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BLYMYER ENGINEERS, INC.
1829 Clement Avenue
Alameda, California 94501-1396
(510) 521-3773 FAX: (510) 865-2594

DATE September 3, 1999	BEI Job No. 94015
ATTENTION: Mr. Amir K Gholami	
CITY:	
SIC:	
RE: Kawahara Nursery	
PM: Jeanna Hudson	

Alameda County Health Care Services Agency
Environmental Health Services

1131 Harbor Bay Parkway, Suite 250

Alameda, CA 94502-6577

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Mark Detterman (Blymyer Engineers in Alameda) will assume management of the Kawahara Nursery project.

Thank you. Jeanna Hudson

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Results of Additional Subsurface Investigation and Quarterly Groundwater Monitoring, Second Quarter 1999

Kawahara Nursery
16550 Ashland Avenue
San Lorenzo, California

September 2, 1999 BEI Job No. 94015

Prepared for:

Kawahara Nursery, Inc.
16550 Ashland Avenue
San Lorenzo, CA 94508

Prepared by:

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\jhudson\KAWA\siteinv99

Limitations

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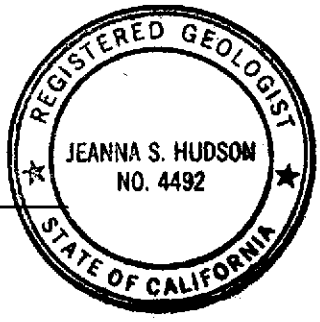
Blymyer Engineers, Inc.



By: _____

Jeanna Hudson, R.G.
Senior Geologist

And: _____

Michael S. Lewis
Vice President, Technical Services

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1.0 Introduction

1.1 Previous Work

1.1.1 Underground Storage Tank Removal

On December 1, 1992, one steel 5,000-gallon underground storage tank (UST) was removed from the property owned by Kawahara Nursery, located at 16550 Ashland Avenue, San Lorenzo, California, (Figure 1). The UST, used to store diesel, was reported to be in good condition at the time of removal with no visible evidence of holes. However, soil samples collected from the UST excavation contained Total Petroleum Hydrocarbons (TPH) as diesel, suggesting that some type of release had occurred. The results of the UST closure were described in the *Underground Storage Tank Closure Report*, prepared by Tank Protect Engineering.

According to information obtained from the property owners (the Kawaharas), a 1,000-gallon gasoline UST was previously located in the vicinity of the lath house on the north side of the property (Figure 2). The UST was reportedly removed from the site shortly after Kawahara Nursery occupied the property in 1954.

1.1.2 Phase I Site Investigation

In a letter dated January 27, 1993, the Alameda County Health Care Services Agency (ACHCSA) requested that a preliminary subsurface investigation be completed to ascertain the extent of soil and groundwater contamination at the site. On June 10, 1993, Blymyer Engineers supervised the installation of three groundwater monitoring wells (MW-1, MW-2, and MW-3) and one soil bore (SB-1). Minor concentrations of petroleum hydrocarbons were detected in the soil samples collected from soil bores MW-1 and MW-2, and higher concentrations were detected in the samples collected near the water-bearing zone in soil bore MW-3. The groundwater sample collected from monitoring well MW-3, located adjacent to an on-site irrigation well, contained TPH as gasoline and benzene, toluene, ethylbenzene, and xylenes (BTEX).

1.1.3 Phase II Site Investigation

In response to Blymyer Engineers' *Preliminary Site Assessment, Phase I Subsurface Investigation* report and *Subsurface Investigation Status Report*, the ACHCSA requested full delineation of the extent of petroleum hydrocarbons in groundwater at the site and in the soil adjacent to the diesel UST excavation. In 1994, Blymyer Engineers conducted a second phase of investigation at the site consisting of:

- A review of records at the ACHCSA and the Regional Water Quality Control Board to determine if any toxic chemical or fuel leaks reported within a ¼-mile radius may have impacted the site

- A review of historical aerial photographs

- Field tests to assess whether pumping of the on-site irrigation well would influence the shallow water-bearing zone

- A 16-point soil gas survey

- Installation of two additional groundwater monitoring wells (MW-4 and MW-5)

- Collection of groundwater samples from all five monitoring wells during the first three quarters of 1995

Results of the second phase of investigation were presented in Blymyer Engineers' *Subsurface Investigation Letter Report*, dated December 16, 1994 and in quarterly groundwater monitoring reports submitted in 1995.

No potential upgradient sources of contamination were identified during the review of the local

regulatory agency records and aerial photographs. On the basis of the limited field tests, pumping of the irrigation well did not have a significant influence on shallow groundwater beneath the site. Furthermore, petroleum hydrocarbons were not detected in the groundwater samples collected from the irrigation well, which is apparently screened from 45 to 60 feet below ground surface (bgs).

Slightly elevated concentrations of petroleum hydrocarbons were detected in the soil gas samples collected from the northeastern corner of the barn and near the northernmost lath house. Groundwater samples from MW-3, located between the lath house and the barn, contained up to 120,000 micrograms per liter (μg/L) TPH as gasoline, 4,800 μg/L of benzene, 8,400 μg/L of toluene, 3,000 μg/L of ethylbenzene, and 27,000 μg/L of total xylenes. The presence of TPH as gasoline in groundwater samples from MW-3 suggested that there was another source of petroleum hydrocarbons at the site, in addition to the diesel UST that was removed in 1992.

TPH as diesel was detected in the MW-5 groundwater sample only during the March 1995 sampling event. TPH as gasoline, TPH as diesel, and BTEX were not detected in groundwater samples collected from monitoring wells MW-1, MW-2, or MW-4. The direction of groundwater flow in September 1995 was estimated to be northwest with an average gradient of 0.004 feet/foot.

On the basis of the *Subsurface Investigation Letter Report* and quarterly groundwater monitoring reports, the ACHCSA requested (in a letter dated May 31, 1995) that Kawahara Nursery conduct additional work at the site. Specifically, they requested submittal of a workplan to identify the source and extent of contamination in soil and groundwater in the vicinity of monitoring well MW-3.

On June 3, 1997, Blymyer Engineers submitted the *Workplan for Additional Site Characterization and Site Risk Classification* (Workplan) to the ACHCSA. In a letter dated June 6, 1997, the ACHCSA requested that several additional tasks be included in the Workplan. On June 12, 1997, Blymyer Engineers submitted the *Revised Workplan for Additional Site Characterization* (Revised Workplan), which addressed the ACHCSA requirements. The above-mentioned documents are included in Appendix A.

1.2 Scope of Current Investigation

The Revised Workplan includes the following tasks:

- Resume quarterly groundwater monitoring and sampling of MW-3, MW-4, and MW-5
- Conduct a geophysical survey in an attempt to locate the gasoline UST or its former basin in the vicinity of the lath house on the north side of the site
- Conduct an additional investigation in the vicinity of the former gasoline UST by advancing approximately 6 direct-push soil bores
- Decommission monitoring wells MW-1 and MW-2, as approved by the ACHCSA
- Analyze soil and groundwater samples to evaluate the potential for natural attenuation (aerobic and anaerobic biodegradation)
- Determine if the site can be classified in the "low risk groundwater" category as defined by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB)
- If appropriate, evaluate the risk to human health and the environment

In early 1999, prior to implementation of the Revised Workplan, Mr. Amir Gholami of the ACHCSA requested addition of the following tasks to the above scope of work (see Blymyer Engineers' *Proposed Soil Bore Locations*, dated June 21, 1999, Appendix A):

- Drill two additional soil bores on the west side and east side of monitoring well MW-3
- Drill additional soil bores around the perimeter of the former diesel UST and in the vicinity

of geophysical anomalies

- Collect soil samples at five-foot intervals and collect one grab groundwater sample from each soil bore

This report presents the results the geophysical survey, additional soil bore sampling, well decommissioning, and groundwater monitoring for the second quarter, 1999.

2.0 Field Investigation

2.1 Geophysical Survey

On March 1, 1999, JR Associates conducted a geophysical survey at the site under the supervision of Blymyer Engineers. The purpose of the survey was to search for geophysical indications of the 1,000-gallon gasoline UST or the former UST basin.

JR Associates conducted the survey using a magnetometer grid with 7-foot centers and ground-penetrating radar grid with 5-foot centers. The area investigated was approximately 60 feet wide by 70 feet long in the vicinity of the lath house and parking lot (Figure 2).

2.2 Quarterly Groundwater Monitoring

In March 1999, Blaine Tech Services, Inc. (BT) conducted groundwater gauging and sampling at Kawahara Nursery under contract to Blymyer Engineers. The results of that groundwater monitoring event are presented in Blymyer Engineers' *Quarterly Groundwater Monitoring Report, First Quarter 1999*, dated April 13, 1999.

Groundwater monitoring for the second quarter, 1999 was conducted by BT on June 29, 1999. The work was conducted in accordance with the BT *Standard Operating Procedures*, included in Appendix B. Prior to sampling, BT personnel gauged the depth to groundwater in wells MW-1 through MW-5. The depth to water was measured with an accuracy of 0.01 foot from the top of casing using an oil-water interface probe. Groundwater measurements are presented in Table I, and are included on the Well Gauging and Well Monitoring Data Sheets presented in Appendix C.

BT collected groundwater samples from wells MW-3, MW-4, and MW-5 on June 29, 1999. Prior to purging the wells, the dissolved oxygen content was measured using a field instrument. Each well was then purged by removing a minimum of three well casing volumes of groundwater. The

temperature, pH, turbidity, and conductivity of the purge water were measured after each well volume had been removed. The amount of groundwater purged from each well was considered sufficient when the parameters appeared to be stable.

Groundwater samples were collected from each monitoring well, then decanted into the appropriate containers. The samples were labeled and placed in a cooler with ice for transport to Entech Analytical Labs, Inc. of Sunnyvale, California, under chain-of-custody documentation. All purged groundwater was placed in labeled, 55-gallon capacity, Department of Transportation-approved steel drums. The samples were to be analyzed for the following compounds:

- TPH as gasoline (EPA Method 8015M)
- TPH as diesel (EPA Method 8015M)
- BTEX (EPA Method 8020)
- Methyl tert-butyl ether (MTBE; EPA Method 8020)
- Carbon dioxide (EPA Method 310.1)
- Dissolved ferrous iron (SM 3500)
- Nitrate-Nitrogen (EPA Method 353.3)
- Alkalinity (EPA Method 310.1)
- Sulfates (EPA Method 375.4)

2.3 Soil Bore Installation and Sample Collection

On August 9, 1999, Gregg Drilling and Testing, Inc. advanced nine soil bores (SB-2 through SB-10) at the subject location under Alameda County Public Works Agency (ACPWA) Permit Number 97WR453, and under the supervision of a Blymyer Engineers registered geologist. Mr. Amir Gholami of the ACHCSA was present during the advancement of soil bore SB-3. Soil bore locations are shown on Figure 2 and Figure 3.

The nine soil bores were advanced to a depth of approximately 16 feet bgs using a direct-push Rhino®

drilling rig. Continuous soil samples were collected in 1.5-inch-diameter plastic sleeves. Blymyer Engineers inspected the soil samples, logged the lithology, and field-screened the samples for organic vapors using a photoionization detector (PID). PID readings and soil descriptions, based on the Unified Soil Classification System, are presented on soil bore logs in Appendix D.

Soil samples were collected at approximately five-foot intervals for laboratory analysis. The plastic sleeves were cut in sections six to nine inches long, and the ends were covered with Teflon sheets and plastic caps. The sample tubes were sealed with adhesive-free silicon tape, labeled, and placed in a chilled cooler for transport to the laboratory under chain-of-custody.

Following collection of the soil samples, a section of PVC slotted pipe was temporarily placed in each soil bore for collection of grab groundwater samples. Groundwater samples were removed using a 0.5-inch-diameter bailer, and the samples were decanted into 40-milliliter VOAs and amber bottles. The groundwater samples were immediately labeled and placed in a chilled cooler. Following the collection of the soil and grab groundwater samples, the soil bores were backfilled with cement/bentonite grout to grade. Excess soil cuttings and decontamination fluids were stored onsite in 55-gallon drums, pending characterization and appropriate disposal.

All soil and grab groundwater samples were collected in accordance with Blymyer Engineers' *Standard Operating Procedure No. 4, Soil and Grab Groundwater Sampling Using Hydraulically-Driven Sampling Equipment*, Revision No. 1, included as Appendix E.

2.4 Analysis of Soil and Grab Groundwater Samples

The soil and grab groundwater samples were submitted to McCampbell Analytical, Inc., a California-certified laboratory located in Pacheco, California. The following is a summary of the analyses conducted:

- All soil and grab groundwater samples were analyzed for TPH as diesel and TPH as gasoline (EPA Method 8015M), BTEX (EPA Method 8020) and MTBE (EPA Method 8020)

- The sample with the highest TPH concentrations (SB-4 at 15 feet bgs) was also analyzed for total Kjeldahl nitrogen (TKN; EPA Method 351.3), pH (EPA Method 150.1/9040), and total organic carbon (TOC; EPA Method 9060)

- One "background" soil sample from the unsaturated zone (SB-2 at 5 feet bgs) was analyzed for TKN, pH, and TOC

- One "background" soil sample from the saturated zone (SB-2 at 12.5 feet bgs) and one contaminated soil sample from the saturated zone (SB-5 at 12.5 feet bgs) were analyzed for grain size, bulk density, porosity, moisture content (ASTM E3173), and fractional organic content (FOC: ASTM 2974c)

2.5 Well Abandonment

As approved by the ACHCSA, monitoring wells MW-1 and MW-2 were abandoned on August 10, 1999. The groundwater samples from MW-1 and MW-2 had contained no evidence of petroleum hydrocarbon contamination for several consecutive rounds of testing conducted during 1993, 1994, and 1995.

The wells were abandoned under ACPWA Permit Number 97WR452 by overdrilling and removing the casing. In each well, bentonite chips were placed in the borehole (up to the water level) and the remainder of the borehole was filled with grout. The upper two feet of each borehole were filled with concrete.

3.0 Results of the Investigation

3.1 Geophysical Survey Results

The results of the geophysical survey are included as Appendix F. Two magnetic anomalies were located in the vicinity of the west end of the lath house, and metal pipes were located near MW-3 and MW-5 (Figure 3 and Appendix F). Results of the ground-penetrating radar survey were less conclusive, and did not indicate what the source of the magnetic anomalies were.

On the basis of JR Associates' interpretation of the data, they could not determine whether the magnetic anomalies resulted from metal debris or an UST that was still in place. The anomalies were marked on the ground (with paint) during the March 1999 survey.

3.2 Results of Quarterly Groundwater Monitoring

Table I and Figure 4 present groundwater gauging data collected on June 29, 1999. The depth to groundwater ranged from 7.41 feet below the top of casing (BTOC) in monitoring well MW-5 to 9.04 feet BTOC in MW-4. The average groundwater gradient was 0.004 feet/foot toward the northwest.

Results of quarterly groundwater analyses are presented in Appendix G, and are summarized in Tables II and III. Groundwater samples from monitoring wells MW-4 and MW-5 did not contain TPH as diesel, BTEX, or MTBE concentrations above the detection reporting limits (DRLs). TPH as gasoline concentrations were 130 μg/L and 160 μg/L in samples from MW-4 and MW-5, respectively.

The groundwater sample from MW-3 contained 8,000 μg/L TPH as gasoline, 98 μg/L benzene, 34 μg/L toluene, 3.7 μg/L ethylbenzene, 1,200 μg/L xylenes, and 37 μg/L MTBE. TPH as diesel was not detected at a concentration exceeding the elevated DRL of 1,000 μg/L. Concentrations of

petroleum hydrocarbons in groundwater were slightly higher during the June 1999 sampling event than they were in March 1999.

Table III presents the analytical results of natural attenuation indicators that were measured in groundwater samples from MW-3, MW-4, and MW-5. Dissolved oxygen was present in pre-purge groundwater in concentrations ranging from 0.4 milligrams per liter (mg/L) in monitoring well MW-3 to 1.2 mg/L in the groundwater sample from MW-4. The depleted oxygen concentrations in groundwater from MW-3 indicates that any natural attenuation would proceed under slightly anaerobic conditions.

During March and June 1999, there were no consistent and significant differences in the concentrations of ferrous iron, and nitrate/nitrogen among the three wells tested. Carbon dioxide, which is a by-product of petroleum hydrocarbon biodegradation, ranged from 3.5 mg/L in MW-3 to 24 mg/L in MW-4. Because there is no apparent depletion of anaerobic electron receptors (such as nitrate and ferrous iron) inside the groundwater plume, the data collected to date cannot be used as conclusive evidence that natural attenuation (by biodegradation) is occurring.

3.3 Site Stratigraphy

Nine soil bores were advanced to a depth of 16 feet bgs on August 9, 1999. Continuous soil samples were inspected and described (in accordance with the Unified Soil Classification System) by a Blymyer Engineers geologist. The soil bore logs are presented in Appendix D.

The soil encountered at the site generally consisted of brown silty clay from the surface to a depth of approximately 12 feet bgs. In most of the soil bores, a sand and gravel stringer 1 to 3 inches thick was noted at a depth of approximately 8 feet bgs. The stringer was moist, but did not appear to be saturated with groundwater.

The silty clay is underlain by a brown to gray silty sand encountered at approximately 12 feet bgs.

The sand unit is 1 to 2 feet thick and saturated. Materials encountered from the base of the sand unit to 16 feet bgs (the total depth explored) consisted of gray and brown silty clay.

Groundwater was initially encountered at 12 to 13 feet bgs in the silty sand, but often stabilized a few feet higher. This suggests that the groundwater beneath the site is confined or partially confined. Based on the rate at which groundwater recharged into the borehole, the sandy water-bearing zone at 12 feet bgs appears to be relatively permeable.

Two soil samples were analyzed for grain size analysis (Appendix H). One sample, SB-2 at 12 feet bgs, was collected from the saturated zone in a location that has not apparently been impacted by petroleum hydrocarbons. The other soil sample, SB-5 at 12.5 feet, was collected from the saturated zone within the contaminant plume. Grain size analysis indicated silty clay comprised both samples. Silt content ranged from 48 to 61 percent, and the clay content ranged from 24 to 34 percent. It should be noted that both samples were collected from the top of the water-bearing zone.

3.4 Results of Soil and Grab Groundwater Analyses

Soil and grab groundwater samples collected from the nine soil bores (SB-2 through SB-10) were analyzed for TPH as diesel, TPH as gasoline, BTEX, and MTBE. A total of 23 soil samples and nine grab groundwater samples were analyzed. Results of soil analyses are presented in Table V, and the results of grab groundwater analyses are presented in Table VI. Laboratory reports for the soil samples and grab groundwater samples are included as Appendix H.

Concentrations of TPH as diesel, TPH as gasoline, BTEX, and MTBE were below the DRLs in all soil samples analyzed from SB-2, SB-3, and SB-10. Soil samples collected at 5 feet bgs from SB-6, SB-7, SB-8, and SB-9 contained very minor concentrations of TPH as diesel and/or xylenes. The maximum concentration of TPH as diesel was 7.4 milligrams per kilogram (mg/kg) in soil sample SB-7 @ 5' and the maximum concentration of xylenes was 98 micrograms per kilogram (μg/kg) in sample SB-6 @ 5'. This suggests that there may have been limited surface spills in the vicinity of soil

bores SB-6, SB-7, SB-8, and SB-9.

Soil samples collected at 15 feet bgs in SB-4 and at 12 feet bgs in SB-5 contained up to 910 mg/kg TPH as gasoline and up to 360 mg/kg TPH as diesel. They also contained elevated concentrations of BTEX (Table V). It should be noted that these two samples were collected from the saturated zone, and that product was visible on the soil samples during field inspection.

Soil samples were field-screened with a PID to detect organic vapors. The maximum PID readings, 1,308 parts per million (ppm) and 543 ppm, were detected in the soil samples from the saturated zone of SB-5 and SB-4, respectively. PID readings from other soil samples typically ranged from 0 to 10 ppm.

One "background" soil sample from the saturated zone (SB-2 at 12.5 feet bgs) and one contaminated soil sample from the saturated zone (SB-5 at 12.5 feet bgs) were analyzed for bulk density, porosity, moisture content, and fractional organic content (Table IV). These physical parameters were very similar in both samples, ranging from 20 to 21 percent moisture content, 1.9 to 2.0 grams per cubic centimeter bulk density, and 40 to 41 percent porosity. The fractional organic content of the uncontaminated sample was 2.8 percent (wet), and that of the contaminated soil sample was 3.8 percent (wet).

One "background" soil sample from the unsaturated zone (SB-2 at 5 feet bgs) and one contaminated soil sample (SB-4 at 15 feet bgs) were analyzed for TKN, pH, and TOC. The pH values of the soils ranged from 7.73 to 8.04. The TKN content was 258 mg/kg in the sample from SB-2 (uncontaminated), and 190 mg/kg in the sample from SB-4 (contaminated). This indicates that nitrogen, an electron donor in the biodegradation process, is slightly depleted in the contaminated soil sample.

The total organic content of the uncontaminated and contaminated samples were 6,910 mg/kg and 849 mg/kg, respectively. Typically, the contaminated soil sample would be expected to contain more

TOC than the uncontaminated soil, assuming that the soil samples were lithologically similar. However, the higher TOC in the uncontaminated sample probably results from the fact that the soil sample was composed of a high percentage clay, and the contaminated sample was from a sandier soil. Therefore, the relative amounts of TOC in the two soil samples is inconclusive.

Results of grab groundwater analyses, presented on Table VI, indicate that the samples from SB-4 and SB-5 contained significant concentrations of petroleum hydrocarbons. TPH as diesel and TPH as gasoline were present in concentrations up to 990,000 μg/L and 730 ,000 μg/L, respectively, at those two locations. The laboratory report contains qualifiers for these analytical results, indicating that the hydrocarbons present may consist of aged gasoline within the diesel chromatographic range. The laboratory report also states that a hydrocarbon sheen was observed in the groundwater samples from SB-4 and SB-5, indicating that separate-phase hydrocarbons (free product) may be present on groundwater beneath this part of the site.

Concentrations of BTEX in the grab groundwater samples from SB-4 and SB-5 were above the respective California Maximum Contaminant Levels (MCLs) for drinking water standards. BTEX concentrations in the other grab groundwater samples did not exceed the MCLs. The groundwater sample from SB-9 contained 58 μg/L TPH as gasoline, and the sample from SB-7 contained 220 μg/L and 73 μg/L TPH as gasoline and as diesel, respectively. Figure 5 shows the dissolved concentrations of TPH as gasoline and benzene in the vicinity of the northernmost lath house.

The grab groundwater sample from SB-10 contained 810 μg/L TPH as gasoline, 500 μg/L TPH as diesel, and very minor concentrations of ethylbenzene, toluene, and xylenes. The MCLs for BTEX were not exceeded in the groundwater sample from SB-10, indicating that the soil around the former diesel UST is not a source of significant groundwater contamination.

4.0 Conclusions and Recommendations

The following conclusions can be made on the basis of groundwater monitoring, the geophysical survey, and installation of soil bores during the second quarter, 1999:

- The direction of groundwater flow is toward the northwest
- On the basis of the geophysical survey, buried metal objects appear to be present in two locations near the west end of the lath house
- Soil and grab groundwater samples collected from SB-4 and SB-5, located downgradient of one magnetic anomaly, contained very high concentrations of petroleum hydrocarbons
- A petroleum sheen was observed on SB-4 and SB-5 water samples, and free product was observed on the soil samples
- Groundwater samples from MW-3, located between the barn and the northermost lath house, contained significant concentrations of TPH as gasoline and benzene
- The soil samples and grab groundwater sample collected downgradient of the former diesel UST (removed in 1992) indicated that this area is not a significant source of groundwater contamination

One of the goals of this phase of investigation, as presented in the Revised Workplan, was to determine if the site could be placed in a "low risk groundwater" category, as defined by the San Francisco Bay Regional Water Quality Control Board. In order to be classified as a "low risk groundwater" site, all petroleum hydrocarbon sources, including contaminated soil and free product, must be removed from the site.

On the basis of this investigation, it appears that there may be free product present in soil and groundwater in the vicinity of the lath house (downgradient of one magnetic anomaly). The site cannot, therefore, be classified as "low risk groundwater".

Furthermore, the concentrations of benzene were compared to the Tier 1 table of Risk-Based Screening Levels (RBSLs) as described in the ASTM E 1739-95 *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (RBCA). A California-modified toxicity and exposure table was used. Benzene concentrations in groundwater samples from SB-4, SB-5, and MW-3 exceed the target levels for an exposure pathway of groundwater volatilization to indoor residential air. Because there is a residence immediately downgradient of the apparent gasoline source, we cannot, at this time, recommend closure of this site on the basis of a low risk to human health.

On the basis of this investigation, Blymyer Engineers recommends conducting a Tier 2 RBCA evaluation to evaluate site-specific target levels (SSTLs) for both soil and groundwater. When the SSTLs have been evaluated, the remaining petroleum hydrocarbon sources should be removed from the site, using the SSTLs as cleanup goals.

