CH2M HILL
Engineers
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June 25, 1996

117761.RP.01

Sum Arigala
Ravi Arulanantham
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, CA 94612

Subject: Del Monte Plant 35, Emeryville, CA

This letter transmits the information pertaining to groundwater monitoring results at Del Monte's Emeryville property that you requested during our meeting of June 10, 1996. The attachments to this letter are as follows:

Attachment 1 - Concentration versus Time Graphs

Plots for four compounds (PCE, TCE, cis-1,2-DCE, and trans-1,2-DCE) and groundwater elevation are included. For each compound, concentrations detected in each of five monitoring wells on the downgradient end of the property are plotted on the graph for the time period of May 1989 through March 1996. Not all wells were monitored for the entire period because some wells were installed later, and one well (MW-11) was taken out of service when the groundwater extraction trench was constructed in August 1994. As noted as a footnote on each graph, the groundwater extraction and treatment system on the West Parcel where these wells are located became operational in January 1993 and ceased operating in July 1995.

Attachment 2 - Area-Weighted Average Concentrations

Area-weighted averages for each of the five chlorinated hydrocarbon compounds present in groundwater on the property were calculated using results of the March 1996 sampling event and the Thiessen method as explained in *Hydrology for Engineers, Second Edition*, by Linsley, Kohler, and Paulhus. Attachment 2 provides

a figure showing the total estimated area of affected groundwater and the areas associated with each monitoring well, and a table showing the calculated averages.

Attachment 3 - Trend Analysis

A trend analysis was performed on groundwater monitoring data from the wells on the down-gradient portion of the property (MW-7, 9, 10, and 12). Since the GET system shut off in July 1995, TCE data show no statistically significant increase over time. The analysis methods and results are described in Attachment 3.

Please contact me at 510/251-2888 x 2189 if you have questions about the material or need additional information.

