

Rec'd from  
Jim Gribi  
6/26/01

CO 201

**REPORT OF GROUNDWATER INVESTIGATION**

**Liquid Sugars, Inc. Site  
1266 66<sup>th</sup> Street  
Emeryville, California**

**GA Project No. 149-02-03**

Prepared for:

Liquid Sugars, Inc.  
P O Box 96  
Oakland, California, 94604

Prepared by:

Gribi Associates  
1350 Hayes Street, Suite C-14  
Benicia, CA 94510  
(707)748-7743

February 11, 2000

February 11, 2000

San Francisco Bay Regional  
Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

Attention: Stephen Hill

Subject: Report of Groundwater Investigation  
Liquid Sugars, Inc., 1266 66<sup>th</sup> Street  
Emeryville, California  
GA Project No. 149-02-03

Ladies and Gentlemen:

Gribi Associates is pleased to submit this report on behalf of Liquid Sugars, Inc. documenting a recently-completed groundwater investigation for the Liquid Sugars, Inc. property located at 1266 66<sup>th</sup> Street in Emeryville, California. The groundwater investigation included the drilling, installation, and sampling of four groundwater monitoring wells (MW-1 through MW-4) at the site. The goal of this investigation has been to assess true groundwater conditions relative to halogenated volatile organic compounds (HVOCs) identified during recent soil boring investigations at the site.

Results of this investigation support the previous conclusion that active HVOC remediation at the site is not warranted and that remediation via natural attenuation is the only feasible remedial option for this site. Specific conclusions derived from results of well installation activities include the following:

- Shallow groundwater flow gradient beneath the site is towards the southwest, consistent with shallow groundwater flow gradient at nearby sites to the south and southeast. Also, groundwater appears to be held under confining pressure below about 20 feet in depth.
- Soil laboratory analytical results suggest an offsite northeasterly source for 1,2-DCA encountered in soil and groundwater in the "warm room" area on the northwest side of the site. A prior soil sample collected in April 1999 at 12 feet in depth in upgradient boring IB-7 (located on the north side of the "warm room") contained 0.042 parts per million (ppm) of 1,2-dichloroethane (1,2-DCA). A soil sample collected on December 16, 1999 at 21 feet in depth in well boring MW-1 (located about 40 feet downgradient from IB-7) contained 0.027 ppm of 1,2-DCA. This supports an offsite source for the 1,2-DCA encountered on the northwest side of the site, whereby 1,2-DCA migrated both vertically downward and laterally southwestward from a northeast offsite source. Note also that these 1,2-DCA concentrations

in soil are extremely low, and, based on our experience, would not warrant significant regulatory concern.

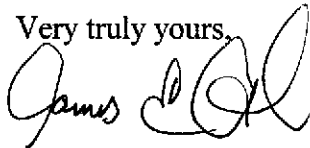
- The groundwater sample from well MW-1 (located in the “warm room” and installed on December 16, 1999) contained 0.230 ppm of 1,2-DCA. In comparison, groundwater samples from prior soil borings SB-3 and IB-8 (located in the “warm room” immediately adjacent to MW-1 and drilled in February 1999 and April 1999, respectively) contained 0.660 ppm and 2.20 ppm of 1,2-DCA, respectively. Since water samples from monitoring wells are generally viewed as more representative of true groundwater conditions than grab groundwater samples from Geoprobe-type soil borings, we believe that the lower concentration of 1,2-DCA encountered in the MW-1 groundwater sample is probably more representative of true groundwater conditions beneath the site.
- The groundwater sample from well MW-3 (located on the southeast side of the site immediately adjacent to the Union Pacific railroad tracks, and also installed on December 16, 1999) contained 16.0 ppm of tetrachloroethene (PCE). The groundwater sample from MW-2 (located about 45 feet downgradient from MW-3 and also installed on December 16, 1999) contained only 0.530 ppm of PCE. Thus, low-permeability soils beneath the site appear to have limited the extent of downgradient migration of PCE and other HVOCs encountered adjacent to the Union Pacific Railroad tracks.
- Groundwater HVOC and biochemical parameter results indicate very slow natural attenuation of HVOCs identified at the site. For PCE, the most common natural bioattenuation process, reductive dechlorination, occurs most rapidly when groundwater dissolved oxygen concentrations are below 0.5 mg/L, oxygen-reduction potential levels are below 50 millivolts (mV), and dissolved iron concentrations are above 1 mg/L. However, these optimum biochemical parameter levels were not encountered in groundwater samples from MW-2, MW-3, and MW-4, located within PCE plume areas. In addition, if natural bioattenuation were occurring rapidly, we would expect to see more segregation of the HVOC plume, with elevated levels of “parent” compound PCE in well MW-3, located closer to the HVOC release source, and relatively high concentrations of possible “daughter” compounds (trichloroethene, dichloroethene, and vinyl chloride) in downgradient wells MW-2 and MW-4. However, the ratio of “daughter” to “parent” compounds is fairly similar in all wells, with higher concentrations of PCE relative to TCE, DCE, or VC in all four wells. Note also that tight soils beneath the site, which have bound up HVOC constituents, seem to have hampered other nonbiological natural attenuation processes, such as advection and dilution.
- Given the apparent slow rate of natural biodegradation of HVOCs at the site, we would not expect significant changes in HVOCs concentrations within a reasonable time of measurement (significant decreases in HVOC concentrations might only be measurable over decades, and not years). Also, because we don’t see rapid bioattenuation from PCE to TCE, DCE, and VC, we would not expect to see significant increases in concentrations of the more toxic vinyl chloride over the course of time.

Based on results of this and previous investigations at the site, we believe that regulatory closure of this site is warranted, given: (1) The possible offsite sources for much of the HVOCs identified on the site; (2) The apparent immobility and persistence of these HVOCs; (3) The lack of significant groundwater aquifers and groundwater beneficial uses in the site vicinity; and (4) The lack of significant risk posed by residual HVOCs identified beneath the site. Overall, we believe that the HVOCs identified at this site should be viewed as a relatively small environmental concern, especially when compared to large HVOC sites, such as Lawrence Livermore National Laboratory in Livermore or several sites in the Silicon Valley, where true beneficial use groundwater aquifers have been impacted and HVOC plumes extend thousands of feet in length.


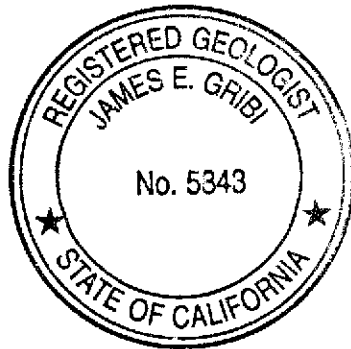
In accordance with the approved Remediation/Risk Management Plan, we will conduct additional groundwater monitoring in late March 2000 to provide additional assessment of groundwater conditions beneath the site.

We appreciate the opportunity to present this report for your review. Please call if you have questions or require additional information.

Very truly yours,



James E. Gribi  
Registered Geologist  
California No. 5843



Stanton Stubbs  
Environmental Scientist

JEG/ct  
Enclosure

- c Mr. Rory Campbell,  
Mr. Ron Mooney, Liquid Sugars, Inc.  
Mr. Ygnacio Dyart, City of Emeryville Redevelopment Agency

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## 1.0 INTRODUCTION

This report documents a recently-completed groundwater investigation conducted by Gribi Associates for the Liquid Sugars, Inc. property located at 1266 66<sup>th</sup> Street in Emeryville, California (see Figure 1, Figure 2, and Figure 3). The groundwater investigation included the drilling, installation, and sampling of four groundwater monitoring wells, MW-1 through MW-4, at the site. The goal of this investigation has been to assess true groundwater conditions relative to halogenated volatile organic compounds (HVOCs) recently identified during previous soil boring investigations at the site.

### 1.1 General Site Background

Liquid Sugars, Inc., the current owner of the subject parcel, has operated a food-grade vegetable oil and liquid sugar facility on the site since the 1970s. On behalf of a potential purchaser of the site, Geomatrix conducted grab groundwater sampling in February 1999 from seven borings (SB-1 through SB-3, and B-1 through B-4) on the subject property. Laboratory analytical results from these borings indicated the presence of chlorinated hydrocarbons (HVOCs) in groundwater beneath the site. Specific HVOCs detected at various locations and concentrations included tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), 1,2-dichloroethane (1,2-DCA), and vinyl chloride (VC). Elevated levels of PCE, TCE, and cis-1,2-DCE were encountered in a grab groundwater sample collected from boring B-4, located near the east edge of the project site. In addition, an elevated level of 1,2-DCA was encountered in a groundwater sample collected from SB-3, located on the northwest side of the site.

In April 1999, Gribi Associates conducted a soil and groundwater investigation and a Risk-Based Corrective Action (RBCA) assessment for the project site (*Report of Soil and Groundwater Investigation and Risk-Based Corrective Action Assessment*, Gribi Associates, June 15, 1999). The soil and groundwater investigation included the drilling and sampling of 13 soil borings at the site using direct-push coring equipment. The RBCA assessment involved modeling site-specific environmental and human health exposure risks posed by residual contaminants identified at the site for both inside and outside areas of the site.

Both field and laboratory analytical results from this soil boring investigation seemed to indicate small releases from both onsite and offsite sources which, due to low-permeability soils beneath the site, have resulted in small, concentrated plumes that have not migrated significant distances. Three apparently isolated release areas were identified on the project site: (1) An area along the upgradient east property line adjacent to the Union Pacific Railroad tracks, which contained up to 2.5 milligrams per liter (mg/L) of PCE in a grab groundwater sample; (2) An area beneath the "tile room" portion of the project site building, which contained up to 0.620 mg/L of PCE in a grab groundwater sample; and (3) An area on the west side of the "warm room" portion of the project site building, which contained up to 2.20 mg/L of 1,2-DCA in a grab groundwater sample. Low to moderate levels of possible PCE breakdown products (TCE, t-1,2-DCE, c-1,2-DCE, and VC) were encountered in soil and grab groundwater samples from the first two areas, indicating that natural attenuation is occurring at the site.

Based on calculated risk estimates, it appears that there is no significant risk of exposure from any identified HVOC constituents present at the project site. The risk values associated with the outdoor air exposure and soil exposure pathways are below target risk levels. The total pathway cumulative carcinogenic risk values associated with indoor vapor exposure for the outside and inside project site

areas are  $4.9 \times 10^{-5}$  and  $2.0 \times 10^{-5}$ , respectively. These cumulative risk values are below the cumulative risk target level of  $1.0 \times 10^{-4}$ . The only calculated risk values which exceed target risk levels are the individual carcinogenic risk values associated with possible indoor air exposure to vinyl chloride. These individual risk values for indoor vinyl chloride vapor exposure in the outside and inside project site areas are  $3.8 \times 10^{-5}$  and  $1.8 \times 10^{-5}$ , respectively. We believe that since these risk values are only slightly above the target risk of  $1 \times 10^{-5}$ , they do not represent a significant risk.

Based on the lack of significant risk associated with residual HVOCs at the site and the lack of evidence of historical HVOC use at the site, Gribi Associates requested that regulatory closure be granted for this site. However, in a letter dated August 11, 1999, the San Francisco Bay Regional Water Quality Control Board (RWQCB) denied regulatory closure and requested that a Remediation/Risk Management Plan be prepared for the site.

Gribi Associates submitted the Remediation/Risk Management Plan on October 28, 1999. Key elements of the Remediation/Risk Management Plan included the following:

- The project site is located in an area of little or no usable shallow groundwater resources.
- As with most of the East Bay area, the project site is underlain predominantly by clays and silty clays, with occasional thin, discontinuous sand and gravel layers.
- Gribi Associates has uncovered no evidence of historic HVOC use at the site. Liquid Sugars, Inc. the current owner of the project site, has operated a food-grade liquid sugar/vegetable oil facility on the site since the 1970s. (LSI is in the initial stages of re-locating their facility, and has put the project site up for sale.) Prior to LSI ownership, the project site was owned by Diamond Alkali and was used for the manufacturing of sodium silicates since at least 1939. Sanborn Fire Insurance Maps identify project site land use in 1903 and 1911 as residential.
- In preparing the Remediation/Risk Management Plan, Gribi Associates established risk-based cleanup goals for the site and evaluated three remedial options for the site. These three remedial options included: (1) Natural attenuation; (2) Insitu groundwater treatment; and (3) Groundwater extraction and treatment.
- After considering the relative costs of each option, the apparent lack of migration of HVOCs at the site, the low risk associated with residual HVOCs at the site, and the lack of groundwater beneficial uses in the area, it is apparent that active remediation of HVOCs at the site is not warranted and that the natural attenuation option is the most feasible remedial option for this site.

Based on these results, the Remediation/Risk Management Plan included a workplan to install four groundwater monitoring wells at the site. The monitoring workplan proposed to conduct quarterly groundwater monitoring for one year, whereupon closure/remedial options will be re-evaluated for the site. During the initial monitoring, groundwater samples from the four wells will be additionally analyzed for biochemical parameters to help in evaluating the effectiveness of natural attenuation at the site. Verbal approval to implement this workplan was granted by Mr. Stephen Hill of the RWQCB on November 23, 1999.

## 1.2 Scope of Work

Gribi Associates was contracted by Liquid Sugars, Inc. to conduct the following scope of work:

- **Task 1**      **Conduct prefield activities.**
- **Task 2**      **Conduct well installation and sampling activities.**
- **Task 3**      **Conduct laboratory analyses.**
- **Task 4**      **Prepare report of findings.**

These tasks were conducted in accordance with the approved the workplan and with applicable investigative methods and guidelines.

## 1.3 Limitations

The services provided under this contract as described in this report include professional opinions and judgments based on data collected. These services have been provided according to generally accepted environmental protocol. The opinions and conclusions contained in this report are typically based on information obtained from:

1. Observations and measurements made by our field staff.
2. Contacts and discussions with regulatory agencies and others.
3. Review of available hydrogeologic data.

## 2.0 DESCRIPTION OF FIELD ACTIVITIES

The four wells, MW-1 through MW-4, were installed on Thursday and Friday, December 16 and 17, 1999. Mean sea level elevations were surveyed and the four wells were purged and sampled on Wednesday, December 22, 1999.

### 2.1 Prefield Activities

Prior to initiating drilling activities, a well installation permit was obtained from Alameda Department of Public Works. A copy of this permit is contained in Appendix A. In addition, proposed well locations were marked with white paint, and Underground Services Alert (USA) was notified at least 48 hours prior to drilling. Also, Foresite, a private underground utility locator, cleared proposed well locations. Prior to initiating drilling activities, a Site Safety Plan was prepared, and a tailgate safety meeting was conducted with all site workers.

### 2.2 Location of Soil Borings

Locations for the four wells, MW-1 through MW-4, are shown on Figure 3. In order to assess true groundwater conditions in known HVOC-impacted areas, well MW-1 was placed in the area of elevated 1,2-DCA in the southwest corner of the LSI "warm room", and another well, MW-3, was sited in the area of elevated PCE near the railspur on the east side of the site. A third well, MW-2, was sited west-southwest in an expected downgradient direction from this PCE-impacted area. The



fourth well, MW-4, was sited west-southwest in an expected downgradient direction from the PCE-impacted area in the LSI "tile room".

### 2.3 Drilling and Sampling of Soil Borings

The four well borings were drilled by Gregg Drilling, a State-licensed drilling contractor, using hollow stem auger equipment. MW-1 and MW-4 well borings were drilled to about 35 feet in depth. MW-2 well boring was drilled to about 30 feet in depth, and MW-3 well boring was drilled to about 25 feet in depth. Soils from each well boring were logged by a qualified Gribi Associates scientist using sight, smell, and photoionization detector (PID). Boring logs for the four well borings are included in Appendix B. Soil cuttings from the four well borings were placed in sealed DOT-approved 55-gallon drums pending laboratory results.

Soil samples were collected from the four well borings at approximately five-foot intervals starting at approximately five feet below surface grade. Undisturbed soils were sampled in advance of the auger as follows: (1) A two-inch inside diameter California-style split spoon sampler was driven into undisturbed soil ahead of the drill bit; (2) The sampler was raised quickly to the surface and the brass liners exposed; (3) The brass liner containing the most undisturbed soil was quickly sealed with aluminum foil and plastic end caps, labeled, and wrapped tightly with tape; and (4) The sealed soil sample was immediately placed in a cooler with crushed ice for transport to the analytical laboratory under formal chain-of-custody. All sampling equipment was thoroughly cleaned and decontaminated between each sample collection by triple rinsing first with water, then with dilute tri-sodium phosphate solution, and finally with distilled water. All downhole drilling equipment, including auger and drill bit, were steam cleaned before and after drilling the well boring.