A copy of this report has been forwarded to:

Mr. Amir Gholami
Alameda County Health Care Services Agency
Environmental Protection Division
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Table I, Summary of Groundwater Elevation Measurements
BEI Job No. 94015, Kawahara Nursery, Inc.
16550 Ashland Avenue, San Lorenzo, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-1	6/16/93	100	10.7	89.3
	3/24/94		11.11	88.89
	3/28/94		11.26	88.74
	11/22/94		12.04	87.96
	3/29/95		7.26	92.74
	6/7/95		8.67	91.33
	9/7/95		10.56	89.44
	3/4/99		Not Measured	Not Measured
	6/29/99		8.81	91.19
MW-2	6/16/93	99.27	10.24	89.03
	3/24/94		10.65	88.62
	3/28/94		10.79	88.48
	11/22/94		11.58	87.69
	3/29/95		6.93	92.34
	6/7/95		8.36	90.91
	9/7/95		10.18	89.09
	3/4/99		6.95	92.32
	6/29/99		8.52	90.75
MW-3	6/16/93	99.52	10.46	89.06
	3/24/94		10.81	88.71
	3/28/94		10.96	88.56
	11/22/94		11.68	87.84
	3/29/95		6.95	92.57
	6/7/95		8.48	91.04
	9/7/95		10.30	89.22
	3/4/99		7.98	91.54
	6/29/99		8.49	91.03
MW-4	11/22/94	100.46	12.34	88.12
	3/29/95		7.49	92.97
	6/7/95		8.95	91.51
	9/7/95		10.88	89.58
	3/4/99		8.03	92.43
	6/29/99		9.04	91.42

Table I, Summary of Groundwater Elevation Measurements
BEI Job No. 94015, Kawahara Nursery, Inc.
16550 Ashland Avenue, San Lorenzo, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-5	11/22/94	98.14	10.42	87.72
	3/29/95		5.76	92.38
	6/7/95		7.33	90.81
	9/7/95		9.11	89.03
	3/4/99		6.63	91.51
	6/29/99		7.41	90.73

Note: TOC = Top of casing Elevations in feet above mean sea level

Table II, Summary of Groundwater Sample Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Date	Modified EPA Method 8015 (µg/L)		EPA Method 8020 (µg/L)				
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE
MW-1	6/16/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/28/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	11/8/94	NS	NS	NS	NS	NS	NS	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/4/99	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS
MW-2	6/16/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/28/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	11/8/94	NS	NS	NS	NS	NS	NS	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	5/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/4/99	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS
MW-3	6/16/93	**120,000**	**170,000**	**4,600**	**8,400**	**2,100**	**27,000**	NS
	3/28/94	**23,000**	**94,000**	**4,800**	**6,500**	**3,000**	**15,000**	NS
	11/8/94	**35,000**	**27,000**	**3,600**	**4,100**	**2,700**	**18,000**	NS
	3/29/95	**18,000**	<50*	**1,600**	**1,400**	**780**	**6,200**	NS
	6/7/95	**20,000**	<50	**1,700**	**1,400**	**750**	**6,800**	NS
	9/7/95	**17,000**	<50	**1,100**	**800**	**570**	**4,800**	NS
	3/4/99	**1,300**	<50	**33**	<0.5	**1.2**	**17**	**5.3**
	6/29/99	**8,000**	<1,000	**98**	**34**	**3.7**	**1,200**	**37**
MW-4	6/16/93	NS	NS	NS	NS	NS	NS	NS
	3/28/94	NS	NS	NS	NS	NS	NS	NS
	11/8/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS

Table II, Summary of Groundwater Sample Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Date	Modified EPA Method 8015 (µg/L)		EPA Method 8020 (µg/L)				
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE
	3/4/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	6/29/99	**130**	<50	<0.5	<0.5	<0.5	<0.5	<5.0
MW-5	6/16/93	NS	NS	NS	NS	NS	NS	NS
	3/28/94	NS	NS	NS	NS	NS	NS	NS
	11/8/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/29/95	<50	**64**	<0.5	<0.5	<0.5	<0.5	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS
	3/4/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	6/29/99	**160**	<50	<0.5	<0.5	<0.5	<0.5	<5.0

Notes:

µg/L	=	Micrograms per liter
TPH	=	Total Petroleum Hydrocarbons
B	=	Benzene
T	=	Toluene
E	=	Ethylbenzene
X	=	Total Xylenes
MTBE	=	Methyl tert-butyl ether
NS	=	Not Sampled
<x	=	Less than the analytical detection limit (x)
EPA	=	Environmental Protection Agency
*	=	Laboratory reported the presence of petroleum hydrocarbons with a chromatograph pattern uncharacteristic of diesel fuel

Table III, Summary of Groundwater Sample Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Date	EPAM 310.1	SM 3500	EPAM 353.3	EPAM 310.1	EPAM 375.4	Field
		Carbon Dioxide (mg/L)	Ferrous Iron (mg/L)	Nitrate/ Nitrogen (mg/L)	Alkalinity (mg/L)	Sulfate (mg/L)	Dissolved Oxygen (mg/L)
MW-1	3/4/99	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS
MW-2	3/4/99	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS
MW-3	3/4/99 3/8/99	4.4	<0.01	26	520	1,000	1.2
	6/29/99	3.5	<0.10	10	500	73	0.4
MW-4	3/4/99 3/8/99	2.3	<0.01	13	320	390	2.1
	6/29/99	21	<0.10	12	360	46	1.2
MW-5	3/4/99 3/8/99	2.1	<0.01	140	370	500	1.8
	6/29/99	7.0	<0.10	14	360	46	0.9

Notes

NS = Not sampled
EPAM = Environmental Protection Agency Method
Field = Field instruments used for measurement of parameter
mg/L = Milligrams per liter

Table IV, Summary of Soil Sample Physical Parameters
BEI Job No. 94015, Kawabara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Date	ASTM E3173			ASTM 2974c	EPA 150.1	EPA 351.3	EPA 9060
		Weight % Moisture (%)	Bulk Density (g/cc)	Porosity (vol %)	FOC (wet %)	pH	TKN (mg/kg)	TOC (mg/kg)
SB-2 5'	8/9/99	NA	NA	NA	NA	7.73	258	6,910
SB-2 12.5'	8/9/99	21	2.0	40	2.8	NA	NA	NA
SB-5 12'	8/9/99	20	1.9	41	3.8	NA	NA	NA
SB-4 15'	8/9/99	NA	NA	NA	NA	8.04	190	849

ASTM = American Society for Testing and Materials
EPA = Environmental Protection Agency
FOC = Fractional organic content
TKN = Total Kjeldahl nitrogen
TOC = Total organic carbon
g/cc = Grams per cubic centimeter
wet % = Wet weight percent
NA = Not analyzed

Table V, Summary of Soil Sample Analytical Results
BEI Job No. 94015, Kawahara Nursery, Inc.
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Collection Date	Modified EPA Method 8015 (mg/kg)		EPA Method 8020 (µg/kg)				
		TPH as Gasoline	TPH as Diesel	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-1 5'	6/10/93	<1	<1	NA	<5	<5	<5	<5
MW-1 16'	6/10/93	<1	<1	NA	<5	<5	<5	<5
MW-2 2.5'	6/10/93	<1	**1.9**	NA	<5	<5	<5	<5
MW-2 11.5	6/10/93	<1	<1	NA	<5	<5	<5	<5
MW-3 6'	6/10/93	<1	<1	NA	<5	<5	<5	<5
MW-3 15'	6/10/93	<1	<1	NA	**200**	**980**	**680**	**4,000**
MW-4 12'	10/31/94	<1	<1	NA	<2.5	<2.5	<2.5	<2.5
MW-4 17'	10/31/94	<1	<1	NA	<2.5	<2.5	<2.5	<2.5
MW-5 12.5'	10/31/94	<1	<1	NA	<2.5	<2.5	<2.5	<2.5
MW-5 17'	10/31/94	<1	<1	NA	<2.5	**11**	<2.5	**27**
SB-1 7.5'	10/31/94	<1	<1	NA	<2.5	<2.5	<2.5	<2.5
SB-1 17'	10/31/94	**130**	**4.1**	NA	<2.5	<2.5	<2.5	<2.5
SB-2 5'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-2 10'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-2 12.5'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-3 10'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-3 15'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-4 5'	8/9/99	<1	<1	<50	<5	<5	<5	**9**
SB-4 10'	8/9/99	**1.4**	**1.6**	<50	<5	**33**	<5	<5
SB-4 15'	8/9/99	**910**	**360**	<2,000	**870**	**10,000**	**14,000**	**92,000**
SB-5 10'	8/9/99	**1.2**	<1	<50	<5	**26**	<5	<5
SB-5 12'	8/9/99	**250**	**100**	<200	<10	**1,300**	**1,400**	**13,000**
SB-6 5'	8/9/99	<1	**5.7**	<50	<5	<5	<5	**98**
SB-6 10'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-6 16'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-7 5'	8/9/99	<1	**7.4**	<50	<5	<5	<5	**36**
SB-7 10'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-8 5'	8/9/99	<1	**3.8**	<50	<5	<5	<5	<5
SB-8 10'	8/9/99	<1	<1	<50	<5	<5	<5	<5

Table V, Summary of Soil Sample Analytical Results
BEI Job No. 94015, Kawahara Nursery, Inc.
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Collection Date	Modified EPA Method 8015 (mg/kg)		EPA Method 8020 (µg/kg)				
		TPH as Gasoline	TPH as Diesel	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes
SB-8 15'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-9 5'	8/9/99	<1	**1.8**	<50	<5	<5	<5	<5
SB-9 10'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-9 16'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-10 5'	8/9/99	<1	<1	<50	<5	<5	<5	<5
SB-10 10'	8/9/99	<1	<1	<50	<5	<5	<5	<5

Notes:

TPH	=	Total petroleum hydrocarbons
EPA	=	Environmental Protection Agency
<x	=	Not detected above the analytical method reporting limit of x
mg/kg	=	Milligrams per kilogram
µg/kg	=	Micrograms per kilogram
NA	=	Not analyzed

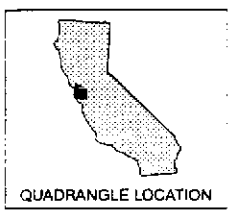
Table VI. Summary of Grab Groundwater Analytical Results
BEI Job No. 94015, Kawahara Nursery, Inc.
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Collection Date	Modified EPA Method 8015 (µg/L)		EPA Method 8020 (µg/L)				
		TPH as Gasoline	TPH as Diesel	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes
SB-2	8/9/99	<50	160	<5	<0.5	<0.5	<0.5	**1.6**
SB-3	8/9/99	<50	<50	<5	<0.5	<0.5	<0.5	**1.7**
SB-4	8/9/99	**140,000**	**990,000**	<200	**2,300**	**8,700**	**5,300**	**32,000**
SB-5	8/9/99	**730,000**	**610,000**	<800	**460**	**4,600**	**12,000**	**76,000**
SB-6	8/9/99	<50	<50	<5	<0.5	<0.5	<0.5	<0.5
SB-7	8/9/99	**220**	**73**	<5	<0.5	**0.69**	**1.4**	**5.7**
SB-8	8/9/99	<50	<50	<5	<0.5	<0.5	<0.5	**2.1**
SB-9	8/9/99	**58**	<50	<5	<0.5	**0.60**	**1.2**	**7.4**
SB-10	8/9/99	**810**	**500**	<5	<0.5	**6.1**	**18**	**120**
Trip Blank	8/9/99	<50	NA	<5	<0.5	<0.5	<0.5	<0.5

Notes:

TPH	=	Total petroleum hydrocarbons
EPA	=	Environmental Protection Agency
<x	=	Not detected above the analytical method reporting limit of x
µg/L	=	Micrograms per liter
NA	=	Not analyzed

UNITED STATES GEOLOGICAL SURVEY 7.5' QUADS. "SAN LEANDRO, CA" AND "HAYWARD, CA" BOTH ED. 1959 , PHOTOREVISED 1980.



BLYMYER ENGINEERS, INC.

BB JOB NO. 94015

DATE 4-9-99

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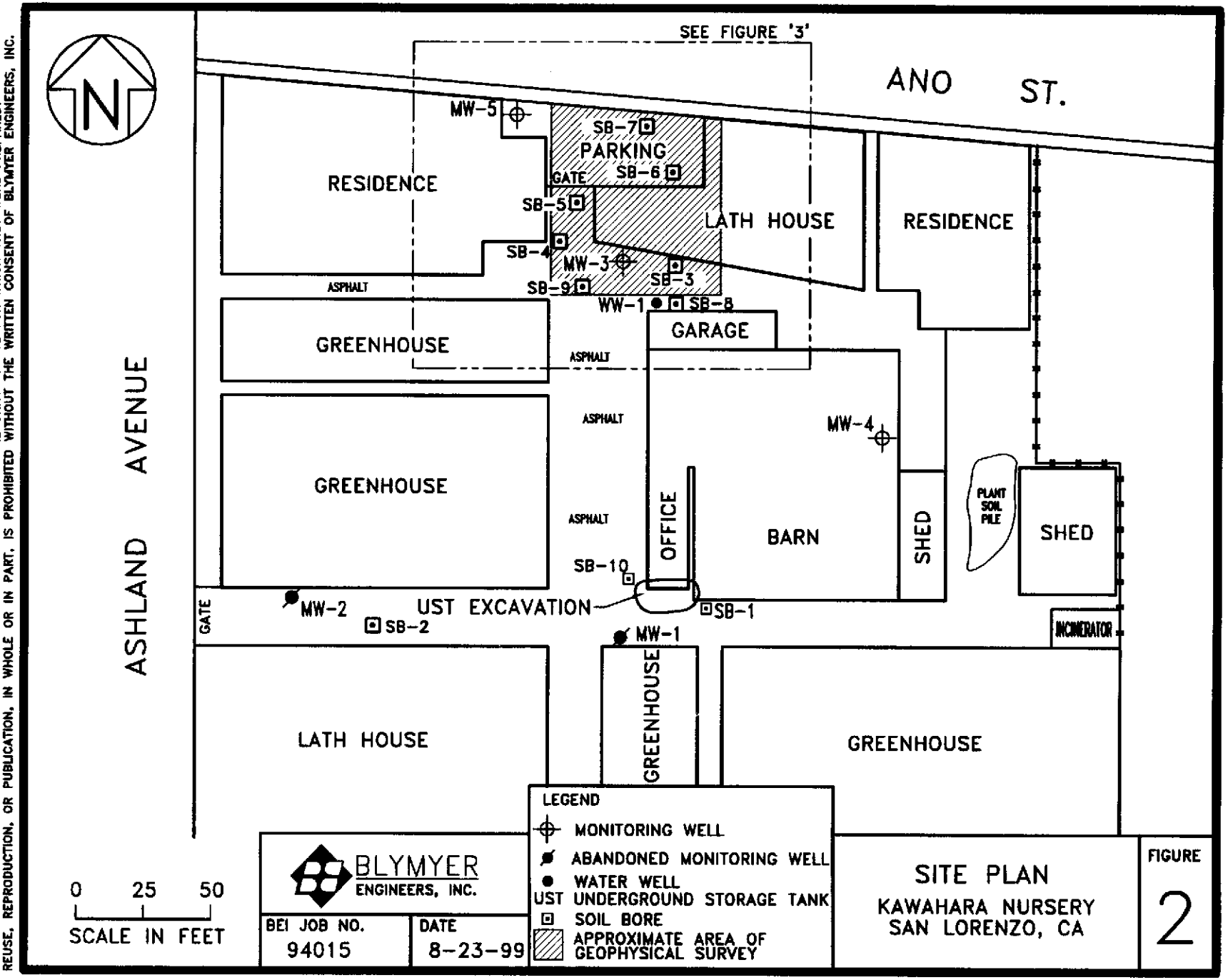
SCALE IN FEET

N

SITE LOCATION MAP

KAWAHARA NURSERY
16550 ASHLAND AVE.
SAN LORENZO, CA

FIGURE 1



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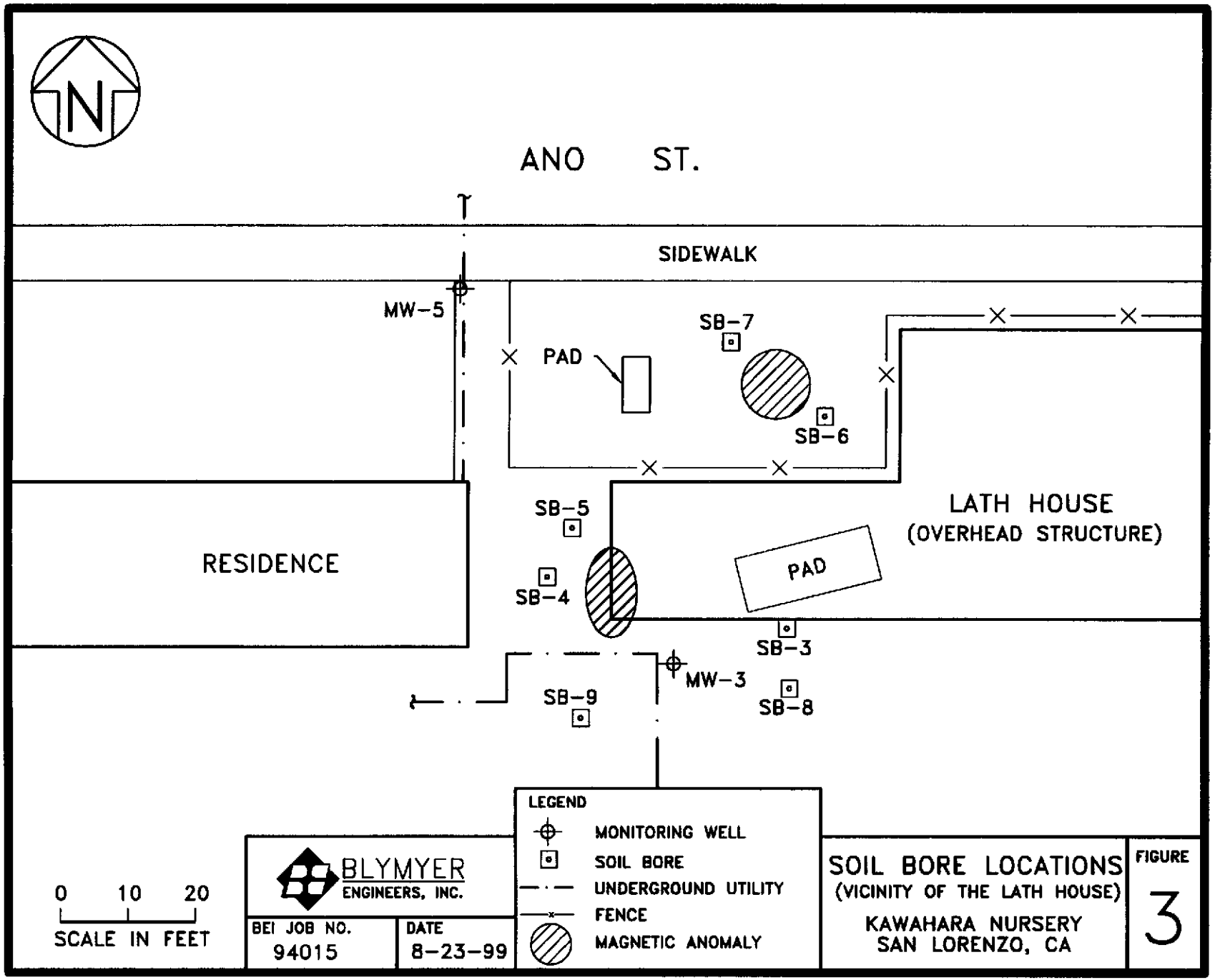

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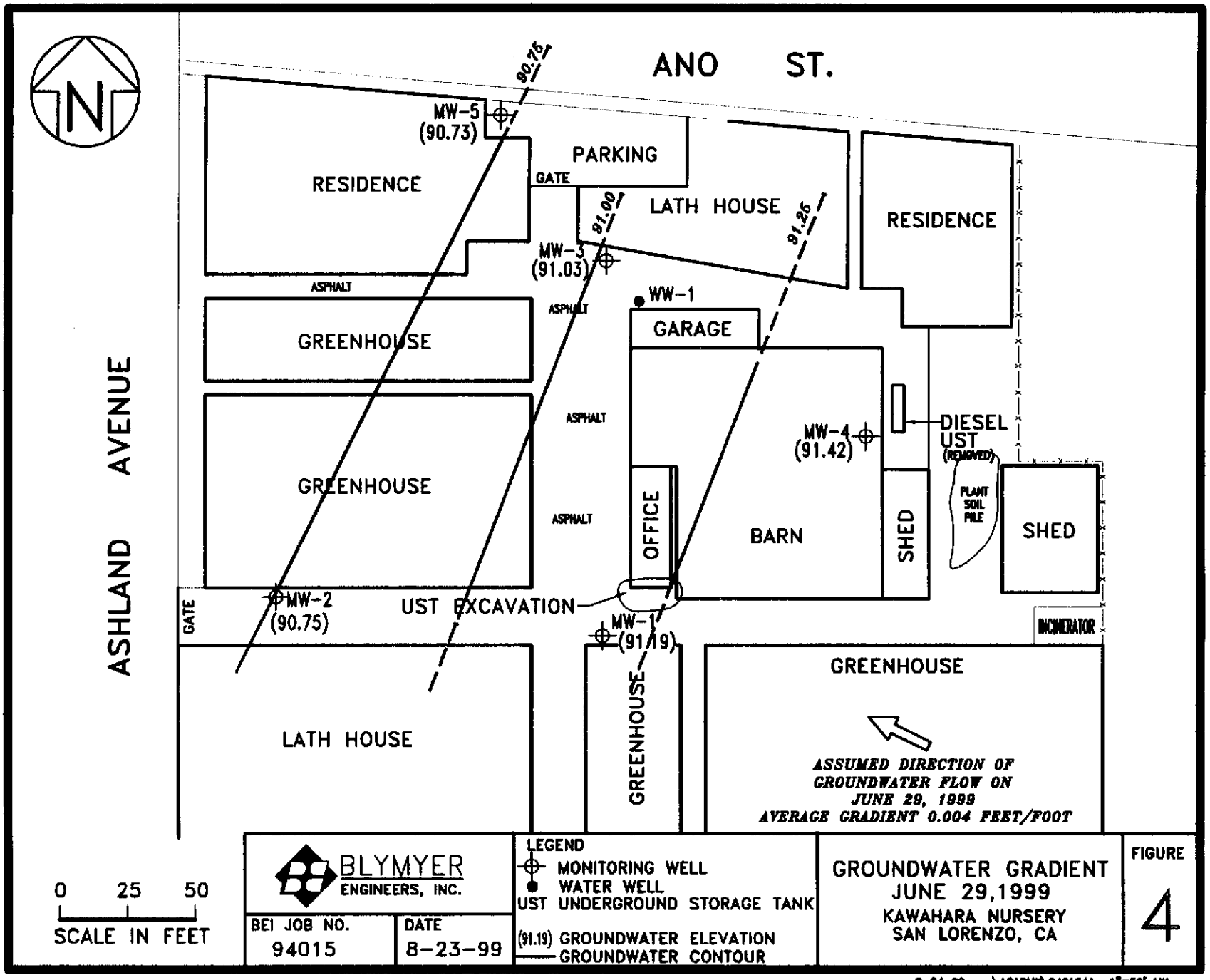

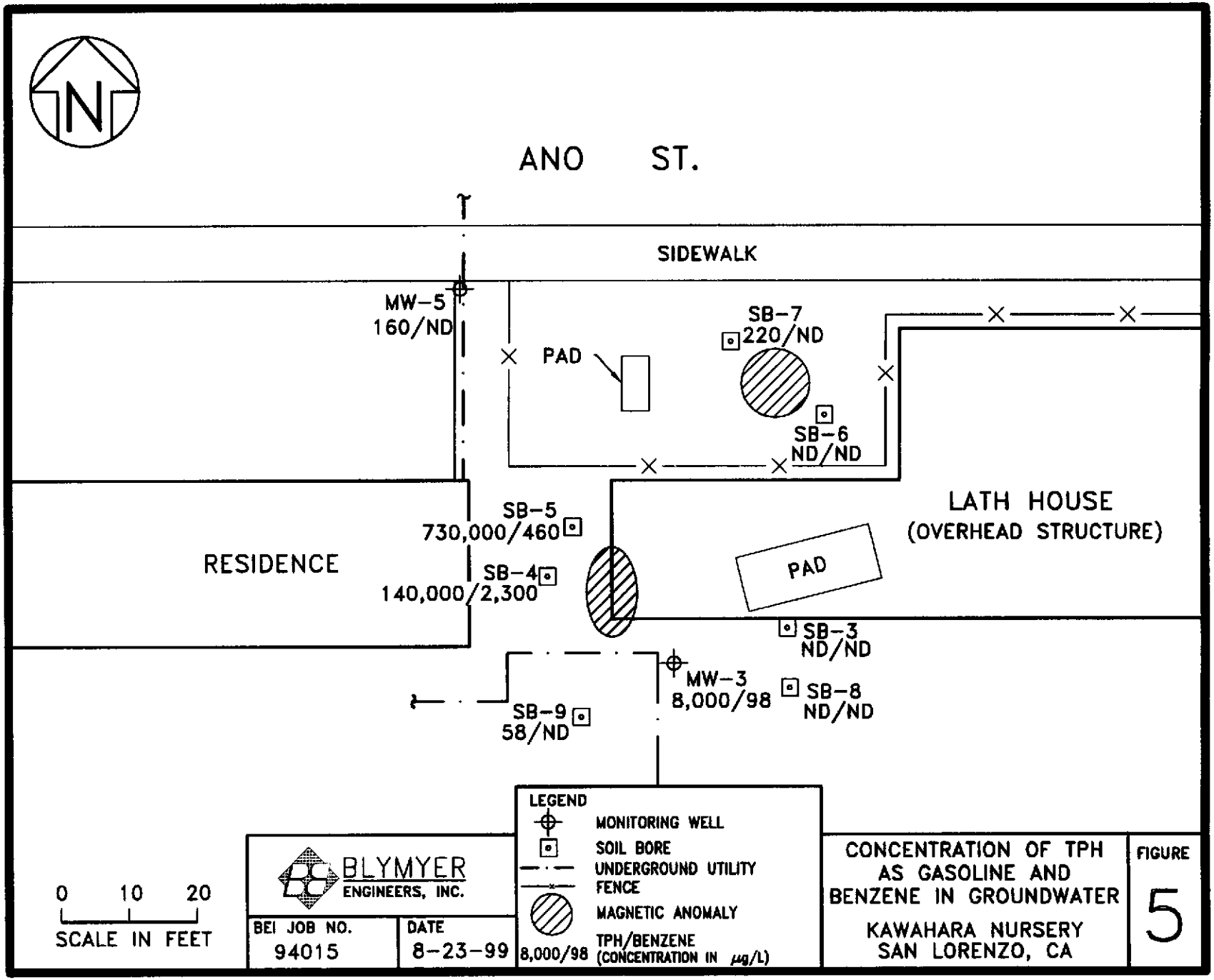

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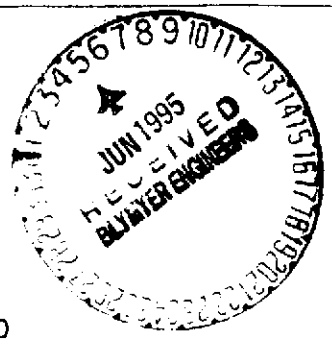
Appendix A:
Workplans and Regulatory Correspondence

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

RAFAT A. SHAHID, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6700



May 31, 1995

Sam Kawahara
Kawahara Nursery
16550 Ashland Ave
San Lorenzo CA 94580

StId 4403

Subject: Investigations at Kawahara Nursery located at 16550 Ashland Ave., San Lorenzo, CA

Dear Mr. Kawahara:

This office has recently reviewed Blymyer Engineers' (Blymyer) Quarterly Groundwater Monitoring Report for First Quarter 1995, dated April 17, 1995.

