:00	16.5	6	201	0.26	0.022			50
	20:00	16.5	6	201	0.26	0.022			34
	23:55	16.5	6	100	0.26	0.022			44
10/17/2006	8:00	16.5	5.5	196	0.30	0.022	0	0	41
			W-1s		EW-1	W-Bs			
(extract vapor only)	9:05	18.5	10	164	0.23	0.024			213
	10:00	18	10	185	0.24	0.022			212
	11:00	18	9	197	0.25	0.022			195
dual phase in progress 11:15	12:00	19.5	5	154	0.19	0.022			204
	13:00	19	6	174	0.22	-			230
	14:00	18.5	6	177	0.22	-			246
	15:00	18.5	6	75	0.22	0.031			243
	16:00	17	7.5	108	0.26	0.043			245
	18:00	18	6.5	137	0.24	0.04			218
	20:00	18	6.5	170	0.24	0.041			254
10/18/2006	8:15	17	6	135	0.25	0.051			284
			W-1s & EW-1		W-Bs				
	10:00	6.5	3	127	3	0.047			188
	10:30	6	2.5	138	3	0.047			194
	11:00	6	2.5	139	3	0.046			178
	14:15	6	2.5	135	3	0.047			191
10/19/2006	7:00	6	2.5	156	3				203

Table E3: Mass Removed by Soil Vapor Extraction

Sullins
187 North L Street
Livermore, California

Date	Time	Sys. OVM	System CFM	avg. cfm	Laboratory	avg.	minutes	TPH-G (kg)	TPH-G kg/day
					TPH-G (mg/l)	TPH-G (mg/l)	in	in period*	
EW-1									
10/16/2006	11:00	201	74						
lab sample	11:30	144	79		3.75				
	12:00	104	87						
	13:00	76	101						
	14:00	56	124						
	15:00	68	152						
lab sample	15:15				1.23				
	16:00	59	179						
	18:00	50	201						
	20:00	34	201						
	23:55	44	100						
10/17/2006	8:00	41	196						
elapsed time 21 hours →				136		2.49	1260	12	13.7
								13.7 kg/day = 5 gal/day	
W-1s									
10/17/2006									
(extract vapor only)	9:05	213	164						
lab sample	9:50				4.51				
	10:00	212	185						
	11:00	195	197						
(dual phase in progress 11:15)	12:00	204	154						
	13:00	230	174						
lab sample	13:50				4.89				
	14:00	246	177						
	15:00	243	75						
	16:00	245	108						
	18:00	218	137						
	20:00	254	170						
10/18/2006	8:15	284	135						
elapsed time 23.2 hours →				152		4.70	1390	28	29
								29 kg/day = 10 gal/day	

*Formula for "TPH-G in period":

$$(TPH-G \text{ mg/L}) * (\text{ft}^3/\text{min}) * (28.32\text{L}/\text{ft}^3) * (\text{kg}/1000000\text{mg}) * (\text{minutes in period}) = \text{TPH-G (kg)}$$