Sincerely,

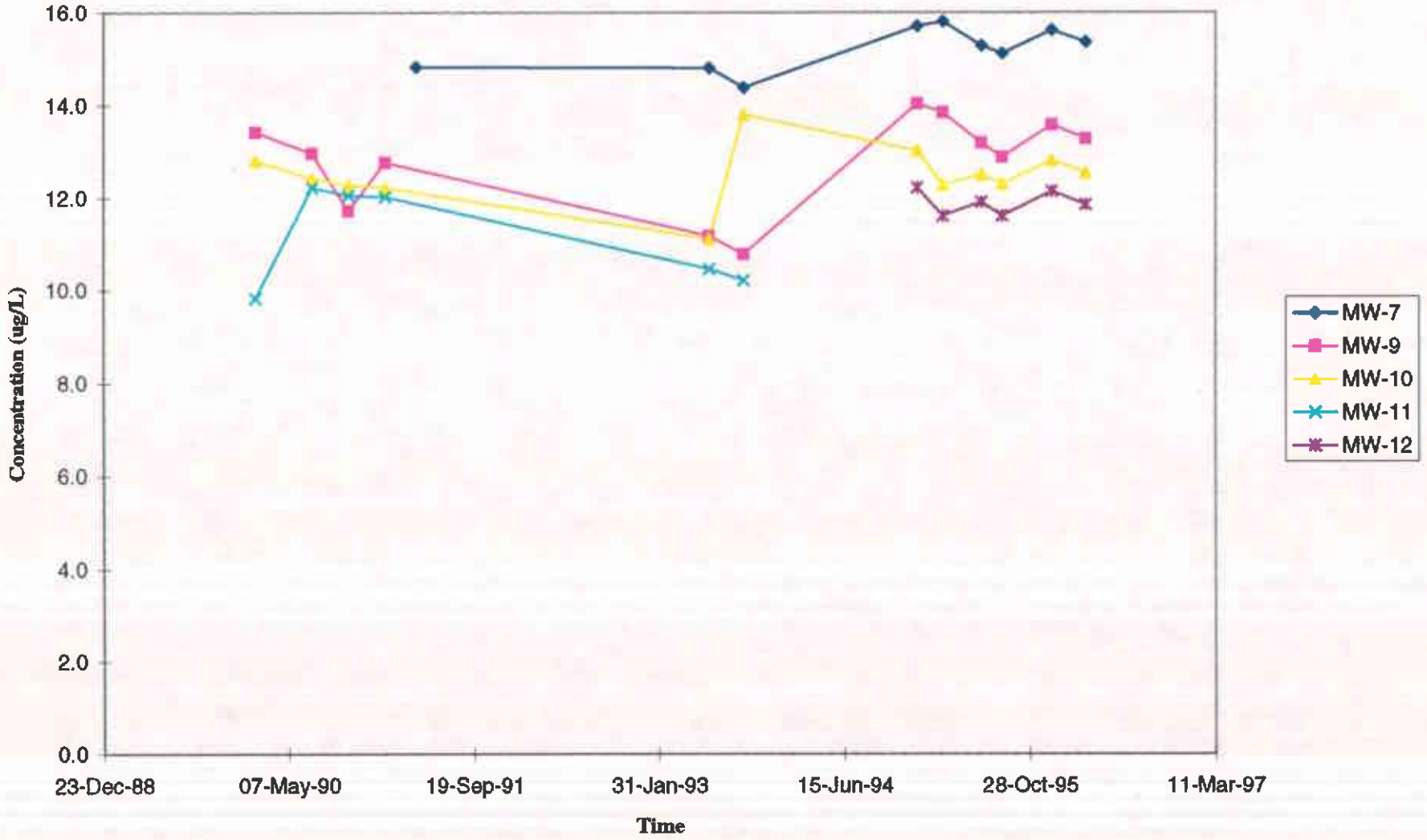
CH2M HILL

Madeline Wall

Madeline Wall
Project Manager

c: Brian Oliva/ACDEH
Steve Ronzone/Del Monte
Thomas Bender/The Bender Partnership

