

ALTA GEOSCIENCES, Inc.

Environmental & Geotechnical Solutions

COPY

December 30, 1999

Mr. Yoshiro Tokiwa
US EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Re: Groundwater Monitoring
Westinghouse Emeryville Site, Emeryville, California

Dear Mr. Tokiwa:

Enclosed are two copies of the 1999 Groundwater Sampling and Analysis Report for the Westinghouse Emeryville Site in Emeryville, California. This report is submitted on behalf of CBS Corporation (formerly Westinghouse Electric Corporation).

If you have any questions, please feel free to call me at your convenience.

Sincerely,
ALTA Geosciences, Inc.



Alex Tula, R.G.
Principal Consultant

Enclosure: 1999 Groundwater Sampling and Analysis Report

cc: Gordon Taylor - CBS Corp.

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1999 GROUNDWATER SAMPLING AND ANALYSIS REPORT

**Westinghouse Emeryville Site
Emeryville, California**

November 1999

Prepared for:
CBS Corporation

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report presents the results of the July 1999 annual groundwater monitoring event for the Westinghouse Emeryville Site (Site), located in Emeryville, California. This report has been prepared by Alta Geosciences, Inc., on behalf of CBS Corporation (formerly Westinghouse Electric Corporation). Monitoring is required by the Second Amendment to the Consent Agreement and Final Order between Westinghouse and the U.S. Environmental Protection Agency (USEPA), Region 9, dated August 16, 1985. Groundwater monitoring is required only for Polychlorinated Biphenyls (PCBs), for the purpose of assessing potential PCB impacts to Site Groundwater.

Staff from ALTA Geosciences, Inc. performed field work for this event on July 28, 29 and 30, 1999. Groundwater elevations were determined in sixteen wells and piezometers, and samples were collected from twelve wells. Analytical testing was performed on these samples for PCBs at a California Certified Testing Laboratory. Data analysis and production of this report were under the direct supervision of an ALTA Geosciences, Inc., Civil Engineer and Engineering Geologist.

1.2 ORGANIZATION OF REPORT

This report presents Site information and background data in sufficient detail to identify the project and place the monitoring work in perspective. Previous groundwater monitoring work was completed by Engineering Science, Inc. from April 1986 to February 1990, EMCON from March 1991 to May 1996 and ALTA Geosciences, Inc. from April 1997 to the present. Groundwater elevation data and analytical data for PCBs from this prior work has been retained in summary tables in this report, and updated with the July 1999 data developed by ALTA Geosciences, Inc. Groundwater elevations were analyzed to develop groundwater contour maps for both shallow and deep wells. Groundwater contour maps are presented as Figures 3-1 and 3-2. The Appendices present copies of field and analytical data, as well as a quality control analysis of the analytical data.

2.0

SITE BACKGROUND AND PHYSICAL SETTING

2.1 SITE LOCATION AND DESCRIPTION

The project is located at 5899 Peladeau Street in the City of Emeryville, California, on the east side of the San Francisco Bay (Figure 2-1, Site Location Map). The portion of the Westinghouse Emeryville property in which groundwater monitoring is required is about 3 acres, in the NE portion of the property. The subject area is about 30 percent covered with Portland cement concrete (former building area), 20 percent covered with compacted gravel (former service yard), and 50 percent covered with asphalt concrete (engineered cap, see below). The site was formerly fenced on all sides with a 6-foot high steel chainlink fence, however, following construction of surrounding features and paving of the TSCA Cell, fencing is only present on the north and west sides.

2.2 HISTORY OF SITE ACTIVITIES

This property was formerly the site of an electrical apparatus service facility, which serviced and manufactured transformers and other electrical equipment in addition to fulfilling administrative and engineering functions for their service district. Westinghouse ceased using the facility for work on electrical apparatus in 1982 and stopped using the facility for all work in 1992. Buildings on the Site have been demolished and only concrete floor slabs and foundations, plus outside pavements remain from the original facility.

Some of the manufacturing and service functions at the facility involved handling, storing, and/or using fluids containing or impacted with Polychlorinated Biphenyls (PCBs), volatile organic compounds (VOCs), hydrocarbon products such as gasoline and diesel, and mineral or hydraulic oils. Investigations conducted on the Site identified the above compounds as present in the groundwater and in some soils on the Site.

In 1984, WEC entered into a Consent Agreement and Final Order with the U.S. Environmental Protection Agency (EPA), Region 9 regarding the Site. As part of this Order, a slurry wall was constructed in 1985 in the northwest portion of the property to limit the lateral migration of impacted groundwater beneath the Site. PCB-impacted soil from areas surrounding the containment cell were consolidated into the cell, and an engineered cap of geomembrane and asphalt concrete was placed over the top.

At the request of the California Regional Water Quality Control Board, a site specific Baseline Human Health Risk Assessment (HHRA, SOMA, 1996) was performed for the former Westinghouse facility site east of the capped area and west of Peladeau Street. This facility area extends south to Powell Street. Although this assessment focussed on the adjacent portions of the facility, the groundwater fate and transport modeling included the capped area. The groundwater fate and transport modeling showed no significant contaminants of concern to be migrating from the capped area. Based on the results of this HHRA, a soil remediation for PCBs was performed in the former service yard area at the north end of the former facility on the northeast side of the capped area (see Figure 3-1). The results of this soil remediation are summarized in *Completion Report, Site Remediation, Westinghouse Emeryville Site, Emeryville, CA.* (ALTA Geosciences, Inc. (ALTA) 1996). Following approval by the RWQCB, the parcels encompassing the former facility and the service yard were sold to a land developer (the capped area was retained by CBS Corp.).

In 1998 and 1999, a multistory office building was being built on the former Westinghouse facility site which had been sold (east of the capped area and west of Peladeau Street and south to Powell Street). Parking lot improvements including earthwork and paving were being constructed in the Summer of 1999. This included repaving the TSCA cap with 4-8 inches of asphalt concrete and the extension of Landregen Street northward through the Site. After these paving operations, well boxes had to be raised, and the well piping extended to allow access.

2.3 WELL CONSTRUCTION

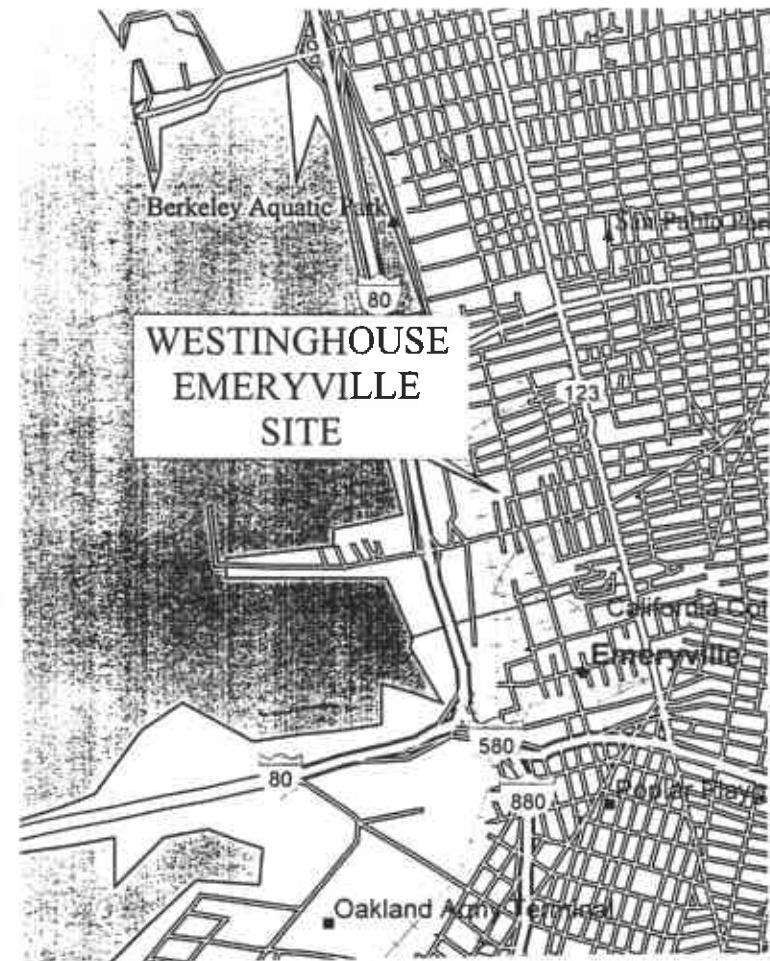
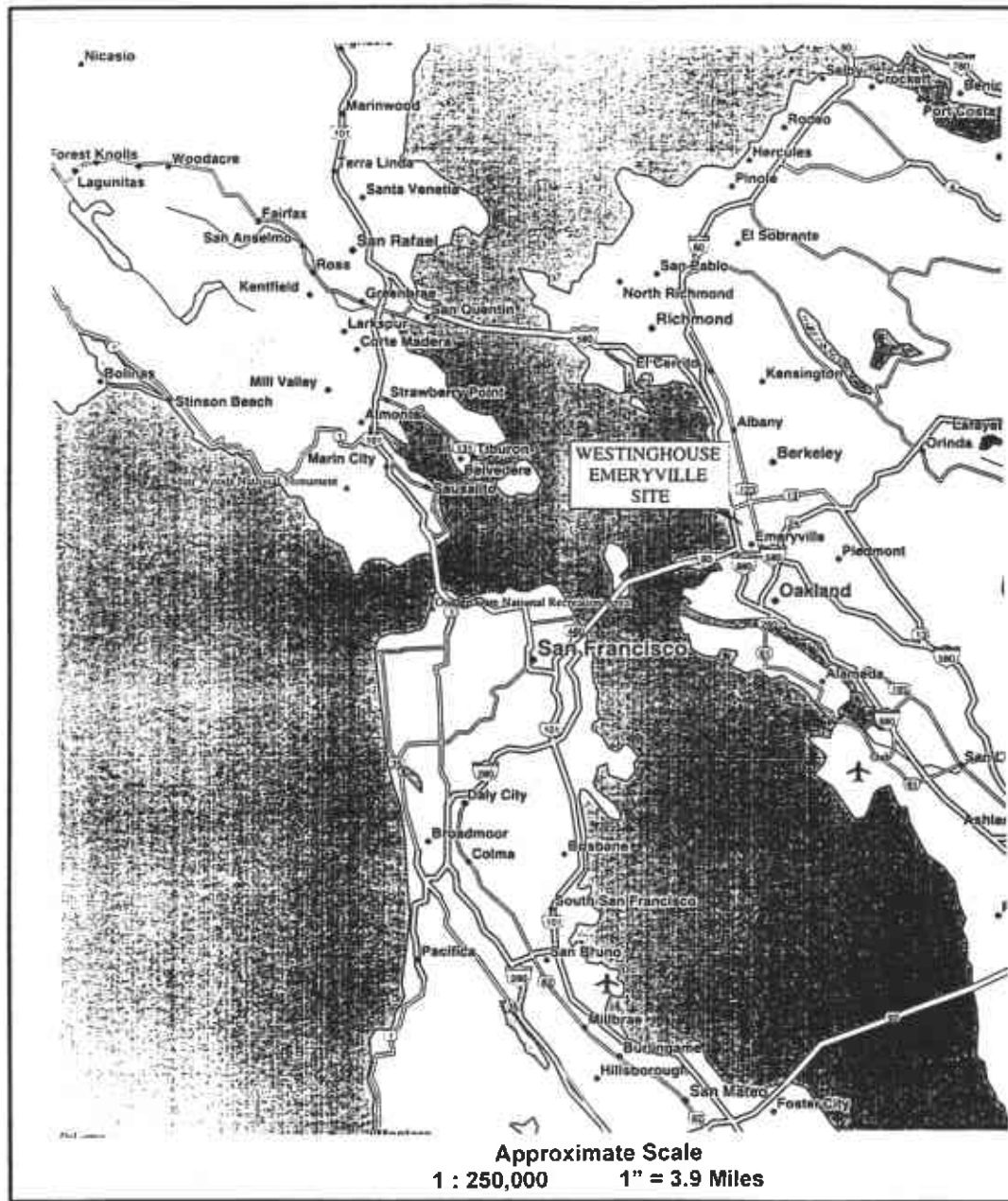
In March 1983 nine wells, which had been constructed as part of an investigation of the Site, were sampled. PCBs were detected in five of these wells and VOCs in eight. These findings, along with related findings regarding PCB impacts to soils on the Site, lead to the construction in September and October 1985 of the slurry wall and engineered cap mentioned above. This construction destroyed all but one of the original monitoring wells, which was subsequently given the designation of D-6, and is still in use. In 1986, as part of the Consent Agreement and Final Order between Westinghouse and the USEPA, a post-construction groundwater monitoring program was initiated with the installation and sampling of thirteen additional wells. The stated purpose of this program was to assess and monitor PCB concentrations in the Site groundwater. Initially monitoring was done by Engineering Science, Inc. every two months. Starting in 1991, monitoring performed by EMCON was done semiannually, and presently, monitoring performed by ALTA Geosciences, Inc. is required annually.