Total kg = 40
 lb = 89
 gal = 14

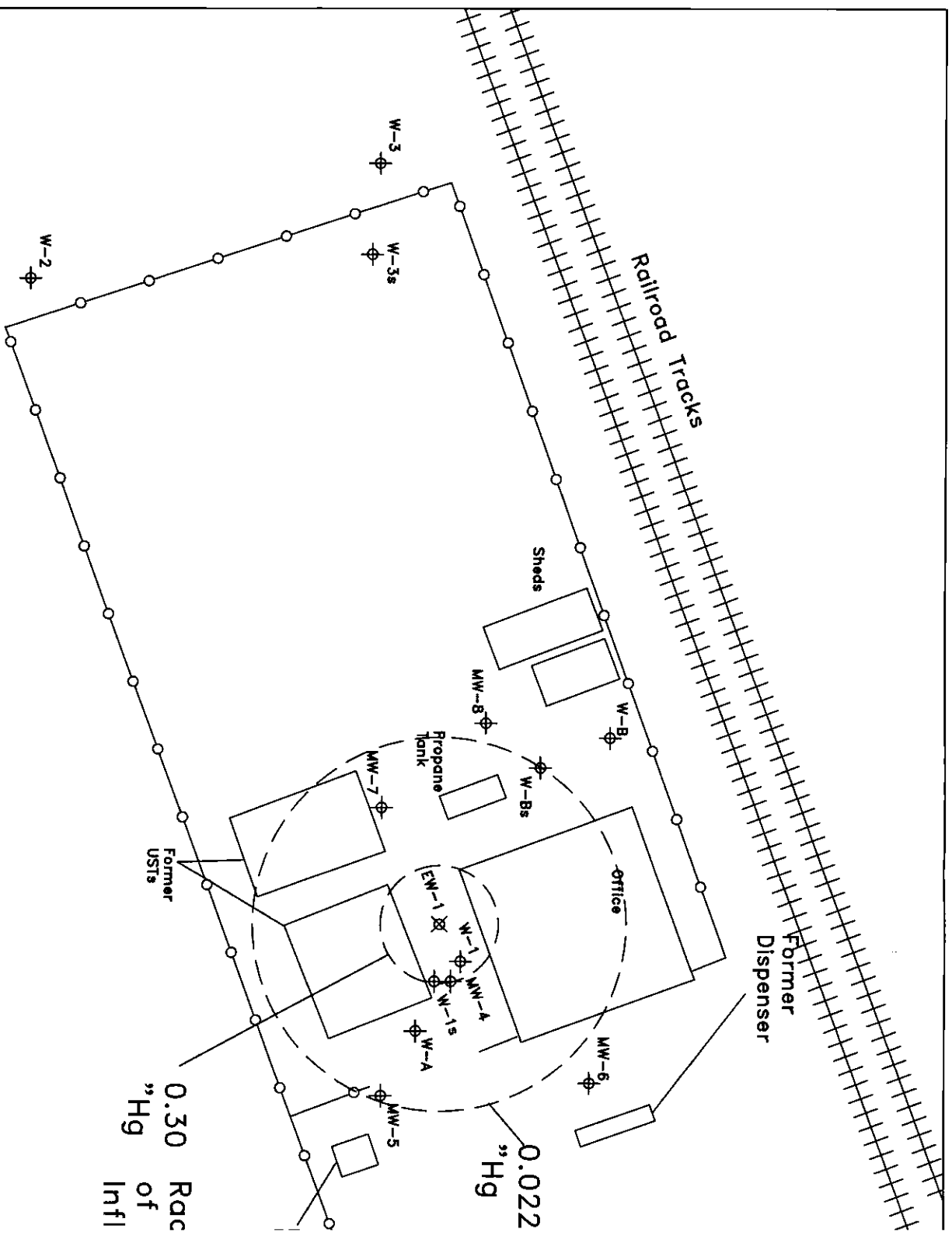


Fig E1: Well EW-1
Radius of Influence

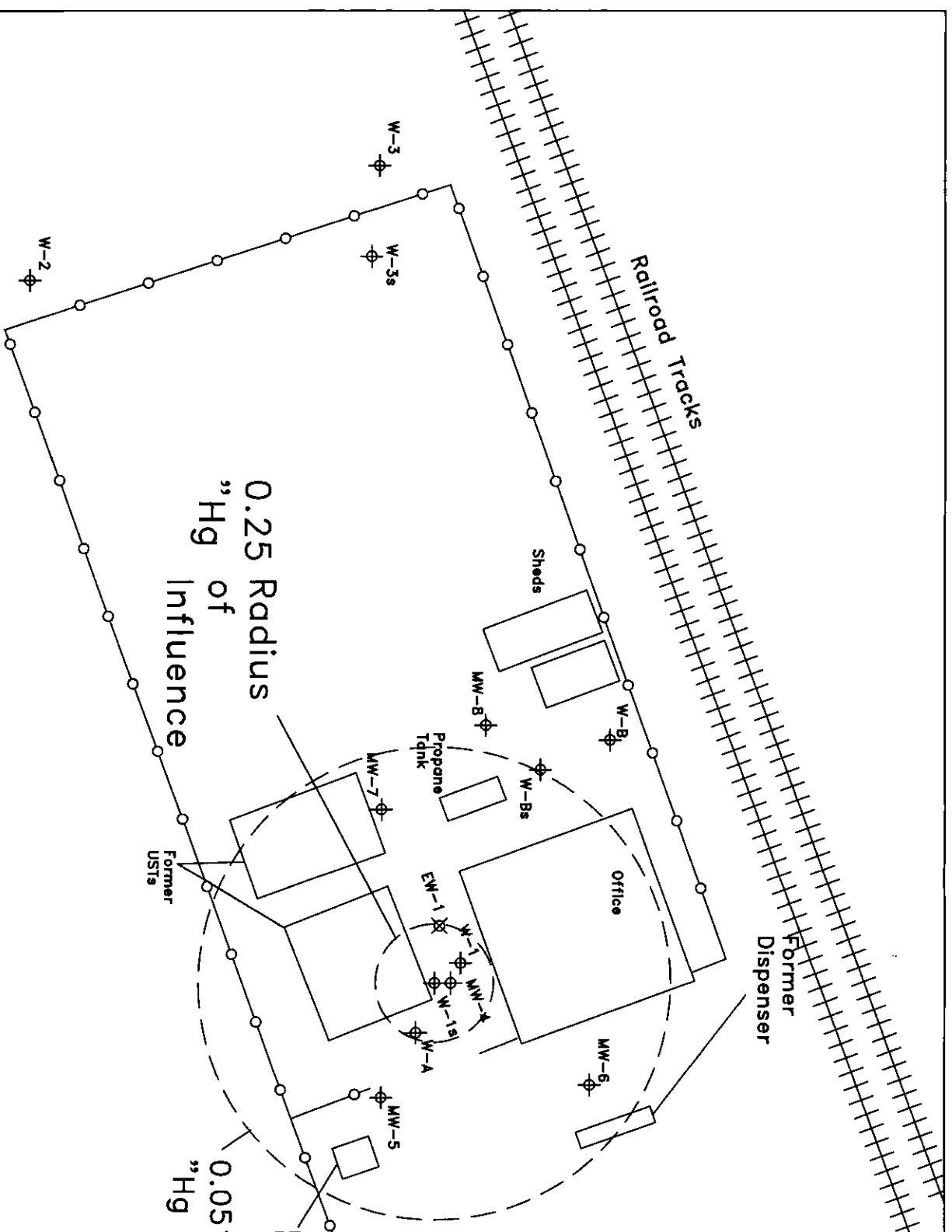
Arrow Rentals
187 North L Street
Livermore, CA

Geological Technics Inc.

10/31/06

Legend

- ⊕ Monitoring Well
- Soil Boring
- ⊗ Extraction Well



**Fig E2: Well W-1s
Radius of Influence**
Arrow Rentals
187 North L Street
Livermore, CA

Geological Technics Inc.