Because contaminant levels continue to be identified at very elevated levels from monitoring well MW-3, **you are required to submit a work plan that proposes to identify the source and delineate the extent of contamination in soil and groundwater in the vicinity of MW-3 within 60 days from the date of this letter.**

As stated in our letters to you dated August 10, 1994 and February 3, 1995, all monitoring wells at your site must be surveyed to an established bench mark (i.e. mean sea level), with an accuracy of 0.01 foot. It is my understanding that you currently have stockpiled soil at your site, and that this soil was analyzed in June 1993. Analytical results identified 25 parts per million (ppm) Total Petroleum Hydrocarbon as Diesel (TPHd). Per our conversation on May 24, 1995, you indicated you intend to dispose of this soil at Vasco landfill. Enclosed are "Waste Acceptance Guidelines" for Vasco for your reference. **Please include confirmation of the well survey and the manifests for disposal of the stockpiled soil in the required work plan.**

Please continue quarterly monitoring and sampling the monitoring wells at your site. If you have questions or need additional information, please do not hesitate to call me at (510)567-6755.

Sincerely,

Amy Leech
Hazardous Materials Specialist

ATTACHMENT

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

RAFAT A. SHAHID, DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6777

StId 4403

December 26, 1995

Mr. and Mrs. Kawahara
Kawahara Nursery
16550 Ashland Ave
San Lorenzo CA 94580

Subject: Investigations at Kawahara Nursery located at 16550 Ashland Ave., San Lorenzo, CA

Dear Mr. and Mrs. Kawahara:

This office has recently reviewed Blymyer Engineers' (Blymyer) Quarterly Groundwater Monitoring Report for Third Quarter 1995, dated October 6, 1995, and Blymyer's proposal for Additional Subsurface Investigations, dated July 14, 1995. In addition per your request during our October 18th meeting, I reviewed the case file regarding the fate of stockpiled soil from the diesel tank removal that occurred at your site in December 1992.

Groundwater Quarterly Monitoring

This office concurs with Blymyer's recommendation to reduce the sampling frequency for monitoring wells MW-4 and MW-5 to a semi-annual event and to eliminate sample collection from monitoring wells MW-1 and MW-2. Monitoring wells MW-1 and MW-2 were installed in June 1993 and are located cross-gradient from the former diesel tank. Groundwater has been sampled and analyzed from MW-1 and MW-2 for five quarters. TPH as gasoline, TPH as diesel, and BTEX have not been detected in groundwater samples collected from MW-1 and MW-2 since the wells were installed.

It does not appear that TPH as diesel has significantly impacted groundwater at this site. To date, TPH as diesel has not been detected in any of the groundwater samples collected from monitoring wells MW-1 through MW-5. **Continue to analyze groundwater for TPH as gasoline and BTEX and discontinue analyses for TPH as diesel.**

Fate of Diesel Impacted Stockpiled Soil

Per your request, I reviewed the case file regarding the fate of stockpiled soil at your site. When the diesel tank was excavated in December 1992, excavated soil from the tank pit was separated into two piles, pile ST-1 and pile ST-2. You were given authorization to reuse soil from ST-2, since analytical results from this pile was non-detect for TPH as diesel. However, as of August 1993, soil sampled from ST-1 was at 25 ppm TPH as diesel which is above the allowable concentrations for reuse at the site. You had indicated that you were making arrangements to dispose of this soil off-site. (See attached letters dated May 18, 1994 and May 31, 1995.) Please submit manifests for disposal for this soil or more recent sampling data for soil from pile ST-1.

Soil and Groundwater Investigations in the Vicinity of MW-3

Elevated levels of TPH as gasoline and BTEX continue to be detected in groundwater samples collected from monitoring MW-3. You indicated during our meeting on October 18, 1995, that a 1,000 gallon gasoline underground storage tank (UST) was located next to monitoring well MW-3 but was removed some time ago. If you are able to pinpoint the exact location of this former tank, then the proposed geophysical survey could possibly be eliminated from the proposed work plan for delineating the extent of soil and groundwater contamination in the vicinity of monitoring well MW-3.

This office concurs with Blymyer's proposal to use Geoprobe to collect soil and groundwater samples to assist in delineating the extent of soil and groundwater contamination in the northwest corner of the subject property. Information obtained from the Geoprobe study will also assist in determining if removal of contaminated soil is appropriate and/or proper location(s) for additional monitoring well(s).

Please submit to this office a final draft of the required work plan for delineating the extent of soil and groundwater contamination in the vicinity monitoring well MW-3 (location of the former gasoline UST) no later than February 1, 1996.

If you have questions or need additional information, please call me at (510)567-6755.

Sincerely,

Amy Leech
Hazardous Materials Specialist

ATTACHMENT

c: Attn: Laurie Buckman w/attachments
Blymyer Engineers, Inc.
1829 Clement Ave
Alameda CA 94501-1395

Gordon Coleman-File(ALL)

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

Stid 4403/lop
June 6, 1997

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

Mr. and Mrs. Kawahara
Kawahara Nursery
16550 Ashland Ave
San Lorenzo CA 94580

Subject: Investigations at Kawahara Nursery located at 16550 Ashland Ave., San Lorenzo CA

Dear Mr. and Mrs. Kawahara:

This office has completed a review of Blymyer Engineers' *Workplan for Additional Site Characterization and Site Risk Classification*, dated June 3, 1997, concerning the subject. This workplan proposes to investigate soil and groundwater conditions in the vicinity of monitoring well MW-3 and in the location of a former gasoline underground storage tank via a geophysical survey and GeoProbe® investigation; complete groundwater monitoring and sampling for monitoring wells MW-3 through MW-5; complete an evaluation of risk; and destroy monitoring wells MW-1 and MW-2. This workplan is acceptable to this office with the following comments/additions:

1. Soil and groundwater samples should be collected downgradient of monitoring well MW-3 adjacent to the residential home. This data can be used when evaluating residential exposure scenarios for risk.

2. The minimum analyses for the background soil sample should include fraction of organic carbon (foc), soil bulk density, soil moisture content, and soil porosity.

3. Per my conversation with Laurie Buckman on June 6, 1997, in addition to soil samples, "grab" groundwater samples will also be collected from all GeoProbe® borings.

4. It would be acceptable to this office if monitoring wells MW-1 and MW-2 were decommissioned now or in the future after this site qualifies for site closure. In any event, this office concurs that groundwater samples will no longer need to be collected from MW-1 and MW-2.

5. Subsequent to the geophysical study and prior to the GeoProbe® study, please contact and/or submit to this office the proposed soil and groundwater sample location map for review and approval.

If you have any questions or comments, please contact me at (510)567-6755.

Sincerely,

Amy Leech
Hazardous Materials Specialist

c: Attn: Laurie Buckman, Blymyer Engineers, Inc., 1829 Clement Ave., Alameda CA 94501-1395

Cheryl Gordon, SWRCB
ALL- File

BLYMYER ENGINEERS, INC.

June 12, 1997
BEI Job No. 94015

Ms. Amy Leech
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502-6577

pursuant to ACHCS letter dated 6/6/97

Subject: **Revised Workplan for Additional Site Characterization and Site Risk Classification**
Kawahara Nursery
16550 Ashland Avenue
San Lorenzo, CA

Dear Ms. Leech:

Blymyer Engineers, Inc., on behalf of Kawahara Nursery, is pleased to present this letter workplan to conduct additional site characterization and site risk classification at the above-referenced site.

Background

On December 1, 1992, one steel 5,000-gallon diesel underground storage tank (UST) was removed from the property owned by Kawahara Nursery, located at 16550 Ashland Avenue, San Lorenzo, California (Figure 1), by Tank Protect Engineering of Northern California. The UST was reported to be in good condition with no visible evidence of holes at the time of removal. The excavated soil was stockpiled at the site in two distinct piles and a composite soil sample was collected from each pile. Verification soil samples were collected and analyzed for Total Petroleum Hydrocarbons (TPH) as diesel. The soil sample collected from the southeastern wall of the UST excavation contained 5,000 milligrams per kilogram (mg/kg) TPH as diesel. The composite soil sample collected from the soil excavated from the southeastern portion of the excavation contained 210 mg/kg TPH as diesel.

The results of the UST closure were described in the *Underground Storage Tank Closure Report*, completed by Tank Protect Engineering and forwarded to the Alameda County Health Care Services Agency (ACHCSA) by Mr. Tom Kawahara. In a letter dated January 27, 1993, the ACHCSA requested that a Preliminary Subsurface Investigation be completed at the site to ascertain the extent of soil and groundwater petroleum hydrocarbon contamination.

On June 10, 1993, Blymyer Engineers supervised the installation of three groundwater monitoring wells (MW-1, MW-2, and MW-3) at the site in the locations depicted on Figure 2. Minor concentrations of petroleum hydrocarbons were detected in the soil samples collected during the installation of soil bores. The groundwater sample collected from monitoring well MW-3, installed adjacent to an on-site groundwater well contained 120,000 micrograms per liter (ug/L) of TPH as gasoline, 170,000 ug/L of ethylbenzene, and 27,000 ug/L of total xylenes.

Blymyer Engineers also collected four discrete soil samples from the stockpiled soil removed from the southeastern portion of the excavation and composited them into one sample. The results of the analysis of the composite soil sample did not indicate detectable concentrations of TPH as diesel.

In March 1994, Blymyer Engineers conducted a phased groundwater investigation at the site. The initial phases of the investigation included the review of records at the ACHCSA and the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) to determine if any toxic chemical or fuel leaks reported within a ¼-mile radius may have impacted the site; the review of historical aerial photographs; and the review of all available information regarding the construction and pumping rates of the on-site irrigation well to determine the radius of influence of the well on the local groundwater flow.

Depth to groundwater measurements were collected from each of the monitoring wells prior to the disengagement of the irrigation well pump. After the pump had been disengaged for approximately 48 hours, depth to groundwater measurements were again collected from the wells to determine the influence of the pumping system on the shallow water-bearing zone. Following the disengagement of the irrigation well pump, the groundwater elevation decreased less than 0.2 inches in each of the monitoring wells. Blymyer Engineers reactivated the well and collected groundwater samples from each of the three monitoring wells and the irrigation well on March 28, 1994. No detectable concentrations of petroleum hydrocarbons were detected in the groundwater samples collected from the irrigation well or monitoring wells MW-1 and MW-2. The analytical results of the groundwater sample collected from monitoring well MW-3 indicated 23,000 µg/L of TPH as diesel, 94,000 µg/L of TPH as gasoline, 4,800 µg/L of benzene, 6,500 µg/L of toluene, 3,000 µg/L of ethylbenzene, and 15,000 µg/L of total xylenes.

On March 28, 1994, Blymyer Engineers collected one discrete soil sample from the stockpiled soil on the site. The soil sample contained 51 mg/kg of TPH as diesel.

A review of the local regulatory agency records indicated that an Army National Guard facility located approximately 300 feet downgradient of the site has reported an unauthorized release of gasoline into the groundwater. However, the lateral extent of the reported release had not been determined. The construction log of the on-site irrigation well indicated that the well is screened from approximately 45 to 60 feet below grade surface. Based on the depth of the irrigation well screen interval and the very small change in depth to groundwater during pump operation and after pump disengagement, it was determined that the irrigation well pump does not influence the shallow, impacted water-bearing zone.

The soil gas survey completed at the site indicated slightly elevated concentrations of petroleum hydrocarbons in the soil gas samples collected from the northeastern corner of the barn and the north-central portion of the property in the vicinity of the lath house (in the vicinity of the suspected location of the former gasoline UST). Figure 3 depicts the locations and results of the

soil gas sample collection points. Based on this data, monitoring wells MW-4 and MW-5 were installed at the site on October 24, 1994. Soil and groundwater data collected from monitoring wells MW-4 and MW-5 did not indicate detectible concentrations of petroleum hydrocarbons either upgradient (MW-4) or immediately down gradient of the areas of elevated soil gas concentrations. Tables 1, 2, and 3 summarize the soil sample analytical results, groundwater analytical results, and the groundwater elevations, respectfully, collected from the site. Figures 5, 6, and 7 depict the groundwater gradient measured during three consecutive quarterly monitoring events conducted at the site on November 22, 1994, March 29, 1995, and June 7, 1995, respectfully.

Recently obtained information indicated the former presence of a 1,000-gallon gasoline UST in the vicinity of the lath house to the north of monitoring well MW-3 and upgradient of monitoring well MW-5. According to information provided by the property owner, the UST was removed from the site shortly after Kawahara Nursery occupied the property. This former gasoline UST is a potential source for the gasoline contamination detected at the site. Due to the location of the former gasoline UST and absence of detectable concentrations of diesel in the collected soil and groundwater samples, the ACHCSA has agreed that the removed diesel UST is not a potential source of the contamination detected at the site and therefore, monitoring wells MW-1 and MW-2 can be properly abandoned.

Overview of Proposed Activities

Based on a review of the data collected to date, the site may currently fall in the "low risk groundwater" category as defined by the SFRWQCB. As specified in a letter, dated January 12, 1996, the SFRWQCB defines a low risk groundwater site as one where:

1. the leak has been stopped and ongoing sources, including free petroleum hydrocarbons (FPH), have been removed or remediated

2. the site has been adequately characterized

3. the dissolved hydrocarbon plume is not migrating

4. no water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted

5. the site presents no significant risk to human health or the environment

If these criteria are met at a site, a management strategy using natural attenuation with subsequent monitoring to confirm that site conditions have remained stable or improved may be implemented.

At the Kawahara Nursery property a limited soils investigation in the vicinity of the reported former gasoline UST is necessary to complete site characterization. Based on available information, the source of the release at the site has been stopped. Following the completion of the site characterization, Blymyer Engineers proposes to evaluate the risk status of the site as set forth by the SFRWQCB, to determine if the site can be classified as a "low risk groundwater site". If low risk classification is appropriate for the site, Blymyer Engineers proposes subsequent quarterly groundwater monitoring to evaluate the effect of natural attenuation on the contaminant concentrations at the site. If the site still meets the low risk criteria following four consecutive quarterly monitoring events, Kawahara Nursery will request site closure.

Scope of Work

The proposed scope of work was designed to accomplish the following goals:

- further site characterization in the vicinity of the former gasoline UST
- confirmation that FPH are not present in the monitoring wells at the site
- determination of the dissolved hydrocarbon concentrations present at the site
- collection and analysis of soil and groundwater samples to evaluate the potential for natural attenuation (aerobic and anaerobic biodegradation)
- evaluation of the risk to human health and the environment

In order to accomplish the above goals, Blymyer Engineers proposes to complete the following detailed scope of work:

- **Prepare a site-specific health and safety plan**

  A health and safety plan outlining the potentially hazardous work conditions and contingencies for an emergency will be prepared for the site.

- **Obtain permits**

  Permits will be obtained to destroy groundwater monitoring wells MW-1 and MW-2 and install GeoProbe® soil bores, from the Zone 7 Water Agency.

- **Overdrill two monitoring wells and grout to surface**

  Using a hollow-stem auger drill rig, monitoring wells MW-1 and MW-2 will be overdrilled. Following documented destruction of the wells, the resulting bore holes will be grouted to the surface.

- **Collect groundwater samples from each monitoring well at the site**

  One groundwater sample will be collected from monitoring wells MW-3, MW-4, and MW-5, constituting the first quarterly groundwater monitoring event. Prior to sample collection, the monitoring wells will be gauged with an oil-water interface probe to determine the presence of measurable FPH. If FPH are not present in the site wells in measurable quantities, then it can be concluded that the source of the release has been removed, or at least stopped, as required for low risk classification.

- **Groundwater sample analysis for plume extent determination**

  The collected groundwater samples will be submitted to American Environmental Network (AEN), a California-certified laboratory located in Pleasant Hill, California, for analysis of Total Petroleum Hydrocarbons (TPH) as gasoline and diesel by modified EPA Method 8015 and benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8020.

- **Groundwater sample analysis for determination of natural attenuation**

  Natural attenuation of dissolved hydrocarbons is a function of several factors including aerobic and anaerobic biodegradation, volatilization, dispersion, and sorption. For the purposes of this study, aerobic and anaerobic degradation are considered potentially significant.

  Background electron receptor and metabolic product concentrations will be measured in the groundwater samples collected from monitoring wells MW-3, MW-4, and MW-5. The collected groundwater samples will be field screened for dissolved oxygen (DO), pH, ferrous (Fe), and redox potential (Eh), and laboratory analyzed for total alkalinity by EPA Method 310.1, carbon dioxide (CO_2) by EPA method 406A, nitrate by EPA method ~~353.1~~ 300.1 and sulfate by EPA Method 375.4.

  The measurement of the background electron receptor concentrations at sampling points both inside and outside of the plume is necessary to assess the potential for passive biodegradation. If biodegradation is occurring, concentrations of metabolic products should be higher within the plume than background levels, and electron receptors within the plume should be relatively depleted.

- **Conduct a geophysical survey**

A geophysical survey of an area approximately 50 feet by 60 feet in the vicinity of the suspected former gasoline UST will be coordinated by Blymyer Engineers. The survey will be performed by a contractor experienced in the location of USTs using magnetometer and ground penetrating radar (GPR) techniques. The GPR technique has the potential advantage of being able to locate a previously filled area, such as a backfilled UST excavation, which could isolate the source of the subsurface petroleum hydrocarbon contamination at the site.

- **Drill approximately six GeoProbe® soil bores** ← Increased to 9 SBs per Amir Gholami

Using a GeoProbe® sampling system, approximately four soil bores will be advanced to approximately 20 feet below grade surface (bgs) in the vicinity of the lath house, or areas of suspected fill material noted during the GPR survey. One soil bore will be advanced downgradient of monitoring well MW-3 and upgradient of the on site residence. One soil bore will be installed in an area previously investigated and determined to be free of detectable petroleum hydrocarbons in order to obtain background soil quality data.

- **Collect soil samples for laboratory analysis**

← Three soil samples per soil bore, per Amir Gholami

One soil sample and one grab groundwater sample will be collected from each soil bore. Soil samples will be collected from the capillary fringe or from the interval displaying the highest field photoionization detector (PID) reading.

- **Submit the collect soil and grab groundwater samples for laboratory analysis**

The collected soil and grab groundwater samples will be submitted to AEN for analysis of TPH as diesel and TPH as gasoline by modified EPA Method 8015 and BTEX and MTBE by EPA Method 8020.

To evaluate the natural attenuation potential, one soil sample collected from the area of highest petroleum hydrocarbon concentration and one from the background soil bore will also be submitted for laboratory analysis of total kjeldahl nitrogen (TKN) by EPA Method 350.3, total organic carbon (TOC) (the background sample only) by EPA Method 415.1, and pH by EPA Method 9040/150.1. Two representative soil samples, one from the background soil bore, will also be collected from the water-bearing zone for determination of grain size, soil bulk density, moisture content, and soil porosity and analysis of fraction of organic carbon (foc).

Total 9 Grab GW samples
27 Soil samples

- **Determination of human health and environmental exposure risk**

A Tier 1 risk assessment will be conducted for the site to determine risk-based screening levels (RBSLs) and, if necessary, site-specific target levels (SSTLs) according to the methods outlined in the ASTM E 1739-95, *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites*. Since the main contaminant detected at this site has been gasoline, the risk assessment will be performed for BTEX constituents.

Using California-modified toxicity and exposure levels, a Tier 1 lookup table will be consulted for each of the contaminants detected at the site. Exposure pathways for the Tier 1 assessment will include:

- groundwater volatilization to outdoor air
- groundwater volatilization to indoor air

Based on data collected during previous investigations, the irrigation well present at the site is not hydraulically connected to the shallow impacted water-bearing zone, and therefore, is not anticipated to be a potential groundwater ingestion pathway. A limited sensitive receptor survey conducted by Blymyer Engineers prior to the installation of monitoring wells MW-4 and MW-5, in October 1994, did not indicate any other potential sensitive receptor points within a ¼-mile downgradient of the site.

If plume concentrations exceed the RBSLs determined for either of the two pathways evaluated during the Tier 1 assessment, these pathways will require further evaluation using site-specific information in a Tier 2 assessment.

- **Evaluate collected data and prepare letter report**

The collected geophysical survey and soil and groundwater analytical data will be evaluated to determine the feasibility of utilizing natural attenuation as a remedial alternative at the site. A letter report will be prepared following the monitoring well abandonment, GPR survey, initial soil and groundwater sampling, and risk assessment documenting all work performed, including a detailed summary of analytical and investigative results, a scaled site map and groundwater contour and gradient map, groundwater concentration maps, and a summary of the initial natural attenuation evaluation. The report will document the monitoring well destruction for submittal to the Zone 7 Water Agency.

- **Conduct additional quarterly monitoring events**

  In order to comply with plume management requirements, one groundwater sample will be collected from monitoring wells MW-3, MW-4, and MW-5 during two consecutive quarterly sampling events.

- **Analyze groundwater samples**

  The groundwater samples collected during the second and third quarterly monitoring events will be field screened for DO, pH, ferrous Fe, and Eh and submitted to AEN for analysis of TPH as gasoline and diesel by modified EPA Method 8015, BTEX and MTBE by EPA Method 8020, nitrate by EPA Method 353.1, CO_2 by EPA method 406A and sulfate by EPA Method 375.4.

- **Prepare groundwater monitoring reports**

  A letter report will be prepared following each sampling event which will document all work performed, including a detailed summary of the groundwater analytical data, a scaled site map and groundwater contour and gradient map, groundwater concentration maps, conclusions, and recommendations for future work at the site.

- **Final sampling and site closure request**

  The groundwater samples collected during the fourth consecutive quarterly sampling event will be field screened for DO, pH, ferrous Fe, and Eh, and laboratory analyzed for TPH as gasoline and diesel by modified EPA Method 8015, BTEX and MTBE by EPA Method 8020, total alkalinity by EPA Method 310.1, CO_2 by EPA method 406A, nitrate by EPA method 353.1, and sulfate by EPA Method 375.4.

  If the results of the proposed soil and groundwater sampling indicate that the site meets the criteria for a low risk site, then Blymyer Engineers will recommend site closure with no further action in accordance with the requirements outlined in the *Tri-Regional Board Staff Recommendations for Closure Requests*, dated March 1, 1994.

- **Drum soil cuttings and well development water**

  All generated soil cuttings and decontamination and purge water will be stored on-site in labeled Department of Transportation-approved, 55-gallon drums for later disposal by the owner. Blymyer Engineers estimates that approximately eight 55-gallon drums of water and one 55-gallon drum of soil will be generated during this phase of the investigation.

All work will be completed in accordance with Blymyer Engineers's *Standard Operating Procedures* previously submitted to the ACHCSA.

Please call Laurie Buckman at (510) 521-3773 with any questions or comments regarding this project.

Sincerely,

Blymyer Engineers, Inc.

By: _____
Laurie A. Buckman
Project Geologist

And: _____
Mark Detterman, CEG #1788
Senior Geologist

REGISTERED GEOLOGIST
MARK E DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
9/97
STATE OF CALIFORNIA

Enclosures:

Tables:

Table 1:	Summary of Soil Sample Analytical Results
Table 2:	Summary of Groundwater Sample Analytical Results
Table 3:	Summary of Groundwater Elevation Measurements

Figures:

Figure 1:	Site Location Map
Figure 2:	Site Plan
Figure 3:	Soil Gas Survey Concentration Map
Figure 4:	Groundwater Gradient November 22, 1994
Figure 5:	Groundwater Gradient March 29, 1995
Figure 6:	Groundwater Gradient June 7, 1995

cc: Ms. Jean Kawahara, Kawahara Nursery, Inc.

