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

STID 4403

LETTER OF TRANSMITTAL

DATE July 5, 2002	BEI Job No. 94015
ATTENTION: John Kawahara	
SUBJECT: Kawahara Nursery	
16550 Ashland Avenue	
San Lorenzo, California	
Site # 4403	

Kawahara Nursery
698 Burnett Avenue
Morgan Hill, CA 95037

JUL 10 2002

R0291

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COPY TO: File
Mr. Amir Gholami, Alameda County Health Care Services Agency

SIGNED: Mark Detterman

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Semiannual Groundwater Monitoring Report
Spring 2002

Kawahara Nursery
16550 Ashland Avenue
San Lorenzo, California
Site # 4403

June 24, 2002 BEI Job No. 94015

Prepared by:

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

Client:

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

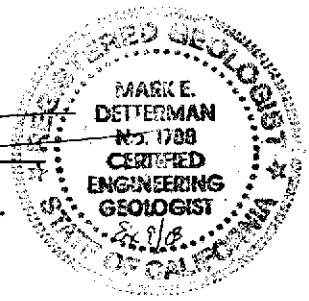
Limitations

Services performed by Blymyer Engineers, Inc. have been provided in accordance with generally accepted professional practices for the nature and conditions of similar work completed in the same or similar localities, at the time the work was performed. The scope of work for the project was conducted within the limitations prescribed by the client. This report is not meant to represent a legal opinion. No other warranty, expressed or implied, is made. This report was prepared for the sole use of Kawahara Nursery, Inc.

Blymyer Engineers, Inc.

By: _____

Mark E. Detterman C.E.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 a 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 Kawahara Nursery, 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 additional ACHCSA requirements.

The Revised Workplan included the following tasks:

- Resume quarterly groundwater monitoring and sampling of MW-3, MW-4, and MW-5
- Generate 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
- Perform 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

On March 4, 1999, Blymyer Engineers resumed quarterly groundwater monitoring and sampling of MW-3, MW-4, and MW-5, and submitted the *Quarterly Groundwater Monitoring Report, First Quarter 1999 (January through March)*, dated April 13, 1999.

In June 1999, prior to implementation of the Revised Workplan, Mr. Amir Gholami of the ACHCSA requested (June 2, 1999) the addition of the following tasks to the above scope of work (see Blymyer Engineers' *Proposed Soil Bore Locations*, dated June 21, 1999):

- 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 5-foot intervals and collect one grab groundwater sample from each soil bore

1.1.4 Additional Subsurface Investigation

On September 2, 1999, Blymyer Engineers submitted the *Results of Additional Subsurface Investigation and Quarterly Groundwater Monitoring, Second Quarter 1999*. This report presented the results the geophysical survey, additional soil bore sampling, well decommissioning, and groundwater monitoring for the second quarter, 1999. In addition to decommissioning monitoring wells MW-1 and MW-2, as approved by the ACHCSA, the following conclusions were made:

- 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 in the soil samples

- Groundwater samples from MW-3, located between the barn and the northernmost 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

On the basis of the 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 could not, 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, closure of this site could not be recommended on the basis of a low risk to human health.

Blymyer Engineers recommended that a Tier 2 RBCA evaluation be generated to evaluate site-specific target levels (SSTLs) for both soil and groundwater. When the SSTLs are generated, it was recommended that the remaining petroleum hydrocarbon sources be removed from the site, using the SSTLs as cleanup goals. Blymyer Engineers has been retained to conduct a Tier 2 RBCA evaluation of the site and submitted the *Health Risk Assessment Workplan*, dated January 20, 2000, to the ACHCSA. The workplan was approved by the ACHCSA in a December 14, 2000 letter.

Due to the relative stability of the groundwater analytical data over an extended period of time, Blymyer Engineers recommended, and the ACHCSA approved, that the site move to semi-annual groundwater monitoring. This is the third semi-annual sampling event at the site.

A *Remedial Action Plan*, dated September 10, 2001, was forwarded to the ACHCSA. In a letter dated September 18, 2001, the ACHCSA accepted the proposed remedial actions.

2.0 Data

On May 28, 2002, Blaine Tech Services, Inc. (Blaine) conducted groundwater gauging and sampling at the Kawahara Nursery under contract to Blymyer Engineers. The Blaine *Standard Operating Procedures* for groundwater gauging and sampling are included in Appendix A.

2.1 Groundwater Gauging

Blaine personnel measured the depth to groundwater in wells MW-3, MW-4, and MW-5 (Figure 3). The groundwater was gauged with an accuracy of 0.01 feet from the top of casing using an oil-water interface probe. Groundwater measurements are presented in Table I and Figure 3, and are included on the Well Gauging and Well Monitoring Data Sheets presented in Appendix B.

2.2 Groundwater Sampling and Analysis

Blaine collected groundwater samples from wells MW-3, MW-4, and MW-5. 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 Curtis & Tompkins, Ltd., of Berkeley, 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 analyzed for the following compounds:

- TPH as gasoline (EPA Method 8015M)
- TPH as diesel (EPA Method 8015M)
- BTEX (EPA Method 8021B)
- Methyl *tert*-butyl ether (MTBE; EPA Method 8021B)
- Carbon dioxide (EPA Method 310.1)
- Dissolved ferrous iron (SM 3500)
- Nitrate-Nitrogen (EPA Method 300 or AM20GAX)
- Alkalinity (EPA Method 310.1)
- Sulfate (EPA Method 300.0)

Methane was not analyzed during the current groundwater monitoring event. Curtis & Tompkins elected to subcontract carbon dioxide analysis to a new subcontract laboratory, Microseeps, Inc, of Pittsburgh, PA, due to better reproducibility and quality control issues. Due to this change, additional analytes were included in the analytical suite. The analysis for carbon dioxide utilizes a new sample container and analytical method, both developed by Microseeps. Curtis & Tompkins has anticipated that the reported concentration of carbon dioxide would change and could change significantly. The sample container is designed to reduce changes in water chemistry between the field and the laboratory.

3.0 Results

3.1 Groundwater Elevations and Gradient

Table I and Figure 3 present groundwater gauging data collected on May 28, 2002. The depth to groundwater ranged from 8.05 feet below the top of casing (BTOC) in monitoring well MW-5 to 9.68 feet BTOC in MW-4. The depth to groundwater has decreased an average of 1.87 feet since the previous monitoring event. The average groundwater gradient was 0.004 feet/foot. The direction of groundwater flow could not be conclusively determined based on the linear configuration of the wells. However, the gradient is likely to be directed toward the northwest based on the consistent historic flow direction documented at the site.

3.2 Groundwater Sample Analytical Results

The results of groundwater analyses are found in Appendix C, and are summarized in Table II, Table III, and Table IV.

During the August 2000 monitoring event MTBE and all other fuel oxygenates (*tert*-Butyl Alcohol [TBE], Isopropyl Ether [DIPE], Ethyl *tert*-Butyl Ether [ETBE], and Methyl *tert*-Amyl Ether [TAME]) were not detected in well MW-3 at the site using EPA Method 8260 (run on a one-time basis). EPA Methods 8020 or 8021B can give false MTBE positives as MTBE will coelute with 3-methyl-pentane, another gasoline compound. EPA Method 8260 is a GC/MS method and is capable of distinguishing between 3-methyl-pentane and MTBE. As a consequence of the results of the analytical testing with EPA Method 8260, all previous, and current, detections of MTBE at the site are considered to be 3-methyl-pentane and not MTBE. During the current sampling event, MTBE was detected in well MW-3 at a concentration of 2.3 μg/L.

For the fifth consecutive monitoring event downgradient monitoring well MW-5 and upgradient well MW-4 contained no detectable concentrations of the petroleum hydrocarbon analytes (excluding the sporadic trace detections of MTBE / 3-methyl-pentane in wells MW-4 and MW-5 in several events).

Groundwater from MW-3 contained 870 μg/L TPH as gasoline, 570 μg/L TPH as diesel, 6.3 μg/L benzene, 2.2 μg/L toluene, 12 μg/L ethylbenzene, and 70 μg/L total xylenes. Except for TPH as diesel these concentrations represent decreases over the previous sampling event, and extend the generally decreasing trend to 18 months (since the November 2000 sampling event).

The laboratory again included copies of the diesel and gasoline chromatograms for the TPH analysis for well MW-3. Notes contained in the report indicate that the chromatogram for TPH as diesel did not match the standard for diesel (included in the report) and that a lighter hydrocarbon contributed to the quantitation. No notes were included with the analysis for TPH as gasoline, documenting the laboratory opinion that the detected compound was composed predominantly of gasoline.

Previously, the laboratory has noted that the chromatographic pattern for TPH as diesel was not typical for diesel fuel in well MW-3. At that time, Blymyer Engineers requested the laboratory to review the TPH as diesel chromatogram. The laboratory verbally confirmed that the TPH as diesel detected was overlap from the TPH as gasoline chromatogram, that the chromatogram suggested that a single hydrocarbon pattern was present, and that the set of data likely indicated aged gasoline was present, and that a second source of diesel was not present. Because TPH as diesel is not present as a separate release in the northern portion of the site, Blymyer Engineers has previously recommended, and continues to recommend, that TPH as diesel be dropped from the analytical suite for future monitoring events. However, the ACHCSA has requested continued analysis for TPH as diesel.