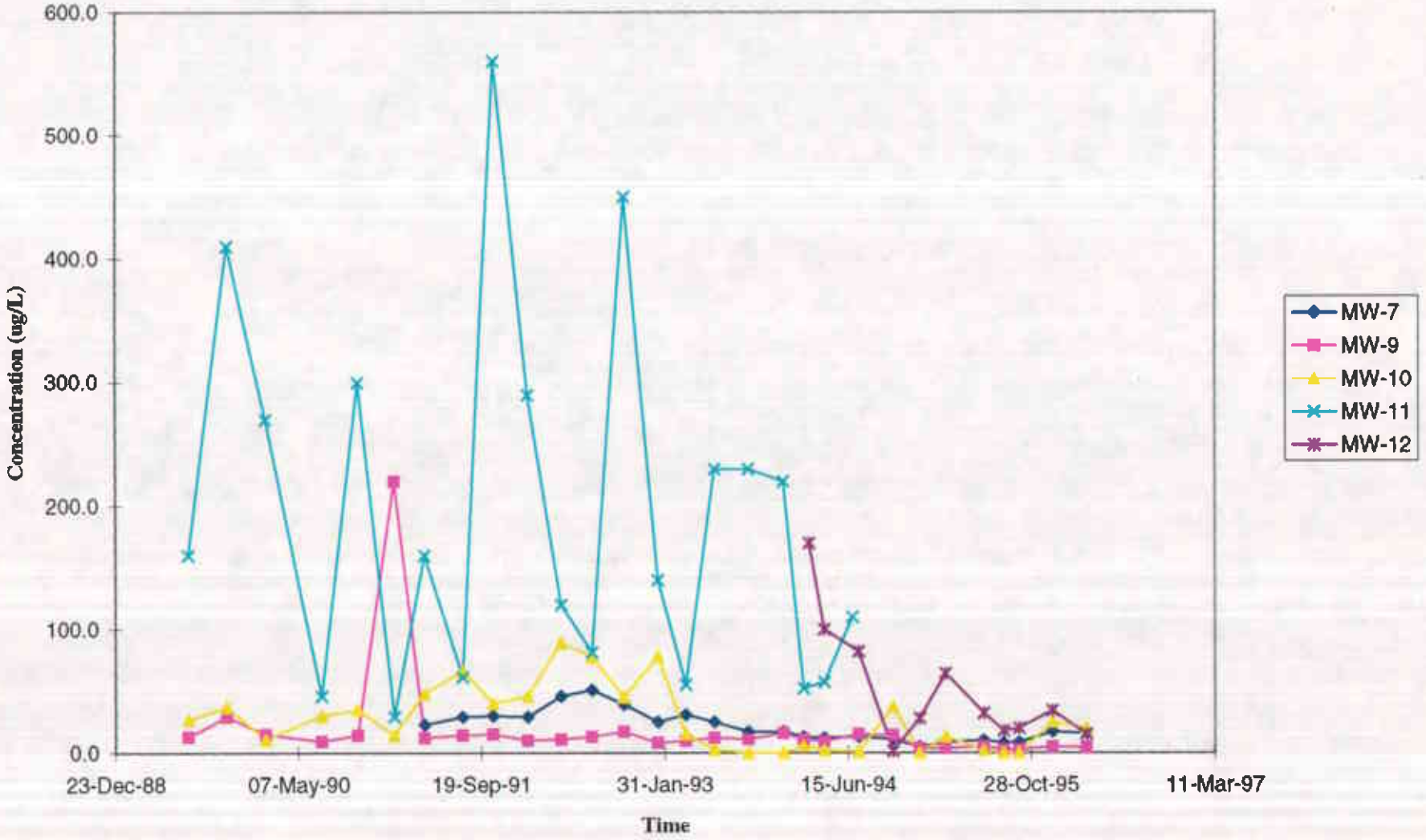
Water Elevation



Groundwater extraction began on 1/93 and ended on 7/95

T2_01_95.XLS/Chart6

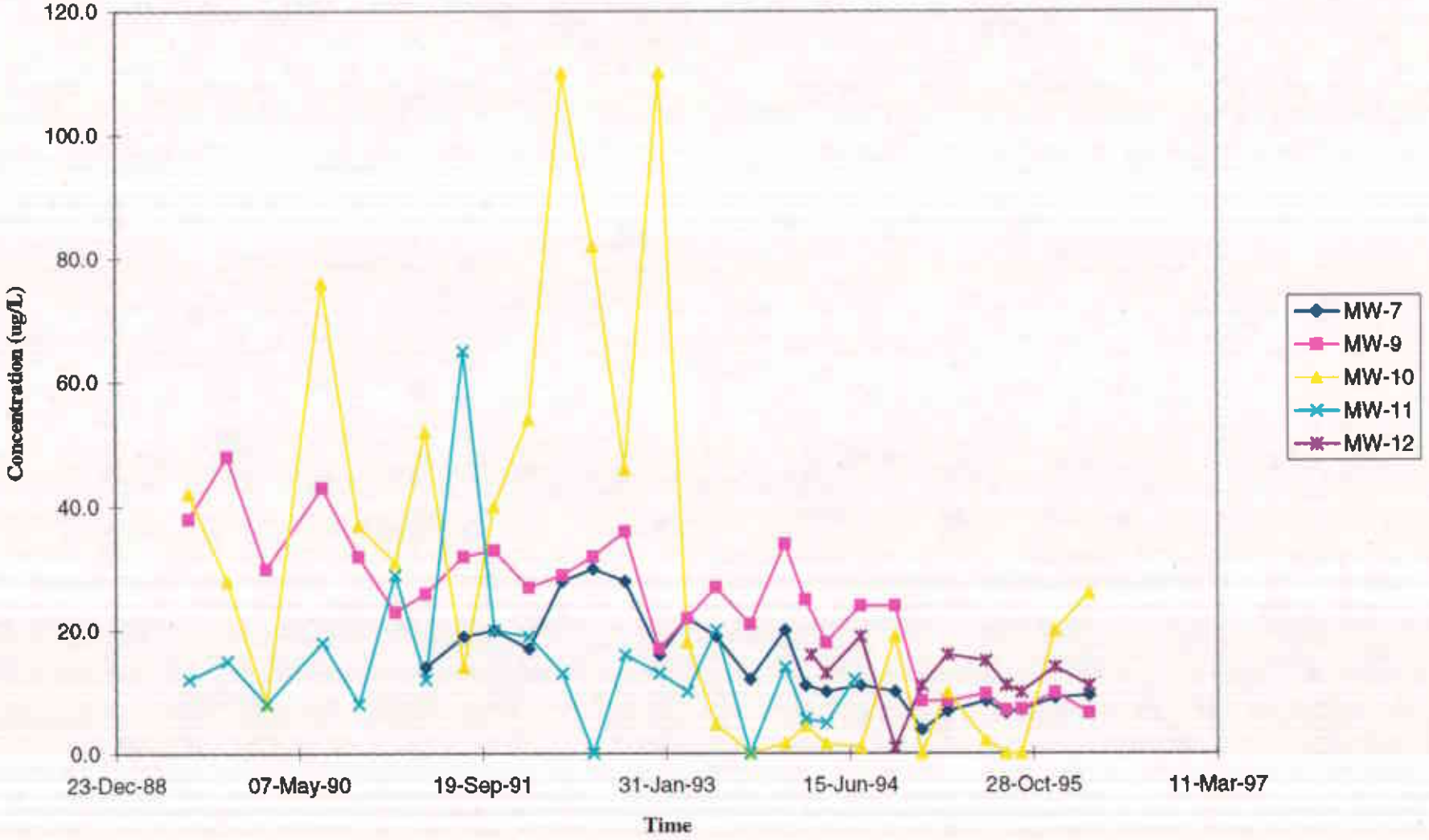
TCE