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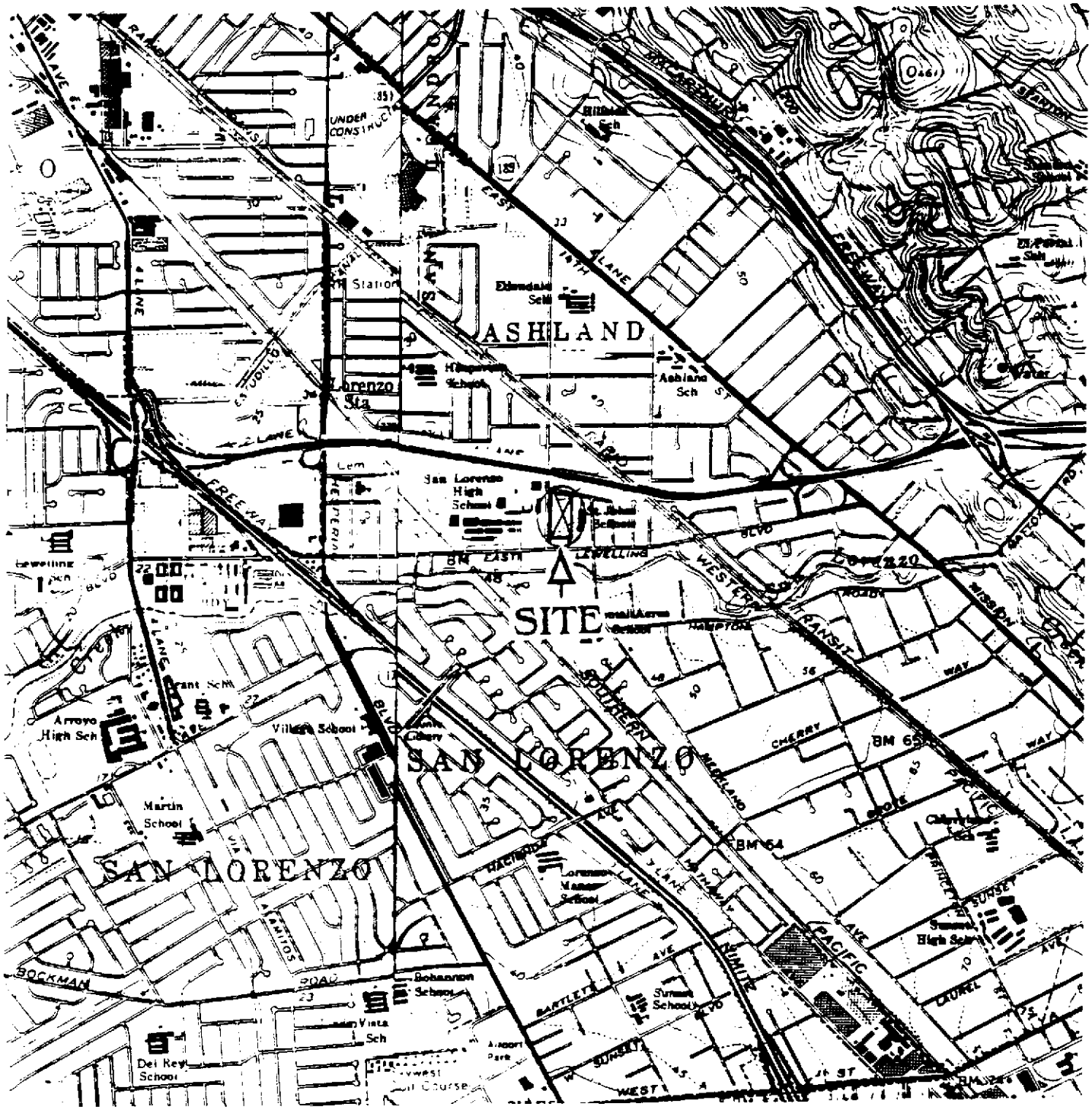


QUADRANGLE LOCATION

SOURCE: UNITED STATES GEOGRAPHICAL SURVEY 7.5' QUAD. "SAN LEANDRO CA" PHOTOREVISED 1980.

BLYMYER ENGINEERS, INC.

0 1000 2000

SCALE IN FEET

N

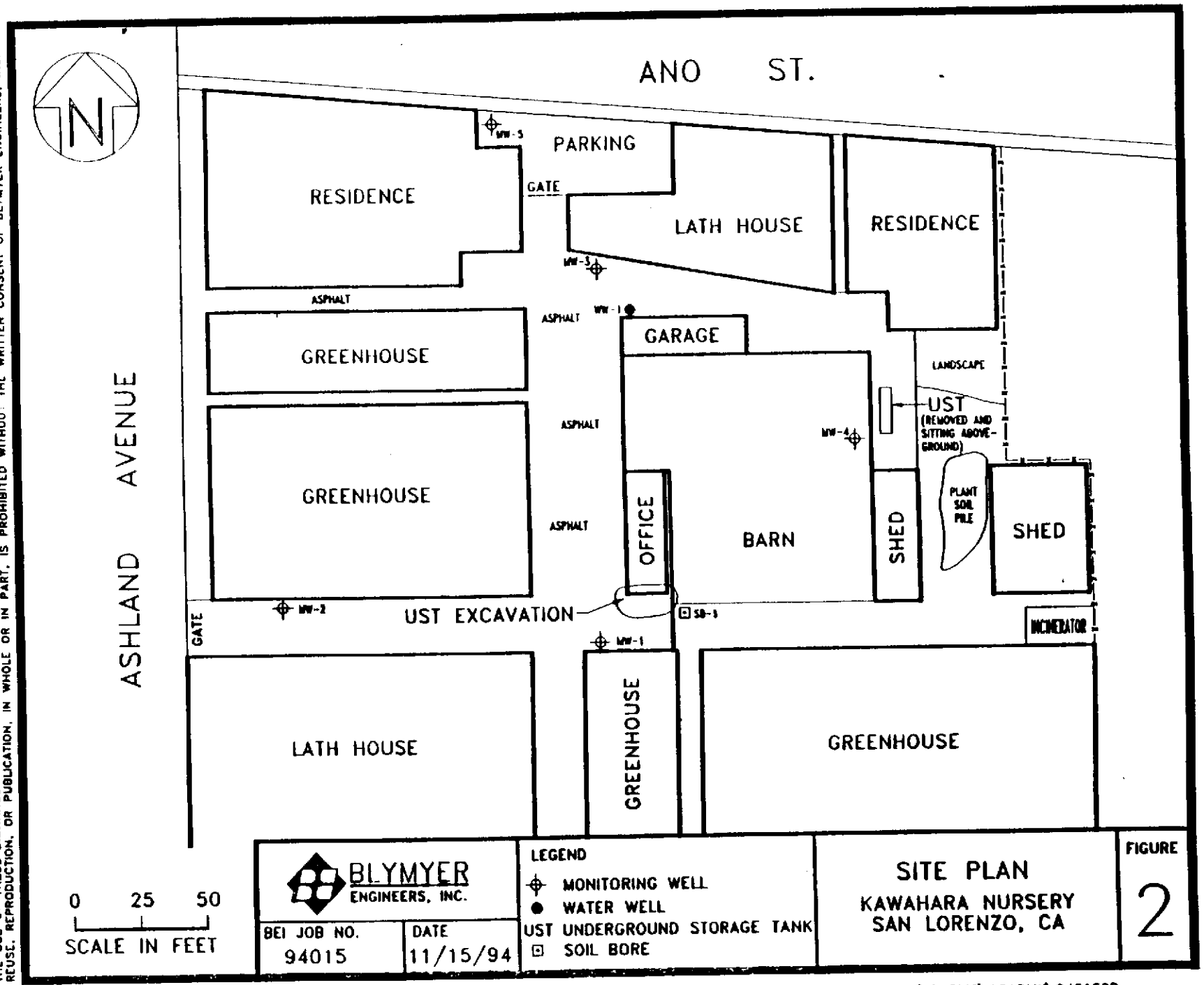
SITE LOCATION MAP

KAWAHARA NURSERY
16550 ASHLAND AVE.
SAN LORENZO, CA

FIGURE 1

BEI JOB NO. 94015

DATE 4/18/94



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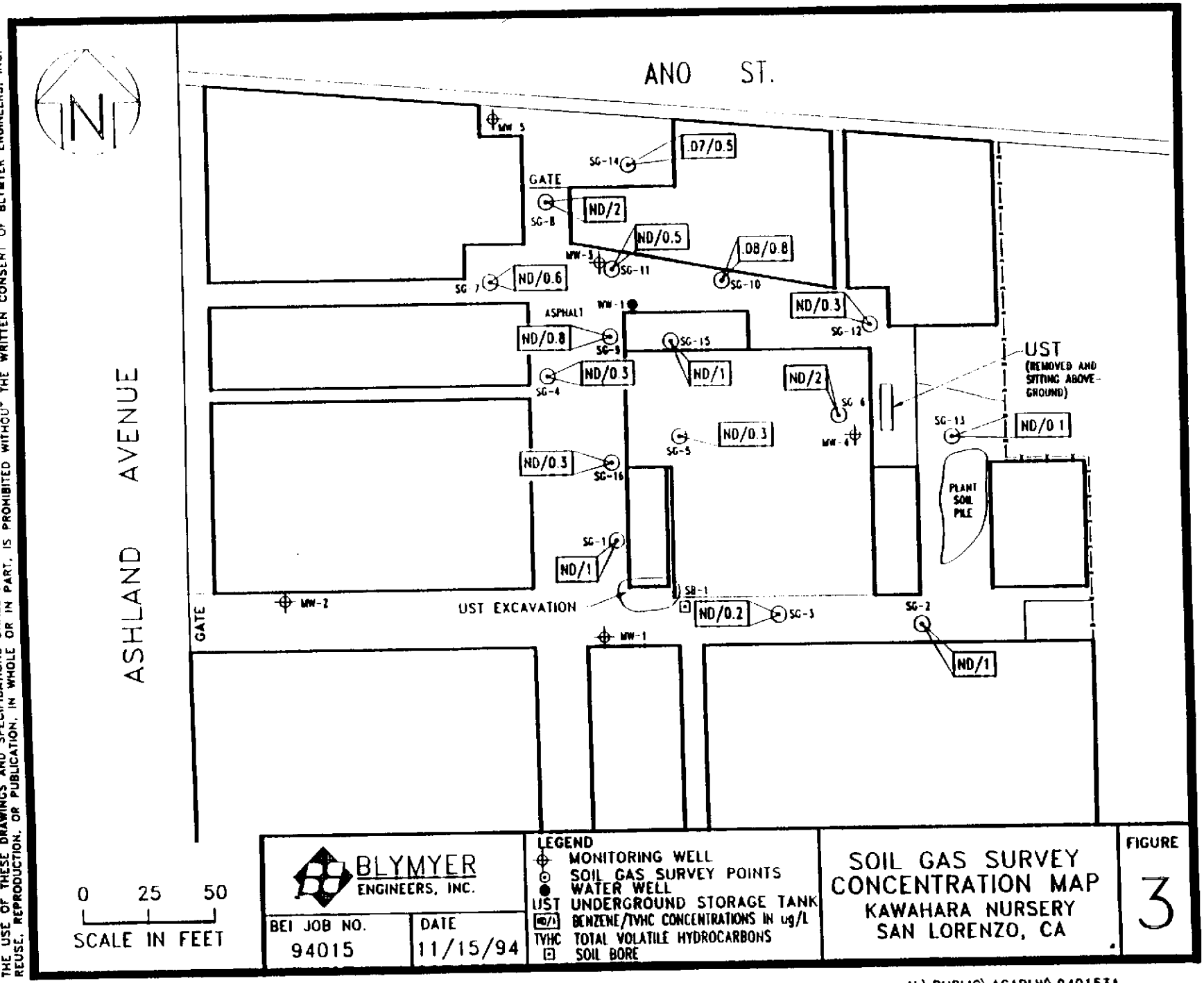

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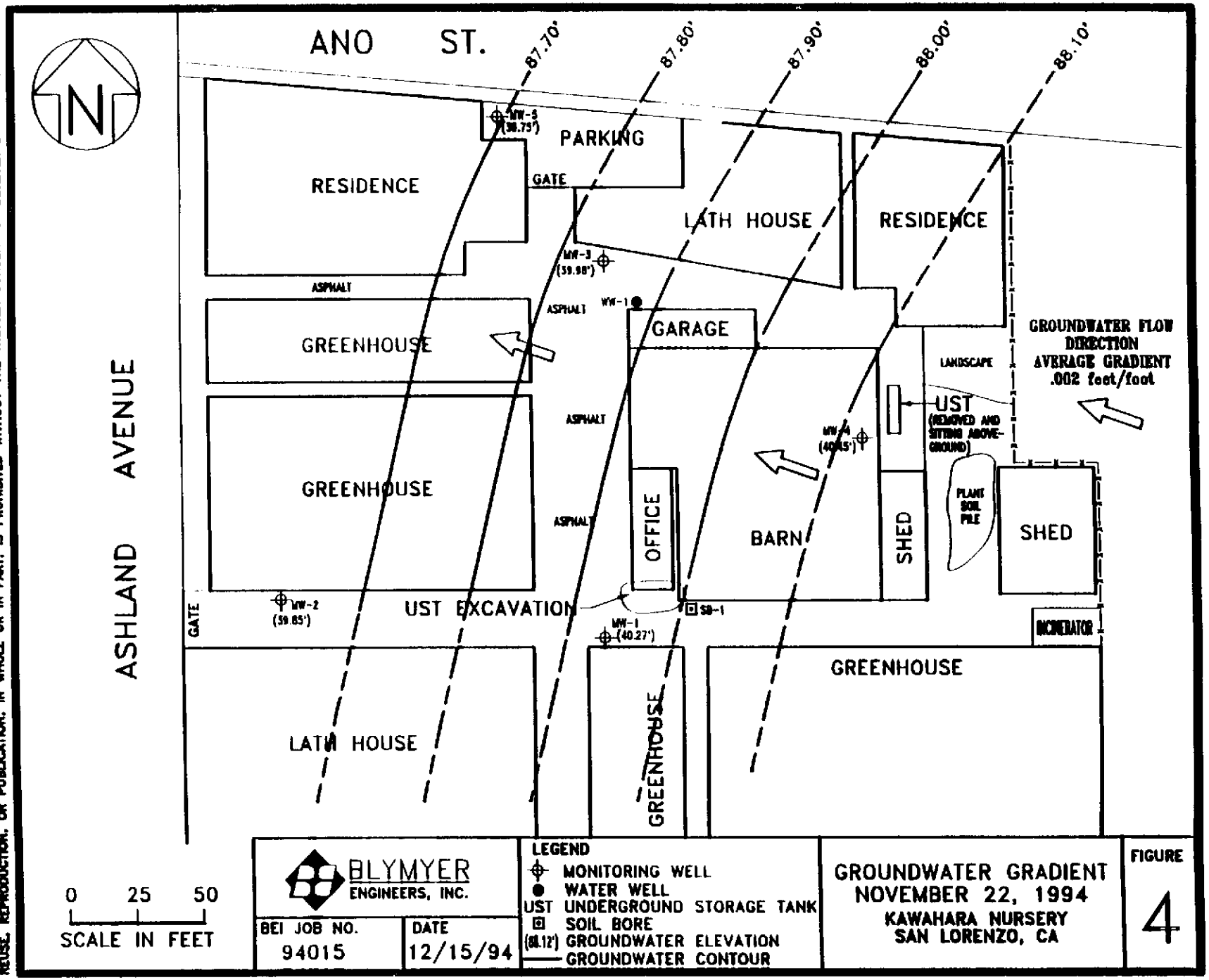

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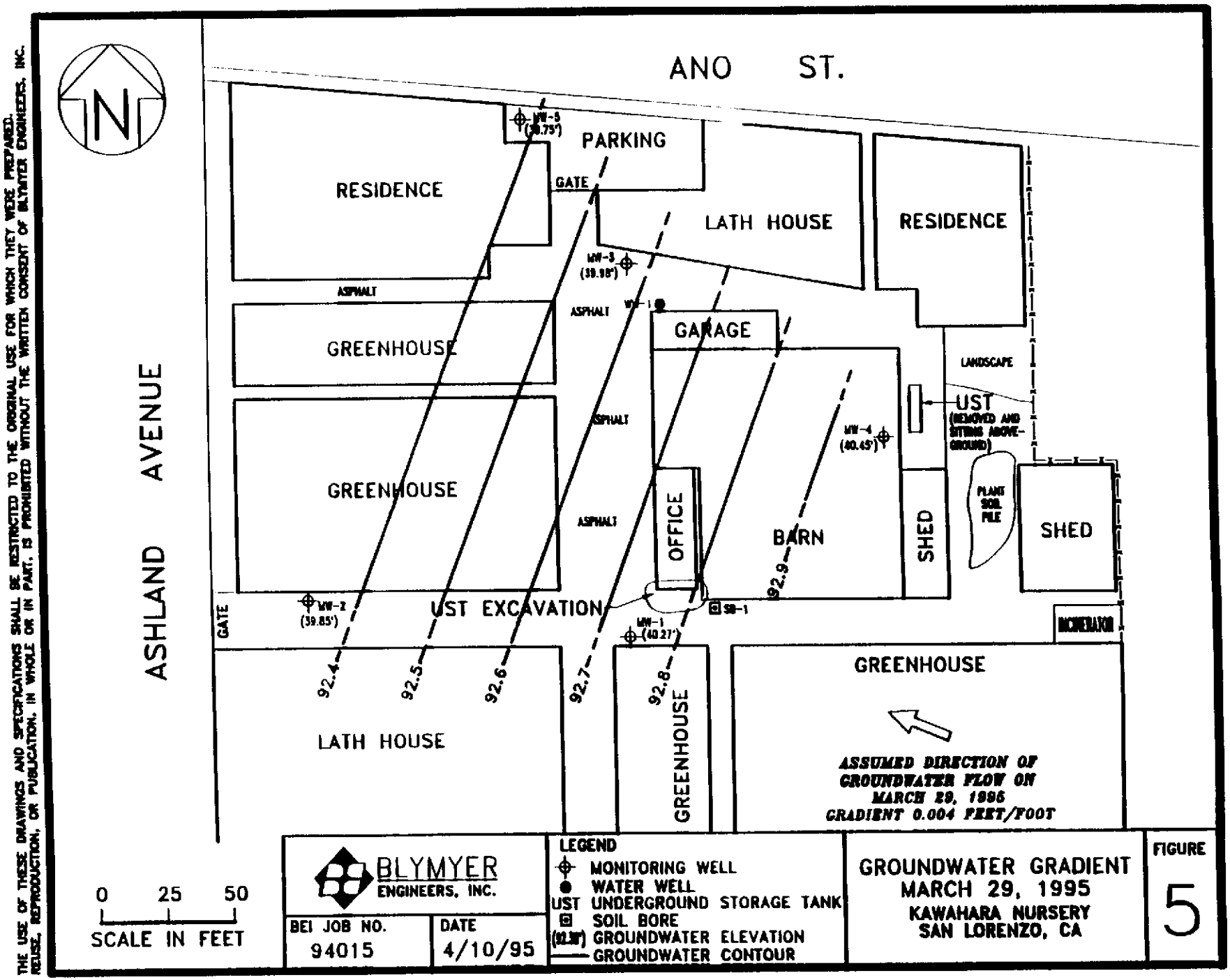

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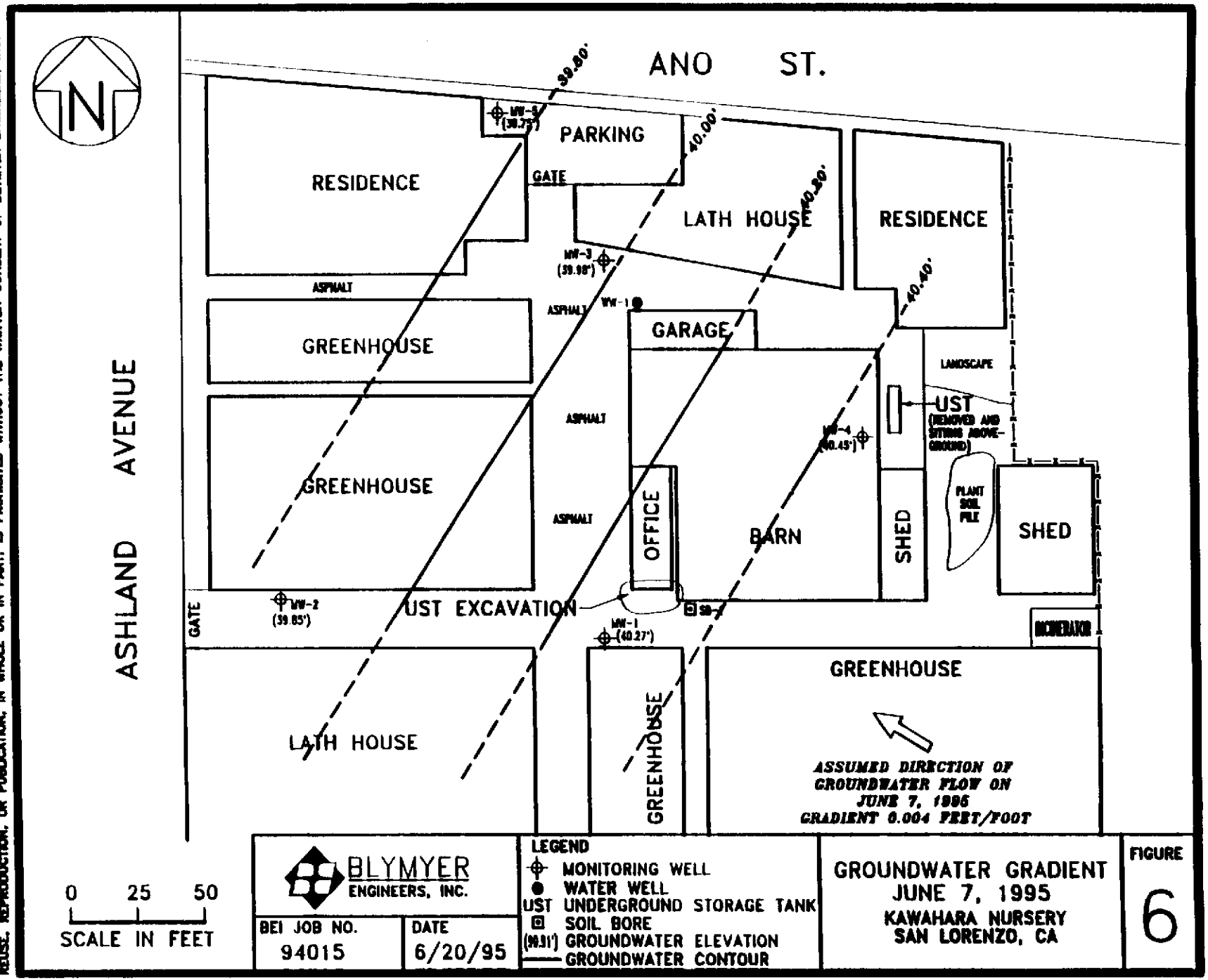

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ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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

Stid 4403

June 2, 1999

Mr. & Ms. Kawahara
Kawahara Nursery
16550 Ashland Ave.,
San Lorenzo, CA 94580

RE: Kawahara Nursery, at 16550 Ashland Ave., San Lorenzo, CA 94580

Dear Mr. Kawahara:

I have received and reviewed the "Quarterly Groundwater Monitoring Report" dated April 13th, 1999, regarding the above referenced site, submitted by Geanna Hudson of Blymyer Engineering. I concur with additional soil sampling. However, please address the following:

- The soil sampling should be performed around the perimeter of the former underground storage tanks (USTs) rather than the proposed locations. You may choose to take the proposed samples in addition to the soil samples around the perimeter of the former tanks.
- Perform several grab groundwater samples on the west and east side of the MW-3 well to ensure that the groundwater has not diverted due to geological formations and thus revealing a drastic reduction in the concentrations of the chemical constituents in MW-3 well.
- As indicated in the report, more round of groundwater monitoring will be necessary to get a better picture of the status of the plume.

Please modify and resubmit the plan accordingly to reflect the above required items by June 21, 1999.

Please call me at (510) 567-6876, if you have any questions, or need additional time.

Sincerely,

Amir K. Gholami, REHS
Hazardous Materials Specialist

Clement

C: Jeanna Hudson, Blymyer Engineering, 1825 ~~Clairmont~~ Ave., CA 94501
Files

BLYMYER
ENGINEERS, INC.

June 21, 1999
BEI Job No. 94015

Mr. Amir K. Gholami
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: **Proposed Soil Bore Locations**
Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, CA

Dear Mr. Gholami:

On April 19, 1999, Blymyer Engineers submitted the *Quarterly Groundwater Monitoring Report, 1st Quarter 1999* to the Alameda County Health Care Services Agency (ACHCSA) on behalf of Kawahara Nursery. In that report, Blymyer Engineers proposed additional soil bores to comply with the requirements of the ACHCSA letter from Amy Leech dated June 6, 1997 (attached) and the *Revised Workplan for Additional Site Characterization*, dated June 12, 1997 (attached). In order to keep Kawahara Nursery eligible for reimbursement, the approximate cost of the original scope of work was pre-approved by the California Underground Storage Tank Cleanup Fund (USTCF) in June 1997.

Recently, the ACHCSA requested additional work at the site, as follows:

- Two additional Geoprobe soil bores on the west side and east side of monitoring well MW-3 (letter dated June 2, 1999)
- Additional soil bores around the perimeter of the former underground storage tanks (letter dated June 2, 1999)
- Soil samples collected at five-foot intervals and grab groundwater samples collected from each soil bore (verbal request on June 17, 1999)

The attached site plans (Figures 1 and 2) indicate the locations of three soil bores (PSB-8, PSB-9, and PSB-10), in addition to the six soil bores already proposed (PSB-2 through PSB-7). PSB-8 and PSB-9 are located east and west of MW-3, respectively. Soil bore PSB-10 will be drilled north of MW-1 and immediately downgradient of the former diesel UST location, as requested.