Because of damage during construction on the adjacent AMTRAK station, several wells have had to be repaired, and two wells, S-2 and D-2 had to be abandoned and replaced with S-2R and D-2R. At present the monitoring well network contains eight shallow wells (S-1, S-2R, and S-3 through S-8) which are screened approximately,

9.5 to 24.5 feet below the ground surface. All shallow monitoring wells are all within the Site fence, except for S-8 which is a few feet south of the fence. Also included in the monitoring network are six deep wells (D-1, D-2R, and D-3 through D-6), which are screened approximately between 25 and 40 feet below the surface. These are all within the limits of the Site fence. Two shallow and two deep piezometers are located within the slurry wall/capped area and are monitored for water depth only. All wells and piezometers are constructed with 2-inch diameter PVC casings. The surface completions vary because of construction at different times and because of differing local site conditions. Some wells have rectangular steel boxes approximately 2-1/2 feet tall, and some wells have flush completions and metal lids (especially in paved areas).

2.4 SITE INSPECTIONS

A site inspection was performed in July 1999, in conjunction with the groundwater monitoring activities. Site fencing on the north and west sides of the Site was in place and in good condition. The TSCA cell had been repaved, in preparation for use as a parking lot. Work on the new office building located on the old Westinghouse building site was nearly finished. The portion of the old Westinghouse building (slab) located between 59th Street and the north service yard was under construction as a parking structure. The north service yard, remediated in 1996 for PCB soils contamination, was being excavated as a borrow source for aggregate base placed as backfill in 1996. Wells D-6 and S-6, located at the east end of the north service yard were destroyed or covered with concrete during the building project on the old Westinghouse building slab.



Approximate Scale
1 : 31,250 1" = 0.5 Miles

WESTINGHOUSE ELECTRIC CORPORATION
EMERYVILLE SITE, EMERYVILLE, CALIFORNIA
ANNUAL GROUNDWATER MONITORING
SITE LOCATION MAP

FIGURE 2-1
ALTA GEOSCIENCES, INC.

July 1999

3.0

JULY 1999 GROUNDWATER SAMPLING AND ANALYSIS

3.1 GROUNDWATER MONITORING LEVELS – July 1999

The depth to groundwater in each well was measured to the nearest 0.01 foot using an electronic well sounder. The July 1999 water depths and elevations (MSL) are shown in Table 3-1 (located at end of section). Figures 3-1 and 3-2 contain geologically interpreted groundwater contours in those portions of the Site where sufficient information is available to allow interpretation. Contours are intended to be a qualitative expression of the general head potential and direction of groundwater flow beneath the Site. The depth to water in the wells is also shown on these two figures (in parentheses, next to the well numbers). Loss of Wells D-6 and S-6 make it difficult to draw groundwater contours and increase the amount of geologic interpretation necessary in the task.

Table 3-2 (located at end of section) contains historical groundwater elevation data back to April 1986. The latest data was placed near the bottom of the table. Groundwater levels are generally within the range of values previously seen on this site.

3.2 SAMPLING PROCEDURES

Groundwater samples were collected from 12 Site monitoring wells on 28-30 July 1999 for analytical laboratory testing. To obtain a sample representative of the surrounding formation, each well was purged using a low-flow technique to reduce interference's associated with turbidity.

Measurement

Fluid level measurements in each monitoring well were completed with a flat tape water level meter to indicate depth to groundwater relative to the top of the well casings. Inspection of the tape after use at each well did not reveal the presence of floating oil.

Sampling

Sampling equipment consisted of a portable 12 Volt submersible pump (ES-40), discharging through Teflon-lined Tygon tubing to the surface. The tubing at the surface was connected to a flow meter to regulate flow at 1.2 L/min. Water analyses during sampling were made using a YSI Model 55 dissolved oxygen meter, Oakton pH5, pH meter, Orbeco-Hellige Model 966 Turbidimeter, and Oakton WD-35607 conductivity and temperature meter. All meters were calibrated the days of use.

Wells were purged at a rate of 1 liters per minute to 2 liters per minute with the submersible pump set above the screened interval. The rate selected for a given

well depended on the amount of screened depth and past records of well performance, with the aim of maintaining submergence of the pump throughout the purging/sampling process. The parameters pH, temperature, conductivity, dissolved oxygen, and turbidity were monitored and recorded at intervals throughout the purging process.

Prior to groundwater sampling, each well was purged until pH, conductivity and temperature readings stabilized within 10 percent, with a low turbidity, where possible (see Table 3-1). The samples were dispensed directly into laboratory provided containers. Each sample was appropriately labeled and stored on ice at approximately 4°C from the time of collection through the time of delivery to the laboratory, and chain of custody procedures were followed to ensure sample integrity.

**Table 3-3
Groundwater Field Parameters**

	SAMPLING LOCATION											
	D-1	D-2R	D-3	D-4	D-5	S-1	S-2R	S-3	S-4	S-5	S-7	S-8
Field Parameters												
Temperature (°C)	19.2	19.9	19.4	18.3	17.9	20.6	17.8	18.6	17.9	18.9	19.0	19.9
pH	7.20	6.86	7.00	6.23	6.97	6.74	6.67	7.07	6.64	6.78	6.50	6.66
Conductivity (uS)	857	830	974	1298	756	1242	966	1273	1216	912	1099	944
Oxygen (mg/L)	0.44	0.28	0.26	0.22	0.13	0.28	0.21	0.20	0.78	0.26	0.37	0.28
Turbidity (NTU)	2.9	4.2	4.1	0.2	0.8	4.5	0.6	1.0	4.9	1.6	0.5	1.2

Decontamination Procedures

All sampling equipment was decontaminated between each monitoring well location to avoid cross-contamination. The entire pump and hose assembly was immersed in analconox detergent solution and allowed to circulate for at least 2 minutes. The assembly was then immersed in fresh tap water and run for another 2 minutes.

Purge Water Storage

All purge water was stored in 55 gallon open-top drums at the site. The drums were closed with sealed lids, bolted, and appropriately labeled.

Documentation

Record keeping documentation for the samples included the use of the following:

- Fluid level measurement form; to record depth to fluid in each well.
- Groundwater sampling form; to record method of collection, purge volume, parameters pH, cond, temp., D.O., turbidity and general observations.

- Labels to identify individual samples; with well #, project name, date, time, samplers name and type of preservation (if any).
- Chain-of-custody record sheets; to document possession and transfer of samples and specify analysis requested.
- Field report form; Describing general site conditions, well integrity and condition of the asphalt cap.