Groundwater extraction began on 1/93 and ended on 7/95
MCL = 5 ug/L

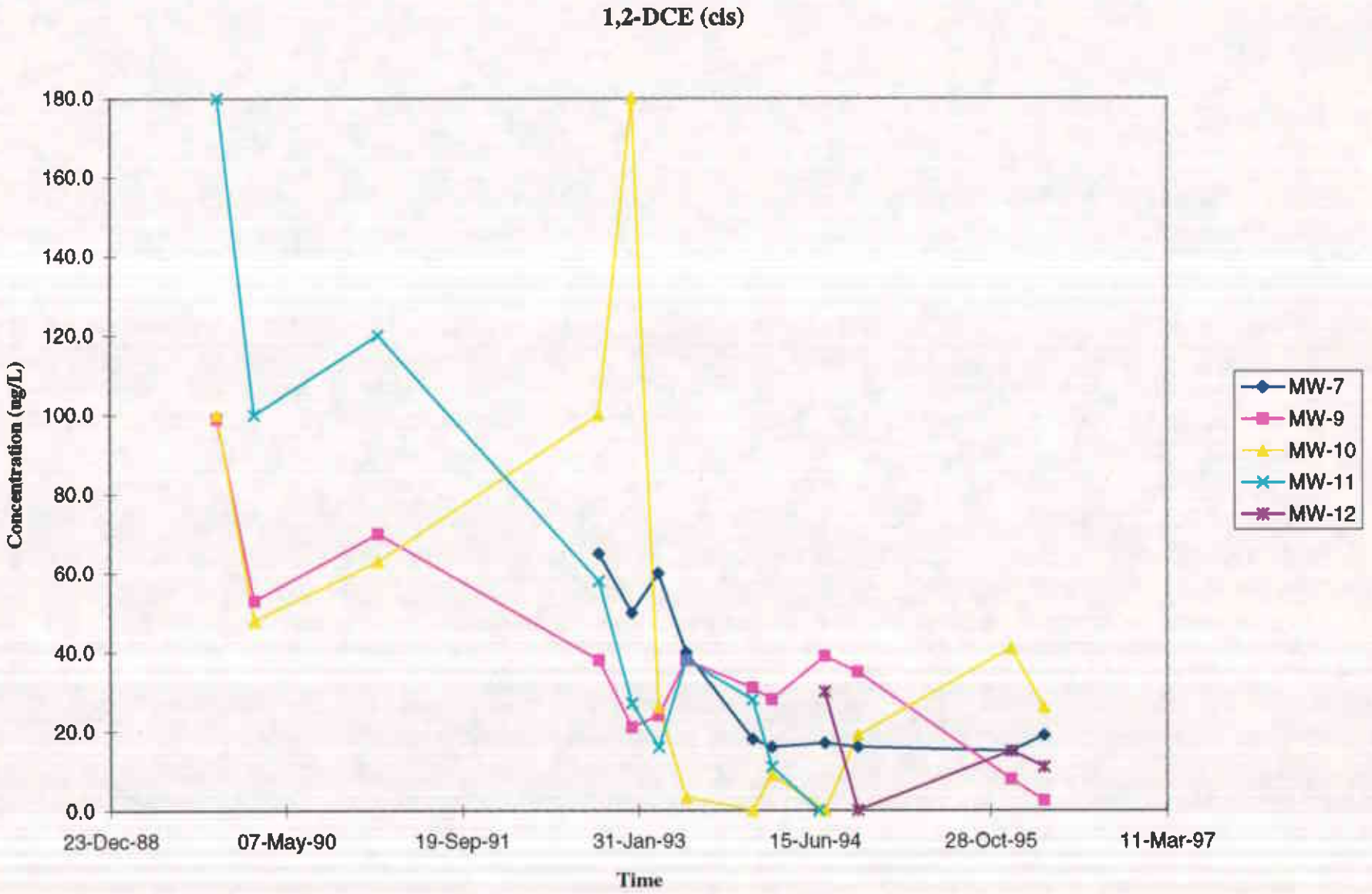
T2_01_95.XLS/Chart4

PCE



Groundwater extraction began on 1/93 and ended on 7/95
