

**Quarterly Groundwater Monitoring
4300 San Pablo Avenue
Emeryville, California**

August 30, 1994

Prepared for :

City of Emeryville
Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608

AGI Project No. 15,681.004.04

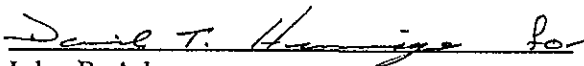
A Report Prepared For

City of Emeryville
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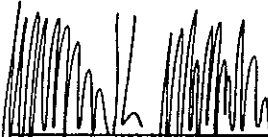
QUARTERLY GROUNDWATER MONITORING
4300 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

AGI Project No. 15,681.004.04

by



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August 30, 1994

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1.0 INTRODUCTION

1.1 GENERAL

This report describes the actions conducted during installation of one groundwater monitoring well and quarterly groundwater monitoring performed by AGI Technologies (AGI) on behalf of the City of Emeryville Redevelopment Agency (Agency), at 4300 San Pablo Avenue in Emeryville, California. Our scope of services consisted of installing one upgradient monitoring well, purging and sampling four monitoring wells, monitoring groundwater levels in seven monitoring wells, analyzing groundwater samples for petroleum hydrocarbons, determining the direction of groundwater flow, and reporting the results. AGI presented a Work Plan dated May 9, 1994 to the Alameda County Health Care Services Agency (ACHCSA) to perform the above services. The Work Plan was approved by the ACHCSA in a letter dated June 1, 1994.

The Work Plan was based upon information from the following sources:

- Correspondence from Subsurface Consultants Inc. (SCI) dated March 1, May 24, June 23, and September 22, 1993.
- A letter from the ACHCSA dated August 6, 1993.
- Data gathered during the installation of upgradient well MW7 on March 3, 1994.
- Our understanding of local, state, and federal laws and regulations.

The Work Plan also included a Health and Safety Plan (HASP) to address personnel and public safety during performance of work at the site.

1.2 BACKGROUND

The site is located at the northeast corner of the intersection of San Pablo Avenue and 43rd Street in Emeryville, California, as shown on Figure 1, Vicinity Map, and Figure 2, Site Plan. The site is bounded by residential property to the east, a U. S. Post Office to the north, San Pablo Avenue to the west, and 43rd Street to the south. The site is currently used for mail delivery vehicle parking.

The site was formerly occupied by service stations from about 1926 to 1966, and a car wash from about 1969 to 1990. After 1936, the service station had four 550-gallon gasoline underground storage tanks (USTs). The USTs were located beneath the sidewalks along San Pablo Avenue (2) and 43rd Street (2).

Soil samples were obtained by SCI from the native soil/tank backfill interface at the former UST locations and analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and diesel (TPH-D); and benzene, ethylbenzene, toluene, and xylenes (BETX). TPH-G and TPH-D concentrations in soil samples from the former UST locations along San Pablo Avenue ranged

up to 57 mg/kg. TPH-G and TPH-D concentrations in soil samples from the 43rd Street UST locations ranged up to 490 mg/kg. As part of remediation efforts by SCI, approximately 250 cubic yards (cy) of contaminated soil were removed from the 43rd Street location. Soil was excavated to a clean-up level of 300 mg/kg. The contaminated excavated soil was remediated by solid phase treatment to TPH-G and TPH-D concentrations less than 1 mg/kg. Approximately one-third of the remediated soil was reused as backfill on-site. The rest was disposed of at a Class III landfill. Prior to backfilling, about 2,500 gallons of contaminated water was removed from the excavation and disposed of off-site.

Six groundwater monitoring wells were installed by SCI at the site and monitored intermittently since June 1990. Contaminant concentrations in water samples from the wells have ranged as follow: TPH-G, <0.05 to 1.8 mg/L; TPH-D, <0.05 to 2.8 mg/L; benzene, <0.5 to 5.3 ug/L; ethylbenzene, <0.5 to 3.2 ug/L; toluene, <0.5 to 3.9 ug/L, and xylenes; <0.5 to 6.9 ug/L. The depth to groundwater has ranged from approximately 3 to 11 feet below ground surface. The direction of groundwater flow has been consistently to the northwest. Prior to the June 30, 1994 monitoring event, AGI installed an additional well (MW7) to assess upgradient conditions. The activities performed during installation of MW7 are described in this report.

2.0 FIELD EXPLORATION AND MONITORING

2.1 PURPOSES

The purposes of our services included the following:

- Assessing the potential existence of a contaminant source from an upgradient from the site.
- Monitoring groundwater levels and gradient direction.
- Monitoring groundwater quality at the site.
- Determining appropriate remedial action, if necessary, based upon the results of monitoring.

2.2 SCOPE OF SERVICES

Our specific scope of services included the following:

- Preparing a Work Plan for groundwater monitoring activities, including a site Health and Safety Plan.
- Conducting a utility survey in the area of drilling.
- Installing one upgradient well (MW7). Installation included advancing one boring, collecting and analyzing soil samples, installing and developing the well, and collecting and analyzing a groundwater sample from the well.
- Performing an elevation survey of the top of casing at each monitoring well.
- Monitoring groundwater levels in seven monitoring wells.
- Collecting and analyzing groundwater samples from four wells (MW4, MW5, MW6, and MW7) on a quarterly basis for one year.
- Preparing quarterly reports documenting well installation and groundwater monitoring procedures, and results of sample analyses. The reports include analytical test data, chain-of-custody documentation, and a site plan indicating the groundwater flow direction. Recommendations based upon the data collected during quarterly monitoring are to be presented in the final quarterly report.

2.3 WELL INSTALLATION

This section describes procedures employed during installation of MW7. The purpose of installing this well was to assess the potential presence of an upgradient source for contamination at the site, or to determine the upgradient limit of contamination.

2.3.1 Utility Search and Permits

Prior to installing the well, the proposed well location was checked by Underground Service Alert subscribers and a private utilities locator. We obtained a permit from Alameda County Flood Control and Water Conservation District Zone 7 Water Agency, as required, to install the well.

2.3.2 New Groundwater Monitoring Well

On March 3, 1994, AGI installed one monitoring well (MW7) in an upgradient location from the site, near the south side of 43rd Street, as shown on Figure 2. We advanced the boring for the well using a truck-mounted drill rig equipped with hollow-stem augers. The boring extended to a depth of about 15 feet, approximately 8 feet below the groundwater level. Our field geologist observed drilling operations and prepared a log of the conditions encountered. The boring log for MW7 is presented in Appendix A. Field exploration and soil sampling procedures are described in Appendix B.

Soil samples were obtained at approximate 5 foot intervals using a California drive sampler. Soil from each sampling interval was field tested for organic vapor content using an organic vapor meter equipped with a photo-ionization detector (OVM-PID). Drilling and sampling equipment was steam-cleaned prior to each use. Soil cuttings generated during drilling were placed in DOT approved 55-gallon drums and left on-site for later disposal.

Soils encountered beneath the asphaltic concrete pavement section during drilling consisted of silty clay to approximately 4 feet below the ground surface (bgs), clay to approximately 8 feet bgs, and sandy clay to the depth explored (15 feet bgs). Groundwater was encountered at approximately 8 feet bgs during drilling, but rose to approximately 7 feet bgs following well installation. No visual or olfactory indications of contamination were observed in the soil and groundwater samples.

AGI installed a ground water monitoring well in the borehole. The well consists of 2-inch diameter schedule 40 PVC well casing. The lower 10 feet of the well consists of slotted well screen. The upper portion consists of blank casing. The well head was set below grade in a utility box. The casing sections were connected with flush-threaded joints. The annular space around the slotted portion of the well was backfilled with No. 3 washed sand. A 1-foot-thick bentonite seal was placed above the sandpack. The upper portion of the annular space was filled with cement grout. The well head was provided with a locking cap. Well construction details for MW7 are presented in Appendix A.

We developed the well using surge-and-pump techniques, removing about 10 well casing volumes. Well development water is stored on-site in DOT approved 55-gallon drums for later disposal. The well development equipment was steam-cleaned prior to use.

Selected soil samples were collected during drilling and submitted to Curtis & Tompkins, Ltd. of Berkeley, California for analysis. Three soil samples were analyzed for total petroleum hydrocarbons as diesel fuel (TPH-D) and gasoline (TPH-G), and benzene, ethylbenzene, toluene, and xylenes (BETX). None were detected in the samples. Analytical results for soil samples are summarized in Table 1. Following installation, the well was developed until removed water was free of sediment. Soil cuttings and wash water were collected and stored on-site in DOT-rated 55-gallon storage drums for later disposal.

On March 11, 1994, an AGI representative collected a groundwater sample from MW7, in accordance with procedures described in Appendix C, and submitted it to Curtis & Tompkins, Ltd. for analysis. The sample was analyzed for TPH-D, TPH-G, and BETX. No TPH-D, TPH-G, or BETX were detected in the sample. Purge water removed from the well was collected and stored on-site in DOT-rated 55-gallon storage drums for later disposal. Analytical results for the groundwater sample collected are summarized in Table 1. Copies of analytical reports for soil and groundwater samples collected from MW7 are presented in Appendix D.