Field records are included in Table 3-3 and the Chain of Custody forms are filed following the analytical data sheets in Appendix A.

3.3 ANALYTICAL PROCEDURES

Sixteen samples from twelve wells, including a matrix spike and matrix spike duplicate, environmental duplicate and field rinse blank, were analyzed by Sequoia Analytical laboratory, Redwood City, California. All samples were analyzed by EPA Method 8082 for PCBs. Results were reported for seven Aroclors, with a detection limit of one-half microgram per liter (1/2 part per billion) (EPA, 1986).

3.4 ANALYTICAL RESULTS

Testing results indicate no detectable PCBs in all 12 wells. Historical analytical results are shown, along with the latest results on Table 3-4 for the deep wells and Table 3-5 (located at end of section) for the shallow wells. Laboratory analysis certificates are contained in Appendix A

3.5 QUALITY ASSURANCE/QUALITY CONTROL

Appendix C contains a Data Quality Assurance Review of the laboratory reports. This review may be summarized as follows:

Holding Times -- all acceptable
Method Blanks -- two analyzed, no PCBs detected
Surrogate Recovery -- %R for DBC acceptable, %R for TXMX outside limits
Matrix Spike Recovery -- %R is acceptable
Blank Spike Recovery -- %R is acceptable
Precision -- RPD is acceptable
Completeness -- completeness is acceptable

See Appendix B for discussion of these parameters.

The required detection limits for all aroclors was 0.10 µg/L. Because of a laboratory error, the reporting limit for all aroclors except PCB-1221 was 0.5 µg/L. Aroclor 1221 had a reporting limit of 2.0 µg/L. These limits were given for the subject

samples, despite the lab having been given a copy of the QAPP, and instructed regarding the need for 0.1µg/L detection limits. After the error was discovered, they responded that the samples having been analyzed, they could not be reanalyzed due to insufficient material. The reporting limits obtained are within the action limits set in the EPA Order and therefore are adequate for purposes of this report. Future analyses will be performed by a different laboratory and special caution will be taken to assure compliance with the required limit.

**Table 3-1
Groundwater Levels In July 1999**

WELL NUMBER	TOC ELEVATION (Feet, MSL)	DEPTH TO WATER (Feet)	WATER ELEVATION (Feet, MSL)
D-1	16.17	6.30	9.87
D-2R	14.45	5.83	8.62
D-3	14.13	6.55	7.58
D-4	15.00	6.00	9.00
D-5	13.32	4.05 ↗	9.27
D-6		Destroyed By Construction	
S-1	15.99	7.60 ↓	8.39
S-2R	14.46	7.13	7.33
S-3	14.04	7.38	6.66
S-4	15.04	5.95	9.09
S-5	13.36	4.70	8.66
S-6		Destroyed By Construction	
S-7	12.28	4.78	7.50
S-8	15.57	7.30	8.27
P-1	16.59	6.05	10.54
P-2	16.53	5.90	10.63
P-3	15.48	4.80	10.68
P-4	15.30	4.68	10.62

Table 3-2
Groundwater Elevation Data (Ft, MSL)¹

Date	MONITORING WELLS						
	^{16.17} D-1	D-2	^{14.45} D-2R	^{14.13} D-3	^{15.03} D-4	^{13.32} D-5	D-6
04/86	9.19	9.01	-	8.29	10.51	9.72	11.16
06/86	8.98	7.99	-	7.75	9.84	9.37	10.56
08/86	8.75	7.95	-	7.35	9.30	9.25	10.24
10/86	8.82	8.16	-	7.62	9.63	9.30	10.42
12/86	8.47	7.60	-	7.29	9.10	8.94	9.74
02/87	9.09	9.04	-	8.35	10.64	9.61	10.77
04/87	9.20	8.33	-	8.17	10.49	9.62	10.98
06/87	8.73	7.75	-	7.73	9.55	9.19	10.60
08/87	8.59	7.55	-	7.15	9.19	9.12	10.77
10/87	8.47	7.37	-	6.92	9.06	8.99	10.64
12/87	9.10	8.72	-	7.87	10.56	9.57	10.92
02/88	9.38	8.76	-	^{5.5} 8.61	10.69	9.71	11.36
04/88	8.64	7.85	-	7.55	9.84	9.13	10.45
06/88	8.69	8.00	-	7.70	9.96	9.26	10.53
08/88	8.57	7.71	-	7.45	9.58	9.05	10.67
10/88	8.36	7.31	-	6.71	8.97	8.91	10.32
12/88	7.50	8.03	-	7.72	10.03	9.17	10.48
02/89	8.82	8.13	-	7.78	10.19	9.21	10.66
04/89	9.08	8.31	-	8.44	10.39	9.60	10.93
06/89	8.64	7.67	-	7.56	9.37	9.11	10.67
08/89	8.42	7.51	-	7.04	8.94	9.17	10.58
10/89	8.57	7.74	-	7.25	9.05	9.12	10.59
12/89	8.01	8.23	-	7.88	10.04	9.56	10.85
02/90	9.15	8.75	-	8.10	10.47	9.72	11.19
03/20/91	9.20	9.33	-	8.03	FW2	9.67	11.13
04/04/91	9.26	8.32	-	8.16	10.58	9.67	11.21
09/11/91	8.57	7.36	-	6.90	9.13	9.07	10.72
03/16/92	9.42	8.82	-	8.33	10.47	9.91	11.95
09/21/92	8.47	7.28	-	6.66	8.15	8.87	9.83
03/22/93	9.22	8.33	-	8.24	10.00	9.41	11.20
09/21/93	NS ³	NA ⁸	-	7.23	NS	8.98	10.23
05/17/94	4.31	NA	-	7.89	8.07	9.62	11.73
11/15/94	4.41	NA	-	8.25	8.55	9.79	11.93
05/23/95	9.08	NA	8.52	8.18	11.41	9.56	11.62
11/28/95	8.31	NA	8.25	7.07	8.79	8.42	10.10
05/16/96	9.05	NA	9.03	8.03	2.93 12.07	9.65	11.07
04/21/97	8.91	NA	8.87	7.88	10.87	9.53	12.02
05/13/98	9.45	NA	5.02 9.43	8.53	11.04	3.22 10.10	12.26
7/30/99	6.3 9.87	NA	8.62	7.58	9.00	9.27	NA ⁸
TOC ⁴ Elev.	16.17 ⁵	11.20	14.45 ⁶	14.13 ^{5,9}	15.00 ⁹	13.32 ⁹	13.75

6.3

**Table 3-2
Groundwater Elevation Data
(Ft, MSL)¹(Continued)**

Date	Monitoring Wells <i>15 at 133</i>								
	S-1	S-2	S-2R	S-3	S-4	S-5	S-6	S-7	S-8
04/86	8.88	9.66	-	7.96	10.65	10.28	11.41	9.94	9.70
06/86	7.16	7.54	-	7.52	9.92	9.45	10.58	8.69	9.20
08/86	6.59	6.98	-	7.02	9.36	8.83	10.16	7.54	8.30
10/86	7.23	7.62	-	7.23	9.77	9.56	10.40	8.92	8.66
12/86	6.55	6.38	-	6.89	9.08	8.84	9.83	9.70	8.24
02/87	<i>6.43</i> 9.56	9.85	-	7.69	<i>10.78</i>	<i>10.38</i>	11.45	9.73	9.89
04/87	8.08	7.77	-	8.09	10.57	9.90	11.13	9.22	9.98
06/87	6.72	6.78	-	5.17	9.66	9.32	10.89	8.01	8.59
08/87	6.25	6.22	-	6.77	9.32	9.35	11.10	6.77	7.85
10/87	5.84	5.88	-	6.48	9.11	9.25	11.13	6.23	7.52
12/87	8.92	9.17	-	7.94	<i>10.94</i>	10.67	11.69	9.25	9.64
02/88	8.81	8.65	-	8.27	10.73	10.05	11.40	9.60	10.06
04/88	7.07	7.06	-	7.30	9.85	9.33	10.72	8.09	9.19
06/88	7.22	7.19	-	7.64	10.03	9.15	10.74	8.36	9.46
08/88	6.51	6.53	-	7.02	9.48	9.07	10.89	7.03	8.19
10/88	5.98	5.92	-	6.44	8.86	8.67	10.57	6.45	7.67
12/88	7.81	7.35	-	7.51	10.17	9.66	10.73	8.76	9.15
02/89	8.09	7.60	-	7.87	10.31	9.74	10.91	9.21	9.73
04/89	8.30	7.90	-	7.96	10.49	9.93	11.05	9.32	10.12
06/89	6.99	6.97	-	6.23	9.83	9.31	11.04	7.73	8.69
08/89	6.49	6.45	-	6.83	9.30	8.91	10.91	6.81	7.92
10/89	6.80	6.72	-	7.13	9.81	9.61	10.85	8.24	8.63
12/89	8.03	7.53	-	7.60	10.20	9.71	10.96	8.96	9.19
02/90	9.06	8.86	-	7.86	10.77	10.08	11.38	10.05	9.79
03/20/91	9.52	9.78	-	8.17	FW	<i>10.74</i>	12.11	10.11	9.99
04/04/91	8.54	7.83	-	8.00	10.61	10.15	11.27	9.46	9.84
09/11/91	6.12	6.06	-	6.62	9.30	8.90	10.82	7.23	9.02
03/16/92	9.00	8.66	-	8.17	<i>11.06</i>	10.62	12.35	10.08	6.54
09/21/92	5.82	5.68	-	6.30	8.23	8.90	9.77	6.08	4.96
03/22/93	8.68	7.78	-	8.10	10.82	9.22	11.25	9.62	9.61
09/21/93	NS	NA	-	7.01	NS	8.03	10.13	6.28	NS
05/17/94	3.23	NA	-	7.78	8.60	10.13	11.70	7.96	4.69
11/15/94	3.63	NA	-	7.99	9.26	<i>10.77</i>	12.47	8.35	4.83
05/23/95	7.11	NA	7.28	7.78	11.39	9.87	11.60	8.04	9.34
11/28/95	6.18	NA	6.10	7.01	8.93	9.07	10.19	6.04	8.17
05/16/96	8.28	NA	<i>5.94</i> 8.54	7.79	<i>12.99</i>	10.80	12.82	8.09	9.96
04/21/97	7.15	NA	7.16	7.72	11.07	10.40	12.25	7.65	9.67
05/13/98	7.79	NA	7.95	<i>5.11</i> 8.38	11.2	10.37	12.49	8.07	9.47
7/30/99	8.39	NA	7.33	6.66	9.09	8.66	NA ⁸	7.50	8.27
TOC ⁴ Elev.	15.99 ⁵	10.46	14.46 ⁶	14.04 ⁹	15.04 ⁹	13.36 ⁹	13.77	12.28	15.57