Table III presents the analytical results of the remediation by natural attenuation (RNA) indicator parameters. Microbial use of petroleum hydrocarbons as a food source is affected by the concentration of a number of chemical compounds dissolved in groundwater at a site. RNA monitoring parameters were established by research conducted by the Air Force Center for Environmental Excellence. The research results were used to develop a technical protocol for documenting RNA in groundwater at petroleum hydrocarbon release sites (Wiedemeier, Patrick Haas, 1995, *Technical Protocol for Implementing the Intrinsic Remediation with Long Term*

Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater, Volumes I and II, U.S. Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas). The protocol focuses on documenting both aerobic and anaerobic degradation processes whereby indigenous subsurface bacteria use various dissolved electron acceptors to degrade dissolved petroleum hydrocarbons.

In the order of preference, the following electron acceptors and metabolic by-products are used and generated, respectively, by the subsurface microbes to degrade petroleum hydrocarbons: oxygen to carbon dioxide, nitrate to nitrogen and carbon dioxide, manganese (Mn^{4+} to Mn^{2+}), ferric iron (Fe^{3+}) to ferrous iron (Fe^{2+}), sulfate to hydrogen sulfide, and carbon dioxide to methane. With the exception of oxygen, use of all other electron acceptor pathways indicate anaerobic degradation. Investigation of each of these electron acceptor pathways, with the exception of the manganese and carbon dioxide to methane pathways, was conducted at the site as part of the evaluation of RNA chemical parameters.

Microbial use of petroleum hydrocarbons as a food source is principally affected by the concentration of dissolved oxygen (DO) in the groundwater present at a site; it is the preferable electron acceptor for the biodegradation of hydrocarbons. DO was present in pre-purge groundwater in concentrations ranging from 0.7 milligrams per liter (mg/L) in monitoring well MW-3 to 0.8 mg/L in the groundwater sample from MW-4 and MW-5. Although this difference is probably not statistically significant this monitoring event, the current pattern of DO distribution at the site in general conforms to the pattern of DO distribution observed during most previous sampling events. In general, DO at the site has been highest upgradient of the presumed metallic objects, has decreased in the vicinity of well MW-3, and began to recover in well MW-5. There have, however, been variations documented at the site where DO concentrations in downgradient well MW-5 have not recovered as completely as observed during other events. This has suggested that natural attenuation can proceed under slightly anaerobic conditions during periods of the year with lower rainfall recharge. It should be noted that RNA appears to be degrading contaminant concentrations to below the appropriate laboratory reporting limits before the impacted groundwater reaches the position of well MW-5.

Should oxygen be in insufficient supply in groundwater, the next preferred electron acceptor is nitrate which creates a denitrifying condition. In denitrifying conditions, nitrate concentrations decrease in the contaminant plume over background nitrate concentrations. This trend has been observed at the site, and is again present during this sampling event. During previous monitoring events, nitrate concentrations have been observed to continue to decrease from background levels in downgradient well MW-5. This suggests seasonal expansion of the zone of depressed RNA parameters in the downgradient direction, but one which does not appear to be allowing contaminant concentrations to reach downgradient well MW-5.

Because nitrate has been utilized in well MW-3, as discussed above, ferrous iron concentrations have also been evaluated at the site. When previously present, detectable concentrations of ferrous iron are generally only in well MW-3, as would be anticipated. During the present monitoring event, ferrous iron was not detected at the site, likely indicating that microbes are not currently utilizing iron to degrade the lower contaminate concentrations present during this event.

Sulfate concentrations were also evaluated at the site as part of the evaluation of RNA chemical parameters. If utilized by the microbes, sulfate concentrations, like nitrate concentrations, decrease in the contaminant plume over background sulfate concentrations. This is the general trend seen at the site during the current monitoring event; however, as has been seen in previous monitoring events, sulfate concentrations remain depressed downgradient of well MW-3. This indicates that periodic marginally sulfate-reducing conditions are present at the site.

Higher concentrations of CO_2 relative to DO concentrations continue in general to indicate that microbial respiration is occurring as DO is being depleted at a site. During the present monitoring event, the concentration of CO_2 is highest relative to DO in well MW-3 as would be expected. This continues to suggest microbial activity in the vicinity of well MW-3 and decreased activity in groundwater obtained from well MW-5 due to the significantly lower hydrocarbon concentrations, thus allowing a recovery to near background CO_2 concentrations in the aquifer.

Trends over time, and between wells, for alkalinity (higher levels with aerobic biodegradation) indicate similar trends for alkalinity as for the other monitored parameters at the site, and consistency with historic data.

Carbon dioxide is also used as an electron acceptor for methane fermentation reactions. The presence of methane in groundwater can be attributed to fermentation of natural organic mater as well as petroleum hydrocarbons. Methane was not analyzed during the current monitoring event; however, during the previous monitoring event, a change in subcontracted analytical laboratories for a portion of the analytical suite resulted in the analysis of methane concentrations for the first time at the site. Methane was detected in each of the three monitored wells during the previous sampling event. An increase in methane in plume interior wells would be anticipated if the methane fermentation reaction is proceeding. A slight increase in the concentration of methane in well MW-3 from background concentrations was observed (2.9 μg/L from 2.0 μg/L, respectively).

RNA indicators will continue to be monitored to assess the average concentrations of the indicators.

4.0 Conclusions and Recommendations

The following conclusions can be made from the on-going groundwater monitoring events:

- Only the groundwater sample from well MW-3 contained detectable concentrations of petroleum hydrocarbons during the current sampling event.

- The analytical laboratory has continued to strongly indicate with the use of chromatograms that TPH as diesel is not present in any of the groundwater samples. This has not varied in six consecutive monitoring events. Blymyer continues to recommend elimination of the laboratory analysis for TPH as diesel at the site.

- During several previous monitoring events, upgradient monitoring well MW-4 has contained trace concentrations of petroleum hydrocarbons at the limit of reporting, suggestive of a possible upgradient source.

- During a previous monitoring event, a one-time analysis for fuel oxygenates by EPA Method 8260 found that there are no fuel oxygenates in the groundwater sample collected from well MW-3. Specifically, MTBE was not detected by this method. Thus, all reported concentrations of MTBE are considered to be 3-methyl-pentane.

- In general, decreasing contaminant concentrations have been present at this site since the November 2000 sampling event.

- The direction of groundwater flow is likely to the northwest based on previously generated data.

- An evaluation of RNA chemical parameters present at the site appears to indicate that the site is largely under aerobic conditions; however, anaerobic conditions are present in the core of

the contaminant plume, and are seasonally present over a larger area at the site. In general, aerobic conditions appear to be undergoing reestablishment prior to flow of the groundwater beneath the onsite residential dwelling.

- Aerobic or anaerobic degradation of the hydrocarbons appears to be occurring onsite upgradient of monitoring well MW-5 and the onsite residential dwelling.

- The *Health Risk Assessment Workplan* has been reviewed, modified, and approved. A Health Risk Assessment will be generated and forwarded under separate cover in order that remedial goals for soil and groundwater can be established and appropriate remedial actions can be taken, if required.

- As approved by the ACHCSA, the site will continue with semiannual (twice a year) monitoring and sampling. The next monitoring event is scheduled for November 2002.

- 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

Tables

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
	11/15/99		Destroyed	Destroyed
	5/22/00		Destroyed	Destroyed
	8/16/00		Destroyed	Destroyed
	11/16/00		Destroyed	Destroyed
	2/21/01		Destroyed	Destroyed
	5/31/01		Destroyed	Destroyed
	11/28/01		Destroyed	Destroyed
	5/28/02		Destroyed	Destroyed

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-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
	11/15/99		Destroyed	Destroyed
	5/22/00		Destroyed	Destroyed
	8/16/00		Destroyed	Destroyed
	11/16/00		Destroyed	Destroyed
	2/21/01		Destroyed	Destroyed
	5/31/01		Destroyed	Destroyed
	11/28/01		Destroyed	Destroyed
	5/28/02		Destroyed	Destroyed

Table 1, 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-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
	11/15/99		10.35	89.17
	5/22/00		7.65	91.87
	8/16/00		9.44	90.08
	11/16/00		9.86	89.66
	2/21/01		8.65	90.87
	5/31/01		9.56	89.96
	11/28/01		11.04	88.48
	5/28/02		9.17	90.35

Table I, Summary of Groundwater Elevation Measurements

BEI Job No. 94015, Kassfinger Nursery, Inc.

16550 Ashland Avenue, San Lorenzo, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
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
	11/15/99		11.00	89.46
	5/22/00		8.28	92.18
	8/16/00		10.04	90.42
	11/16/00		10.50	89.96
	2/21/01		9.42	91.04
	5/31/01		10.20	90.26
	11/28/01		11.67	88.79
	5/28/02		9.68	90.78

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	3/29/95	98.14	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
	11/15/99		9.18	88.96
	5/22/00		6.68	91.46
	8/16/00		8.27	89.87
	11/16/00		8.68	89.46
	2/21/01		7.51	90.63
	5/31/01		8.40	89.74
	11/28/01		9.79	88.35
	5/28/02		8.05	90.09

Notes: TOC = Top of casing

Elevations in feet above mean sea level

Table II, Summary of Groundwater Sample Hydrocarbon 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 or 8021B (μg/L)					EPA Method 8260 (μg/L)
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE	MTBE
MW-1	6/16/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/28/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	11/8/94	NS	NS	NS	NS	NS	NS	NS	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/4/99	NS	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS	NS	NS
	5/22/00	NS	NS	NS	NS	NS	NS	NS	NS
	8/16/00	NS	NS	NS	NS	NS	NS	NS	NS
	11/16/00	NS	NS	NS	NS	NS	NS	NS	NS
	2/21/01	NS	NS	NS	NS	NS	NS	NS	NS
	5/31/01	NS	NS	NS	NS	NS	NS	NS	NS
	11/28/01	NS	NS	NS	NS	NS	NS	NS	NS
	5/28/02	NS	NS	NS	NS	NS	NS	NS	NS