2.4 GROUNDWATER MONITORING

2.4.1 Elevation Survey

On July 25, 1994, AGI performed a level survey to establish top of casing elevations for the new and existing monitoring wells. A fire hydrant located on the northeast corner of San Pablo Avenue and 43rd Street was used as the datum point for the survey. All monitoring well elevations are referenced to the fire hydrant which is assumed to be 100.00 feet above Mean Sea Level.

2.4.2 Groundwater Elevations and Sample Collection

Prior to sampling, the groundwater level in each of the seven monitoring wells was measured to a precision of 0.01 feet using an electronic water level indicator. Prior to each measurement, the portion of the water level indicator that was submerged in the well was cleaned with a mild detergent solution and rinsed with de-ionized water. A groundwater elevation map constructed from the data is presented on Figure 3. An historical summary of groundwater elevations for wells at the site is presented in Table 1.

Groundwater samples were collected on June 30, 1994 from monitoring wells MW4, MW5, MW6, and MW7. Prior to sampling, the groundwater was visually inspected to assess the presence of floating product. A minimum of four well volumes was evacuated prior to sampling MW7. Approximately one well volume from each well; MW4, MW5, and MW6 was removed prior to being dewatered. Groundwater in these wells was allowed to recover

to 80 percent of their initial levels prior to sampling. During pumping the discharge water from each well was measured for pH, temperature, electrical conductivity, and turbidity. Samples were collected from the four wells using clean disposable polyethylene bailers and decanted into clean 40-milliliter glass vials and 1-liter glass bottles. Groundwater sampling procedures are described in Appendix C.

2.4.3 Sample Handling and Analytical Testing

Groundwater samples were placed in the appropriate containers for the analytical tests performed. All samples were placed on "blue ice" in a cooler, and kept cool until delivery to the analytical laboratory. Sample handling was documented using Chain-of-Custody records. Copies of the Chain-of-Custody records are included in Appendix D.

The samples were submitted to Curtis & Tompkins, Ltd., a California Department of Health Services certified analytical laboratory. The samples were analyzed for TPH-D and TPH-G (EPA 8015 modified), and BETX (EPA 8020).

Results of analysis indicate the presence of diesel-range hydrocarbons in groundwater samples collected from MW4 and MW5. Results also indicate the presence of gasoline-range hydrocarbons, ethylbenzene, and total xylenes in samples collected from MW5. No TPH-D, TPH-G, or BETX were detected in samples collected from the other two wells sampled. Table 3 presents a summary of analytical results. A copy of the analytical report is presented in Appendix D.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Results of analyses of soil and groundwater samples collected in March 1994, during drilling and well installation at MW7, indicate hydrocarbons are not present at this location. These results indicate the upgradient limit of hydrocarbon contamination is downgradient (toward the site) from MW7. Results also indicate an upgradient source of hydrocarbon contamination is not present.

Water-levels in wells MW1 through MW6 have all lowered since the April, 1993 monitoring event. A groundwater high point was detected in the vicinity of MW1. This high point has not been reported by others. The general direction of groundwater flow was to the northwest and is consistent with that reported by others. We will continue to monitor the groundwater levels to determine if the high point is a temporary or long term condition.

Results of groundwater monitoring in June 1994 indicate the presence of diesel and gasoline in groundwater near the former UST locations. These results are consistent with those from previous reports by others and indicate that some source material remains at the site. Results of analyses indicate the hydrocarbon levels detected are consistent with historical levels at the wells sampled. No hydrocarbons were detected in samples collected from the upgradient (MW7) or downgradient (MW6) monitoring wells.

Water-level data collected on June 30, 1994 from wells MW1, MW2, MW3, MW4, MW5, MW6 and, recently installed MW7 show a groundwater high point located at MW1. This data shows groundwater moving away from MW1 in all directions. Used alone, the most recent data from wells MW1 through MW6 shows groundwater flow to be northwest, consistent with past observations. Calculations used in determining the direction of groundwater flow on June 30, 1994 are the first to incorporate data from MW7. Future quarterly water-level measurements will be used to determine if this is a one time anomaly or a regular feature of groundwater flow at the site .

AGI will continue to monitor groundwater flow direction and hydrocarbon contamination at the site on a quarterly basis. Notable changes in site conditions, if encountered, will be discussed in subsequent quarterly reports. Based upon the information contained in this report, we believe no immediate remedial action is required at the site. AGI will provide appropriate recommendations for further action, if necessary, at the completion of four quarterly monitoring events, based upon the data collected during this monitoring project.

DISTRIBUTION

3 Copies

City of Emeryville
Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608

Attention: Mr. Ignacio Dayrit

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Alameda County Health Care Services Agency
Hazardous Materials Division
1131 Harbor Bay Parkway
Alameda, California 94502

Attention: Ms. Susan L. Hugo

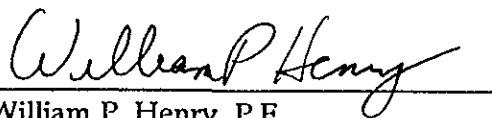
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Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

Attention: Mr. Lester Feldman

Quality Assurance/Technical Review

by:



William P. Henry, P.E.
Principal Engineer

TABLES

Table 1
Summary of Chemical Analyses - Investigation

4300 San Pablo Avenue
Emeryville, California

Sample ID	Date Sampled	EPA Test Method					
		8015M TPH-G (mg/kg)	8015M TPH-D (mg/kg)	BETX 5030/8020			Total Xylenes (mg/kg)
				Benzene (mg/kg)	Ethylbenzene (mg/kg)	Toluene (mg/kg)	
Soil							
MW7 - 4 1/2 - 5	03/04/94	<1	<1	<0.005	<0.005	<0.005	<0.005
MW7 - 9 1/2 - 10	03/04/94	<1	<1	<0.005	<0.005	<0.005	<0.005
MW7 - 14 1/2 - 15	03/04/94	<1	<1	<0.005	<0.005	<0.005	<0.005
Laboratory Reporting Limit - Soil		1	1	0.005	0.005	0.005	0.005
		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Water							
MW7	03/04/94	<0.050	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
Laboratory Reporting Limit - Water		0.050	0.050	<0.0005	<0.0005	<0.0005	<0.0005

Notes:

- TPH-G - Total petroleum hydrocarbons quantified as gasoline.
- TPH-D - Total petroleum hydrocarbons quantified as diesel fuel and kerosene.
- mg/kg - Milligrams per kilogram is equivalent to parts per million (ppm).
- ug/l - Micrograms per liter is equivalent to parts per billion (ppb).

Table 2
Groundwater Elevation Monitoring Data

4300 San Pablo Avenue
Emeryville, California

Monitoring Well	Measurement Date	Groundwater Elevation Monitoring Data		
		Field Measurement Data		Groundwater Elevation (feet)
		DTW Below TOC (feet)	TOC Elevation*	
MW1	06/06/90	5.33	101.13	95.80
	06/11/90	5.52	101.13	95.61
	06/18/90	5.50	101.13	95.63
	06/22/90	6.18	101.13	94.95
	06/29/90	6.50	101.13	94.63
	10/30/90	9.10	101.13	92.03
	12/11/90	7.18	101.13	93.95
	12/26/90	7.90	101.13	93.23
	01/02/91	8.27	101.13	92.86
	07/10/91	8.00	101.13	93.13
	09/13/91	9.16	101.13	91.97
	12/24/91	7.29	101.13	93.84
	01/27/93	3.60	101.13	97.53
	04/30/93	5.14	101.13	95.99
06/30/94	5.91	98.67	92.76	
MW2	06/06/90	7.15	101.49	94.34
	06/11/90	6.98	101.49	94.51
	06/18/90	7.04	101.49	94.45
	06/22/90	7.60	101.49	93.89
	06/29/90	9.96	101.49	91.53
	10/30/90	10.66	101.49	90.83
	12/11/90	9.88	101.49	91.61
	12/26/90	9.19	101.49	92.30
	01/02/91	9.65	101.49	91.84
	07/10/91	9.40	101.49	92.09
	09/13/91	NM	101.49	NM
	12/24/91	9.19	101.49	92.30
	01/27/93	4.84	101.49	96.65
	04/30/93	6.74	101.49	94.75
06/30/94	7.29	99.00	91.71	
MW3	06/06/90	6.22	100.20	93.98
	06/11/90	6.50	100.20	93.70
	06/18/90	6.49	100.20	93.71
	06/22/90	7.11	100.20	93.09
	06/29/90	9.34	100.20	90.86
	10/30/90	10.11	100.20	90.09
	12/11/90	9.36	100.20	90.84
	12/26/90	9.00	100.20	91.20
	01/02/91	9.28	100.20	90.92
	07/10/91	8.94	100.20	91.26
	09/13/91	9.93	100.20	90.27
	12/24/91	9.02	100.20	91.18
	01/27/93	3.90	100.20	96.30
	04/30/93	5.85	100.20	94.35
	06/30/94	7.80	97.77	89.97

