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QUARTERLY GROUNDWATER MONITORING RESULTS, MAY-JUNE 1999

AT THE

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EXECUTIVE SUMMARY

Presented in this report are the results of the eleventh quarterly groundwater sampling event (May-June 1999) completed as part of a long-term quarterly groundwater monitoring program at the NASA-Jet Propulsion Laboratory (JPL). The long-term quarterly monitoring program was initiated in 1996 in response to a request from the United States Environmental Protection Agency (EPA). The program began during the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation for on-site and off-site groundwater at JPL.

From May 14 to June 8, 1999, groundwater samples were collected from JPL monitoring wells (both on- and off-site) and analyzed for volatile organic compounds (VOCs), metals (arsenic, lead, total chromium, and hexavalent chromium), perchlorate, and major anions/cations. Analysis for 1,4-dioxane was performed on six samples collected from selected wells/screens to determine whether or not this chemical is present in the groundwater beneath JPL.

Results indicate that only four VOCs (carbon tetrachloride, trichloroethene, tetrachloroethene and 1,2-dichloroethane) were detected at concentrations above state or Federal Maximum Contaminant Levels (MCLs) for drinking water. Perchlorate was detected at concentrations exceeding the state Interim Action Level (IAL) of 18 μg/L. Hexavalent chromium was found in one well. To date, an MCL has not been established for hexavalent chromium. Arsenic was detected in two wells at concentrations below both state and Federal MCLs. Total chromium was infrequently detected at levels well below its MCL. Lead was detected in one well at a concentration below its action level. A summary of the sampling procedures is included in Section 2.0 and a summary of the analytical results is included in Section 3.0.

Results from major anion/cation analyses (water chemistry) were used to identify the general water types beneath JPL during this sampling event. These results are presented in Section 4.0. Water-level measurements, recorded before and after sampling activities, are presented in Section 5.0.

1.0 INTRODUCTION

This report summarizes the results from the eleventh groundwater sampling event completed as part of the long-term quarterly monitoring program currently being conducted at the NASA-Jet Propulsion Laboratory (JPL). The purpose of the program is to monitor the elevation, flow direction, and quality of the groundwater beneath and adjacent to the JPL site. From May 14 to June 8, 1999, Foster Wheeler Environmental Corporation (Foster Wheeler) personnel collected samples from all JPL monitoring wells (both on- and off-site). In addition, the water-level elevation at each well was measured prior to (May 13, 1999), and after (June 9, 1999) sampling to evaluate groundwater flow directions and gradients.

The locations of the JPL groundwater monitoring wells are shown in Figure 1-1. Monitoring wells MW-3, MW-4, MW-11, MW-12, MW-14, and MW-17 through MW-24 are deep multi-port wells, each containing five screened intervals within a Westbay Instruments, Inc. (Westbay) multi-port casing system. Monitoring wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, MW-15, and MW-16 are relatively shallow standpipe wells, each containing a single screened interval located just below the water table. Monitoring well MW-2 was not sampled since it was replaced with well MW-14 (Figure 1-1) as a JPL sampling point. A summary of the well construction details for the JPL groundwater monitoring wells is included in Table 1-1.

All of the JPL groundwater samples were taken to Montgomery Watson Laboratories in Pasadena, California, for chemical analysis. Montgomery Watson Laboratories is certified by the California Department of Health Services. The following analyses were performed on the samples collected at JPL:

Analysis	Well (Screen)	EPA Method
Volatile Organic Compounds (VOCs)	All	524.2
Total Chromium (Cr)	All	200.8
Hexavalent Chromium [Cr(VI)]	All	7196
Total Lead (Pb)	All	200.8
Total Arsenic (As)	All	200.9
Major Cations and Major Anions	All	Various
Perchlorate (ClO_4^-)	All	300.0, modified
1,4-Dioxane	MW-4(2), MW-7, MW-13, MW-16, MW-17(3), MW-24(1)	8270

In addition to groundwater samples, field quality assurance/quality control (QA/QC) samples, including trip blanks, equipment blanks, duplicate samples, and a field blank were collected for laboratory analysis. Sampling records for each shallow well are included in Appendix A, and sampling records and piezometric pressure profiling records for each deep multi-port well are included in Appendix B. Field instrument calibration forms are included in Appendix C, and laboratory analytical reports and associated chain-of-custody forms are included in Appendix D.

2.0 SAMPLING AND FIELD QUALITY ASSURANCE/ QUALITY CONTROL PROCEDURES

Two different procedures were used in collection of groundwater samples at JPL, one designed for the shallow wells and the other for the deep multi-port wells. These procedures are outlined below.

2.1 SHALLOW MONITORING WELLS

The sampling procedure described below was applied to all the shallow JPL monitoring wells, which includes monitoring wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, MW-15, and MW-16.

The primary equipment used to sample the shallow wells included dedicated 2-inch Grundfos Redi-Flo2® pumps, a pump controller, and a 220-volt generator. All of the dedicated 2-inch Grundfos Redi-Flo2® pump systems were decontaminated prior to their installation before the beginning of the long-term quarterly monitoring program. Details of the decontamination procedures for the Grundfos Redi-Flo2® pump systems are outlined in a previous document (Ebasco, 1993a).

Prior to sample collection, the water in each shallow well casing was purged (by pumping) to remove groundwater that may have been exposed to the atmosphere and thus may not be representative of undisturbed aquifer conditions. This purged groundwater was discharged into 500- or 1,000-gallon polyethylene storage tanks for disposal by JPL personnel pursuant to Environmental Protection Agency (EPA) guidance (EPA, 1991 and 1992).

Temperature, pH, dissolved oxygen, E_h (oxidation reduction potential), electrical conductivity, and turbidity of the water removed from each well were monitored during purging. After these parameters had stabilized (when two successive measurements made approximately 3 minutes apart were within 10 percent of each other) and the turbidity was less than 5 Nephelometric Turbidity Units, the groundwater samples were collected with the dedicated pump. During sampling for VOCs, the pump rate was reduced to approximately 0.02 gallons per minute to minimize sample agitation. All information concerning sampling was noted on the Well Development/Well Sampling Log forms included in Appendix A.

All sample bottles were filled completely (though not allowed to overflow), capped, labeled, and placed in a cooler with ice immediately thereafter. Samples collected for VOCs had zero headspace.

Calibration, or standardization, of the field instruments used to measure temperature, pH, electrical conductivity, and turbidity, was performed to the manufacturer's specifications at the beginning and end of each sampling day. Field instrument calibration forms are included in Appendix C.

2.2 DEEP MULTI-PORT MONITORING WELLS

Sampling of the deep multi-port monitoring wells at JPL required specialized sampling equipment manufactured by Westbay. This equipment included a pressure profiling/sampling probe with a surface control unit. Field personnel using this equipment were trained by Westbay personnel to ensure proper use. Copies of the detailed operations manuals for the Westbay pressure profiling/sampling probe are included in the OU-1 and OU-3 Field Sampling and Analysis Plans (Ebasco, 1993a; 1994).

The Westbay sampling probe and sample-collection bottles were decontaminated prior to sampling each screened interval in the deep multi-port wells according to the following procedures:

- Wash each 250-mL stainless-steel sample-collection bottle in a solution of non-phosphate detergent (Liquinox®) and distilled water followed by washing each bottle in a solution of an acidic detergent (Citranox®) and American Society of Testing Materials (ASTM) Type II water.
- Rinse each bottle with ASTM Type II water.
- The interior surfaces of the Westbay sampling probe, and the hoses and valves associated with the Westbay sample bottles, were decontaminated by forcing several volumes of a solution of Liquinox® and distilled water through them followed by forcing several volumes of a Citranox® and ASTM Type II water solution through them. A final rinse with ASTM Type II water was carried out. Each of these decontamination procedures was completed using a clean plastic squeeze bottle used only for this purpose.

Purging before sampling is not required in the deep multi-port monitoring wells because the groundwater sample is collected directly from the aquifer, thus ensuring that the groundwater sample has not been exposed to the atmosphere. However, at each screened interval an initial sample was collected in order to check temperature, pH, dissolved oxygen, E_h, conductivity, and turbidity in the field, and to rinse the Westbay stainless-steel sample-collection bottles with formation water. Samples for laboratory analysis were then collected and transferred to sample containers as described in Section 2.1. A final sample was then collected and the temperature, pH, conductivity, and turbidity were measured to ensure continuity of aquifer conditions during sampling. Results of the field analyses were recorded on well development logs, which are included in Appendix B. Calibration of field instruments was carried out according to procedures described previously (Ebasco, 1993a; 1994).

2.3 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

To verify the quality of the groundwater samples collected from the JPL monitoring wells, field QA/QC samples were collected. The field QA/QC program included the collection of duplicate samples, equipment blanks, trip blanks, and a field blank. In addition, laboratory QA/QC samples were used by the laboratory according to analytical method requirements.

Duplicate samples for VOCs, metals and perchlorate (ClO_4^-) analyses were collected from shallow groundwater monitoring wells MW-10 and MW-13, and deep multi-port monitoring wells MW-4 (Screen 2) and MW-12 (Screen 2). In addition, after every 10 samples that were collected for VOC analyses, a matrix-spike (MS) sample and a matrix-spike-duplicate (MSD) sample were collected and submitted to the laboratory for use in verifying the accuracy of the analytical method. Similarly, after every 10 samples that were collected for metals analyses, an MS/MSD sample was collected and submitted to the laboratory for analytical method verification. A MS/MSD sample for 1,4-dioxane was also submitted.

One equipment blank was collected from the Westbay sample bottles during each day of sampling of the deep multi-port wells. Equipment blanks consisted of ASTM Type II water (provided by the laboratory) which had been passed through the sampling equipment after the equipment had been decontaminated. Equipment blanks were analyzed for the same constituents (except cations and anions) as the groundwater samples to identify potential cross contamination due to inadequate decontamination procedures. Equipment blanks were not collected during sampling of the shallow wells as dedicated sampling equipment was used.

A trip blank, consisting of ASTM Type II water placed in two 40-mL glass vials by the laboratory, was transported with the empty sample bottles to the field and back to the laboratory with the groundwater samples. One trip blank was submitted for VOC analysis with each shipment of groundwater samples to the laboratory. Trip blanks were used to identify potential cross contamination of groundwater samples during transport.

During this sampling event, one field blank was collected at monitoring well MW-7. The field blank is used to determine whether ambient conditions or sample containers may effect analytical results. The field blank consisted of sample bottles, filled with ASTM Type II water supplied by the laboratory, left open at the well head during the sampling of the well. After sampling, the bottles containing the field blank were capped and analyzed for the same constituents as the groundwater samples, except for cations and anions, which are used solely for the purpose of identifying water types beneath and adjacent to the JPL site.

3.0 ANALYTICAL RESULTS

JPL groundwater monitoring wells MW-1, and MW-3 through MW-24 were sampled from May 14 to June 8, 1999. Monitoring well MW-2 was not sampled as it was replaced as a JPL monitoring point by deep multi-port monitoring well MW-14.

The groundwater samples collected during this sampling event were analyzed for volatile organic compounds (VOCs), total chromium (Cr), hexavalent chromium [Cr(VI)], total lead (Pb), total arsenic (As), and perchlorate (ClO_4^-). Samples collected from selected wells/screens were also analyzed for 1,4-dioxane. N-nitrosodimethylamine (NDMA) was not detected during the previous four consecutive quarters of sampling, therefore, NDMA sampling was discontinued as agreed to by EPA, DTSC and the RWQCB. In addition, all samples were analyzed for general water chemistry parameters that included major cations and anions [sodium (Na), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), alkalinity (CO_3 + HCO_3), chloride (Cl), sulfate (SO_4), nitrate (NO_3)], total dissolved solids (TDS), electrical conductivity and pH. A summary of the samples collected, sample numbers used, and the analyses performed on each sample is presented in Table 3-1. Analytical laboratory reports and associated chain-of-custody forms are included in Appendix D.

3.1 VOLATILE ORGANIC COMPOUNDS RESULTS

Groundwater samples collected during the May-June 1999 sampling event were analyzed for over 60 different VOCs in accordance with EPA Method 524.2. To present the results on concentration contour maps, the JPL aquifer was divided into four aquifer layers based primarily on correlations interpreted from lithologic cross sections. Listed in Table 3-2 are the JPL monitoring well screens and their corresponding aquifer layers. Results of the analyses for VOCs in the May-June 1999 samples are summarized in Table 3-3 along with the Maximum Contaminant Levels (MCLs) for drinking water as listed in Title 22 of the California Code of Regulations and in the EPA Health Advisory Guidelines. A small number of compounds were detected in the JPL samples, and only four VOCs [carbon tetrachloride (CCl_4), trichloroethene (TCE), tetrachloroethene (PCE), and 1,2-dichloroethane (1,2-DCA)] were found in concentrations exceeding state and/or Federal MCLs (Table 3-3). The concentrations of CCl_4, TCE, PCE, and 1,2-DCA detected in each aquifer layer are contoured on site maps to show the spatial distribution of each constituent. For instances where a constituent was not detected in a particular aquifer layer, a contour map was not prepared for that constituent in that particular layer. Carbon tetrachloride concentrations detected in aquifer Layers 1, 2 and 3 are contoured in Figures 3-1, 3-2 and 3-3, respectively. Figures 3-4, 3-5 and 3-6 display contours of TCE concentrations detected in Layers 1, 2 and 3, respectively, and Figure 3-7 contains contours of

1,2-DCA concentrations detected in aquifer Layer 1. Figures 3-8, 3-9 and 3-10 show contours of PCE detected in aquifer Layers 1, 2 and 3. A summary of the VOC results compiled from all eleven long-term quarterly sampling events completed to date is provided in Table 3-4.

CCl_4 in excess of the state MCL (0.5 μg/L) was found in eight on-site wells and one off-site well (Table 3-3, Figures 3-1, 3-2 and 3-3). The Federal MCL (5.0 μg/L) was exceeded in six on-site wells. The highest concentrations of CCl_4 were found in on-site wells MW-7, MW-12 (Screen 3), MW-16, MW-24 (Screen 2) and MW-3 (Screen 3).

TCE concentrations met or exceeded the state and Federal MCL (5.0 μg/L) in five on-site wells, and two off-site wells (Table 3-3, Figures 3-4, 3-5, and 3-6). The highest levels of TCE were found in on-site wells MW-7, MW-13 , MW-16 and off-site well MW-21 (Screen 1).

1,2-DCA was detected in two on-site wells (MW-13 and MW-16) in excess of its state MCL (0.5 μg/L) (Table 3-3 and Figure 3-7). 1,2-DCA was not detected in any off-site well. The Federal MCL for 1,2-DCA (5.0 μg/L) was not exceeded in any well.

PCE was detected at low levels in several on-site and off-site wells (Figures 3-8, 3-9 and 3-10). The state and Federal MCL (5.0 μg/L) was exceeded only in off-site well, MW-21 (Screen 5).

3.2 PERCHLORATE RESULTS

Perchlorate analyses were conducted on groundwater samples from the May-June 1999 event using ion chromatography (EPA 300.0, modified). Results are included in Table 3-3. No MCLs for ClO_4^- have been established to date, however, the California Department of Health Services has established an Interim Action Level (IAL) of 18 μg/L for ClO_4^-. Perchlorate was detected in a total of 16 wells (Table 3-3). Concentrations in six of the sixteen wells exceeded the Interim Action Level (18 μg/L). Perchlorate concentrations are contoured in Figures 3-11, 3-12 and 3-13 for aquifer Layers 1, 2 and 3, respectively. The highest ClO_4^- levels were observed on-site in wells MW-7, MW-13, MW-16, and MW-24 (Screen 2).

3.3 METALS RESULTS

Groundwater samples were analyzed for the following suite of metals: total As, total Pb, total Cr, and Cr(VI). The results of these analyses are summarized below and in Table 3-5.

Total As was detected in only two JPL groundwater samples at concentrations well below both state and Federal MCLs during the May-June 1999 event. Total Pb was detected at a level well below the state and Federal Action Level (0.015 mg/L) in one well, MW-17 (Screen 5). Total Cr was detected in three wells, MW-6, MW-7, and MW-13 at concentrations below state and Federal drinking water standards (0.05 and 0.10 mg/L, respectively). Hexavalent chromium was

detected in one on-site shallow well, MW-13. At this time, neither state nor Federal agencies have established an MCL for Cr(VI).

Table 3-6 contains a summary of metals data from all eleven quarterly sampling events completed to date during the long-term monitoring program.

3.4 1,4-DIOXANE RESULTS

Groundwater samples were collected from six locations [MW-4 (Screen 2), MW-7, MW-13, MW-16, MW-17 (Screen 3), and MW-24 (Screen 1)] during the May-June 1999 sampling event and analyzed for 1,4-dioxane to screen for the presence of this chemical in the groundwater beneath JPL. Samples from these six wells have historically contained the highest concentrations of VOCs at JPL. 1,4-Dioxane was analyzed using EPA Method 8270. At this time, state or Federal MCLs have not been established for this compound. The method detection limit for 1,4-dioxane is 3.0 μg/L. 1,4-Dioxane was detected once, in MW-16 (3.4 μg/L).

3.5 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

Review of the QA/QC data provided with the laboratory analytical results (Appendix D) indicates that results obtained from May-June 1999 samples are acceptable for their intended use of characterizing aquifer quality. Surrogate compound, matrix and blank spike, and method blank results were used by the laboratory to determine the accuracy and precision of the analytical techniques with respect to the JPL groundwater matrix, and to identify anomalous results due to laboratory contamination or instrument malfunction.

In addition to laboratory QA/QC samples, Foster Wheeler personnel collected QA/QC samples in the field. These samples included duplicate samples, equipment blanks, trip blanks and a field blank.

Duplicate samples were used to evaluate the precision of the laboratory analyses. Duplicate groundwater samples were collected from MW-4 (Screen 2), MW-10, MW-12 (Screen 2), and MW-13 and analyzed for VOCs, ClO_4^- and metals. All of the analytical results for the duplicate samples were similar to the results of the original groundwater samples (Table 3-3 and Table 3-5).

Fourteen equipment blanks and eighteen trip blanks were submitted for analysis during the May-June 1999 sampling event. A level of dichloromethane well below its Federal and state MCLs was detected in one equipment blank. It was also detected at about the same level in the associated groundwater sample (MW-12, Screen 2). Communication with Westbay® Instruments, Inc. revealed that dichloromethane was used to clean electronic components of the sampling tool that had been sent in for repair. This may be the source of contamination. Also,

dichloromethane is a common laboratory contaminant that has been detected in various QA/QC blanks in the past.