### 2.4 Installation of Monitoring Wells

The four groundwater monitoring wells were constructed using two-inch diameter Schedule 40 threaded PVC casing. Well specifications, which varied based on site conditions, are shown in Table 1.

	MW-1	MW-2	MW-3	MW-4
Well Depth <sup>1</sup>	35.0	30.0	25.0	35.0
Blank PVC Riser	0-15.2	0-10.0	0-9.9	0-15.3
PVC Screen <sup>2</sup>	15.2-35.0	10.0-30.0	9.9-25.0	15.3-35.0
Grout Seal <sup>3</sup>	0.5-11.0	0.5-6.0	0.5-6.0	0.5-11.0
Bentonite Seal	11.0-13.0	6.0-8.0	6.0-8.0	11.0-13.0
Filter Pack <sup>4</sup>	13.0-35.0	8.0-30.0	8.0-25.0	13.0-35.0

- 1 = All measurements are in feet below top of casing.
- 2 = 0.020-inch slot size.
- 3 = Portland cement
- 4 = Lonestar No. 3 Silica Sand

The top of each well was enclosed in a traffic-rated locking box set in concrete, with inside wells MW-1 and MW-4 set at inside building floor grade, and outside wells MW-2 and MW-3 set slightly above grade.

## **2.5 Well Development and Sampling**

After allowing the cement seal to cure for at least 48 hours, each monitoring well was developed and sampled using a 12-volt purge pump. Well development consisted of purging each well of at least three well volumes before sampling. During well development, ground water was monitored periodically for presence of free-floating product and odor, pH, specific conductance, temperature and visible clarity. Groundwater sampling data sheets for the four wells are contained in Appendix C. After these parameters have stabilized, groundwater was sampled directly from the pump outlet in the following manner: (1) Laboratory-supplied containers were completely filled directly from the pump outlet with a minimum of agitation; (2) After making sure that no air bubbles were present, each container was tightly sealed with a teflon-lined septum; and (3) Each container was labeled and placed in cold storage for transport to the analytical laboratory under formal chain-of-custody. All purged groundwater was stored on site in a sealed DOT-approved 55-gallon drum pending groundwater analytical results. All sampling equipment was thoroughly cleaned and decontaminated between each sample collection by triple rinsing as described above.

After purging, dissolved oxygen and oxygen-reduction potential (ORP) were measured for each well using field instruments.

## **2.6 Determination of Groundwater Flow Gradient**

Following well installation, wellhead mean sea level elevations for the four wells were surveyed by Mr. Ahmad Moghaddas, a State-licensed land surveyor. A copy of the surveyor's report is included in Appendix D. In addition, groundwater depths in the four wells were measured to the nearest 0.01 foot using an electronic probe. These data were then used to calculate groundwater flow direction and gradient.

## **2.7 Laboratory Analysis of Soil and Groundwater Samples**

A total of eight soil samples and four groundwater samples were analyzed for the following parameters:

USEPA 8260 Halogenated Volatile Organic Compounds (HVOCs)

In addition, groundwater samples from each of the four wells were analyzed for the following parameters to evaluate the effectiveness of natural attenuation at the site.

USEPA 310.1 Alkalinity  
USEPA 6010 Dissolved Iron  
USEPA 405.1 Biological Oxygen Demand (BOD)  
USEPA 410.1 Chemical Oxygen Demand (COD)  
RSK-175 (ASTM 3810) Methane, Ethane, Ethene

All analyses were conducted by Acculabs, Inc., a California-certified analytical laboratory, with two-week turn around on lab results.

### 3.0 RESULTS OF INVESTIGATION

#### 3.1 General Subsurface Conditions

Native soils encountered in the four well borings were generally similar, consisting primarily of brown to olive grey gravelly silts and clays, with occasional thin gravel and sand units encountered in MW-2 and MW-4 well borings. In the MW-2 well boring, a brown silty sand was encountered from about 25 feet to 27 feet in depth. In the MW-4 well boring, brown gravelly sand was encountered from about 20 feet to 23 feet in depth, and reddish brown silty, gravelly sand was encountered from about 30 feet to 32 feet in depth. Overall, the gravelly and sandy silts and clays encountered beneath the site appeared to possess low permeabilities.

Soils encountered in the four well borings exhibited no visual or olfactory evidence of HVOC impacts. The only significant PID reading was recorded in shallow fill sands in well boring MW-2. This well is located in the unpaved "foot print" of a former sugar/vegetable oil product above ground storage tank (AST), and these shallow soils were wet and exhibited a strong organic "vegetable oil" type odor.

#### 3.2 Hydrologic Conditions

During drilling, water-saturated soils were encountered in inside well borings MW-1 and MW-4 at depths of about 26 feet and 23 feet below surface grade, respectively, and in outside well borings MW-2 and MW-3 at depths of about 22 feet and 16 feet below surface grade, respectively. After well completion, groundwater depths were measured in the four wells at depths ranging from 6.01 feet in MW-3 to 8.35 feet in MW-1. Groundwater flow gradient, which is shown on Figure 4, is approximately 0.012 foot/foot to the southwest.

#### 3.3 Results of Laboratory Analyses

Soil analytical results are summarized in Table 2 and on Figure 5. Groundwater analytical results are summarized in Table 3 and Table 4, and on Figure 4. Laboratory data reports and chain-of-custody records for soil and groundwater analyses are contained in Appendix E.

**Table 2**  
**SUMMARY OF SOIL ANALYTICAL RESULTS**  
Liquid Sugars North Parcel, 1266 66<sup>th</sup> Street

Sample ID	Sample Depth	Concentration (ppm)						
		VC	i-1,2-DCE	c-1,2-DCE	TCE	PCE	1,2-DCA	Other
MW-1.2	11.0 ft	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
MW-1.4	21.0 ft	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<b>0.027</b>	<0.0050
MW-2.1	6.0 ft	<b>0.026</b>	<b>0.0064</b>	<b>0.83</b>	<b>0.051</b>	<b>0.15</b>	<0.0050	<0.0050
MW-2.2	11.0 ft	<0.0050	<0.00050	<b>0.013</b>	<0.0050	<b>0.16</b>	<0.0050	<0.0050
MW-3.1	6.0 ft	<b>0.091</b>	<b>0.011</b>	<b>1.9</b>	<b>0.63</b>	<b>1.3</b>	<0.0050	<0.0050
MW-3.2	11.0 ft	<0.0050	<0.0050	<b>0.16</b>	<b>0.025</b>	<b>0.72</b>	<0.0050	<0.0050
MW-4.3	16.0 ft	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
MW-4.5	26.0 ft	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ppm = Parts per million (milligrams per kilogram)  
 VC = Vinyl Chloride  
 t-1,2-DCE = trans-1,2-Dichloroethene  
 c-1,2-DCE = cis-1,2-Dichloroethene  
 TCE = Trichloroethene

PCE = Tetrachloroethene  
 1,2-DCA = 1,2-Dichloroethane  
 Other = Sum of concentrations of 22 remaining HVOC compounds  
 (see footnotes for specific compounds and concentrations).  
 <0.0050 = Not detected above the value expressed in parentheses.

**Table 3**  
**SUMMARY OF GROUNDWATER HVOC ANALYTICAL RESULTS**  
 Liquid Sugars North Parcel, 1266 66<sup>th</sup> Street

Sample ID	GW Elevation	Concentration (ppm)						
		VC	t-1,2-DCE	c-1,2-DCE	TCE	PCE	1,2-DCA	Other
MW-1 <30.18>	21.87 ft	<0.00050	<0.00050	0.0040	0.0032	0.720	0.230	0.0071 <sup>1</sup>
MW-2 <29.48>	22.63 ft	0.0094	0.00078	0.064	0.029	0.530	<0.00050	0.0018 <sup>2</sup>
MW-3 <29.04>	23.03 ft	0.014	0.030	1.2	0.300	16.0	<0.00050	0.00846 <sup>3</sup>
MW-4 <30.00>	21.65 ft	0.013	0.0024	0.110	0.059	0.300	0.027	0.0014 <sup>4</sup>

ppm = Parts per million (milligrams per liter)  
 GW Elevation = Groundwater mean sea level elevation.  
 VC = Vinyl Chloride  
 t-1,2-DCE = trans-1,2-Dichloroethene  
 c-1,2-DCE = cis-1,2-Dichloroethene  
 TCE = Trichloroethene  
 PCE = Tetrachloroethene  
 1,2-DCA = 1,2-Dichloroethane  
 Other = Sum of concentrations of 22 remaining HVOC compounds  
 (see footnotes for specific compounds and concentrations).

<30.18> = Top of casing mean sea level elevation for well  
 <0.0050 = Not detected above the value expressed in parentheses.  
 1 = Sum of 0.0060 ppm of Chloroform and 0.0011 ppm of 1,2-Dichloropropane.  
 2 = 0.0018 ppm of 1,1-Dichloroethene.  
 3 = Sum of 0.0075 ppm of 1,1-Dichloroethene and 0.00096 ppm of 1,1,2-Trichloroethane.  
 4 = 0.0014 ppm of 1,1-Dichloroethene.

**Table 4**  
**SUMMARY OF GROUNDWATER BIOCHEMICAL ANALYTICAL RESULTS**  
 Liquid Sugars North Parcel, 1266 66<sup>th</sup> Street

Sample ID	Concentration (ppm, ORP in mV)								
	ALK	Fe <sup>2+</sup>	BOD	COD	METHANE	ETHANE	ETHENE	DO	ORP
MW-1	240	<0.050	<2.0	50	<0.010	<0.010	<0.010	0.35	195
MW-2	210	<0.050	<4.0	71	0.014	<0.010	<0.010	2.02	211
MW-3	270	<0.050	<4.0	<50	0.010	<0.010	<0.010	2.25	217
MW-4	470	<0.050	<4.0	50	0.13	<0.010	<0.010	2.18	162

ppm = Parts per million (milligrams per liter)  
 ALK = Alkalinity, in milligrams per liter (mg/L, or ppm) as calcium carbonate (CaCO<sub>3</sub>).  
 Fe<sup>2+</sup> = Dissolved Iron  
 BOD = Biological Oxygen Demand

COD = Chemical Oxygen Demand  
 DO = Dissolved Oxygen, field measurement  
 ORP = Oxygen Reduction Potential, field measurement, in millivolts (mV)

#### 4.0 CONCLUSIONS

Results of this investigation support the previous conclusion that active HVOC remediation at the site is not warranted and that remediation via natural attenuation is the only feasible remedial option for this site. Specific conclusions derived from results of well installation activities include the following:

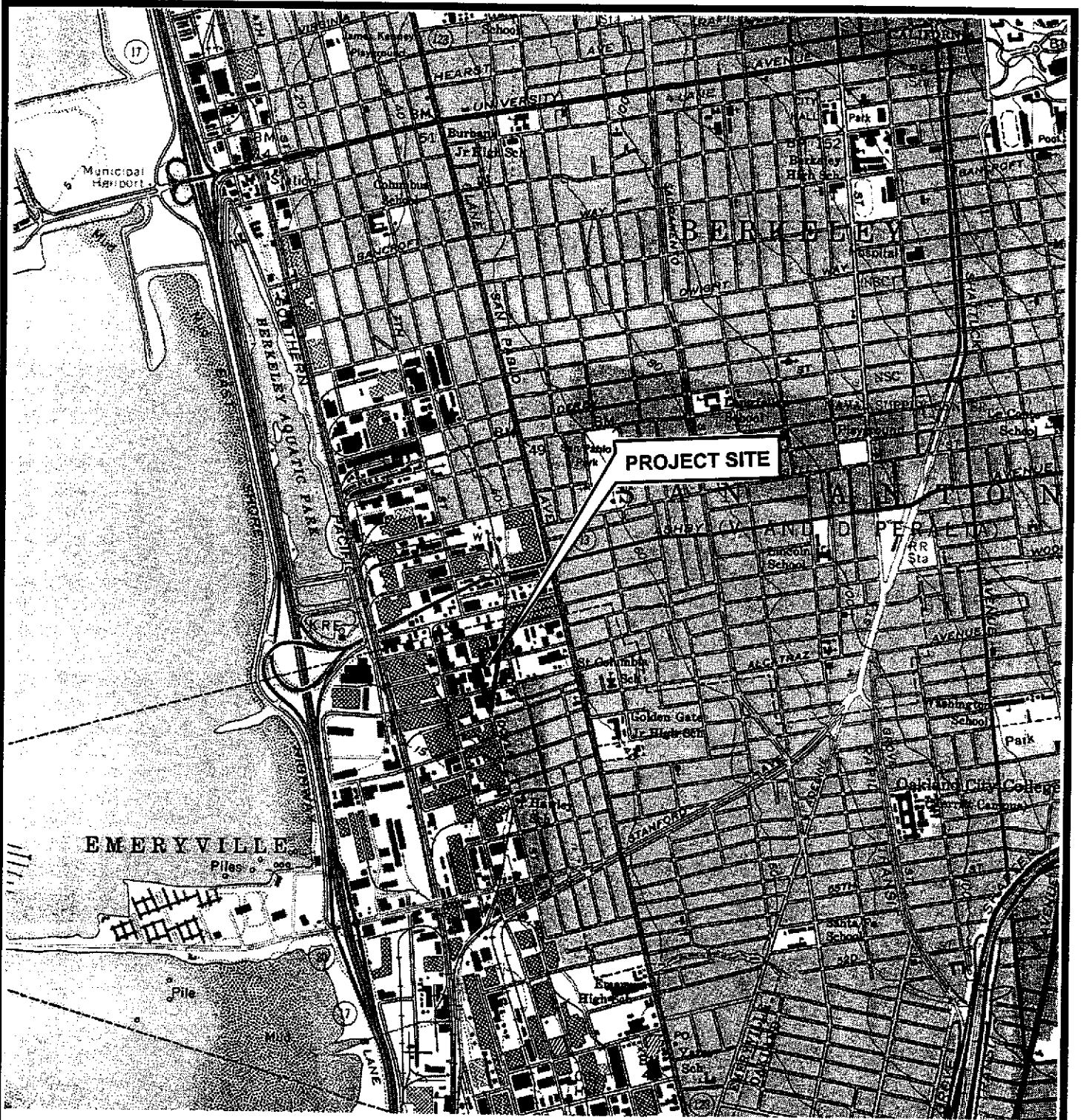
- Shallow groundwater flow gradient beneath the site is towards the southwest, consistent with shallow groundwater flow gradient at nearby sites to the south and southeast. Also, groundwater appears to be held under confining pressure below about 20 feet in depth.
- Soil laboratory analytical results suggest an offsite northeasterly source for 1,2-DCA encountered in soil and groundwater in the "warm room" area on the northwest side of the site. A prior soil sample collected in April 1999 at 12 feet in depth in upgradient boring IB-7 (located on the north side of the "warm room") contained 0.042 parts per million (ppm) of 1,2-DCA. A soil sample collected on December 16, 1999 at 21 feet in depth in well boring MW-1 (located about 40 feet downgradient from IB-7) contained 0.027 ppm of 1,2-DCA. This supports an offsite source for the 1,2-DCA encountered on the northwest side of the site, whereby 1,2-DCA migrated both vertically downward and laterally southwestward from a northeast offsite source. Note also that these 1,2-DCA concentrations in soil are extremely low, and, based on our experience, would not warrant significant regulatory concern.
- The groundwater sample from well MW-1 (located in the "warm room" and installed on December 16, 1999) contained 0.230 ppm of 1,2-DCA. In comparison, groundwater samples from prior soil borings SB-3 and IB-8 (located in the "warm room" immediately adjacent to MW-1 and drilled in February 1999 and April 1999, respectively) contained 0.660 ppm and 2.20 ppm of 1,2-DCA, respectively. Since water samples from monitoring wells are generally viewed as more representative of true groundwater conditions than grab groundwater samples from Geoprobe-type soil borings, we believe that the lower concentration of 1,2-DCA encountered in the MW-1 groundwater sample is probably more representative of true groundwater conditions beneath the site.
- The groundwater sample from well MW-3 (located on the southeast side of the site immediately adjacent to the Union Pacific railroad tracks, and also installed on December 16, 1999) contained 16.0 ppm of PCE. The groundwater sample from MW-2 (located about 45 feet downgradient from MW-3 and also installed on December 16, 1999) contained only 0.530 ppm of PCE. Thus, low-permeability soils beneath the site appear to have limited the extent of downgradient migration of PCE and other HVOCs encountered adjacent to the Union Pacific Railroad tracks.
- Groundwater HVOC and biochemical parameter results indicate very slow natural attenuation of HVOCs identified at the site. For PCE, the most common natural bioattenuation process, reductive dechlorination, occurs most rapidly when groundwater dissolved oxygen concentrations are below 0.5 mg/L, oxygen-reduction potential levels are below 50 millivolts (mV), and dissolved iron concentrations are above 1 mg/L. However, these optimum biochemical parameter levels were not encountered in groundwater samples from MW-2, MW-3, and MW-4, located within PCE plume areas. In addition, if natural bioattenuation were occurring rapidly, we would expect to see more segregation of the HVOC plume, with elevated levels of "parent" compound PCE in well MW-3, located closer

to the HVOC release source, and relatively high concentrations of possible "daughter" compounds (trichloroethene, dichloroethene, and vinyl chloride) in downgradient wells MW-2 and MW-4. However, the ratio of "daughter" to "parent" compounds is fairly similar in all wells, with higher concentrations of PCE relative to TCE, DCE, or VC in all four wells. Note also that tight soils beneath the site, which have bound up HVOC constituents, seem to have hampered other nonbiological natural attenuation processes, such as advection and dilution.