**Table 2 (cont.)
Groundwater Elevation Monitoring Data**

4300 San Pablo Avenue
Emeryville, California

Monitoring Well	Measurement Date	Groundwater Elevation Monitoring Data		
		Field Measurement Data		Groundwater Elevation (feet)
		DTW Below TOC (feet)	TOC Elevation*	
MW4	12/26/90	6.93	100.25	93.32
	01/02/91	7.31	100.25	92.94
	07/10/91	7.12	100.25	93.13
	09/13/91	8.53	100.25	91.72
	12/24/91	6.70	100.25	93.55
	01/27/93	3.29	100.25	96.96
	04/30/93	4.74	100.25	95.51
	06/30/94	6.12	97.80	91.68
MW5	12/26/90	7.74	99.54	91.80
	01/02/91	7.95	99.54	91.59
	07/10/91	6.48	99.54	93.06
	09/13/91	7.07	99.54	92.47
	12/24/91	9.65	99.54	89.89
	01/27/93	4.80	99.54	94.74
	04/30/93	5.21	99.54	94.33
	06/30/94	6.48	97.08	90.60
MW6	12/26/90	9.20	99.26	90.06
	01/02/91	9.40	99.26	89.86
	07/10/91	8.66	99.26	90.60
	09/13/91	9.95	99.26	89.31
	12/24/91	9.61	99.26	89.65
	01/27/93	5.17	99.26	94.09
	04/30/93	5.92	99.26	93.34
	06/30/94	7.31	96.82	89.51
MW7	03/11/94	6.44	99.76	93.32
	06/30/94	8.52	99.76	91.24

Notes:

- * - 06/06/90 through 04/30/93: Elevation reference was top of curb at fire hydrant on 43rd Street.
- 06/30/94: Elevation reference was top of hydrant in sidewalk at NE corner of 43rd/San Pablo intersection.
- DTW - Depth to water.
- TOC - Top of monitoring well casing (data beginning 3/11/94 is based upon 7/25/94 resurveyed TOC elevations).
- NM - Not measured.

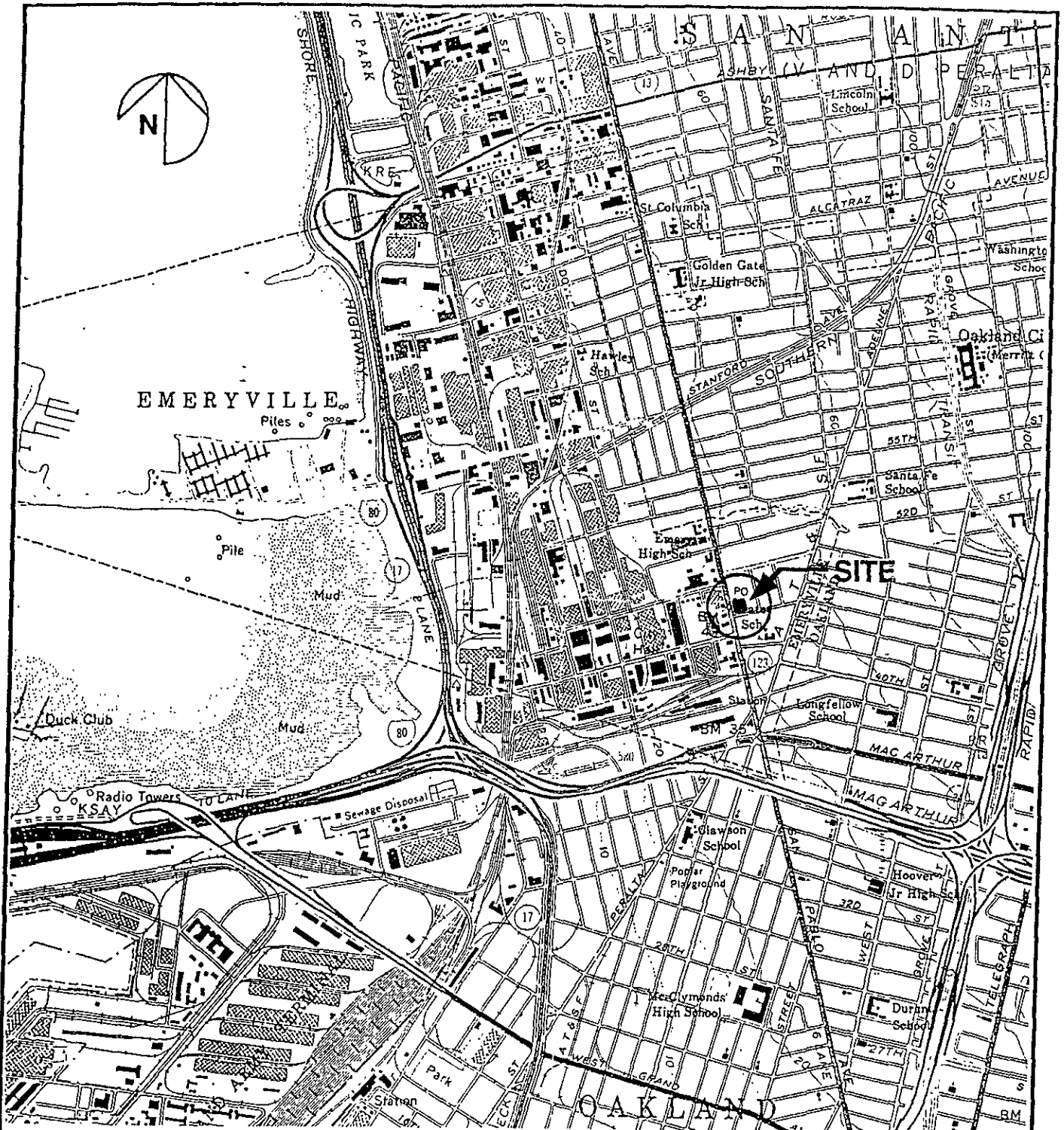
Table 3
Summary of Chemical Analyses - Groundwater
 4300 San Pablo Avenue
 Emeryville, California

Sample ID	Date Sampled	EPA METHOD					
		8015 MODIFIED		8020			
		TPH-D (mg/l)	TPH-G (mg/l)	B (mg/l)	E (mg/l)	T (mg/l)	X (mg/l)
MW1	06/11/90	1.90	0.94	0.0053	0.0018	0.0018	0.0019
	12/11/90	NA	0.26	0.0005	<0.0005	0.0008	0.0007
	09/13/91	0.38	0.33	<0.0005	0.0005	0.0018	0.0022
	12/24/91	0.41	0.15	<0.0005	<0.0005	<0.0005	<0.0005
	01/27/93	0.40	0.94	0.0030	0.0021	0.0039	0.0069
	04/30/93	0.32	1.00	0.0019	0.0019	0.0005	0.0044
MW2	06/11/90	2.80	1.80	<0.0005	0.0005	<0.0005	<0.0005
	12/11/90	NA	1.60	0.0030	0.0021	0.0025	0.0038
MW3	06/11/90	<0.05	<0.05	<0.0005	0.0005	<0.0005	<0.0005
	12/11/90	NA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW4	12/10/90	NA	0.30	<0.0005	0.0006	0.0011	0.0013
	09/13/91	0.18	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	12/24/91	0.65	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	04/30/93	0.35	0.5	0.0010	0.0021	<0.0005	0.0035
	06/30/94	0.66	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW5	12/10/90	NA	0.42	<0.0005	0.0015	<0.0005	0.0028
	09/16/91	0.20	1.20	0.0006	0.0023	0.0033	0.0051
	12/24/91	0.82	0.66	<0.0005	0.0015	0.0010	0.0032
	01/27/93	0.49	0.77	0.0012	0.0032	0.0018	0.0065
	04/30/93	0.45	0.93	<0.0005	0.0020	<0.0005	0.0020
	06/30/94	0.77	0.62	<0.0005	0.0014	<0.0005	0.0019
MW6	12/11/90	NA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	09/13/91	0.11	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	12/24/91	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	01/27/93	0.06	<0.05	0.0007	0.0007	0.0019	0.0031
	04/30/93	0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	06/30/94	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW7	03/11/94	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	06/30/94	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
Laboratory Reporting Limit		0.05	0.05	0.0005	0.0005	0.0005	0.0005

Notes:

- TPH-D - Total petroleum hydrocarbons quantified as diesel fuel.
- TPH-G - Total petroleum hydrocarbons quantified as gasoline.
- B - Benzene.
- E - Ethylbenzene.
- T - Toluene.
- X - Total xylenes.
- NA - Not analyzed.

FIGURES



Reference: U.S.G.S. 7.5 minute Oakland West Quadrangle.