Table II, Summary of Groundwater Sample Hydrocarbon 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 or 8021B (μg/L)					EPA Method 8260 (μg/L)
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE	MTBE
MW-2	6/16/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/28/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	11/8/94	NS	NS	NS	NS	NS	NS	NS	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	5/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/4/99	NS	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS	NS	NS
	5/22/00	NS	NS	NS	NS	NS	NS	NS	NS
	8/16/00	NS	NS	NS	NS	NS	NS	NS	NS
	11/16/00	NS	NS	NS	NS	NS	NS	NS	NS
	2/21/01	NS	NS	NS	NS	NS	NS	NS	NS
	5/31/01	NS	NS	NS	NS	NS	NS	NS	NS
	11/28/01	NS	NS	NS	NS	NS	NS	NS	NS
	5/28/02	NS	NS	NS	NS	NS	NS	NS	NS

Table II, Summary of Groundwater Sample Hydrocarbon 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 or 8021B (µg/L)					EPA Method 8260 (µg/L)
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE	MTBE
MW-3	6/16/93	**120,000**	**170,000**	**4,600**	**8,400**	**2,100**	**27,000**	NS	NS
	3/28/94	**23,000**	**94,000**	**4,800**	**6,500**	**3,000**	**15,000**	NS	NS
	11/8/94	**35,000**	**27,000**	**3,600**	**4,100**	**2,700**	**18,000**	NS	NS
	3/29/95	**18,000**	<50*	**1,600**	**1,400**	**780**	**6,200**	NS	NS
	6/7/95	**20,000**	<50	**1,700**	**1,400**	**750**	**6,800**	NS	NS
	9/7/95	**17,000**	<50	**1,100**	**800**	**570**	**4,800**	NS	NS
	3/4/99	**1,300**	<50	**33**	<0.5	**1.2**	**17**	**5.3** [e]	NS
	6/29/99	**8,000**	<1,000	**98**	**34**	**3.7**	**1,200**	**37** [e]	NS
	11/15/99	**4,200**	**2,000** [a]	**63**	**25**	**65**	**590**	**33** [e]	NS
	5/22/00	**5,800**	**1,480**	**53**	**29**	**58**	**490**	**4.9** [e]	NS
	8/16/00	**2,400**	**530** [c,*]	**18**	**5.8** [b]	**18**	**182**	**12** [b,e]	**ND** [e]
	11/16/00	**9,000**	**3,700** [c]	**35**	**27**	**88**	**719**	**<10** [e]	NS
	2/21/01	**2,400**	**880** [c,*]	**28**	**12**	**46**	**276**	**<2.0**	NS
	5/31/01	**2,900**	**680** [c,*]	**5.3**	**33** [b]	**17**	**144**	**<2.0**	NS
	11/28/01	**1,700**	**430** [c,*]	**23**	**3.0**	**37**	**184**	**4.2** [e]	NS
	5/28/02	**870**	**570** [c,*]	**6.3**	**2.2**	**12**	**70**	**2.3** [e]	NS

Table II, Summary of Groundwater Sample Hydrocarbon 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 or 8021B (µg/L)					EPA Method 8260 (µg/L)
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE	MTBE
MW-4	6/16/93	NS	NS	NS	NS	NS	NS	NS	NS
	3/28/94	NS	NS	NS	NS	NS	NS	NS	NS
	11/8/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/29/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/4/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0 [e]	NS
	6/29/99	**130**	<50	<0.5	<0.5	<0.5	<0.5	<5.0 [e]	NS
	11/15/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0 [e]	NS
	5/22/00	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS
	8/16/00	<50	**56** [*,d]	<0.5	<0.5	<0.5	**0.51**	**2.3** [e]	NS
	11/16/00	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS
	2/21/01	<50	<50	<0.5	<0.5	<0.5	<0.5	**2.6** [e]	NS
	5/31/01	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS
	11/28/01	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS
	5/28/02	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS

Table II, Summary of Groundwater Sample Hydrocarbon 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 or 8021B (μg/L)					EPA Method 8260 (μg/L)
		TPH as Gasoline	TPH as Diesel	B	T	E	X	MTBE	MTBE
MW-5	6/16/93	NS	NS	NS	NS	NS	NS	NS	NS
	3/28/94	NS	NS	NS	NS	NS	NS	NS	NS
	11/8/94	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/29/95	<50	**64**	<0.5	<0.5	<0.5	<0.5	NS	NS
	6/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	9/7/95	<50	<50	<0.5	<0.5	<0.5	<0.5	NS	NS
	3/4/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0 [e]	NS
	6/29/99	**160**	<50	<0.5	<0.5	<0.5	<0.5	<5.0 [e]	NS
	11/15/99	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0 [e]	NS
	5/22/00	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS
	8/16/00	<50	<50	<0.5	<0.5	<0.5	<0.5	**3.5** [e]	NS
	11/16/00	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS
	2/21/01	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS
	5/31/01	<50	<50	<0.5	<0.5	<0.5	<0.5	**2.8** [e]	NS
	11/28/01	<50	<50	<0.5	<0.5	<0.5	<0.5	**4.2** [e]	NS
	5/28/02	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0 [e]	NS

Table II continued, Summary of Groundwater Sample Hydrocarbon Analytical Results

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
[a] = Laboratory note indicates the result is within the quantitation range, but that the chromatographic pattern is not typical of fuel
[b] = Laboratory note indicates that confirmation of the result differed by more than a factor of two
[c] = Laboratory note indicates lighter hydrocarbons contributed to the quantification
[d] = Laboratory note indicates the sample has an unknown single peak or peaks
[e] = Detection of MTBE by EPA Method 8021B is regarded as erroneous; likely chemical detected is 3-methyl-pentane. See text and Table IV.

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

Sample ID	Date	Field	EPA Method 310.1	EPA Method 353.3	Method AM20GAX	Standard Method 3500	EPA Method 310.1	EPA Method 375.4
		Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	Nitrate/ Nitrogen (mg/L)	Methane (μg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)	Sulfate (mg/L)
MW-1	3/4/99	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS	NS
	5/22/00	NS	NS	NS	NS	NS	NS	NS
	8/16/00	NS	NS	NS	NS	NS	NS	NS
	11/16/00	NS	NS	NS	NS	NS	NS	NS
	2/21/01	NS	NS	NS	NS	NS	NS	NS
	5/31/01	NS	NS	NS	NS	NS	NS	NS
	11/28/01	NS	NS	NS	NS	NS	NS	NS
	5/28/02	NS	NS	NS	NS	NS	NS	NS
MW-2	3/4/99	NS	NS	NS	NS	NS	NS	NS
	6/29/99	NS	NS	NS	NS	NS	NS	NS
	11/15/99	NS	NS	NS	NS	NS	NS	NS
	5/22/00	NS	NS	NS	NS	NS	NS	NS
	8/16/00	NS	NS	NS	NS	NS	NS	NS
	11/16/00	NS	NS	NS	NS	NS	NS	NS
	2/21/01	NS	NS	NS	NS	NS	NS	NS
	5/31/01	NS	NS	NS	NS	NS	NS	NS
	11/28/01	NS	NS	NS	NS	NS	NS	NS
	5/28/02	NS	NS	NS	NS	NS	NS	NS

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

Sample ID	Date	Field	EPA Method 310.1	EPA Method 353.3	Method AM20GAX	Standard Method 3500	EPA Method 310.1	EPA Method 375.4
		Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	Nitrate/ Nitrogen (mg/L)	Methane (μg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)	Sulfate (mg/L)
MW-3	3/4/99 3/8/99	1.2	4.4	26	NS	<0.01	520	1,000
	6/29/99	0.4	3.5	10	NS	<0.10	500	73
	11/15/99	0.5	48	5.7	NS	<0.01	530	110
	5/22/00	0.04	63.3	18	NS	<0.10	460	63
	8/16/00	1.0	59.8	13	NS	0.54	450	62
	11/16/00	1.2	63.5	8.9	NS	2.2	470	52
	2/21/01	1.2	63	12	NS	0.41	430	50
	5/31/01	1.8	50	14	NS	0.49	410	49
	11/28/01	0.8	47	7.7	2.9	0.54	450	43
	5/28/02	0.7	63	11	NS	<0.10	440	50
MW-4	3/4/99 3/8/99	2.1	2.3	13	NS	<0.01	320	390
	6/29/99	1.2	21	12	NS	<0.10	360	46
	11/15/99	1.4	22	8.9	NS	<0.01	370	140
	5/22/00	1.6	35.6	19	NS	<0.10	340	49
	8/16/00	2.9	42.2	14	NS	0.10	350	51
	11/16/00	3.7	34.4	12	NS	<0.10	390	53
	2/21/01	1.9	40	13	NS	0.16	310	55
	5/31/01	1.4	32	14	NS	<0.10	350	56
	11/28/01	4.2	36	13	2.0	<0.10	370	60
	5/28/02	0.8	34	12	NS	<0.10	380	70

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

Sample ID	Date	Field	EPA Method 310.1	EPA Method 353.3	Method AM20GAX	Standard Method 3500	EPA Method 310.1	EPA Method 375.4
		Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	Nitrate/ Nitrogen (mg/L)	Methane (μg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)	Sulfate (mg/L)
MW-5	3/4/99 3/8/99	1.8	2.1	140	NS	<0.01	370	500
	6/29/99	0.9	7.0	14	NS	<0.10	360	46
	11/15/99	0.9	6.0	11	NS	<0.01	370	150
	5/22/00	0.4	35.1*	11	NS	<0.10	360	50
	8/16/00	0.8	38.25*	12	NS	0.13	360	47
	11/16/00	2.4	34.3	12	NS	<0.10	380	48
	2/21/01	2.7	38	11	NS	0.23	350	49
	5/31/01	2.1	30	11	NS	<0.10	360	48
	11/28/01	3.5	32	12	2.0	<0.10	360	47
	5/28/02	0.8	30	12	NS	<0.10	370	47

Notes: NS = Not sampled
Field = Field instruments used for measurement of parameter
mg/L = Milligrams per liter
* = Average value

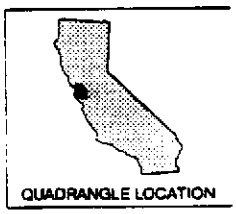
Table IV, Summary of Groundwater Sample Fuel Oxygenate Analytical Results
BEI Job No. 94015, Kawahara Nursery
16550 Ashland Avenue, San Lorenzo, California

Sample ID	Date	EPA Method 8260				
		TBE (μg/L)	MTBE (μg/L)	DIPE (μg/L)	ETBE (μg/L)	TAME (μg/L)
MW-3	8/16/00	<20	<0.50	<0.50	<0.50	<0.50

Notes: TBE = *tert*-Butyl Alcohol
MTBE = Methyl *tert*-butyl ether
DIPE = Isopropyl Ether
ETBE = Ethyl *tert*-Butyl Ether
TAME = Methyl *tert*-Amyl Ether
(μg/L) = Milligrams per liter

Figures

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



BLYMYER ENGINEERS, INC.