- Given the apparent slow rate of natural biodegradation of HVOCs at the site, we would not expect significant changes in HVOCs concentrations within a reasonable time of measurement (significant decreases in HVOC concentrations might only be measurable over decades, and not years). Also, because we don't see rapid bioattenuation from PCE to TCE, DCE, and VC, we would not expect to see significant increases in concentrations of the more toxic vinyl chloride over the course of time.

Based on results of this and previous investigations at the site, we believe that regulatory closure of this site is warranted, given: (1) The possible offsite sources for much of the HVOCs identified on the site; (2) The apparent immobility and persistence of these HVOCs; (3) The lack of significant groundwater aquifers and groundwater beneficial uses in the site vicinity; and (4) The lack of significant risk posed by residual HVOCs identified beneath the site. Overall, we believe that the HVOCs identified at this site should be viewed as a relatively small environmental concern, especially when compared to large HVOC sites, such as Lawrence Livermore National Laboratory in Livermore or several sites in the Silicon Valley, where true beneficial use groundwater aquifers have been impacted and HVOC plumes extend thousands of feet in length.

In accordance with the approved Remediation/Risk Management Plan, we will conduct additional groundwater monitoring in late March 2000 to provide additional assessment of groundwater conditions beneath the site.



TOPOGRAPHY FROM USGS OAKLAND, WEST, CALIFORNIA  
7.5-MINUTE QUADRANGLE MAPS, (TOPO! 1997).



DESIGNED BY:	CHECKED BY:
DRAWN BY: JG	SCALE: 1:24,000
PROJECT NO: 149-01-01	

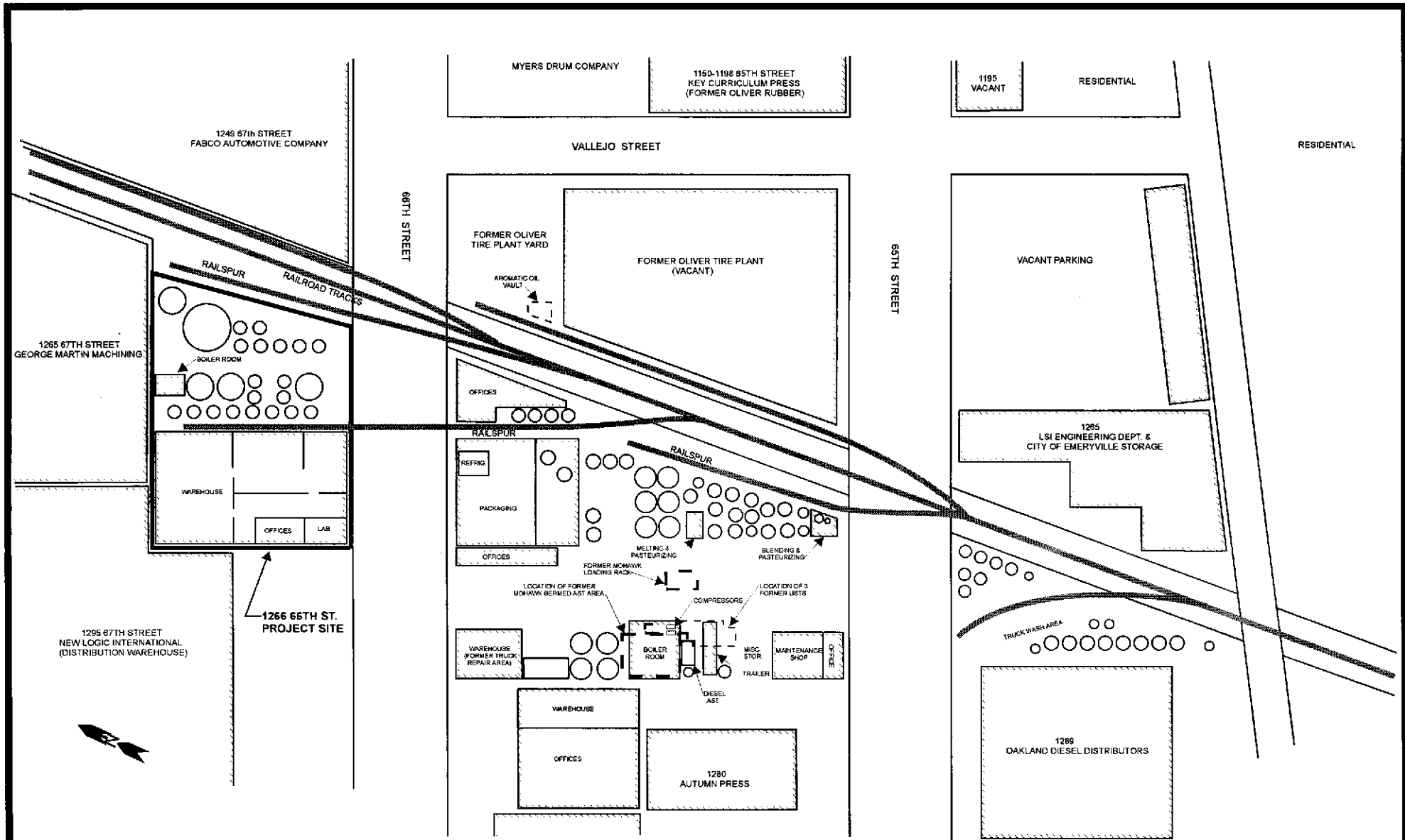
**SITE VICINITY MAP**

LIQUID SUGARS, INC.  
EMERYVILLE, CALIFORNIA

DATE: 11/09/98

FIGURE: 1

**GRIBI Associates**



**NOTES**

- - VERTICAL PRODUCT SILO/TANK
- - RAILROAD TRACKS OR RAILSPUR

ALL LSI PARCELS ARE PAVED (90+% CONCRETE)

0 70 140  
APPROX. SCALE IN FEET

DESIGNED BY:	CHECKED BY:
DRAWN BY: JG	SCALE:
PROJECT NO: 149-01-03	

**SITE AREA MAP**  
 LIQUID SUGARS, INC. FACILITY  
 EMERYVILLE, CALIFORNIA

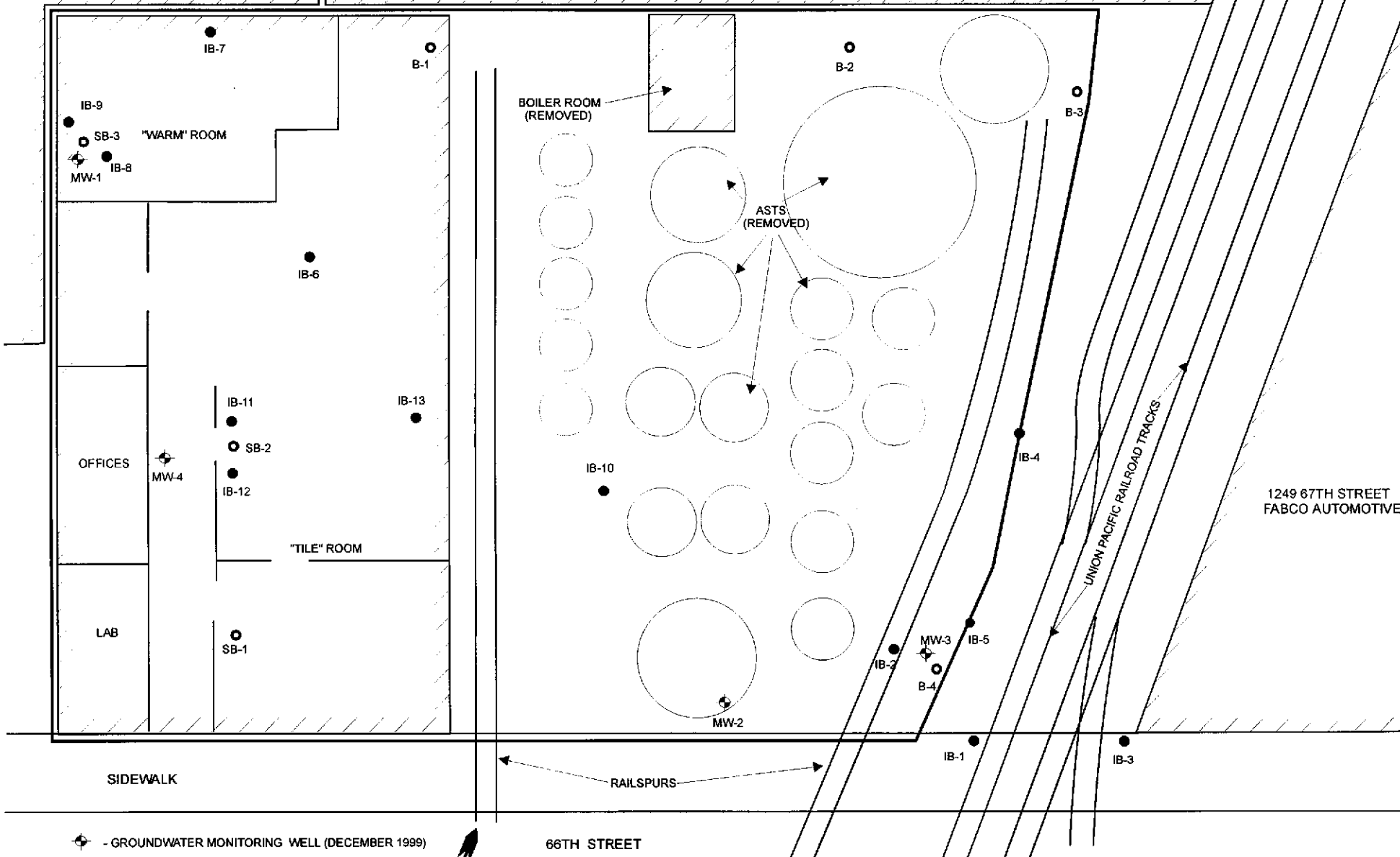
DATE: 06/09/99	FIGURE: 2
<b>GRIBI Associates</b>	



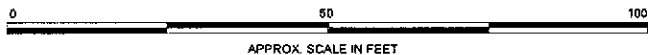
1295 67TH STREET  
NEW LOGIC INTERNATIONAL  
(DISTRIBUTION WAREHOUSE)

1265 67TH STREET  
GEORGE MARTIN MACHINING

1249 67TH STREET  
FABCO AUTOMOTIVE



- ⊕ - GROUNDWATER MONITORING WELL (DECEMBER 1999)
- - GRIBI ASSOCIATES BORING (APRIL 1999)
- - GEOMATRIX BORING (FEBRUARY 1999)

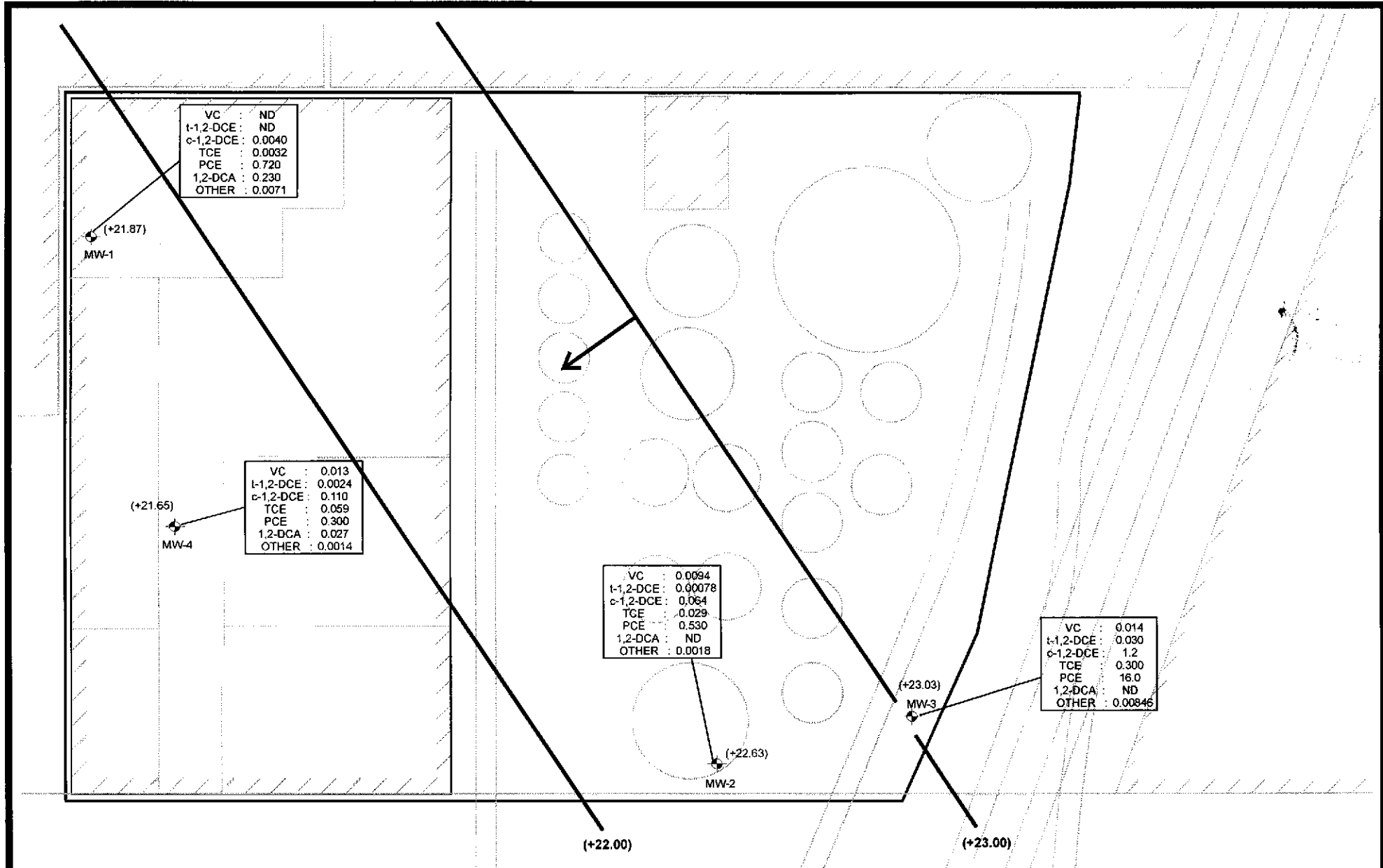


DESIGNED BY:	CHECKED BY:
DRAWN BY: JG	SCALE:
PROJECT NO: 149-01-03	

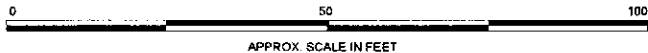
**SITE PLAN**

LIQUID SUGARS, INC. FACILITY  
1266 66TH STREET  
EMERYVILLE, CALIFORNIA

DATE: 01/10/00	FIGURE: 3
<b>GRIBI Associates</b>	



⊕ - GROUNDWATER MONITORING WELL (DECEMBER 1999)



DESIGNED BY:	CHECKED BY:
DRAWN BY: JG	SCALE:
PROJECT NO: 149-01-03	

**GROUNDWATER GRADIENT &  
HVOC RESULTS - 12/22/99**  
LIQUID SUGARS, INC. FACILITY  
1266 66TH STREET  
EMERYVILLE, CALIFORNIA

DATE: 01/10/00

FIGURE: 4

**GRIBI Associates**

DEPTH	3.0'	6.5'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	ND	ND
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	4.5'	12.0'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	ND	0.042
1,2-DCA	ND	0.042
OTHER	ND	ND

DEPTH	3.5'	6.0'	15.0'
VC	ND	ND	ND
t-1,2-DCE	ND	ND	ND
c-1,2-DCE	0.0061	ND	ND
TCE	0.0096	ND	ND
PCE	0.0052	ND	0.011
1,2-DCA	ND	ND	0.012
OTHER	ND	ND	ND