**Table 3-2
Groundwater Elevation Data
(Ft, MSL)¹
(Continued)**

Date	Piezometers			
	P-1	P-2	P-3	P-4
04/86	NR ⁷	NR	NR	NR
06/86	NR	NR	NR	NR
08/86	6.19	6.31	4.86	4.80
10/86	6.48	6.67	5.27	5.23
12/86	7.16	7.15	5.81	5.72
02/87	7.29	7.13	5.94	5.83
04/87	7.35	6.95	6.06	5.57
06/87	8.74	6.79	5.39	5.34
08/87	6.57	6.67	5.21	5.18
10/87	6.84	6.90	5.55	5.45
12/87	7.09	6.94	5.64	5.60
02/88	7.34	7.33	6.26	5.99
04/88	7.13	7.17	5.92	5.86
06/88	6.84	6.87	5.63	5.43
08/88	8.34	6.59	5.27	5.13
10/88	9.19	6.95	5.55	5.49
12/88	7.20	7.21	5.91	5.72
02/89	7.46	7.38	FW	5.67
04/89	7.29	7.14	5.87	5.72
06/89	6.75	6.84	5.46	5.03
08/89	6.51	6.64	5.19	5.16
10/89	6.75	6.94	5.48	5.30
12/89	6.72	6.77	5.49	5.21
02/90	7.15	7.00	5.81	5.82
03/20/91	8.75	8.95	8.95	8.93
04/04/91	8.94	8.97	8.90	9.00
09/11/91	9.53	9.53	9.58	9.54
03/16/92	9.23	9.28	9.23	9.27
09/21/92	9.51	9.46	9.43	9.57
03/22/93	9.47	9.45	9.43	9.47
09/21/93	9.71	9.74	9.77	9.79

**Table 3-2
Groundwater Elevation Data
(Ft, MSL)¹
(Continued)**

Date	Piezometers			
	P-1	P-2	P-3	P-4
05/17/94	10.96	9.99	9.97	10.01
11/15/95	9.47	9.53	9.49	9.62
05/23/95	10.54	10.57	10.55	10.62
11/28/95	9.19	9.18	9.23	9.20
05/16/96	10.76	10.72	10.80	10.82
04/21/97	10.25	10.12	10.28	10.21
05/13/98	11.10	11.10	11.19	11.22
7/30/99	10.54	10.63	10.68	10.62
TOC ⁴ Elevations	16.59 ⁹	16.53 ⁹	15.48 ⁹	15.30 ⁹
<p>¹ ft, MSL = feet relative to mean sea level. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990, and were calculated from ESI monitoring well elevations (top of steel casing). Groundwater elevation data beginning with March 1991 were calculated from April 2, 1991, well elevation survey data.</p> <p>² FW = flooded well; water was detected at or above the top of the well casing.</p> <p>³ NS = not surveyed.</p> <p>⁴ TOC = top of casing; TOC elevations were surveyed by EMCON on April 2, 1991.</p> <p>⁵ Elevation resurveyed by EMCON on June 14, 1995.</p> <p>⁶ Elevation surveyed by EMCON on June 14, 1995.</p> <p>⁷ NR = not recorded.</p> <p>⁸ NA = not accessible; well covered with concrete.</p> <p>⁹ Area paved in June 1999, well casing extended to allow access; elevation shown is new TOC</p>				

**Table 3-4
Analytical Results¹
Deep Wells (µg/l)²**

Polychlorinated Biphenyls (PCBs) As Total Aroclors							
Monitoring Wells							
Date	D-1	D-2	D-2R	D-3	D-4	D-5	D-6
04/86	ND ³	ND	-	ND	ND	ND	14.3
06/86	ND	ND	-	ND	ND	ND	1.8
08/86	0.1	ND	-	ND	ND	0.2	6.7
10/86	ND	ND	-	ND	ND	ND	3.2
12/86	ND	ND	-	ND	ND	0.8	8.4
02/87	ND	ND	-	ND	ND	0.5	5.5
04/87	ND	ND	-	ND	0.3	ND	1.9
06/87	ND	ND	-	ND	ND	0.2	6.0
08/87	0.4	ND	-	ND	ND	ND	3.1
10/87	0.1	ND	-	ND	0.2	0.3	4.4
12/87	ND	ND	-	0.1	ND	0.5	1.8
02/88	ND	0.1	-	ND	ND	0.4	0.6
04/88	ND	ND	-	ND	ND	1.9	1.6
06/88	ND	0.1	-	ND	ND	1.5	3.2
08/88	ND	1.5	-	ND	ND	0.7	4.9
10/88	ND	1.8	-	0.3	0.2	31.0	1.4
12/88	ND	0.3	-	0.4	ND	5.2	21.9
02/89	ND	0.3	-	0.3	ND	2.8	8.0
04/89	ND	0.2	-	ND	ND	2.1	8.8
06/89	ND	0.7	-	ND	ND	0.5	3.9
08/89	ND	ND	-	ND	0.2	5.3	4.2
10/89	ND	0.1	-	0.4	ND	2.7	8.4
12/89	ND	0.3	-	ND	ND	3.0	6.7
02/90	ND	0.2	-	0.2	ND	5.0	4.5
03/91	<0.1 ⁴	0.2	-	0.1	<0.1	0.2	1.0
09/91	<0.1	<0.1	-	<0.1	<0.1	<0.2	0.4
03/92	<0.1	<0.1	-	<0.1	<0.1	<0.1	0.2
09/92	<0.1	<0.1	-	<0.1	<0.1	0.2	0.3
03/93	0.1	<0.1	-	<0.1	<0.1	<0.1	0.5
09/93	NS ⁵	NS ⁵	-	<0.1	NS	0.1	0.3
05/94	NA ⁶	NS ⁵	-	<0.1	<0.1	<0.1	0.4
11/94	NA ⁶	NS ⁵	-	<0.1	<0.1	<0.1	0.8
05/95	<0.1	NS ⁵	<0.1	<0.1	0.1	<0.1	<0.1
11/95	<1	NS ⁵	<1	<1	<1	<1	<1
05/96	<0.1	NS ⁵	<0.1	<0.1	<0.1	0.5	<0.1
04/97	<0.1	AB ⁷	<0.1	<0.1	<0.1	<0.1	<0.1
05/98	<0.1	AB ⁷	<0.1	<0.1	<0.1	<0.1	<0.1
07/99	<0.5	AB ⁷	<0.5	<0.5	<0.5	<0.5	NA

1. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990
2. µg/l = micrograms per liter
3. ND = not detected at or above the method reporting limit
4. < = not detected at or above the specified method reporting limit
5. NS = not sampled
6. NA = not accessible.
7. AB = Well abandoned during Amtrak Station construction