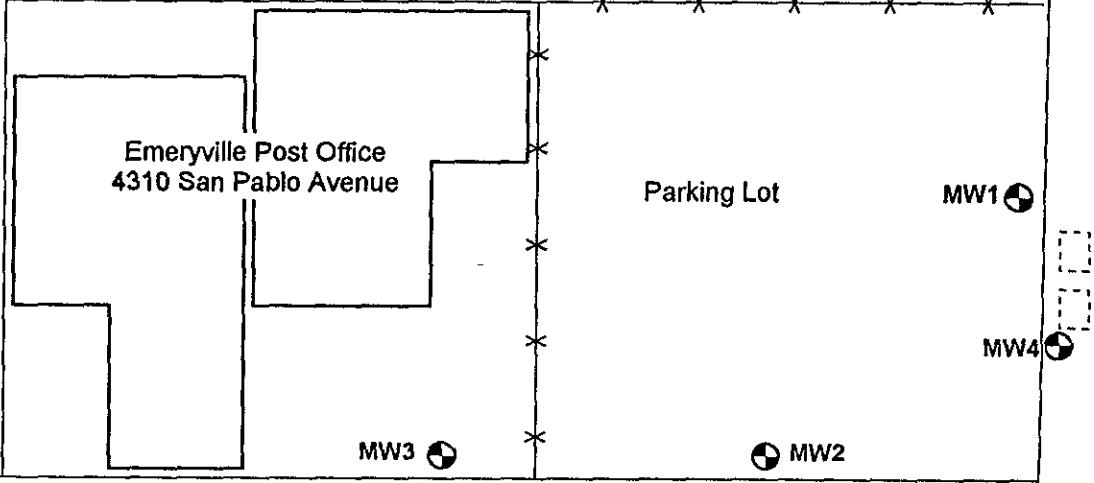
AGI
TECINOLOGIES

Vicinity Map
Emeryville Redevelopment Agency/
4300 San Pablo Avenue
Emeryville, California

FIGURE
1

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,681.004.04	DH				

MW7



43rd Street

Emeryville Post Office
4310 San Pablo Avenue

Parking Lot

Sidewalk

San Pablo Avenue

Sidewalk

LEGEND

⊕ MW2 Monitoring Well

⊞ Former Underground Storage Tank



Retail Building



AGI
TECHNOLOGIES

Site Plan

Emeryville Redevelopment Agency/4300 San Pablo Avenue
Emeryville, California

FIGURE

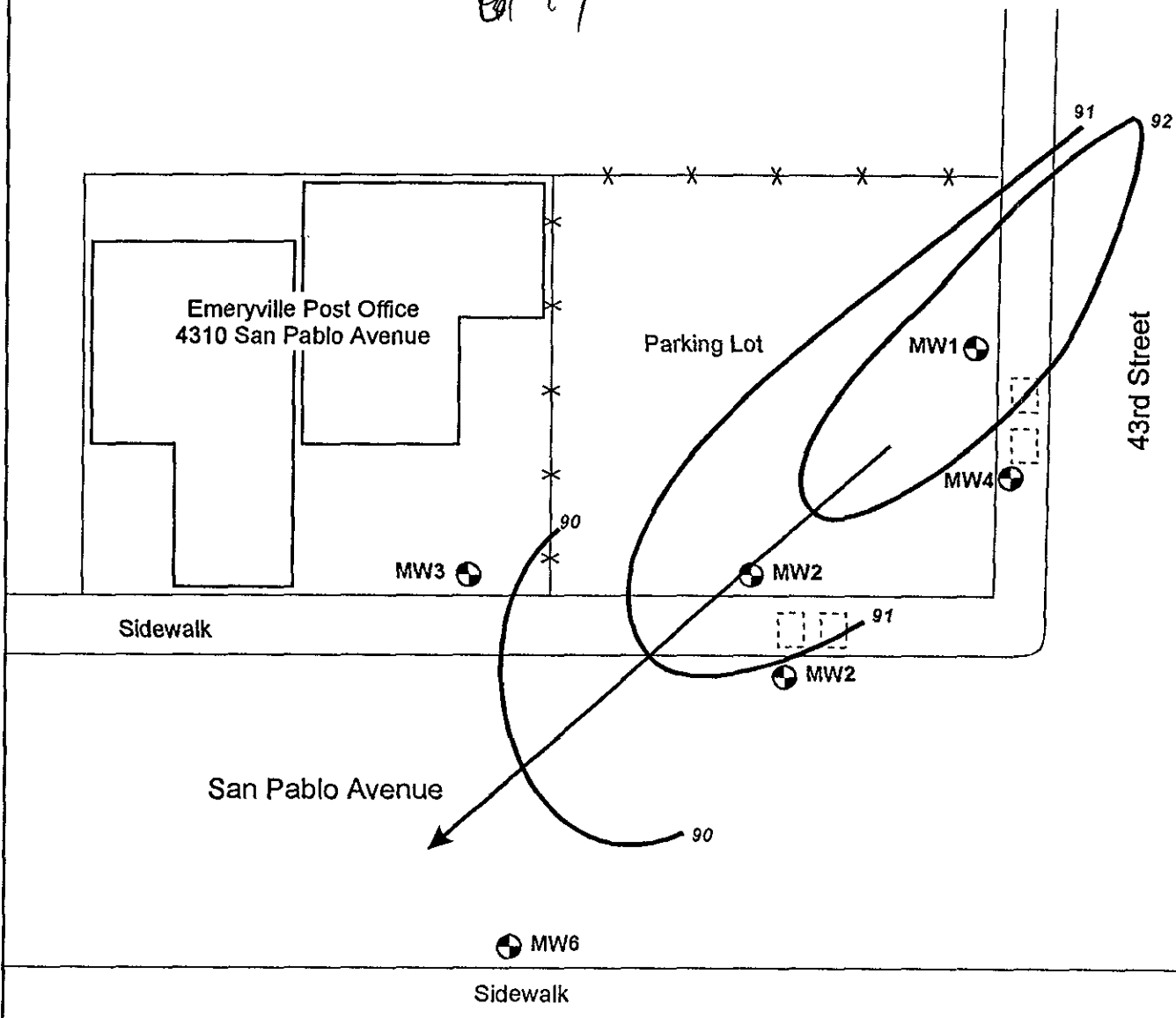
2

PROJECT NO. 15,833.002	DRAWN SES	DATE 31 August 94	APPROVED	REVISED	DATE
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881004sp.cdr

6/94

MW7



LEGEND

- MW2 Monitoring Well
- Former Underground Storage Tank
- 90 Groundwater Elevation Countour
- Inferred Direction of Groundwater Flow

Emeryville Fire Station #1
















Retail Building





Scale in Feet

APPENDIX A

FIELD EXPLORATION DATA

UNIFIED SOIL CLASSIFICATIONS SYSTEM

MAJOR DIVISIONS					TYPICAL NAMES	
COARSE GRAINED SOILS More than half is larger than No. 200 Sieve	GRAVELS More than half coarse fraction is larger than No. 4 sieve size	Clean gravels with little or no fines	GW		Well graded gravels, gravel-sand mixtures	
		SANDS More than half coarse fraction is larger than No. 4 sieve size	Gravels with over 12% fines	GP		Poorly graded gravels, gravel-sand mixtures
				GM		Silty Gravels, poorly graded gravel-sand-silt mixtures
			GC		Clayey gravels, poorly graded gravel-sand-clay mixtures	
	SANDS More than half coarse fraction is larger than No. 4 sieve size		Clean sands with little or no fines	SW		Well graded sands, gravelly sands
		SP			Poorly graded sands, gravelly sands	
		Sands with over 12% fines	SM		Silty sand, poorly graded sand-silt mixtures	
			SC		Clayey sands, poorly graded sand-clay mixtures	
FINE GRAINED SOILS More than half is smaller than No. 200 Sieve	SILTS AND CLAYS Liquid limit less than 50		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	
	SILTS AND CLAYS Liquid limit greater than 50		CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL		Organic clays and organic silty clays of low plasticity	
			MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
	SILTS AND CLAYS Liquid limit greater than 50		CH		Inorganic clays of high plasticity, fat clays	
			OH		Organic clays of medium to high plasticity, organic silts	
HIGHLY ORGANIC SOILS			PT		Peat and other highly organic soils	

SAMPLE <input type="checkbox"/> "Undisturbed" <input checked="" type="checkbox"/> Bulk/Grab <input type="checkbox"/> Not Recovered <input checked="" type="checkbox"/> Recovered, Not Retained	CONTACT BETWEEN UNITS  Well Defined Change  Gradational Change  Obscure Change  End of Exploration	PHYSICAL PROPERTY TESTS Consol - Consolidation LL - Liquid Limit PL - Plastic Limit Gs - Specific Gravity SA - Size Analysis TxS - Triaxial Shear TxP - Triaxial Permeability Perm - Permeability Po - Porosity MD - Moisture/Density DS - Direct Shear VS - Vane Shear Comp - Compaction UU - Unconsolidated, Undrained CU - Consolidated, Undrained CD - Consolidated, Drained
BLOWS PER FOOT Hammer is 140 pounds with 30-inch drop, unless otherwise noted S - SPT Sampler (2.0-Inch O.D.) T - Thin Wall Sampler (2.8-Inch Sample) H - Split Barrel Sampler (2.4-Inch Sample)		
MOISTURE DESCRIPTION Dry - Considerably less than optimum for compaction Moist - Near optimum moisture content Wet - Over optimum moisture content Saturated - Below water table, in capillary zone, or in perched groundwater		