DEPTH	3.0'	6.0'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	ND	ND
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	6.0'	9.0'
VC	0.18	ND
t-1,2-DCE	0.011	ND
c-1,2-DCE	0.039	0.025
TCE	ND	0.041
PCE	0.078	0.10
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	6.5'
VC	ND
t-1,2-DCE	ND
c-1,2-DCE	ND
TCE	ND
PCE	ND
1,2-DCA	ND
OTHER	ND

DEPTH	3.5'	5.5'
VC	0.039	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	0.82	0.37
TCE	0.025	0.13
PCE	0.048	ND
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	11.0'	21.0'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	ND	ND
1,2-DCA	ND	0.027
OTHER	ND	ND

DEPTH	3.5'	6.0'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	0.020	ND
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	3.5'	6.0'
VC	0.0090	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	0.078	0.044
TCE	0.0080	0.0073
PCE	0.010	0.025
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	2.0'	4.0'	13.0'
VC	0.045	0.014	ND
t-1,2-DCE	ND	ND	ND
c-1,2-DCE	0.32	0.18	0.0094
TCE	0.21	0.13	0.012
PCE	0.017	0.068	0.028
1,2-DCA	ND	ND	ND
OTHER	ND	ND	ND

DEPTH	16.0'	26.0'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	ND	ND
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	3.5'	6.0'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	0.087	ND
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	6.0'	11.0'
VC	0.091	ND
t-1,2-DCE	0.011	ND
c-1,2-DCE	1.9	0.16
TCE	0.63	0.025
PCE	1.3	0.72
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	6.0'	11.0'
VC	0.026	ND
t-1,2-DCE	0.0064	ND
c-1,2-DCE	0.83	0.013
TCE	0.051	ND
PCE	0.15	0.16
1,2-DCA	ND	ND
OTHER	ND	ND

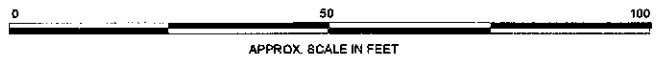
DEPTH	2.0'	5.5'
VC	ND	ND
t-1,2-DCE	ND	ND
c-1,2-DCE	ND	ND
TCE	ND	ND
PCE	0.017	0.068
1,2-DCA	ND	ND
OTHER	ND	ND

DEPTH	2.0'	6.0'	11.5'
VC	ND	0.13	0.0063
t-1,2-DCE	ND	0.024	0.021
c-1,2-DCE	ND	0.33	0.099
TCE	0.024	0.11	0.048
PCE	0.28	0.29	2.6
1,2-DCA	ND	ND	ND
OTHER	0.0021	ND	0.0072

◆ - GROUNDWATER MONITORING WELL (DECEMBER 1999)

● - GRIBI ASSOCIATES BORING (03/99)

○ - GEOMATRIX BORING (02/99)



DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_  
 DRAWN BY: JG SCALE: \_\_\_\_\_  
 PROJECT NO: 149-01-03

**SOIL HVOC RESULTS**  
 LIQUID SUGARS, INC. FACILITY  
 1266 66TH STREET  
 EMERYVILLE, CALIFORNIA

DATE: 01/10/00 FIGURE: 5  
**GRIBI Associates**

**APPENDIX A**  
**DRILLING PERMIT**



# ALAMEDA COUNTY PUBLIC WORKS AGENCY

## WATER RESOURCES SECTION

551 TURNER COURT, SUITE 300, HAYWARD, CA 94545-2461  
PHONE (510) 670-8575 ANDREAS GODFREY FAX (510) 670-8262  
(510) 670 8348 ALVIN KAN

### DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 1266 66th Street  
Emeryville CA  
(Liquid Sugar, Inc)

PERMIT NUMBER 99WR679  
WELL NUMBER \_\_\_\_\_  
APN \_\_\_\_\_

Geologic Conditions Source \_\_\_\_\_ ft. Accuracy & \_\_\_\_\_ ft.  
CON \_\_\_\_\_ ft. CCE \_\_\_\_\_ ft.  
APN \_\_\_\_\_

#### PERMIT CONDITIONS

Circle Permit Requirements to Apply

CLIENT  
Name Liquid Sugars, Inc  
Address 7901 POSEY AVE Phone 510/772-4700  
City Oakland, CA Zip 94621

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

APPLICANT  
Name Jim Gribi  
GRIBI Associates Fax 707/748-7763  
Address 1350 HAYES ST, C-14 Phone 707/748-7143  
City Emeryville Zip 94610

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

TYPE OF PROJECT		Geotechnical Investigation	
Well Construction	<input type="checkbox"/>	General	<input type="checkbox"/>
Pathing/Projection	<input type="checkbox"/>	Contamination	<input type="checkbox"/>
Water Supply	<input type="checkbox"/>	Well Destruction	<input type="checkbox"/>
Maintaining	<input checked="" type="checkbox"/>		

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

PROPOSED WATER SUPPLY WELL USE			
New Domestic	<input type="checkbox"/>	Replacement Domestic	<input type="checkbox"/>
Municipal	<input type="checkbox"/>	Irrigation	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	Other	<input type="checkbox"/>

- D. GEOTECHNICAL  
Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. If areas of known or suspected contamination, tremie cement grout shall be used in place of compacted cuttings.
- E. CATHODIC  
Fill hole above anode zone with concrete placed by tremie.
- F. WELL DESTRUCTION  
See attached
- G. SPECIAL CONDITIONS

DRILLING METHOD:  
Air Rotary  All Rotary  Auger   
Cable  Other

DRILLER'S LICENSE NO. C-57 405165

WELL PROJECTS  
Drill Hole Diameter 6 in. Maximum Depth 30 ft.  
Logging Diameter 2 in. Number 4  
Surface Seal Depth 10 ft.

GEOTECHNICAL PROJECTS  
Number of Boreings \_\_\_\_\_ Maximum Depth \_\_\_\_\_ ft.  
Hole Diameter \_\_\_\_\_ in.

EST. MAINTENANCE STARTING DATE 12/1/99  
EST. MAINTENANCE COMPLETION DATE 1/1/99

I hereby agree to comply with all requirements of this permit, and Alameda County Ordinance No. 73-02.

APPLICANT'S SIGNATURE James P. Gribi DATE 11/24/99

APPROVED Frank L. Codd DATE 11/29/99



COUNTY OF ALAMEDA  
PUBLIC WORKS AGENCY  
951 Turner Court, Room 300  
Hayward, CA 94545-2651

**FAX TRANSMITTAL**

TO: Jim Gribi -  
Gribi Associates -

DATE: 11/30/99

FAX NO.: 707-748-7763

TRANSMITTING THE FOLLOWING:

TITLE/DESCRIPTION  
Drilling Permit 99WR679 -

2 TOTAL PAGES INCLUDING THIS SHEET.

FROM WATER RESOURCES

NAME: Marlon Magallanes/Cindy Hutchinson TEL: (510) 670-5248 FAX: (510) 670-5262

E-MAIL: Wrebcc@acwpa.mail.co.alameda.ca.us-Cindyh@acwpa.mail.co.alameda.ca.us

IF YOU EXPERIENCE PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL US.

REMARKS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**APPENDIX B**  
**SOIL BORING LOGS**

# LOG OF WELL BORING

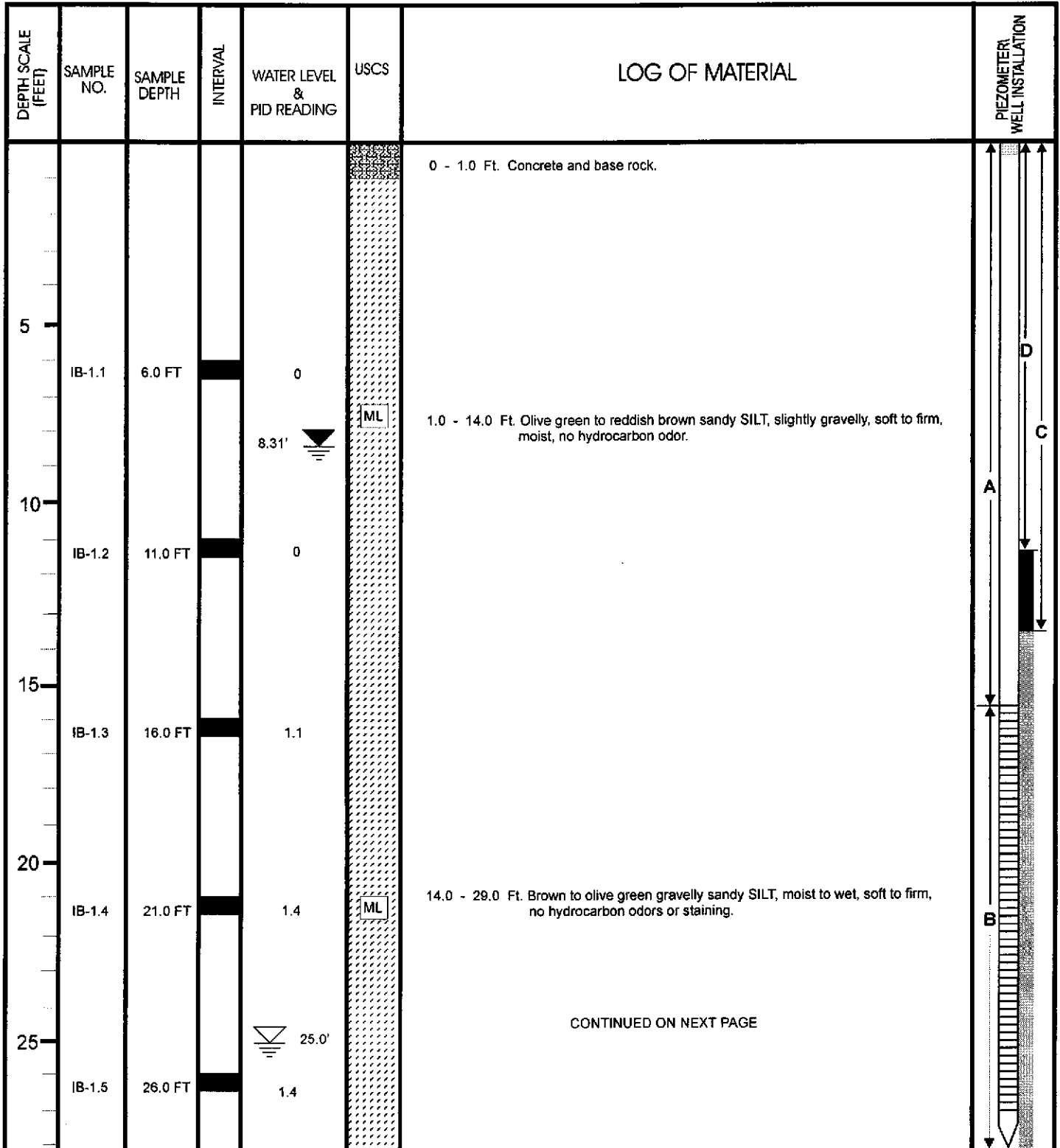
## GRIBI Associates

SHEET 1 OF 2

BORING NUMBER : MW-1  
 BORING LOCATION: WEST WALL OF WARM ROOM  
 BORING TYPE: INVESTIGATIVE BORING  
 PROJECT NAME: LSI-NORTH  
 PROJECT NUMBER: 124-02-03

START DATE: 12/16/99  
 COMPLETION DATE: 12/16/99

DRILLING CONTRACTOR: GREGG DRILLING  
 DRILLING METHOD: HOLLOW STEM AUGER  
 BOREHOLE DIAMETER: 6 INCHES  
 COMPLETION METHOD: GROUTED  
 BORING TOTAL DEPTH: 35 FEET  
 GROUNDWATER TOTAL DEPTH: 25.0 FEET





BORING NUMBER : MW-1  
 BORING LOCATION:  
 WEST WALL OF WARM ROOM  
 BORING TYPE: INVESTIGATIVE BORING  
 PROJECT NAME: LSI-NORTH  
 PROJECT NUMBER: 124-02-03

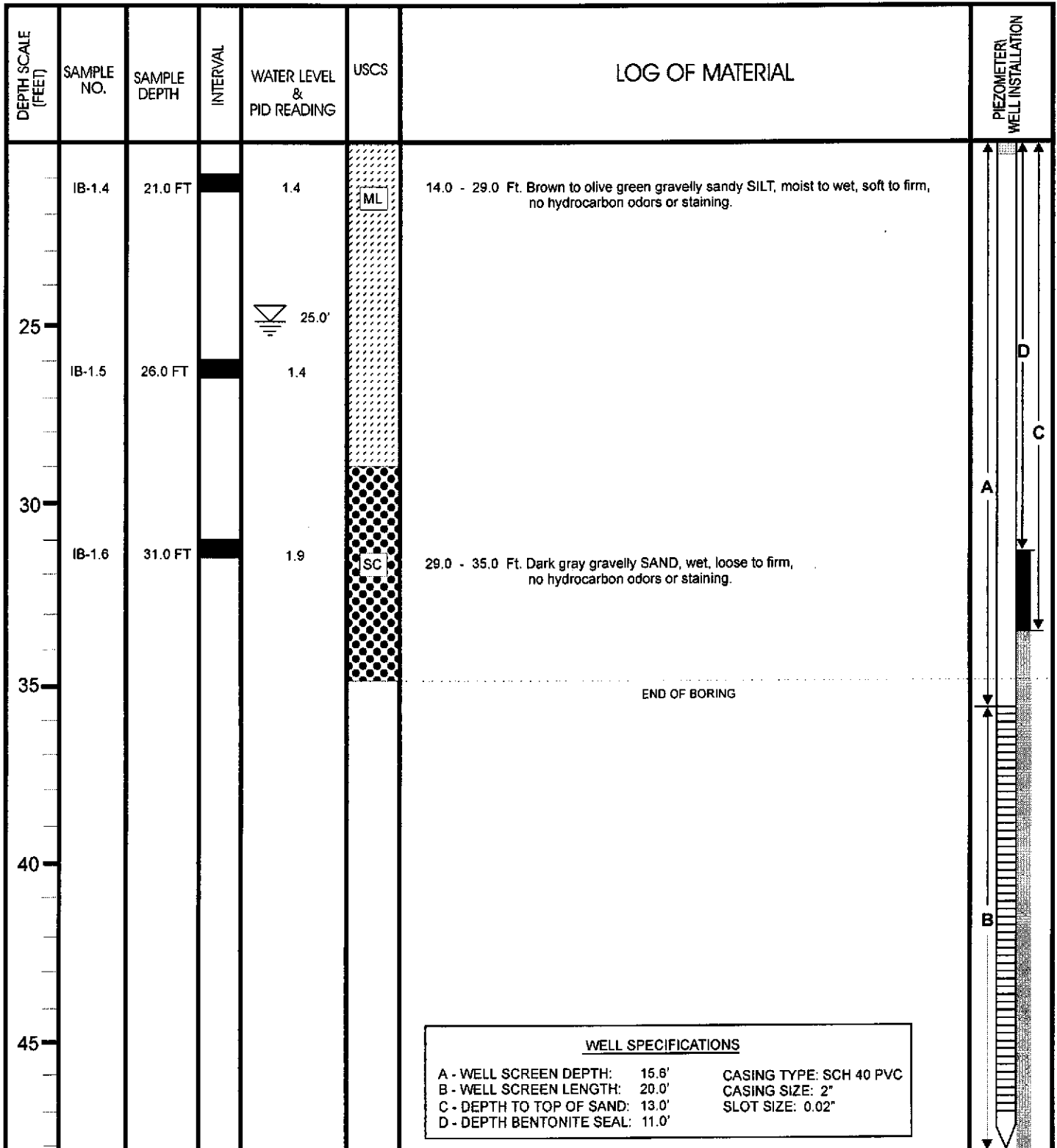
# LOG OF WELL BORING

## GRIBI Associates

SHEET 2 OF 2

DRILLING CONTRACTOR: GREGG DRILLING  
 DRILLING METHOD: HOLLOW STEM AUGER  
 BOREHOLE DIAMETER: 6 INCHES  
 COMPLETION METHOD: GROUTED  
 BORING TOTAL DEPTH: 35 FEET  
 GROUNDWATER TOTAL DEPTH: 25.0 FEET

START DATE: 12/16/99  
 COMPLETION DATE: 12/16/99



# LOG OF WELL BORING

SHEET 1 OF 2

BORING NUMBER : MW-2

BORING LOCATION: INSIDE TANK YARD 12'

FROM SIDEWALK AND 26' EAST SIDE OF TANK YARD

BORING TYPE: INVESTIGATIVE BORING

PROJECT NAME: LSI-NORTH

PROJECT NUMBER: 124-02-03

## GRIBI Associates

DRILLING CONTRACTOR: GREGG DRILLING

DRILLING METHOD: HAND AUGER

BOREHOLE DIAMETER: 6 INCHES

COMPLETION METHOD: GROUTED

BORING TOTAL DEPTH: 30.0 FEET

GROUNDWATER TOTAL DEPTH: 25.0 FEET

START DATE: 12/16/99

COMPLETION DATE: 12/16/99

DEPTH SCALE (FEET)	SAMPLE NO.	SAMPLE DEPTH	INTERVAL	WATER LEVEL & PID READING	USCS	LOG OF MATERIAL	PIEZOMETER WELL INSTALLATION
5	IB-2.1	6.0 FT		330 6.85'	ML	0 - 4.0 Ft. Black sandy SILT, soft, wet, no hydrocarbon odor.	
10	IB-2.2	11.0 FT		0	ML	4.0 - 19.0 Ft. Olive green to brown sandy SILT, slightly gravelly, dense, moist, no hydrocarbon odor.	
15	IB-2.3	16.0 FT		1.1			
20	IB-2.4	21.0 FT		1.4			
25	IB-2.5	26.0 FT		1.4 25.0'	ML	19.0 - 30.0 Ft. Brown to dark green gravelly sandy SILT, moist to wet, soft to firm, no hydrocarbon odors or staining.	