0 1000 2000

SCALE IN FEET

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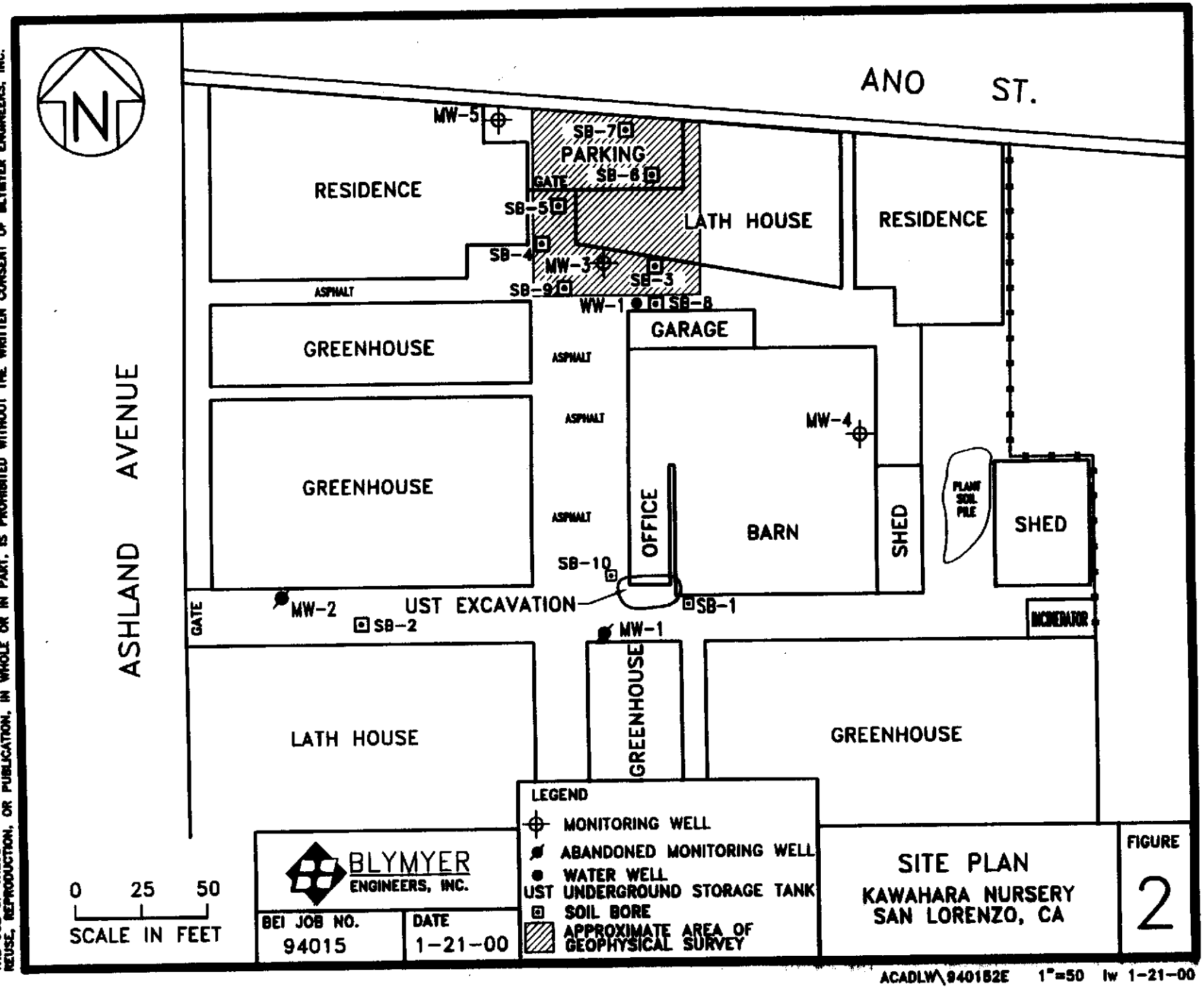
SITE LOCATION MAP

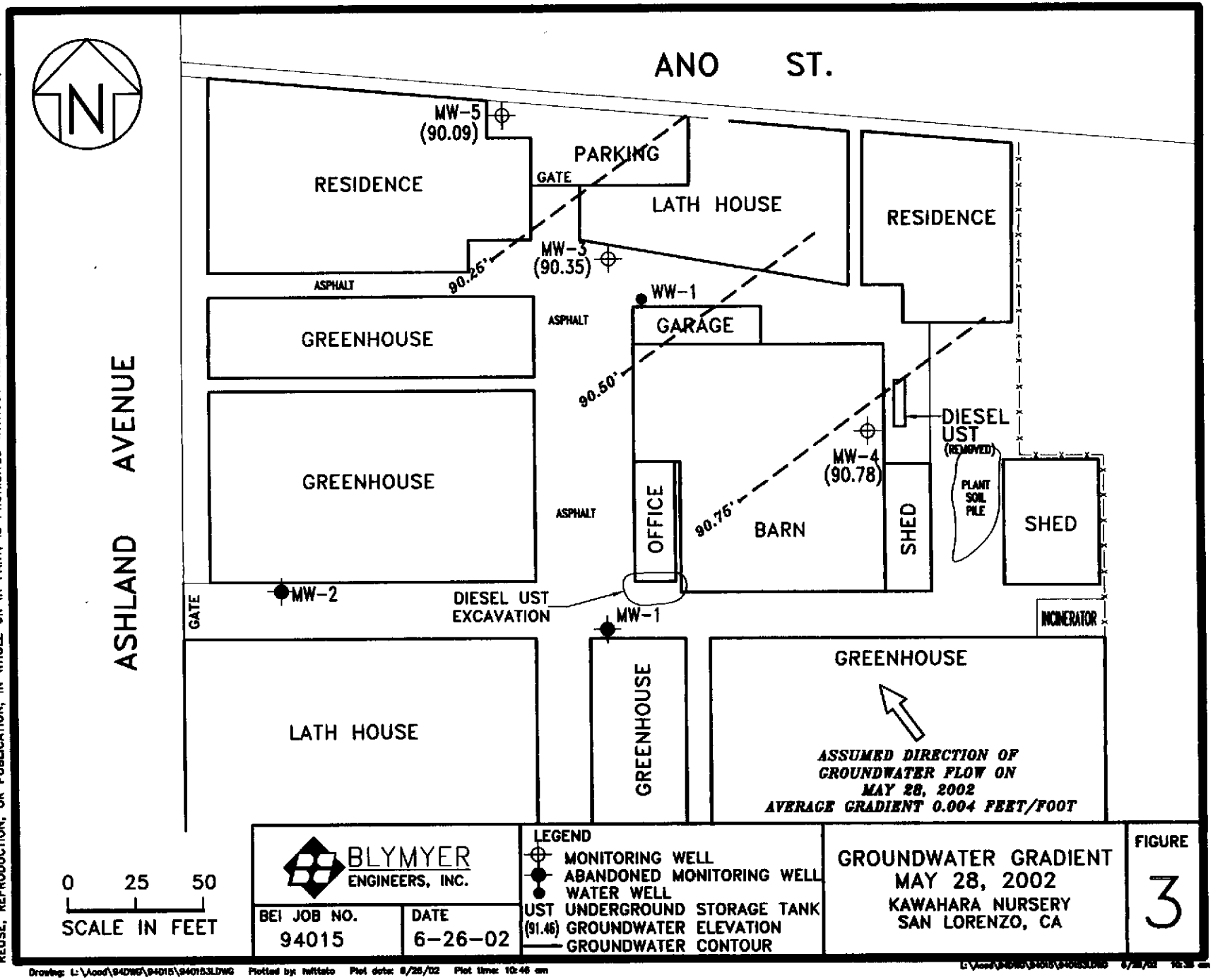
KAWAHARA NURSERY
16550 ASHLAND AVE.
SAN LORENZO, CA

FIGURE 1

BB JOB NO. 94015

DATE 4-9-99





Drawing: L:\Acad\94DWG\94015\94015GL.DWG Plotted by: tuttolo Plot date: 6/25/02 Plot time: 10:46 am

Appendix A

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.**

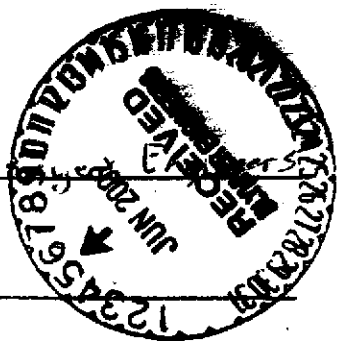
Select voice mail extension number **203.**

Appendix B

Well Monitoring Data Sheet and Well Gauging Data

Blaine Tech Services, Inc., dated May 28, 2002

WELL GAUGING DATA



Project # 070528-DW-1 Date 5-28-07 Client Blaine Tech Services

Site 16550 Hesperian Blvd San Lorenzo

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	
MW-3	2					9.17	19.16		
MW-4	2					9.65	19.46		
MW-5	2					9.05	19.66		

WELL MONITORING DATA SHEET

Project #: 020528-DW-1	Client: Blymeyer Engineers @ Kawahara Nursery
Sampler: Dan Walter	Start Date: 5-28-02
Well I.D.: MW-3	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 19.15	Depth to Water: 4.17
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
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: Bailer

- (Disposable Bailer
- Extraction Port
- Dedicated Tubing

Other: _____

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

1.5 (Gals.) X 3 = 4.5 Gals.