10/31/06

Legend

- ⊕ Monitoring Well
- Soil Boring
- ⊗ Extraction Well

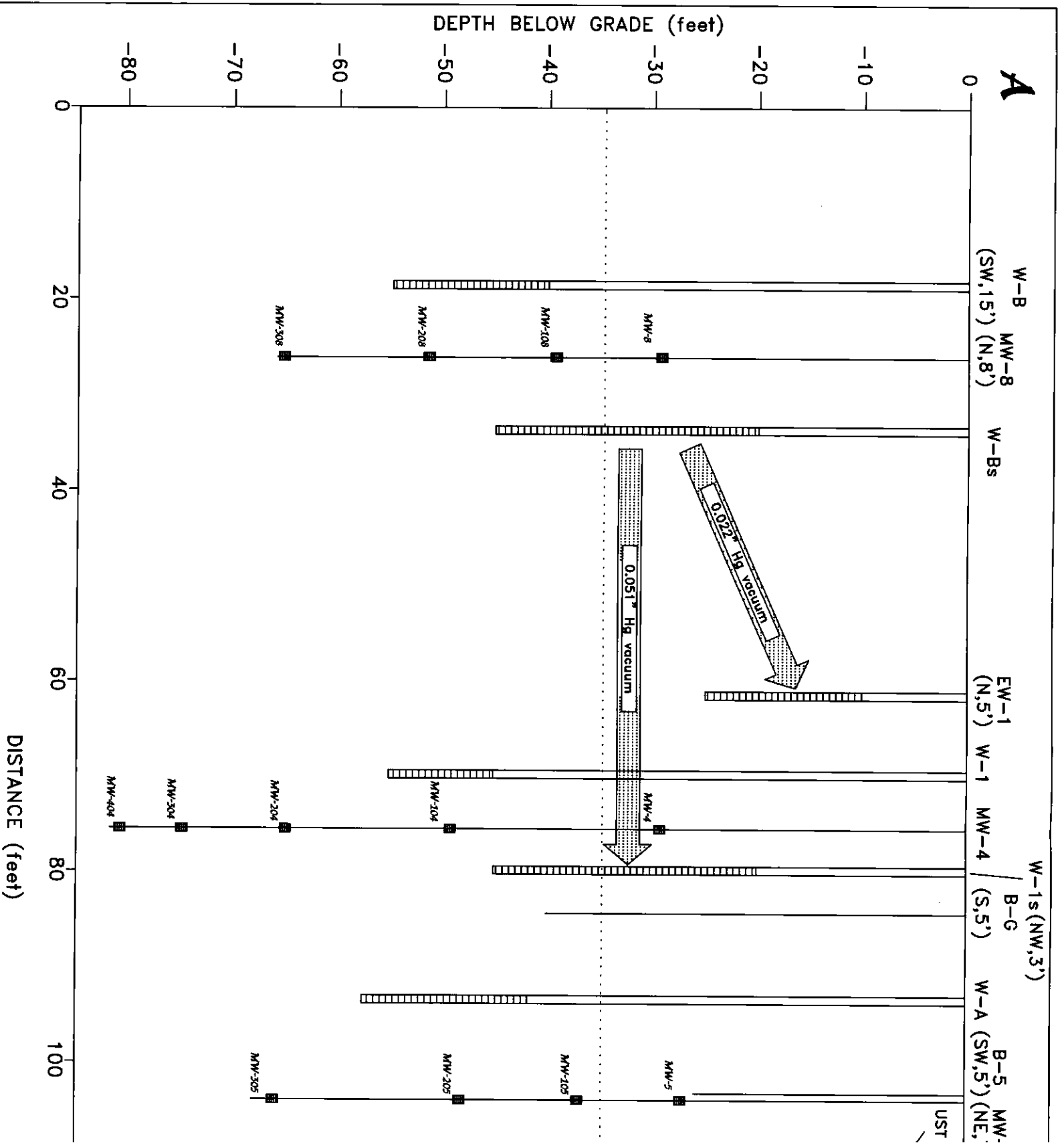


Figure E3
 Cross Section A - A'
 With Vacuum Influence

Arrow Rentals
 187 N L Street
 Livermore, CA
 Project No.: 1262.2

Geological Technics Inc. 10/24/06

MW-108 = CMT well screen section

LEGEND

Appendix F

Groundwater Extraction Data

Wells	Date	TPH	TPH	Benzene	Toluene	Ethyl	Total	MTBE	ETBE	DIPE	TAME	TBA	1,2 DCA	EDB
		Gasoline ug/L	Diesel ug/L	ug/L	ug/L	Benzene ug/L	Xylenes ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
W-3s	3/22/1996	100	-	13	6.9	5.3	14	<5	-	-	-	-	-	-
	11/22/1996	3,200	-	270	29	63	100	<100	-	-	-	-	-	-
	7/15/1997	2,100	340	230	7	33	51	<20	-	-	-	-	-	-
	10/29/1997	2,800	750	630	31	71	69	<30	-	-	-	-	-	-
	4/27/1998	<50	<50	<0.5	<0.5	<0.5	<0.5	<3	-	-	-	-	-	-
	10/23/1998	3,800	1,000	500	28	90	37	35	-	-	-	-	-	-
	4/9/1999	980	430	240	4	37	3	<12	-	-	-	-	-	-
	10/5/1999	1,500	1,000	290	9.5	53	9.8	<6	-	-	-	-	-	-
	4/5/2000	810	320	150	3	9	5.7	<5	-	-	-	-	-	-
	10/26/2000	310	120	83	3.5	6.4	1.2	<5	-	-	-	-	-	-
	4/18/2001	2,300	1,600	320	8	16	7	<20	-	-	-	-	-	-
	11/13/2001	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/30/2002	1,400	490	320	5.5	24	5	<25	-	-	-	-	-	-
	9/30/2002	420	390	68	1.4	3.1	1.1	<5	-	-	-	-	-	-
	3/19/2003	5,300	1,500	920	24	140	27	<25	-	-	-	-	-	-
	9/16/2003	1,600	1,400	270	1.7	5.2	<0.5	<5	-	-	-	-	-	-
	4/29/2004	1,300	400	210	5.1	23	4.5	<25	-	-	-	-	-	-
7/7/2006	110	<500	44	0.77	<0.5	<0.5	<1	<5	<5	<5	<10	<0.5	<0.5	
10/17/2006	1,300	<50	95	ND<2	2	ND<2	-	-	-	-	-	-	-	
W-Bs	3/22/1996	61,000	-	9,800	8,000	2,200	11,000	<5000	-	-	-	-	-	-
	11/22/1996	47,000	-	5,100	3,100	1,400	7,800	<2500	-	-	-	-	-	-
	7/15/1997	66,000	17,000	7,800	4,900	1,900	10,000	<600	-	-	-	-	-	-
	10/29/1997	44,000	27,000	6,000	500	1,500	6,400	380	-	-	-	-	-	-
	4/27/1998	63,000	17,000	6,100	5,400	1,900	9,100	<600	-	-	-	-	-	-
	10/23/1998	48,000	9,600	6,700	1,200	1,500	6,200	<300	-	-	-	-	-	-