CONTINUED ON NEXT PAGE

# LOG OF WELL BORING

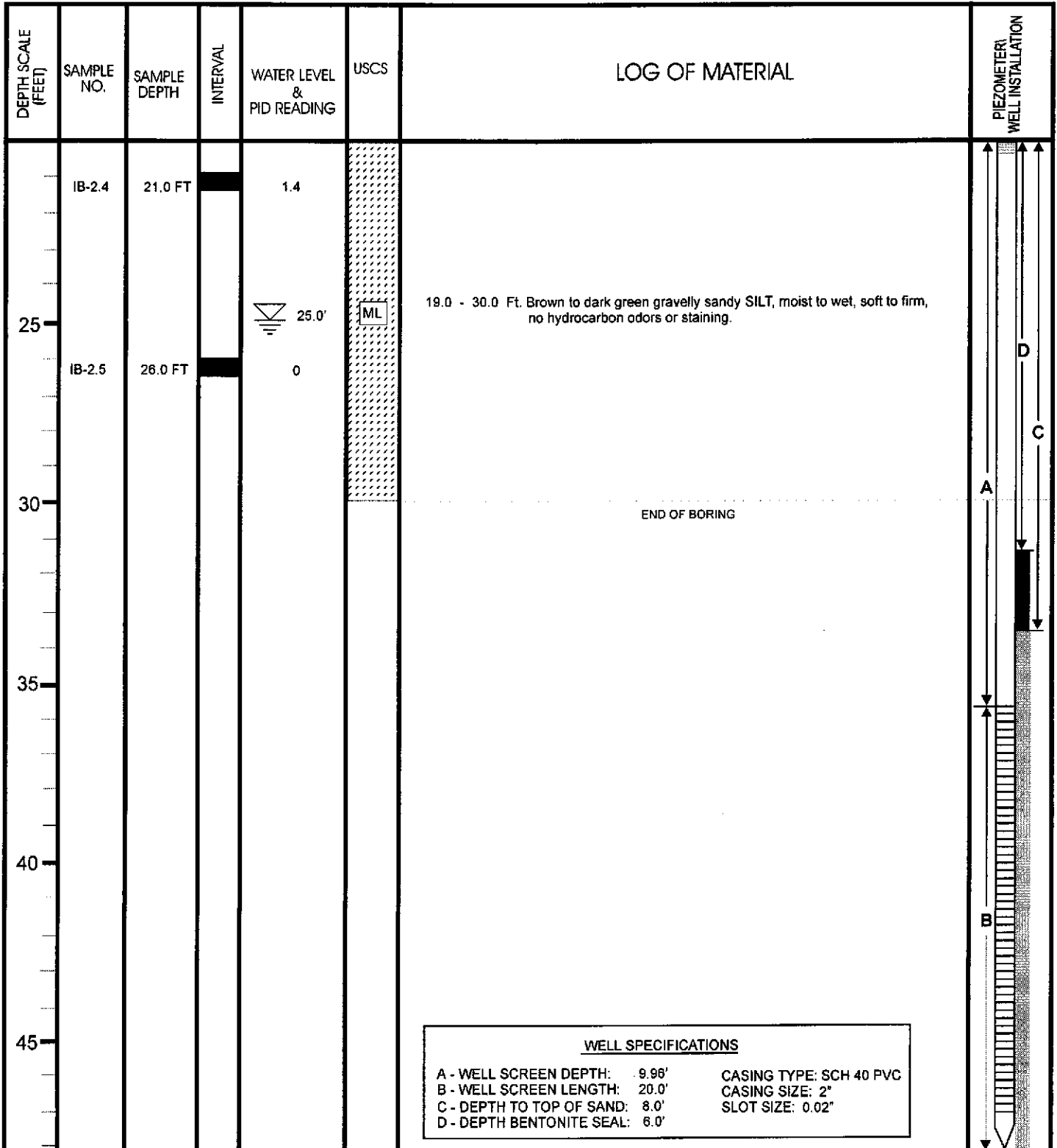
## GRIBI Associates

SHEET 2 OF 2

BORING NUMBER : MW-2  
 BORING LOCATION: INSIDE TANK YARD 12'  
 FROM SIDEWALK AND 26' EAST SIDE OF TANK YARD  
 BORING TYPE: INVESTIGATIVE BORING  
 PROJECT NAME: LSI-NORTH  
 PROJECT NUMBER: 124-02-03

START DATE: 12/16/99  
 COMPLETION DATE: 12/16/99

DRILLING CONTRACTOR: GREGG DRILLING  
 DRILLING METHOD: HAND AUGER  
 BOREHOLE DIAMETER: 6 INCHES  
 COMPLETION METHOD: GROUTED  
 BORING TOTAL DEPTH: 30.0 FEET  
 GROUNDWATER TOTAL DEPTH: 25.0 FEET



# LOG OF WELL BORING

SHEET 1 OF 1

BORING NUMBER : MW-3

BORING LOCATION: 20' EAST OF TANK YARD  
24' NORTH OF SIDEWALK

BORING TYPE: INVESTIGATIVE BORING

PROJECT NAME: LSI-NORTH

PROJECT NUMBER: 124-02-03

## GRIBI Associates

DRILLING CONTRACTOR: GREGG DRILLING

DRILLING METHOD: HAND AUGER

BOREHOLE DIAMETER: 6 INCHES

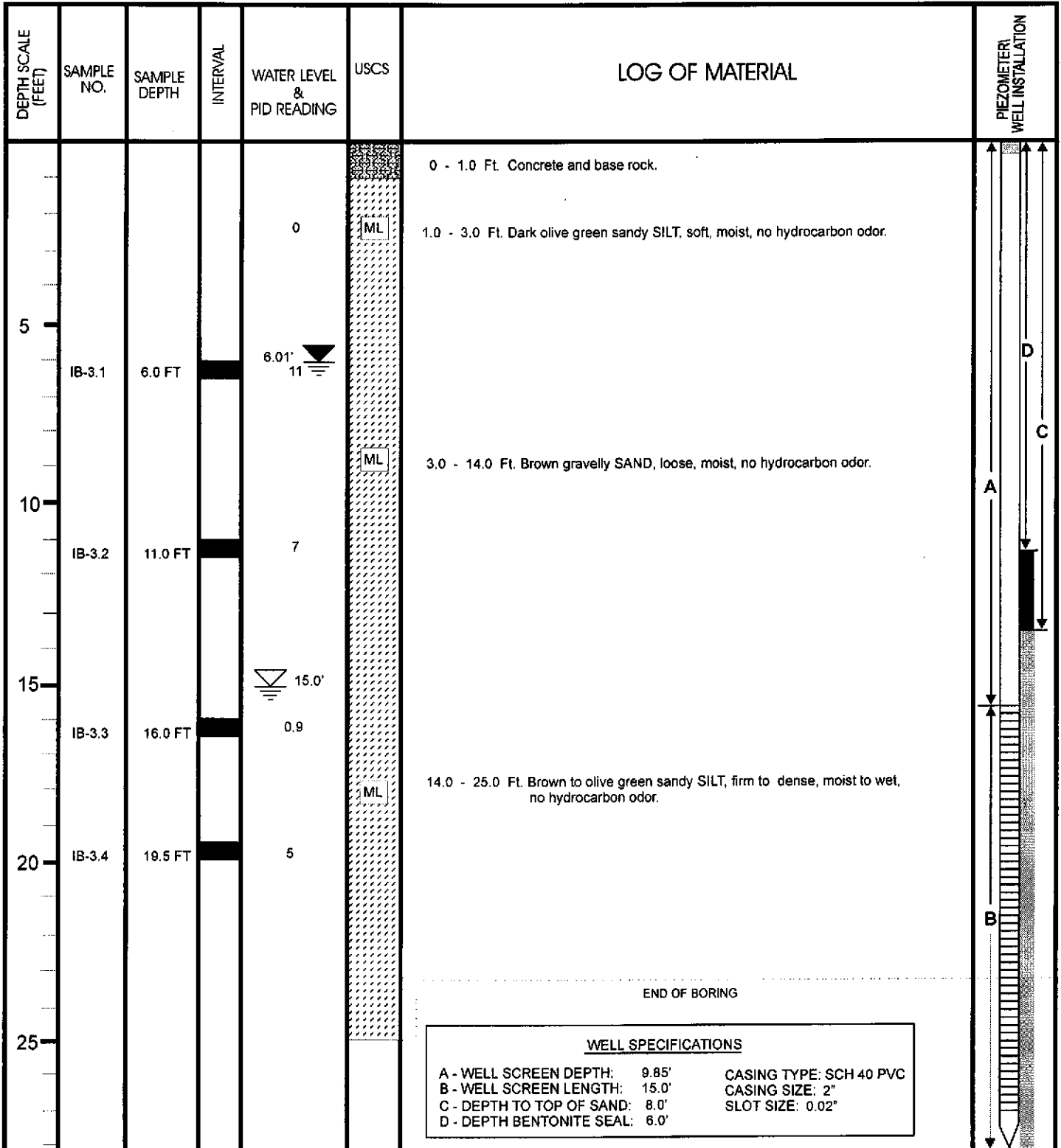
COMPLETION METHOD: GROUTED

BORING TOTAL DEPTH: 25.0 FEET

GROUNDWATER TOTAL DEPTH: 15.0 FEET

START DATE: 12/17/99

COMPLETION DATE: 12/17/99



# LOG OF WELL BORING

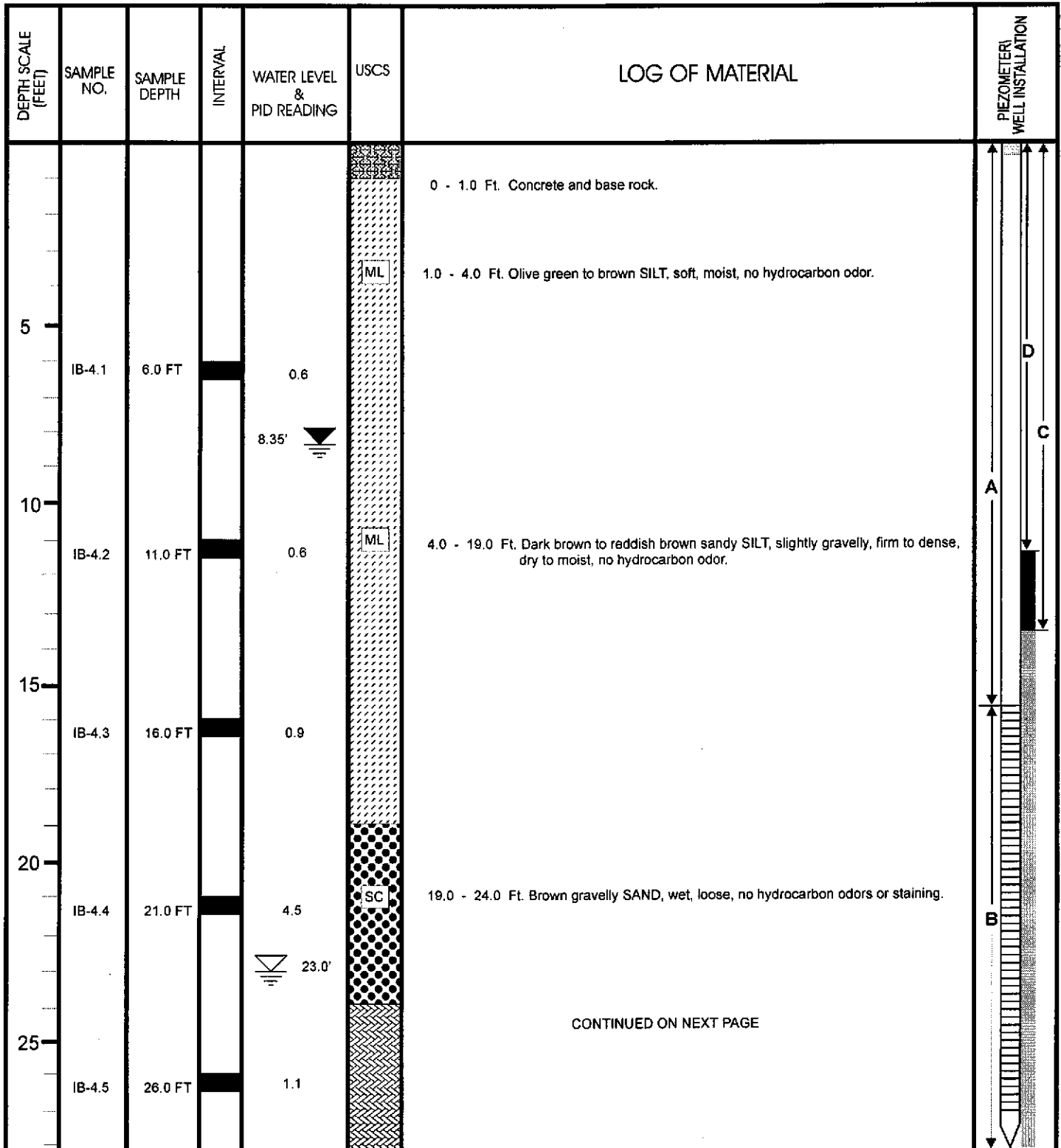
## GRIBI Associates

SHEET 1 OF 2

BORING NUMBER: MW-4  
 BORING LOCATION: 5' EAST OF LAB WALL  
 75' NORTH OF SIDEWALK  
 BORING TYPE: INVESTIGATIVE BORING  
 PROJECT NAME: LSI-NORTH  
 PROJECT NUMBER: 124-02-03

START DATE: 12/17/99  
 COMPLETION DATE: 12/17/99

DRILLING CONTRACTOR: GREGG DRILLING  
 DRILLING METHOD: HOLLOW STEM AUGER  
 BOREHOLE DIAMETER: 6 INCHES  
 COMPLETION METHOD: GROUTED  
 BORING TOTAL DEPTH: 35 FEET  
 GROUNDWATER TOTAL DEPTH: 23.0 FEET