1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
9:23	64.9	7.2	1010	200+	1.6	gray
9:31	64.2	7.1	984	200+	3.2	a lot less gray
9:36	63.6	7.2	956	28	4.8	clear

Did well dewater? Yes (No) Gallons actually evacuated: 4.8

Sampling Time: 10:00 Sampling Date: 5-28-02

Sample I.D.: MW-3 Laboratory: Curtis & Tompkins

Analyzed for: (TPH-G) BTEX MTBE (TPH-D) Other: See SOW sheet

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

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

D.O. (if req'd):	(Pre-purge):	3.7 mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 020528-DW-1	Client: Blymeyer Engineers @ Kawahara Nurse
Sampler: Dave Walter	Start Date: 5-28-02
Well I.D.: MW-4	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 19.40	Depth to Water: 7.67
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
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: Bailer

- X Disposable Bailer
- Extraction Port
- Dedicated Tubing

Other: _____

1 Case Volume		Specified Volumes		Calculated Volume	
1.6	(Gals.) X	3	=	4.8	Gals.

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
3:45	62.1	7.5	970	7.20	1.6	Brown
3:53	61.8	7.4	973	7.20	3.2	
3:57	61.6	7.4	965	7.20	4.8	

Did well dewater? Yes (No) Gallons actually evacuated: 4.8

Sampling Time: 4:05 Sampling Date: 5-28-02

Sample I.D.: MW-4 Laboratory: Curtis & Tompkins

Analyzed for: (TPH-G) BTEX MTBE (TPH-D) Other: See Sow sheet

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

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

D.O. (if req'd):	Pre-purge:	3.7 mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 020528-DW-1	Client: Blymeyer Engineers @ Kawahara Nursery
Sampler: Dan Walter	Start Date: 5-28-02
Well I.D.: MW-5	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 19.60	Depth to Water: 5.45
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
- X Middleburg
- Electric Submersible
- Waterra
- Peristaltic
- Extraction Pump
- Other _____

Sampling Method: Bailer

- X Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
~~2"~~	~~0.16~~	6"	1.47
3"	0.37	Other	radius² * 0.163

5 (Gals.) X 3 = 5.4 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
10:42	64.7	7.6	827	>200	1.8	Brown
10:43	64.3	7.5	825	>200	3.6	
10:44	64.7	7.5	824	>200	5.4	cloudy

Did well dewater? Yes (No) Gallons actually evacuated: 5.4

Sampling Time: 10:52 Sampling Date: 5-28-02

Sample I.D.: MW-5 Laboratory: Curtis & Tompkins

Analyzed for: (TPH-G) BTEX MTBE (TPH-D) Other: see Sample sheet

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

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

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

Appendix C

Certified Laboratory Analytical Report

Curtis & Tompkins, dated June 19, 2002

Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

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

Date: 19-JUN-02
Lab Job Number: 158791
Project ID: 020528-DW-1
Location: Kawahara Nursery

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

BLAINE
TECH SERVICES, INC.

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

CHAIN OF CUSTODY BTS # 020528-DW-1

CLIENT: Blymyer Engineers, Inc.

SITE: Kawahara Nursery
16550 Ashland Ave
San Lorenzo, CA

LAB: Curtis & Tompkins DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND
☐ EPA ☐ RWQCB REGION ____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS

Invoice and Report to : Blymyer Engineers, Inc.
Attn: Mark Detterman

* Samples have Short Hold Times.

SAMPLE I.D.	DATE	TIME	MATRIX S=SOIL W=H_2O	CONTAINERS TOTAL	C = COMPOSITE ALL CONTAINERS	CONDUCT ANALYSIS TO DETECT: TPH-G/BTEX/MTBE	TPH-D	Alkalinity, Nitrate */Nitrite, Sulfate	Carbon Dioxide	Dissolved Ferrous Iron *	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
MW-3	5-28	10:00	W	9		X	X	X	X	X				
MW-4	↓	10:20	↓	9		X	X	X	X	X				
MW-5	↓	10:50	↓	9		X	X	X	X	X				

Preservation Correct?
☑ Yes ☐ No ☐ N/A

Received ☐ On Ice
☑ Cold ☐ Ambient ☑ Intact

SAMPLING COMPLETED	DATE	TIME
	5-28-02	11:15

SAMPLING PERFORMED BY Dave Walter

RESULTS NEEDED NO LATER THAN Per Client

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
David Blaker	5-28-02	11:55		5-28-02	11:55
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 5030B
Project#:	020528-DW-1	Analysis:	8015B(M)
Matrix:	Water	Sampled:	05/28/02
Units:	ug/L	Received:	05/28/02
Dil'n Fac:	1.000	Analyzed:	05/30/02
Batch#:	72618		

Field ID: MW-3 Lab ID: 158791-001
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	870	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	86	68-145
Bromofluorobenzene (FID)	91	66-143

Field ID: MW-4 Lab ID: 158791-002
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	84	68-145
Bromofluorobenzene (FID)	97	66-143

Field ID: MW-5 Lab ID: 158791-003
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	84	68-145
Bromofluorobenzene (FID)	90	66-143

Type: BLANK Lab ID: QC179640

Analyte	Result	RL
Gasoline C7-C12	ND	50

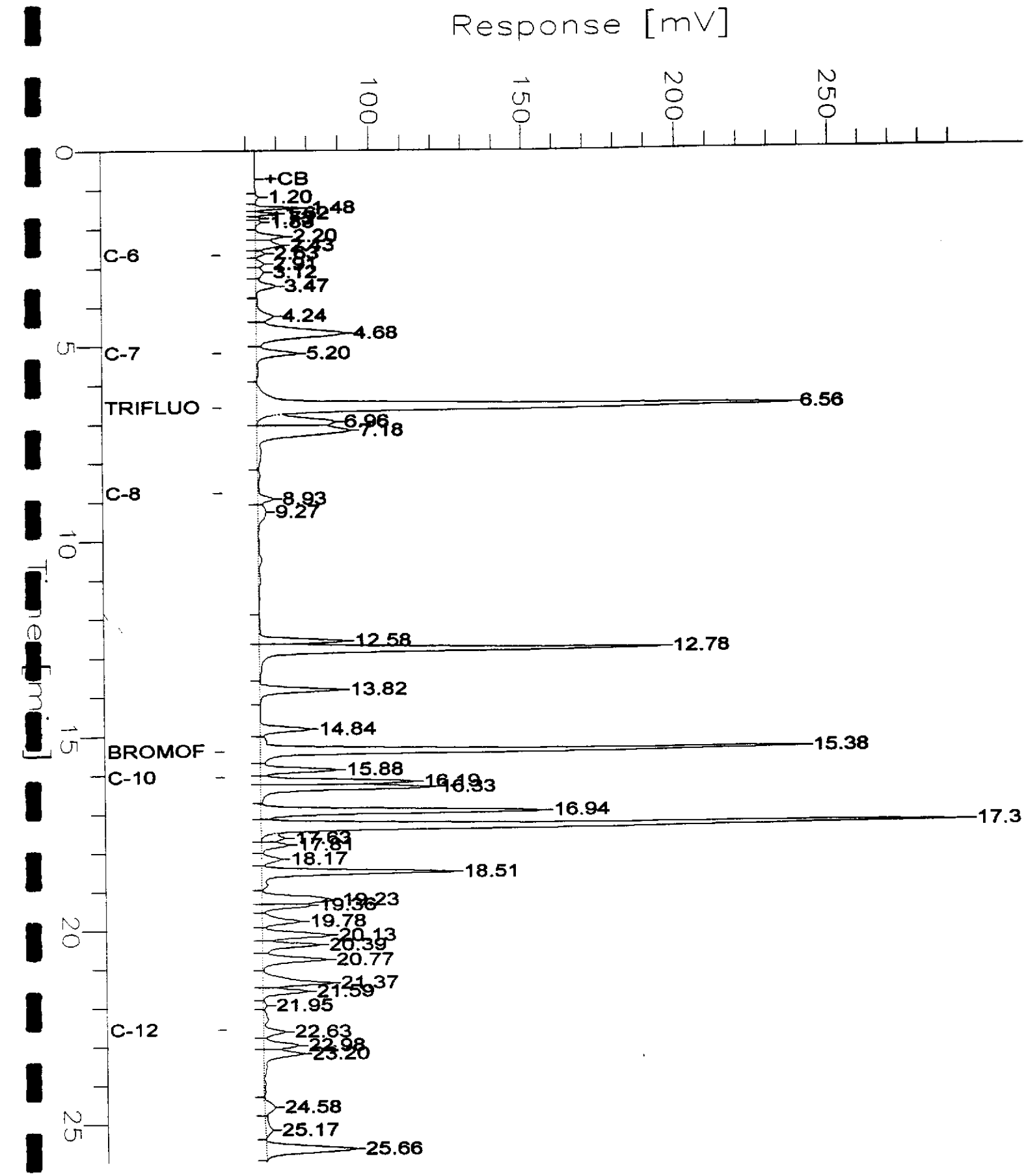
Surrogate	%REC	Limits
Trifluorotoluene (FID)	86	68-145
Bromofluorobenzene (FID)	86	66-143