The magnetic anomalies represent suspected UST locations (west and north of the lath house). Soil bores PSB-4 and PSB-5 are on the downgradient perimeter of one anomaly, approximately 5 feet from it (Figure 2). Upgradient locations were not proposed because of underground utilities and the presence of the lath house. We believe that the downgradient perimeter locations proposed should be adequate to assess any soil or groundwater contamination that may have resulted from a leaking UST at the location of the anomaly. The proposed locations of PSB-6 and PSB-7 are approximately

3 or 4 feet from the magnetic anomaly north of the lath house (in upgradient and downgradient locations, respectively). No additional soil bore locations are proposed there.

On the basis of this expanded scope of work, the additional estimated project costs are:

- Drill three additional soil bores, with one extra mobilization (approximately $2,000)
- Analyze three extra groundwater samples (six originally proposed); additional cost is $450
- Analyze a total of 27 soil samples (three samples from each of nine soil bores). Because six soil samples were originally proposed, this results in an additional cost of $3,150 for 21 more soil samples.

If you concur with the soil bore locations proposed in this document, please provide written approval to Kawahara Nursery and Blymyer Engineers. The written approval is required so that we may justify the above expenditures that are in excess of the amount already pre-approved by the USTCF. Additional pre-approval will not be obtained because it will further delay the project. If you do not concur with the proposed soil bore locations, please mark the preferred locations on the site map and attach it to the ACHCSA response letter.

Blymyer Engineers will obtain permits, drill the soil bores, and report the results of the investigation within eight weeks of receiving ACHCSA's written response to this letter. The results of the investigation will be presented in the same report as the results of the second quarterly groundwater monitoring event.

If you wish to discuss this letter, please call Jeanna Hudson at (510) 521-3773.

Rec'd 7/12/99

Sincerely,

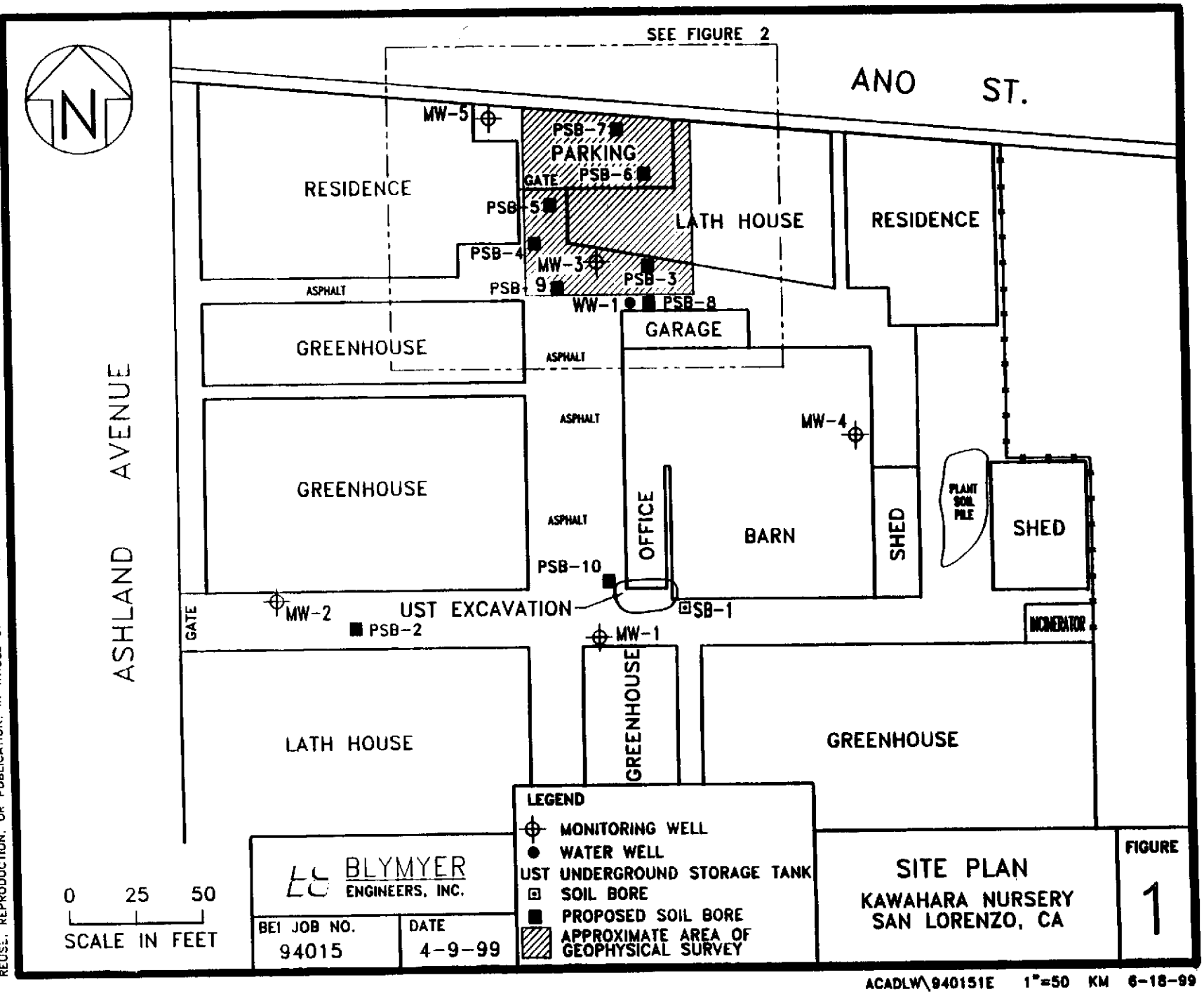
Blymyer Engineers, Inc.

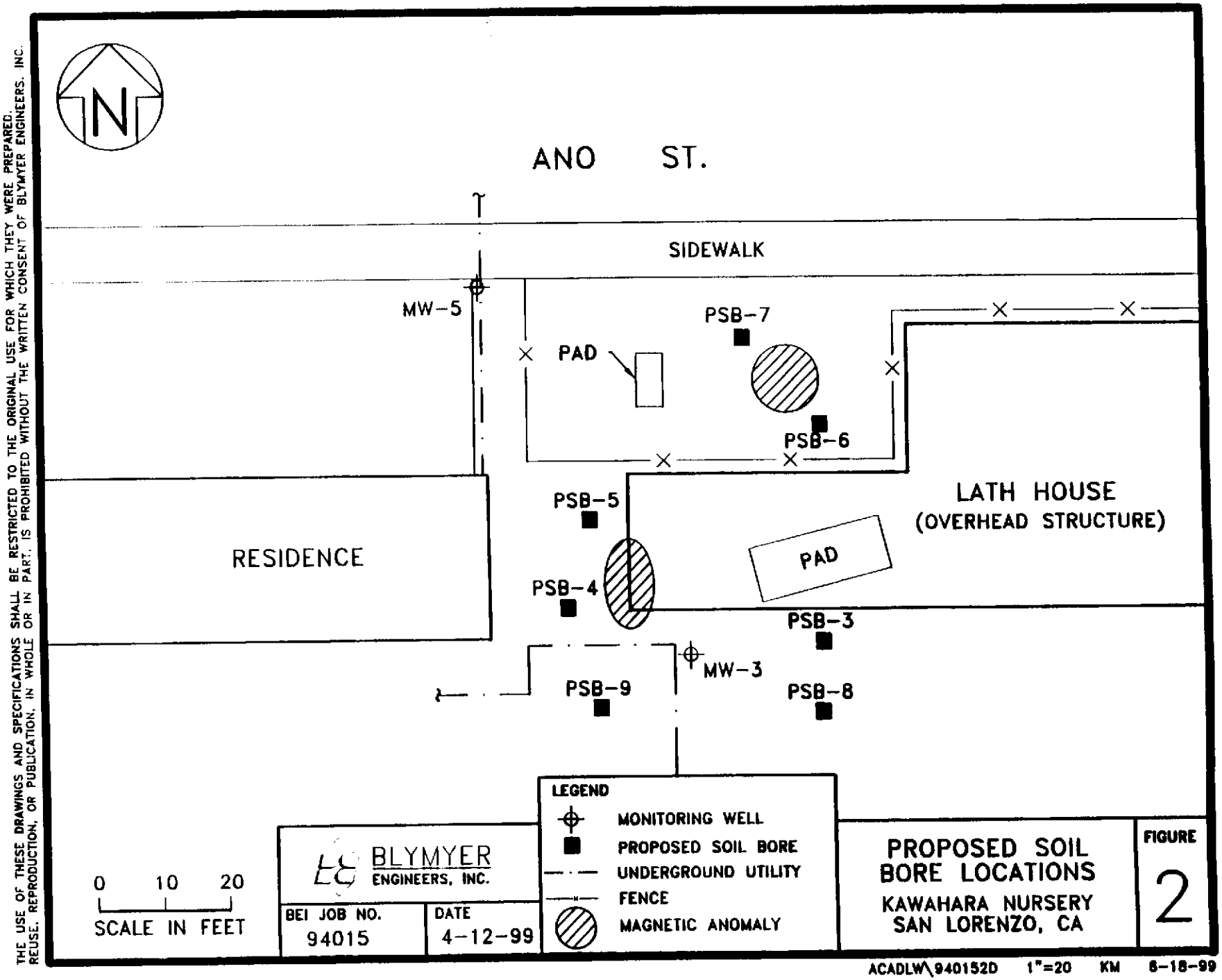
REGISTERED GEOLOGIST
JEANNA S. HUDSON
NO. 4492
STATE OF CALIFORNIA

By: Jeanna Hudson
Jeanna Hudson
Senior Geologist

By:
Michael S. Lewis
Vice President, Technical Services

Attachments
cc: Mr. John Kawahara, Kawahara Nursery





Appendix B:
Standard Operating Procedures, Blaine Tech Services, Inc.

SUMMARY OVERVIEW OF

STANDARD OPERATING PROCEDURES

FOR THE ROUTINE MONITORING OF GROUNDWATER WELLS

APPLIES TO WELLS WHICH ARE SAMPLED AND ANALYZED
FOR COMPOUNDS ASSOCIATED WITH
PETROLEUM FUELS,
HEAVY METALS,
CHLORINATED SOLVENTS AND
PRIORITY POLLUTANTS
AND OTHER COMMON CONTAMINANTS
RELATED TO INDUSTRY, AGRICULTURE, COMMERCE AND LANDFILL OPERATIONS

REVISED AND REISSUED SEPTEMBER 10, 1995

1. OBJECTIVE INFORMATION

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. We intentionally limit the scope of our activities and are primarily engaged in the execution of technical assignments which generate objective information. To avoid conflicts of interest which might compromise our impartiality, Blaine Tech Services, Inc. makes no recommendations, does not participate in the interpretation of analytical results and performs no consulting of any kind.

2. SPECIFIC ASSIGNMENTS

All work is performed in accordance with the specific request, authorization and informed consent of the client who may be the property owner, the responsible party or the professional consultant overseeing work at the particular site. The scope of services is defined in individual one-time work orders or in contracts which reference compliance with regulatory requirements, particular client specifications and conformance with our own Standard Operating Procedures. Decisions about what work will be done, how the work will be done and the sequence of events are established in advance of sending personnel to the site. Except where particular procedures and equipment are specified in advance, the determination of how to best complete the individual tasks which comprise the assignment is left to the discretion of our field personnel.

3. INSPECTION AND GAUGING

Wells are inspected prior to evacuation and sampling. The condition of the wellhead will be checked and noted in the degree of detail requested by the client. Measurements include the depth to water

and the total well depth obtained with industry standard electronic sounders which are graduated in increments of tenths of a foot and hundredths of a foot. The surface of the water in each well is further inspected for the presence of immiscibles and any separate phase hydrocarbon layer is measured in situ with an electronic interface probe and confirmed by visual inspection of the separate phase material in a clear acrylic bailer.

Notations are entered in blank areas on forms provided for the collection of instrument readings and included in the specially prepared field notebook. Data collected in the course of our work may be presented in a TABLE OF WELL MONITORING DATA prepared by our personnel or passed to the client or consultant in their original form on the field data sheets.

4. ADEQUATE PURGE STANDARD

Minimum purge volumes and purge completion standards are established by the interested regulatory agency controlling groundwater monitoring in each particular jurisdiction and by the consultant reviewing technical work performed on the project for submission to the interested regulatory agency. Depth to water measurements are collected by our personnel prior to purging and minimum purge volumes are calculated anew for each well based on the height of the water column and the diameter of the well. Expected purge volumes are never less than three case volumes and are set at no less than four case volumes in several jurisdictions.

5. STABILIZED PARAMETERS

Completion standards include minimum purge volumes, but additionally require stabilization of normal groundwater parameters. Normal groundwater parameter readings include electrical conductivity (EC), pH, and temperature which are obtained at regular intervals during the evacuation process (no less than once per case volume) and at the time of sample collection.

Temperature is considered to have stabilized when successive readings do not fluctuate more than +/- 1 degree Celsius. Electrical conductivity is considered stable when successive readings are within 10%. pH is thought to be stable when successive readings remain constant or vary no more than 0.2 of a pH unit.

Additional completion standards are used in some jurisdictions. Turbidity of <50 NTU is such a completion standard.

6. DEWATERED WELLS

Normal evacuation removes no less than three case volumes of water from the well. However, less water may be removed in cases where the well dewaters and does not recharge.

In a typical accommodation procedure worked out between the consultants and the regulatory agency, a well which does not recharge to 80% of its original volume within two hours (and any additional time our personnel have reason to remain at the site) will require our personnel to return to the site within twenty four hours to sample the well. In such cases, our personnel return to the site within the prescribed time limit and collect sample material from the water which has flowed back into the well case

without regard to what percentage of the original volume this recharge represents.

There are also instances in which the client, consultant and regulators agree that it is better to collect certain types of water samples (for volatile constituents) from the available water remaining in a dewatered well rather than let the water stand for prolonged periods of times and risk the loss of volatile constituents. These arrangements are client specific and are contained in client directives to our personnel. These are carried as printed directives in reference binders in the sampling vehicle and are on file at our office for use by our project coordination personnel.

7. PURGEWATER CONTAINMENT

All purgewater evacuated from each groundwater monitoring well is captured and contained as are all fluids form the on-site decontamination of reusable apparatus (sounders, electric pumps and hoses etc.). Hazardous materials are placed in appropriately labeled DOT drums and left at the site for handling by a licensed hazardous waste hauler who will move the material to a TSDF. Non-hazardous purgewater will be drummed or discharged into an on-site treatment system. Non-hazardous effluent from petroleum industry sites is typically collected in vehicle mounted tanks and transported to the nearest refinery operated by the client.

8. EVACUATION

Wells are purged prior to sampling with a variety of evacuation devices. Small diameter wells which contain a relatively small volume of water are often hand bailed. Larger volumes of water found in deeper wells and larger diameter wells are removed with down hole electric submersible pumps or pneumatic purge pumps.

In a typical evacuation, the well is pumped with a Grundfos brand electrical pump deployed into the well on a long section of hose which is paid out form a reel assembly mounted on the sampling vehicle.

Specialized evacuation devices such as USGS Middleburg bladder pumps can be used in response to special circumstances, but unless specifically dictated by the client, consultant or regulator, the type of device used to evacuate the well will be selected based on its appropriateness and efficiency.

9. SAMPLE COLLECTION DEVICES

Irrespective of the type of device used to evacuate the well, samples are always collected with a specialized sampling bailer. Standard sampling bailers are constructed of either stainless steel or PTFE (Teflon®). Some clients request that their samples be obtained with disposable bailers which are made from a variety of materials (PTFE, polyethylene, PVC etc.) which are represented by the manufacturer to be adequate and appropriate for one time use applications after which the disposable bailer is discarded.

Regardless of the type of bailer used to collect sample material, the number of check valves the bailer contains or the presence or absence of a bottom emptying device, the water which is the sample material is promptly decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA standard for handling volatile organic and semi-volatile compounds.

The exceptions to this rule are samples which must be field filtered (i.e. for metals) prior to preservation or those that must be fixed or manipulated in the field (e.g. Winkler titration). Such samples are handled according to procedures described in STANDARD METHODS, the SW-846 and other texts.

10. SAMPLE CONTAINERS

Sample material is decanted directly from the sampling bailer into sample containers provided by the laboratory which will analyze the samples. The transfer of sample material from the bailer to the sample container conforms to specifications contained in the USEPA T.E.G.D. The type of sample container, material of construction, method of closure and filling requirements are specific to intended analysis. Chemicals needed to preserve the sample material are commonly already placed inside the sample containers by the laboratory or glassware vendor. The number of replicates is set by the laboratory.

11. QC BLANKS

QC blanks are collected in accordance with the regimen agreed upon by the interested parties and typically include trip blanks, duplicates and equipment blanks.

12. CHAIN OF CUSTODY RECORDS

All samples are labeled and logged on a standardized Chain of Custody form. The Blaine Tech Services, Inc., preprinted Chain of Custody form is a multi-page carbonless form, whereas client and laboratory forms are usually single pages which are replicated by making photocopies. All Chain of Custody forms follow standard EPA conventions set forth in USEPA SW-846 for recording the time, date and signature of the person collecting the samples, and go further to require paired time, date and responsible party entries each time the samples change hands.

According to this convention, each time the samples move from the custody of one person to another person, the Chain of Custody form must record the time, date and signature of the person relinquishing custody of the samples and the time data and signature of the person accepting custody of the samples.

In practice, all samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under a standard Chain of Custody form. If the samples are taken charge of by a different party (such as another person from our office, or a courier who will transport the samples to the laboratory) prior to being delivered to the laboratory, appropriate release and acceptance entries must be made on the Chain of Custody form (time, date, and signature of the person releasing the samples followed by the time, date and signature of the person taking possession of the samples).

13. SAMPLE STORAGE

All sample containers are promptly placed in food grade ice chests for storage in the field and transport (direct or via our facility) to the analytical laboratory which will perform the intended analytical procedures. These ice chests contain quantities of ice as a refrigerant material. The samples are maintained in either an ice chest or a refrigerator until relinquished into the

custody of the laboratory or laboratory courier.

14. ICE

Temperature in the ice chest is lowered and maintained with ice. Our firm produces ice in a restaurant grade commercial ice maker which is supplied with deionized water which has been filtered and polished and is the same grade of water tanked on our sampling vehicles for use in decontamination procedures.

15. DOCUMENTATION CONVENTIONS

All sample containers are identified with a site designation and a discrete sample identification number specific to that particular groundwater well. Additional standard notations (e.g. time, date, sampler) are also made on the label.

Each and every sample container has a label affixed to it. In most cases these labels are generated by our office personnel and are partially preprinted. Labels can also be hand written by our field personnel. The site is identified (usually with a code specified by the client), as is the particular groundwater well from which the sample is drawn (e.g. MW-1, MW-2, S-1, etc.). The time at which the sample was collected and the initials of the person collecting the sample are handwritten onto the label.

Our representative adds the Blaine Tech Services, Inc. Sampling Event Number. This Sampling Event Number also appears on the Chain of Custody form and all other notebook pages and papers associated with the work done at the site on the particular day by this particular technician. The Sampling Event Number also becomes the number of the Blaine Tech Services, Inc. Sampling Report.

The Sampling Event Number is derived form the date on which the work was done, the specific employee who did the work and what the relationship of this particular assignment was to any other assignments performed on that day by this specific employee.

An example Sampling Event Number is 950910-B-2.

The first six digits indicate the date (yymmdd) which is 950910 for September 10, 1995. The alpha character indicates the letter assigned to the specific employee doing the work (e.g. the letter B is assigned to Mr. Richard Blaine). The final digit indicates that this was the second sampling assignment performed by Mr. Blaine on that particular date.

16. DECONTAMINATION

All equipment is brought to the site in clean and serviceable condition and is cleaned after use is each well and before subsequent use in any other well. Equipment is decontaminated before leaving the site.

The primary decontamination device is a commercial steam cleaner. Because high temperature water retains heat better than does a jet of steam and poses fewer hazards to the operator, we have our steam cleaners detuned by the manufacturer to produce hot water several degrees below the transition to live steam.

The steam cleaner / hot pressure washer is operated with high quality deionized water which is produced at our facility and tanked

on our sampling vehicle for use at remote sites.

Decontamination effluent is collected in the same onboard effluent tanks as are used to contain the effluent from purging the groundwater wells at the site. The decon effluent is handled in the same manner as groundwater from the well.

17. FREE PRODUCT SKIMMERS

A skimmer is a free product recovery device sometimes installed in wells with a free product zone on the surface of the water. The presence of the skimmer in the well often prevents normal well gauging and free product zone measurements. The Petro Trap brand 2.0" and 3.0" diameter skimmers which are used on some petroleum industry sites fall into the category of devices that obstruct the well to the extent of preventing normal gauging. Gauging at such sites is performed in accordance with specific directions from the professional consulting firm overseeing work at the site on behalf of the property owner or responsible party.

In cases where the consultant elects to have our personnel pull the skimmers out of the well and gauge the well, our personnel perform the additional task of draining the accumulated free product out of the Petro Trap before putting it back into the well. The recovered free product is measured and recorded. The notation on the amount of free product with subsequently be entered in the VOLUME OF IMMISCIBLES REMOVED column on the TABLE OF WELL GAUGING DATA in the next Blaine Tech Services, Inc. Sampling Report.

18. CERTIFIED LABORATORY

Samples are directed to analytical laboratories which have been certified by the California Department of Health Services as an authorized Hazardous Materials Testing Laboratory and that laboratory's name and DOHS HMTL number should be noted on the Chain of Custody form.

18. REPORTAGE

A typical groundwater monitoring assignment involves the work of several different firms and a series of reports are generated, beginning with a Blaine Tech Services, Inc. Sampling Report. The Sampling Report (whether in extended or abbreviated form) details the particulars of the work that was performed and either presents directly or references descriptions of the methodologies which were used.

An attachment to the Sampling Report is the Chain of Custody form which is a legal document which records that transfer of the samples from Blaine Tech Services, Inc. to the analytical laboratory which will analyze the samples. The laboratory completes its work and issues its own Certified Analytical Report presenting the results of the analyses they conducted. Both our Sampling Report and the laboratory's Analytical Report deal with the objective information. Neither the Sampling Report nor the Analytical Report interprets the data being reported.

Interpretations are provided by professional geologists and engineers who are working as environmental consultants. The consultant reviews the measurements made by our field personnel and plots an updated groundwater gradient map. The most recent analytical results are compared to earlier results to establish trends and information about the presence of various compounds in the groundwater. Anomalous data are examined

with reference to our field data sheets to see if our notes indicate changed site conditions.

In general, the consultant is charged with making sense of the objective information and deciding what it may mean to the property owner and to the people to the State of California. The consultant signs off on is or her review of the objective information, makes whatever recommendations are appropriate and submits the assembled package of related documents to the regulatory agency on behalf of the property owner or responsible party.

The individual reports from Blaine Tech Services, Inc. and the analytical laboratory are distinct objective information documents, linked together by the Chain of Custody. In contrast, groundwater gradient maps require professional judgements and adjustments and are, therefore, within the domain of the professional consultant. Any professional evaluations or recommendation are always made by the consultant under separate cover.

20. FIELD PERSONNEL

All Blaine Tech Services, Inc. field personnel are required to have 40 hours of initial training in Hazardous Waste Operations and Emergency Response per 29 CFR 1910. 120 with 8-hour annual refresher courses. They are also given an 8-hour BATT course in refinery safety orientation. They receive several days of on-the-job-training and are given additional in-house training which included study of all the applicable Codes of Safe Practices form our Injury and Illness Prevention Program, review of the written Hazard Communication Program, familiarization with our written Drug Alcohol Free Work Place Policy and orientation on the Blaine Tech Services, Inc. Comprehensive Quality Assurance Program.

Field personnel also receive 29 CFR 1910 Supervisor Training to better prepare them to establish safe work sites at remote locations and supervise their own work, including compliance with site specific Site Safety Plans (SSP). Client requirement binders and Standard Operating Procedures are also provided. Blaine Tech Services, Inc. Policies and extensive in house training materials covering Basics and Diverse Sampling Assignments are included in advance employee training.

Blaine Tech Services, Inc. field personnel routinely commence work at OSHA level D and can upgrade to appropriate levels of additional protection as needed. They maintain their personal protective equipment in accordance with OSHA requirements and the specific mandates of our Respiratory Protection Program. All field personnel are trained and expected to comply with the requirements of any site specific Safety Plan which is in effect at any given site. Our personnel are prepared and able to follow the directions of any Site Safety Officer (SSO) administering the Site Safety Plan and, in the absence of an SSO, can apply the pertinent provisions of the SSP to themselves and to other Blaine Tech Services, Inc. personnel.

21. WORK ORIENTATION

Blaine Tech Services, Inc. field personnel are chosen from applicants who usually have bachelors' degrees in the sciences, environmental studies or related fields. People from the observational sciences (like botanists) often do better field sampling than young engineers who want to learn consulting (and are encouraged to find work

with a good consulting firm). We notice that we employ a disproportionate number of people with degrees in fire science.

The academic concentration, however, has proven less important than the broader aptitude, durability and willingness of the applicant to deal with the range of problems which attend executing exacting procedures in a noisy workplace largely unprotected from sun, wind and rain.

Put simply, there is a lot of physical work that surrounds the science. Those who succeed at field sampling are those who can manage the physical work, handle emergencies and make field repairs without losing track of the particular requirements of the procedure they are performing.