Chloroform was detected at very low levels (<3.0 μg/L) in all equipment blanks, in one trip blank, in the field blank, and in some groundwater samples associated with these blanks (see Table 3-3 and Table 3-4). Since chloroform was detected in all the equipment blanks, and not in all of the groundwater samples, it is probable that the source of chloroform was the laboratory supplied ASTM Type II deionized water (used for both the equipment blanks and decontamination water).

Overall, the field QA/QC data suggest that impacts to groundwater samples during sampling is insignificant.

4.0 GENERAL WATER CHEMISTRY

As part of this groundwater monitoring event, groundwater samples were submitted for analysis of major cations and anions in an effort to further understand the natural water chemistry of the groundwater beneath and adjacent to JPL. Samples from each of the JPL shallow monitoring wells and each of the deep multi-port wells were analyzed for major cations (Ca, Fe, Mg, Na, and K), major anions (Cl, SO_4, NO_3, CO_3 + HCO_3), pH, and total dissolved solids (TDS). The water chemistry results for this quarterly sampling event are summarized in Table 4-1.

4.1 ANALYTICAL RESULTS

To illustrate the relative proportions of the major cations and anions in each groundwater sample, the water chemistry results from the May-June 1999 event have been compiled as Stiff diagrams (Figures 4-1, 4-2 and 4-3). Review of the water chemistry data indicates that the majority of groundwater sampled at JPL can be classified as one of three general types, based on the predominant cation and anion, and the occurrence of other ions. These general water types include:

Type 1. Calcium-bicarbonate groundwater. Groundwater with Ca as the dominant cation and HCO_3 as the dominant anion.

Type 2. Sodium-bicarbonate groundwater. Groundwater with Na as the dominant cation and HCO_3 as the dominant anion.

Type 3. Calcium-bicarbonate/chloride/sulfate groundwater. Groundwater with Ca as the dominant cation and HCO_3 as the dominant anion, but with relatively elevated Cl and SO_4 concentrations.

In addition to the general water types described above, the analytical data suggest that these water types mix, or blend with one another, creating "intermediate" water types. For example, water Types 1 and 2 can mix to create a 1+2 or a 2+1 type, where the first number indicates the general water type that is predominant in the mixture. The Stiff diagrams presented in Figures 4-1 through 4-3 contain some graphical representations of these "intermediate" water types.

Water Type 1, the calcium-bicarbonate water type, was the most common water type at JPL during the May-June 1999 sampling event. In general, it was found at relatively shallow depths in wells located around the Arroyo Seco. Water Type 2, the sodium-bicarbonate water type (including associated blends), was typically found in the deeper well screens of both the on-site and off-site multi-port wells. Type 3 groundwater, the calcium-bicarbonate/chloride/sulfate water type, was prevalent in the shallower screens of the monitoring wells located upgradient and to the

south of the JPL facility. A list of water types and JPL monitoring wells in which they occur is provided in Table 4-2.

4.2 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

To evaluate the general quality of the water chemistry data, two independent geochemical quality control checks of the analytical results from the May-June 1999 samples were performed. These checks included calculation of total ion-charge balances, and comparison of measured TDS to calculated TDS. The results of these checks for the May-June 1999 water-chemistry results are presented in Table 4-3. Charge balances are expressed as the percent difference between the sum of the equivalent weights of all of the anions and all of the cations analyzed (Freeze and Cherry, 1979). The ideal range for charge balances is ± 5 percent, although charge balance errors up to ± 10 percent are considered acceptable.

The charge balances for samples analyzed for major anions and cations during the May-June 1999 sampling event are within the ideal range (± 5 percent) for all wells. This indicates that the results are acceptable for their intended use.

TDS results can be used to verify that all of the important water-chemistry constituents have been analyzed. This is done by comparing the measured laboratory TDS value to a calculated TDS value (calculated as the sum of the concentrations of all the major anions and cations) for each sample. Under ideal conditions, the ratio should range from 1.0 to 1.2 (Oppenheimer and Eaton, 1986).

The ratio of measured to calculated TDS values for the May-June 1999 water-chemistry results fell within the ideal range (1.0 to 1.2) for 72 of the 75 sets of water chemistry analyses performed (Table 4-3). The ratio for the remaining three sets of water chemistry data fell slightly outside this ideal range suggesting minor analytical errors or errors in the measured TDS values. However, these data are suitable for their intended use of identifying differences in water chemistry across the site.

5.0 WATER-LEVEL MEASUREMENTS

Water-level measurements were recorded before sampling, on May 13, 1999, and after sampling, on June 9, 1999, to evaluate groundwater flow directions and gradients beneath and adjacent to JPL. Water-level data in the shallow wells were collected using a Solinst® water-level meter that utilized a water-sensor probe attached to a measuring tape. As the probe was lowered into a well, contact with the groundwater completed a circuit between two electrodes in the probe, thus activating a sounding device attached to a reel at the surface. Depth to groundwater was then read directly from the measuring tape at the top of the well casing.

In the deep multi-port wells, the hydraulic head at each sampling port in each screened interval was measured with a pressure-transducer probe manufactured by Westbay specifically for the unique casing used in these wells.

Water-table elevation measurements taken before sampling are provided in Table 5-1 and have been contoured in Figure 5-1. Water-table elevation measurements taken after sampling are provided in Table 5-2 and have been contoured in Figure 5-2. The hydraulic heads measured at each deep multi-port well screen before and after sampling are presented graphically in Figures 5-3 and 5-4, respectively. The pressure-profile records for the deep wells are included in Appendix B.

As indicated by Figures 5-1 and 5-2, groundwater flow was primarily to the south and east both before and after sampling. The "trough" of depression observed around the City of Pasadena municipal production wells (Figures 5-1 and 5-2) is the result of active pumping by several of these wells throughout this sampling event. This is also indicated by data shown in Figures 5-3 and 5-4 where the effects of municipal well pumping are reflected by relatively large drawdowns in the hydraulic heads measured at the lowermost screens within the multi-port wells closest to the production wells (MW-3, -4, -11, -12, -17 and -19).

6.0 REFERENCES

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TABLES

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-1	Shallow Standpipe	1989	Mud Rotary	120	70-110	1116.7	1006.70-1046.70	-	99		4" PVC
MW-2	Shallow Standpipe	1989	Mud Rotary	177	127-167	1168.85	1001.85-1041.85	-			
MW-3	Deep Multi-Port	1990	Mud Rotary	700	170-180	1099.82	919.82-929.82	1	37	0.010	4" low-carbon steel
					250-260		839.82-849.82	2	47	0.010	4" low-carbon steel
					344-354		745.82-755.82	3	45	0.010	4" low-carbon steel
					555-565		534.82-544.82	4	39	0.010	4" low-carbon steel
					650-660		433.82-443.82	5	64	0.010	4" low-carbon steel
MW-4	Deep Multi-Port	1990	Mud Rotary	559	147-157	1082.72	925.72-935.72	1	48	0.010	4" low-carbon steel
					237-247		835.72-845.72	2	34	0.010	4" low-carbon steel
					318-328		754.72-764.72	3	42	0.010	4" low-carbon steel
					389-399		683.72-693.72	4	54	0.010	4" low-carbon steel
					509-519		563.72-573.72	5	52	0.010	4" low-carbon steel
MW-5	Shallow Standpipe	1990	Air Percussion	140	85-135	1071.6	936.60-986.60	-	71	0.010	4" low-carbon steel
MW-6	Shallow Standpipe	1990	Air Percussion	245	195-245	1188.52	943.52-993.52	-	62	0.010	4" low-carbon steel
MW-7	Shallow Standpipe	1990	Air Percussion	275	225-275	1212.88	937.88-987.88	-	63	0.010	4" low-carbon steel
MW-8	Shallow Standpipe	1992	Air Percussion	205	155-205	1139.53	934.53-984.53	-	75	0.010	4" low-carbon steel
MW-9	Shallow Standpipe	1992	Air Percussion	68	18-68	1106.02	1038.02-1088.02	-	56	0.010	4" PVC
MW-10	Shallow Standpipe	1992	Air Percussion	155	105-155	1087.71	932.71-982.71	-	67.5	0.010	4" PVC (0-85') 4" stainless steel (85'-105')
MW-11	Deep Multi-Port	1992	Mud Rotary	680	140-150	1139.35	989.35-999.35	1	24	0.010	4" low-carbon steel
					250-260		879.35-889.35	2	22	0.010	4" low-carbon steel
					420-430		709.35-719.35	3	26	0.010	4" low-carbon steel
					515-525		614.35-624.35	4	26	0.010	4" low-carbon steel
					630-640		499.35-509.35	5	28	0.010	4" low-carbon steel

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-12	Deep Multi-Port	1994	Mud Rotary	596	135-145	1102.14	957.14-967.14	1	22	0.010	4" low-carbon steel
					240-250		852.14-862.14	2	19	0.010	4" low-carbon steel
					315-325		777.14-787.14	3	21	0.010	4" low-carbon steel
					430-440		662.14-672.14	4	22	0.010	4" low-carbon steel
					546-556		546.14-556.14	5	21	0.010	4" low-carbon steel
MW-13	Shallow Standpipe	1994	Air Rotary	235	180-230	1183.47	953.47-1003.47	-	65	0.010	4" PVC
MW-14	Deep Multi-Port	1994	Mud Rotary	588	205-215	1173.42	958.42-968.42	1	22	0.010	4" low-carbon steel
					275-285		888.42-898.42	2	26	0.010	4" low-carbon steel
					380-390		783.42-793.42	3	22	0.010	4" low-carbon steel
					453-463		710.42-720.42	4	27	0.010	4" low-carbon steel
					538-548		625.42-635.42	5	21	0.010	4" low-carbon steel
MW-15	Shallow Standpipe	1994	Air Percussion	74	19-69	1120.66	1051.66-1101.66	-	60	0.010	4" stainless steel
MW-16	Shallow Standpipe	1994	Air Percussion	285	230-280	1236.27	956.27-1006.27	-	62	0.010	4.5" PVC
MW-17	Deep Multi-Port	1995	Mud Rotary	774	246-256	1190.99	934.99-944.99	1	24	0.010	4" low-carbon steel
					366-376		814.99-824.99	2	24	0.010	4" low-carbon steel
					466-476		714.99-724.99	3	27	0.010	4" low-carbon steel
					578-588		602.99-612.99	4	25	0.010	4" low-carbon steel
					723-733		457.99-467.99	5	22	0.010	4" low-carbon steel
MW-18	Deep Multi-Port	1995	Mud Rotary	732	266-276	1225.34	949.34-959.34	1	22	0.010	4" low-carbon steel
					326-336		889.34-899.34	2	24	0.010	4" low-carbon steel
					421-431		794.34-804.34	3	20	0.010	4" low-carbon steel
					561-571		654.34-664.34	4	22	0.010	4" low-carbon steel
					681-691		534.34-544.34	5	23	0.010	4" low-carbon steel
MW-19	Deep Multi-Port	1995	Mud Rotary	543	240-250	1143.2	893.20-903.20	1	20	0.010	4" low-carbon steel
					310-320		823.20-833.20	2	20	0.010	4" low-carbon steel
					390-400		743.20-753.20	3	17	0.010	4" low-carbon steel
					442-452		691.20-701.20	4	20	0.010	4" low-carbon steel
					492-502		641.20-651.20	5	22	0.010	4" low-carbon steel

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-20	Deep Multi-Port	1995	Mud Rotary	948	228-238	1164.89	926.89-936.89	1	24	0.010	4" low-carbon steel
					388-398		766.89-776.89	2	23	0.010	4" low-carbon steel
					558-568		596.89-606.89	3	19	0.010	4" low-carbon steel
					698-708		456.89-466.89	4	23	0.010	4" low-carbon steel
					898-908		256.89-266.89	5	27	0.010	4" low-carbon steel
MW-21	Deep Multi-Port	1995	Mud Rotary	416	86-96	1058.99	962.99-972.99	1	26	0.010	4" low-carbon steel
					156-166		892.99-902.99	2	25	0.010	4" low-carbon steel
					236-246		812.99-822.99	3	21	0.010	4" low-carbon steel
					306-316		742.99-752.99	4	22	0.010	4" low-carbon steel
					366-376		682.99-692.99	5	22	0.010	4" low-carbon steel
MW-22	Deep Multi-Port	1997	Mud Rotary	634	239-249	1176.81	927.81-937.81	1	24	0.010	4" low-carbon steel
					324-334		842.81-852.81	2	21	0.010	4" low-carbon steel
					384-394		782.81-792.81	3	22	0.010	4" low-carbon steel
					464-474		702.81-712.81	4	23	0.010	4" low-carbon steel
					584-594		582.81-592.81	5	22	0.010	4" low-carbon steel
MW-23	Deep Multi-Port	1997	Mud Rotary	590	170-180	1108.34	928.34-938.34	1	23	0.010	4" low-carbon steel
					250-260		843.34-858.34	2	20.5	0.010	4" low-carbon steel
					315-325		783.34-793.34	3	18	0.010	4" low-carbon steel
					440-450		658.34-668.34	4	25	0.010	4" low-carbon steel
					540-550		558.34-568.34	5	22.5	0.010	4" low-carbon steel
MW-24	Deep Multi-Port	1997	Mud Rotary	725	275-285	1200.91	915.91-925.91	1	25	0.010	4" low-carbon steel
					370-380		820.91-830.91	2	50	0.010	4" low-carbon steel
					430-440		760.91-770.91	3	25	0.010	4" low-carbon steel
					550-560		640.91-650.91	4	19	0.010	4" low-carbon steel
					675-685		515.91-525.91	5	16	0.010	4" low-carbon steel

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

Sample Location	Sample Number	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270
MW-1	MW-991-001	GW	X	X	X	X	X	
MW-3								
Screen 1	MW-991-002	GW	X	X	X	X	X	
Screen 2	MW-991-003	GW	X	X	X	X	X	
Screen 3	MW-991-004	GW	X	X	X	X	X	
Screen 4	MW-991-005	GW	X	X	X	X	X	
Screen 5	MW-991-006	GW	X	X	X	X	X	
MW-4								
Screen 1	MW-991-007	GW	X	X	X	X	X	
Screen 2	MW-991-008	GW	X	X	X	X	X	X
Screen 2	MW-991-009	DUP	X	X (no cations)	X		X	
Screen 3	MW-991-010	GW	X	X	X	X	X	
Screen 4	MW-991-011	GW	X	X	X	X	X	
Screen 5	MW-991-012	GW	X	X	X	X	X	
MW-5	MW-991-013	GW	X	X	X	X	X	
MW-6	MW-991-014	GW	X	X	X	X	X	
MW-7	MW-991-015	GW	X	X	X	X	X	X
MW-8	MW-991-016	GW	X	X	X	X	X	
MW-9	MW-991-017	GW	X	X	X	X	X	
MW-10	MW-991-018	GW	X	X	X	X	X	
MW-10	MW-991-019	DUP	X	X (no cations)	X		X	
MW-11								
Screen 1	MW-991-020	GW	X	X	X	X	X	
Screen 2	MW-991-021	GW	X	X	X	X	X	
Screen 3	MW-991-022	GW	X	X	X	X	X	
Screen 4	MW-991-023	GW	X	X	X	X	X	
Screen 5	MW-991-024	GW	X	X	X	X	X	

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

Sample Location	Sample Number	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270
MW-12								
Screen 1	MW-991-025	GW	X	X	X	X	X	
Screen 2	MW-991-026	GW	X	X	X	X	X	
Screen 2	MW-991-027	DUP	X	X (no cations)	X		X	
Screen 3	MW-991-028	GW	X	X	X	X	X	
Screen 4	MW-991-029	GW	X	X	X	X	X	
Screen 5	MW-991-030	GW	X	X	X	X	X	
MW-13	MW-991-031	GW	X	X	X	X	X	X
MW-13	MW-991-032	DUP	X	X (no cations)	X		X	
MW-14								
Screen 1	MW-991-033	GW	X	X	X	X	X	
Screen 2	MW-991-034	GW	X	X	X	X	X	
Screen 3	MW-991-035	GW	X	X	X	X	X	
Screen 4	MW-991-036	GW	X	X	X	X	X	
Screen 5	MW-991-037	GW	X	X	X	X	X	
MW-15	MW-991-038	GW	X	X	X	X	X	
MW-16	MW-991-039	GW	X	X	X	X	X	X
MW-17								
Screen 1	MW-991-040	GW	X	X	X	X	X	
Screen 2	MW-991-041	GW	X	X	X	X	X	
Screen 3	MW-991-042	GW	X	X	X	X	X	X
Screen 4	MW-991-043	GW	X	X	X	X	X	
Screen 5	MW-991-044	GW	X	X	X	X	X	
MW-18								
Screen 1	MW-991-045	GW	X	X	X	X	X	
Screen 2	MW-991-046	GW	X	X	X	X	X	
Screen 3	MW-991-047	GW	X	X	X	X	X	
Screen 4	MW-991-048	GW	X	X	X	X	X	
Screen 5	MW-991-049	GW	X	X	X	X	X	

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

Sample Location	Sample Number	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270
MW-19								
Screen 1	MW-991-050	GW	X	X	X	X	X	
Screen 2	MW-991-051	GW	X	X	X	X	X	
Screen 3	MW-991-052	GW	X	X	X	X	X	
Screen 4	MW-991-053	GW	X	X	X	X	X	
Screen 5	MW-991-054	GW	X	X	X	X	X	
MW-20								
Screen 1	MW-991-055	GW	X	X	X	X	X	
Screen 2	MW-991-056	GW	X	X	X	X	X	
Screen 3	MW-991-057	GW	X	X	X	X	X	
Screen 4	MW-991-058	GW	X	X	X	X	X	
Screen 5	MW-991-059	GW	X	X	X	X	X	
MW-21								
Screen 1	MW-991-060	GW	X	X	X	X	X	
Screen 2	MW-991-061	GW	X	X	X	X	X	
Screen 3	MW-991-062	GW	X	X	X	X	X	
Screen 4	MW-991-063	GW	X	X	X	X	X	
Screen 5	MW-991-064	GW	X	X	X	X	X	
MW-22								
Screen 1	MW-991-065	GW	X	X	X	X	X	
Screen 2	MW-991-066	GW	X	X	X	X	X	
Screen 3	MW-991-067	GW	X	X	X	X	X	
Screen 4	MW-991-068	GW	X	X	X	X	X	
Screen 5	MW-991-069	GW	X	X	X	X	X	
MW-23								
Screen 1	MW-991-070	GW	X	X	X	X	X	
Screen 2	MW-991-071	GW	X	X	X	X	X	
Screen 3	MW-991-072	GW	X	X	X	X	X	
Screen 4	MW-991-073	GW	X	X	X	X	X	
Screen 5	MW-991-074	GW	X	X	X	X	X	