	4/9/1999	39,000	12,000	4,100	1,900	1,400	5,600	<300	-	-	-	-	-	-
	10/5/1999	38,000	7,300	3,800	390	1,600	5,900	<60	-	-	-	-	-	-
	4/5/2000	34,000	9,600	3,500	1,200	1,400	4,700	<150	-	-	-	-	-	-
	10/26/2000	23,000	650	2,500	210	1,100	2,600	150	-	-	-	-	-	-
	4/18/2001	20,000	2,500	2,400	180	880	1,800	<20	-	-	-	-	-	-
	11/13/2001	17,000	3,600	2,000	130	1,100	1,700	<150	-	-	-	-	-	-
	4/30/2002	13,000	2,300	1,000	38	660	360	<170	-	-	-	-	-	-
	9/30/2002	7,100	1,500	940	28	260	93	<250	-	-	-	-	-	-
	3/19/2003	14,000	3,900	1,200	77	820	900	<120	-	-	-	-	-	-
	9/16/2003	9,400	1,900	1,300	36	580	160	<150	-	-	-	-	-	-
	4/29/2004	15,000	3,300	2,400	170	1,300	950	<200	-	-	-	-	-	-
7/7/2006	11,000	<50	1,900	160	820	440	<40	<200	<200	<200	<400	<20	<20	
10/17/2006	6,500	<47	1,000	37	410	83	-	-	-	-	-	-	-	
10/20/2006	630	<47	39	8.5	1.7	20	-	-	-	-	-	-	-	
W-Es	3/22/1996	<50	-	<0.5	<0.5	<0.5	<0.5	<5	-	-	-	-	-	-
	11/22/1996	280	-	24	0.6	1.8	2.2	<5	-	-	-	-	-	-
	7/15/1997	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/29/1997	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/27/1998	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/23/1998	82	69	<0.5	0.8	<0.5	0.8	4	-	-	-	-	-	-
	4/9/1999	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/5/1999	68	88	<0.5	<0.5	<0.5	<1.0	4	-	-	-	-	-	-
	4/5/2000	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/26/2000	110	<50	0.7	<0.5	<0.5	<1.0	<5	-	-	-	-	-	-
	4/18/2001	-	-	-	-	-	-	-	-	-	-	-	-	-
	11/13/2001	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/30/2002	-	-	-	-	-	-	-	-	-	-	-	-	-
	9/30/2002	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/19/2003	86	61	<0.5	<0.5	<0.5	<0.5	<5	-	-	-	-	-	-
	9/16/2003	-	-	-	-	-	-	-	-	-	-	-	-	-
	4/29/2004	55	87	0.62	<0.5	<0.5	<0.5	<5	-	-	-	-	-	-
7/7/2006	<25	<50	<0.5	<0.5	<0.5	<0.5	2.4	<5	<5	<5	<10	<0.5	<0.5	
10/17/2006	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	