MCL = 5 ug/L

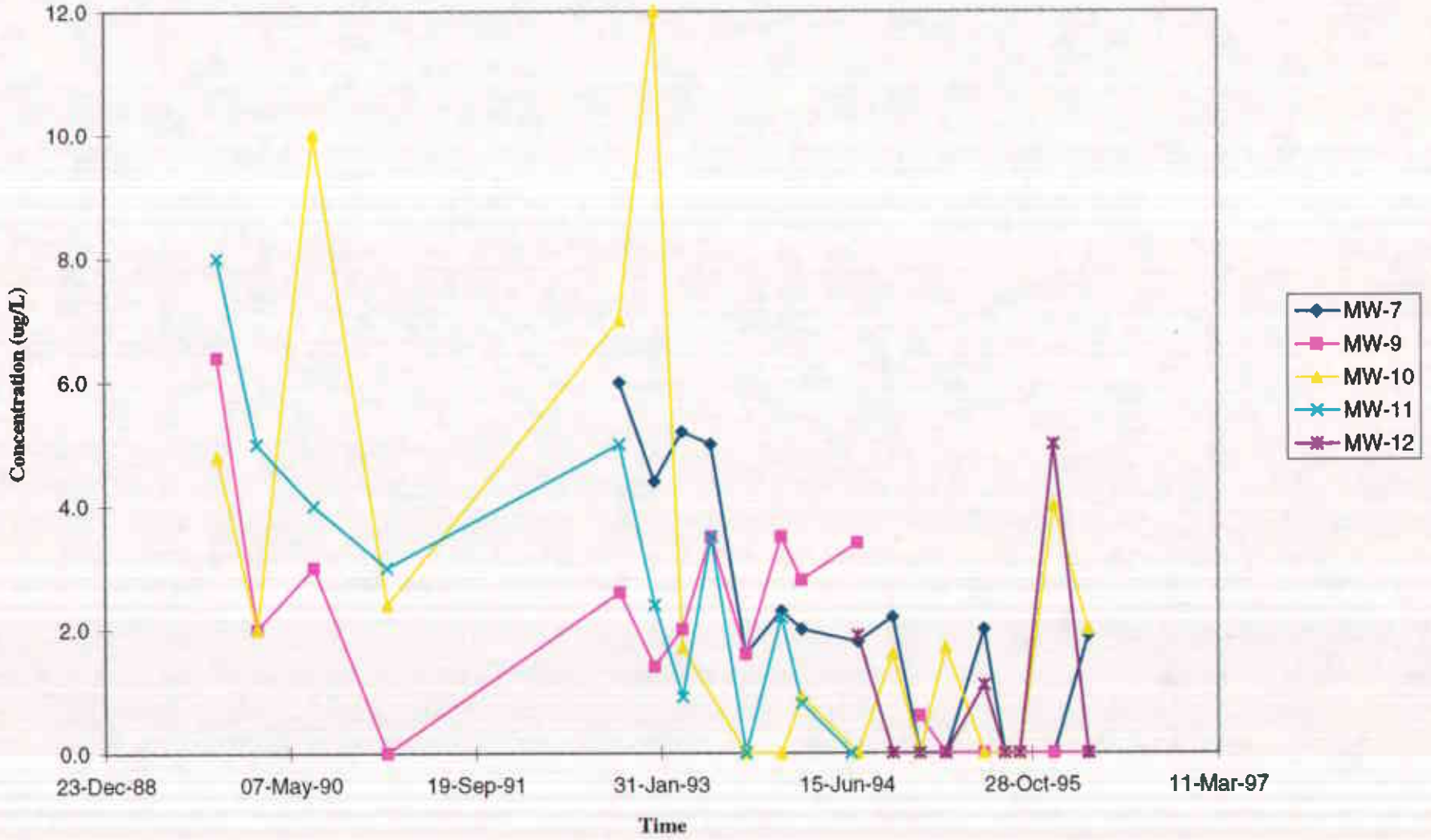
T2_01_95.XLS/Chart5



Groundwater extraction began on 1/93 and ended on 7/95
MCL = 6 ug/L

T2_01_95.XLS/Chart3

1,2-DCE (trans)