22. PLAIN BUT IMPORTANT

Blaine Tech Services, Inc. has concentrated on providing high quality environmental sampling and documentation for well over a decade. During that time we have contributed mechanical and procedural innovations, helped establish higher quality and performance standards and have assisted in the replacement of inefficient sole-source-vendor monopolies with the new practice of separating projects into identifiable modules in which professional, technical and contractor functions are evaluated, bid and awarded individually – on the basis of price and actual performance.

Real as these advances are, sampling remains unglamorous and even misunderstood. Some engineers have expressed the view that field sampling is such a menial activity that it may as well be performed by their newest employees who are paying their dues before being allowed to do *real* work such as data interpretation, computer modeling, and the design of remediation systems.

We assert the contrary view, that sample collection is at least as important as sample analysis in the laboratory. This is based on the fact that no amount of care in the laboratory can – retroactively – put back into a sample, the integrity and quality that has been lost by indifferent sample collection. It can even be argued that objective scientific information is *more credible* when it is produced by people who are wholly impartial and really have no interest in any particular outcome.

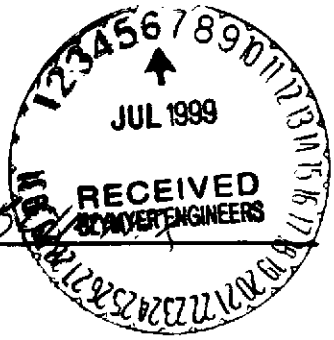
Blaine Tech Services, Inc. exists because there is technical work which needs to be done that is neither glamorous nor highly remunerative, but is still important enough that it needs to be done correctly.

Any questions can be directed to our senior project coordinator, Mr. Kent Brown who can be reached at: **(408) 573-0555.**

Select voice mail extension number **203.**

Appendix C:
Well Gauging and Well Monitoring Data Sheets

WELL GAUGING DATA



Project # 990629 Y2 Date 6/29 Client [illegible]

Site KAWAHARA NURSERY

Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	
MW1						8.81	18.05	TOC	
MW2						8.52	18.43		
MW3						8.49	19.21		
MW4						9.04	19.59		
MW5						7.41	19.84		

WELL MONITORING DATA SHEET

Project #: 990629 Y2	Client: BLYMYER
Sampler: B. TAYLOR	Start Date: 6/29
Well I.D.: MW3	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 19.21	Depth to Water: 8.49
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method: Bailer, Disposable Bailer, Middleburg, Electric Submersible, Extraction Pump, Other: _____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Other: _____

2 (Gals.) X 3 = 6 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
947	66.1	6.4	1153	>200	2	
950	64.4	6.7	1162	>200	4	
953	64.1	6.6	1164	>200	6	

Did well dewater? Yes (No) Gallons actually evacuated: 6

Sampling Time: 955 Sampling Date: 6/29

Sample I.D.: MW3 Laboratory: (ENTECH)

Analyzed for: (TPH-G BTEX MTBE TPH-D) Other: ALK, NITRATE/NITRITE / CO_2 / DISS. FE

Equipment Blank I.D.: @ Time Duplicate I.D.:

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	0.4 mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 990629 Y2	Client: KLYMYER
Sampler: B. TAYLOR	Start Date: 6/29
Well I.D.: MW4	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 19.59	Depth to Water: 9.04
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: ~~PVC~~ Grade	D.O. Meter (if req'd): ~~YSI~~ HACH

Purge Method: ~~Bailer~~
Disposable Bailer
Middleburg
Electric Submersible
Extraction Pump
Other: _____

Sampling Method: ~~Bailer~~
Disposable Bailer
Extraction Port
Other: _____

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

2 (Gals.) X 3 = 6 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1006	64.3	6.9	833	>200	2	
1009	64.4	6.8	907	>200	4	
1012	64.6	6.9	909	>200	6	

Did well dewater? Yes ~~No~~ Gallons actually evacuated: 6

Sampling Time: 1015 Sampling Date: 6/29

Sample I.D.: MW4 Laboratory: ENTECH

Analyzed for: TPH-G BTEX MTBE TPH-D Other: ALK, NITRATE/NITRITE / CO_2 / DISS. FE

Equipment Blank I.D.: @ Time Duplicate I.D.:

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-~~purge~~:	1.2 mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 990629 Y2	Client: BLYMYER
Sampler: B. TAYLOR	Start Date: 6/29
Well I.D.: MW3	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 19.84	Depth to Water: 7.41
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method: ~~Bailer~~ Disposable Bailer / Middleburg / Electric Submersible / Extraction Pump / Other: ___

Sampling Method: ~~Bailer~~ Disposable Bailer / Extraction Port / Other: ___

2 (Gals.) X 3 = 6 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
10 27	65.4	6.5	1081	>200	2	
10 30	64.4	6.6	1073	>200	4	
10 33	64.3	6.6	1072	>200	6	

Did well dewater? Yes (No) Gallons actually evacuated: 6

Sampling Time: 10 35 Sampling Date: 6/29

Sample I.D.: MW3 Laboratory: (ENTECH)

Analyzed for: (TPH-G BTEX MTBE TPH-D) Other: ALK, NITRATE/NITRITE / CO_2 / DISS. F_e

Equipment Blank I.D.: @ Time Duplicate I.D.:

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	~~Pre-purge:~~	0.9 mg/L	Post-purge:		mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:		mV

BLYMYER
ENGINEERS, INC.

SOIL BORE LOG: SB-2

Job No.: 94015
Client: Kawahara Nursery
Site: 16550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 16 ft.

Initial Water Depth: ▽ 12 ft.
Stabilized Water Depth: ▼

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY, with sand and <2% gravel; dry; odorless	CL		
5		4.2					
				Tan silty SAND; fine grained with gravel; moist; odorless	SM		
10		5.1		Tan silty CLAY, with <1% gravel; moist; odorless	CL		▽ 12'
				Tan silty SAND; fine grained; poorly graded; wet; odorless	SM		
15				Gray silty CLAY, moist; odorless	CL		
				Bore terminated at 16 ft.			
20							
25							
30							

BLYMYER
ENGINEERS, INC.

SOIL BORE LOG: SB-3

Job No.: 94015
Client: Kawahara Nursery
Site: 18550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 18 ft.

Initial Water Depth: ▽ 12 ft.
Stabilized Water Depth: ▼ 11 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY; dry; odorless	CL		
		2.5					
5				No recovery between 5 to 8 feet bgs.			
				Tan silty CLAY; moist; odorless	CL		
10							▼ 12'
				Tan silty SAND; fine grained; poorly graded; wet; odorless	SM		
				Gray silty CLAY, moist; odorless	CL		
15							
				Bore terminated at 18 ft.			
20							
25							
30							

SOIL BORE LOG: SB-4

BLYMYER
ENGINEERS, INC.

Job No.: 94015
Client: Kawahara Nursery
Site: 18550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 18 ft.

Initial Water Depth: ▽ 12.5 ft.
Stabilized Water Depth: ▼ 11 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY; trace fine sand; dry; odorless	CL		
5				As above; gray between 6 to 7 ft.	CL		
				Tan silty SAND; fine grained; with gravel	SM		
				Gray silty CLAY; moist	CL		▼ 11'
10				Gray silty SAND; fine grained; wet; strong gasoline odor	SM		▽ 12.5'
		543					
15				Gray silty CLAY, moist	CL		
				Bore terminated at 18 ft.			
20							
25							
30							

BLYMYER
ENGINEERS, INC.

SOIL BORE LOG: SB-5

Job No.: 94015
Client: Kawahara Nursery
Site: 18550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 18 ft.

Initial Water Depth: ▽ 12.5 ft.
Stabilized Water Depth: ▼ 11 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY; with sand; dry; odorless	CL		
5				No recovery between 4 to 8 feet bgs.			
				Gray to brown silty CLAY; moist; strong gasoline odor at 12 ft.	CL		
10		1308					▼ 11'
				No recovery between 12 to 18 ft.			▽ 12.5'
15							
				Bore terminated at 18 ft.			
20							
25							
30							

BLYMYER
ENGINEERS, INC.

SOIL BORE LOG: SB-6

Job No.: 94015
Client: Kawahara Nursery
Site: 18550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 18 ft.

Initial Water Depth: ▽ 13 ft.
Stabilized Water Depth: ▼ 11 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY; dry; odorless	CL		
		3.7					
5							
				Tan silty SAND; fine grained; with gravel; moist; odorless	SM		
		3.1		Tan silty CLAY; moist; odorless	CL		▼ 11'
10							
							▽ 13'
				Tan silty SAND; fine grained; poorly graded; wet; odorless	SM		
		4.2					
15				Brown silty CLAY, moist; odorless	CL		
				Bore terminated at 18 ft.			
20							
25							
30							

BLYMYER
ENGINEERS, INC.

SOIL BORE LOG: SB-7

Job No.: 94015
Client: Kawahara Nursery
Site: 18550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 18 ft.

Initial Water Depth: ▽ 13 ft.
Stabilized Water Depth: ▼ 10 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY, with trace sand; dry; odorless	CL		
5		0					
				Tan silty SAND; fine grained; with gravel; moist; odorless	SM		
10		0		Tan silty CLAY, silt content increasing with depth; odorless	CL		▼ 10'
				No recovery 12 to 18 feet.			▽ 13'
15							
				Bore terminated at 18 ft.			
20							
25							
30							

SOIL BORE LOG: SB-8

BLYMYER ENGINEERS, INC.

Job No.: 94015
Client: Kawahara Nursery
Site: 18550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 16 ft.

Initial Water Depth: ▽ 12 ft.
Stabilized Water Depth: ▼ 11 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY, with fine sand; dry; odorless	CL		
5		1.2					
				Tan silty SAND; fine grained; poorly graded; moist; odorless	SM		
10		0		Brown gray silty CLAY; moist; odorless	CL		▼ 12'
				Tan silty SAND; fine grained; poorly graded; wet; odorless	SM		
15		2.3		Gray silty CLAY; odorless	CL		
				Bore terminated at 16 ft.			
20							
25							
30							

BLYMYER
ENGINEERS, INC.

SOIL BORE LOG: SB-9

Job No.: 94015
Client: Kawahara Nursery
Site: 16550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 18 ft.

Initial Water Depth: ▽ 12 ft.
Stabilized Water Depth: ▼ 11 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT–gravel; FILL	F		
				Brown silty CLAY, with fine sand; dry; odorless	CL		
		16.8	■				
5							
				Tan silty SAND; fine grained; with gravel; moist; odorless	SM		
		26.2	■	Brown silty CLAY; moist; odorless	CL		▼ 12'
10							
				Tan silty SAND; fine grained; wet; odorless	SM		
				Gray silty CLAY; odorless	CL		
		15.2	■				
15							
				Bore terminated at 18 ft.			
20							
25							
30							

BLYMYER
ENGINEERS, INC.

SOIL BORE LOG: SB-10

Job No.: 94015
Client: Kawahara Nursery
Site: 18550 Ashland Avenue
San Lorenzo, CA
Date Drilled: 8/9/99
Logged By: J. Hudson

Drilling Company: Gregg Drilling
Driller: Bob
Drilling Equipment: Rhino Direct Push
Sample Method: Plastic Sleeves
Bore Diameter: 1.5 in.
Total Depth: 18 ft.

Initial Water Depth: ⊽
Stabilized Water Depth: ⊽

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0				ASPHALT-gravel; FILL	F		
				Brown silty CLAY, with sand; dry; odorless	CL		
5		3.3					
				Tan silty SAND; fine grained; poorly graded; dry; odorless	SM		
10		6.5		Brown gray silty CLAY; with <1% gravel; odorless	CL		
				No recovery 12 to 18 feet.			
15				Bore terminated at 18 ft.			
20							
25							
30							

Appendix E:
Blymyer Engineers' Standard Operating Procedure No. 4

BLYMYER
ENGINEERS, INC.

Standard Operating Procedure No. 4

Soil and Grab Groundwater Sampling Using Hydraulically-Driven Sampling Equipment

Revision No. 1

Approved By:

Michael Lewis
Quality Assurance/Quality Control Officer
Blymyer Engineers, Inc.

11/94
Date

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Attachments:

Boring and Well Construction Log
Drum Inventory Sheet

1.0 Introduction and Summary

This Standard Operating Procedure (SOP) describes methods for drilling with the use of hydraulically-driven equipment, soil sampling with the use of split-spoon samplers, and grab groundwater sampling through an open borehole. Drilling activities covered by this SOP are conducted to obtain soil and grab groundwater samples. Soil samples may be obtained to log subsurface materials, to collect samples for chemical characterization, or to collect samples for physical parameter characterization.

The soil sampling techniques described in this SOP are generally suitable for chemical characterization and physical classification tests; because a driven split-spoon sampler is employed, the resulting soil samples should generally be considered "disturbed" with respect to physical structure and may not be suitable for measuring sensitive physical parameters, such as strength and compressibility. The techniques described in this SOP generally produce a borehole with a diameter corresponding to the outside diameter of the drill rods, a relatively small annulus of remolded soil surrounding the outside diameter of the drill rods, and limited capability for cross-contamination between subsurface strata as the leading drill rods pass from contaminated strata to uncontaminated underlying strata. However, should conditions require strict measures to help prevent cross-contamination or maintain the integrity of an aquitard, consideration should be given to augmenting the procedures of this SOP, for example, by using pre-drilled and grouted isolation casing.

The procedures for hydraulically-driven soil sampling generally consist of initial decontamination, advancement of the drill rods, driving and recovery of the split-spoon sampler, logging and packaging of the soil samples, decontamination of the split-spoon and continued driving and sampling until the total depth of the borehole is reached. Withdrawal of the drill rods upon reaching the total depth requires completion of the borehole by grouting or other measures.

2.0 Equipment and Materials

- Drill rods and drive-weight assembly (hydraulic hammer or vibrator) for driving the drill rods and split-spoon sampler.

- Split-spoon sampler should conform to ASTM D 1586-Standard Method for Penetration Test and Split-Barrel Sampling of Soils, except: (1) split-spoon should be fitted with liners for collection of chemical characterization samples, and (2) allowable split-spoon diameters include nominal 1.5-inch inside diameter by nominal 2-inch outside diameter (Standard Penetration Test split-spoon), nominal 2-inch inside diameter by nominal

2.5-inch outside diameter (California Modified split-spoon), or nominal 2-1/2-inch inside diameter by nominal 3-inch outside diameter (Dames & Moore split-spoon). The split-spoon type and length of the split barrel portion of the sampler should be noted on the Boring and Well Construction Log (copy attached), as should the use of a sample catcher if employed.

- Liners should be 3- to 6-inch length, fitted with plastic end caps, brass or stainless steel, with a nominal diameter corresponding to that of the inside diameter of the split-spoon sampler. The Boring and Well Construction Log should note whether brass or stainless steel liners were used.
- Teflon® sheets, approximate 6-mil thickness, precut to a diameter or width of the liner diameter plus approximately 1 inch.
- Plastic end caps.
- Adhesiveless silicone tape.
- Disposable polyethylene bailer.
- Type I/Type II Portland cement.
- Groundwater sample containers (laboratory provided only).
- Kimwipes®, certified clean silica sand, or deionized water (for blank sample preparation).
- Sample labels, Boring and Well Construction Logs, chain-of-custody forms, drum labels, Drum Inventory Sheet (copy attached), and field notebook.
- Ziploc® plastic bags of size to accommodate a liner.
- Stainless steel spatula and knife.
- Cooler with ice or dry ice (do not use blue ice) and packing material.
- Field organic vapor monitor. The make, model, and calibration information for the field organic vapor monitor (including compound and concentration of calibration gas) should be noted in the field notebook.

- Pressure washer or steam cleaner.
- Large trough (such as a water tank for cattle), plastic-lined pit, or equivalent for decontamination of drill rod and end plug.
- Buckets and bristle brushes for decontamination of liners, split-spoon sampler, and other small gear.
- Low-residue, organic-free soap such as Liquinox® or Alconox®.
- Distilled water.
- Heavy plastic sheeting such as Visqueen.
- 55-gallon, open-top, DOT-approved, 17H drums
- 5-gallon open-top DOT-approved pails, if required.

As specified in the Site Safety Plan, additional safety and personnel decontamination equipment and materials may be needed.

3.0 Typical Procedures

The following typical procedures are intended to cover the majority of hydraulic drilling and sampling conditions. However, normal field practice requires re-evaluation of these procedures and implementation of alternate procedures upon encountering unusual or unexpected subsurface conditions. Deviations from the following typical procedures may be expected and should be noted on the Boring and Well Construction Log.

1. Investigate location of the proposed boreholes for buried utilities and obstructions. At least 48 hours before drilling, contact known or suspected utility services individually or through collective services such as "Underground Service Alert."

2. Decontaminate drill rods, split-spoon sampler, and other drilling equipment immediately prior to mobilization to the site.

3. Calibrate field organic vapor monitor equipment in accordance with the manufacturer's specifications. Note performance of the calibration in the geologist's field notebook.

4. Conduct "tail-gate" meeting and secure the work area in accordance with the Site Safety Plan.

5. Core concrete, if required.

6. Using hand-augering device, hand auger to a depth of 5 feet, if feasible, to clear underground utilities and structures not located by a utility service or on drawings. As appropriate, retain private buried utility location services or geophysical investigation services to search for buried utilities and obstructions. During initial advancement of each borehole, drill cautiously and have the driller pay particular attention to the "feel" of drilling conditions. The suspected presence of an obstruction, buried pipeline or cable, utility trench backfill, or similar may be cause for suspension of drilling, subject to further investigation.

7. Advance drill rods, or nested drill rods, to the desired sampling depth using hydraulic hammer or vibrator. Note depth interval, augering conditions, and driller's comments on Boring and Well Construction Log. Samples should be collected at intervals of 5 feet or less in homogeneous strata and at detectable changes of strata.

The sampling procedure varies depending on whether the drill rods are nesting-type. With nesting-type drill rods, the inner and outer drill rods are driven simultaneously. As they are driven, soil is forced into the lined inner drill rod. The outer drill rod is left in place and the inner drill rod is relined with sample sleeves and replaced for the next sampling segment. Where nesting-type drill rods are not used, a split-spoon sampler is used. The following sampling procedures cover sampling with a split-spoon sampler:

8. Remove drill rod and note presence of water mark on drill rod, if any. Also, monitor the top of hollow drill rods using field organic vapor monitor, as appropriate.

9. Decontaminate split-spoon sampler, liners, spatulas and knives, and other equipment that may directly contact the chemical characterization sample. Fit the split-spoon sampler with liners and attach to drill rod.

10. Lower split-spoon sampler until sampler is resting on soil. If more than 6 inches of slough exists inside the borehole, consider the conditions unsuitable and re-advance the drill rods and sampler to a new sampling depth.

11. Drive and recover split-spoon sampler. Record depth interval and sample recovery on Boring and Well Construction Log. Monitor the recovered split-spoon sampler with the field organic vapor monitor, as appropriate.

12. Remove either bottom-most or second-from-bottom liner (or both) from split-spoon sampler for purposes of chemical characterization and physical parameter testing. Observe soil at each end of liner(s) for purposes of completing sample description. Place Teflon® sheet at each end of liner, cover with plastic caps, and tape plastic caps with adhesiveless silicone tape (do not use electrical or duct tape) to further minimize potential loss of moisture or volatile compounds. Label liner(s) and place in Ziploc® bag on ice or dry ice inside cooler.

13. Extrude soil from remaining liner(s) and subsample representative 1-inch cube (approximate dimensions). Place subsample in Ziploc® bag and seal. Allow bag to equilibrate at ambient conditions for approximately 5 minutes and screen for organic vapors by inserting the probe of the field organic vapor monitor into the bag. Record depth interval, observed sample reading, and ambient (background) reading on the Boring and Well Construction Log. Discard bag and sample after use in the solid waste stockpile.

14. Classify soil sample in approximate accordance with ASTM D 2488-Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and in accordance with the Unified Soil Classification System (USCS). Description should include moisture content, color, textural information, group symbol, group name, and odor. Optional descriptions, especially if classification is performed with protective gloves, include particle angularity and shape, clast composition, plasticity, dilatancy, dry strength, toughness, and reaction with HCl. Add notes on geologic structure of sample, as appropriate. Record depth interval, field organic vapor monitor reading, USCS classification, and other notes on the Boring and Well Construction Log.

15. Repeat steps 7 through 14 until total depth of borehole is reached.

16. If a grab groundwater sample is to be collected, slowly lower bailer through the open borehole to minimize agitation and aeration of the sampled water. Transfer the grab groundwater sample into sample container(s). Label sample container(s), place packing materials around containers, and place on ice inside cooler.

17. After drill rods are removed, complete borehole according to the requirements specified elsewhere or by abandonment in accordance with section 8.0.

18. Decontaminate drill rods between boreholes and after finishing last borehole prior to drill rig leaving site.

19. Change decontamination solutions and clean decontamination trough, buckets, and brushes between boreholes.

20. Containerize decontamination liquids in 17H steel drums. Affix completed "Caution - Analysis Pending" labels to the drums.

21. Store any excess soil sample on and cover with heavy plastic sheeting. If required by local regulations or due to site constraints, store excess soil sample in 5-gallon pails. Affix completed "Caution - Analysis Pending" labels to drums.

22. Complete Drum Inventory Sheet.

23. Complete pertinent portion of the chain-of-custody form and enter descriptions of field work performed in the field notebook.

4.0 Quality Assurance and Quality Control (QA/QC)

Optional quality control sampling consists of sequential replicates, collected at an approximate frequency of one sequential replicate for every 10 collected soil samples. Sequential replicates are collected by packaging two adjacent liners of soil from a selected split-spoon drive. Each sample is labeled according to normal requirements. The replicate samples obtained in such a manner are suitable for assessing the reproducibility of both chemical and physical parameters. Interpretations of data reproducibility should recognize the potential for significant changes in soil type, even over 6-inch intervals. Accordingly, sequential replicates do not supply the same information as normally encountered in duplicate or split samples. Duplicate or split samples are better represented by the laboratory performing replicate analyses on adjacent subsamples of soil from the same liner.

Optional quality control samples may be collected to check for cross-contamination using field blanks. Field blanks may be prepared by (1) wipe sampling decontaminated liners and split-spoon with Kimwipes®, (2) pouring clean silica sand into a decontaminated split-spoon sampler that has been fitted with liners, or (3) pouring deionized water over the decontaminated liners and split-spoon sampler and collecting the water that contacts the sampling implements for aqueous analysis. Field blanks may be prepared at the discretion of the field staff given reasonable doubt regarding the efficacy of the decontamination procedures.

The comparability of the field soil classification may be checked by conducting laboratory classification tests. Requests for laboratory testing verification of the field classification should be left to the discretion of the field staff.

Field decisions that may also affect the quality of collected data include the frequency of sampling and the thoroughness of documentation. Subject to reasonable limitations of budget and schedule, the completeness, comparability, and representativeness of data obtained using this SOP will be enhanced by decreasing the sampling interval (including collecting continuous samples with depth) and increasing the level of detail for sample classification and description of drilling conditions. More frequent sampling and more detailed documentation may be appropriate in zones of chemical concentration or in areas of critical geology (for example, zones of changing strata or cross-correlation of confining strata).

As required, rinse or wipe samples may be collected from the sampling equipment before the initial sampling is conducted to establish a baseline level of contamination present on the sampling equipment. Rinse or wipe samples may also be collected at intervals of decontamination wash and rinse events or after the final decontamination wash and rinse event.

5.0 Documentation

Observations, measurements, and other documentation of the drilling and soil sampling effort should be recorded on the following:

- Sample label
- Boring and Well Construction Log
- Field notebook
- Chain-of-custody form
- Drum Inventory Sheet

Documentation should include any deviations from this SOP, notations of unusual or unexpected conditions, and documentation of the containerization and disposal of investigation-derived waste. Information to be documented on the sample label and Boring and Well Construction Log is listed below.

5.1 Sample Label

- Project name and project number
- Borehole number
- Sample depth interval (feet below ground surface), record the depth interval using notation similar to "19.2-19.7;" generally do not record just one depth "19.2" because of uncertainty regarding the location such depth corresponds to (midpoint, top, etc.)
- Sample date and sample time
- Name of on-site geologist
- Optional designation of orientation of sample within the subsurface, for example, an arrow with "up" or "top" designated

5.2 Boring Log

- Project name, project number, and name of on-site geologist
- Borehole number
- Description of borehole location, including taped or paced measurements to noticeable topographic features (a location sketch should be considered)
- Date and time drilling started and completed
- Name of drilling company and name of drilling supervisor, optional names and responsibilities of driller's helpers
- Name of manufacturer and model number of sampling rig
- Type and size of sampler, optional description of the size of drill rod
- USCS classification
- Sampling interval and total depth of borehole

- Depth at which groundwater was first encountered with the notation "initial" and any other noted changes in groundwater movement or stabilized water level
- Field organic vapor monitor readings
- Method of boring completion
- Other notations and recordings described previously in section 2.0, Equipment and Materials, and section 3.0, Typical Procedures

6.0 Decontamination

Prior to entering the site, the sampling rig and appurtenant items (drill rods, split-spoon sampler, shovels, troughs and buckets, driller's stand, etc.) should be decontaminated by steam cleaning or pressure washing. Between each borehole, appurtenant items that contacted downhole soil (essentially all appurtenant items including drill rod, split-spoon sampler, shovels, troughs, and buckets, etc.) should be decontaminated by steam cleaning or pressure washing. The sampling rig should be steam cleaned or pressured washed as a final decontamination event. On-site decontamination should be conducted within the confines of a trough or lined pit to temporarily contain the wastewater. Between each borehole and prior to demobilization, the trough or lined pit should be decontaminated by steam cleaning or pressure washing. If a rack or other support is used to suspend appurtenant items over the trough or lined pit during decontamination, only the rack or other support needs to be decontaminated between boreholes.