ND= Not Detected
RL= Reporting Limit

GC04 TVH 'J' Data File FID

Sample Name : 158791-001,72618
FileName : G:\GC04\DATA\150J010.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: 51 mV

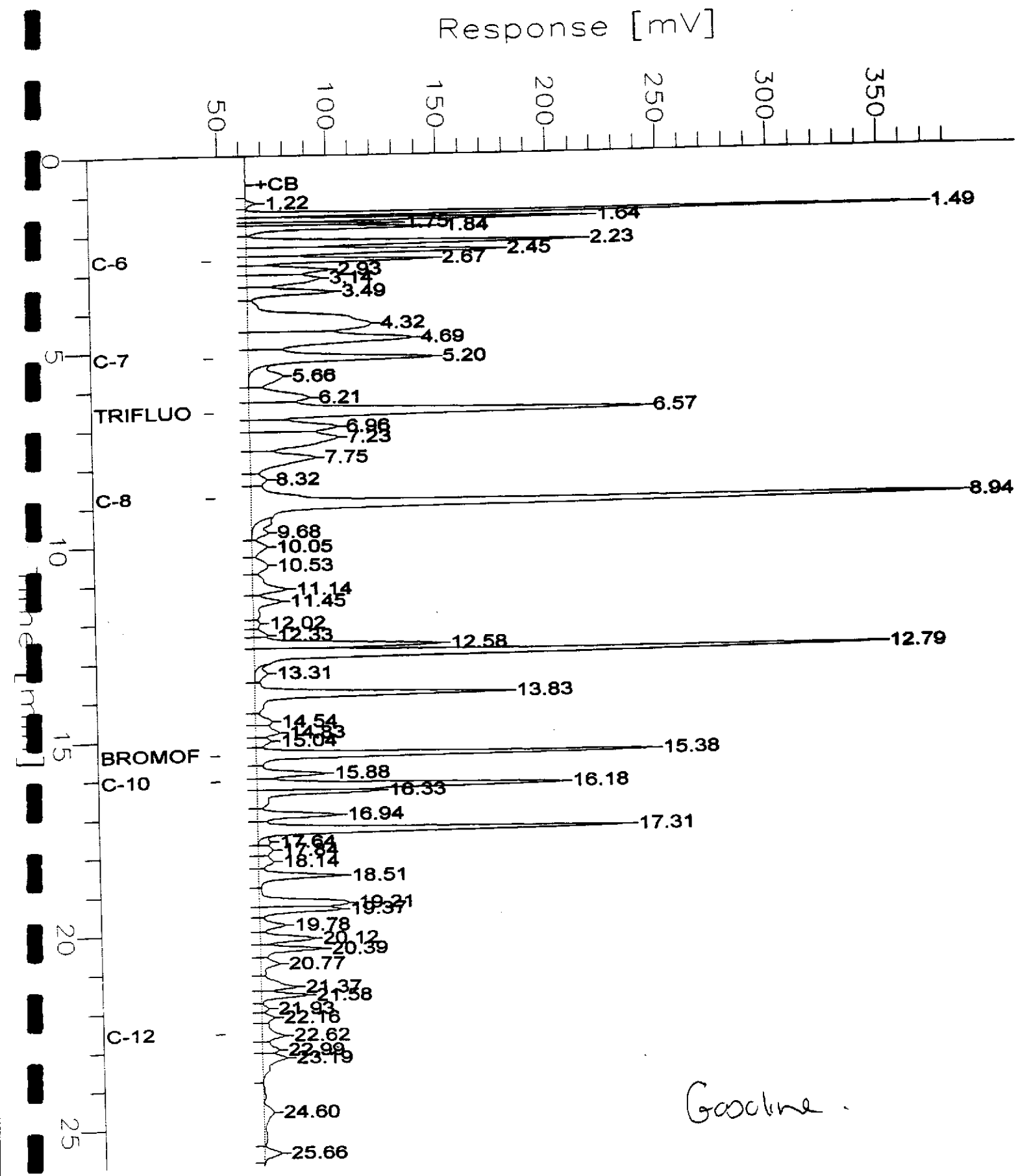
Sample #: A1
Date : 5/30/02 07:02 PM
Time of Injection: 5/30/02 06:36 PM
Low Point : 51.47 mV High Point : 294.62 mV
Plot Scale: 243.1 mV



GC04 TVH 'J' Data File FID

mple Name : ccv/lcs,qc179641,72618,02ws0791,5/5000
leName : g:\gc04\data\150j002.raw
eth : TVHBTXE
a Time : 0.00 min End Time : 26.00 min
ale Factor: 1.0 Plot Offset: 47 mV

Sample #:
Date : 5/30/02 01:33 PM
Time of Injection: 5/30/02 01:05 PM
Low Point : 46.82 mV High Point : 385.20 mV
Plot Scale: 338.4 mV



Gasoline.

Curtis & Tompkins, Ltd.

Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 5030B
Project#:	020528-DW-1	Analysis:	EPA 8021B
Matrix:	Water	Sampled:	05/28/02
Units:	ug/L	Received:	05/28/02
Dil'n Fac:	1.000	Analyzed:	05/30/02
Batch#:	72618		

Field ID: MW-3 Lab ID: 158791-001
Type: SAMPLE

Analyte	Result	RL
MTBE	2.3	2.0
Benzene	6.3	0.50
Toluene	2.2 C	0.50
Ethylbenzene	12	0.50
m,p-Xylenes	58	0.50
o-Xylene	12	0.50

Surrogate	%REC	Limits
Trifluorotoluene (PID)	112	53-143
Bromofluorobenzene (PID)	110	52-142

Field ID: MW-4 Lab ID: 158791-002
Type: SAMPLE

Analyte	Result	RL
MTBE	ND	2.0
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Trifluorotoluene (PID)	113	53-143
Bromofluorobenzene (PID)	113	52-142

C= Presence confirmed, but confirmation concentration differed by more than a factor of two
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 5030B
Project#:	020528-DW-1	Analysis:	EPA 8021B
Matrix:	Water	Sampled:	05/28/02
Units:	ug/L	Received:	05/28/02
Dil'n Fac:	1.000	Analyzed:	05/30/02
Batch#:	72618		

Field ID: MW-5 Lab ID: 158791-003
Type: SAMPLE

Analyte	Result	RL
MTBE	ND	2.0
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Trifluorotoluene (PID)	112	53-143
Bromofluorobenzene (PID)	113	52-142

Type: BLANK Lab ID: QC179640

Analyte	Result	RL
MTBE	ND	2.0
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Trifluorotoluene (PID)	108	53-143
Bromofluorobenzene (PID)	108	52-142

C= Presence confirmed, but confirmation concentration differed by more than a factor of two
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 5030B
Project#:	020528-DW-1	Analysis:	8015B(M)
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC179641	Batch#:	72618
Matrix:	Water	Analyzed:	05/30/02
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	1,933	97	79-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	95	68-145
Bromofluorobenzene (FID)	92	66-143

Curtis & Tompkins, Ltd.

Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 5030B
Project#:	020528-DW-1	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC179644	Batch#:	72618
Matrix:	Water	Analyzed:	05/30/02
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	20.00	17.23	86	59-135
Benzene	20.00	18.98	95	65-122
Toluene	20.00	19.55	98	67-121
Ethylbenzene	20.00	20.69	103	70-121
m,p-Xylenes	20.00	22.60	113	72-125
o-Xylene	20.00	20.64	103	73-122

Surrogate	%REC	Limits
Trifluorotoluene (PID)	106	53-143
Bromofluorobenzene (PID)	109	52-142

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 5030B
Project#:	020528-DW-1	Analysis:	8015B(M)
Field ID:	ZZZZZZZZZZ	Batch#:	72618
MSS Lab ID:	158823-004	Sampled:	05/24/02
Matrix:	Water	Received:	05/29/02
Units:	ug/L	Analyzed:	05/31/02
Diln Fac:	1.000		

Type: MS Lab ID: QC179642

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	69.92	2,000	1,873	90	67-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	95	68-145
Bromofluorobenzene (FID)	95	66-143

Type: MSD Lab ID: QC179643

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,914	92	67-120	2	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	96	68-145
Bromofluorobenzene (FID)	95	66-143

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 3520C
Project#:	020528-DW-1	Analysis:	EPA 8015B(M)
Matrix:	Water	Sampled:	05/28/02
Units:	ug/L	Received:	05/28/02
Dln Fac:	1.000	Prepared:	06/03/02
Batch#:	72704		

Field ID:	MW-3	Lab ID:	158791-001
Type:	SAMPLE	Analyzed:	06/04/02

Analyte	Result	RL
Diesel C10-C24	570 L Y	50

Surrogate	%REC	Limits
Hexacosane	105	39-137

Field ID:	MW-4	Lab ID:	158791-002
Type:	SAMPLE	Analyzed:	06/04/02

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	101	39-137

Field ID:	MW-5	Lab ID:	158791-003
Type:	SAMPLE	Analyzed:	06/04/02

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	96	39-137

Type:	BLANK	Analyzed:	06/05/02
Lab ID:	QC179990	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