Groundwater extraction began on 1/93 and ended on 7/95
MCL = 10 ug/L

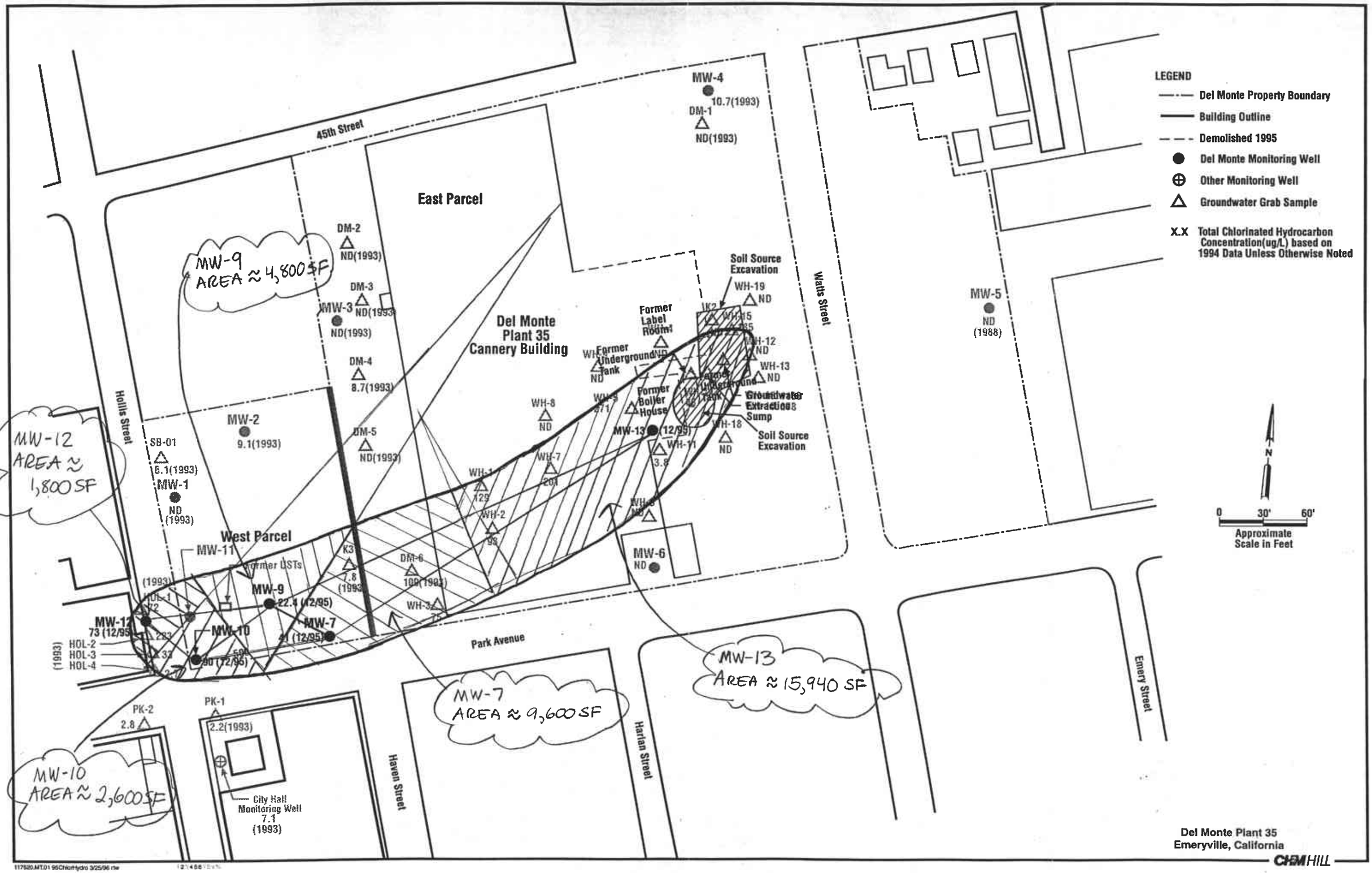
T2_01_95.XLS/Chart2

Groundwater Concentrations - Area Weighted Average
Del Monte Plant 35
Emoryville, California

Concentration units are µg/l

	Total	MW-7	MW-9	MW-10	MW-12	MW-13	Area Weighted Average
Area (sq. ft.)	34,740	9600	4800	2600	1800	15940	
% of total	100	0.28	0.14	0.07	0.05	0.46	
TCE		16	4	20	15	8	10.87
PCE		9.4	6.6	26	11	18	14.21
cis-1,2-DCE		19	2.5	26	11	27	20.46
trans-1,2-DCE		1.9	< 0.5	2	< 0.5	2.2	1.78
Vinyl Chloride		< 0.5	< 0.5	< 0.5	< 0.5	6.7	3.35

Notes:
Concentrations from March 27, 1996 sampling event
For calculations of area-weighted average, "non-detects" were set equal to the detection limit



Del Monte Plant 35
Emeryville, California

CH2MHILL

117520.MT.01 96Chlorhydro 3/25/96 rtw

MEMORANDUM CH2MHILL

TO: Madeline Wall/SFO

FROM: Susan Blake/DEN/Twilight Peak Analysis

DATE: 6/22/96

SUBJECT: Del Monte Statistical Trend Analysis

PROJECT: 117761.RP.01

INTRODUCTION/PURPOSE

Groundwater well quarterly sampling data from the Del Monte site were analyzed to determined if there is a statistically significant decreasing trend in analyte concentrations over time and to determine if the samples collected after GET system shutdown are significantly different from during GET system operation.