# LOG OF WELL BORING

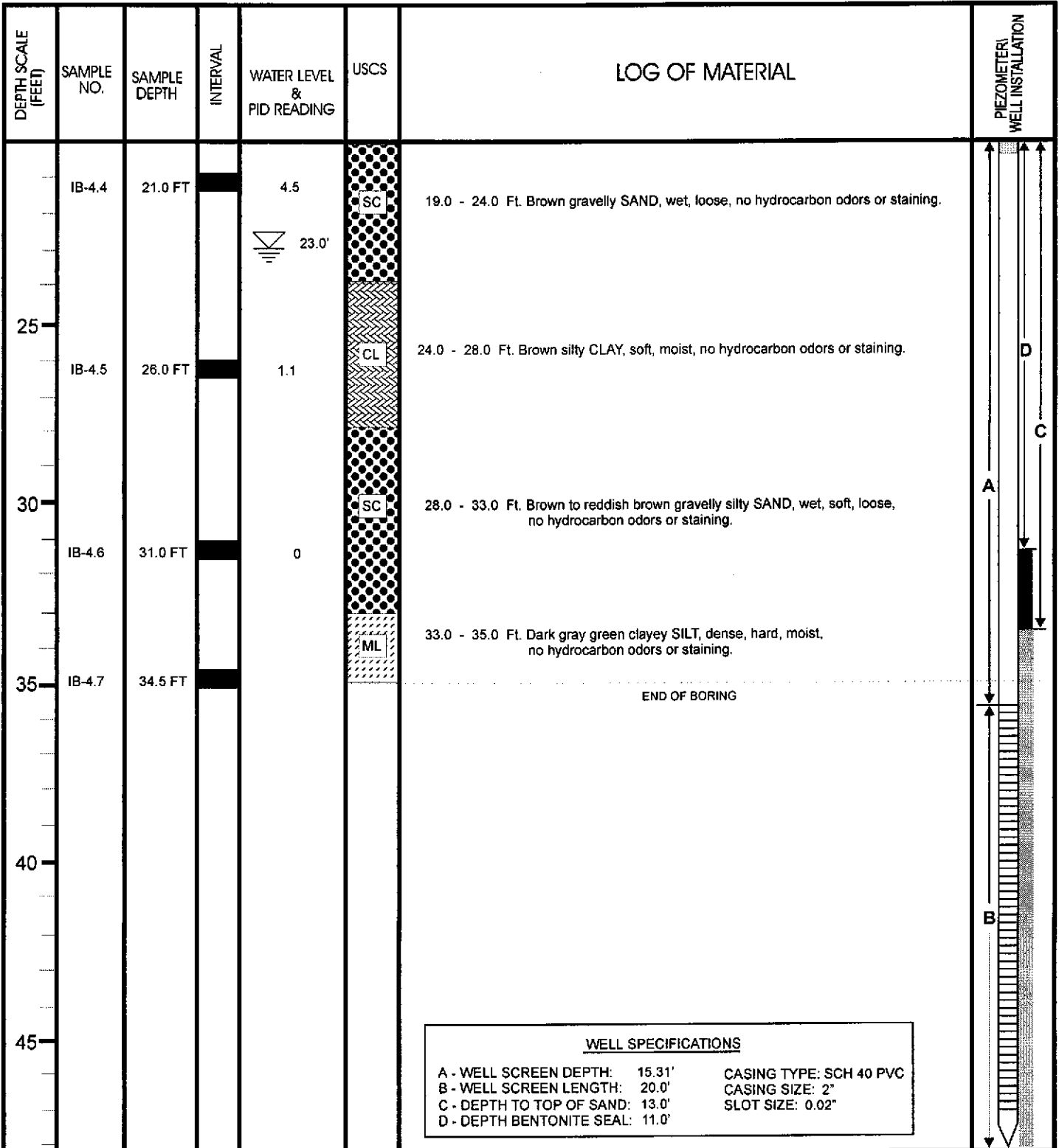
## GRIBI Associates

SHEET 2 OF 2

BORING NUMBER : MW-4  
 BORING LOCATION: 5' EAST OF LAB WALL  
 75' NORTH OF SIDEWALK  
 BORING TYPE: INVESTIGATIVE BORING  
 PROJECT NAME: LSI-NORTH  
 PROJECT NUMBER: 124-02-03

START DATE: 12/17/99  
 COMPLETION DATE: 12/17/99

DRILLING CONTRACTOR: GREGG DRILLING  
 DRILLING METHOD: HOLLOW STEM AUGER  
 BOREHOLE DIAMETER: 6 INCHES  
 COMPLETION METHOD: GROUTED  
 BORING TOTAL DEPTH: 35 FEET  
 GROUNDWATER TOTAL DEPTH: 23.0 FEET



**APPENDIX C**

**GROUNDWATER SAMPLING DATA SHEETS**

**GROUNDWATER SAMPLING RECORD**

**GRIBI Associates**

Well No. <u>MW-1</u>	Well Loc.
Project Name	Project No.
Date _____ Time _____	TOC Elevation _____ GW Elevation _____
Depth to Water <u>8.31</u>	Well Depth _____ Well Diameter _____
Purge Water, 2": Wtr Column X 0.163 X 3 =	Purge Water, 4": Wtr Column X 0.653 X 3 =
Purge/Sample Method	Lab Analyses
Weather Conditions	Laboratory

Time	Volume Purged	Temp.	Cond.	pH	Visual
<u>1410</u>	<u>0</u>	<u>76.1</u>	<u>1.75</u>	<u>5.65</u>	<u>Muddy Brn, No H<sub>2</sub>O O<sub>2</sub>H</u>
	<u>2</u>	<u>74.6</u>	<u>1.77</u>	<u>5.55</u>	<u>     </u>
	<u>4</u>	<u>73.5</u>	<u>1.61</u>	<u>5.54</u>	<u>     </u>
	<u>8</u>	<u>73.6</u>	<u>1.59</u>	<u>5.57</u>	<u>     </u>
<u>1440</u>	<u>14</u>	<u>73.2</u>	<u>1.60</u>	<u>5.59</u>	<u>     , Sweet Odor</u>

mod. Sweet Odor

Remarks Slow Recharge  
DO: 4.2 <sup>0.0</sup> <sub>0.35</sub>  
ORP: <sup>195</sup>



GROUNDWATER SAMPLING RECORD		GRIBI Associates	
Well No. MW-2	Well Loc.		
Project Name LSI-North	Project No.		
Date 12/22 Time	TOC Elevation	GW Elevation	
Depth to Water 6.85' TP=25.0'	Well Depth	Well Diameter	
Purge Water, 2": Wtr Column X 0.163 X 3 = 8.9 gal	Purge Water, 4": Wtr Column X 0.653 X 3 =		
Purge/Sample Method Pump	Lab Analyses		
Weather Conditions	Laboratory		

Time	Volume Purged	Temp.	Cond.	pH	Visual
1245	0	69.4	0.99	5.13	Murky, Brown, No HCO <sub>3</sub> <sup>-</sup> /SH
	2	68.5	1.05	5.27	" " "
	4	68.7	1.06	5.25	" " "
1255	9	68.5	0.95	5.52	" " "
Remarks DO: 22.0 mg/L mV 2.02 ORP: 211					

**GROUNDWATER SAMPLING RECORD**

**GRIBI Associates**

Well No. <u>MW-3</u>	Well Loc.
Project Name	Project No.
Date <u>12</u> Time	TOC Elevation GW Elevation
Depth to Water <u>6.01</u> <u>25.0'</u>	Well Depth Well Diameter
Purge Water, 2": Wtr Column X 0.163 X 3 =	Purge Water, 4": Wtr Column X 0.653 X 3 =
Purge/Sample Method	Lab Analyses
Weather Conditions	Laboratory

Time	Volume Purged	Temp.	Cond.	pH	Visual
1315	0	70.1	1.45	6.83	muty Brn, No HC 0/5 H
	2	68.5	1.45	6.73	" "
	4	68.5	1.47	6.67	" "
1330	10	68.6	1.48	6.59	" "

Remarks MU  
 ORP: 217  
 DO: 0/0 mg/L  
2.97 2.25

GROUNDWATER SAMPLING RECORD		GRIBI Associates	
Well No. MW-4	Well Loc.		
Project Name LSI-North	Project No.		
Date 12/22 Time	TOC Elevation	GW Elevation	
Depth to Water 8.35' TP=35.6	Well Depth	Well Diameter	
Purge Water, 2": Wtr Column X 0.163 X 3 = 13	Purge Water, 4": Wtr Column X 0.653 X 3 =		
Purge/Sample Method Pump	Lab Analyses		
Weather Conditions	Laboratory		

ORP MV	Time	Volume Purged	Temp.	Cond.	pH	Visual
183	1105	0	68.1	2.22	5.49	M. & B. Brn, No H <sub>2</sub> C O/S H
178		2	66.2	2.05	5.39	" "
176		4	66.9	1.95	5.38	" "
171		8	66.1	2.02	5.40	" "
162	1130	13	66.4	1.92	5.44	" "

Remarks Mg/L O/L  
 DO: 2.28 21.8 Bucket 1 0-4 gal  
 1.98 25.6 Bucket 2 4-8 gal  
 2.18 Bucket 3 8-13 gal  
 Elevation: 15' Salinity 0 Pump Depth: 25.0'

**APPENDIX D**

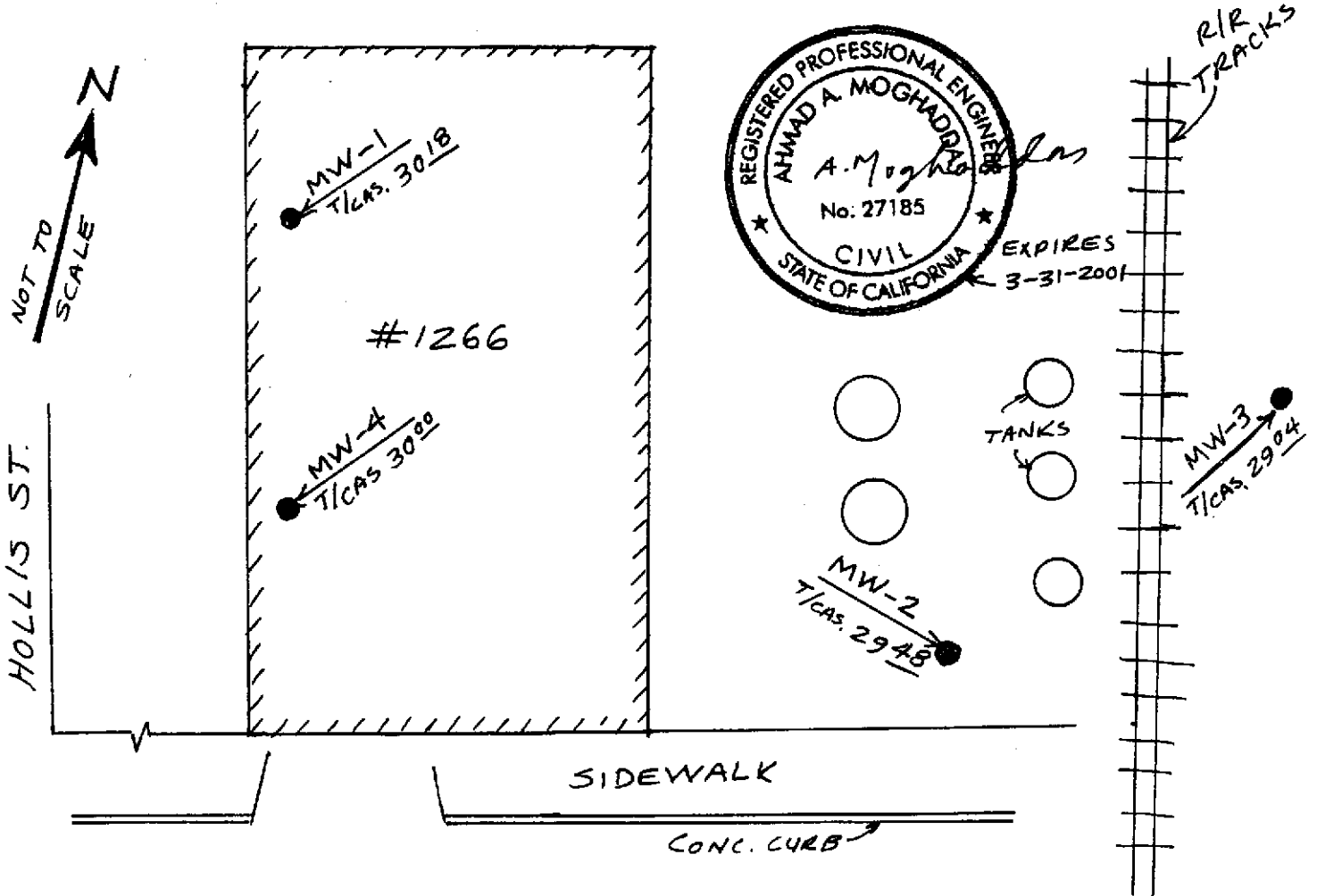
**SURVEYOR'S REPORT**

AHMAD MOGHADDAS  
REGISTERED CIVIL ENGINEER  
1631 BERKELEY WAY  
BERKELEY, CA 94703  
BA3-6580

12-30-99

1266 66TH ST., EMERYVILLE

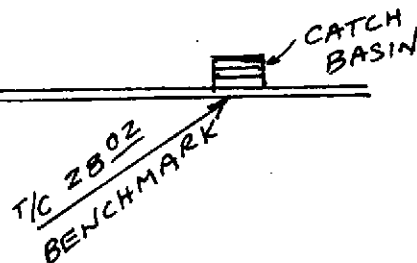
MONITORING WELLS N. SIDE OF 66th ST.,  
ON LIQUID SUGARS INC. PROPERTY.



66TH STREET

BENCHMARK

BENCHMARK IS TOP OF  
CURB AT CATCH BASIN ACROSS  
THE STREET AT EL. 28.02 IN  
THE CITY OF EMERYVILLE DATUM.



**APPENDIX E**

**LABORATORY DATA REPORTS AND  
CHAIN OF CUSTODY RECORDS**



# Acculabs Inc.

Davis

1046 Olive Drive, Davis, CA 95616 ■ 530-757-0920 ■ Fax 753-6091

Sample Log 20874  
January 03, 2000

Jim Gribi  
Gribi Associates  
1350 Hayes Street, #C-14  
Benicia, CA 94510

Subject : 22 Soil Sample  
Project Name : LSI-North  
Project Number : 124-02-03

Dear Mr. Gribi,

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.

Acculabs - Davis is certified by the State of California (# 2330), the State of Arizona (AZ0583) and the State of Nevada. If you have any questions regarding procedures or results, please call me at 530-757-0920.

Sincerely,

Tom Kwoka

Sample : MW-1.2 (11.0)

Project Name : LSI-North

Project Number : 124-02-03

Date Analyzed : 12/29/1999

Matrix : Soil

Sample Date :12/16/1999

Analysis Method: EPA 8260B

Parameter	Measured Value	MRL	Units
Chloromethane	< 0.0050	0.0050	mg/Kg
Vinyl Chloride	< 0.0050	0.0050	mg/Kg
Bromomethane	< 0.0050	0.0050	mg/Kg
Chloroethane	< 0.0050	0.0050	mg/Kg
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg
Methylene Chloride	< 0.0050	0.0050	mg/Kg
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
Chloroform	< 0.0050	0.0050	mg/Kg
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg
Trichloroethene	< 0.0050	0.0050	mg/Kg
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg
Bromodichloromethane	< 0.0050	0.0050	mg/Kg
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg
Tetrachloroethene	< 0.0050	0.0050	mg/Kg
Dibromochloromethane	< 0.0050	0.0050	mg/Kg
Chlorobenzene	< 0.0050	0.0050	mg/Kg
Bromoform	< 0.0050	0.0050	mg/Kg
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
Dibromofluoromethane (Surr)	96.4		% Recovery
1,2-Dichloroethane-d4 (Surr)	102		% Recovery

MRL = Method reporting limit  
 tr = Trace detected below reporting limit

Approved By:  Joel Kiff





Report Number : 15670

Date : 01/03/2000

Sample : MW-2.2 (11.0)

Project Name : LSI-North

Project Number : 124-02-03

Date Analyzed : 12/29/1999

Matrix : Soil

Sample Date : 12/16/1999

Analysis Method: EPA 8260B

Parameter	Measured		Units
	Value	MRL	
Chloromethane	< 0.0050	0.0050	mg/Kg
Vinyl Chloride	< 0.0050	0.0050	mg/Kg
Bromomethane	< 0.0050	0.0050	mg/Kg
Chloroethane	< 0.0050	0.0050	mg/Kg
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg
Methylene Chloride	< 0.0050	0.0050	mg/Kg
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg
<b>cis-1,2-Dichloroethene</b>	<b>0.013</b>	0.0050	mg/Kg
Chloroform	< 0.0050	0.0050	mg/Kg
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg
Trichloroethene	< 0.0050	0.0050	mg/Kg
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg
Bromodichloromethane	< 0.0050	0.0050	mg/Kg
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg
<b>Tetrachloroethene</b>	<b>0.16</b>	0.0050	mg/Kg
Dibromochloromethane	< 0.0050	0.0050	mg/Kg
Chlorobenzene	< 0.0050	0.0050	mg/Kg
Bromoform	< 0.0050	0.0050	mg/Kg
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
Dibromofluoromethane (Surr)	102		% Recovery
1,2-Dichloroethane-d4 (Surr)	101		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff



Report Number : 15670

Date : 01/03/2000

Sample : MW-3.1 (6.0)