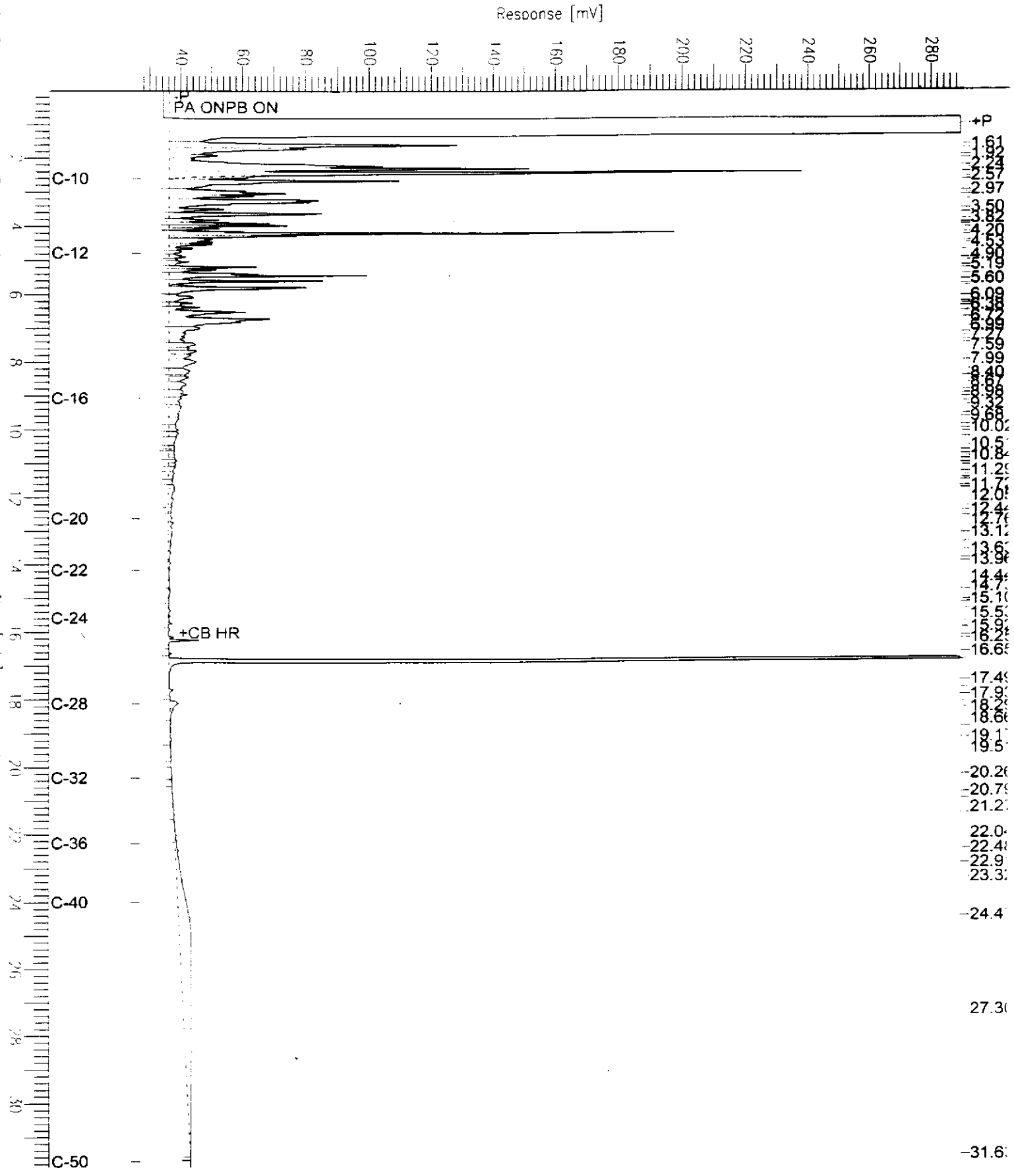
Surrogate	%REC	Limits
Hexacosane	69	39-137

L= Lighter hydrocarbons contributed to the quantitation
Y= Sample exhibits fuel pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Chromatogram

Sample Name : 158791-001,72704
FileName : G:\GC13\CHB\154B044.RAW
Method : BTEH149.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 27 mV

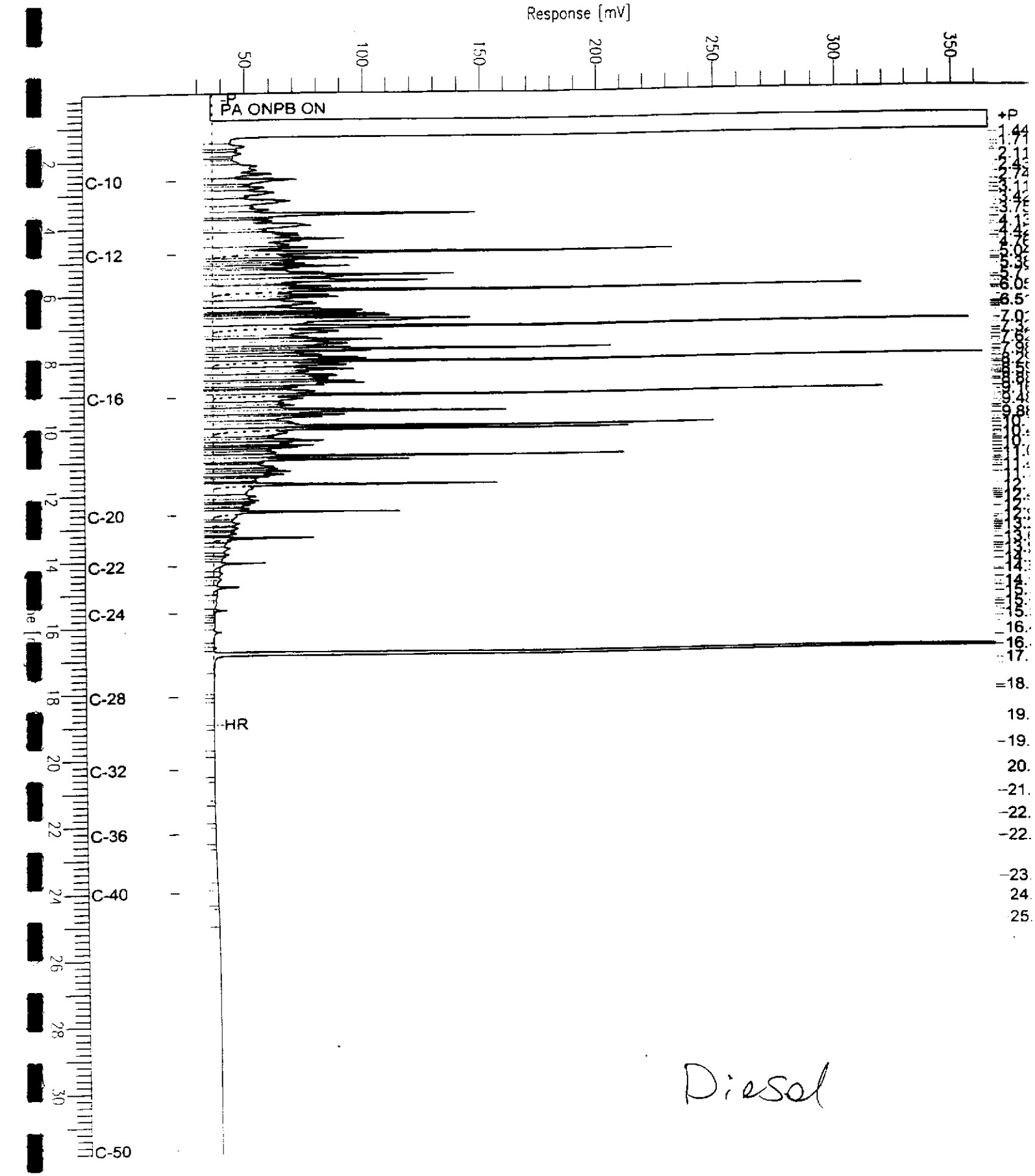
Sample #: 72704 Page 1 of 1
Date : 6/4/02 05:00 PM
Time of Injection: 6/4/02 03:34 PM
Low Point : 27.04 mV High Point : 289.38 mV
Plot Scale: 262.3 mV



Chromatogram

Sample Name : ccv,02ws0887,dsl
FileName : G:\GC13\CHB\154B002.RAW
Method : BTEH149.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 21 mV

Sample #: 500mg/L
Date : 6/3/02 01:26 PM
Time of Injection: 6/3/02 08:36 AM
Low Point : 21.12 mV High Point : 365.43 mV
Plot Scale: 344.3 mV



Diesel

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	EPA 3520C
Project#:	020528-DW-1	Analysis:	EPA 8015B(M)
Matrix:	Water	Batch#:	72704
Units:	ug/L	Prepared:	06/03/02
Dil'n Fac:	1.000	Analyzed:	06/05/02

Type: BS
Lab ID: QC179991

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,255	50	37-120

Surrogate	%REC	Limits
Hexacosane	57	39-137

Type: BSD
Lab ID: QC179992

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,431	57	37-120	13	26

Surrogate	%REC	Limits
Hexacosane	71	39-137

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Alkalinity

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 310.1
Matrix:	Water	Sampled:	05/28/02
Units:	mg/L	Received:	05/28/02
Diln Fac:	1.000	Analyzed:	05/28/02
Batch#:	72578		

Field ID: MW-3 Lab ID: 158791-001
Type: SAMPLE

Analyte	Result	RL
Alkalinity, Bicarbonate	440	1.0
Alkalinity, Carbonate	ND	1.0
Alkalinity, Hydroxide	ND	1.0
Alkalinity, Total as CaCO3	440	1.0