Wells	Date	TPH	TPH	Benzene	Toluene	Ethyl	Total	MTBE	ETBE	DIPE	TAME	TBA	1,2 DCA	EDB	
		Gasoline ug/L	Diesel ug/L	ug/L	ug/L	Benzene ug/L	Xylenes ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-4	10/16/2006														DRY
MW-5	10/16/2006														DRY
MW-6	10/16/2006														DRY
MW-7	10/16/2006														DRY
MW-8	10/16/2006														DRY
MW-104	10/19/2006	960	-	250	170	20	83	-	-	-	-	-	-	-	-
MW-105	10/16/2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	10/16/2006	56	-	2.2	<0.5	0.57	<0.5	-	-	-	-	-	-	-	-
MW-107	10/19/2006	320	-	430	290	33	140	-	-	-	-	-	-	-	-
MW-108	10/16/2006	3,400	-	790	46	<20	65	-	-	-	-	-	-	-	-
MW-204	10/19/2006	5,800	-	560	420	110	580	-	-	-	-	-	-	-	-
MW-205	10/16/2006	<2000	-	880	63	<20	54	-	-	-	-	-	-	-	-
	10/17/2006	5,100	-	2,000	190	52	220	-	-	-	-	-	-	-	-
MW-206	10/16/2006	<50	-	0.72	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
MW-207	10/19/2006	1,000	-	170	52	18	67	-	-	-	-	-	-	-	-
MW-208	10/17/2006	1,500	-	520	39	<10	100	-	-	-	-	-	-	-	-
MW-304	10/19/2006	3,300	-	290	240	56	530	-	-	-	-	-	-	-	-
MW-305	10/16/2006	<50	-	1.8	<0.5	<0.5	0.67	-	-	-	-	-	-	-	-
MW-306	10/16/2006	<50	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
MW-307	10/19/2006	<50	-	2.3	1.5	<0.5	4.7	-	-	-	-	-	-	-	-
MW-308	10/16/2006	<50	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
MW-404	10/19/2006	1,700	-	120	73	27	280	-	-	-	-	-	-	-	-

pre- 2006 data adapted from *Environmental Sampling Services 5/27/04 Groundwater Monitoring Report*