Project Name : LSI-North

Project Number : 124-02-03

Date Analyzed : 12/30/1999

Matrix : Soil

Sample Date : 12/16/1999

Analysis Method: EPA 8260B

Parameter	Measured Value	MRL	Units
Chloromethane	< 0.0050	0.0050	mg/Kg
Vinyl Chloride	0.091	0.0050	mg/Kg
Bromomethane	< 0.0050	0.0050	mg/Kg
Chloroethane	< 0.0050	0.0050	mg/Kg
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg
Methylene Chloride	< 0.0050	0.0050	mg/Kg
trans-1,2-Dichloroethene	0.011	0.0050	mg/Kg
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg
cis-1,2-Dichloroethene	1.9	0.0050	mg/Kg
Chloroform	< 0.0050	0.0050	mg/Kg
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg
Trichloroethene	0.63	0.0050	mg/Kg
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg
Bromodichloromethane	< 0.0050	0.0050	mg/Kg
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg
Tetrachloroethene	1.3	0.0050	mg/Kg
Dibromochloromethane	< 0.0050	0.0050	mg/Kg
Chlorobenzene	< 0.0050	0.0050	mg/Kg
Bromoform	< 0.0050	0.0050	mg/Kg
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
Dibromofluoromethane (Surr)	100		% Recovery
1,2-Dichloroethane-d4 (Surr)	105		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff



Report Number : 15670

Date : 01/03/2000

Sample : MW-3.2 (11.0)

Project Name : LSI-North

Project Number : 124-02-03

Date Analyzed : 12/30/1999

Matrix : Soil

Sample Date : 12/16/1999

Analysis Method: EPA 8260B

Parameter	Measured Value	MRL	Units
Chloromethane	< 0.0050	0.0050	mg/Kg
Vinyl Chloride	< 0.0050	0.0050	mg/Kg
Bromomethane	< 0.0050	0.0050	mg/Kg
Chloroethane	< 0.0050	0.0050	mg/Kg
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg
Methylene Chloride	< 0.0050	0.0050	mg/Kg
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg
<b>cis-1,2-Dichloroethene</b>	<b>0.16</b>	0.0050	mg/Kg
Chloroform	< 0.0050	0.0050	mg/Kg
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg
<b>Trichloroethene</b>	<b>0.025</b>	0.0050	mg/Kg
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg
Bromodichloromethane	< 0.0050	0.0050	mg/Kg
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg
<b>Tetrachloroethene</b>	<b>0.72</b>	0.0050	mg/Kg
Dibromochloromethane	< 0.0050	0.0050	mg/Kg
Chlorobenzene	< 0.0050	0.0050	mg/Kg
Bromoform	< 0.0050	0.0050	mg/Kg
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
Dibromofluoromethane (Surr)	104		% Recovery
1,2-Dichloroethane-d4 (Surr)	104		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff



Report Number : 15670

Date : 01/03/2000

Sample : MW-4.3 (16.0)

Project Name : LSI-North

Project Number : 124-02-03

Date Analyzed : 12/30/1999

Matrix : Soil

Sample Date :12/16/1999

Analysis Method: EPA 8260B

Parameter	Measured Value	MRL	Units
Chloromethane	< 0.0050	0.0050	mg/Kg
Vinyl Chloride	< 0.0050	0.0050	mg/Kg
Bromomethane	< 0.0050	0.0050	mg/Kg
Chloroethane	< 0.0050	0.0050	mg/Kg
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg
Methylene Chloride	< 0.0050	0.0050	mg/Kg
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
Chloroform	< 0.0050	0.0050	mg/Kg
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg
Trichloroethene	< 0.0050	0.0050	mg/Kg
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg
Bromodichloromethane	< 0.0050	0.0050	mg/Kg
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg
Tetrachloroethene	< 0.0050	0.0050	mg/Kg
Dibromochloromethane	< 0.0050	0.0050	mg/Kg
Chlorobenzene	< 0.0050	0.0050	mg/Kg
Bromoform	< 0.0050	0.0050	mg/Kg
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
Dibromofluoromethane (Surr)	103		% Recovery
1,2-Dichloroethane-d4 (Surr)	106		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff

Sample : MW-4.5 (26.0)

Project Name : LSI-North

Project Number : 124-02-03

Date Analyzed : 12/30/1999

Matrix : Soil

Sample Date : 12/16/1999

Analysis Method: EPA 8260B

Parameter	Measured Value	MRL	Units
Chloromethane	< 0.0050	0.0050	mg/Kg
Vinyl Chloride	< 0.0050	0.0050	mg/Kg
Bromomethane	< 0.0050	0.0050	mg/Kg
Chloroethane	< 0.0050	0.0050	mg/Kg
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg
Methylene Chloride	< 0.0050	0.0050	mg/Kg
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg
Chloroform	< 0.0050	0.0050	mg/Kg
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg
Trichloroethene	< 0.0050	0.0050	mg/Kg
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg
Bromodichloromethane	< 0.0050	0.0050	mg/Kg
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg
Tetrachloroethene	< 0.0050	0.0050	mg/Kg
Dibromochloromethane	< 0.0050	0.0050	mg/Kg
Chlorobenzene	< 0.0050	0.0050	mg/Kg
Bromoform	< 0.0050	0.0050	mg/Kg
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg
Dibromofluoromethane (Surr)	101		% Recovery
1,2-Dichloroethane-d4 (Surr)	103		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff

15670

# Acculabs - Davis/Sacramento Subcontracted Tests Form

Laboratory Name KiFF

Project Name : LSI-North  
Project Number : 124-02-03  
Project Manager: Troy Turpen

Mail Results and Invoices To 1046 Olive Drive, Suite 2, Davis, CA 95616

Fax Results To 530-753-6091

Call 530-757-0920 with questions

Use this number as a Purchase Order No.: **20874**

Number	Name	Mx.	Date Sampled	Tests	No. of Containers:
20874-02	MW-1.2 (11.0)	SO	12/16/99	8010 List by 8260 HVOCs	1
Location:					
20874-04	MW-1.4 (21.0)	SO	12/16/99		1
Location:					
20874-07	MW-2.1 (6.0)	SO	12/16/99		1
Location:					
20874-08	MW-2.2 (11.0)	SO	12/16/99		1
Location:					
20874-12	MW-3.1 (6.0)	SO	12/16/99		1
Location:					
20874-13	MW-3.2 (11.0)	SO	12/16/99		1
Location:					
20874-18	MW-4.3 (16.0)	SO	12/16/99		1
Location:					

Remarks:

Relinquished by:	Received by:	Date	Time
<i>[Signature]</i>	<i>Justin Reusch</i>	12/21/99	1600

Due Date/Time : 12/21/99 1500

Subcontract Lab Reference # : \_\_\_\_\_

Fax this form to 530-753-6091 when reference number has been assigned to samples and written in space above.

Please fax results prior to mailing.

15670

# Acculabs - Davis/Sacramento

## Laboratory Name

Kiff

## Subcontracted Tests Form

Mail Results and Invoices To 1046 Olive Drive, Suite 2, Davis, CA 95616

Project Name : LSI-North

Fax Results To 530-753-6091

Project Number : 124-02-03

Call 530-757-0920 with questions

Project Manager: Troy Turpen

Use this number as a Purchase Order No.:

**20874**

Number	Name	Mx.	Date Sampled	Tests
20874-20	MW-4.5 (28.0)	SO	12/16/99	8010 List by 8260 HVOCs

-08

Location: \_\_\_\_\_

No. of Containers: 1

Remarks:

Relinquished by:	Received by:	Date	Time
<i>[Signature]</i>	<i>Justin Resch</i>	12/21/99	1600

Due Date/Time : 12/28/99 1500

Subcontract Lab Reference # : \_\_\_\_\_

Fax this form to 530-753-6091 when reference number has been assigned to samples and written in space above.

Please fax results prior to mailing.





# Acculabs Inc.

Lab Number

20874

Report

Due Date:

- [ ] 1725 W. 17th. St. Tempe AZ 85281
- [ ] 4455 S. Park Ave. Tucson AZ 85714
- [ ] 2029 N. 4th St. Flagstaff AZ 86004
- [ ] 1046 Olive Drive Davis CA 95616
- [ ] 75 Suttle St. Durango CO 81301
- [ ] 4663 Table Mountain Dr. Golden CO 80403
- [ ] 992 Spice Islands Dr. Sparks NV 89431

- 480-967-1310 Fax 967-1019
- 520-807-3801 Fax 807-3803
- 520-774-7643 Fax 774-7648
- 530-757-0920 Fax 753-6091
- 970-247-4220 Fax 247-4227
- 303-277-9514 Fax 277-9512
- 775-355-0202 Fax 355-0817

Client <b>GRI B1</b>		Fax Results Y N	Page of
Address		<b>PUBLIC WATER SUPPLY INFORMATION</b>	
City, State & Zip		System Name	
Contact		PWS No.	Report to State/EPA Y N
Phone	Collector's Name <b>Grib 1</b>	POE No.	DWR No.
Fax	Project Name <b>LS1-North</b>	Collection Point	
P.O. Number	Project Number <b>124-02-03</b>	Location (City)	

SAMPLE TYPE CODES			Compliance Monitoring Y N	S a m p l e  T y p e	C o n t a i n e r s	Analyses Requested											Spl. No.					
DW = drinking water	TB = travel blank	SO = soil					/ HNO <sub>3</sub>															
WW = waste water	SD = solid	SL = sludge																				
MW = monitoring well	SO = soil																					
HW = hazardous waste	SL = sludge																					
TURNAROUND TIME REQUESTED			Lab Manager Approval																			
Standard																						
RUSH																						
Special																						
CLIENT'S SAMPLE ID/LOCATION	Date	Time													Spl. No.							
MW-3.1 (6.0)	12/17		S	1	X																12	
MW-3.2 (11.0)					X																	13
MW-3.3 (16.0)																					X	14
MW-3.4 (21.0)																					X	15
MW-4.1 (6.0)																					X	16
MW-4.2 (11.0)																					X	17
MW-4.3 (16.0)											X											18
MW-4.4 (21.0)																					X	19
MW-4.5 (26.0)											X											20
MW-4.6 (31.0)																					X	21
MW-4.7 (36.0)																					X	22

Instructions/Comments/Special Requirements:

SAMPLE RECEIPT		Date	Time	Samples Relinquished By	Samples Received By
Received Cold	Y N	12/18	15:33	<i>[Signature]</i>	<i>[Signature]</i>
Custody Seals	Y N				
Seals Intact	Y N				
No. of Containers					

Acculabs' terms are: Net 40 (Payment must be received by the date shown on the invoice or any discount is void)

To the maximum extent permitted by law, the Client agrees to limit the liability of Acculabs Inc. for the Client's damages to the total compensation received unless other arrangements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted.



# Acculabs Inc.

Davis

1046 Olive Drive, Davis, CA 95616 ■ 530-757-0920 ■ Fax 753-6091

Sample Log 20892  
January 19, 2000

Jim Gribi  
Gribi Associates  
1350 Hayes Street, #C-14  
Benicia, CA 94510

Subject : 4 Water samples  
Project Name : LSI-North  
Project Number : 149-02-03

Dear Mr. Gribi,

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.

Acculabs - Davis is certified by the State of California (# 2330), the State of Arizona (AZ0583) and the State of Nevada. If you have any questions regarding procedures or results, please call me at 530-757-0920.

Sincerely,

Tom Kwoka



Report Number : 15707

Date : 12/31/1999

Sample : MW-1

Project Name : LSI-North

Project Number : 149-02-03

Date Analyzed : 12/30/1999

Matrix : Water

Sample Date : 12/22/1999

Analysis Method: EPA 8260B

Parameter	Measured		Units
	Value	MRL	
Chloromethane	< 0.50	0.50	ug/L
Vinyl Chloride	< 0.50	0.50	ug/L
Bromomethane	< 0.50	0.50	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 0.50	0.50	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	4.0	0.50	ug/L
<b>Chloroform</b>	<b>6.0</b>	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
<b>1,2-Dichloroethane</b>	<b>230</b>	5.0	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
<b>Trichloroethene</b>	<b>3.2</b>	0.50	ug/L
<b>1,2-Dichloropropane</b>	<b>1.1</b>	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
<b>Tetrachloroethene</b>	<b>720</b>	5.0	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
Dibromofluoromethane (Surr)	98.8		% Recovery
1,2-Dichloroethane-d4 (Surr)	98.4		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff



Report Number : 15707

Date : 12/31/1999

Sample : MW-2

Project Name : LSI-North

Project Number : 149-02-03

Date Analyzed : 12/30/1999

Matrix : Water

Sample Date : 12/22/1999

Analysis Method: EPA 8260B

Parameter	Measured Value	MRL	Units
Chloromethane	< 0.50	0.50	ug/L
<b>Vinyl Chloride</b>	<b>9.4</b>	0.50	ug/L
Bromomethane	< 0.50	0.50	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
<b>1,1-Dichloroethene</b>	<b>1.8</b>	0.50	ug/L
Methylene Chloride	< 0.50	0.50	ug/L
<b>trans-1,2-Dichloroethene</b>	<b>0.78</b>	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
<b>cis-1,2-Dichloroethene</b>	<b>64</b>	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
<b>Trichloroethene</b>	<b>29</b>	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
<b>Tetrachloroethene</b>	<b>530</b>	5.0	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
Dibromofluoromethane (Surr)	99.5		% Recovery
1,2-Dichloroethane-d4 (Surr)	96.2		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff



Report Number : 15707

Date : 12/31/1999

Sample : MW-3

Project Name : LSI-North

Project Number : 149-02-03

Date Analyzed : 12/30/1999

Matrix : Water

Sample Date : 12/22/1999

Analysis Method: EPA 8260B

Parameter	Measured		Units
	Value	MRL	
Chloromethane	< 0.50	0.50	ug/L
<b>Vinyl Chloride</b>	<b>14</b>	0.50	ug/L
Bromomethane	< 0.50	0.50	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
<b>1,1-Dichloroethene</b>	<b>7.5</b>	0.50	ug/L
Methylene Chloride	< 0.50	0.50	ug/L
<b>trans-1,2-Dichloroethene</b>	<b>30</b>	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
<b>cis-1,2-Dichloroethene</b>	<b>1200</b>	50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
<b>Trichloroethene</b>	<b>300</b>	50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
<b>1,1,2-Trichloroethane</b>	<b>0.96</b>	0.50	ug/L
<b>Tetrachloroethene</b>	<b>16000</b>	200	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
Dibromofluoromethane (Surr)	101		% Recovery
1,2-Dichloroethane-d4 (Surr)	97.7		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff



Report Number : 15707

Date : 12/31/1999

Sample : MW-4

Project Name : LSI-North

Project Number : 149-02-03

Date Analyzed : 12/30/1999

Matrix : Water

Sample Date :12/22/1999

Analysis Method: EPA 8260B

Parameter	Measured Value	MRL	Units
Chloromethane	< 0.50	0.50	ug/L
<b>Vinyl Chloride</b>	13	0.50	ug/L
Bromomethane	< 0.50	0.50	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
<b>1,1-Dichloroethene</b>	1.4	0.50	ug/L
Methylene Chloride	< 0.50	0.50	ug/L
<b>trans-1,2-Dichloroethene</b>	2.4	0.50	ug/L
<b>1,1-Dichloroethane</b>	1.0	0.50	ug/L
<b>cis-1,2-Dichloroethene</b>	110	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
<b>1,2-Dichloroethane</b>	27	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
<b>Trichloroethene</b>	59	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
<b>Tetrachloroethene</b>	300	2.0	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
Dibromofluoromethane (Surr)	98.9		% Recovery
1,2-Dichloroethane-d4 (Surr)	97.7		% Recovery

1) MRL = Method reporting limit  
tr = Trace detected below reporting limit

Approved By:  Joel Kiff



# Laboratory Report

Acculabs Inc.  
1046 Olive Dr. #2  
Davis, CA 95616  
Attn: Troy Turpen

ELAP Lab ID: 2326  
Received: 12/23/99  
Lab Sample ID: 5-912-102  
Reported: 12/29/99

Phone: 530 757-0920 Fax: 753-6091

Project Name/ Number: LSI-North / 149-02-03  
Date Collected: 12/22/99  
Sampled By: Client

Parameter	Method	Results	Units	Analyzed
<b>20892-01 MW-1</b>				
Alkalinity	2320B	240	mg/L as CaCO3	12/28/99
Biochemical Oxygen Demand	405.1	<2.0	mg/L	12/23/99
<b>20892-02 MW-2</b>				
Alkalinity	2320B	210	mg/L as CaCO3	12/28/99
Biochemical Oxygen Demand	405.1	<4.0	mg/L	12/23/99
<b>20892-03 MW-3</b>				
Alkalinity	2320B	270	mg/L as CaCO3	12/28/99
Biochemical Oxygen Demand	405.1	<4.0	mg/L	12/23/99
<b>20892-04 MW-4</b>				
Alkalinity	2320B	470	mg/L as CaCO3	12/28/99
Biochemical Oxygen Demand	405.1	<4.0	mg/L	12/23/99

*Michelle Kramer*  
Michelle Kramer, Lab Manager



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-01

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: WC0119001A

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-1

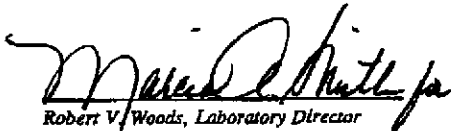
Sample Date: 12/22/99

Sample Matrix: Water

## Wet Chemistry

### RESULTS

PARAMETER	METHOD	REPORT		DIL	UNITS	DATE	ANALYST
		LIMIT	RESULT			ANALYZED	
COD	410.4	50	50	1	mg/L	01/19/00	JP

  
Robert V. Woods, Laboratory Director





# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-02

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: WC0119001A

**PROJECT NAME:** LSI-North/149-02-03  
**PROJECT NUMBER:** 20892  
**SAMPLE I.D.:** MW-2

Sample Date: 12/22/99

Sample Matrix: Water

## Wet Chemistry

### RESULTS

PARAMETER	METHOD	REPORT		DIL	UNITS	DATE	ANALYST
		LIMIT	RESULT			ANALYZED	
COD	410.4	50	71	1	mg/L	01/19/00	JP

*Robert V. Woods*  
Robert V. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

Precision Analytical ID No.: 1-912-418

January 19, 2000

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Project Name: LSI-North/149-02-03  
Project Number: 20892  
Date Received: 12/23/99

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, 19th Edition, 40 CFR Part 136 and Test Methods for Evaluating Solid Waste, EPA SW-846, 3rd Edition.