ANALYSIS METHODOLOGY

The data reviewed included quarterly samples from wells MW-07, MW-08, MW-09, MW-10, MW-11, and MW-12 from July 1989 to March 1996. The analytes considered were 1,2-DCE(trans), 1,2-DCE(cis), PCE, and TCE. A review of plots of analyte concentration versus time showed no obvious trends for 1,2-DCE(trans) and 1,2-DCE(cis). Therefore, these analytes were not statistically analyzed. Well MW-11 had no data after June 1994 and was not included in any analyses. TCE and PCE concentrations in wells MW-07, MW-09, MW-10, and MW-12 were statistically analyzed. The wells were analyzed separately. It was assumed the GET treatment system operated between October 1992 and June 1995.

The nonparametric Mann-Kendall test for trend was performed to analyze for general upward or downward trends over time in the analyte concentrations (EPA, 1989; Gilbert, 1987; Hollander and Wolfe, 1973). Two time periods were analyzed. One analysis utilized all the data available over time for each well. The second analysis only considered time since the GET system shutoff (July 1995 to March 1996). Reference Table 1 for data included in the analysis.

Analysis of variance (ANOVA) was performed on the ranked values of the PCE and TCE analytes to determine if the average concentration after GET system operation is significantly different from during GET system operation (EPA, 1989; Gilbert, 1987). Reference Table 3 for data analyzed.

Levels of significance (confidence) were determined at the 90% and 95% confidence levels for the trend analysis and at the 95% confidence level for the ANOVA.

SAS® (version 6.09) software was used to analyze the data.

RESULTS/CONCLUSIONS

Table 2 shows the results of the Mann-Kendall trend analysis at the 90% and 95% confidence level. Table 4 summarizes the ANOVA results at 95% confidence. Statistically significant results are discussed below.

At 90% confidence, there is a statistically significant decreasing trend in PCE concentration over time in wells MW-07, MW-09, and MW-10 when all the data are considered. For PCE data since the GET system shutoff, there is a statistically significant increase in concentration over time at 90% confidence for wells MW-07 and MW-10. However, ANOVA results at 95% confidence show that the average concentrations of wells MW-07 and MW-10 after GET system shutdown are not statistically significantly different from during GET system operation. Well MW-09 average PCE concentration after GET system shutoff is statistically significantly less than during GET system operation.

For TCE concentration, there is a statistically significant decreasing trend over time in wells MW-07 and MW-10 when data from all quarters are considered. Data considered since the GET system shutoff show no statistically significant trends in time in TCE concentration. Well MW-09 has a statistically significantly lower average concentration at 95% confidence after GET system shutoff than from during GET system operation.

Table 1. Del Monte Quarterly Groundwater Well Samples 1
14:36 Friday, June 21, 1996

QTR	SDATE	TCEMW07	TCEMW09	TCEMW10	TCEMW12	PCEMW07	PCEMW09	PCEMW10	PCEMW12
1	10JUL89	.	13.0	27.0	.	.	38.0	42.0	.
2	24OCT89	.	29.0	37.0	.	.	48.0	28.0	.
3	07FEB90	.	15.0	11.0	.	.	30.0	8.0	.
4	10JUL90	.	9.0	10.0	.	.	43.0	76.0	.
5	17OCT90	.	14.0	35.0	.	.	32.0	37.0	.
6	24JAN91	.	220.0	14.0	.	.	23.0	31.0	.
7	17APR91	23.0	12.0	48.0	.	14.0	26.0	52.0	.
8	31JUL91	29.0	14.0	66.0	.	19.0	32.0	14.0	.
9	22OCT91	30.0	15.0	40.0	.	20.0	33.0	40.0	.
10	23JAN92	29.0	10.0	46.0	.	17.0	27.0	54.0	.
11	23APR92	46.0	11.0	89.0	.	28.0	29.0	110.0	.
12	17JUL92	51.0	13.0	78.0	.	30.0	32.0	82.0	.
13	12OCT92	39.0	17.0	45.0	.	28.0	36.0	46.0	.
14	13JAN93	25.0	7.9	78.0	.	16.0	17.0	110.0	.
15	30MAR93	31.0	9.6	15.0	.	22.0	22.0	18.0	.
16	16JUN93	25.0	12.0	2.7	.	19.0	27.0	4.7	.
17	17SEP93	17.0	11.0	1.0	.	12.0	21.0	1.0	.
18	21DEC93	17.0	16.0	0.5	.	20.0	34.0	1.6	.
19	14FEB94	13.0	11.0	5.4	.	11.0	25.0	4.4	.
20	02MAR94	.	.	.	170.0	.	.	.	16.0
21	11APR94	12.0	9.0	2.2	100.0	10.0	18.0	1.5	13.0
22	15JUL94	13.0	15.0	1.0	82.0	11.0	24.0	1.0	19.0
24	17OCT94	11.0	14.0	37.0	1.1	10.0	24.0	19.0	0.9
25	29DEC94	4.4	3.5	1.0	28.0	3.8	8.5	1.0	11.0
26	09MAR95	8.4	3.4	13.0	64.0	6.8	8.4	9.8	16.0
27	21JUN95	10.0	4.8	2.1	32.0	8.5	9.7	2.1	15.0
28	15AUG95	7.8	2.5	1.0	18.0	6.6	7.0	1.0	11.0
29	25SEP95	8.5	2.5	1.0	20.0	7.1	7.2	1.0	9.9
30	26DEC95	17.0	4.7	25.0	34.0	9.0	9.8	20.0	14.0
31	27MAR96	16.0	4.0	20.0	15.0	9.4	6.6	26.0	11.0