Prior to collection of each sample, the split-spoon sampler, liners, sample catcher, spatulas and knives, and other equipment or materials that may directly contact the sample should be decontaminated. Decontamination for these items should consist of a soap wash (Alconox®, Liquinox®, or other organic-free, low-residue soap), followed by a clean water rinse. If testing for metals, a final rinse of deionized water should be conducted. Wastewater should be temporarily contained.

Between each borehole, buckets and brushes should be decontaminated by steam cleaning or pressure washing. Before installation of each borehole is begun, fresh decontamination solutions should be prepared. Decontaminated equipment should be kept off of the ground surface. Cleaned equipment should be placed on top of plastic sheeting, which is replaced after completion of each borehole, or on storage racks.

More rigorous decontamination procedures may be employed if necessary to meet sampling or QA/QC requirements.

7.0 Investigation-Derived Waste

Wastes resulting from the activities of this SOP may include excess soil samples, decontamination liquids, and miscellaneous waste (paper, plastic, gloves, bags, etc.).

Solid waste from each borehole should be placed on and covered with heavy plastic sheeting or containerized in DOT-approved 5-gallon pails. Solids from multiple boreholes may be combined within a single stockpile if field observations (presence or absence of chemical staining and field organic vapor monitoring) indicate the solids are similarly uncontaminated or similarly contaminated. Given sufficient space and reasonable doubt, separate stockpiles should be used for solid waste from each borehole.

Decontamination liquids for each borehole should be placed in individual 17H steel drums with completed "Caution - Analysis Pending" labels affixed. Liquids from multiple boreholes may be combined, subject to the same limitations as solids.

8.0 Borehole Abandonment

Each borehole should be completely filled with neat cement (5.5 gallons of water in proportion to one 94-pound bag of Type I/Type II Portland cement, ASTM C-150) from the bottom of the bore to grade surface. Water used to hydrate cement should be free of contaminants and organic material. Bentonite may be added to reduce shrinkage and improve fluidity. Add 3 to 5 pounds of bentonite with 6.5 gallons of water and one 94-pound bag of Type I/Type II Portland cement. The water and bentonite should be mixed first before adding the cement. The borehole should be filled from the bottom first to grade surface. A tremie pipe should be used in small diameter boreholes or in formations prone to bridging or collapse. The tremie pipe should be lifted as the cement grout is poured, but should never be lifted above the surface of the neat cement. In boreholes deeper than 50 feet, the neat cement may need to be applied with pressure.

9.0 References

Aller, L., Bennett T.W., Hackett G., Petty R.J., Lehr J.H., Sedoris H., and Nielson D.M., 1989. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. National Water Well Association, Dublin, OH, 1989.

American Society for Testing and Materials, 1992. ASTM Standards On Ground Water and Vadose Zone Investigations. ASTM, Philadelphia, PA, 1992.

Driscoll, F.G., 1986. Groundwater and Wells. Johnson Filtration Systems Inc., St. Paul, MN, 1986.

Neilson, D.M., 1991. Practical Handbook of Ground-Water Monitoring. Lewis Publishers, Chelsea, MI, 1991.

United States Environmental Protection Agency, 1992. RCRA Ground-Water Monitoring: Draft Guidance Document. U.S. EPA, 1992.

BLYMYER ENGINEERS, INC.

SOIL BORE/WELL CONSTRUCTION LOG

SOIL BORE/WELL NO.:

Location:

Client:

Project Site Address:

Drilling Company:

BEI Job No:

Driller:

Logged By:

License No.:

Sampling Method:

Drilling Method:

Started Time:

Date:

Completed Time:

Date:

Scale:

Elevation (msl):

Total Bore Depth/Diameter:

Total Well Depth/Diameter:

Surface Seal Type/Completion:

Annular Seal Type/Interval:

Seal Type/Interval:

Sand Type/Interval:

Blank Casing Type/Diameter/Interval:

Screened Casing Type/Diameter/Interval:

Water Depth:	Initial: (SZ):		Stabilized: (SZ):
Time:			
Date:			

LITHOLOGIC DESCRIPTION	U.S. Classification/ Contact Type	Depth (ft)	Sample Intervals (symbols)	Sample Number	Blows/6 in	Inches Driven	Inches Recovered	PID Readings (ppm)	Screened/Blank Casing Intervals
		1							
		2							
		3							
		4							
		5							
		6							
		7							
		8							
		9							
		10							
		11							
		12							
		13							
		14							
		15							

n:\public\system\wellsite\firstlog.cdr

BLYMYER ENGINEERS INC.

SOIL BORE/WELL CONSTRUCTION LOG (continued)

SOIL BORE/WELL NO.:

Notes:

LITHOLOGIC DESCRIPTION	U S C / Contact Type	Depth (ft.)	Sample Interval	Sample Number	Blows/6 in.	Inches Driven	Inches Recovered	PID Readings (ppm)	Casing Intervals	Sand/Seal

BLYMYER ENGINEERS DRUM INVENTORY FORM

Number of Drums	Date Generated	Person on-site when generated	Soil or Groundwater	Contents (Cuttings, Purge Water, Development Water, Decon Water, PPE)	% Full	Bore or Monitoring Well ID	Do Lab Results Exist for Contents?

Date Client informed? _____ All drums labeled? _____

Appendix F:
Results of Geophysical Survey by JR Associates

J R ASSOCIATES

Engineering Geophysics
1886 Emory Street
San Jose, CA 95126
(408) 293-7390

Transmittal Memo

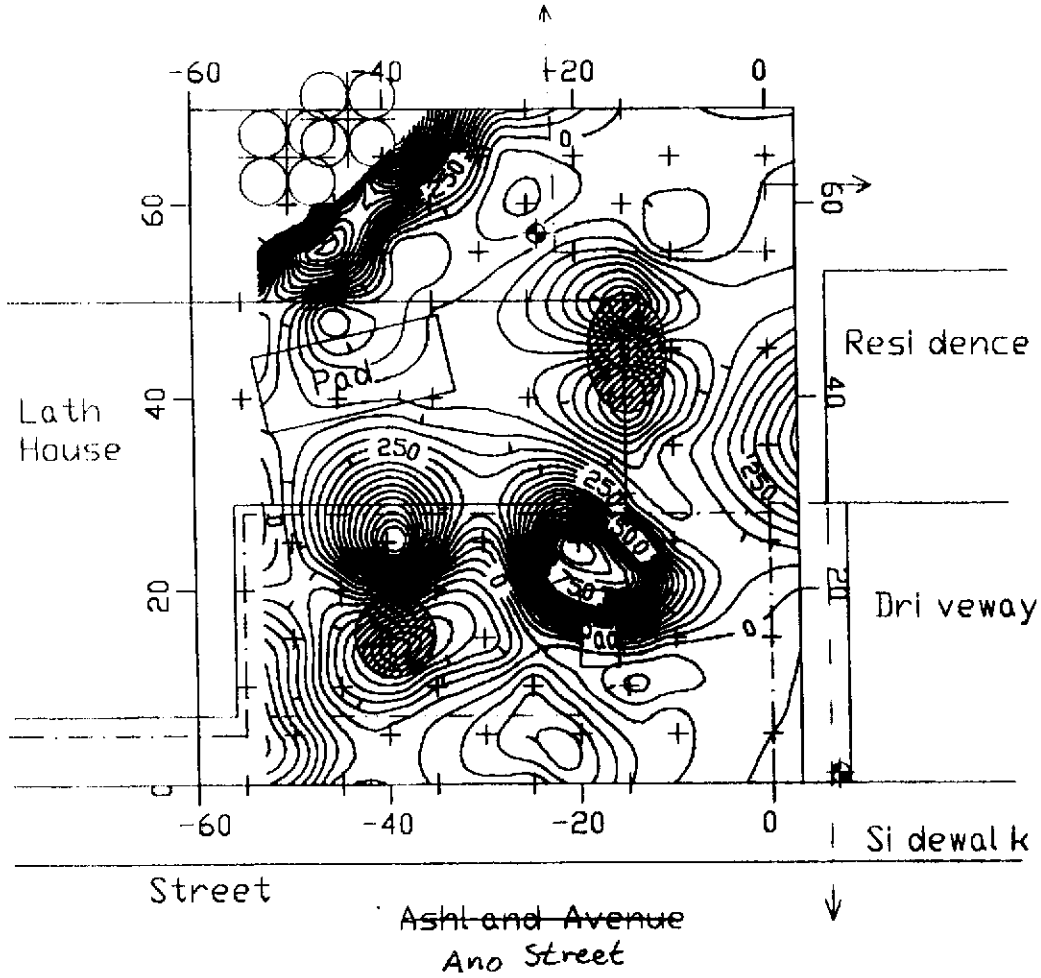
To: Jeanna Hudson
Blymyer Engineers
1829 Clement Avenue
Alameda, CA 94501-1395

Date: March 3, 1999

From: Jim Rezowalli

Regarding: Kawahara Nursery

Enclosed is a contour map of the magnetic data collected at the Kawahara nursery. We found two magnetic anomalies indicative of buried metal. These are shown in red on the contour map and were marked in the field with paint. The radar scans collected in the area did not reveal what the sources of the anomalies were. We can not tell from the radar or magnetic data whether the buried metal are tanks or debris. The anomalies will need to be excavated to determine if they are from buried tanks. Please call if you have any questions.



EXPLANATION

- SURFACE METAL
- WELL
- BURIED PIPE
- FENCE
- MAGNETIC ANOMALIES

Magnetic Map
Kawahara Nursery
San Lorenzo, California

SCALE 1" = 20'			DRAWN BY: J.J.R.
DATE 3-2-1999	JOB NUMBER	107-161-99	REVISED

J R ASSOCIATES Civil and Environmental Geophysics
1886 Emory Street, San Jose, CA (408) 293-7390

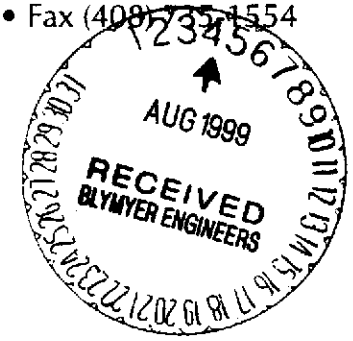
DRAWING NUMBER 1

Appendix G:
Laboratory Reports from Entech Analytical Labs, Inc.

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554



July 16, 1999

Jenna Hudson
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501

Subject:	3 Water Samples
Lab #'s:	15027-001 – 15027-002
Project Name:	
Project Number:	94015
P.O. Number:	
Method(s):	EPA 8015M
Subcontract Lab(s):	Kiff Analytical (CAELAP #2236)

Dear Jenna Hudson,

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

Entech Analytical Labs, Inc. is certified by the State of California (#I-2346). If you have any questions regarding procedures or results, please call me at 408-735-1550.

Sincerely,

Michelle L. Anderson
Lab Director

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501
Attn: Jenna Hudson

Date: 7/8/99
Date Received: 6/29/99
Project: 94015
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	MW-3			MW-4			MW-5				
Sample Date	6/29/99			6/29/99			6/29/99				
Sample Time	9:55			10:15			10:35				
Lab #	15027-001			15027-002			15027-003				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Analysis Date	6/29-7/7/99			6/29-7/7/99			6/29-7/7/99				
Results in mg/Liter:											
Alkalinity	**500**	1.0	2.0	**360**	1.0	2.0	**360**	1.0	2.0	2.0	310.1
Carbon Dioxide	**3.5**	1.0	1.0	**21**	1.0	1.0	**7.0**	1.0	1.0	1.0	SM 4500
Dissolved Ferrous Iron	**ND**	1.0	0.10	**ND**	1.0	0.10	**ND**	1.0	0.10	0.10	SM 3500
Nitrate-Nitrogen	**10**	25	2.5	**12**	25	2.5	**14**	25	2.5	0.10	353.3
Nitrite-Nitrogen	**0.38**	1.0	0.10	**ND**	1.0	0.10	**ND**	1.0	0.10	0.10	353.3
Sulfate	**73**	10	1.0	**46**	10	1.0	**46**	10	1.0	0.10	375.4

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Lab Director

DF=Dilution Factor
PQL= Practical Quantitation Limit

ND=None Detected above DLR
DLR=Detection Reporting Limit

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501
Attn: Jenna Hudson

Date: 7/8/99
Date Received: 6/29/99
Project: 94015
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	MW-3			MW-4			MW-5				
Sample Date	6/29/99			6/29/99			6/29/99				
Sample Time	9:55			10:15			10:35				
Lab #	15027-001			15027-002			15027-003				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	7/1/99			7/7/99			7/1/99				
TPH-Gas	**8,000**	5.0	250	**130** [x]	1.0	50	**160** [x]	1.0	50	50	8015M
MTBE	**37**	5.0	25	**ND**	1.0	5.0	**ND**	1.0	5.0	5.0	8020
Benzene	**98**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020
Toluene	**34**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020
Ethyl Benzene	**3.7**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020
Xylenes (total)	**1,200**	5.0	2.5	**ND**	1.0	0.50	**ND**	1.0	0.50	0.50	8020

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Lab Director

Environmental Analysis Since 1983

KIFF ANALYTICAL LLC

Report Number : 14482
Date : 07/16/99

Michelle Anderson
Entech Analytical Labs
525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

Subject : 3 Water Samples
Project Name : Blymer Eng
Project Number :

Dear Ms. Anderson,

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

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

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 14482
Date : 07/16/99

Subject : 3 Water Samples
Project Name : Blymer Eng
Project Number :

Case Narrative

The Method Reporting Limit for TPH as Diesel is increased due to interference from gasoline-range hydrocarbons for the following sample(s):

15027-001 (MW3)

Approved By: Joel Kiff

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

KIFF ANALYTICAL LLC

Report Number : 14482
Date : 07/16/99

Project Name : **Blymer Eng**
Project Number :

Sample : **15027-001 (MW3)** Matrix : Water
Sample Date :06/29/99

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	**< 1000**	1000	ug/L	M EPA 8015	07/07/99

Sample : **15027-002 (MW4)** Matrix : Water
Sample Date :06/29/99

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	**< 50**	50	ug/L	M EPA 8015	07/07/99

Sample : **15027-003 (MW5)** Matrix : Water
Sample Date :06/29/99

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	**< 50**	50	ug/L	M EPA 8015	07/07/99

Approved By: Joel Kiff

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

Entech Analytical Labs, Inc.

14482

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Subcontract Chain of Custody

Subcontract Lab:		Date Sent:	Project Name:		Due Date:	
Kiff		6/30/99	Blymyer Eng		7/7/99	
Sample ID and Source	**Matrix**	**Required Analysis**	**Date Taken**	**Time Taken**	**Containers**	**Pres?**
15027-001 (MW3)	W	TPH-Diesel	6/29/99	9:55	1x/LA/6	—
15027-002 (MW4)	↓	↓	↓	10:15	↓	—
15027-003 (MW5)	↓	↓	↓	10:35	↓	—

6/30/99

Relinquished By:	Received By:	Date:	Time:
Jennifer Dunkin via CA Overnight		6/30/99	18:00
Relinquished By:	Received By:	Date:	Time:
	Margaret Edwards/Kiff Analytical	7/1/99	0715
Relinquished By:	Received By:	Date:	Time:

Notes: received via Ca overnight @ 5°C mk 7/1

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG2990707
Matrix: Water
Units: µg/L

Date Analyzed: 07/07/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	SP % R	SPD µg/L	SPD %R	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	5.0	ND	4.3	**86**	4.0	79	7.9	25	68-118
Toluene	8020	<0.50	25.0	ND	27	**107**	27	**108**	1.4	25	79-122
Ethyl Benzene	8020	<0.50	5.0	ND	5.4	**108**	5.4	**108**	0.7	25	81-121
Xylenes	8020	<0.50	25.0	ND	29	**115**	29	**115**	0.0	25	79-120
Gasoline	8015	<50.0	500	ND	465	**93**	484	**97**	3.9	25	75-125
aaa-TFT(S.S.)-PID	8020			104%	100%		104%				65-135
aaa-TFT(S.S.)-FID	8015			102%	101%		101%				65-135

Note: LCS and LCSD results reported for the following Parameters:
All

Definition of Terms:

na: Not Analyzed in QC batch
MB: Method Blank
SA: Spike Added
SR: Sample Result
RPD(%): Duplicate Analysis - Relative Percent Difference
SP: Spike Result
SP (%R): Spike % Recovery
SPD: Spike Duplicate Result
SPD (%R): Spike % Recovery
NC: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Sample

QC Batch #: GBG2990701
Matrix: Water
Units: µg/Liter

Date Analyzed: 07/01/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/Liter	SA µg/Liter	SR µg/Liter	SP µg/Liter	SP % R	SPD µg/Liter	SPD %R	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	5.0	ND	3.8	**76**	3.9	**79**	3.9	25	69-118
Toluene	8020	<0.50	25.0	ND	25	**98**	27	**107**	8.4	25	82-122
Ethyl Benzene	8020	<0.50	5.0	ND	5.0	**100**	5.5	**109**	9.2	25	77-114
Xylenes	8020	<0.50	25.0	ND	27	**106**	29	**116**	8.9	25	85-125
Gasoline	8015	<50.0	500	ND	434	**87**	511	102	16.4	25	75-125
aaa-TFT(S.S.)-PID	8020			102%	96%		101%				65-135
aaa-TFT(S.S.)-FID	8015			105%	97%		102%				65-135

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R): Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R): Spike % Recovery
- nc: Not Calculated

BLAINE TECH SERVICES INC.

1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112-1105
FAX (408) 573-7771
PHONE (408) 573-0555

CHAIN OF CUSTODY BTJ # 990629 Y2

CLIENT Blymyer Engr. Inc

SITE Kawahara Nursery
16550 Ashland Ave
San Lorenzo, CA

LAB ENTECH DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

☐ EPA ☐ RWQCB REGION
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS
Invoice & Report to
Blymyer Engr.
Attn: Joanna Hudson
BEI: Project N. 94015
* Short Hold Times

SAMPLE I.D.			MATRIX S = SOIL W = H2O	CONTAINERS TOTAL	C = COMPOSITE ALL CONTAINERS	CONDUCT ANALYSIS TO DETECT: (8015) (8020) TPH-G / BTEX / MTBE	TPH-D (8015)m	ALKALINITY (310.1)	* NITRATE/NITRITE (353.3)	SULFATE (375.4)	CARBON DIOXIDE (SM 4500)	DISS. FERROUS IRON (*	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
MW3	6/29	955	W	9		X	X	X	X	X	X	X				5027-001
MW4	↓	1015	↓	↓		↓	↓	↓	↓	↓	↓	↓				5027-002
MW5	↓	1035	↓	↓		↓	↓	↓	↓	↓	↓	↓				5027-003

SAMPLING COMPLETED	DATE	TIME	SAMPLING PERFORMED BY	RESULTS NEEDED NO LATER THAN
	6/29	1100	B. TAYLOR	Per Client

RELEASED BY		DATE	TIME	RECEIVED BY	DATE / TIME
RELEASED BY		DATE	TIME	RECEIVED BY Mara Gonzales	DATE 6/29/99 TIME 15:30
RELEASED BY		DATE	TIME	RECEIVED BY	DATE / TIME

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #

Appendix H:
Laboratory Reports from McCampbell Analytical, Inc.

McCAMPBELL ANALYTICAL INC.

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

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery 16550 Ashland Ave. San Lorenzo, CA	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09/99
	Client P.O:	Date Analyzed: 08/09/99

08/16/99

Dear Jeanna:

Enclosed are:

1). the results of 9 samples from your **#94015; Kawahara Nursery 16550 Ashland Ave. San Lorenzo, CA** project,

2). a QC report for the above samples

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

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.

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

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery 16550 Ashland Ave. San Lorenzo, CA	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09-08/11/99
	Client P.O:	Date Analyzed: 08/09-08/11/99

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	MTBE	Benzene	Toluene	Ethylben -zene	Xylenes	% Recovery Surrogate
16914	SB-2	W	ND	ND	ND	ND	ND	1.6	104
16915	SB-3	W	ND,i	ND	ND	ND	ND	1.7	106
16916	SB-4	W	140,000,a,h,i	ND<200	2300	8700	5300	32,000	104
16917	SB-5	W	730,000,b,j,h,i	ND<800	460	4600	12,000	76,000	109
16918	SB-6	W	ND	ND	ND	ND	ND	ND	105
16919	SB-7	W	220,b,j,i	ND	ND	0.69	1.4	5.7	106
16920	SB-8	W	ND,i	ND	ND	ND	ND	2.1	105
16921	SB-9	W	58,b	ND	ND	0.60	1.2	7.4	101
16922	SB-10	W	810,b,j,i	ND	ND	6.1	18	120	98
16923	TRIP BLANK	W	ND	ND	ND	ND	ND	ND	107
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

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

" cluttered chromatogram; sample peak coelutes with surrogate peak

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery 16550 Ashland Ave. San Lorenzo, CA	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09-08/16/99
	Client P.O:	Date Analyzed: 08/10-08/16/99

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d)[^]	% Recovery Surrogate
16914	SB-2	W	160,g	119
16915	SB-3	W	ND,i	96
16916	SB-4	W	990,000,d,b,h,i	96
16917	SB-5	W	610,000,d,b,h,i	100
16918	SB-6	W	ND	98
16919	SB-7	W	73,b,i	100
16920	SB-8	W	ND,i	105
16921	SB-9	W	ND	85
16922	SB-10	W	500,d,i	93
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	
		S	1.0 mg/kg	

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

[a] cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

[^]The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant: no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR HYDROCARBON ANALYSES

Date: 08/08/99-08/09/99 Matrix: WATER

Analyte	Concentration (ug/L) Sample (#16610)	MS	MSD	Amount Spiked	% Recovery MS	MSD	RPD
TPH (gas)	0.0	105.1	96.6	100.0	105.1	96.6	8.4
Benzene	0.0	9.7	8.7	10.0	97.0	87.0	10.9
Toluene	0.0	9.9	9.0	10.0	99.0	90.0	9.5
Ethyl Benzene	0.0	10.2	9.2	10.0	102.0	92.0	10.3
Xylenes	0.0	30.5	27.7	30.0	101.7	92.3	9.6
TPH(diesel)	0.0	8765	8116	7500	117	108	7.7
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR HYDROCARBON ANALYSES

Date: 08/10/99 Matrix: WATER

Analyte	Concentration (ug/L) Sample (#16610)	MS	MSD	Amount Spiked	% Recovery MS	MSD	RPD
TPH (gas)	0.0	103.8	102.1	100.0	103.8	102.1	1.7
Benzene	0.0	9.7	9.9	10.0	97.0	99.0	2.0
Toluene	0.0	9.9	10.2	10.0	99.0	102.0	3.0
Ethyl Benzene	0.0	10.2	10.4	10.0	102.0	104.0	1.9
Xylenes	0.0	30.8	31.6	30.0	102.7	105.3	2.6
TPH(diesel)	0.0	8023	8167	7500	107	109	1.8
TRPH (oil & grease)	0	19600	19600	23700	83	83	0.0

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

BLYMYER ENGINEERS, INC.

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

CHAIN OF CUSTODY RECORD 16252ZBE1 9.doc

PAGE 1 OF 1

JOB # 94013

PROJECT NAME/LOCATION KAWAHARA NURSERY
16550 ASHLAND AVE
SAN LORENZO, CA

SAMPLERS (SIGNATURE) JEANNA HUDSON Jeanna Hudson

TURNAROUND TIME: Normal DAY(S)

REMARKS:
FAX results to:
JEANNA HUDSON
510-865-2594

	DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION WATER	# OF CONTAINERS	TPH AS GASOLINE + BTXE + MTBE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	HOLD	
+2	8/9/99			✓	SB-2	3 VOAs	X	X						16914
+5	8/9/99			✓	SB-3	1 amber								16915
+10				✓	SB-4									16916
+10				✓	SB-5									16917
+2				✓	SB-6									
+10				✓	SB-7*									*2 ambers for SB-7
+5				✓	SB-8									16918
+2				✓	SB-9									16919
+5				✓	SB-10									16920
					TRIP BLANK		X							16921
														16922
														16923

phone 510-521-3773

REQUESTED BY: JEANNA HUDSON, BLYMYER ENGINEERS
1829 Clement Avenue
Alameda CA 94501

RESULTS AND INVOICE TO: BLYMYER ENGINEERS
1829 Clement Avenue
Alameda CA 94501
Attn: Jeanna Hudson

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Jeanna Hudson	8/9/99 6:55 pm	M.A.I 8/9/99 6:55 pm
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)
		Maria R. Venegas

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
	8/9/99 6:55 pm	

REMARKS: ICE/T ✓ GOOD CONDITION ✓ HEAD SPACE ABSENT ✓

PRESERVATION APPROPRIATE CONTAINERS ✓

VOAs	O&G	METALS	OTHER

TB. MV

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

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

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09/99
	Client P.O:	Date Analyzed: 08/09/99

08/16/99

Dear Jeanna

Enclosed are:

1). the results of **23**amples from your **#94015; Kawahara Nursery** project,

2). a QC report for the above samples

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

4). a bill for analytical services.