Samples were received by Precision Analytical Laboratories, Inc. in good condition.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Robert V. Woods  
Laboratory Director  
ADHS License Number AZ0610

Enclosure



# Precision Analytical Laboratories, Inc.

## LAB CERTIFICATIONS

<p>Precision Analytical Laboratories, Inc. 1725 West 17th Street Tempe, AZ 85281 Arizona: AZ0610 California: 2302 Nevada: AZ00946</p>	<p>Precision Analytical Laboratories, Inc. 4455 South Park Avenue, Suite 110 Tucson, AZ 85714 Arizona: AZ0609</p>	<p>Precision Analytical Laboratories, Inc. 2020 W. Lone Cactus Dr. Phoenix, AZ 85027 Arizona: AZ0611</p>
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## DATA QUALIFIERS

<b>B</b>	Analyte was found in the associated method blank.
<b>E</b>	Exceeded calibration range at the dilution reported.
<b>G</b>	Surrogate recovery demonstrated matrix effect. Matrix interference was confirmed by reanalysis.
<b>H</b>	Surrogate recovery was outside acceptance criteria in the undiluted sample. Surrogate recovery was acceptable in the diluted analysis.
<b>M</b>	Reported value for this analyte demonstrated matrix effect.
<b>N</b>	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
<b>NC</b>	Not calculated due to matrix interference.
<b>SA</b>	Reported value was calculated using the method of standard additions.
<b>T</b>	Analyte was detected in the Trip Blank.



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-01

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: WC0119001A

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-1

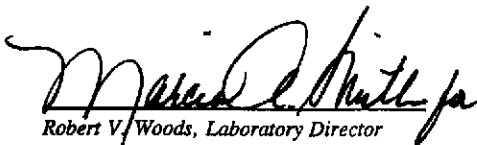
Sample Date: 12/22/99

Sample Matrix: Water

## Wet Chemistry

### RESULTS

PARAMETER	METHOD	REPORT		DIL	UNITS	DATE	
		LIMIT	RESULT			ANALYZED	ANALYST
COD	410.4	50	50	1	mg/L	01/19/00	JP

  
Robert V. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-02

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: WC0119001A

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-2

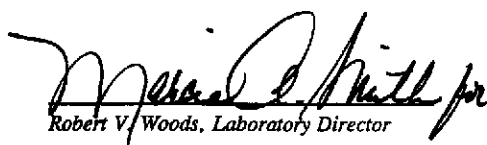
Sample Date: 12/22/99

Sample Matrix: Water

## Wet Chemistry

### RESULTS

PARAMETER	METHOD	REPORT		DIL	UNITS	DATE	
		LIMIT	RESULT			ANALYZED	ANALYST
COD	410.4	50	71	1	mg/L	01/19/00	JP

  
Robert V. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-03

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: WC0119002A

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-3

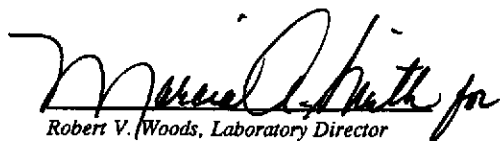
Sample Date: 12/22/99

Sample Matrix: Water

## Wet Chemistry

### RESULTS

PARAMETER	METHOD	REPORT		DIL	UNITS	DATE	ANALYST
		LIMIT	RESULT			ANALYZED	
COD	410.4	10	<10	1	mg/L	01/19/00	JP

  
Robert V. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-04

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: WC0119001A

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-4

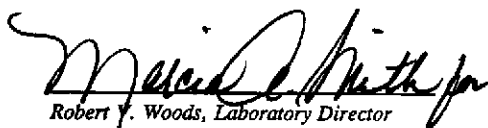
Sample Date: 12/22/99

Sample Matrix: Water

## Wet Chemistry

### RESULTS

PARAMETER	METHOD	REPORT		DIL	UNITS	DATE	
		LIMIT	RESULT			ANALYZED	ANALYST
COD	410.4	50	50	1	mg/L	01/19/00	JP

  
Robert Y. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-01

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: W122799-1

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-1

Sample Date: 12/22/99

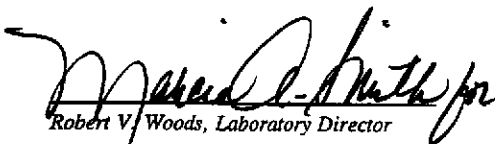
Sample Matrix: Water

Units: mg/L

## Metals

### RESULTS

PARAMETER	METHOD	REPORT		DILUTION	DATE	
		LIMIT	RESULT		ANALYZED	ANALYST
Iron, Dissolved	200.7	0.050	<0.050	1	12/28/99	MK

  
Robert V. Woods, Laboratory Director





# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-02

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: W122799-1

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-2

Sample Date: 12/22/99

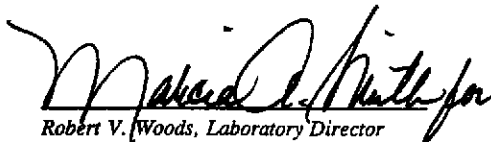
Sample Matrix: Water

Units: mg/L

## Metals

### RESULTS

PARAMETER	METHOD	REPORT		DILUTION	DATE	
		LIMIT	RESULT		ANALYZED	ANALYST
Iron, Dissolved	200.7	0.050	<0.050	1	12/28/99	MK

  
Robert V. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-03

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: W122799-1

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-3

Sample Date: 12/22/99

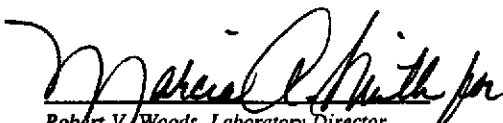
Sample Matrix: Water

Units: mg/L

## Metals

### RESULTS

PARAMETER	METHOD	REPORT		DILUTION	DATE	
		LIMIT	RESULT		ANALYZED	ANALYST
Iron, Dissolved	200.7	0.050	<0.050	1	12/28/99	MK

  
Robert V. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

Acculabs Inc.  
1046 Olive Drive, Suite 2  
Davis, CA 95616  
Attention: Troy Turpen

Precision Analytical ID No.: 1-912-418-04

Date Received: 12/23/99

Date Reported: 01/19/00

QC Batches: W122799-1

**PROJECT NAME:** LSI-North/149-02-03

**PROJECT NUMBER:** 20892

**SAMPLE I.D.:** MW-4

Sample Date: 12/22/99

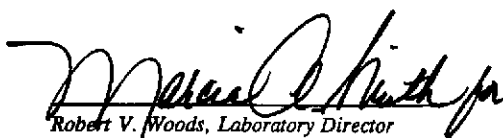
Sample Matrix: Water

Units: mg/L

## Metals

### RESULTS

PARAMETER	METHOD	REPORT		DILUTION	DATE	
		LIMIT	RESULT		ANALYZED	ANALYST
Iron, Dissolved	200.7	0.050	<0.050	1	12/28/99	MK

  
Robert V. Woods, Laboratory Director



# Precision Analytical Laboratories, Inc.

QC Batch: W122799-1	<b>METALS QUALITY CONTROL REPORT</b>	Date Digested: 12/27/99
Spiked Spl #: 1-912-418-1		Units: mg/L

PARAMETER	EPA METHOD	METHOD BLANK	MATRIX SPIKES						LAB CONTROL SAMPLE			DATE ANALYZED	
			SAMPLE RESULT	SPIKE ADDED	SPIKE RESULT	% REC	MSD RESULT	% REC	RPD	SPIKE ADDED	LCS RESULT		% REC
Iron	200.7	< 0.050	< 0.050	1.0	0.999	100	0.980	98	2	1.0	0.965	97	12/28/99

Lee Hecht, Metals Manager

## WET CHEM ANALYSES QUALITY CONTROL REPORT

MATRIX: WATER/AQUEOUS

QC BATCH: WC0119002A

	Method No.	Method Blank	Units	Sample Result	Dup.	RPD	Spike Added	Spike Result	% Rec	Sample No. Dup'd/Spk'd	Lab Control Sample		
											Added	Result	% Rec
COD	410.4	<10	mg/L	<10	<10	NA	50	48.2	96	1-912-418-3	100	101	101



*Lee Hecht, Inorganics Manager*

## WET CHEM ANALYSES QUALITY CONTROL REPORT

MATRIX: WATER/AQUEOUS

QC BATCH: WC0119001A

	Method No.	Method Blank	Units	Sample Result	Dup.	RPD	Spike Added	Spike Result	% Rec	Sample No. Dup'd/Spk'd	Lab Control Sample		
											Added	Result	% Rec
COD	410.4	<50	mg/L	541	546	1	100	573	NC	2-001-082-1	500	500	100



*Lee Hecht, Inorganics Manager*

# Acculabs - Davis/Sacramento

1-917-418

## Subcontracted Tests Form

Project Name : LSI-North  
 Project Number : 149-02-03  
 Project Manager: Troy Turpen

Laboratory Name PAL-Tempe

Mail Results and Invoices To 1046 Olive Drive, Suite 2, Davis, CA 95616

Fax Results To 530-753-6091

Call 530-757-0920 with questions

Use this number as a Purchase Order No.: **20892**

Number	Name	Mx.	Date Sampled	Tests	No. of Containers:
20892-01	MW-1	WA	12/22/99	[REDACTED], COD, Dissolved Fe, [REDACTED]	2
Location:					
20892-02	MW-2	WA	12/22/99	[REDACTED], COD, Dissolved Fe, [REDACTED]	2
Location:					
20892-03	MW-3	WA	12/22/99	[REDACTED], COD, Dissolved Fe, [REDACTED]	2
Location:					
20892-04	MW-4	WA	12/22/99	[REDACTED], COD, Dissolved Fe, [REDACTED]	2
Location:					

Remarks:

Relinquished by:	Received by:	Date	Time
<i>Troy D. Turpen</i>	<i>via Fed Ex</i>	<i>12-22-99</i>	<i>1830</i>
<i>FedEx</i>	<i>Rhonda Ar...</i>	<i>12/23/99</i>	<i>0900</i>

Due Date/Time : 12-30-99 / 1700

Subcontract Lab Reference # : \_\_\_\_\_

Fax this form to 530-753-6091 when reference number has been assigned to samples and written in space above.

Please fax results prior to mailing.

# AIR TOXICS LTD.

SAMPLE NAME : MW-1

ID#: 9912419-01A

Modified Method RSK-175 GC/FID

File Name:	7122906	Date of Collection:	12/22/99
Dil. Factor:	1.00	Date of Analysis:	12/29/99

Compound	Det. Limit (uG/mL)	Amount (uG/mL)
Methane	0.010	Not Detected
Ethane	0.010	Not Detected
Ethene	0.010	Not Detected

Container Type: VOA Vial



# AIR TOXICS LTD.

SAMPLE NAME : MW-2

ID#: 9912419-02A

Modified Method RSK-175 GC/FID

File Name:	7122907	Date of Collection:	12/22/99
Dil. Factor:	1.00	Date of Analysis:	12/29/99

Compound	Det. Limit (uG/mL)	Amount (uG/mL)
Methane	0.010	0.014
Ethane	0.010	Not Detected
Ethene	0.010	Not Detected

Container Type: VOA Vial

# AIR TOXICS LTD.

SAMPLE NAME : MW-3

ID#: 9912419-03A

Modified Method RSK-175 GC/FID

File Name:	7122908	Date of Collection:	12/22/99
Dil. Factor:	1.00	Date of Analysis:	12/29/99

Compound	Det. Limit (uG/mL)	Amount (uG/mL)
Methane	0.010	0.010
Ethane	0.010	Not Detected
Ethene	0.010	Not Detected

Container Type: VOA Vial

# AIR TOXICS LTD.

SAMPLE NAME : MW-4

ID#: 9912419-04A

Modified Method RSK-175 GC/FID

<b>File Name:</b>	7122909	<b>Date of Collection:</b> 12/22/99
<b>Dil. Factor:</b>	1.00	<b>Date of Analysis:</b> 12/29/99

<b>Compound</b>	<b>Det. Limit (uG/mL)</b>	<b>Amount (uG/mL)</b>
Methane	0.010	0.13
Ethane	0.010	Not Detected
Ethene	0.010	Not Detected

Container Type: VOA Vial

# AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 9912419-05A

Modified Method RSK-175 GC/FID

File Name:	7122904	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 12/29/99

Compound	Det. Limit (uG/mL)	Amount (uG/mL)
Methane	0.010	Not Detected
Ethane	0.010	Not Detected
Ethene	0.010	Not Detected

Container Type: NA

# Acculabs Inc.

[ ] 3902 E. University Dr. Phoenix AZ 85034  
 [ ] 710 E. Evans Blvd. Tucson AZ 85713  
 [ ] 2020 W. Lone Cactus Dr. Phoenix AZ 85027  
 [ ] 4663 Table Mountain Dr. Golden CO 80403  
 [ ] 992 Spice Islands Dr. Sparks NV 89431  
 [ ] 1046 Olive Drive #2 Davis CA 95616

602-437-0979 Fax 437-0826  
 520-884-5811 Fax 884-5812  
 602-780-4800 Fax 780-7695  
 303-277-9514 Fax 277-9512  
 702-355-0202 Fax 355-0817  
 530-757-0920 Fax 753-6091

Lab Number

20892

Report  
 Due Date:

Client Gribi Associates		<b>PUBLIC WATER SUPPLY INFORMATION</b>	
Address 1350 Hayes Street, Ste C-14		System Name	
City, State & Zip Benicia, CA 94510		PWS No.	Report to State/EPA Y N
Contact Jim Gribi		POE No.	DWR No.
Phone 707/748-7743	Project Name LSI-North	Collection Point	
Fax 707/748-7763	Project Number 149-02-03	Collector's Name	
P.O. Number	Fax Results <input checked="" type="radio"/> Y <input type="radio"/> N	Page 1 of 3	Location (City)

SAMPLE TYPE CODES			S a m p l e  T y p e  C o n t a i n e r s	A n a l y s e s  R e q u e s t e d
DW = drinking water	TB = travel blank	Compliance Monitoring		
WW = waste water	SD = solid	Y N		
MW = monitoring well	SO = soil			
HW = hazardous waste	SL = sludge			
TURNAROUND TIME REQUESTED				
Standard	Lab Director Approval			
RUSH				
Special				
CLIENT'S SAMPLE ID/LOCATION	Date	Time		Spl. No.

MW-1	12/22/99	14:40	w	7	X	X	X	X	X	X										01	
MW-2	12/22/99	11:55	w	7	X	X	X	X	X	X										02	
MW-3	12/22/99	13:30	w	7	X	X	X	X	X	X										03	
MW-4	12/22/99	11:30	w	7	X	X	X	X	X	X										04	

SAMPLE RECEIPT			Date	Time	Samples Relinquished By	Samples Received By
Received Cold	Y	N	12/22/99	15:45	<i>[Signature]</i>	<i>[Signature]</i>
Custody Seals	Y	N				
Seals Intact	Y	N				
No. of Containers						

Acculabs' terms are: Net 40 (Payment must be received by the date shown on the invoice or any discount is void)