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

Sample Location	Sample Number	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270
MW-24								
Screen 1	MW-991-075	GW	X	X	X	X	X	X
Screen 2	MW-991-076	GW	X	X	X	X	X	
Screen 3	MW-991-077	GW	X	X	X	X	X	
Screen 4	MW-991-078	GW	X	X	X	X	X	
Screen 5	MW-991-079	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

Well Number	AQUIFER LAYERS			
	Layer 1	Layer 2	Layer 3	Layer 4
MW-1	X			
MW-3				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-4				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4		X		
Screen 5			X	
MW-5	X			
MW-6	X			
MW-7	X			
MW-8	X			
MW-9	X			
MW-10	X			
MW-11				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4		X		
Screen 5			X	
MW-12				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4		X		
Screen 5			X	
MW-13	X			
MW-14				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

Well Number	AQUIFER LAYERS			
	Layer 1	Layer 2	Layer 3	Layer 4
MW-15	X			
MW-16	X			
MW-17				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-18				
Screen 1	X			
Screen 2	X			
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-19				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-20				
Screen 1	X			
Screen 2		X		
Screen 3			X	
Screen 4			X	
Screen 5				X
MW-21				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-22				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

Well Number	AQUIFER LAYERS			
	Layer 1	Layer 2	Layer 3	Layer 4
MW-23				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-24				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-1	MW-991-001	--	--	--	--	--	--	--	--	--	--
MW-3											
Screen 1	MW-991-002	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-003	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-991-004	**42**	1.3	--	--	--	--	1.0	26(EB)(2)	--	8.9
Screen 4	MW-991-005	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-006	--	--	--	--	--	--	--	--	--	**75**
MW-4											
Screen 1	MW-991-007	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-008	**2.0**	**6.4**	0.7	--	--	--	--	3.7(EB)(2)	--	**56**
Screen 2 (DUP)	MW-991-009	**1.5**	4.9	0.5	--	--	--	--	2.9(EB)(2)	--	**55**
Screen 3	MW-991-010	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-011	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-012	--	--	--	--	--	--	--	--	--	--
MW-5	MW-991-013	--	--	--	--	--	--	--	--	--	--
MW-6	MW-991-014	--	--	1.5	--	--	--	--	--	--	--
MW-7	MW-991-015	**42**	**14**	--	--	--	--	2.2	5.7(FB)	--	**120**
MW-8	MW-991-016	--	--	--	--	--	--	--	--	--	--
MW-9	MW-991-017	--	--	--	--	--	--	--	--	--	--
MW-10	MW-991-018	--	1.1	--	--	--	--	--	--	--	10
MW-10 (DUP)	MW-991-019	--	1.0	--	--	--	--	--	--	--	11

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-11											
Screen 1	MW-991-020	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-021	**0.5**	--	--	--	--	--	--	0.7(EB)(2)	--	--
Screen 3	MW-991-022	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-023	--	--	--	--	--	--	--	0.5(EB)(2)	--	--
Screen 5	MW-991-024	--	--	--	--	--	--	--	--	--	--
MW-12											
Screen 1	MW-991-025	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-026	**0.8**	--	--	--	--	--	--	0.6(EB)(2)	0.8 Dichloromethane(EB)	5.0
Screen 2 (*DUP*)	MW-991-027	**0.8**	--	--	--	--	--	--	0.6(EB)(2)	0.6 Dichloromethane(EB)	5.0
Screen 3	MW-991-028	**19**	--	--	--	--	--	--	2.0(EB)(2)	--	8.7
Screen 4	MW-991-029	**4.0**	--	--	--	--	--	--	1.0(EB)(2)	--	9.1
Screen 5	MW-991-030	**1.6**	--	--	--	--	--	--	0.5(EB)(2)	--	--
MW-13	MW-991-031	**9.8**	**40**	0.6	--	**0.5**	0.8	1.0	9.4	--	**120**
MW-13 (DUP)	MW-991-032	**9.1**	**41**	0.6	--	**0.5**	0.8	0.9	9.4	--	**120**
MW-14											
Screen 1	MW-991-033	--	--	0.5	2.6	--	--	--	--	--	--
Screen 2	MW-991-034	--	1.0	1.2	0.8	--	--	--	0.6(EB)(2)	--	9.6
Screen 3	MW-991-035	--	--	--	--	--	--	--	--	--	7.0
Screen 4	MW-991-036	--	--	--	--	--	--	--	--	--	9.9
Screen 5	MW-991-037	--	--	--	--	--	--	--	--	--	--
MW-15	MW-991-038	--	--	--	--	--	--	--	--	--	--
MW-16	MW-991-039	**58**	**15**	1.0	--	**0.8**	1.3	1.2	23	0.5 Fluorotrichloromethane	**650**

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-17											
Screen 1	MW-991-040	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-041	--	--	--	--	--	--	--	3.2(EB)(2)	--	--
Screen 3	MW-991-042	--	1.5	--	--	--	--	--	3.5(EB)(2)	--	--
Screen 4	MW-991-043	--	3.2	--	--	--	--	--	1.4(EB)(2)	--	14
Screen 5	MW-991-044	--	**6.6**	0.6	--	--	--	--	2.0(EB)(2)	--	12
MW-18											
Screen 1	MW-991-045	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-046	--	--	--	--	--	--	--	0.8(EB)(2)	--	--
Screen 3	MW-991-047	--	1.1	--	--	--	--	--	2.5(EB)(2)	0.6 Dichloromethane	--
Screen 4	MW-991-048	**3.6**	1.6	2.5	--	--	--	--	1.1(EB)(2)	0.7 Dichloromethane	16
Screen 5	MW-991-049	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
MW-19											
Screen 1	MW-991-050	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-051	--	1.3	1.1	--	--	--	--	--	--	4.5
Screen 3	MW-991-052	--	0.9	2.7	--	--	--	--	--	--	7.2
Screen 4	MW-991-053	--	0.7	--	--	--	--	--	2.6(EB)(2)	--	--
Screen 5	MW-991-054	--	--	2.1	--	--	--	--	--	0.7 Dichloromethane	4.4
MW-20											
Screen 1	MW-991-055	--	--	--	--	--	--	--	1.9(EB)(2)	--	4.4
Screen 2	MW-991-056	--	--	--	--	--	--	--	4.6(EB)(2)	0.6 Bromodichloromethane	--
Screen 3	MW-991-057	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-058	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-059	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-21											
Screen 1	MW-991-060	--	**20**	0.5	--	--	--	--	1.6(EB)(2)	--	15
Screen 2	MW-991-061	--	--	0.6	--	--	--	--	--	--	--
Screen 3	MW-991-062	--	0.6	1.4	--	--	--	--	--	--	--
Screen 4	MW-991-063	--	--	3.2	--	--	--	--	--	0.6 cis-1,2-Dichloroethene	4.8
Screen 5	MW-991-064	--	--	**8.2**	--	--	--	--	0.7(EB)(2)	1.5 cis-1,2-Dichloroethene	--
MW-22											
Screen 1	MW-991-065	--	--	2.7	1.0	--	--	--	--	--	4.9
Screen 2	MW-991-066	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-991-067	--	--	--	--	--	--	--	--	--	4.5
Screen 4	MW-991-068	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-069	--	--	--	--	--	--	--	--	--	--
MW-23											
Screen 1	MW-991-070	--	**7.0**	1.1	--	--	--	0.6	1.0(EB)(2)	0.7 1,2,3-Trichlorobenzene	7.6
Screen 2	MW-991-071	--	--	--	0.5	--	--	--	0.6(EB)(2)	--	7.8
Screen 3	MW-991-072	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-073	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-074	--	--	--	--	--	--	--	--	--	--
MW-24											
Screen 1	MW-991-075	**1.0**	1.6	--	--	--	--	--	0.6(EB)(2)	--	14
Screen 2	MW-991-076	**33**	4.3	1.3	--	--	1.8	--	7.7(EB)(2)	--	**690**
Screen 3	MW-991-077	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-078	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-079	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.0
California Maximum Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	6 cis-1,2-Dichloroethene[a] 100 1,1,1-Trichloroethane[a]	18[1]
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	NE	5.0	7.0	NE	100	70 cis-1,2-Dichloroethene[a] 200 1,1,1-Trichloroethane[a]	NE

--: Not detected
DUP: Duplicate
NE: Not established
1: California Department of Health Services Interim Action Level
2: All the equipment blanks for the round had chloroform concentrations ranging from 0.8 to 2.9 µg/L. The ASTM Type II water used for the equipment blanks is the probable source of the chloroform
a: Only VOCs for which MCLs have been established are listed
EB: Compound detected in associated equipment blank
FB: Compound detected in associated field blank

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-1	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	1.3 m, p-xylenes	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-3											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	1.2	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	8.3	0.7(B) Naphthalene	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	2.6 Carbon disulfide	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	5.5	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	4.8	1.9(B) Naphthalene	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	4.4	8.0 Carbon disulfide	NA
	Jun/Jul 1997	--	--	--	--	--	--	1.0	1.2	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	0.8	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	**0.6**	0.8	--	--	--	--	--	1.6	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	0.7	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--	NA
	Jun/Jul 1997	**1.2**	0.8	0.6	--	--	--	2.8	1.8	--	**21**
	Sep/Oct 1997	**1.2**	0.5	--	--	--	--	--	1.6	--	13
	Jan/Feb 1998	**1.2**	--	--	--	--	--	--	2.7	--	6.5
	Apr/May 1998	**3.6**	0.9	--	--	--	--	--	3.9	--	6.2

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Jul/Aug 1998	**2.4**	0.6	--	--	--	--	--	3.6	--	10
	Oct/Nov 1998	**5.8**	0.7	--	--	--	--	--	21	2.7 Carbon disulfide	--
	Feb/Mar 1999	**4.5**	1.3	--	--	--	--	0.9	42	--	--
	May/Jun 1999	**42**	1.3	--	--	--	--	1.0	26(EB)(5)	--	8.9
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.2 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.0 Hexane	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	4.7 Carbon disulfide(4)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1 Dichloromethane	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.1 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.2 Carbon disulfide 1.5 Carbon disulfide 2.7 Sulfur dioxide 1.3 Unknown (RT=2.51)	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	4.5 Carbon disulfide	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	**91**
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	**75**
MW-4											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.4
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	9.6
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	3.4 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.8(B)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 2	Aug/Sep 1996	**5.5**	**19**	--	--	**0.9**	0.7	--	6.7	3.2(B) Acetone	NA
	Oct/Nov 1996	**5.3**	**15**	--	--	**0.6**	0.8	--	5.4	1.8 Acetone	NA
	Feb/Mar 1997	**7.9**	**19**	--	--	**0.8**	0.8	--	7.8	--	NA
	Jun/Jul 1997	**4.0**	**5.7**	--	--	--	0.5	--	3.4	--	**51**
	Sep/Oct 1997	**4.0**	**8.0**	0.5	0.6	--	0.5	--	3.5	--	**34**
	Jan/Feb 1998	**1.9**	2.7	0.6	--	--	--	--	1.8	--	**30**
	Apr/May 1998	**2.8**	4.3	0.7	0.5	--	--	--	3.1	--	**41**
	Jul/Aug 1998	**1.5**	3.0	0.8	0.5	--	--	--	2.0	--	**29**
	Oct/Nov 1998	**0.9**	2.4	0.7	--	--	--	--	1.6	--	**25**
	Feb/Mar 1999	**1.2**	4.1	0.6	0.5	--	--	--	2.5	--	**38**
	May/Jun 1999	**2.0**	**6.4**	0.7	--	--	--	--	3.7(EB)(5)	--	**56**
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.0(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.5 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.0 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.6(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	7.4 Hexane	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.6(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	4.2
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	6.5 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-6	Aug/Sep 1996	--	--	--	--	--	--	--	1.3(TB)	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	0.8	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	5.5
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	2.0	1.0	--	--	--	--	--	--
	Apr/May 1998	--	0.7	3.2	1.1	--	--	--	0.6	--	--
	Jul/Aug 1998	--	0.6	2.5	0.8	--	--	--	--	7.6 Dichloromethane(b)	4.2
	Oct/Nov 1998	--	--	0.7	--	--	--	--	--	--	--
	Feb/Mar 1999	--	0.8	3.8	1.0	--	--	--	0.6	--	--
	May/Jun 1999	--	--	1.5	--	--	--	--	--	--	--
MW-7	Aug/Sep 1996	**90**	**39**	0.8	--	**1.2**	1.1	7.2	13(TB)	--	NA
	Oct/Nov 1996	**170**	**27**	1.3	--	**0.8**	2.3	7.7	14	4.3(B) 1,1-Difluoroethane 2.8(B) Acetone	NA
	Feb/Mar 1997	**45**	**27**	0.6	--	**0.8**	0.9	5.1	9.9	--	NA
	Jun/Jul 1997	**39**	**23**	0.7	--	**0.8**	1.0	4.1	11	10 Unknown	**285**
	Sep/Oct 1997	**93**	**22**	1.1	--	**0.9**	1.3	4.7	13	--	**550**
	Jan/Feb 1998	**150**	**24**	3.7	--	**0.8**	2.1	6.4	13	--	**720**
	Apr/May 1998	**31**	**13**	0.5	--	--	--	3.1	6.1	--	**130**
	Jul/Aug 1998	**43**	**19**	0.8	--	**0.6**	0.9	3.4	9.0	1.0 Dichloromethane(b)	**190**
	Oct/Nov 1998	**51**	**18**	0.9	--	**0.7**	1.1	3.0	9.8	3.4 Carbon disulfide	**210**
	Feb/Mar 1999	**49**	**17**	0.6	--	--	0.9	2.0	7.2	--	**150**
	May/Jun 1999	**42**	**14**	--	--	--	--	2.2	5.7(FB)	--	**120**
MW-8	Aug/Sep 1996	**4.0**	4.6	--	--	--	--	--	1.3	--	NA
	Oct/Nov 1996	**2.8**	2.2	--	--	--	--	0.6	0.6	1.7 Acetone	NA
	Feb/Mar 1997	**1.5**	4.5	--	--	--	--	--	1.3	1.1 Freon 11 1.9 Carbon disulfide	NA

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	6.4
	Sep/Oct 1997	**3.2**	3.6	--	--	--	--	--	1.2	1.0 Freon 11	**29**
	Jan/Feb 1998	**1.8**	1.3	--	--	--	--	--	0.8	0.8 Freon 11	11
	Apr/May 1998	**1.3**	1.3	--	--	--	--	--	0.5	--	7.6
	Jul/Aug 1998	--	--	--	--	--	--	--	--	6.6 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-9	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	3.9 Unknown RT=6.21	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-10	Aug/Sep 1996	**0.7**	**18**	0.5	--	--	--	1.2	1.4(TB)	--	NA
	Oct/Nov 1996	**0.6**	**6.6**	1.0	1.9	--	--	0.8	1.1	3.0(B) Acetone 1.1 Unknown scan #350	NA
	Feb/Mar 1997	--	**5.2**	--	--	--	--	--	0.6	--	NA
	Jun/Jul 1997	--	2.2	--	--	--	--	--	--	--	11
	Sep/Oct 1997	--	4.3	1.3	1.2	--	--	--	1.0	--	16
	Jan/Feb 1998	--	1.1	2.2	1.6	--	--	--	1.4	--	4.7
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	8.2 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	**5.7**	--	--	--	--	--	0.9	--	**39**
	May/Jun 1999	--	1.1	--	--	--	--	--	--	--	10
MW-11											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.6(B) Acetone 7.1 MTBE	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.8 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	**1.4**	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	**1.5**	--	--	--	--	--	--	--	--	--

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Oct/Nov 1998	**1.4**	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.9(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	**2.4**	--	--	--	--	--	--	1.0	--	NA
	Oct/Nov 1996	**1.1**	--	--	--	--	--	--	1.2	--	NA
	Feb/Mar 1997	**1.7**	--	--	--	--	--	--	1.0	--	NA
	Jun/Jul 1997	**1.2**	--	--	--	--	--	--	1.0	--	--
	Sep/Oct 1997	**0.6**	--	--	--	--	--	--	0.6	--	--
	Jan/Feb 1998	**0.7**	--	--	--	--	--	--	0.7	--	--
	Apr/May 1998	**1.0**	--	--	--	--	--	--	0.7	--	--
	Jul/Aug 1998	**0.9**	--	--	--	--	--	--	0.6	--	--
	Oct/Nov 1998	**0.6**	--	--	--	--	--	--	0.7	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	1.1	--	--
	May/Jun 1999	**0.5**	--	--	--	--	--	--	0.7(EB)(5)	--	--
Screen 3	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	1.3	2.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	1.4	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	1.1	--	NA
	Jun/Jul 1997	**0.7**	--	--	--	--	--	--	1.4	--	--
	Sep/Oct 1997	**0.6**	--	--	--	--	--	--	1.3	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	1.4	--	--
	Apr/May 1998	**1.0**	--	--	--	--	--	--	1.3	--	--
	Jul/Aug 1998	**1.5**	--	--	--	--	--	--	1.4	--	--
	Oct/Nov 1998	**1.3**	--	--	--	--	--	--	1.1	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	0.5	2.4(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.5 2-Methyl-1-Propene	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	0.5	--	--
	Apr/May 1998	--	--	--	--	--	--	--	0.5	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	0.5	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	0.6	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	0.5(EB)(5)	--	--