Table 2.

Kendall tau Statistics for Mann-Kendall Trend and P-values 2
14:36 Friday, June 21, 1996

OBS	WELL	TPERIOD	KENTB	E_KENTB	Trend at 95% one-sided Conf.	90% Conf.
2	PCEMW07	ALL	-0.58286	0.09000	none	decreasing
3	PCEMW09	ALL	-0.62703	0.08278	none	decreasing
4	PCEMW10	ALL	-0.36708	0.09143	none	decreasing
5	PCEMW12	ALL	-0.28322	0.18652	none	none
6	PCEMW07	AFTGETDN	1.00000	0.00000	increasing	increasing
7	PCEMW09	AFTGETDN	0.00000	0.57735	none	none
8	PCEMW10	AFTGETDN	0.91287	0.09129	none	increasing
9	PCEMW12	AFTGETDN	0.18257	0.16432	none	none
10	TCEMW07	ALL	-0.58804	0.09330	none	decreasing
11	TCEMW09	ALL	-0.47816	0.10443	none	none
12	TCEMW10	ALL	-0.30003	0.08537	none	decreasing
13	TCEMW12	ALL	-0.49091	0.25899	none	none
14	TCEMW07	AFTGETDN	0.66667	0.33333	none	none
15	TCEMW09	AFTGETDN	0.54772	0.23735	none	none
16	TCEMW10	AFTGETDN	0.54772	0.23735	none	none
17	TCEMW12	AFTGETDN	0.00000	0.57735	none	none

Table 3.

Del Monte Well Samples During and Post GET System 3

14:36 Friday, June 21, 1996

OBS	QTR	SDATE	TCEMW0 7	TCEMW0 9	TCEMW1 0	TCEMW1 2	PCEMW0 7	PCEMW0 9	PCEMW1 0	PCEMW1 2	PHASE
1	13	12OCT92	39.0	17.0	45.0	.	28.0	36.0	46.0	.	GETON
2	14	13JAN93	25.0	7.9	78.0	.	16.0	17.0	110.0	.	GETON
3	15	30MAR93	31.0	9.6	15.0	.	22.0	22.0	18.0	.	GETON
4	16	16JUN93	25.0	12.0	2.7	.	19.0	27.0	4.7	.	GETON
5	17	17SEP93	17.0	11.0	1.0	.	12.0	21.0	1.0	.	GETON
6	18	21DEC93	17.0	16.0	0.5	.	20.0	34.0	1.6	.	GETON
7	19	14FEB94	13.0	11.0	5.4	.	11.0	25.0	4.4	.	GETON
8	20	02MAR94	.	.	.	170.0	.	.	.	16.0	GETON
9	21	11APR94	12.0	9.0	2.2	100.0	10.0	18.0	1.5	13.0	GETON
10	22	15JUL94	13.0	15.0	1.0	82.0	11.0	24.0	1.0	19.0	GETON
11	24	17OCT94	11.0	14.0	37.0	1.1	10.0	24.0	19.0	0.9	GETON
12	25	29DEC94	4.4	3.5	1.0	28.0	3.8	8.5	1.0	11.0	GETON
13	26	09MAR95	8.4	3.4	13.0	64.0	6.8	8.4	9.8	16.0	GETON
14	27	21JUN95	10.0	4.8	2.1	32.0	8.5	9.7	2.1	15.0	GETON
15	28	15AUG95	7.8	2.5	1.0	18.0	6.6	7.0	1.0	11.0	GETPO
16	29	25SEP95	8.5	2.5	1.0	20.0	7.1	7.2	1.0	9.9	GETPO
17	30	26DEC95	17.0	4.7	25.0	34.0	9.0	9.8	20.0	14.0	GETPO
18	31	27MAR96	16.0	4.0	20.0	15.0	9.4	6.6	26.0	11.0	GETPO