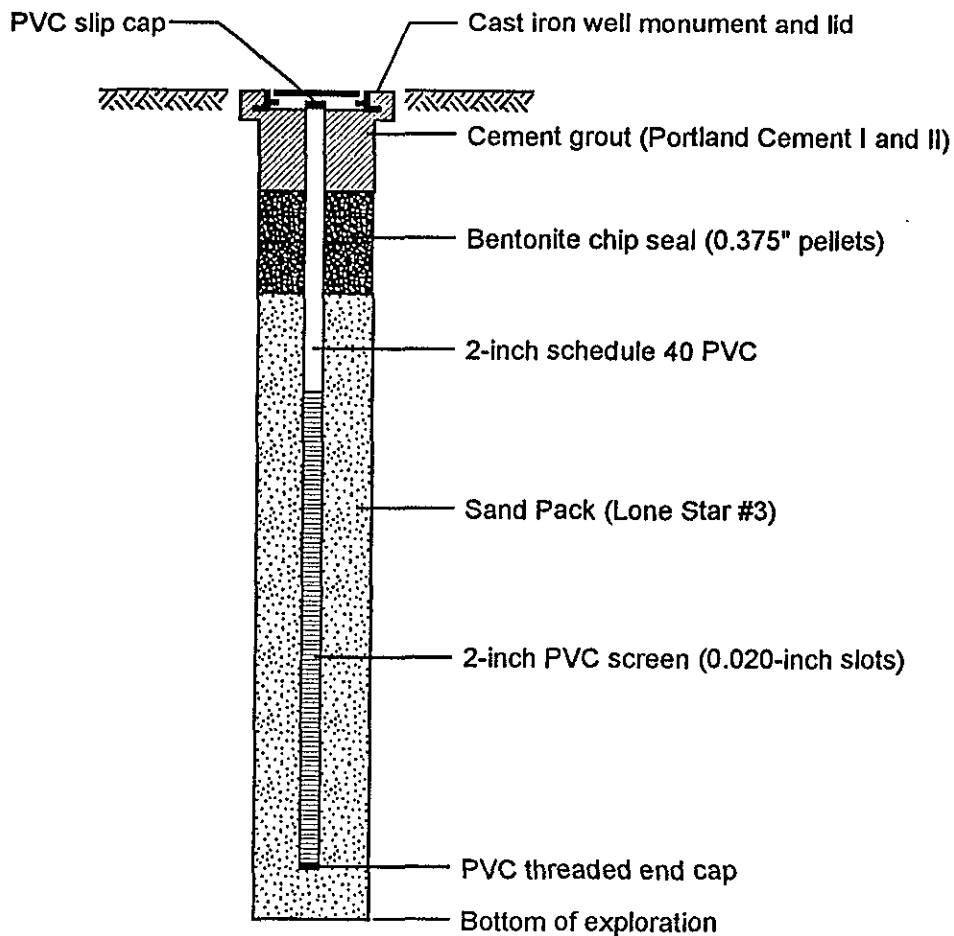
AGI
TECHNOLOGIES

Soil Classification/Legend
 Emeryville Redevelopment Agency/4300 San Pablo Avenue
 Emeryville, California

PLATE

A1

681004sl.cdr PROJECT NO. 15,681.004.04 DRAWN SES DATE 31 August 94 APPROVED _____ REVISED _____ DATE _____



AGI
TECHNOLOGIES

Monitoring Well Construction
Emeryville Redevelopment Agency/4300 San Pablo Avenue
Emeryville, California

PLATE
A2

681004mn.cdr

PROJECT NO.
15,681.004.04

DRAWN
SES

DATE
30 August 94

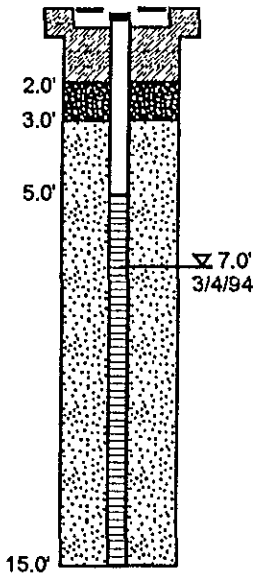
APPROVED

REVISED

DATE

Equipment CME 8" Hollow Stem Auger

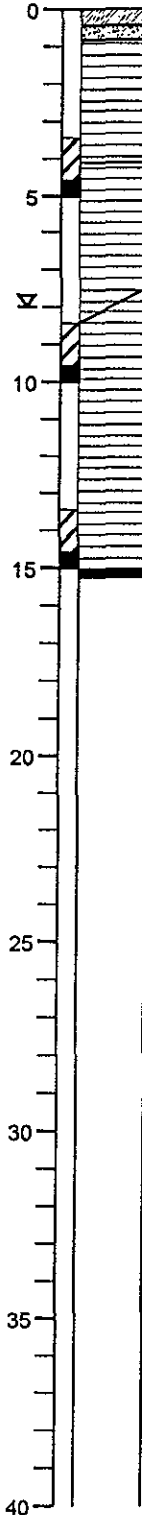
Top of Casing Elevation 99.76 feet Date 3/4/94



OVM (ppm)
Blows per Foot

Depth (feet)
Sample

ND 27
ND 34
ND 82



Asphaltic Concrete Pavement.
Base Rock.

DARK BROWN SILTY CLAY (CL) medium stiff, moist;
with a trace of sand.

GRAY BROWN CLAY (CL) medium stiff, moist; with
fine sand, and a trace of gravel.

LIGHT GRAY BROWN SANDY CLAY (CL) medium
stiff, wet; fine sand.

Groundwater encountered at 8 feet during drilling.

* Datum: Fire hydrant at NE corner of
43rd Street and San Pablo Avenue
assumed to be 100.00 feet.

AGI
TECHNOLOGIES

Log of Monitoring Well 7
Emeryville Redevelopment Agency/4300 San Pablo Avenue
Emeryville, California

PLATE

A3

681004mw odr PROJECT NO. 15,681.004.04 DRAWN SES DATE 31 August 94 APPROVED REVISED DATE

APPENDIX B

FIELD EXPLORATION AND SOIL SAMPLING PROCEDURES

APPENDIX B

FIELD EXPLORATION AND SOIL SAMPLING PROCEDURES

INTRODUCTION

The following sections describe the field work performed by AGI Technologies (AGI) for the City of Emeryville site located at 4300 San Pablo Avenue in Emeryville, California. The field investigation was performed in accordance with U.S. Environmental Protection Agency (EPA) protocol and our current agreement.

DRILLING

A truck-mounted hollow-stem auger drill rig was used to advance the soil boring. All drilling equipment was thoroughly decontaminated using a high-pressure steam cleaner prior to and following drilling.

SAMPLING

Soil samples were collected at intervals of approximately 5 feet by driving a split-barrel sampler 18 inches, when possible, into undisturbed soil ahead of the auger with a 140-pound surface hammer dropped 30 inches. Blow counts required to drive the sampler the final 1 foot were recorded on the boring log. Soil samples were examined and logged according to the Unified Soil Classification System.

Soil and groundwater conditions were characterized and logged during drilling using the following methods:

Examine drill cuttings and drive samples removed from the borehole.

- Observe the resistance to drilling, as indicated by the drilling rate, rig pressure applied, and overall rig behavior.
- Obtain soil samples, as described below.

Soil samples were collected in 6-inch-long, 2.4-inch-diameter brass tubes at approximately 5-foot intervals to the total depth of each boring.

The following procedures were employed during soil sampling:

- Split-barrel sampler containing soil is retrieved from auger.
- Driller provides split-barrel sample to AGI field representative.
- Sample is sectioned and the interval measured.
- Soil characteristics are described.
- The sample is field screened for volatile petroleum hydrocarbons using an organic vapor meter equipped with a photoionization detector (OVM-PID). A portion of the sample is placed in an airtight resealable plastic bag, disaggregated, and allowed to equilibrate for approximately 1 minute. The OVM-PID probe is then inserted through the bag into the headspace above the soil and the maximum reading of headspace vapors recorded on the boring log. OVM-PID analysis is not compound-specific and is affected by, among other influences, climate (e.g., temperature and humidity), soil type and conditions, and instrument calibration/operation. The intent of this analysis is to qualitatively compare samples and assist in sample selection for chemical analysis. OVM-PID measurements are shown on the boring log.
- One 6-inch section is extracted, a Teflon sheet is placed between the soil and plastic end caps, and the sample is sealed with silicone tape to prevent potential loss of volatile components.
- The sample is labeled, placed on Blue Ice in an insulated cooler, and chilled to approximately 4°C.
- Proper chain-of-custody protocol is followed to ensure laboratory receipt of a representative sample.

AIR QUALITY SURVEILLANCE

Air quality was monitored at the drill sites according to the AGI Corporate Health and Safety Plan for underground storage tank (UST) sites. An OVM-PID was used to check ambient air quality.

DECONTAMINATION PROCEDURES

All drilling and sampling equipment and materials coming into contact with soil sampled were decontaminated prior to the start of drilling, and after use. This included the auger flight(s), drill rods, split-barrel sampler, and other sampling equipment.

The drill rig and drilling equipment were decontaminated using a steam cleaner. A decontamination area was established on site during the field exploration.

The following decontamination procedures were used on soil sampling equipment:

Step 1: Rinse and preclean in potable water.

Step 2: Wash in solution of laboratory-grade non-phosphate-based soap and potable water.

Step 3: Dip rinse in potable water.

Step 4: Rinse with distilled water.

All solutions were renewed between sampling as necessary. Scrub brushes and nylon scrubbers were used during all steps. All equipment was air dried and held in clean plastic bags between sampling.