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in μg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.4(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.1 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	44 Carbon disulfide(4)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-12											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	4.1	--	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	--	--	--	--	--	--	5.8	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.5	--	--
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	--	--	--	--	--	--	--	0.8	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	**1.5**	0.6	--	--	--	--	0.5	--	--	NA
	Feb/Mar 1997	**1.1**	0.5	--	--	--	--	--	--	1.1(B) Acetone	NA
	Jun/Jul 1997	**1.0**	--	--	--	--	--	--	0.8	--	6.9
	Sep/Oct 1997	**0.8**	--	--	--	--	--	--	0.8	--	5.8
	Jan/Feb 1998	**1.1**	--	--	--	--	--	--	0.6	--	6.3
	Apr/May 1998	**1.2**	--	--	--	--	--	--	0.9	--	6.0
	Jul/Aug 1998	**1.4**	--	--	--	--	--	--	0.9	--	5.1
	Oct/Nov 1998	**1.3**	--	--	--	--	--	--	1.0	--	4.2
	Feb/Mar 1999	**1.3**	--	--	--	--	--	--	0.9	--	4.1
	May/Jun 1999	**0.8**	--	--	--	--	--	--	0.6(EB)(5)	0.8 Dichloromethane(EB)	5.0
Screen 3	Aug/Sep 1996	**4.5**	--	--	--	--	--	--	1.3	--	NA
	Oct/Nov 1996	**3.8**	--	--	--	--	--	--	1.3	1.6 Acetone	NA
	Feb/Mar 1997	**6.4**	--	--	--	--	--	--	1.4	1.3(B) Acetone	NA
	Jun/Jul 1997	**20**	--	--	--	--	--	--	1.6	--	5.7
	Sep/Oct 1997	**14**	--	--	--	--	--	--	1.7	--	6.2
	Jan/Feb 1998	**23E**	--	--	--	--	--	--	2.3	--	5.9
	Apr/May 1998	**25**	--	--	--	--	--	--	2.0	--	6.9

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Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Jul/Aug 1998	35	--	--	--	--	--	--	2.2	--	6.6
	Oct/Nov 1998	27	--	--	--	--	--	--	2.2	--	6.9
	Feb/Mar 1999	23	--	--	--	--	--	--	--	--	--
	May/Jun 1999	19	--	--	--	--	--	--	2.0(EB)(5)	--	8.7
Screen 4	Aug/Sep 1996	6.3	--	--	--	--	--	--	1.4	--	NA
	Oct/Nov 1996	5.1	--	--	--	--	--	--	1.4	2.5 Acetone	NA
	Feb/Mar 1997	4.9	--	--	--	--	--	--	1.3	--	NA
	Jun/Jul 1997	4.9	--	--	--	--	--	--	1.3	--	7.3
	Sep/Oct 1997	3.8	--	--	--	--	--	--	1.0	--	7.6
	Jan/Feb 1998	4.0	--	--	--	--	--	--	1.1	--	8.0
	Apr/May 1998	4.3	--	--	--	--	--	--	1.2	--	8.0
	Jul/Aug 1998	5.1	--	--	--	--	--	--	1.2	--	6.0
	Oct/Nov 1998	4.1	--	--	--	--	--	--	1.2	--	7.7
	Feb/Mar 1999	4.5	--	--	--	--	--	--	1.2	--	7.0
	May/Jun 1999	4.0	--	--	--	--	--	--	1.0(EB)(5)	--	9.1
Screen 5	Aug/Sep 1996	3.4	--	--	--	--	--	--	0.7	--	NA
	Oct/Nov 1996	1.3	--	--	--	--	--	--	--	1.5 Acetone	NA
	Feb/Mar 1997	1.7	--	--	--	--	--	--	0.5	--	NA
	Jun/Jul 1997	1.9	--	--	--	--	--	--	0.5	--	4.1
	Sep/Oct 1997	1.3	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	1.3	--	--	--	--	--	--	--	--	--
	Apr/May 1998	1.7	--	--	--	--	--	--	0.6	--	--
	Jul/Aug 1998	2.1	--	--	--	--	--	--	0.6	--	--
	Oct/Nov 1998	2.0	--	--	--	--	--	--	0.6	--	--
	Feb/Mar 1999	1.3	--	--	--	--	--	--	0.7	--	--
	May/Jun 1999	1.6	--	--	--	--	--	--	0.5(EB)(5)	--	--
MW-13	Aug/Sep 1996	21	47	0.6	--	2.5	1.5	0.7	21(TB)	--	NA
	Oct/Nov 1996	27	27	--	--	1.9	1.5	0.6	14	--	NA
	Feb/Mar 1997	18	28	--	--	0.9	1.1	0.6	9.2	--	NA
	Jun/Jul 1997	6.4	24 E	--	--	0.9	0.5	--	11	--	130
	Sep/Oct 1997	8.2	19	--	--	1.1	0.5	--	10	--	210
	Jan/Feb 1998	12	5.2	0.5	--	--	0.5 (DUP 3)	--	2.9	1.8 Freon 11	99
	Apr/May 1998	13	17	0.6	--	--	0.9	0.6	5.7	--	100
	Jul/Aug 1998	15	29	0.6	--	--	1.2	0.7	7.7	1.0 Dichloromethane(b) 0.5 1,1,1-Trichloroethane	59
	Oct/Nov 1998	9.0	20	--	--	--	1.1	0.5	9.3	--	86
	Feb/Mar 1999	9.4	28	--	--	0.7	0.7	11	--	--	98
	May/Jun 1999	9.8	40	0.6	--	0.5	0.8	1.0	9.4	--	120

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Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-14											
Screen 1	Aug/Sep 1996	--	--	--	2.4	--	--	--	0.6	--	NA
	Oct/Nov 1996	--	--	--	2.9	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	0.7	1.5	--	--	--	0.7	--	NA
	Jun/Jul 1997	--	--	--	2.0	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	1.9	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	2.1	--	--	--	0.5	--	--
	Apr/May 1998	--	--	1.2	0.8	--	--	--	0.8	--	4.4
	Jul/Aug 1998	--	--	0.8	1.7	--	--	--	0.6	--	4.4
	Oct/Nov 1998	--	--	0.5	2.4	--	--	--	0.6	--	4.2
	Feb/Mar 1999	--	--	0.8	1.2	--	--	0.6(b)	0.6	--	4.2
	May/Jun 1999	--	--	0.5	2.6	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	2.8	1.6	1.4	--	--	--	1.5	--	NA
	Oct/Nov 1996	--	1.5	1.6	1.0	--	--	--	0.9	0.6 1,2,3-Trichlorobenzene 1.1 Acetone	NA
	Feb/Mar 1997	--	0.9	1.9	1.3	--	--	--	0.8	0.8 1,2,3-Trichlorobenzene 1.1 Acetone	NA
	Jun/Jul 1997	--	1.1	1.7	1.5	--	--	--	0.9	0.5 1,2,3-Trichlorobenzene	--
	Sep/Oct 1997	--	1.2	1.9	1.6	--	--	--	0.8	--	--
	Jan/Feb 1998	--	--	1.2	0.7	--	--	--	--	8.9 Carbon disulfide(4)	9.0
	Apr/May 1998	--	--	1.2	0.7	--	--	--	0.6	--	4.0
	Jul/Aug 1998	--	0.9	1.8	0.8	--	--	--	0.6	--	4.9
	Oct/Nov 1998	--	0.6	1.5	0.7	--	--	--	0.5	--	4.2
	Feb/Mar 1999	--	0.9	1.6	0.7	--	--	0.6(b)	0.6	--	4.2
	May/Jun 1999	--	1.0	1.2	0.8	--	--	--	0.6(EB)(5)	--	9.6
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	4.3
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	5.6
	Apr/May 1998	--	--	--	--	--	--	--	--	--	5.8
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	5.9
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	6.7
	Feb/Mar 1999	--	--	0.5	--	--	--	0.6(b)	0.5	--	5.9
	May/Jun 1999	--	--	--	--	--	--	--	--	--	7.0
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.6(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	9.9
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6(TB) Acetone 1.3 Carbon disulfide	NA NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	4.6 Carbon disulfide(4)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-15	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-16	Aug/Sep 1996	**125**	**33**	1.3	--	**2.4**	2.2	2.0	40(TB)	--	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	**91**	**23**	1.3	--	**1.7**	2.6	1.6	29	--	NA
	Jun/Jul 1997	**68**	**25**	1.1	--	**2.1**	1.7	0.6	43	--	**615**
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	**30**	3.5	1.0	--	--	1.3	--	14	--	**1230**
	Apr/May 1998	**42**	**12**	0.8	--	**1.4**	1.6	1.2	20	--	**640**
	Jul/Aug 1998	**58**	**19**	1.3	--	**0.8**	2.7	1.2	23	0.6 Dichloromethane(b) 1.0 1,1,1-Trichloroethane	**420**
	Oct/Nov 1998	**51**	**18**	1.0	--	**1.5**	1.6	1.4	29	1.1 1,1,1-Trichloroethane 13 Carbon disulfide	**220**

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Feb/Mar 1999	**67**	**20**	1.4	--	**1.1**	1.8	1.1	24	--	**790**
	May/Jun 1999	**58**	**15**	1.0	--	**0.8**	1.3	1.2	23	0.5 Fluorotrichloromethane	**650**
MW-17											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.3(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.4 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	2.9	--	--
	Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	3.8	4.5(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	6.0	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	5.2	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	4.1	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	6.1	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	5.4	--	--
	Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	2.4	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	3.7	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.0[b]	3.9	--	--
	May/Jun 1999	--	--	--	--	--	--	--	3.2(EB)[5]	--	--
Screen 3	Aug/Sep 1996	**2.0**	**7.9**	--	--	--	--	--	7.5	--	NA
	Oct/Nov 1996	**3.3**	**18**	0.8	--	--	--	--	8.7	--	NA
	Feb/Mar 1997	**5.1**	**23**	1.1	--	--	--	--	6.2	--	NA
	Jun/Jul 1997	**1.3**	**5.9**	--	--	--	--	--	8.2	--	12
	Sep/Oct 1997	**6.6**	**22**	1.4	--	--	--	--	9.2	--	**55**
	Jan/Feb 1998	**3.3**	**8.7**	--	--	--	--	--	6.8	--	**25**
	Apr/May 1998	--	0.9	--	--	--	--	--	5.3	--	--
	Jul/Aug 1998	--	1.0	--	--	--	--	--	4.9	--	--
	Oct/Nov 1998	--	1.9	--	--	--	--	--	4.1	--	5.1
	Feb/Mar 1999	--	1.6	--	--	--	--	--	3.8	--	4.2
	May/Jun 1999	--	1.5	--	--	--	--	--	3.5(EB)[5]	--	--
Screen 4	Aug/Sep 1996	--	**9.5**	0.5	--	--	--	--	1.1	--	NA
	Oct/Nov 1996	--	**8.9**	--	--	--	--	--	1.5	--	NA
	Feb/Mar 1997	--	**5.8**	--	--	--	--	--	0.7	--	NA
	Jun/Jul 1997	--	4.5	--	--	--	--	--	0.6	--	13
	Sep/Oct 1997	--	**6.8**	0.5	--	--	--	--	1.0	--	16

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Jan/Feb 1998	--	**7.3**	0.6	--	--	--	--	1.2	--	16
	Apr/May 1998	--	**7.6**	0.6	--	--	--	--	1.5	--	17
	Jul/Aug 1998	--	**8.9**	0.6	--	--	--	--	1.9	--	14
	Oct/Nov 1998	--	**6.2**	0.5	--	--	--	--	1.9	--	12
	Feb/Mar 1999	--	3.8	--	--	--	--	1.0(b)	1.8	--	9.8
	May/Jun 1999	--	3.2	--	--	--	--	--	1.4(EB)(5)	--	14
Screen 5	Aug/Sep 1996	--	**13**	0.6	--	--	--	--	1.7	3.4(B) Acetone	NA
	Oct/Nov 1996	--	**16**	0.7	--	--	--	--	1.7	--	NA
	Feb/Mar 1997	--	**14**	0.7	--	--	--	--	1.3	--	NA
	Jun/Jul 1997	--	**11**	0.7	--	--	--	--	1.3	--	12
	Sep/Oct 1997	--	**8.6**	0.6	--	--	--	--	1.4	--	15
	Jan/Feb 1998	--	**7.9**	--	--	--	--	--	1.5	--	15
	Apr/May 1998	--	**8.8**	0.6	--	--	--	--	1.8	--	15
	Jul/Aug 1998	--	**8.9**	0.6	--	--	--	--	2.0	--	13
	Oct/Nov 1998	--	**11**	0.8	--	--	--	--	2.7	--	12
	Feb/Mar 1999	--	4.9	--	--	--	--	--	2.1	--	6.4
	May/Jun 1999	--	**6.6**	0.6	--	--	--	--	2.0(EB)(5)	--	12
MW-18											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	1.6	--	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	--	--	--	--	--	--	3.0	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	--
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	Not Sampled*									
	Apr/May 1998	--	--	--	--	--	--	--	0.7	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	3.4 Unknown Hydrocarbon (RT=7.14)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.3	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	8.2	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	1.9	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	4.5	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	2.5	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	3.7	--	--
	Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	0.9	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	3.0	0.8 Bromodichloromethane	--
	May/Jun 1999	--	--	--	--	--	--	--	0.8(EB)(5)	--	--

TABLE 3-4

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(concentrations in μg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 3	Aug/Sep 1996	0.7	4.7	2.8	--	--	--	--	5.1	--	NA
	Oct/Nov 1996	0.7	6.4	3.2	--	--	--	--	5.6	--	NA
	Feb/Mar 1997	0.8	6.6	2.9	--	--	--	--	5.1	--	NA
	Jun/Jul 1997	0.6	2.4	1.8	--	--	--	--	4.4	--	--
	Sep/Oct 1997	--	3.0	1.9	--	--	--	--	6.2	--	--
	Jan/Feb 1998	--	1.9	1.7	--	--	--	--	6.6	4.1 Unknown (RT=4.33)	--
	Apr/May 1998	0.5	1.8	1.3	--	--	--	--	5.7	--	5.0
	Jul/Aug 1998	--	1.5	0.9	--	--	--	--	4.6	--	5.2
	Oct/Nov 1998	--	1.4	0.8	--	--	--	--	4.2	--	--
	Feb/Mar 1999	--	1.0	0.5	--	--	--	--	3.5	--	--
	May/Jun 1999	--	1.1	--	--	--	--	--	2.5(EB)(5)	0.6 Dichloromethane	--
Screen 4	Aug/Sep 1996	2.2	--	0.7	--	--	--	--	0.5	--	NA
	Oct/Nov 1996	2.2	--	0.7	--	--	--	--	0.5	1.4(TB) Acetone	NA
	Feb/Mar 1997	2.2	--	1.5	--	--	--	--	0.6	--	NA
	Jun/Jul 1997	1.9	--	0.7	--	--	--	--	--	--	11
	Sep/Oct 1997	2.4	--	0.7	--	--	--	--	--	1.5 Carbon Disulfide	12
	Jan/Feb 1998	2.6	--	1.0	--	--	--	--	0.5	--	11
	Apr/May 1998	3.1	0.6	1.4	--	--	--	--	0.8	--	13
	Jul/Aug 1998	2.5	0.6	1.2	--	--	--	--	0.6	--	16
	Oct/Nov 1998	3.4	0.8	1.5	--	--	--	--	0.7	--	19
	Feb/Mar 1999	4.7	1.2	2.3	--	--	--	--	1.1	--	24
	May/Jun 1999	3.6	1.6	2.5	--	--	--	--	1.1(EB)(5)	0.7 Dichloromethane	16
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	1.1 Carbon disulfide	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	4.6 Hexane	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
MW-19											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.9	3.7(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.9 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	2.5	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	1.4	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	0.8	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--

TABLE 3-4

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(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	--	0.8	--	--	--	--	--	3.0(B) Acetone	NA
	Oct/Nov 1996	--	--	1.1	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	0.6	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	0.6	0.9	--	--	--	--	--	--	--
	Apr/May 1998	--	0.9	1.2	--	--	--	--	--	--	--
	Jul/Aug 1998	--	0.6	0.7	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	0.6	--	--	--	--	--	--	--	--
	May/Jun 1999	--	1.3	1.1	--	--	--	--	--	--	4.5
Screen 3	Aug/Sep 1996	--	--	3.1	--	--	--	--	--	2.6(B) Acetone	NA
	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	2.1	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	2.0	--	--	--	--	--	--	4.1
	Sep/Oct 1997	--	--	1.5	--	--	--	--	--	0.6 Toluene	--
	Jan/Feb 1998	--	--	2.1	--	--	--	--	--	--	--
	Apr/May 1998	--	--	2.5	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	2.1	--	--	--	--	--	--	4.4
	Oct/Nov 1998	--	--	2.0	--	--	--	--	--	--	4.2
	Feb/Mar 1999	--	--	1.5	--	--	--	--	--	--	--
	May/Jun 1999	--	0.9	2.7	--	--	--	--	--	--	7.2
Screen 4	Aug/Sep 1996	0.5	1.5	--	--	--	--	--	2.1	--	NA
	Oct/Nov 1996	--	1.5	--	--	--	--	--	1.9	--	NA
	Feb/Mar 1997	--	1.1	0.6	--	--	--	--	1.5	--	NA
	Jun/Jul 1997	--	0.7	--	--	--	--	--	1.3	--	--
	Sep/Oct 1997	--	0.7	0.6	--	--	--	--	1.7	--	4.9
	Jan/Feb 1998	--	0.5	0.6	--	--	--	--	1.3	--	--
	Apr/May 1998	--	0.8	1.0	--	--	--	--	1.6	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	1.4	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	2.2	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	3.0	--	--
	May/Jun 1999	--	0.7	--	--	--	--	--	2.6(EB)(5)	--	--

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	--	--	3.0	--	--	--	--	0.6	1.6(B) Unknown scan #940	NA
	Oct/Nov 1996	--	--	2.4	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	1.7	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	1.5	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	2.2	--	--	--	--	0.8	--	--
	Jan/Feb 1998	--	--	1.4	--	--	--	--	--	--	--
	Apr/May 1998	--	--	0.9	--	--	--	--	0.6	--	--
	Jul/Aug 1998	--	--	1.5	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	1.5	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	1.3	--	--	--	--	--	--	--
	May/Jun 1999	--	--	2.1	--	--	--	--	--	0.7 Dichloromethane	4.4
MW-20											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	3.4(B) Acetone	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	--	--	--	--	--	--	1.4	2.4(EB) Acetone	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	5.7
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	--	--	--	--	--	--	--	1.4	--	6.3
	Apr/May 1998	--	--	--	--	--	--	--	2.5	--	5.5
	Jul/Aug 1998	--	--	--	--	--	--	--	1.8	--	5.9
	Oct/Nov 1998	--	--	--	--	--	--	--	0.8	--	7.8
	Feb/Mar 1999	--	--	--	--	--	--	--	2.2	--	4.9
	May/Jun 1999	--	--	--	--	--	--	--	1.9(EB)(5)	--	4.4
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.7	4.0(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	4.4	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	3.2	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	3.3	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	5.7	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	2.7	--	--
	Apr/May 1998	--	--	--	--	--	--	--	2.7	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	4.2	0.5 Dichlorobromomethane	--
	Oct/Nov 1998	--	--	--	--	--	--	--	3.6	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	4.2	--	--
	May/Jun 1999	--	--	--	--	--	--	--	4.6(EB)(5)	0.6 Bromodichloromethane	--
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.7(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.3 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	3.4 Unknown (RT=6.2)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--