**Table 3-5
Analytical Results¹
Shallow Wells (µg/l)²**

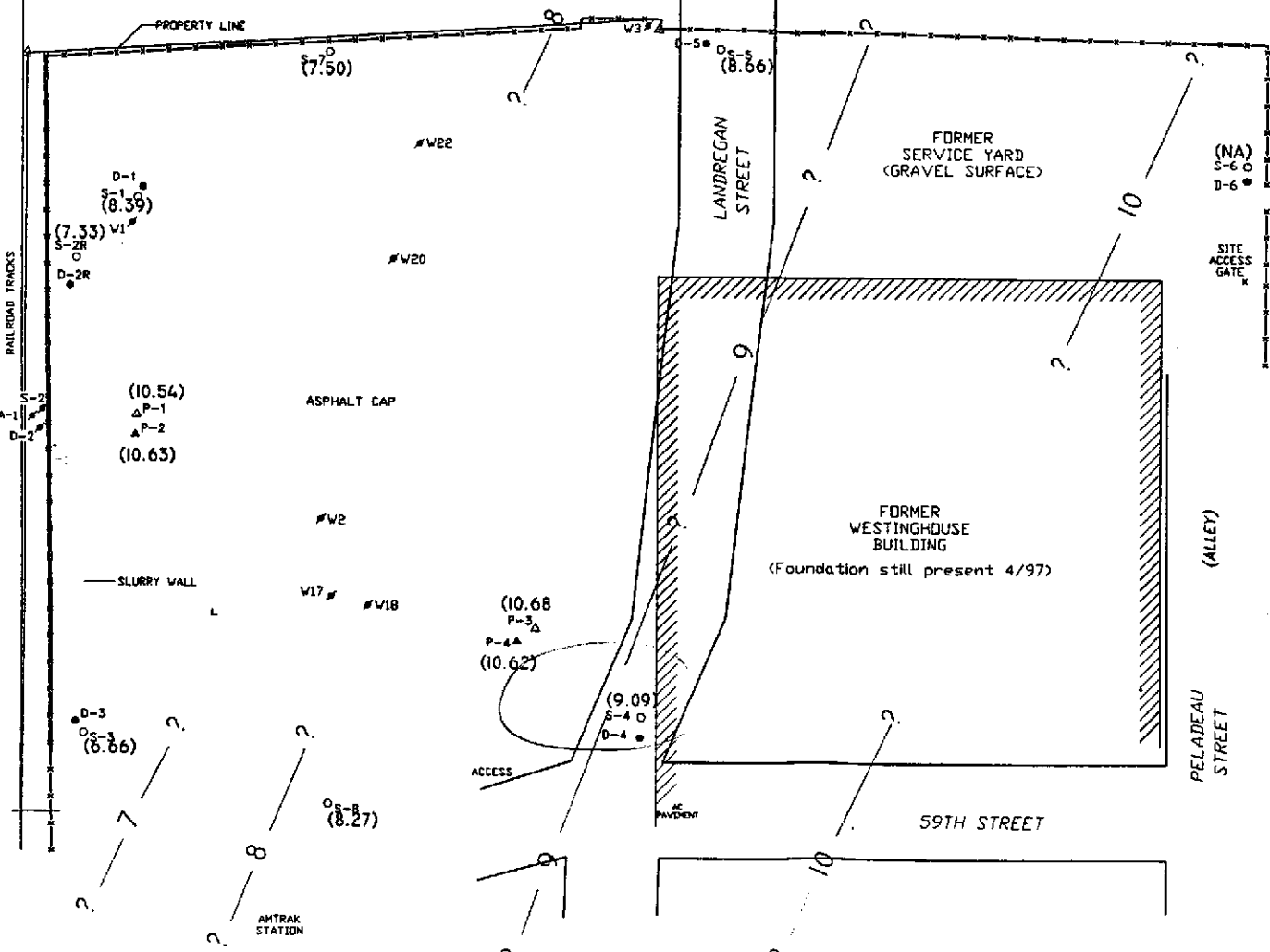
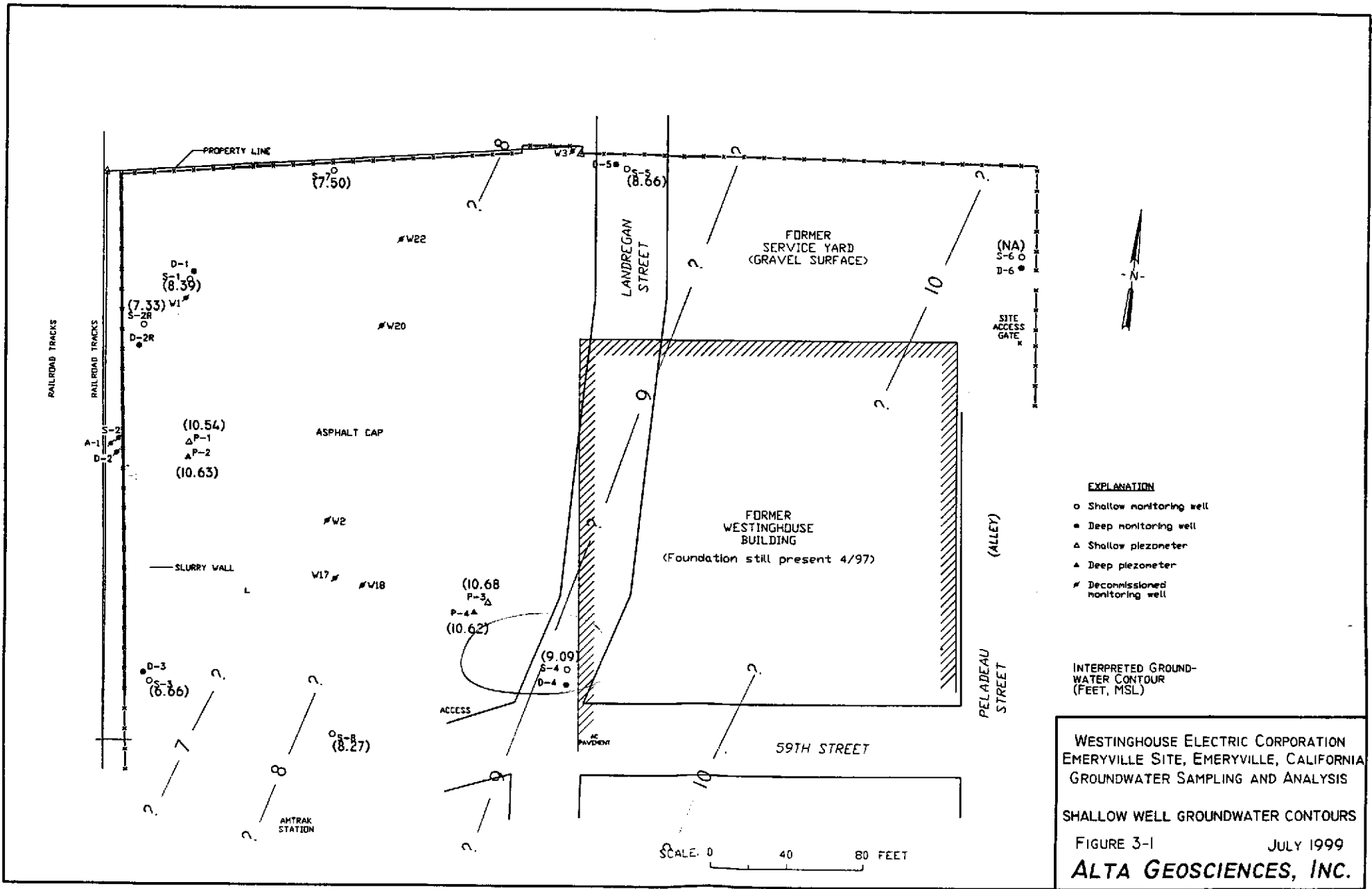
Polychlorinated Biphenyls (PCBs) as Total Aroclors									
Date	Monitoring Wells								
	S-1	S-2	S-2R	S-3	S-4	S-5	S-6	S-7	S-8
04/86	ND ³	ND	-	4.0	ND	ND	ND	ND	ND
06/86	0.8	0.8	-	1.4	0.8	1.9	1.4	1.5	0.7
08/86	0.7	0.2	-	0.1	0.3	0.5	2.7	2.4	0.9
10/86	0.9	0.7	-	0.3	0.3	1.6	2.2	0.5	0.8
12/86	0.8	0.5	-	0.5	0.5	0.7	2.6	2.4	2.3
02/87	0.8	0.3	-	0.3	0.2	0.2	0.1	1.1	0.4
04/87	0.6	0.2	-	0.9	0.3	0.4	1.8	0.4	0.1
06/87	0.3	0.3	-	ND	ND	0.4	1.3	0.3	0.2
08/87	ND	ND	-	ND	ND	0.7	1.2	0.7	ND
10/87	0.2	0.1	-	ND	0.1	0.3	2.4	0.4	ND
12/87	0.3	ND	-	ND	ND	0.5	1.3	0.8	0.3
02/88	0.8	ND	-	ND	0.2	0.5	1.8	6.9	0.5
04/88	0.2	0.2	-	0.2	ND	0.9	2.1	1.6	0.2
06/88	0.2	0.1	-	0.1	ND	5.7	2.1	1.3	0.1
08/88	0.3	ND	-	ND	1.2	1.9	1.2	1.3	ND
10/88	0.4	ND	-	0.3	ND	4.4	0.7	4.0	0.2
12/88	0.3	0.2	-	ND	ND	1.5	6.0	0.4	ND
02/89	0.3	0.2	-	ND	ND	1.7	5.0	1.2	1.1
04/89	0.5	ND	-	0.1	ND	0.8	1.0	1.2	0.2
06/89	0.6	0.2	-	ND	ND	0.3	1.1	0.5	ND
08/89	19.0	0.2	-	0.1	0.2	2.9	4.3	0.6	ND
10/89	0.2	0.2	-	1.5	ND	4.0	1.8	2.7	0.4
12/89	0.3	ND	-	0.6	ND	4.0	2.8	1.9	0.9
02/90	0.6	ND	-	0.5	ND	2.2	1.0	0.9	0.1
03/91	0.6	0.3	-	0.5	0.1	1.0	0.2	3.0	<0.1 ⁴
09/91	1.4	0.3	-	0.6	0.2	1.0	0.2	1.6	<0.1
03/92	0.4	<0.1	-	0.2	<0.1	0.2	0.2	0.4	<1 ⁵
09/92	0.5	0.2	-	<0.1	0.2	0.7	0.4	0.4	<0.1
03/93	<0.1	0.4	-	<0.1	<0.1	0.4	<0.1	0.8	<0.1
09/93	NS ⁶	NS ⁶	-	<0.1	NS	0.3	0.2	0.6	NS
05/94	0.2	NS ⁶	-	<0.1	<0.1	0.2	0.2	0.2	<0.1
11/94	0.1	NS ⁶	-	<0.1	<0.1	0.2	0.2	0.2	<0.1