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

Yours truly,

Edward Hamilton, Lab Director

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

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09-08/10/99
	Client P.O:	Date Analyzed: 08/09-08/10/99

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)[+]	MTBE	Benzene	Toluene	Ethylben-zene	Xylenes	% Recovery Surrogate
16891	SB-2 5'	S	ND	ND	ND	ND	ND	ND	103
16892	SB-2 10'	S	ND	ND	ND	ND	ND	ND	92
16893	SB-2 12.5'	S	ND	ND	ND	ND	ND	ND	100
16894	SB-3 10'	S	ND	ND	ND	ND	ND	ND	103
16895	SB-3 15'	S	ND	ND	ND	ND	ND	ND	97
16896	SB-4 5'	S	ND	ND	ND	ND	ND	0.009	100
16897	SB-4 10'	S	1.4,j	ND	ND	0.033	ND	ND	100
16898	SB-4 15'	S	910,b	ND<2	0.87	10	14	92	103
16899	SB-5 10'	S	1.2,j	ND	ND	0.026	ND	ND	100
16900	SB-5 12'	S	250,b	ND<0.20	ND<0.01	1.3	1.4	13	98
16901	SB-6 5'	S	ND	ND	ND	ND	ND	0.098	101
16902	SB-6 10'	S	ND	ND	ND	ND	ND	ND	103
16903	SB-6 16'	S	ND	ND	ND	ND	ND	ND	97
16904	SB-7 5'	S	ND	ND	ND	ND	ND	0.036	103
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

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

[#] cluttered chromatogram; sample peak coelutes with surrogate peak

[+]The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09-08/10/99
	Client P.O:	Date Analyzed: 08/09-08/10/99

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	MTBE	Benzene	Toluene	Ethylben-zene	Xylenes	% Recovery Surrogate
16905	SB-7 10'	S	ND	ND	ND	ND	ND	ND	102
16906	SB-8 5'	S	ND	ND	ND	ND	ND	ND	93
16907	SB-8 10'	S	ND	ND	ND	ND	ND	ND	95
16908	SB-8 15'	S	ND	ND	ND	ND	ND	ND	96
16909	SB-9 5'	S	ND	ND	ND	ND	ND	ND	95
16910	SB-9 10'	S	ND	ND	ND	ND	ND	ND	93
16911	SB-9 16'	S	ND	ND	ND	ND	ND	ND	94
16912	SB-10 5'	S	ND	ND	ND	ND	ND	ND	95
16913	SB-10 10'	S	ND	ND	ND	ND	ND	ND	93
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

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

cluttered chromatogram; sample peak coelutes with surrogate peak

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09/99
	Client P.O:	Date Analyzed: 08/09-08/15/99

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d)+	% Recovery Surrogate
16891	SB-2 5'	S	ND	107
16892	SB-2 10'	S	ND	108
16893	SB-2 12.5'	S	ND	106
16894	SB-3 10'	S	ND	104
16895	SB-3 15'	S	ND	108
16896	SB-4 5'	S	ND	104
16897	SB-4 10'	S	1.6,d	100
16898	SB-4 15'	S	360,d,b	103
16899	SB-5 10'	S	ND	107
16900	SB-5 12'	S	100,d,b	98
16901	SB-6 5'	S	5.7,g	112
16902	SB-6 10'	S	ND	98
16903	SB-6 16'	S	ND	109
16904	SB-7 5'	S	7.4,g	99
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	
		S	1.0 mg/kg	

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

[a] cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

for Edward Hamilton, Lab Director

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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09/99
	Client P.O:	Date Analyzed: 08/09-08/15/99

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d)+	% Recovery Surrogate
16905	SB-7 10'	S	ND	108
16906	SB-8 5'	S	3.8,g	99
16907	SB-8 10'	S	ND	98
16908	SB-8 15'	S	ND	108
16909	SB-9 5'	S	1.8,g	114
16910	SB-9 10'	S	ND	107
16911	SB-9 16'	S	ND	106
16912	SB-10 5'	S	ND	107
16913	SB-10 10'	S	ND	101
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	
		S	1.0 mg/kg	

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

* cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/09/99
	Client P.O:	Date Analyzed: 08/10-08/12/99

Analytical methods			**Moisture**	**Bulk Density**	**Porosity**	**Fractional Organic Content**
			ASTM E3173	#	&	ASTM 2974c
Lab ID	Client ID	Matrix	Weight %	Grams / cc	Vol % Porosity	Wet Weight %
16893	SB-2 12.5'	S	21	2.0	40	2.8
16900	SB-5 12'	S	20	1.9	41	3.8
Reporting Limit or Method Accuracy unless otherwise stated; ND means not detected above the reporting limit		S	± 2%	± 0.1g/cc	± 2%	± 0.3%

calculated

& calculated volume percentage assuming that the specific gravity of soil is 2.65 grams/cc.

DHS Certification No. 1644

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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #94015; Kawahara Nursery	Date Sampled: 08/09/99
		Date Received: 08/09/99
	Client Contact: Jeanna Hudson	Date Extracted: 08/16-08/18/99
	Client P.O:	Date Analyzed: 08/16-08/18/99

Analytical methods			pH	Total Solids	Total Suspended Solids	Total Dissolved Solids	Specific Conductance
			EPA 150.1, 9040, 9045	EPA 160.3, SM2540B	EPA 160.2, SM2540D	EPA160.1, SM2540C	EPA 120.1, 9050 SM2510
Lab ID	Client ID	Matrix	pH @ _°C	TS	TSS	TDS	Conductivity
16891	SB-2 5'	S	7.73 @ 25.4 °C	---	---	---	---
16898	SB-4 15'	S	8.04 @ 26.0 °C	---	---	---	---
Reporting Limit or Method Accuracy unless otherwise stated; ND means not detected above the reporting limit; N/A means not applicable		W	± 0.05	10 mg/L	4 mg/L	10 mg/L	10 µmhos/cm
		S	± 0.1	N/A	N/A	N/A	N/A
Reporting Units		---	- log(a_H^+) @ _°C	mg/L	mg/L	mg/L	µmhos/cm @ _ °C

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.

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QC REPORT FOR HYDROCARBON ANALYSES

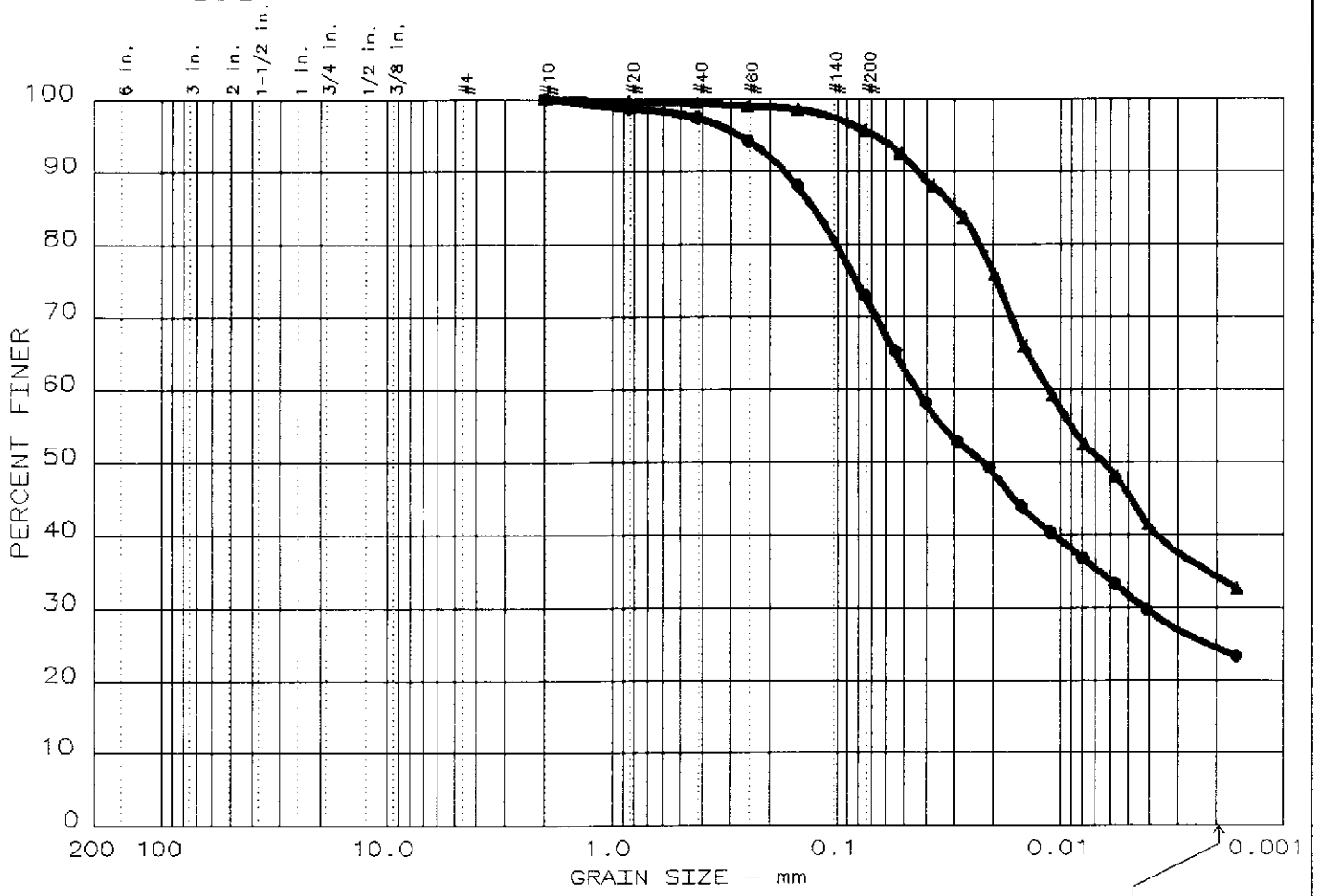
Date: 08/08/99-08/09/99 Matrix: SOIL

Analyte	Concentration (mg/kg) Sample (#09948)	MS	MSD	Amount Spiked	% Recovery MS	MSD	RPD
TPH (gas)	0.000	2.115	2.292	2.03	104	113	8.0
Benzene	0.000	0.198	0.194	0.2	99	97	2.0
Toluene	0.000	0.208	0.202	0.2	104	101	2.9
Ethylbenzene	0.000	0.210	0.220	0.2	105	110	4.7
Xylenes	0.000	0.610	0.614	0.6	102	102	0.7
TPH(diesel)	0	345	347	300	115	116	0.7
TRPH (oil and grease)	0.0	21.0	21.2	20.8	101	102	0.9

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

GRAIN SIZE DISTRIBUTION CURVE



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.0	27.2	48.3	24.5
▲	0.0	0.0	4.5	61.3	34.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.13	0.04	0.02	0.004				
▲				0.01	0.01					

MATERIAL DESCRIPTION	USCS	AASHTO
● Daek grey silty CLAY.	CL	
▲ Daek grey silty CLAY w/caliche inclusions.	CL	

Project No.: 16251
Project: BEI
● Location: SB-5 12.5'(16893)
▲ Location: SB-2 12'(16900)

Date: 8-24-99

GRAIN SIZE DISTRIBUTION CURVE

Soil Mechanics Lab

Remarks:

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 4

Date: 8-24-99
Project No.: 16251
Project: BEI

Sample Data

Location of Sample: SB-2 12'(16900)
Sample Description: Daek grey silty CLAY w/caliche inclusions.
USCS Class: CL Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks:

Fig. No.:

Mechanical Analysis Data

Initial

Dry sample and tare= 44.60
Tare = 0.00
Dry sample weight = 44.60
Tare for cumulative weight retained= 0

Sieve	Cumul. Wt. retained	Percent finer
# 10	0.00	100.0
# 20	0.20	99.6
# 40	0.30	99.3
# 60	0.50	98.9
# 100	0.70	98.4
# 200	2.00	95.5

Hydrometer Analysis Data

Separation sieve is number 10
Percent -# 10 based on complete sample= 100.0
Weight of hydrometer sample: 44.6
Calculated biased weight= 44.60
Automatic temperature correction
Composite correction at 20 deg C =-9

Meniscus correction only= 0
Specific gravity of solids= 2.7
Specific gravity correction factor= 0.989
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.5	23.0	50.0	41.7	0.0130	50.0	8.1	0.0521	92.4
1.0	23.0	48.0	39.7	0.0130	48.0	8.4	0.0376	87.9
2.0	23.0	46.0	37.7	0.0130	46.0	8.8	0.0271	83.5
4.0	23.0	42.5	34.2	0.0130	42.5	9.3	0.0198	75.8
8.0	23.0	38.0	29.7	0.0130	38.0	10.1	0.0145	65.8
15.0	23.0	35.0	26.7	0.0130	35.0	10.6	0.0109	59.1
30.0	23.0	32.0	23.7	0.0130	32.0	11.0	0.0079	52.5
60.0	23.0	30.0	21.7	0.0130	30.0	11.4	0.0056	48.0
120.0	23.0	27.0	18.7	0.0130	27.0	11.9	0.0041	41.4
840.0	21.0	23.5	14.7	0.0133	23.5	12.4	0.0016	32.5

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 4.5
% SILT = 61.3 % CLAY = 34.2

D85= 0.03 D60= 0.011 D50= 0.006

GRAIN SIZE DISTRIBUTION TEST DATA — Test No.: 3

Date: 8-24-99
Project No.: 16251
Project: BEI

Sample Data

Location of Sample: SB-5 12.5'(16893)
Sample Description: Daek grey silty CLAY.
USCS Class: CL — Liquid limit:
AASHTO Class: — Plasticity index:

Notes

Remarks:

Fig. No.:

Mechanical Analysis Data

	Initial
Dry sample and tare=	55.60
Tare =	0.00
Dry sample weight =	55.60

Tare for cumulative weight retained= 0

Sieve	Cumul. Wt. retained	Percent finer
# 10	0.00	100.0
# 20	0.80	98.6
# 40	1.50	97.3
# 60	3.30	94.1
# 100	6.70	87.9
# 200	15.10	72.8

Hydrometer Analysis Data

Separation sieve is number 10
Percent -# 10 based on complete sample= 100.0
Weight of hydrometer sample: 55.6
Calculated biased weight= 55.60
Automatic temperature correction
Composite correction at 20 deg C =-9

Meniscus correction only= 0
Specific gravity of solids= 2.7
Specific gravity correction factor= 0.989
Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.5	23.0	45.0	36.7	0.0130	45.0	8.9	0.0547	65.2
1.0	23.0	41.0	32.7	0.0130	41.0	9.6	0.0401	58.1
2.0	23.0	38.0	29.7	0.0130	38.0	10.1	0.0291	52.8
4.0	23.0	36.0	27.7	0.0130	36.0	10.4	0.0209	49.2
8.0	23.0	33.0	24.7	0.0130	33.0	10.9	0.0151	43.9
15.0	23.0	31.0	22.7	0.0130	31.0	11.2	0.0112	40.3
30.0	23.0	29.0	20.7	0.0130	29.0	11.5	0.0080	36.8
60.0	23.0	27.0	18.7	0.0130	27.0	11.9	0.0058	33.2
120.0	23.0	25.0	16.7	0.0130	25.0	12.2	0.0041	29.6
840.0	21.0	22.0	13.2	0.0133	22.0	12.7	0.0016	23.4

Fractional Components

Gravel/Sand based on #4 sieve
Sand/Fines based on #200 sieve
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 27.2
% SILT = 48.3 % CLAY = 24.5

D85= 0.13 D60= 0.044 D50= 0.022
D30= 0.0043

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

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

Date Printed
08/23/99

Project Name: B.E.I. 16251

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via	Project No.
A99081906	08/19/99 10:10AM	MCCLAB		MAIL	

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL

Order A99081906 consisted of 1 Samples and 1 Tests.

Sample 1 SB-2 5'
Sample Type: Soil Sampled By: Sampled: 08/09/99

Total Organic Carbon	9060	08/20/99	6910	mg/kg	1

PQL = Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Date Printed: 08/23/99

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

Order Number: A99081906
August 23, 1999

Sample Notes:

Bruce L. Gove
Laboratory Director

Date Printed: 08/23/99

McCAMPBELL ANALYTICAL INC.

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

CHAIN OF CUSTODY RECORD

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

Report To: Ed Hamilton Bill To: MAI

Project #: 1625 Project Name: B.E.I

Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	EPA 601/8010	EPA 602/8020	EPA 608/808	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM - 17 Metals	EPA - Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	ANALYSIS REQUEST / OTHER	COMMENTS
SB2 5'		8/9		1	JAR	X	X				X															X	TPC	16891

A99-0819-06

Relinquished By: [signature] Date: 8/18 Time: Received By: CAL OVERNIGHT

Relinquished By: Date: 8/19/99 Time: 1010 Received By: Sandi Simmons

Relinquished By: Date: Time: Received By:

Remarks: SPOKE with ED & Heidi they said the sample should be marked Soil Not water 8-19-99 11:15 SS

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e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

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

Date Printed
08/23/99

Project Name: BEI

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via	Project No.
A99081706	08/17/99 10:30AM	MCCLAB	16251	MAIL	16251

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
Order A99081706 consisted of 1 Samples and 1 Tests.						
Sample 1 SB-4 14.5-15'						
Sample Type: Soil	Sampled By:		Sampled: 08/09/99			
Total Organic Carbon	9060		08/20/99	849	mg/kg	1

PQL = Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Date Printed: 08/23/99

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

Order Number: A99081706
August 23, 1999

Sample Notes:

Bruce L. Gove
Laboratory Director

Date Printed: 08/23/99

AA

8/23

McCAMPBELL ANALYTICAL INC.

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

CHAIN OF CUSTODY RECORD

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

Report To: Ed Hamilton Bill To: MAI

Project #: 1625 Project Name: B.L.I

Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other
SD-4	14.5-15'	8/9		1	JAR		X				X			

ANALYSIS REQUEST												OTHER							COMMENTS
EPA 601/8010	EPA 602/8020	EPA 608/808	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM – 17 Metals	EPA – Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	TPHG							
												X							
A99-0817-D6							1												14.5-15'

Relinquished By:	Date:	Time:	Received By:
Lisa YUNATS	8/16		CAL OVERNIGHT
Relinquished By:	Date:	Time:	Received By:
	8/17/99	1030	Sandi Simmons
Relinquished By:	Date:	Time:	Received By:

Remarks:

CW

320

K23T-02

McCAMPBELL ANALYTICAL INC.

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

CHAIN OF CUSTODY RECORD

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

Report To: Vd Hamilton Bill To: MAI

Project #: 1625.1 Project Name: B.E.I

Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	Soil	Air	Sludge	Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	EPA 601/8010	EPA 602/8020	EPA 608/808	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM – 17 Metals	EPA – Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	ANALYSIS REQUEST						OTHER						COMMENTS
																											TKN												
SB-2 5'	8/9			1	JAR		X				X																X						K22637						16891

Relinquished By:	Date:	Time:	Received By:
Vd Hamilton	8/18		CAL OVERNIGHT
California Overnight	9/14	9:30am	Michelle Hoffman
Relinquished By:	Date:	Time:	Received By:

Remarks:

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # K231-02 **Date:** 8/25/99

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Project: 16251 B.E.I.

PO#

Date Rec'd: 8/19/99
Date Started: 8/23/99
Date Completed: 8/24/99

Date Sampled:
Time:
Sampler:

Sample ID: SB-2 5'
Lab ID: K22637

Method	MDL	Analyte	Results	Units
351.3	5.0	Total Kjeldahl Nitrogen	258	mg/Kg

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

QC REPORT

Report# K231-02

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Dates Analyzed 8/24/99

Analyte	Batch #	Method	MS % Recovery	MSD % Recovery	RPD	Blank
Total Kjeldahl Nitrogen	I03086	351.3	91.5	92.0	0.5	ND

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # K229-01 **Date:** 8/18/99

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Project: 16251 B.E.I.

PO#

Date Rec'd: 8/17/99
Date Started: 8/17/99
Date Completed: 8/17/99

Date Sampled: 8/09/99
Time:
Sampler:

Sample ID: SB-4 14.5-15'
Lab ID: K22633

Method	MDL	Analyte	Results	Units
351.3	5.0	Total Kjeldahl Nitrogen	190	mg/Kg

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

Report# K229-01

QC REPORT

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Dates Analyzed 8/17/99

Analyte	Batch #	Method	MS % Recovery	MSD % Recovery	RPD	Blank
Total Kjeldahl Nitrogen	I02981	351.3	84.1	87.4	3.8	ND

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

Soil MP

McCAMPBELL ANALYTICAL INC.

1310 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

Report To: Edward Hamilton Bill To: MAI

Project #: 16251 Project Name: BEI

Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	ANALYSIS REQUEST EPA 601/8010	EPA 602/8020	EPA 608/8081	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM – 17 Metals	EPA – Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	OTHER Oil & Grease S.72	COMMENTS
SB-2 12.5'		8/9					X																			X	16893
SB-5 12'		8/9					X																			X	16900

Relinquished By:	Date:	Time:	Received By:
Vina Yumul	8/10		AE-720
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks:

McCAMPBELL ANALYTICAL INC.

1900 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

Report To: Ed Hamilton Bill To: MAT

Project #: 16251 Project Name: B.E.I

Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	ANALYSIS REQUEST EPA 601/8010	EPA 602/8020	EPA 608/808	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM - 17 Metals	EPA - Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	OTHER TKN	COMMENTS
SB-4 14.5-15'		8/9		1	JAR		X				X															X	16898

Relinquished By: Linda Yuratt	Date: 8/10	Time:	Received By: CAL OVERNIGHT
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks:

G26

McCAMPBELL ANALYTICAL INC.

1110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

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

Report To: Ed Hamilton Bill To: MAI

Project #: 16251 Project Name: B.E.I

Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	ANALYSIS REQUEST EPA 601/8010	EPA 602/8020	EPA 608/808	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM – 17 Metals	EPA – Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	OTHER TTLC	COMMENTS
SB-2 5'	8/9			1	JAR		X				X															X	16891

Relinquished By: Mindy Wai	Date: 8/18	Time:	Received By: CAL OVERNIGHT
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks:

16891 16896
16892 16897
16893
16894
16895

BLYMYER ENGINEERS, INC.

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

16251 2bei

CHAIN OF CUSTODY RECORD

PAGE 1 OF 2

JOB #	PROJECT NAME/LOCATION
94015	KAWAHARA NURSERY 16550 Ashland Ave San Lorenzo CA

SAMPLERS (SIGNATURE): JEANNA HUDSON Jeanna Hudson

Normal DAY(S)

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE + MTBE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	TKN (EPA 350.3)	pH (EPA 9040/150.1)	Total Org Carb (EPA 415.1)	SEE FOOTNOTE (A)	HOLD
8/9/99			✓	SB-2 5′	plastic sleeve	X	X					X	X	X		
8/9/99			✓	SB-2 10′												
8/9/99			✓	SB-2 12.5′											X	
8/9/99			✓	SB-3 10′												
8/9/99			✓	SB-3 15′												
8/9/99			✓	SB-4 5′												
8/9/99			✓	SB-4 10′												
8/9/99			✓	SB-4 15′								X	X	X		
8/9/99			✓	SB-5 10′												
8/9/99			✓	SB-5 12′											X	
8/9/99			✓	SB-6 5′												
8/9/99			✓	SB-6 10′												
8/9/99			✓	SB-6 16′												

ICE/T ✓ PRESERVATION ✓
GOOD CONDITION ✓ APPROPRIATE
HEAD SPACE ABSENT ✓ CONTAINERS ✓

VOAS | O&G | METALS | OTHER

REMARKS:
FAX results to JEANNA HUDSON 510-865-2594

Review TPHg results from all soil samples (SB-2 thru SB-10). For the soil sample w/ highest TPHg, run:
① TKN (EPA 350.3)
② pH (EPA 9040/150.1)
[ONE SAMPLE ONLY]

FOOTNOTE (A): grain size, bulk density, moisture content, soil porosity, fraction org. carbon (foc)

phone 510-521-3773

REQUESTED BY: JEANNA HUDSON, BLYMYER ENGINEERS
1829 Clement Avenue
Alameda CA 94501

RESULTS AND INVOICE TO: BLYMYER ENGINEERS
1829 Clement Ave
Alameda CA 94501
Attn: Jeanna Hudson

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Jeanna Hudson	8/9/99 6:15pm	VCAL
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)

RECEIVED BY: (SIGNATURE)

16898 16902
16899 16903
16900
16901

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

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

16251 ZBE110

CHAIN OF CUSTODY RECORD

JOB # 94015

PROJECT NAME/LOCATION: KAWAHARA NURSERY, 16550 Ashland Ave, San Lorenzo CA

SAMPLERS (SIGNATURE): JEANNA HUDSON Jeanna Hudson

TURNAROUND TIME: Normal DAY(S)

REMARKS: Fax results to JEANNA HUDSON 510-865-2594

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE + MTBE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)						HOLD	
8/9/99			✓	SB-7 5'	plastic sleeve	X	X											16904
			✓	SB-7 10'														16905
			✓	SB-8 5'														16906
			✓	SB-8 10'														16907
			✓	SB-8 15'														16908
			✓	SB-9 5'														16909
			✓	SB-9 10'														16910
			✓	SB-9 16'														16911
			✓	SB-10 5'														16912
			✓	SB-10 10'														16913

phone 510-521-5773
Attn: Jeanna Hudson

REQUESTED BY: JEANNA HUDSON, BLYMYER ENGINEERS, 1829 Clement Ave, Alameda CA 94501

RESULTS AND INVOICE TO: BLYMYER ENGINEERS, 1829 Clement Ave, Alameda CA 94501

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Jeanna S Hudson	8/9/99 1:55 PM	[illegible]
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
		VOAS | O&G | METALS | OTHER
DATE / TIME	ICE/T ✓ GOOD CONDITION HEAD SPACE ABSENT	PRESERVATION APPROPRIATE CONTAINERS

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