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	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	**21**
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	**20**
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	**21**
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	8.2
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
MW-21											
Screen 1	Aug/Sep 1996	--	**33**	0.7	--	--	--	--	1.8	2.3(B) Acetone	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	**29**	--	--	--	--	--	2.2	--	NA
	Jun/Jul 1997	--	**20**	--	--	--	--	--	1.6	--	**19**
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	--	**16**	--	--	--	--	--	1.8	--	14
	Apr/May 1998	--	**16**	--	--	--	--	--	1.8	--	14
	Jul/Aug 1998	--	**16**	0.6	--	--	--	--	1.8	--	13
	Oct/Nov 1998	--	**10**	--	--	--	--	--	1.6	--	13
	Feb/Mar 1999	--	**20**	0.5	--	--	--	--	1.8	--	14
	May/Jun 1999	--	**20**	0.5	--	--	--	--	1.6(EB)(5)	--	15

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 2	Aug/Sep 1996	--	--	0.9	--	--	--	--	0.5	--	NA
	Oct/Nov 1996	--	0.6	2.3	--	--	--	--	0.6	1.4(TB) Acetone	NA
	Feb/Mar 1997	--	--	1.1	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	0.7	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	1.1	--	--	--	--	--	--	--
	Apr/May 1998	--	--	1.0	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	0.7	--	--	--	--	0.7	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	0.7	--	--
	Feb/Mar 1999	--	--	0.8	--	--	--	--	--	--	4.1
	May/Jun 1999	--	--	0.6	--	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	--	0.7	1.5	--	--	--	--	0.5	--	NA
	Oct/Nov 1996	--	0.9	1.6	--	--	--	--	--	1.2 Acetone	NA
	Feb/Mar 1997	--	0.8	1.6	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	1.2	--	--	--	--	--	--	--
	Sep/Oct 1997	--	0.6	1.3	--	--	--	--	--	--	--
	Jan/Feb 1998	--	0.5	1.4	--	--	--	--	--	--	--
	Apr/May 1998	--	--	1.1	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	0.9	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	0.8	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	1.0	--	--	--	--	--	--	4.1
	May/Jun 1999	--	0.6	1.4	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	1.8	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	2.8	--	--	--	--	--	--	4.6
	Sep/Oct 1997	--	0.6	4.4	--	--	--	--	--	--	7.7
	Jan/Feb 1998	--	--	2.4	--	--	--	--	--	--	--
	Apr/May 1998	--	0.6	4.4	--	--	--	--	--	0.7 cis-1,2-Dichloroethene	--
	Jul/Aug 1998	--	0.8	4.3	--	--	--	--	--	0.8 cis-1,2-Dichloroethene	4.3
	Oct/Nov 1998	--	1.1	**8.3**	--	--	--	--	0.6	1.3 cis-1,2-Dichloroethene	--
	Feb/Mar 1999	--	--	3.8	--	--	--	--	--	0.7 cis-1,2-Dichloroethene	--
	May/Jun 1999	--	--	3.2	--	--	--	--	--	0.6 cis-1,2-Dichloroethene	4.8
Screen 5	Aug/Sep 1996	--	--	4.5	--	--	--	--	0.6	--	NA
	Oct/Nov 1996	--	--	3.1	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	3.0	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	3.0	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	2.9	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	4.1	--	--	--	--	--	0.6 cis-1,2-Dichloroethene 5.0 Carbon disulfide(4)	5.2
	Apr/May 1998	--	--	**6.5**	--	--	--	--	--	1.0 cis-1,2-Dichloroethene	5.8

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
	Jul/Aug 1998	--	--	**7.6**	--	--	--	--	0.6	1.5 cis-1,2-Dichloroethene	--
	Oct/Nov 1998	--	--	**6.7**	--	--	--	--	0.6	1.4 cis-1,2-Dichloroethene	4.0
	Feb/Mar 1999	--	0.5	**7.7**	--	--	--	--	0.7	1.4 cis-1,2-Dichloroethene	4.2
	May/Jun 1999	--	--	**8.2**	--	--	--	--	0.7(EB)(5)	1.5 cis-1,2-Dichloroethene	--
MW-22(1)											
Screen 1	Sep/Oct 1997	--	--	2.0	0.7	--	--	--	--	--	--
	Jan/Feb 1998	--	--	2.3	0.8	--	--	0.5	--	--	--
	Apr/May 1998	--	0.9	2.1	0.8	--	--	--	0.5	--	5.4
	Jul/Aug 1998	--	0.9	1.7	0.6	--	--	--	--	--	6.4
	Oct/Nov 1998	--	--	1.7	0.7	--	--	--	--	--	5.0
	Feb/Mar 1999	--	0.6	3.6	1.0	--	--	1.3(b)	0.5	--	6.4
	May/Jun 1999	--	--	2.7	1.0	--	--	--	--	--	4.9
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	0.6	--	--	--	--	1.4(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	15
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.3(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	4.5
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.3(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.3(b)	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-23(1)											
Screen 1	Sep/Oct 1997	--	3.1	0.6	0.8	--	--	--	--	--	4.4
	Jan/Feb 1998	--	4.2	1.6	1.2	--	--	--	0.9	0.6 1,2,3-Trichlorobenzene	5.2
	Apr/May 1998	**0.5**	**16**	0.8	1.2	--	--	--	1.9	--	16
	Jul/Aug 1998	**0.5**	**9.2**	--	--	--	--	--	1.0	2.2 Dichloromethane(b)	**19**
	Oct/Nov 1998	**0.8**	**15**	--	--	--	--	--	1.9	--	**21**
	Feb/Mar 1999	**0.6**	**15**	1.1	--	--	1.4	--	1.9	0.06 1,2,3-Trichlorobenzene	8.4
	May/Jun 1999	--	**7.0**	1.1	--	--	--	0.6	1.0(EB)(5)	0.7 1,2,3-Trichlorobenzene	7.6
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.6
	Jan/Feb 1998	--	--	--	--	--	--	--	0.7	--	6.7
	Apr/May 1998	--	--	--	--	--	--	--	--	--	7.5
	Jul/Aug 1998	--	1.1	1.0	0.8	--	--	--	0.7	1.8 Dichloromethane(b)	7.8
	Oct/Nov 1998	--	0.6	0.7	0.6	--	--	--	0.6	--	16
	Feb/Mar 1999	--	--	--	--	--	--	--	0.5	--	7.7
	May/Jun 1999	--	--	--	0.5	--	--	--	0.6(EB)(5)	--	7.8
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	2.3 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane(b) 3.0 Unknown (RT=3.93)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	3.1 2-Methyl-1-propene	17
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-24(1)											
Screen 1	Sep/Oct 1997	**5.0**	**5.0**	--	--	--	--	0.6	3.1	--	**92**
	Jan/Feb 1998	**30E**	**15**	0.5	--	**0.8**	--	0.6	15	--	**330**
	Apr/May 1998	**6.7**	**5.4**	--	--	--	--	--	3.3	--	**74**
	Jul/Aug 1998	--	1.7	--	--	--	--	--	0.9	--	**20**
	Oct/Nov 1998	**1.0**	1.3	--	--	--	--	--	0.8	--	16
	Feb/Mar 1999	**1.0**	1.5	--	--	--	--	--	0.8	--	14
	May/Jun 1999	**1.0**	1.6	--	--	--	--	--	0.6(EB)(5)	--	14
Screen 2	Sep/Oct 1997	**13**	1.3	--	--	--	--	--	3.8	--	**200**
	Jan/Feb 1998	**6.9**	0.7	--	--	--	--	--	2.4	--	**110**
	Apr/May 1998	**29**	3.3	0.9	--	--	1.4	--	9.4	--	**480**
	Jul/Aug 1998	**58**	4.0	1.5	--	--	2.0	--	8.4	--	**500**
	Oct/Nov 1998	**19**	2.3	0.8	--	--	0.8	--	5.9	--	**490**
	Feb/Mar 1999	**30E**	3.0	1.0	--	--	1.5	--	6.6	--	**580**
	May/Jun 1999	**33**	4.3	1.3	--	--	1.8	--	7.7(EB)(5)	--	**690**
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
	May/Jun 1999	--	--	--	--	--	--	--	--	--	--

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.0
California Maximum Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	150 Freon 11[a] 6.0 cis-1,2-Dichloroethene[a] 1,1,1-Trichloroethane[a]	18[2]
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	NE	5.0	7.0	NE	100	5.0 Dichloromethane[a] 70 cis-1,2-Dichloroethene[a] 100 Bromodichloromethane[a] 1,1,1-Trichloroethane[a]	NE

--: Not detected
*: Not sampled, no water over screen
a: Only VOCs for which MCLs have been established are listed
b: Attributed to Laboratory Contamination
B: Compound detected in the laboratory method blank
E: Estimated concentration; result exceeded calibration range
EB: Compound detected in associated equipment blank
FB: Compound detected in associated field blank
TB: Compound detected in associated trip blank

NA: Not analyzed
NE: Not established
RT: Retention time
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
3: DUP – Results from duplicate analysis; original sample was non-detect.
4: Suspected by the laboratory to have resulted from carry over in analysis (see January/February 1998 report)
5: All the equipment blanks for the round had chloroform concentrations ranging from 0.8 to 2.9 µg/L. The ASTM Type II water used for the equipment blanks is the probable source of the chloroform

TABLE 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	MW-991-001	--	--	--	--	0.40
MW-3						
Screen 1	MW-991-002	--	--	--	--	4.60
Screen 2	MW-991-003	--	--	--	--	3.14
Screen 3	MW-991-004	--	--	--	--	1.76
Screen 4	MW-991-005	--	--	--	--	1.51
Screen 5	MW-991-006	0.006	--	--	--	4.22
MW-4						
Screen 1	MW-991-007	--	--	--	--	1.80
Screen 2	MW-991-008	--	--	--	--	4.80
Screen 2 (DUP)	MW-991-009	--	--	--	--	4.80
Screen 3	MW-991-010	--	--	--	--	4.90
Screen 4	MW-991-011	--	--	--	--	2.90
Screen 5	MW-991-012	--	--	--	--	1.12
MW-5	MW-991-013	--	--	--	--	1.65
MW-6	MW-991-014	--	--	0.036	--	4.10
MW-7	MW-991-015	--	--	0.011	--	3.48
MW-8	MW-991-016	--	--	--	--	1.50
MW-9	MW-991-017	--	--	--	--	0.07
MW-10	MW-991-018	--	--	--	--	1.80
MW-10 DUP	MW-991-019	--	--	--	--	1.80
MW-11						
Screen 1	MW-991-020	--	--	--	--	1.12
Screen 2	MW-991-021	--	--	--	--	1.32
Screen 3	MW-991-022	--	--	--	--	2.73
Screen 4	MW-991-023	--	--	--	--	4.03
Screen 5	MW-991-024	0.005	--	--	--	1.38
MW-12						
Screen 1	MW-991-025	--	--	--	--	10.5
Screen 2	MW-991-026	--	--	--	--	1.66
Screen 2 (DUP)	MW-991-027	--	--	--	--	1.66
Screen 3	MW-991-028	--	--	--	--	0.75
Screen 4	MW-991-029	--	--	--	--	1.06
Screen 5	MW-991-030	--	--	--	--	3.15

TABLE 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in mg/L)
Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-13	MW-991-031	--	--	0.024	0.024	0.38
MW-13 DUP	MW-991-032	--	--	0.025	0.025	0.38
MW-14						
Screen 1	MW-991-033	--	--	--	--	3.36
Screen 2	MW-991-034	--	--	--	--	4.37
Screen 3	MW-991-035	--	--	--	--	0.84
Screen 4	MW-991-036	--	--	--	--	1.73
Screen 5	MW-991-037	--	--	--	--	1.88
MW-15	MW-991-038	--	--	--	--	0.40
MW-16	MW-991-039	--	--	--	--	2.16
MW-17						
Screen 1	MW-991-040	--	--	--	--	0.36
Screen 2	MW-991-041	--	--	--	--	1.63
Screen 3	MW-991-042	--	--	--	--	2.23
Screen 4	MW-991-043	--	--	--	--	7.91
Screen 5	MW-991-044	--	0.004	--	--	16.3
MW-18						
Screen 1	MW-991-045	--	--	--	--	2.79
Screen 2	MW-991-046	--	--	--	--	4.07
Screen 3	MW-991-047	--	--	--	--	2.07
Screen 4	MW-991-048	--	--	--	--	3.03
Screen 5	MW-991-049	--	--	--	--	2.37
MW-19						
Screen 1	MW-991-050	--	--	--	--	5.03
Screen 2	MW-991-051	--	--	--	--	2.34
Screen 3	MW-991-052	--	--	--	--	2.45
Screen 4	MW-991-053	--	--	--	--	1.70
Screen 5	MW-991-054	--	--	--	--	1.66
MW-20						
Screen 1	MW-991-055	--	--	--	--	1.09
Screen 2	MW-991-056	--	--	--	--	0.89
Screen 3	MW-991-057	--	--	--	--	0.97
Screen 4	MW-991-058	--	--	--	--	2.36
Screen 5	MW-991-059	--	--	--	--	2.72

TABLE 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in mg/L)
Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-21						
Screen 1	MW-991-060	--	--	--	--	2.83
Screen 2	MW-991-061	--	--	--	--	0.83
Screen 3	MW-991-062	--	--	--	--	2.21
Screen 4	MW-991-063	--	--	--	--	7.63
Screen 5	MW-991-064	--	--	--	--	3.27
MW-22						
Screen 1	MW-991-065	--	--	--	--	37.6
Screen 2	MW-991-066	--	--	--	--	4.50
Screen 3	MW-991-067	--	--	--	--	3.68
Screen 4	MW-991-068	--	--	--	--	4.08
Screen 5	MW-991-069	--	--	--	--	4.71
MW-23						
Screen 1	MW-991-070	--	--	--	--	6.99
Screen 2	MW-991-071	--	--	--	--	7.31
Screen 3	MW-991-072	--	--	--	--	7.52
Screen 4	MW-991-073	--	--	--	--	1.98
Screen 5	MW-991-074	--	--	--	--	2.41
MW-24						
Screen 1	MW-991-075	--	--	--	--	4.30
Screen 2	MW-991-076	--	--	--	--	5.40
Screen 3	MW-991-077	--	--	--	--	27.2
Screen 4	MW-991-078	--	--	--	--	10.0
Screen 5	MW-991-079	--	--	--	--	5.80
Practical Quantitation Limit		0.005	0.002	0.010	0.005	
California Maximum Contaminant Level		0.050	0.015[1]	0.050	NE	
EPA Maximum Contaminant Level		0.050	0.015[1]	0.100	NE	

(DUP): Duplicate.
NE: Not established.
--: Not detected.
1: Action Level: Treatment technique and public notification triggered.

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	Aug/Sep 1996	--	--	--	--	0.8
	Oct/Nov 1996	--	--	--	--	0.5
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	0.7
	Jan/Feb 1998	--	--	--	--	1.6
	Apr/May 1998	--	--	--	--	0.5
	Jul/Aug 1998	--	0.009	**0.055**	--	1.0
	Oct/Nov 1998	--	--	--	--	1.1
	Feb/Mar 1999	--	--	--	--	1.9
	May/Jun 1999	--	--	--	--	0.4
MW-3						
Screen 1	Aug/Sep 1996	--	--	--	--	7.2
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	6.1
	Jun/Jul 1997	--	--	--	--	2.6
	Sep/Oct 1997	--	--	--	--	2.1
	Jan/Feb 1998	--	--	--	--	2.9
	Apr/May 1998	--	--	--	--	4.8
	Jul/Aug 1998	--	--	--	--	4.5
	Oct/Nov 1998	--	--	--	--	3.8
	Feb/Mar 1999	--	--	--	--	4.7
	May/Jun 1999	--	--	--	--	4.6
Screen 2	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	1.1
	Sep/Oct 1997	--	--	--	--	2.1
	Jan/Feb 1998	--	--	--	--	2.3
	Apr/May 1998	--	--	--	--	4.3
	Jul/Aug 1998	--	0.004	--	--	3.3
	Oct/Nov 1998	--	--	--	--	4.3
	Feb/Mar 1999	--	--	--	--	2.1
	May/Jun 1999	--	--	--	--	3.1
Screen 3	Aug/Sep 1996	--	--	--	--	5.2
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	3.4
	Sep/Oct 1997	--	--	--	--	5.0
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	4.6
	Oct/Nov 1998	--	--	--	--	3.3
	Feb/Mar 1999	--	--	--	--	3.2
	May/Jun 1999	--	--	--	--	1.8

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	Aug/Sep 1996	--	--	--	--	4.3
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	4.5
	Jun/Jul 1997	--	--	--	--	2.7
	Sep/Oct 1997	--	--	--	--	2.5
	Jan/Feb 1998	--	--	--	--	3.0
	Apr/May 1998	--	--	--	--	3.6
	Jul/Aug 1998	--	--	--	--	3.1
	Oct/Nov 1998	--	--	--	--	1.3
	Feb/Mar 1999	--	--	--	--	3.5
	May/Jun 1999	--	--	--	--	1.5
Screen 5	Aug/Sep 1996	0.011	--	--	--	1.5
	Oct/Nov 1996	0.007	--	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	0.007	--	--	--	0.8
	Sep/Oct 1997	0.010	--	--	--	1.0
	Jan/Feb 1998	0.009	0.008	--	--	2.3
	Apr/May 1998	--	0.002	--	--	2.0
	Jul/Aug 1998	0.006	--	--	--	3.2
	Oct/Nov 1998	--	--	--	--	4.2
	Feb/Mar 1999	--	--	--	--	4.4
	May/Jun 1999	0.006	--	--	--	4.2
MW-4						
Screen 1	Aug/Sep 1996	--	--	--	--	2.6
	Oct/Nov 1996	--	--	--	--	1.7
	Feb/Mar 1997	--	--	--	--	4.6
	Jun/Jul 1997	--	--	--	--	2.8
	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	--	--	3.7
	Jul/Aug 1998	--	--	--	--	3.0
	Oct/Nov 1998	--	--	--	--	2.7
	Feb/Mar 1999	--	--	--	--	1.0
	May/Jun 1999	--	--	--	--	1.8
Screen 2	Aug/Sep 1996	--	--	0.023	--	3.8
	Oct/Nov 1996	--	--	0.014	--	4.2
	Feb/Mar 1997	--	--	0.011	--	4.5
	Jun/Jul 1997	--	--	0.013	--	2.7
	Sep/Oct 1997	--	--	0.012	--	3.5
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	1.8
	Jul/Aug 1998	--	--	0.011	--	4.9
	Oct/Nov 1998	--	--	0.010	--	3.4
	Feb/Mar 1999	--	--	--	--	6.1
	May/Jun 1999	--	--	--	--	4.8