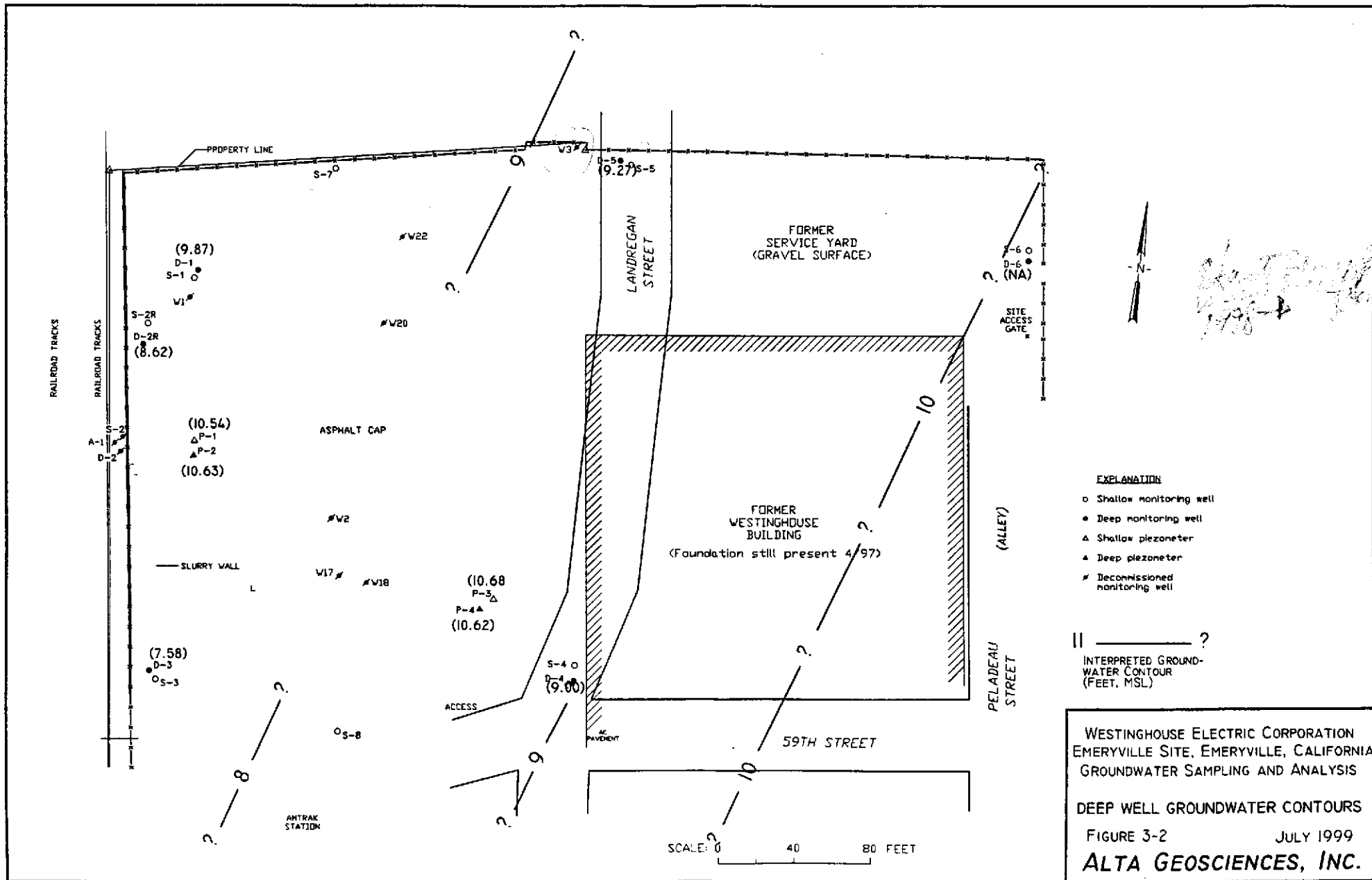
1. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990
2. µg/l= micrograms per liter
3. ND = not detected at or above the method reporting limit
4. < = not detected at or above the specified method reporting limit
5. Elevated method reporting limit due to matrix interference
6. NS = not sampled
7. AB = Well abandoned during Amtrak Station construction

**Table 3-5
Analytical Results¹
Shallow Wells ($\mu\text{g/l}$)²
(Continued)**

Polychlorinated Biphenyls (PCBs) as Total Aroclors									
Date	Monitoring Wells								
	S-1	S-2	S-2R	S-3	S-4	S-5	S-6	S-7	S-8
05/95	0.6	NS ⁶	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1
11/95	<1	NS ⁶	<1	<1	<1	<1	<1	<1	<1
05/96	<0.1	NS ⁶	<0.1	<0.1	<0.1	0.8	<0.1	<0.1	<0.1
04/97	<0.1	AB ⁷	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
05/98	<0.1	AB ⁷	<0.1	0.13	<0.1	0.13	<0.1	<0.1	<0.1
7/99	<0.5	AB ⁷	<0.5	<0.5	<0.5	<0.5	NA	<0.5	<0.5

1. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990
2. $\mu\text{g/l}$ = micrograms per liter
3. ND = not detected at or above the method reporting limit
4. < = not detected at or above the specified method reporting limit
5. Elevated method reporting limit due to matrix interference
6. NS = not sampled
7. AB = Well abandoned during Amtrak Station construction





**4.0
CONCLUSION**

Sampling and testing for annual groundwater monitoring at the Westinghouse Emeryville Site were completed in July 1999. All samples were non-detect for PCBs. Groundwater levels were determined to be within the historic range of levels for this Site.

Sampling employed low-flow sampling techniques with a submersible pump that greatly reduces the turbidity of the samples collected, compared to bailing or use of higher flow pumps. This approach has been adopted as an approved technique by the USEPA for PCB sampling, and has proven useful for properly characterizing the PCB impacts to groundwater at this and other similar sites.

Two upgradient monitoring wells, D-6 and S-6 were destroyed or covered with concrete from construction in the adjoining area. These wells will be located and assessed for damage. Repairs and/or replacement of these wells will depend on the condition they are found in. If they can not be located they will be replaced in time for next years monitoring event.

5.0

REFERENCES

ALTA Geosciences, Inc. (ALTA) 1996. Completion Report, Site Remediation, Westinghouse Emeryville Site, Emeryville, CA.

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SOMA Environmental Engineering, Inc., 1996. Baseline Human Health Risk Assessment For The Former Westinghouse Electric Corporation Facility, 5899 Peladeau Street, Emeryville, California, March 15, 1996.

U.S. Environmental Protection Agency (EPA). 1986. Test Methods for Evaluation of Solid Waste, Vol II: Field Manual Physical/Chemical Methods (SW-846). Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C. November 1986.

APPENDIX A
ANALYTICAL TESTING RESULTS



Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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ANALYTICAL REPORT FOR 9080117

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
9071978/Well S-1	9080117-01	Water	7/28/99
9071979/Well D-1	9080117-02	Water	7/28/99
9071980/Well S2R	9080117-03	Water	7/28/99
9071981/Well D2R	9080117-04	Water	7/28/99
9071982/Well S-3	9080117-05	Water	7/28/99
9071983/Well D-3	9080117-06	Water	7/28/99
9071984/Well S-4	9080117-07	Water	7/28/99
9071985/Well D-4	9080117-08	Water	7/28/99
9071986/ Well S-5	9080117-09	Water	7/28/99
9071987 Well D-5	9080117-10	Water	7/28/99
9071988/ S-3 MS	9080117-11	Water	7/28/99
9071989/ S-MSD	9080117-12	Water	7/29/99
9071990/ Well S-25	9080117-13	Water	7/29/99
9071991/ Rinsate	9080117-14	Water	7/30/99
9071992/Well S-7	9080117-15	Water	7/30/99
9071993/ Well S-8	9080117-16	Water	7/29/99
9071994/ Fill N-1	9080117-17	Soil	7/30/99
9071995/ Fill S-1	9080117-18	Soil	7/30/99





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Polychlorinated Biphenyls by EPA Method 8080A
Sequoia Analytical - Morgan Hill**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
9071978/Well S-1				9080117-01			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		70.0	%	
Surrogate: Dibutylchlorendate	"	"	"	50.0-150		133	"	
9071979/Well D-1				9080117-02			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		65.0	%	
Surrogate: Dibutylchlorendate	"	"	"	50.0-150		131	"	
9071980/Well S2R				9080117-03			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		29.0	%	3
Surrogate: Dibutylchlorendate	"	"	"	50.0-150		51.5	"	
9071981/Well D2R				9080117-04			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		70.0	%	





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Polychlorinated Biphenyls by EPA Method 8080A
Sequoia Analytical - Morgan Hill**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
9071981/Well D2R (continued)				9080117-04			Water	
Surrogate: Dibutylchloroendate	9080161	8/5/99	8/9/99	50.0-150		134	%	
9071982/Well S-3				9080117-05			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		77.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		135	"	
9071983/Well D-3				9080117-06			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		73.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		114	"	
9071984/Well S-4				9080117-07			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		83.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		133	"	
9071985/Well D-4				9080117-08			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Polychlorinated Biphenyls by EPA Method 8080A
Sequoia Analytical - Morgan Hill**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<u>9071985/WellD-4 (continued)</u>				<u>9080117-08</u>			<u>Water</u>	
PCB-1254	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		84.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		133	"	
<u>9071986/ Well S-5</u>				<u>9080117-09</u>			<u>Water</u>	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		84.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		130	"	
<u>9071987 Well D-5</u>				<u>9080117-10</u>			<u>Water</u>	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		74.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		135	"	
<u>9071988/ S-3 MS</u>				<u>9080117-11</u>			<u>Water</u>	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		73.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		139	"	
<u>9071989/ S-MSD</u>				<u>9080117-12</u>			<u>Water</u>	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Polychlorinated Biphenyls by EPA Method 8080A
Sequoia Analytical - Morgan Hill**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
9071989/ S-MSD (continued)				9080117-12			Water	
PCB-1232	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		75.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		136	"	
9071990/ Well S-25				9080117-13			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		78.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		134	"	
9071991/ Rinsate				9080117-14			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		74.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		136	"	
9071992/Well S-7				9080117-15			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		87.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		132	"	





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Polychlorinated Biphenyls by EPA Method 8080A
Sequoia Analytical - Morgan Hill**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
9071993/ Well S-8				9080117-16			Water	
PCB-1016	9080161	8/5/99	8/9/99		0.500	ND	ug/l	
PCB-1221	"	"	"		2.00	ND	"	
PCB-1232	"	"	"		0.500	ND	"	
PCB-1242	"	"	"		0.500	ND	"	
PCB-1248	"	"	"		0.500	ND	"	
PCB-1254	"	"	"		0.500	ND	"	
PCB-1260	"	"	"		0.500	ND	"	
Surrogate: Tetrachloro-m-xylene	"	"	"	50.0-150		79.0	%	
Surrogate: Dibutylchloroendate	"	"	"	50.0-150		124	"	