WELL DESIGN AND INSTALLATION PROCEDURES

The groundwater monitoring well was installed in conformance with applicable well construction standards by a California-licensed well driller. A summary log showing well completion details and a monitoring well legend is presented in Appendix A. The general procedures for well construction were as follows:

- Boreholes drilled beyond screen depth are backfilled with bentonite chips or pellets to 1-1/2 feet below the base of the screen and then backfilled with silica sand to achieve the desired base depth for the well.
- PVC well screen and blank sections were screwed together at land surface and lowered through the hollow-stem auger.
- The PVC casing consists of 2-inch-diameter, flush-thread coupled Schedule 40 PVC pipe with 0.020-inch milled slots comprising the screened interval. Required screen lengths were determined in the field based upon subsurface conditions encountered. The base of each well casing was sealed with a 4-inch-long, 2-inch-diameter PVC threaded end cap.
- The annulus between the PVC screen and the boring wall was backfilled with Monterey 2-16 silica sand to approximately 1 to 2 feet above the screen. The depth to the top of the backfill materials within the annulus was measured frequently with a fiberglass tape to maintain strict control over well construction and prevent overfilling the hollow-stem auger.

- Hydraulic seals were constructed using 1 foot of hydrated bentonite pellets placed above the sand pack. The top 2 feet of each boring annulus space was backfilled with neat cement to just below ground surface to seal the well from surface water infiltration.
- Flush-mount, traffic-rated protective steel monument cases (typically 8 inches in diameter) with secured caps were installed over the plastic well casings upon completion of construction. Monuments were set in concrete and the well was labeled denoting well designation.

APPENDIX C

GROUNDWATER MONITORING PROCEDURES

APPENDIX C

GROUNDWATER MONITORING PROCEDURES

INTRODUCTION

The following sections describe procedures which are followed during groundwater monitoring at sites undergoing investigation, remediation, or quarterly monitoring. Site-specific variations may be implemented, with the approval of the project manager, based upon site conditions, client or regulatory agency requirements, or other factors, provided the quality of data collected is not in any way reduced.

GROUNDWATER MONITORING PROCEDURES

Elevation Survey

Following well installation, the top of each well casing was surveyed using an on-site benchmark with an assumed elevation of 100.00 feet. Depth to groundwater from the survey mark at the casing top was measured in each well on June 30, 1994.

Well Development

After sufficient time was allowed for a well cover seal to harden, the well is developed using surge-and-pump techniques. Surge-and-pump techniques utilized consisted of the following:

- The screened portion of the well is flushed using an approximately two-inch-diameter surge block. A minimum of 40 surge strokes are used across the full screen length to remove sediment which may have settled in the well screen slots.
- Collected sediment at the base of the well is removed. A high-volume centrifugal suction pump is used to remove water with suspended sediment and sediment at the well base. Pumping of the well continues until the water removed is relatively sediment-free.

The above steps are repeated until the well is functioning properly, settled sediment is completely removed, and suspended sediment is relatively constant during pumping.

Water Level Measurements

Prior to beginning each sampling event, the depth to groundwater is measured in each monitoring well. Measurements are taken from a survey mark or the highest point on the top of each well casing and obtained to the nearest hundredth of a foot using an electronic

water level meter. Water level measurements are recorded on a separate field sampling record for each well. The total depth of each well is also measured to the nearest one-half foot and recorded on the field sampling record. These measurements are used to calculate the minimum purge volume for each well and to prepare groundwater contour maps.

Groundwater Sampling Procedures

Following collection of water level measurement data, each well that is not considered low yielding is purged of a minimum three well casing volumes of water prior to sample collection. During purging, the pH, temperature, and specific conductance of the pump discharge is monitored using a calibrated electronic monitoring device. The well is considered fully purged when the pH, temperature, and specific conductance of the purge water have stabilized, or when the well is pumped dry (low-yield wells only). Immediately following purging of each well, samples are collected using a two-inch diameter positive displacement bladder pump or bailer constructed of stainless steel and Teflon. For low-yield wells, samples are collected following approximately 80 percent recovery or within 24 hours after purging. If the height of the water column within a well is insufficient to maintain proper pump operation, the sample is collected using a pre-cleaned new disposable bailer or a bailer constructed of stainless steel and/or Teflon materials.

Samples are collected in appropriate EPA-approved containers based upon the analyses required. When samples are collected for several different analyses, the samples most sensitive to field conditions are collected first, followed by less sensitive samples (in descending order). Following collection, each sample is placed on "Blue Ice" in a chilled cooler prior to transport to a certified laboratory for analysis.

Following sample collection, the pump, hose, and/or bailer is immediately decontaminated. Decontamination consists of steam cleaning exposed surfaces of the pump, hose, and/or bailer, then thoroughly rinsing each piece of equipment with steamed water. To decontaminate the interior of the bladder pump and hose, a minimum of 40 pump volumes of steamed water are flushed through the pump prior to its subsequent use. Alternatively, the following procedures are used:

- Step 1: Rinse and preclean in potable water.
- Step 2: Wash in solution of laboratory-grade non-phosphate-based soap and potable water.
- Step 3: Dip rinse in potable water.
- Step 4: Rinse with distilled water.

All solutions are renewed between sampling. Scrub brushes and nylon scrubbers are used during all steps. All equipment is air dried, when possible, and held in clean plastic bags between sampling.

Quality Assurance

The following steps are taken, as appropriate, during each groundwater sampling event to assure the quality of samples collected and field data recorded:

- Based upon review of the most recent historical analytical data from each well, a monitoring sequence is determined in order to prevent potential cross-contamination of the monitoring wells. The sequence is determined by the level of contamination in each well, and progresses from least contaminated to most contaminated. If a well is inaccessible in its sequence, an attempt is made to obtain access to the well. If obtaining access will cause significant delay of the monitoring event, the well is skipped and placed in a secondary sequence. The skipped well is not returned to until later when decontamination of the sampling equipment has been verified with analysis of an equipment blank sample, or new equipment is used. The procedure for equipment blank sample collection is described later in this section.
- To assure the accuracy of field parameter measurements, calibration of the pH and specific conductance monitoring devices is performed each day prior to commencing sampling activities. A single-point calibration is used to verify proper function of the specific conductance meter, and a three-point calibration is used to ensure proper pH meter operation. If the calibration check indicates either meter is out of calibration, the meter(s) is recalibrated prior to use. No calibration of the electronic thermometer is required for proper use during groundwater sampling.
- The actual purge volume removed from each well depends upon the stability of pH, specific conductance, and temperature readings from the pump discharge water. The stabilization variance limits employed during monitoring for these parameters are 0.1 pH units, 10 percent specific conductance, and one (1) degree Fahrenheit. Readings are taken following removal of one well casing volume and each successive well casing volume. If these parameters do not stabilize following removal of the minimum purge volume, additional casing volumes are removed until stabilization is achieved.
- During sample collection, the flow rate of the pump is reduced in order to minimize disturbance of the sample upon collection. For samples collected with a bailer, a bottom emptying device is used when appropriate, to limit the loss of volatile organic compounds. After the sample is collected, volatile organic analysis (VOA) vials are checked for the presence of headspace. Samples with headspace are emptied and a replacement sample is collected. For pre-preserved VOA vials, a replacement vial is used. Following sample collection, each sample is labeled and placed in a chilled cooler for transport to the laboratory within 24 hours, when possible. Samples retained for more than a 24 hour period are placed in a locked refrigerator until transport to the laboratory. Only those samples collected one day prior to a holiday or weekend day, or from a remote location, are retained for more than 24 hours.
- Chain-of-custody documentation accompanies all samples collected and submitted to the laboratory. The original chain-of-custody documents remain with the samples until analyzed, and a copy of each is retained in AGI's files. The chain-of-custody indicates the sample identification number as shown on the sample label, number of sample containers, analyses required, date and time of collection, sampler's initials, and the relinquishing and receiving signatures of persons in control of sample handling following collection until delivery to the laboratory.