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	--	--	0.6
	Oct/Nov 1996	--	--	--	--	1.5
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	2.0
	Sep/Oct 1997	--	--	--	--	1.4
	Jan/Feb 1998	--	--	--	--	4.6
	Apr/May 1998	--	--	--	--	3.2
	Jul/Aug 1998	--	--	--	--	3.9
	Oct/Nov 1998	--	--	--	--	1.2
	Feb/Mar 1999	--	--	--	--	2.9
	May/Jun 1999	--	--	--	--	4.9
Screen 4	Aug/Sep 1996	--	--	--	--	3.0
	Oct/Nov 1996	--	--	--	--	1.4
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	4.6
	Sep/Oct 1997	--	--	--	--	3.3
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	2.0
	Jul/Aug 1998	--	--	0.007	--	3.6
	Oct/Nov 1998	--	--	--	--	2.7
	Feb/Mar 1999	--	--	--	--	3.3
	May/Jun 1999	--	--	--	--	2.9
Screen 5	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	--	--	--	4.4
	Jun/Jul 1997	--	--	--	--	4.0
	Sep/Oct 1997	--	--	--	--	3.9
	Jan/Feb 1998	--	--	--	--	4.5
	Apr/May 1998	--	--	--	--	3.8
	Jul/Aug 1998	0.005	--	--	--	4.6
	Oct/Nov 1998	--	--	--	--	2.9
	Feb/Mar 1999	--	--	--	--	2.4
	May/Jun 1999	--	--	--	--	1.1
MW-5	Aug/Sep 1996	--	--	--	--	2.7
	Oct/Nov 1996	--	0.003	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	4.5
	Sep/Oct 1997	--	--	--	--	1.0
	Jan/Feb 1998	--	--	--	--	0.9
	Apr/May 1998	--	--	--	--	3.1
	Jul/Aug 1998	--	--	--	--	4.6
	Oct/Nov 1998	--	--	--	--	4.2
	Feb/Mar 1999	--	--	--	--	7.9
	May/Jun 1999	--	--	--	--	1.7

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-6	Aug/Sep 1996	--	--	**0.050**	--	4.5
	Oct/Nov 1996	--	--	0.011	--	1.1
	Feb/Mar 1997	--	--	0.014	--	4.3
	Jun/Jul 1997	--	--	0.019	--	2.5
	Sep/Oct 1997	--	--	--	--	1.8
	Jan/Feb 1998	--	--	--	--	0.4
	Apr/May 1998	--	--	0.012	--	2.1
	Jul/Aug 1998	--	--	0.013	--	3.0
	Oct/Nov 1998	--	--	0.037	--	3.8
	Feb/Mar 1999	--	--	0.017	--	2.7
	May/Jun 1999	--	--	0.036	--	4.1
MW-7	Aug/Sep 1996	--	--	0.013	0.007	4.8
	Oct/Nov 1996	--	--	0.019	0.019	3.5
	Feb/Mar 1997	--	--	--	0.010	2.2
	Jun/Jul 1997	--	--	--	--	1.0
	Sep/Oct 1997	--	--	0.018	--	0.8
	Jan/Feb 1998	--	--	0.012	--	1.2
	Apr/May 1998	--	--	--	--	4.1
	Jul/Aug 1998	--	--	--	--	4.7
	Oct/Nov 1998	--	--	--	--	1.2
	Feb/Mar 1999	--	--	--	--	4.3
	May/Jun 1999	--	--	0.011	--	3.5
MW-8	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	0.003	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	0.002	--	--	4.6
	Sep/Oct 1997	--	--	--	--	4.2
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	0.013	--	2.6
	Jul/Aug 1998	--	--	--	--	1.2
	Oct/Nov 1998	--	--	--	--	3.7
	Feb/Mar 1999	--	--	--	--	1.5
	May/Jun 1999	--	--	--	--	1.5
MW-9	Aug/Sep 1996	--	--	--	--	2.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.2
	Jun/Jul 1997	--	--	--	--	3.2
	Sep/Oct 1997	--	--	--	--	1.0
	Jan/Feb 1998	--	--	--	--	2.4
	Apr/May 1998	--	--	--	--	1.3
	Jul/Aug 1998	--	--	--	--	3.0
	Oct/Nov 1998	--	--	--	--	2.1
	Feb/Mar 1999	--	--	--	--	2.8
	May/Jun 1999	--	--	--	--	0.1

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-10	Aug/Sep 1996	--	--	0.011	0.010	4.5
	Oct/Nov 1996	--	0.003	0.011	--	4.9
	Feb/Mar 1997	--	--	--	--	2.2
	Jun/Jul 1997	--	--	0.014	--	2.9
	Sep/Oct 1997	--	--	--	--	3.2
	Jan/Feb 1998	--	--	--	--	2.1
	Apr/May 1998	--	0.008	0.010	--	2.6
	Jul/Aug 1998	--	--	--	--	3.8
	Oct/Nov 1998	--	--	--	--	3.6
	Feb/Mar 1999	--	--	0.014	--	3.3
	May/Jun 1999	--	--	--	--	1.8
MW-11						
Screen 1	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	1.5
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	1.0
	Apr/May 1998	--	--	--	--	1.0
	Jul/Aug 1998	--	--	--	--	4.6
	Oct/Nov 1998	--	--	--	--	1.4
	Feb/Mar 1999	--	--	--	--	1.6
	May/Jun 1999	--	--	--	--	1.1
Screen 2	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	--	--	--	4.7
	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	2.4
	Apr/May 1998	--	--	--	--	1.4
	Jul/Aug 1998	--	--	--	--	3.5
	Oct/Nov 1998	--	--	--	--	3.7
	Feb/Mar 1999	--	--	--	--	12.8
	May/Jun 1999	--	--	--	--	1.3
Screen 3	Aug/Sep 1996	--	--	--	--	0.5
	Oct/Nov 1996	--	--	--	--	2.3
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	1.4
	Apr/May 1998	--	--	--	--	2.1
	Jul/Aug 1998	--	--	--	--	2.6
	Oct/Nov 1998	--	0.008	--	--	4.5
	Feb/Mar 1999	--	--	--	--	2.6
	May/Jun 1999	--	--	--	--	2.7

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	Aug/Sep 1996	--	--	--	--	3.9
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.009	--	--	5.2
	Jun/Jul 1997	--	--	--	--	4.8
	Sep/Oct 1997	--	--	--	--	5.0
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	--	--	4.2
	Jul/Aug 1998	--	--	--	--	3.7
	Oct/Nov 1998	--	--	--	--	4.5
	Feb/Mar 1999	--	--	--	--	1.4
	May/Jun 1999	--	--	--	--	4.0
Screen 5	Aug/Sep 1996	0.007	--	--	--	0.6
	Oct/Nov 1996	0.005	--	--	--	1.9
	Feb/Mar 1997	--	0.002	--	--	1.6
	Jun/Jul 1997	--	--	--	--	0.7
	Sep/Oct 1997	--	--	--	--	2.6
	Jan/Feb 1998	--	--	--	--	1.2
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	1.7
	Oct/Nov 1998	--	--	--	--	1.4
	Feb/Mar 1999	--	--	--	--	4.1
	May/Jun 1999	0.005	--	--	--	1.4
MW-12						
Screen 1	Aug/Sep 1996	--	0.004	--	--	50.4
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	0.003	--	--	3.8
	Jun/Jul 1997	--	--	--	--	4.8
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	2.6
	Apr/May 1998	--	--	0.010	--	4.8
	Jul/Aug 1998	--	--	--	--	5.0
	Oct/Nov 1998	--	--	--	--	7.4
	Feb/Mar 1999	--	--	--	--	7.5
	May/Jun 1999	--	--	--	--	10.5
Screen 2	Aug/Sep 1996	--	0.024	--	--	4.0
	Oct/Nov 1996	--	--	--	--	4.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	3.2
	Sep/Oct 1997	--	--	--	--	3.4
	Jan/Feb 1998	--	--	--	--	4.4
	Apr/May 1998	--	--	--	--	1.6
	Jul/Aug 1998	--	0.006	--	--	3.7
	Oct/Nov 1998	--	--	--	--	4.9
	Feb/Mar 1999	--	--	--	--	2.5
	May/Jun 1999	--	--	--	--	1.7

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	--	--	2.5
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	5.0
	Jun/Jul 1997	--	--	--	--	4.8
	Sep/Oct 1997	--	--	--	--	4.2
	Jan/Feb 1998	--	--	--	--	2.8
	Apr/May 1998	--	--	--	--	4.4
	Jul/Aug 1998	--	**0.018**	--	--	3.2
	Oct/Nov 1998	--	--	--	--	4.2
	Feb/Mar 1999	--	--	--	--	4.6
	May/Jun 1999	--	--	--	--	0.8
Screen 4	Aug/Sep 1996	--	0.005	--	--	1.8
	Oct/Nov 1996	--	--	--	--	0.7
	Feb/Mar 1997	--	--	--	--	2.4
	Jun/Jul 1997	--	--	--	--	2.5
	Sep/Oct 1997	--	--	--	--	1.6
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	3.7
	Oct/Nov 1998	--	--	--	--	4.2
	Feb/Mar 1999	--	--	--	--	3.1
	May/Jun 1999	--	--	--	--	1.1
Screen 5	Aug/Sep 1996	--	--	--	--	2.0
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	5.0
	Sep/Oct 1997	--	--	--	--	1.0
	Jan/Feb 1998	--	--	--	--	2.2
	Apr/May 1998	--	--	--	--	3.5
	Jul/Aug 1998	--	--	--	--	3.1
	Oct/Nov 1998	--	--	--	--	1.3
	Feb/Mar 1999	--	--	--	--	5.0
	May/Jun 1999	--	--	--	--	3.2
MW-13	Aug/Sep 1996	--	--	0.046	0.047	4.1
	Oct/Nov 1996	--	0.005	0.031	0.028	3.0
	Feb/Mar 1997	--	--	0.032	0.035	0.5
	Jun/Jul 1997	--	--	0.038	0.037	1.2
	Sep/Oct 1997	--	--	**0.050**	0.045	2.4
	Jan/Feb 1998	--	0.003	0.040	0.036	1.0
	Apr/May 1998	--	--	**0.082**	0.024	3.5
	Jul/Aug 1998	--	--	0.025	0.023	1.0
	Oct/Nov 1998	--	--	0.036	0.029	3.4
	Feb/Mar 1999	--	--	0.030	0.019	1.0
	May/Jun 1999	--	--	0.024	0.024	0.4

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-14						
Screen 1	Aug/Sep 1996	--	--	--	--	3.3
	Oct/Nov 1996	--	--	--	--	4.5
	Feb/Mar 1997	--	--	--	--	4.3
	Jun/Jul 1997	--	--	--	--	2.2
	Sep/Oct 1997	--	--	--	--	3.9
	Jan/Feb 1998	--	0.004	--	--	5.0
	Apr/May 1998	--	--	0.011	--	3.1
	Jul/Aug 1998	--	--	--	--	3.8
	Oct/Nov 1998	--	--	--	--	4.2
	Feb/Mar 1999	--	--	--	--	4.8
	May/Jun 1999	--	--	--	--	3.4
Screen 2	Aug/Sep 1996	--	--	--	--	4.4
	Oct/Nov 1996	--	--	--	--	3.8
	Feb/Mar 1997	--	--	--	--	4.8
	Jun/Jul 1997	--	--	--	--	5.0
	Sep/Oct 1997	--	--	--	--	3.2
	Jan/Feb 1998	--	0.003	--	--	4.8
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	4.3
	Feb/Mar 1999	--	--	--	--	4.7
	May/Jun 1999	--	--	--	--	4.4
Screen 3	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	0.7
	Sep/Oct 1997	--	--	--	--	2.9
	Jan/Feb 1998	--	0.003	0.026	--	2.1
	Apr/May 1998	--	--	--	--	1.4
	Jul/Aug 1998	--	--	--	--	3.1
	Oct/Nov 1998	--	--	--	--	0.8
	Feb/Mar 1999	--	--	--	--	0.7
	May/Jun 1999	--	--	--	--	0.8
Screen 4	Aug/Sep 1996	--	--	--	--	3.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.1
	Jun/Jul 1997	--	--	--	--	2.3
	Sep/Oct 1997	--	--	--	--	1.7
	Jan/Feb 1998	--	0.002	--	--	2.7
	Apr/May 1998	--	--	--	--	1.3
	Jul/Aug 1998	--	--	--	--	1.0
	Oct/Nov 1998	--	--	--	--	2.3
	Feb/Mar 1999	--	--	--	--	2.1
	May/Jun 1999	--	--	--	--	1.7

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 5	Aug/Sep 1996	--	--	--	--	1.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	**0.028**	--	--	2.3
	Jun/Jul 1997	--	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	3.8
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	1.9
	Jul/Aug 1998	--	--	--	--	2.4
	Oct/Nov 1998	--	--	--	--	4.5
	Feb/Mar 1999	--	--	--	--	4.2
	May/Jun 1999	--	--	--	--	1.9
MW-15	Aug/Sep 1996	--	--	--	--	1.3
	Oct/Nov 1996	--	--	NA	--	0.5
	Feb/Mar 1997	--	--	--	--	2.6
	Jun/Jul 1997	--	--	--	--	0.2
	Sep/Oct 1997	--	--	--	--	0.9
	Jan/Feb 1998	--	--	--	--	1.4
	Apr/May 1998	--	--	--	--	0.4
	Jul/Aug 1998	--	--	--	--	3.0
	Oct/Nov 1998	--	--	--	--	2.0
	Feb/Mar 1999	--	--	--	--	0.6
	May/Jun 1999	--	--	--	--	0.4
MW-16	Aug/Sep 1996	--	--	0.018	--	3.4
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	0.007	0.2
	Jun/Jul 1997	--	--	--	--	0.1
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	1.1
	Apr/May 1998	--	--	0.014	--	1.4
	Jul/Aug 1998	--	--	--	--	1.9
	Oct/Nov 1998	--	--	0.013	--	0.9
	Feb/Mar 1999	--	--	0.013	0.007	1.0
	May/Jun 1999	--	--	--	--	2.2
MW-17						
Screen 1	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	2.9
	Feb/Mar 1997	--	--	--	--	2.0
	Jun/Jul 1997	--	--	--	--	2.2
	Sep/Oct 1997	--	--	--	--	1.3
	Jan/Feb 1998	--	--	--	--	5.0
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	1.5
	Oct/Nov 1998	--	--	--	--	0.5
	Feb/Mar 1999	--	--	--	--	1.5
	May/Jun 1999	--	--	--	--	0.4

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.7
	Jun/Jul 1997	--	--	--	--	4.5
	Sep/Oct 1997	--	--	--	--	1.2
	Jan/Feb 1998	--	--	--	--	0.8
	Apr/May 1998	--	--	--	--	2.2
	Jul/Aug 1998	--	0.007	--	--	1.0
	Oct/Nov 1998	--	--	--	--	1.7
	Feb/Mar 1999	--	--	--	--	1.1
	May/Jun 1999	--	--	--	--	1.6
Screen 3	Aug/Sep 1996	--	0.002	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	4.8
	Feb/Mar 1997	--	--	--	--	6.0
	Jun/Jul 1997	--	--	--	--	4.8
	Sep/Oct 1997	--	--	--	0.006	2.5
	Jan/Feb 1998	--	--	--	--	3.2
	Apr/May 1998	--	--	--	--	3.6
	Jul/Aug 1998	--	--	--	--	4.0
	Oct/Nov 1998	--	--	--	--	4.4
	Feb/Mar 1999	--	--	--	--	6.3
	May/Jun 1999	--	--	--	--	2.2
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	5.6
	Jun/Jul 1997	--	--	--	--	4.1
	Sep/Oct 1997	--	--	--	--	3.6
	Jan/Feb 1998	--	--	--	--	3.9
	Apr/May 1998	--	--	--	--	3.7
	Jul/Aug 1998	--	--	--	--	4.4
	Oct/Nov 1998	--	--	--	--	1.8
	Feb/Mar 1999	--	--	--	--	4.8
	May/Jun 1999	--	--	--	--	7.9
Screen 5	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	0.005	--	--	5.2
	Feb/Mar 1997	--	0.003	--	--	25
	Jun/Jul 1997	--	--	--	--	34
	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	0.002	--	--	3.7
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	5.1
	Feb/Mar 1999	--	0.007	--	--	12.4
	May/Jun 1999	--	0.004	--	--	16.3

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-18						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	0.4
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	Not Sampled*				
	Apr/May 1998	--	--	--	--	0.1
	Jul/Aug 1998	--	--	--	--	3.8
	Oct/Nov 1998	--	--	--	--	2.3
	Feb/Mar 1999	--	--	--	--	0.7
	May/Jun 1999	--	--	--	--	2.8
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.5
	Oct/Nov 1996	--	0.003	--	--	3.4
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	1.5
	Sep/Oct 1997	--	--	--	--	1.4
	Jan/Feb 1998	--	--	--	--	3.6
	Apr/May 1998	--	--	--	--	0.1
	Jul/Aug 1998	--	--	--	--	3.1
	Oct/Nov 1998	--	--	--	--	1.9
	Feb/Mar 1999	--	0.005	--	--	2.7
	May/Jun 1999	--	--	--	--	4.1
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	0.002	NA	--	4.0
	Feb/Mar 1997	--	--	0.015	0.007	3.3
	Jun/Jul 1997	--	--	--	--	3.9
	Sep/Oct 1997	--	--	--	--	2.1
	Jan/Feb 1998	--	--	--	--	0.6
	Apr/May 1998	--	--	0.012	0.007	0.04
	Jul/Aug 1998	--	--	0.014	--	2.3
	Oct/Nov 1998	--	--	--	--	1.7
	Feb/Mar 1999	--	--	--	0.007	1.2
	May/Jun 1999	--	--	--	--	2.1
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.0
	Oct/Nov 1996	--	0.003	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	0.005	--	--	--	3.6
	Sep/Oct 1997	--	--	--	--	1.1
	Jan/Feb 1998	--	--	--	--	2.2
	Apr/May 1998	--	--	--	--	0.04
	Jul/Aug 1998	--	--	--	--	2.5
	Oct/Nov 1998	--	--	--	--	4.6
	Feb/Mar 1999	--	--	--	--	2.7
	May/Jun 1999	--	--	--	--	3.0