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Organochlorine Pesticides by EPA Method 8081/Quality Control
Sequoia Analytical - Morgan Hill**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9080802		Date Prepared: 8/10/99			Extraction Method: EPA 3550A					
Blank		9080802-BLK1								
Aldrin	8/19/99			ND	ug/kg	1.00				
alpha-BHC	"			ND	"	1.00				
beta-BHC	"			ND	"	1.00				
delta-BHC	"			ND	"	1.00				
gamma-BHC (Lindane)	"			ND	"	1.00				
Chlordane (tech)	"			ND	"	20.0				
4,4'-DDD	"			ND	"	6.00				
4,4'-DDE	"			ND	"	2.00				
4,4'-DDT	"			ND	"	5.00				
Dieldrin	"			ND	"	2.00				
Endosulfan I	"			ND	"	2.00				
Endosulfan II	"			ND	"	2.00				
Endosulfan sulfate	"			ND	"	6.00				
Endrin	"			ND	"	2.00				
Endrin aldehyde	"			ND	"	6.00				
Endrin ketone	"			ND	"	6.00				
Heptachlor	"			ND	"	1.00				
Heptachlor epoxide	"			ND	"	1.00				
Methoxychlor	"			ND	"	20.0				
Toxaphene	"			ND	"	80.0				
PCB-1016	"			ND	"	20.0				
PCB-1221	"			ND	"	80.0				
PCB-1232	"			ND	"	20.0				
PCB-1242	"			ND	"	20.0				
PCB-1248	"			ND	"	20.0				
PCB-1254	"			ND	"	20.0				
PCB-1260	"			ND	"	20.0				
Surrogate: Dibutylchloroendate	"	33.3		32.0	"	30.0-150	96.1			
Surrogate: Tetrachloro-m-xylene	"	16.7		6.75	"	30.0-150	40.4			
LCS		9080802-BS1								
Aldrin	8/19/99	3.33		2.75	ug/kg	40.0-140	82.6			
Dieldrin	"	13.3		12.1	"	40.0-140	91.0			
Heptachlor	"	3.33		2.92	"	40.0-140	87.7			
Surrogate: Dibutylchloroendate	"	33.3		30.8	"	30.0-150	92.5			
Surrogate: Tetrachloro-m-xylene	"	16.7		6.47	"	30.0-150	38.7			
Matrix Spike		9080802-MS1		9080117-18						
Aldrin	8/19/99	3.33	ND	3.17	ug/kg	40.0-140	95.2			D
Dieldrin	"	13.3	ND	17.5	"	40.0-140	132			D





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Organochlorine Pesticides by EPA Method 8081/Quality Control
Sequoia Analytical - Morgan Hill**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike (continued)		9080802-MS1	9080117-18							
Heptachlor	8/19/99	3.33	ND	2.25	ug/kg	40.0-140	67.6			D
Surrogate: Dibutylchloredate	"	33.3		32.5	"	30.0-150	97.6			D
Surrogate: Tetrachloro-m-xylene	"	16.7		8.08	"	30.0-150	48.4			D
Matrix Spike Dup		9080802-MSD1	9080117-18							
Aldrin	8/19/99	3.33	ND	3.25	ug/kg	40.0-140	97.6	50.0	2.49	D
Dieldrin	"	13.3	ND	15.8	"	40.0-140	119	50.0	10.4	D
Heptachlor	"	3.33	ND	2.25	"	40.0-140	67.6	50.0	0	D
Surrogate: Dibutylchloredate	"	33.3		34.5	"	30.0-150	104			D
Surrogate: Tetrachloro-m-xylene	"	16.7		9.00	"	30.0-150	53.9			D





Sequoia Analytical-Walnut Creek 404 North Wiget Lane Walnut Creek, CA 94598	Project: Emeryville Site Project Number: 9907523/Alta Geosciences Project Manager: Julianne Fegley	Sampled: 7/28/99 to 7/30/99 Received: 7/30/99 Reported: 8/26/99
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**Polychlorinated Biphenyls by EPA Method 8080A/Quality Control
Sequoia Analytical - Morgan Hill**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9080161		Date Prepared: 8/5/99			Extraction Method: EPA 3520B					
Blank										
9080161-BLK1										
PCB-1016	8/9/99			ND	ug/l	0.500				
PCB-1221	"			ND	"	2.00				
PCB-1232	"			ND	"	0.500				
PCB-1242	"			ND	"	0.500				
PCB-1248	"			ND	"	0.500				
PCB-1254	"			ND	"	0.500				
PCB-1260	"			ND	"	0.500				
Surrogate: Tetrachloro-m-xylene	"	0.500		0.300	"	50.0-150	60.0			
Surrogate: Dibutylchloroendate	"	1.00		1.34	"	50.0-150	134			
LCS										
9080161-BS1										
PCB-1260	8/9/99	2.50		3.07	ug/l	40.0-140	123			
Surrogate: Tetrachloro-m-xylene	"	0.500		0.305	"	50.0-150	61.0			
Surrogate: Dibutylchloroendate	"	1.00		1.28	"	50.0-150	128			
Matrix Spike										
9080161-MS2 9080117-12										
PCB-1260	8/9/99	2.50	ND	2.52	ug/l	40.0-140	101			
Surrogate: Tetrachloro-m-xylene	"	0.500		0.410	"	50.0-150	82.0			
Surrogate: Dibutylchloroendate	"	1.00		1.29	"	50.0-150	129			
Matrix Spike Dup										
9080161-MSD2 9080117-12										
PCB-1260	8/9/99	2.50	ND	2.59	ug/l	40.0-140	104	50.0	2.93	
Surrogate: Tetrachloro-m-xylene	"	0.500		0.435	"	50.0-150	87.0			
Surrogate: Dibutylchloroendate	"	1.00		1.27	"	50.0-150	127			





Sequoia Analytical-Walnut Creek
404 North Wiget Lane
Walnut Creek, CA 94598

Project: Emeryville Site
Project Number: 9907523/Alta Geosciences
Project Manager: Julianne Fegley

Sampled: 7/28/99 to 7/30/99
Received: 7/30/99
Reported: 8/26/99

Notes and Definitions

#	Note
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- D Data reported from a dilution.
- 1 Sample diluted ten fold due to matrix interference.
- 2 The reporting limits for this sample have been raised to account for the extraction volumes used.
- 3 The surrogate recovery for this sample is outside of established control limits. Review of associated QC indicates the recovery for this surrogate does not represent an out-of-control condition.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- Recov. Recovery
- RPD Relative Percent Difference





SEQUOIA ANALYTICAL CHAIN OF CUSTODY

J 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
 X 404 N. Wiget Lane • Walnut Creek, CA 94598 • (925) 988-9600 FAX (925) 988-9673
 J 1455 McDowell Blvd. North, Suite D • Petaluma, CA 94954 • (707) 792-1865 FAX (707) 792-0342
 J 1551 Industrial Road • San Carlos, CA 94070 • (650) 232-9600 FAX (650) 232-9612

Company Name: ALTA Geosciences			Project Name: Emerville Site		
Mailing Address: 11711 Northcreek Parkway S Suite 101			Billing Address (if different):		
City: Bothell	State: WA	Zip Code: 98011	9907523		
Telephone: 425 485 1053		FAX #: 425 486 7651	P.O. #: See QAPP 9080117		
Report To: Alex Tula	Sampler: RL Quine		QC Data: <input type="checkbox"/> Level II (Standard) <input type="checkbox"/> Chromatograms <input type="checkbox"/> Level III <input type="checkbox"/> Level IV		

Turnaround <input checked="" type="checkbox"/> Standard	<input type="checkbox"/> 7 Working Days	<input type="checkbox"/> 2 Working Days	<input type="checkbox"/> Drinking Water	Analyses Requested
Time: 10-15 Working Days	<input type="checkbox"/> 5 Working Days	<input type="checkbox"/> 1 Working Day	<input type="checkbox"/> Waste Water	
	<input type="checkbox"/> 3 Working Days	<input type="checkbox"/> ASAP	<input checked="" type="checkbox"/> Other Ground water 9082	

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	PEBS												Comments
1. Well S-1	7-28-99/1525	Water	1	Water	9071978	✓												
2. " D-1	7-28-99/1620		1		9071979	✓												
3. " S2R	7-29-99/0715		1		9071980	✓												
4. " D2R	7-29-99/1500 RR		1		9071981	✓												
5. " S-3	7-29-99/1040		1		9071982	✓												
6. " D-3	7-29-99/0940		1		9071983	✓												
7. " S-4	7-29-99/0445		1		9071984	✓												
8. " D-4	7-29-99/0340		1		9071985	✓												
9. " S-5	7-29-99/0635		1		9071986	✓												
10. " D-5	7-29-99/0550		1		9071987	✓												

Relinquished By: Richard L Quine	Date: 7-30-99	Time: 12:55	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: Donald C. Jensen WC	Date: 7/30/99	Time: 12:55

Pink - Client
 Yellow - Sequoia
 White - Sequoia



SEQUOIA ANALYTICAL CHAIN OF CUSTODY

819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 321-0100
 404 N. Wiget Lane • Walnut Creek, CA 94598 • (925) 988-9600 FAX (925) 988-9673
 1455 McDowell Blvd. North, Suite D • Petaluma, CA 94954 • (707) 792-1865 FAX (707) 792-0342
 1551 Industrial Road • San Carlos, CA 94070 • (650) 232-9600 FAX (650) 232-9612

Company Name: ALTA Geosciences Project Name: Emeryville Site
 Mailing Address: 11711 Northcreek Parkway S Suite 101 Billing Address (if different): 9080917
 City: Bothell State: WA Zip Code: 98011 9907523
 Telephone: 425-485-1053 FAX #: 425-486-7651 P.O. #: 9080917
 Report To: Alex Tula Sampler: R Rume QC Data: See QAPP Level II (Standard) Chromatograms Level III Level IV

Turnaround Standard 7 Working Days 2 Working Days
 Time: 10-15 Working Days 5 Working Days 1 Working Day
 3 Working Days ASAP

Analyses Requested
 Drinking Water
 Waste Water
 Groundwater
 PCBs 8082
 PCBs 8081
 RCRA metals
 CAMM1
 TPH Diesel

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	PCBs 8082	PCBs 8081	RCRA metals	CAMM1	TPH Diesel	Comments
1. S-3 MS	7-29-99/1040	Water	1	Liter	9071988	✓					Matrix Spike
2. S-3 MSD	7-29-99/1040		1		9071989	✓					Matrix Spike Dupl.
3. Well S-25	7-29-99/0600		1		9071990	✓					
4. Rinse	7-30-99/0825		1		9071991	✓					
URR Well S-7	7-30-99/0810		1		9071992	✓					
6. Well S-8	7-29-99/1230	↓	1	↓	9071993	✓					
7. Fill N-1	7-30-99/	Soil	1	902	9071994		✓	✓	✓		
8. Fill S-1	7-30-99/	Soil	1	902	9071995		✓	✓	✓		
9.											
10.											