- Quality assurance samples are collected to verify the effectiveness of sample collection, handling, analysis, and equipment decontamination procedures. A pump blank sample is submitted for analysis prior to each monitoring event and secondary sampling sequence to ensure the cleanliness of the pump prior to its use for sampling. The pump blank consists of clean water which has been passed through the pump and collected from the pump discharge. A pump blank sample is not collected when new disposable bailers are used to collect samples. A trip blank sample is prepared and submitted to the laboratory with each group of samples as a check against potential contamination resulting from sample handling. Trip blanks consist of clean water contained in 40 ml VOA vials carried with the samples throughout the day. One equipment rinsate sample is typically collected during each monitoring event to ensure proper decontamination of sampling equipment. Rinsate samples consist of clean water collected from the pump discharge or bailer following sampling of a contaminated well and decontamination of the equipment. Duplicate samples are collected, as appropriate, during each monitoring event as a check of analytical accuracy. Duplicate samples are collected from selected wells, labeled with a fictitious sample identification number recorded on the sampling record, and submitted to the laboratory for analysis. Results of quality assurance sample analyses are presented with the data summary for the monitoring event. Due to the small number of samples collected during the sampling event, no quality assurance samples were collected.
- Following each day of sampling, field notes and the sampling record are reviewed to ensure the completeness and accuracy of documentation of sampling activities. Review includes verification of sample identification numbers, purge volumes, field monitoring parameter stability, and chain-of-custody documentation. Special notations regarding outside factors, such as wind direction, ambient temperature, and fugitive odors, which may affect sample integrity, are evaluated in conjunction with review of analytical data.
- During the monitoring event, field personnel evaluate the condition of each well with regard to well integrity and record findings on the sample record. These findings are tabulated and presented with or prior to the data summary report. The table provides the well identification number, condition, and any recommended actions necessary to preserve well integrity.
- Results of analytical testing are reviewed for accuracy and any anomalies that occur, based upon historical data. The review includes evaluation of results in conjunction with recorded field data and chain-of-custody documentation, comparing current and historical data, and validation of data using chromatograms and associated QA/QC procedures and results supplied by the laboratory. Any suspect results which cannot be validated through review of field or laboratory data review are immediately brought to the attention of the project manager and recommended actions to mitigate the problem are determined.
- Corrective action procedures are employed for field, laboratory, and program attributes when conditions or data require such action. Corrective actions based upon field data are recommended if such action is deemed necessary to preserve the

integrity of wells or to prevent problems in obtaining representative samples from the selected wells included in the monitoring program. Corrective actions based upon laboratory data are recommended if inherent problems with analytical results occur during implementation of the monitoring program. Any necessary adjustments in the monitoring frequency or analytical schedules are recommended based upon results of the monitoring program and the status of remediation.

Containment and Disposal of Purge Water

Purge water removed from the wells during groundwater sampling are contained in 55-gallon DOT-rated drums for later treatment or disposal following receipt of analytical results. A 500-gallon tank trailer, or other approved container is used when large volumes of purge water are collected, or site conditions or the client dictate.

APPENDIX D

ANALYTICAL REPORTS



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Applied Geotechnology Inc.
827 Broadway
Suite 210
Oakland, CA 94612

Date: 17-MAR-94
Lab Job Number: 114613
Project ID: PW 934039
Location: Emeryville/4300 San Pablo

Reviewed by: Teresa K. Morrison

Reviewed by: Kathy O'Brien

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RECEIVED

MAR 24 1994

APPLIED GEOTECHNOLOGY

Berkeley

Los Angeles

LABORATORY NUMBER: 114613
 CLIENT: APPLIED GEOTECHNOLOGY INC.
 PROJECT ID: PW934039
 LOCATION: EMERYVILLE

DATE SAMPLED: 03/04/94
 DATE RECEIVED: 03/04/94
 DATE ANALYZED: 03/04,05/94
 DATE REPORTED: 03/17/94

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)	REPORTING LIMIT (ug/Kg)	SURROGATE RECOVERIES	
							TFT	BB
114613-1	MW7-4½-5	ND	ND	ND	ND	5	96 %	106 %
114613-2	MW7-9½-10	ND	ND	ND	ND	5	94 %	104 %
114613-3	MW7-14½-15	ND	ND	ND	ND	5	103 %	115* %
METHOD BLANK	N/A	ND	ND	ND	ND	5	93 %	103 %

TFT = Trifluorotoluene (Limits: 43-114)

BB = Bromobenzene (Limits: 47-112)

ND = Not detected at or above reporting limit.
 Reporting Limit applies to all analytes.

*Surrogate recovery above control limit indicating a possible high bias which does not invalidate a non-detect result.

QA/QC SUMMARY: LABORATORY CHECK SAMPLE

=====
 RECOVERY, % 99 (Limits: 75-125)
 =====

LABORATORY NUMBER: 114613
 CLIENT: APPLIED GEOTECHNOLOGY INC.
 PROJECT ID: PW934039
 LOCATION: EMERYVILLE

DATE SAMPLED: 03/04/94
 DATE RECEIVED: 03/04/94
 DATE EXTRACTED: 03/15/94
 DATE ANALYZED: 03/16,17/94
 DATE REPORTED: 03/17/94

Extractable Petroleum Hydrocarbons in Soils & Wastes
 California DOHS Method
 LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT (mg/Kg)	SURROGATE RECOVERY (Hexacosane)
114613-1	MW7-4½-5	ND	ND	1	120 %
114613-2	MW7-9½-10	ND	ND	1	90 %
114613-3	MW7-14½-15	ND	ND	1	115 %
METHOD BLANK	N/A N/A	ND	ND	1	111 %

ND = Not detected at or above the reporting limit.

Surrogate recovery limits: 60% - 150%

QA/QC SUMMARY:

MS/MSD RPD, %	6	(Limit: <25)
MS/MSD RECOVERY, %	106	(Limits: 60-140)
LCS RECOVERY, %	100	(Limits: 70-130)

Spiked sample: 114613-2

LABORATORY NUMBER: 114613
 CLIENT: APPLIED GEOTECHNOLOGY INC.
 PROJECT ID: PW934039
 LOCATION: EMERYVILLE

DATE SAMPLED: 03/04/94
 DATE RECEIVED: 03/04/94
 DATE ANALYZED: 03/04,05/94
 DATE REPORTED: 03/17/94

Total Volatile Hydrocarbons as Gasoline in Soils & Wastes
 California DOHS Method
 LUFT Manual October 1989

LAB ID	CLIENT ID	TVH AS GASOLINE (mg/Kg)	REPORTING LIMIT (mg/Kg)	SURROGATE RECOVERIES	
				TFT, %	BFB, %
114613-1	MW7-4½-5	ND	1	103	102
114613-2	MW7-9½-10	ND	1	102	101
114613-3	MW7-14½-15	ND	1	110	111
METHOD BLANK	N/A	ND	1	98	95

TFT = Trifluorotoluene (Limits: 52-127)
 BFB = Bromofluorobenzene (Limits: 45-140)

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: MS/MSD

RPD, %	2	(Limit: <25 %)
RECOVERY, %	99	(Limits: 70-130)

Spiked sample: 114527-3



114723

Date: 3-11-94

Page 1 of 1

PROJECT INFORMATION					Laboratory Number:																																																																																																																																																																	
Project Manager: <u>JOHN ADAMS</u>					ANALYSIS REQUEST																																																																																																																																																																	
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Site Location: <u>EMERYVILLE</u> Sampled By: <u>JBA</u>																																																																																																																																																																						
DISPOSAL INFORMATION					<table border="1"> <tr> <th colspan="3">PETROLEUM HYDROCARBONS</th> <th colspan="4">ORGANIC COMPOUNDS</th> <th colspan="3">PESTS/PCB's</th> <th colspan="3">METALS</th> <th colspan="3">LEACHING TESTS</th> <th colspan="2">OTHER</th> <th rowspan="4">NUMBER OF CONTAINERS</th> </tr> <tr> <td>TPH-I State:</td> <td>TPH-G State:</td> <td>TPH-D State:</td> <td>TPH Special Instructions</td> <td>418.1 State:</td> <td>8015M</td> <td>8010 Halogenated VOCs</td> <td>8020 Aromatic VOCs</td> <td>8020M - BETX only</td> <td>8240 GCMS Volatiles</td> <td>8270 GCMS Semivol.</td> <td>8310 HPLC PAHs</td> <td>8040 Phenols</td> <td>DWS - Volatiles and Semivol.</td> <td>8080 OC Pest/PCBs</td> <td>8080M PCBs only</td> <td>8140 OP Pesticides</td> <td>8150 OC Herbicides</td> <td>DWS - Herb/pest</td> <td>Selected metals: list</td> <td>Total Lead (Wa)</td> <td>Organic Lead (Ca)</td> <td>TCL Metals (29)</td> <td>Priority Poll. Metals (13)</td> <td>DWS - Metals</td> <td>MSP - Metals (Wa)</td> <td>TCLP - Volatiles (ZHE)</td> <td>TCLP - Semivolatiles</td> <td>TCLP - Pesticides</td> <td>TCLP - Metals</td> <td rowspan="4">PH-6/BETX</td> <td rowspan="4">3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>															PETROLEUM HYDROCARBONS			ORGANIC COMPOUNDS				PESTS/PCB's			METALS			LEACHING TESTS			OTHER		NUMBER OF CONTAINERS	TPH-I State:	TPH-G State:	TPH-D State:	TPH Special Instructions	418.1 State:	8015M	8010 Halogenated VOCs	8020 Aromatic VOCs	8020M - BETX only	8240 GCMS Volatiles	8270 GCMS Semivol.	8310 HPLC PAHs	8040 Phenols	DWS - Volatiles and Semivol.	8080 OC Pest/PCBs	8080M PCBs only	8140 OP Pesticides	8150 OC Herbicides	DWS - Herb/pest	Selected metals: list	Total Lead (Wa)	Organic Lead (Ca)	TCL Metals (29)	Priority Poll. Metals (13)	DWS - Metals	MSP - Metals (Wa)	TCLP - Volatiles (ZHE)	TCLP - Semivolatiles	TCLP - Pesticides	TCLP - Metals	PH-6/BETX	3																																																																																																
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MW7	3-11-94	0955	WATER		X																																																																																																																																																																	