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 5	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	0.002	--	--	3.6
	Feb/Mar 1997	--	--	--	--	2.9
	Jun/Jul 1997	--	--	--	--	4.0
	Sep/Oct 1997	--	--	--	--	1.7
	Jan/Feb 1998	--	--	--	--	1.6
	Apr/May 1998	--	--	--	--	0.1
	Jul/Aug 1998	--	--	--	--	1.1
	Oct/Nov 1998	--	--	--	--	2.8
	Feb/Mar 1999	--	--	--	--	2.0
	May/Jun 1999	--	--	--	--	2.4
MW-19						
Screen 1	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	--	--	--	3.4
	Feb/Mar 1997	--	--	--	--	6.6
	Jun/Jul 1997	--	--	--	--	0.8
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	2.2
	Jul/Aug 1998	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	13.0
	Feb/Mar 1999	--	--	--	--	5.0
	May/Jun 1999	--	--	--	--	5.0
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	3.6
	Feb/Mar 1997	--	--	--	--	22
	Jun/Jul 1997	--	--	--	--	2.8
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	2.3
	Jul/Aug 1998	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	4.8
	Feb/Mar 1999	--	--	--	--	3.9
	May/Jun 1999	--	--	--	--	2.3
Screen 3	Aug/Sep 1996	--	--	NA	NA	3.0
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	4.9
	Jun/Jul 1997	--	--	--	--	4.9
	Sep/Oct 1997	--	--	--	--	2.0
	Jan/Feb 1998	--	--	--	--	4.1
	Apr/May 1998	--	--	--	--	2.4
	Jul/Aug 1998	--	--	--	--	3.9
	Oct/Nov 1998	--	--	--	--	3.4
	Feb/Mar 1999	--	--	--	--	4.1
	May/Jun 1999	--	--	--	--	2.5

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	--	--	--	8.0
	Feb/Mar 1997	--	0.003	--	--	16
	Jun/Jul 1997	--	--	--	--	4.9
	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	4.8
	Jul/Aug 1998	--	--	--	--	4.6
	Oct/Nov 1998	--	--	--	--	1.5
	Feb/Mar 1999	--	--	--	--	4.4
	May/Jun 1999	--	--	--	--	1.7
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	NA	--	4.6
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	2.2
	Sep/Oct 1997	--	--	--	--	5.0
	Jan/Feb 1998	--	--	--	--	4.0
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	0.010	--	--	4.8
	Oct/Nov 1998	--	--	--	--	2.5
	Feb/Mar 1999	--	--	--	--	4.4
	May/Jun 1999	--	--	--	--	1.7
MW-20						
Screen 1	Aug/Sep 1996	--	--	--	NA	3.5
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	2.3
	Jun/Jul 1997	--	--	--	--	0.2
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	3.2
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	3.2
	Oct/Nov 1998	--	--	--	--	1.3
	Feb/Mar 1999	--	--	--	--	0.5
	May/Jun 1999	--	--	--	--	1.1
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.9
	Oct/Nov 1996	--	--	--	--	1.1
	Feb/Mar 1997	--	--	--	--	2.1
	Jun/Jul 1997	--	--	--	--	2.5
	Sep/Oct 1997	--	--	--	--	3.6
	Jan/Feb 1998	--	--	--	--	0.4
	Apr/May 1998	--	--	--	--	1.4
	Jul/Aug 1998	--	--	--	--	1.3
	Oct/Nov 1998	--	--	--	--	2.4
	Feb/Mar 1999	--	--	--	--	0.8
	May/Jun 1999	--	--	--	--	0.9

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	NA	NA	1.7
	Oct/Nov 1996	--	--	--	--	1.6
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	2.1
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	2.2
	Apr/May 1998	--	--	--	--	1.3
	Jul/Aug 1998	--	--	--	--	0.7
	Oct/Nov 1998	--	--	--	--	2.7
	Feb/Mar 1999	--	0.009	--	--	0.1
	May/Jun 1999	--	--	--	--	1.0
Screen 4	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	1.3
	Feb/Mar 1997	--	--	--	--	3.3
	Jun/Jul 1997	--	--	--	--	1.3
	Sep/Oct 1997	--	--	--	--	1.4
	Jan/Feb 1998	--	--	--	--	0.6
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	2.1
	Oct/Nov 1998	--	--	--	--	2.6
	Feb/Mar 1999	--	--	--	--	0.8
	May/Jun 1999	--	--	--	--	2.4
Screen 5	Aug/Sep 1996	--	--	NA	NA	1.8
	Oct/Nov 1996	--	--	NA	--	1.3
	Feb/Mar 1997	--	0.004	--	--	1.6
	Jun/Jul 1997	0.006	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	3.5
	Jan/Feb 1998	--	--	--	--	0.1
	Apr/May 1998	--	--	--	--	1.1
	Jul/Aug 1998	--	--	--	--	3.3
	Oct/Nov 1998	--	--	--	--	1.6
	Feb/Mar 1999	--	--	--	--	1.0
	May/Jun 1999	--	--	--	--	2.7
MW-21						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	1.1
	Jun/Jul 1997	--	--	--	--	2.8
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	0.8
	Apr/May 1998	--	--	--	--	0.7
	Jul/Aug 1998	--	--	--	--	3.4
	Oct/Nov 1998	--	--	--	--	2.2
	Feb/Mar 1999	--	--	--	--	0.3
	May/Jun 1999	--	--	--	--	2.8

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	Aug/Sep 1996	--	--	NA	NA	2.1
	Oct/Nov 1996	--	--	--	--	1.2
	Feb/Mar 1997	--	--	--	--	3.9
	Jun/Jul 1997	--	--	--	--	1.7
	Sep/Oct 1997	--	--	--	--	0.8
	Jan/Feb 1998	--	--	--	--	0.6
	Apr/May 1998	--	--	--	--	1.8
	Jul/Aug 1998	--	--	--	--	3.9
	Oct/Nov 1998	--	--	--	--	3.5
	Feb/Mar 1999	--	--	--	--	0.04
	May/Jun 1999	--	--	--	--	0.8
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.6
	Oct/Nov 1996	--	--	--	--	4.9
	Feb/Mar 1997	--	0.003	--	--	4.6
	Jun/Jul 1997	--	--	--	--	1.4
	Sep/Oct 1997	--	--	--	--	3.2
	Jan/Feb 1998	--	0.003	--	--	4.8
	Apr/May 1998	--	--	--	--	4.1
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	4.8
	Feb/Mar 1999	--	--	--	--	4.2
	May/Jun 1999	--	--	--	--	2.2
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.5
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.004	--	--	4.4
	Jun/Jul 1997	--	--	--	--	2.5
	Sep/Oct 1997	--	--	--	--	4.5
	Jan/Feb 1998	--	--	--	--	1.1
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	2.4
	Oct/Nov 1998	--	--	--	--	4.4
	Feb/Mar 1999	--	--	--	--	13.1
	May/Jun 1999	--	--	--	--	7.6
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	28
	Jun/Jul 1997	--	--	--	--	26
	Sep/Oct 1997	--	--	--	--	12
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	4.2
	Oct/Nov 1998	--	--	--	--	14.0
	Feb/Mar 1999	--	--	--	--	4.3
	May/Jun 1999	--	--	--	--	3.3

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-22[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	34
	Jan/Feb 1998	--	--	--	--	4.5
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	4.0
	Feb/Mar 1999	--	--	--	--	20.1
	May/Jun 1999	--	--	--	--	37.6
Screen 2	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.2
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	4.4
	Oct/Nov 1998	--	--	--	--	4.1
	Feb/Mar 1999	--	--	--	--	8.1
	May/Jun 1999	--	--	--	--	4.5
Screen 3	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	3.8
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	3.5
	Feb/Mar 1999	--	--	--	--	5.2
	May/Jun 1999	--	--	--	--	3.7
Screen 4	Sep/Oct 1997	--	--	--	--	2.8
	Jan/Feb 1998	--	--	--	--	3.7
	Apr/May 1998	--	--	--	--	3.0
	Jul/Aug 1998	--	--	--	--	4.0
	Oct/Nov 1998	--	--	--	--	4.3
	Feb/Mar 1999	--	--	--	--	5.1
	May/Jun 1999	--	--	--	--	4.1
Screen 5	Sep/Oct 1997	--	--	--	--	4.4
	Jan/Feb 1998	--	--	--	--	2.8
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	2.3
	Oct/Nov 1998	--	--	--	--	3.3
	Feb/Mar 1999	--	--	--	--	2.6
	May/Jun 1999	--	--	--	--	4.7
MW-23[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	3.4
	Jan/Feb 1998	--	--	--	--	4.1
	Apr/May 1998	--	--	--	--	4.5
	Jul/Aug 1998	--	--	--	--	4.0
	Oct/Nov 1998	--	--	--	--	6.3
	Feb/Mar 1999	--	--	--	--	4.2
	May/Jun 1999	--	--	--	--	7.0

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	3.4
	Oct/Nov 1998	--	--	--	--	4.1
	Feb/Mar 1999	--	--	--	--	2.5
	May/Jun 1999	--	--	--	--	7.3
Screen 3	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	4.6
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	4.7
	Oct/Nov 1998	--	--	--	--	4.5
	Feb/Mar 1999	--	--	--	--	4.3
	May/Jun 1999	--	--	--	--	7.5
Screen 4	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.5
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.6
	Oct/Nov 1998	--	--	--	--	4.2
	Feb/Mar 1999	--	--	--	--	5.1
	May/Jun 1999	--	--	--	--	2.0
Screen 5	Sep/Oct 1997	--	--	--	--	1.8
	Jan/Feb 1998	--	--	--	--	1.8
	Apr/May 1998	--	--	--	--	2.4
	Jul/Aug 1998	--	--	--	--	1.7
	Oct/Nov 1998	--	--	--	--	2.5
	Feb/Mar 1999	--	--	--	--	3.2
	May/Jun 1999	--	--	--	--	2.4
***MW-24*[1]**						
Screen 1	Sep/Oct 1997	--	--	--	--	1.6
	Jan/Feb 1998	--	--	--	--	3.8
	Apr/May 1998	--	--	--	--	2.7
	Jul/Aug 1998	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	3.8
	Feb/Mar 1999	--	--	--	--	7.6
	May/Jun 1999	--	--	--	--	4.3
Screen 2	Sep/Oct 1997	--	--	--	--	4.4
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.5
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	8.3
	Feb/Mar 1999	--	--	--	--	4.2
	May/Jun 1999	--	--	--	--	5.4
Screen 3	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	0.006	--	--	--	4.7
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	7.8

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	Feb/Mar 1999	0.006	--	0.013	--	34.8
	May/Jun 1999	--	--	--	--	27.2
Screen 4	Sep/Oct 1997	--	--	--	--	4.0
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.3
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	8.3
	Feb/Mar 1999	--	0.003	--	--	6.1
	May/Jun 1999	--	--	--	--	10.0
Screen 5	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	4.0
	Jul/Aug 1998	--	--	--	--	4.0
	Oct/Nov 1998	--	--	--	--	8.0
	Feb/Mar 1999	--	--	--	--	5.7
	May/Jun 1999	--	--	--	--	5.8
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
Calif. Maximum Contaminant Level		0.05	(a)	0.05	NE	
EPA Maximum Contaminant Level		0.05	(a)	0.10	NE	

NA: Not analyzed.
NE: Not established.
1: Wells installed June-August 1997.
*: Not sampled, no water over screen.
a: Treatment technique and public notification triggered at 0.015 mg/L.
--: Not detected.

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in mg/L)

Well	ANIONS					CATIONS					Measured	Measured
Number	CL	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe	Alkalinity	pH
MW-1	15.5	0.85	206	1.49	32.5	24.5	14.9	2.90	46.0	--	169	7.8
MW-3												
Screen 1	8.59	0.90	219	1.44	31.6	19.6	16.4	2.70	47.6	0.30	180	7.8
Screen 2	9.77	0.78	240	0.77	40.7	20.0	18.8	2.80	54.1	0.24	197	7.7
Screen 3	20.6	4.05	197	0.25	40.3	44.9	15.2	3.20	26.4	0.19	163	8.5
Screen 4	10.3	3.84	187	0.20	13.7	47.7	8.70	2.00	17.1	0.27	155	8.5
Screen 5	10.1	28.6	139	--	11.9	69.9	0.55	--	3.30	0.32	124	9.5
MW-4												
Screen 1	9.67	0.21	200	0.62	33.3	21.9	14.6	2.60	43.6	0.34	164	7.2
Screen 2	64.1	0.33	199	7.54	84.9	27.7	26.0	2.40	74.0	0.71	163	7.4
Screen 3	24.1	3.41	166	0.68	9.68	35.3	13.7	2.00	20.8	0.30	137	8.5
Screen 4	16.1	2.35	181	4.84	8.21	41.0	10.5	1.80	26.4	0.35	149	8.3
Screen 5	9.10	1.62	198	1.33	17.8	36.6	9.50	1.90	33.6	--	163	8.1
MW-5	10.3	0.16	193	1.83	29.9	15.5	14.3	2.90	45.7	--	158	7.1
MW-6	78.2	0.22	213	--	95.6	27.8	30.5	2.00	89.8	0.43	175	7.2
MW-7	20.8	0.36	176	4.88	47.3	18.6	16.8	2.60	50.3	0.88	144	7.5
MW-8	11.1	0.21	160	1.11	30.3	14.7	12.8	2.30	38.3	--	131	7.3
MW-9	20.9	0.42	202	1.75	51.5	20.9	17.6	3.10	55.0	0.17	166	7.5
MW-10	20.6	0.22	212	5.17	56.8	16.9	20.6	2.60	61.4	--	174	7.2
MW-11												
Screen 1	16.6	1.50	231	0.52	40.5	25.3	19.6	3.10	50.8	0.11	190	8.0
Screen 2	15.0	3.46	212	0.42	36.8	23.0	18.0	3.10	47.0	0.23	175	8.4
Screen 3	12.3	2.57	198	--	18.9	25.9	13.4	2.20	37.4	0.44	163	8.3
Screen 4	11.0	2.95	181	--	18.1	25.0	13.5	2.30	29.9	0.41	149	8.4
Screen 5	11.7	2.06	159	--	19.3	47.9	2.20	1.20	22.8	0.53	131	8.3
MW-12												
Screen 1	9.66	0.70	214	0.64	31.4	20.5	15.9	2.90	42.9	0.64	176	7.7
Screen 2	14.7	0.75	231	1.87	41.5	24.5	18.5	3.10	54.7	0.13	190	7.7
Screen 3	18.4	1.75	214	1.76	40.2	23.9	15.5	2.70	55.3	--	176	8.1
Screen 4	14.0	1.42	219	1.44	30.6	24.3	13.7	2.20	53.3	0.11	180	8.0
Screen 5	13.8	1.35	207	1.22	20.9	33.9	11.3	2.00	40.9	0.18	170	8.0
MW-13	23.2	0.47	180	11.1	58.3	26.9	19.5	2.50	56.5	--	148	7.6

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in mg/L)

Well	ANIONS					CATIONS					Measured	Measured
Number	CL	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe	Alkalinity	pH
MW-14												
Screen 1	133	0.20	248	18.7	217	43.8	49.4	2.80	141	0.59	203	7.1
Screen 2	116	0.30	290	16.7	192	34.6	52.2	2.60	144	0.60	238	7.2
Screen 3	94.6	1.58	243	13.8	122	38.8	42.9	3.20	93.5	--	200	8.0
Screen 4	37.5	1.25	193	10.9	28.2	29.2	19.6	2.30	54.2	--	159	8.0
Screen 5	8.35	5.41	166	0.10	17.1	35.0	12.9	2.40	17.9	--	138	8.7
MW-15	20.8	0.54	210	2.18	48.6	21.0	18.1	3.00	54.7	--	172	7.6
MW-16	22.8	0.26	124	19.8	42.3	24.3	18.2	2.40	46.6	--	102	7.5
MW-17												
Screen 1	8.51	0.25	194	0.67	30.7	14.9	15.2	2.20	45.3	--	159	7.3
Screen 2	7.09	0.90	174	1.07	26.8	15.1	14.3	2.20	38.2	0.18	143	7.9
Screen 3	9.85	0.96	185	1.05	31.2	18.9	16.2	1.80	41.2	0.46	152	7.9
Screen 4	11.0	1.01	196	1.65	32.4	29.3	12.1	1.50	42.1	0.46	161	7.9
Screen 5	11.3	1.56	191	1.66	32.4	31.0	12.4	1.70	40.5	1.90	157	8.1
MW-18												
Screen 1	5.05	0.17	167	0.56	25.2	13.8	12.6	2.20	36.6	0.16	137	7.2
Screen 2	10.8	0.56	216	1.10	36.4	18.6	16.7	2.60	49.4	0.33	177	7.6
Screen 3	11.9	2.34	227	0.83	36.6	21.8	18.7	2.90	49.3	--	187	8.2
Screen 4	10.1	2.41	186	0.55	23.1	32.3	11.7	1.50	31.6	0.23	153	8.3
Screen 5	11.1	3.76	183	--	6.01	51.7	5.50	1.70	15.0	0.20	151	8.5
MW-19												
Screen 1	5.02	0.26	160	0.24	19.9	12.3	11.7	2.10	34.8	1.00	131	7.4
Screen 2	56.5	0.10	249	8.02	86.7	20.7	33.6	2.20	86.6	0.97	204	6.8
Screen 3	107	0.39	298	10.6	109	32.3	42.9	2.80	115	0.19	244	7.3
Screen 4	19.1	0.71	217	2.88	39.2	24.8	19.7	1.90	49.0	--	178	7.7
Screen 5	61.5	0.85	261	7.85	58.3	31.3	30.4	2.30	76.3	--	214	7.7
MW-20												
Screen 1	36.9	0.83	203	8.29	104	20.7	26.4	3.30	78.3	--	167	7.8
Screen 2	12.0	5.15	158	1.83	30.0	24.7	18.3	2.40	23.6	--	131	8.7
Screen 3	34.4	3.67	225	2.58	25.5	61.3	17.8	2.70	24.5	--	186	8.4
Screen 4	10.0	5.34	164	--	18.7	61.2	3.40	1.20	10.8	0.16	136	8.7
Screen 5	8.59	18.4	179	--	21.1	76.8	1.80	1.50	7.10	--	153	9.2

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(concentrations in mg/L)