Field ID: MW-4 Lab ID: 158791-002
Type: SAMPLE

Analyte	Result	RL
Alkalinity, Bicarbonate	380	1.0
Alkalinity, Carbonate	ND	1.0
Alkalinity, Hydroxide	ND	1.0
Alkalinity, Total as CaCO3	380	1.0

Field ID: MW-5 Lab ID: 158791-003
Type: SAMPLE

Analyte	Result	RL
Alkalinity, Bicarbonate	370	1.0
Alkalinity, Carbonate	ND	1.0
Alkalinity, Hydroxide	ND	1.0
Alkalinity, Total as CaCO3	370	1.0

Type: BLANK Lab ID: QC179486

Analyte	Result	RL
Alkalinity, Bicarbonate	ND	1.0
Alkalinity, Carbonate	ND	1.0
Alkalinity, Hydroxide	ND	1.0
Alkalinity, Total as CaCO3	ND	1.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Alkalinity

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 310.1
Analyte:	Alkalinity, Total as CaCO3	Units:	mg/L
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC179487	Batch#:	72578
Matrix:	Water	Analyzed:	05/28/02

Spiked	Result	%REC	Limits
200.0	185.4	93	80-120

Alkalinity

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 310.1
Analyte:	Alkalinity, Total as CaCO3	Diln Fac:	1.000
Field ID:	MW-5	Batch#:	72578
MSS Lab ID:	158791-003	Sampled:	05/28/02
Matrix:	Water	Received:	05/28/02
Units:	mg/L	Analyzed:	05/28/02

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC179488	370.8	200.0	564.4	97	78-120		
MSD	QC179489		200.0	560.3	95	78-120	1	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Curtis & Tompkins, Ltd.

Ferrous Iron (Fe+2)

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Analysis:	SM3500-FE
Project#:	020528-DW-1		
Analyte:	Ferrous Iron (Fe+2)	Batch#:	72591
Matrix:	Water	Sampled:	05/28/02
Units:	mg/L	Received:	05/28/02
Diln Fac:	1.000	Analyzed:	05/29/02

Field ID	Type	Lab ID	Result	RL
MW-3	SAMPLE	158791-001	ND	0.10
MW-4	SAMPLE	158791-002	ND	0.10
MW-5	SAMPLE	158791-003	ND	0.10
	BLANK	QC179538	ND	0.10

ND= Not Detected
RL= Reporting Limit

Ferrous Iron (Fe+2)

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Analysis:	SM3500-FE
Project#:	020528-DW-1		
Analyte:	Ferrous Iron (Fe+2)	Diln Fac:	1.000
Field ID:	MW-5	Batch#:	72591
MSS Lab ID:	158791-003	Sampled:	05/28/02
Matrix:	Water	Received:	05/28/02
Units:	mg/L	Analyzed:	05/29/02

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC179539	<0.1000	0.8000	0.7550	94	51-146		
MSD	QC179540		0.8000	0.7580	95	51-146	0	20
LCS	QC179541		0.8000	0.9720	101	80-120		

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Nitrite Nitrogen

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrite	Batch#:	72587
Matrix:	Water	Sampled:	05/28/02
Units:	mg/L	Received:	05/28/02
Diln Fac:	1.000	Analyzed:	05/29/02

Field ID	Type	Lab ID	Result	RL
MW-3	SAMPLE	158791-001	0.11	0.05
MW-4	SAMPLE	158791-002	ND	0.05
MW-5	SAMPLE	158791-003	ND	0.05
	BLANK	QC179519	ND	0.05

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Nitrate Nitrogen

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrate	Sampled:	05/28/02
Matrix:	Water	Received:	05/28/02
Units:	mg/L	Analyzed:	05/29/02
Batch#:	72587		

Field ID	Type	Lab ID	Result	RL	Dil Fac
MW-3	SAMPLE	158791-001	11	0.50	10.00
MW-4	SAMPLE	158791-002	12	0.25	5.000
MW-5	SAMPLE	158791-003	12	0.25	5.000
	BLANK	QC179519	ND	0.05	1.000

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Sulfate

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 300.0
Analyte:	Sulfate	Sampled:	05/28/02
Matrix:	Water	Received:	05/28/02
Units:	mg/L	Analyzed:	05/29/02
Batch#:	72587		

Field ID	Type	Lab ID	Result	RL	Diln Fac
MW-3	SAMPLE	158791-001	50	0.50	1.000
MW-4	SAMPLE	158791-002	70	2.5	5.000
MW-5	SAMPLE	158791-003	47	0.50	1.000
	BLANK	QC179519	ND	0.50	1.000

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Nitrite Nitrogen

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrite	Batch#:	72587
Field ID:	MW-3	Sampled:	05/28/02
MSS Lab ID:	158791-001	Received:	05/28/02
Matrix:	Water	Analyzed:	05/29/02
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil. Fac
BS	QC179520		2.000	2.083	104	90-110			1.000
BSD	QC179521		2.000	2.051	103	90-110	2	20	1.000
MS	QC179522	0.1068	10.00	9.776	97	80-120			10.00
MSD	QC179523		10.00	9.890	98	80-120	1	20	10.00

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Nitrate Nitrogen

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrate	Batch#:	72587
Field ID:	MW-3	Sampled:	05/28/02
MSS Lab ID:	158791-001	Received:	05/28/02
Matrix:	Water	Analyzed:	05/29/02
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil. Fac
BS	QC179520		2.000	1.978	99	90-110			1.000
BSD	QC179521		2.000	1.988	99	90-110	0	20	1.000
MS	QC179522	10.90	10.00	20.67	98	80-120			10.00
MSD	QC179523		10.00	20.68	98	80-120	0	20	10.00

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Sulfate

Lab #:	158791	Location:	Kawahara Nursery
Client:	Blymyer Engineers, Inc.	Prep:	METHOD
Project#:	020528-DW-1	Analysis:	EPA 300.0
Analyte:	Sulfate	Batch#:	72587
Field ID:	MW-3	Sampled:	05/28/02
MSS Lab ID:	158791-001	Received:	05/28/02
Matrix:	Water	Analyzed:	05/29/02
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil. Fac
BS	QC179520		20.00	20.56	103	90-110			1.000
BSD	QC179521		20.00	20.51	103	90-110	0	20	1.000
MS	QC179522	49.54	100.0	148.0	98	72-125			10.00
MSD	QC179523		100.0	149.3	100	72-125	1	20	10.00

RPD= Relative Percent Difference

MICROSEEPS

Client Name: Curtis & Tompkins, Ltd.
Contact: Steve Stanley
Address: 2323 Fifth Avenue

Berkeley, CA 94710

Order #: P0205534
Report Date: 06/10/02
Client Proj Name: 158791
Client Proj #: 158791

Sample Identification

Lab Sample #	Client Sample ID
P0205534-01	MW-3
P0205534-02	MW-4
P0205534-03	MW-5

Approved By: Willie Hallo

Order #: P0205534
Report Date: 06/10/02
Client Proj Name: 158791
Client Proj #: 158791

Client Name: Curtis & Tompkins, Ltd.
Contact: Steve Stanley
Address: 2323 Fifth Avenue
Berkeley, CA 94710

Lab Sample #: P0205534-01

Sample Description	Matrix	Sampled Date/Time	Received
MW-3	Water	28 May. 02	29 May. 02

Analyte(s)	Result	PQL	Units	Method #	Analyst	Analysis Date
RiskAnalysis						
Water						
Carbon dioxide	63	0.60	mg/L	AM20GAX	pd	6/6/02

Order #: P0205534
Report Date: 06/10/02
Client Proj Name: 158791
Client Proj #: 158791

Client Name: Curtis & Tompkins, Ltd.
Contact: Steve Stanley
Address: 2323 Fifth Avenue
Berkeley, CA 94710

Lab Sample #: P0205534-02

Sample Description	Matrix	Sampled Date/Time	Received
MW-4	Water	28 May. 02	29 May. 02

Analyte(s)	Result	PQL	Units	Method #	Analyst	Analysis Date
RiskAnalysis						
Water						
Carbon dioxide	34	0.60	mg/L	AM20GAX	pd	6/6/02

Order #: P0205534
Report Date: 06/10/02
Client Proj Name: 158791
Client Proj #: 158791

Client Name: Curtis & Tompkins, Ltd.
Contact: Steve Stanley
Address: 2323 Fifth Avenue
Berkeley, CA 94710

Lab Sample #: P0205534-03

Sample Description	Matrix	Sampled Date/Time	Received
W-5	Water	28 May. 02	29 May. 02

Analyte(s)	Result	PQL	Units	Method #	Analyst	Analysis Date
RiskAnalysis						
Water						
Carbon dioxide	30	0.60	mg/L	AM20GAX	pd	6/6/02

P0205534

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900
(510) 486-0532

Project Number: 158791

Subcontract Laboratory:
Microseeps, Inc.
220 William Pitt Way
Pittsburgh, PA 15238
(412) 826-5245
ATTN: Becky Hanns

Turnaround Time: 6-10 Report Level: II

Please send report to: Tracy Babjar
*** Please report using Sample ID rather than C&T Lab #.

Sample ID	Sampled	Matrix	Analysis	C&T Lab #	Comments
MW-3	05/28	Water	RSK-175	158791-001	CO2
MW-4	05/28	Water	RSK-175	158791-002	CO2
MW-5	05/28	Water	RSK-175	158791-003	CO2

Notes:	Relinquished By:	Received By:
	Ben Makonnen	[illegible]
	Date/Time: May 28th 2002 1:30	Date/Time: 5/29/02 10:51

Signature on this form constitutes a firm Purchase Order for the services requested above.