LAB INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
Lab Name: <u>Curtis & TOMPKINS</u>		Total Number of Containers: <u>3</u>		Signature: <u>[Signature]</u> Time: <u>1025</u>		Signature: _____ Time: _____		Signature: _____ Time: _____	
Lab Address: <u>Berkeley</u>		Chain of Custody Seals: <u>Y/N/A</u>		Printed Name: <u>JOHN B. ADAMS</u> Date: <u>3-11-94</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
Via: <u>HAND</u>		Intact?: <u>Y/N/A</u>		Company: <u>AGI</u>		Company: _____		Company: _____	
Turn Around Time: <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 72 hr. <input type="checkbox"/> 1 wk.		Received in Good Condition/Cold: <input checked="" type="checkbox"/>		RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: 3.	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA				Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: <u>[Signature]</u> Time: <u>1025</u>	
Special Instructions:				Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: <u>[Signature]</u> Date: <u>3-11-94</u>	
				Company: _____		Company: _____		Company: <u>C.T</u>	



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Applied Geotechnology Inc.
827 Broadway
Suite 210
Oakland, CA 94612

Date: 25-MAR-94
Lab Job Number: 114723
Project ID: PW934039
Location: Emeryville/4300 San Pablo

Reviewed by: Teresa K Morrison

Reviewed by: Mary Pless

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MAR 30 1994

APPLIED GEOTECHNOLOGY

Berkeley

Los Angeles

LABORATORY NUMBER: 114723
 CLIENT: APPLIED GEOTECHNOLOGY INC.
 PROJECT ID: PW934039
 LOCATION: EMERYVILLE/4300 SAN PABLO

DATE SAMPLED: 03/11/94
 DATE RECEIVED: 03/11/94
 DATE EXTRACTED: 03/24/94
 DATE ANALYZED: 03/25/94
 DATE REPORTED: 03/25/94

Extractable Petroleum Hydrocarbons in Aqueous Solutions
 California DOHS Method
 LUFT Manual October 1989

LAB ID	CLIENT SAMPLE ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT (ug/L)	SURROGATE RECOVERY (Hexacosane)
114723-1	MW7	ND	ND	50	78 %
METHOD BLANK	N/A	ND	ND	50	95 %

ND = Not detected at or above the reporting limit.

Surrogate recovery limits: 60% - 150%

QA/QC SUMMARY: BS/BSD

RPD, %	8	(Limit: <25)
RECOVERY, %	97	(Limits: 75 - 125)

LABORATORY NUMBER: 114723
 CLIENT: APPLIED GEOTECHNOLOGY INC.
 PROJECT ID: PW934039
 LOCATION: EMERYVILLE/4300 SAN PABLO

DATE SAMPLED: 03/11/94
 DATE RECEIVED: 03/11/94
 DATE ANALYZED: 03/12/94
 DATE REPORTED: 03/25/94

Total Volatile Hydrocarbons as Gasoline in Aqueous Solutions
 California DOHS Method
 LUFT Manual October 1989

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)	REPORTING LIMIT (ug/L)	SURROGATE RECOVERIES	
				TFT	BB
114723-1	MW7	ND	50	92 %	93 %
METHOD BLANK	N/A	ND	50	90 %	93 %

TFT = Trifluorotoluene (Limits: 69-120)

BB = Bromobenzene (Limits: 70-122)

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: LABORATORY CHECK SAMPLE

=====
 RECOVERY, % 97 (Limits: 75-125)
 =====



Date 3-4-94 Page 1 of 1

Project Manager: JOHN ADAMS
Project Name: EMERYVILLE / 4300 San Pablo
Project Number: PW 934039
Site Location: EMERYVILLE
Phone: 238-4590 Sampled By: IBA

Laboratory Number:

ANALYSIS REQUEST

SAMPLE DISPOSAL INSTRUCTIONS
 Lab Disposal Return Pickup (will call)

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TCL Metals (23)	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	TCLP Metals	EP TOX Pesticides (5)	TCLP - Volatiles	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 OC Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418 1 (TPH)	413 2 Grease & Oil	8015M Fuel Fingerprint	TOC 9060	TOX 9020	% Moisture	TPH-G/BETX	TPH-D	NUMBER OF CONTAINERS			
1 MW7-4 $\frac{1}{2}$ -5	3-4-94	0950	SOIL																															
2 MW7-9 $\frac{1}{2}$ -10	3-4-94	1010	↓																											X	X		1	
3 MW7-14 $\frac{1}{2}$ -15	3-4-94	1030	↓																										X	X		1		

LAB INFORMATION
Lab Name: CUTTS + TOMPKINS
Lab Address: BERKELEY
Via: HAND
TAT: 24hr. 48 hr. 72 hr. 1 wk. 2 wks. (normal)

SAMPLE RECEIPT
Total Number of Containers:
Chain of Custody Seals: Y/N/NA
Intact?: Y/N/N
Received in Good Cond./Cold:

RELINQUISHED BY: 1. Signature: [Signature] Time: 1305
Printed Name: JOHN B. ADAMS Date: 3-4-94
Company: AGI

RELINQUISHED BY: 2. Signature: _____ Time: _____
Printed Name: _____ Date: _____
Company: _____

RELINQUISHED BY: 3. Signature: _____ Time: _____
Printed Name: _____ Date: _____
Company: _____

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA
Special Instructions:

RECEIVED BY: 1. Signature: [Signature] Time: _____
Printed Name: ERSEA MORRISON Date: _____
Company: C&T 3/4/94 1305

RECEIVED BY: 2. Signature: _____ Time: _____
Printed Name: _____ Date: _____
Company: _____

RECEIVED BY: 3. Signature: _____ Time: _____
Printed Name: _____ Date: _____
Company: _____



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

AGI Technologies
827 Broadway
Suite 210
Oakland, CA 94612

Date: 15-JUL-94
Lab Job Number: 116169
Project ID: 15681.004
Location: 4300 San Pablo

Reviewed by:

Reviewed by:

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RECEIVED

JUL 18 1994

Berkeley

Los Angeles APPLIED GEOTECHNOLOGY



LABORATORY NUMBER: 116169
CLIENT: AGI TECHNOLOGIES
PROJECT ID: 15681.004
LOCATION: 4300 SAN PABLO

DATE SAMPLED: 06/30/94
DATE RECEIVED: 06/30/94
DATE ANALYZED: 07/05-06/94
DATE REPORTED: 07/14/94

Total Volatile Hydrocarbons as Gasoline in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)	REPORTING LIMIT (ug/L)	SURROGATE RECOVERIES	
				TFT	BB
116169-001	MW-7	ND	50	99%	98%
116169-002	MW-6	ND	50	98%	98%
116169-003	MW-5	620	50	99%	100%
116169-004	MW-4	ND	50	99%	98%
METHOD BLANK	N/A	ND	50	97%	97%

TFT = Trifluorotoluene (Limits: 69-120)
BB = Bromobenzene (Limits: 70-122)

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: BS/BSD

RPD, %	3	(Limit: <25)
RECOVERY, %	94	(Limit: 75-125)

LABORATORY NUMBER: 116169
 CLIENT: AGI TECHNOLOGIES
 PROJECT ID: 15681.004
 LOCATION: 4300 SAN PABLO

DATE SAMPLED: 06/30/94
 DATE RECEIVED: 06/30/94
 DATE ANALYZED: 07/05-06/94
 DATE REPORTED: 07/14/94

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE	TOLUENE	ETHYL	TOTAL	REPORTING	SURROGATE	
		(ug/L)	(ug/L)	BENZENE (ug/L)	XYLENES (ug/L)	LIMIT (ug/L)	TFT	BB
116169-001	MW-7	ND	ND	ND	ND	0.5	86 %	94 %
116169-002	MW-6	ND	ND	ND	ND	0.5	86 %	94 %
116169-003	MW-5	ND	ND	1.4*	1.9*	0.5	90 %	96 %
116169-004	MW-4	ND	ND	ND	ND	0.5	87 %	94 %
METHOD BLANK	N/A	ND	ND	ND	ND	0.5	85 %	94 %

TFT = Trifluorotoluene (Limits: 58-130)
 BB = Bromobenzene (Limits: 62-131)

ND = Not detected at or above reporting limit.
 Reporting Limit applies to all analytes.

* Presence of this compound confirmed by second column; however, the confirmation concentration differed from the reported result by more than a factor of two.



LABORATORY NUMBER: 116169
CLIENT: AGI TECHNOLOGIES
PROJECT ID: 15681.004
LOCATION: 4300 SAN PABLO

DATE SAMPLED: 06/30/94
DATE RECEIVED: 06/30/94
DATE EXTRACTED: 07/07/94
DATE ANALYZED: 07/08-09/94
DATE REPORTED: 07/14/94

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	DIESEL RANGE (ug/L)	REPORTING LIMIT (ug/L)	SURROGATE RECOVERY (Hexacosane)
116169-001	MW-7	ND	50	111 %
116169-002	MW-6	ND	50	230 %*
116169-003	MW-5	770	50	103 %
116169-004	MW-4	660	50	99 %
METHOD BLANK	N/A	ND	50	123 %

Surrogate recovery limits: 60% - 150%

* Analyst suspects that surrogate was added twice.

ND = Not detected at or above the reporting limit.

QA/QC SUMMARY: BS/BSD

RPD, %	8	(Limit: <25)
RECOVERY, %	105	(Limits: 75 - 125)



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