"-" = not analyzed

Table F2: Summary of Groundwater Pumping Data

Sullins
187 North L Street
Livermore, California

Date	Time	Extraction Point	Total Pumped	Water Meter	Δ time (min)	Δ gallons	Extraction Rate (gpm)	Field Notes
10/16/2006	11:40	EW-1	0	188342.2			-	vapor extract only
10/17/2006	11:30	W-1s	-	-	-	-	-	start slurping W-1s, stinger 32'
	13:32	W-1s	23	188365.3	122	23	0.2	stinger 40'
	14:08	W-1s	97	188438.8	36	74	2.0	stinger 43', initial de-water slug?
	15:27	W-1s	118	188460.0	79	21	0.3	stinger 41'
	17:27	W-1s	147	188488.7	120	29	0.2	stinger 41'
	20:17	W-1s	178	188520.6	170	32	0.2	stinger 41'
						W-1s avg. gpm:	0.2	
10/18/2006	7:55	W-1s	321	188662.7	698	142	0.2	stinger 41'
	14:24	W-1s	364	188706.4	389	44	0.1	stinger 41'
10/19/2006	7:00	W-1s	471	188813.4	996	107	0.1	stinger 41'
	14:40	W-1	492	188834.2	-	-	-	start extract W-1, stinger 34'
	15:35	W-1	536	188878.0	55	44	0.8	drop stinger 40'
	16:35	W-1	595	188937.0	60	59	1.0	stinger 40'
						W-1 avg. gpm:	0.9	
	18:55	W-1 & W-A	817	189159.6	-	-	-	stingers 40'
	19:55	W-1 & W-A	955	189296.8	60	137	2.3	stingers 40'
	20:55	W-1 & W-A	1107	189448.7	60	152	2.5	stingers 40'
10/20/2006	6:45	W-1 & W-A	2460	190802.3	590	1354	2.3	stingers 40'
						W-1 & W-A avg. gpm:	2.4	
	10:00	W-1 & W-1s	2766	191108.2	195	306	1.6	
	11:00	W-1 & W-A	2833	191175.4	60	67	1.1	W-1 stinger 35', W-A stinger 43'
	13:00	W-1 & W-A	3158	191500.0	120	325	2.7	
	13:46	W-A	3158	191500.0				W-A stinger 43'
	14:45	W-A	3251	191593.0	59	93	1.6	terminate test

Table F3. Summary of Elevation Data - Groundwater

Sullins
187 North L Street
Livermore, CA
Project No. 1262.2

Date	Time	W-1	W-Bs	W-B	W-A	MW-105	MW-107	W-1s	Remarks
TOC	→								
		elev	elev	elev	elev	elev	elev	elev	
10/16/2006	10:40		447.93			447.97	446.77	447.81	vapor extract EW-1 only
10/17/2006	12:30	446.93		446.12	447.09	447.88	446.91		start dual phase extract W-1s ~11:30
	17:27	447.31		446.11		447.90	447.58		
10/18/2006	9:05	445.89		445.92		447.34	447.44		start dual phase W-1s & EW-1 @ 9:30
	14:24	446.20		445.98		447.31	447.40		
	15:30		446.99						
10/19/2006	8:50	446.29	447.04	445.98					start air sparge W-1s @ 10:30
									start extract W-1 @ 14:40, W-A @ 18:50
10/20/2006	13:00		446.70	446.02					various extract with EW-1, W-1s, W-1, W-A
	14:45	442.09	446.71	446.04	444.77		446.34	442.68	
elevation change		-4.84	-1.22	-0.08	-2.32	-0.66	-0.43	-5.13	

Appendix G

Air Sparge Data

Table G1: Summary of Air Sparge Data

**Sullins
187 North L Street
Livermore, California**

Date	Time	W-1s Sparge (psi)	W-1s cfm inject	EW-1 (vac "Hg)	System (EW-1) cfm	W-Bs (vac "Hg)	System OVM	EW-1 OVM
EW-1 Vapor Extraction Test								
10/16/2006	11:00			6.25	74		201	
(extract vapor only)	11:30			7	79	0.014	144	
	12:00			6.5	87	0.022	104	
	13:00			6	101	0.023	76	
	14:00			6	124	0.023	56	
	15:00			6	152	0.022	68	
	16:00			6	179	0.022	59	
	18:00			6	201	0.022	50	
	20:00			6	201	0.022	34	
	23:55			6	100	0.022	44	
10/17/2006	8:00			5.5	196	0.022	41	
Air Sparge Test								
10/19/2006	10:25	10		5			92	
	10:30	10	1.5	5	211	0.03		
	14:30	10	3.7	5	157	0.03	95	
	16:30	8	3.7	5	190	0.03	141	5
10/20/2006	6:30	9	4.0	2	120		166	114