Relinquished By: Richard L. Quinn Date: 7-30-99 Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: _____ Time: _____ Received By Lab: Harold J. Jensen Date: 7/30/99 Time: 12:55
WJ

Pink - Client
 Yellow - Sequoia
 White - Sequoia

Sub-Chain Of Custody

Sequoia Analytical
 404 N. Wiget Lane
 Walnut Creek, California 94598
 (510) 988-9600 FAX: (510) 988-9673

Subcontracted To: Morgan Hill Turnaround Time: 7 DAY
 Report To: JCF Due Date: 8/11

Work Order #: 9907523

Client: Alta Geosciences

9080117

Date: 7/30/99

Project: Emeryville Site

Method of Shipment: cap bay

Sample No.	Client I.D.	Collect Date	Collect Time	Matrix	Number of Containers	Analysis
9071992	Well S-7	7/30/99		Water	1	8080 - PCB's; Liquid
9071993	Well S-8	7/29/99		Water	1	8080 - PCB's; Liquid
9071994	Fill N-1	7/30/99		soil	1	8081; Solids
9071995	Fill S-1	7/30/99		soil	1	8081; Solids

SEE NOTE

Notes: *** PCBs by EPA 8081 & 8082. Use client-specified MS/MSD. J-Flags required. ***

9071988 - USE FOR MS
 9071989 - USE FOR MSD

2 R-Flags - see 7.9-3 of ~~QAPP~~ QAPP

Relinquished By: Ronald Quinn Date: 8/2/99 Time: _____ Received By: [Signature] Date: 8-2 Time: 1150

Relinquished By: [Signature] Date: 8/2 Time: _____ Received By: _____ Date: _____ Time: _____

Relinquished By: _____ Date: _____ Time: _____ Received By: _____ Date: _____ Time: _____

9080117

Sub-Chain Of Custody

MH

Sequoia Analytical
 404 N. Wiget Lane
 Walnut Creek, California 94598
 (510) 988-9600 FAX: (510) 988-9673

Subcontracted To: Morgan Hill

Turnaround Time: 7 DAY

Report To: JCF

Due Date: 8/11

Work Order #: 9907523

Date: 7/30/99

Client: Alta Geosciences

9080117

Method of Shipment: cap bay

Project: Emeryville Site

Sample No.	Client I.D.	Collect Date	Collect Time	Matrix	Number of Containers	Analysis
11 9071978	Well S-1	7/28/99		Water	1	8080 - PCB's; Liquid
12 9071979	Well D-1	7/28/99		Water	1	8080 - PCB's; Liquid
13 9071980	Well S2R	7/29/99		Water	1	8080 - PCB's; Liquid
14 9071981	Well D2R	7/29/99		Water	1	8080 - PCB's; Liquid
15 9071982	Well S-3	7/29/99		Water	1	8080 - PCB's; Liquid
16 9071983	Well D-3	7/29/99		Water	1	8080 - PCB's; Liquid
17 9071984	Well S-4	7/29/99		Water	1	8080 - PCB's; Liquid
18 9071985	Well D-4	7/29/99		Water	1	8080 - PCB's; Liquid
19 9071986	Well S-5	7/29/99		Water	1	8080 - PCB's; Liquid
20 9071987	Well D-5	7/29/99		Water	1	8080 - PCB's; Liquid
9071988	S-3-MS	7/29/99		Water	1	8080 - PCB's; Liquid
9071989	S-MSD	7/29/99		Water	1	8080 - PCB's; Liquid
9071990	Well S-25	7/29/99		Water	1	8080 - PCB's; Liquid
14 9071991	Rinsate	7/30/99		Water	1	8080 - PCB's; Liquid

SEE NOTE
ON PAGE 2

Relinquished By: [Signature] Date: 8/2/99

Time: _____

Received By: [Signature]

Date: 8-2

Time: 11:45

Relinquished By: [Signature] Date: 8/2

Time: _____

Received By: [Signature]

Date: 8/2

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APPENDIX C
DATA QUALITY ASSURANCE REVIEW

**GROUNDWATER SAMPLES: POLYCHLORINATED BIPHENYLS (PCBs)
DATA QUALITY ASSURANCE REVIEW
(SEQUOIA I.D. # 9080117-01 to -16)**

Upon receipt from Sequoia Analytical (SA) laboratory, all PCB analytical results underwent a Quality Assurance (QA) review of laboratory handling procedures. In addition to sample results, the laboratory data reports included Quality Control (QC) data for blank, laboratory control sample (i.e., blank spike), surrogate, matrix spike, and matrix spike duplicate results.

SAMPLE ANALYSIS

SA performed PCB analyses using EPA Test Method 8080A as promulgated in *Test Methods for Evaluating Solid Waste, USEPA SW846, 3rd Edition, 1994* (SW846).

HOLDING TIMES

Holding times for 16 groundwater samples were assessed relative to the following SW846 holding times:

- o A sample must be extracted within seven days from the date and time of sample collection;
- o A sample must be analyzed within 40 days from the date of extraction; and
- o All samples must be shipped in an iced chest to the laboratory and stored at 4°C until they are extracted.

Fifteen groundwater samples were collected July 28 through 30, 1999. SA received the samples on July 30, 1999. All samples were shipped in an iced chest and were stored at 4°C until extraction. SA extracted PCB samples on August 5, 1999 and samples were analyzed on August 9, 1999. All holding times are acceptable.

BLANK ANALYSIS

Method blank analysis is performed to determine the extent of laboratory contamination of samples. Method blank criteria require that no PCBs be detected in the blank.

One method blank was analyzed. PCBs were not detected in the blank.

ACCURACY

Accuracy was assessed by evaluating surrogates, blank spikes, and matrix spike recoveries. Each sample and QC sample is spiked with a surrogate compound. Each matrix spike (MS) and matrix spike duplicate (MSD) is prepared by spiking a groundwater sample with a known concentration of Aroclor 1260 (A1260). A blank spike (BS) is prepared by spiking a laboratory-prepared aqueous sample with a known concentration of A1260.

Surrogate Recovery

Groundwater samples were spiked with two surrogate compounds: dibutylchlorodate (DBC) and tetrachlor-m-xylene (TCMX). The project QC limits for percent surrogate recovery (%R) of DBC and TCMX are 50% to 150%.

DBC %Rs ranged from 127% to 129%. All %Rs were acceptable.

TCMX %Rs ranged from 82% to 87%. All %Rs were acceptable.

Matrix Spike Recovery

The laboratory prepared one MS and one MSD with the data set (i.e., project sample S-5). The project required MS %R QC limit for A1260 is 40% to 140%. The %R for the MS was reported by the laboratory as 101%. The %R is acceptable.

PRECISION

Precision is expressed as the relative percent difference (RPD) between the MS and the MSD. The project required MS/MSD RPD control limit for A1260 is 50%.

The RPD was reported by the laboratory as 2.93%. The RPD is acceptable.

COMPOUND IDENTIFICATION

PCBs were detected using a gas chromatograph equipped with an electron capture detector (ECD). The identity of a detected compound was determined by comparison of a standard's retention times and its chromatographic trace with that of the sample detected compound.

The required detection limits for all aroclors was 0.10 µg/L. Because of a laboratory error, the reporting limit for all aroclors except PCB-1221 was 0.5 µg/L. Aroclor 1221 had a reporting limit of 2.0 µg/L. These limits were given for the subject samples, despite the lab having been given a copy of the QAPP, and instructed regarding the need for 0.1µg/L detection limits. After the error was discovered, they responded that the samples having been analyzed, they could not be reanalyzed due to insufficient

material. The reporting limits obtained are within the action limits set in the EPA Order and therefore are adequate for purposes of this report. Future analyses will be performed by a different laboratory and special caution will be taken to assure compliance with the required limit.

COMPLETENESS

Completeness is a measure of the amount of valid sample data obtained from the measurement system compared to the amount of sample data that were analyzed. Valid results are those results which meet or exceed quality control criteria and satisfy quality assurance objectives. The percent completeness is compared to a goal of 80%.

Completeness for the data set was 100%. The completeness is acceptable.

APPENDIX B
DATA QUALITY ASSURANCE REVIEW

**GROUNDWATER SAMPLES: POLYCHLORINATED BIPHENYLS (PCBs)
DATA QUALITY ASSURANCE REVIEW
(SEQUOIA I.D. # 9080117-01 to -16)**

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