Well	ANIONS					CATIONS					Measured	Measured
Number	CL	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe	Alkalinity	pH
MW-21												
Screen 1	79.5	0.11	210	15.7	112	29.9	32.2	2.10	94.9	--	172	6.9
Screen 2	139	0.67	327	5.72	150	54.4	46.2	3.00	128	--	268	7.5
Screen 3	97.4	0.51	315	10.2	97.5	40.7	37.6	3.10	114	0.14	258	7.4
Screen 4	45.9	0.38	232	8.30	41.8	27.7	23.3	2.30	70.9	0.17	190	7.4
Screen 5	67.4	1.06	258	10.3	84.0	34.6	31.9	2.80	88.7	0.83	212	7.8
MW-22												
Screen 1	117	0.22	274	10.8	167	33.8	47.9	2.70	131	2.30	225	7.1
Screen 2	49.6	1.06	206	8.76	47.1	31.9	23.9	2.40	60.1	0.14	169	7.9
Screen 3	32.3	1.52	186	8.90	24.5	35.2	15.3	2.00	45.6	0.25	153	8.1
Screen 4	12.3	0.87	168	5.12	7.61	27.9	10.1	1.60	32.5	0.92	138	7.9
Screen 5	8.20	10.6	130	--	47.1	77.7	1.10	--	5.20	0.10	110	9.1
MW-23												
Screen 1	109	0.16	248	13.8	148	35.0	42.7	2.70	116	0.69	203	7.0
Screen 2	104	0.31	240	14.8	142	35.1	40.9	2.70	113	--	197	7.3
Screen 3	30.5	0.92	179	10.7	19.5	28.8	15.9	1.80	46.6	0.31	147	7.9
Screen 4	13.4	0.87	169	6.01	6.92	28.2	11.2	1.80	32.2	--	139	7.9
Screen 5	23.6	58.7	227	--	28.6	115	1.10	2.70	6.40	--	206	9.6
MW-24												
Screen 1	10.4	0.49	189	1.51	33.4	16.4	15.3	2.40	43.4	0.67	155	7.6
Screen 2	27.2	2.53	155	3.16	14.7	40.6	10.1	2.60	23.4	0.86	128	8.4
Screen 3	27.2	1.02	198	2.07	17.6	39.5	12.2	2.00	35.7	1.30	163	7.9
Screen 4	12.0	7.09	173	2.78	7.91	44.1	10.0	2.20	16.2	1.00	144	8.8
Screen 5	9.55	1.35	208	1.27	21.5	40.6	8.90	1.70	34.5	0.27	171	8.0
Detection Limit	1	0.001	0.001	0.1	2	1	1	1	1	0.1	2	

TABLE 4-2

GENERAL WATER TYPES OBSERVED DURING THE MAY-JUNE 1999 SAMPLING EVENT (AS INTERPRETED WITH STIFF DIAGRAMS)

Well/Screen Number	Water Type[1]	Well/Screen Number	Water Type	Well/Screen Number	Water Type
MW-1	Type 1	***MW-14***		***MW-21***	
MW-3		Screen 1	Type 3	Screen 1	Type 1,3
Screen 1	Type 1	Screen 2	Type 3	Screen 2	Type 3
Screen 2	Type 1	Screen 3	Type 3	Screen 3	Type 3
Screen 3	Type 2	Screen 4	Type 1,3	Screen 4	Type 1,3
Screen 4	Type 2	Screen 5	Type 2	Screen 5	Type 1,3
Screen 5	Type 2	***MW-15***	Type 1	***MW-22***	
MW-4		***MW-16***	Type 1	Screen 1	Type 3
Screen 1	Type 1	***MW-17***		Screen 2	Type 1,3
Screen 2	Type 1,3	Screen 1	Type 1	Screen 3	Type 1,2,3
Screen 3	Type 2,1	Screen 2	Type 1	Screen 4	Type 1,2,3
Screen 4	Type 2,1	Screen 3	Type 1	Screen 5	Type 2
Screen 5	Type 2,1	Screen 4	Type 1,2	***MW-23***	
MW-5	Type 1	Screen 5	Type 1,2	Screen 1	Type 3
MW-6	Type 1,3	***MW-18***		Screen 2	Type 3
MW-7	Type 1	Screen 1	Type 1	Screen 3	Type 1,2,3
MW-8	Type 1	Screen 2	Type 1	Screen 4	Type 1,2
MW-9	Type 1	Screen 3	Type 1	Screen 5	Type 2
MW-10	Type 1	Screen 4	Type 1,2	***MW-24***	
MW-11		Screen 5	Type 2	Screen 1	Type 1
Screen 1	Type 1	***MW-19***		Screen 2	Type 2,3
Screen 2	Type 1	Screen 1	Type 1	Screen 3	Type 2,1
Screen 3	Type 1	Screen 2	Type 3	Screen 4	Type 2
Screen 4	Type 1	Screen 3	Type 3	Screen 5	Type 2,1
Screen 5	Type 2	Screen 4	Type 1,3		
MW-12		Screen 5	Type 1,3		
Screen 1	Type 1	***MW-20***			
Screen 2	Type 1	Screen 1	Type 1,3		
Screen 3	Type 1	Screen 2	Type 1,2		
Screen 4	Type 1	Screen 3	Type 2		
Screen 5	Type 1,2	Screen 4	Type 2		
MW-13	Type 1	Screen 5	Type 2		

1: General Water Types:
- Type 1: Calcium-bicarbonate groundwater
- Type 2: Sodium-bicarbonate groundwater
- Type 3: Calcium-bicarbonate/chloride/sulfate groundwater

Note: Water type denoted by more than one number (i.e., ½) represent blends of the listed basic types, with the more dominant type listed first.

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSIS OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(ion concentrations are meq/L; TDS concentrations are mg/L)

Well Number	Total Anion	Total Cations	Total Ions	Charge Balance Error[1]	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS[2]
MW-1	4.60	4.67	9.27	0.8	270	240	1.1
MW-3							
Screen 1	4.60	4.66	9.26	0.6	260	237	1.1
Screen 2	5.12	5.19	10.3	0.7	260	266	1.0
Screen 3	4.70	4.61	9.31	1.0	240	252	1.0
Screen 4	3.69	3.70	7.39	0.1	200	196	1.0
Screen 5	3.01	3.25	6.26	3.8	190	192	1.0
MW-4							
Screen 1	4.29	4.40	8.69	1.3	230	225	1.0
Screen 2	7.38	7.11	14.5	1.9	420	386	1.1
Screen 3	3.67	3.75	7.42	1.1	190	192	1.0
Screen 4	3.95	4.01	7.96	0.8	220	201	1.1
Screen 5	3.98	4.10	8.08	1.5	220	209	1.1
MW-5	4.20	4.21	8.41	0.1	240	215	1.1
MW-6	7.70	8.26	16.0	3.5	470	429	1.1
MW-7	4.80	4.77	9.57	0.3	280	249	1.1
MW-8	3.64	3.67	7.31	0.4	200	189	1.1
MW-9	5.11	5.19	10.3	0.8	290	270	1.1
MW-10	5.61	5.57	11.2	0.4	300	289	1.0
MW-11							
Screen 1	5.15	5.33	10.5	1.7	300	272	1.1
Screen 2	4.72	4.91	9.63	2.0	270	251	1.1
Screen 3	4.00	4.16	8.16	2.0	240	210	1.1
Screen 4	3.67	3.75	7.42	1.1	210	192	1.1
Screen 5	3.35	3.43	6.78	1.2	190	186	1.0
MW-12							
Screen 1	4.49	4.42	8.91	0.8	230	230	1.0
Screen 2	5.21	5.40	10.6	1.8	310	273	1.1
Screen 3	5.00	5.15	10.2	1.5	300	265	1.1
Screen 4	4.74	4.91	9.65	1.8	260	249	1.0
Screen 5	4.31	4.50	8.81	2.2	240	227	1.1
MW-13	5.62	5.66	11.3	0.35	350	287	1.2

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSIS OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(ion concentrations are meq/L; TDS concentrations are mg/L)

Well Number	Total Anion	Total Cations	Total Ions	Charge Balance Error[1]	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS[2]
MW-14							
Screen 1	13.7	13.1	26.8	2.2	830	728	1.1
Screen 2	13.2	13.1	26.3	0.4	800	702	1.1
Screen 3	10.2	9.97	20.2	1.1	630	530	1.2
Screen 4	5.60	5.65	11.3	0.4	350	278	1.3
Screen 5	3.36	3.54	6.90	2.6	210	181	1.2
MW-15	5.19	5.21	10.4	0.2	300	272	1.1
MW-16	4.98	4.95	9.93	0.3	320	238	1.3
MW-17							
Screen 1	4.11	4.22	8.33	1.3	240	213	1.1
Screen 2	3.69	3.80	7.49	1.5	210	191	1.1
Screen 3	4.04	4.26	8.30	2.7	270	213	1.3
Screen 4	4.32	4.41	8.73	1.0	280	228	1.2
Screen 5	4.25	4.44	8.69	2.2	260	228	1.1
MW-18							
Screen 1	3.45	3.52	6.97	1.0	210	178	1.2
Screen 2	4.68	4.72	9.40	0.4	270	243	1.1
Screen 3	4.90	5.03	9.93	1.3	270	256	1.1
Screen 4	3.87	3.99	7.86	1.5	230	205	1.1
Screen 5	3.46	3.49	6.95	0.4	200	185	1.1
MW-19							
Screen 1	3.19	3.29	6.48	1.5	170	166	1.0
Screen 2	8.05	8.05	16.1	0.0	450	418	1.1
Screen 3	10.9	10.8	21.7	0.5	520	567	0.9
Screen 4	5.12	5.20	10.3	0.8	280	264	1.1
Screen 5	7.79	7.74	15.5	0.3	430	397	1.1
MW-20							
Screen 1	7.14	7.07	14.2	0.5	420	379	1.1
Screen 2	3.71	3.82	7.53	1.5	230	196	1.2
Screen 3	5.41	5.42	10.8	0.1	300	283	1.1
Screen 4	3.39	3.51	6.90	1.7	190	190	1.0
Screen 5	3.74	3.88	7.62	1.8	200	223	0.9

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSIS OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, MAY-JUNE 1999

(ion concentrations are meq/L; TDS concentrations are mg/L)

Well Number	Total Anion	Total Cations	Total Ions	Charge Balance Error[1]	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS[2]
MW-21							
Screen 1	9.14	8.75	17.9	2.2	520	470	1.1
Screen 2	12.8	12.6	25.4	0.8	690	688	1.0
Screen 3	10.7	10.6	21.3	0.5	600	556	1.1
Screen 4	6.56	6.73	13.3	1.3	420	335	1.3
Screen 5	8.63	8.64	17.3	0.1	520	448	1.2
MW-22							
Screen 1	12.1	12.0	24.1	0.4	630	647	1.0
Screen 2	6.39	6.42	12.8	0.2	320	326	1.0
Screen 3	5.12	5.12	10.2	0.0	300	257	1.2
Screen 4	3.63	3.71	7.34	1.1	200	182	1.1
Screen 5	3.41	3.73	7.14	4.5	230	213	1.1
MW-23							
Screen 1	11.2	10.9	22.1	1.4	630	590	1.1
Screen 2	10.9	10.6	21.5	1.4	620	571	1.1
Screen 3	4.97	4.94	9.91	0.3	290	243	1.2
Screen 4	3.73	3.80	7.53	0.9	210	184	1.1
Screen 5	5.38	5.48	10.9	0.9	310	348	0.9
MW-24							
Screen 1	4.20	4.20	8.40	0.0	250	217	1.2
Screen 2	3.86	3.83	7.69	0.4	220	201	1.1
Screen 3	4.54	4.56	9.10	0.2	250	236	1.1
Screen 4	3.58	3.61	7.19	0.4	210	188	1.1
Screen 5	4.23	4.27	8.50	0.5	240	222	1.1

1 Expressed in percent: ideal error range between 0 and 5 percent. Values between 5 and 10 percent considered acceptable for intended use.

2 Ideal values range between 0.8 and 1.2.

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

May 13,1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation[1] (ft msl)	Water Level Elevation (ft msl)
MW-1		5/13/99	26.46	1116.69	1090.23
MW-3	1 (top)	5/13/99	90.59	1100.34	1009.75
	2	5/13/99	96.03	1100.34	1004.31
	3	5/13/99	97.62	1100.34	1002.72
	4	5/13/99	115.09	1100.34	985.25
	5	5/13/99	119.39	1100.34	980.95
MW-4	1 (top)	5/13/99	68.70	1082.84	1014.14
	2	5/13/99	76.84	1082.84	1006.00
	3	5/13/99	78.15	1082.84	1004.69
	4	5/13/99	81.08	1082.84	1001.76
	5	5/13/99	94.96	1082.84	987.88
MW-5		5/13/99	58.79	1071.62	1012.83
MW-6		5/13/99	173.51	1188.54	1015.03
MW-7		5/13/99	199.44	1212.90	1013.46
MW-8		5/13/99	124.52	1139.55	1015.03
MW-9		5/13/99	22.68	1106.04	1083.36
MW-10		5/13/99	76.33	1087.73	1011.40
MW-11	1 (top)	5/13/99	106.85	1139.30	1032.45
	2	5/13/99	126.48	1139.30	1012.82
	3	5/13/99	133.95	1139.30	1005.35
	4	5/13/99	132.23	1139.30	1007.07
	5	5/13/99	152.53	1139.30	986.77
MW-12	1 (top)	5/13/99	83.55	1102.14	1018.59
	2	5/13/99	94.15	1102.14	1007.99
	3	5/13/99	95.83	1102.14	1006.31
	4	5/13/99	100.62	1102.14	1001.52
	5	5/13/99	113.26	1102.14	988.88
MW-13		5/13/99	170.10	1183.49	1013.39

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

May 13,1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation[1] (ft msl)	Water Level Elevation (ft msl)
MW-14	1 (top)	5/13/99	158.36	1173.47	1015.11
	2	5/13/99	157.87	1173.47	1015.60
	3	5/13/99	158.04	1173.47	1015.43
	4	5/13/99	158.10	1173.47	1015.37
	5	5/13/99	158.75	1173.47	1014.72
MW-15		5/13/99	32.47	1120.68	1088.21
MW-16		5/13/99	223.15	1236.29	1013.14
MW-17	1 (top)	5/13/99	184.14	1191.21	1007.07
	2	5/13/99	192.39	1191.21	998.82
	3	5/13/99	197.33	1191.21	993.88
	4	5/13/99	205.39	1191.21	985.82
	5	5/13/99	208.58	1191.21	982.63
MW-18	1 (top)	5/13/99	225.62	1225.41	999.79
	2	5/13/99	226.12	1225.41	999.29
	3	5/13/99	226.28	1225.41	999.13
	4	5/13/99	237.13	1225.41	988.28
	5	5/13/99	242.22	1225.41	983.19
MW-19	1 (top)	5/13/99	147.79	1142.94	995.15
	2	5/13/99	153.62	1142.94	989.32
	3	5/13/99	154.34	1142.94	988.60
	4	5/13/99	172.68	1142.94	970.26
	5	5/13/99	172.68	1142.94	970.26
MW-20	1 (top)	5/13/99	186.44	1165.05	978.61
	2	5/13/99	185.24	1165.05	979.81
	3	5/13/99	193.85	1165.05	971.20
	4	5/13/99	185.33	1165.05	979.72
	5	5/13/99	183.19	1165.05	981.86

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

May 13,1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation[1] (ft msl)	Water Level Elevation (ft msl)
MW-21	1 (top)	5/13/99	49.38	1059.10	1009.72
	2	5/13/99	74.03	1059.10	985.07
	3	5/13/99	48.60	1059.10	1010.50
	4	5/13/99	49.72	1059.10	1009.38
	5	5/13/99	49.73	1059.10	1009.37
MW-22	1 (top)	5/13/99	163.72	1176.98	1013.26
	2	5/13/99	164.23	1176.98	1012.75
	3	5/13/99	164.36	1176.98	1012.62
	4	5/13/99	170.64	1176.98	1006.34
	5	5/13/99	173.97	1176.98	1003.01
MW-23	1 (top)	5/13/99	96.63	1108.84	1012.21
	2	5/13/99	99.18	1108.84	1009.66
	3	5/13/99	99.57	1108.84	1009.27
	4	5/13/99	106.70	1108.84	1002.14
	5	5/13/99	107.21	1108.84	1001.63
MW-24	1 (top)	5/13/99	187.25	1200.94	1013.69
	2	5/13/99	191.24	1200.94	1009.70
	3	5/13/99	192.67	1200.94	1008.27
	4	5/13/99	200.08	1200.94	1000.86
	5	5/13/99	204.77	1200.94	996.17

1: Reference elevations were measured from the top of the Westbay® casings for the deep multi-port wells and from the top of the dedicated pump assemblies for the shallow wells.

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

June 9,1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation[1] (ft msl)	Water Level Elevation (ft msl)
MW-1		6/9/99	26.57	1116.69	1090.12
MW-3	1 (top)	6/9/99	104.13	1100.34	996.21
	2	6/9/99	114.25	1100.34	986.09
	3	6/9/99	119.17	1100.34	981.17
	4	6/9/99	192.21	1100.34	908.13
	5	6/9/99	222.13	1100.34	878.21
MW-4	1 (top)	6/9/99	78.38	1082.84	1004.46
	2	6/9/99	94.54	1082.84	988.30
	3	6/9/99	98.44	1082.84	984.40
	4	6/9/99	107.14	1082.84	975.70
	5	6/9/99	179.02	1082.84	903.82
MW-5		6/9/99	67.90	1071.62	1003.72
MW-6		6/9/99	180.00	1188.54	1008.54
MW-7		6/9/99	207.30	1212.90	1005.60
MW-8		6/9/99	132.95	1139.55	1006.60
MW-9		6/9/99	21.84	1106.04	1084.20
MW-10		6/9/99	85.10	1087.73	1002.63
MW-11	1 (top)	6/9/99	111.17	1139.30	1028.13
	2	6/9/99	139.17	1139.30	1000.13
	3	6/9/99	154.94	1139.30	984.36
	4	6/9/99	161.93	1139.30	977.37
	5	6/9/99	220.04	1139.30	919.26
MW-12	1 (top)	6/9/99	93.27	1102.14	1008.87
	2	6/9/99	110.02	1102.14	992.12
	3	6/9/99	114.16	1102.14	987.98
	4	6/9/99	128.35	1102.14	973.79
	5	6/9/99	185.58	1102.14	916.56
MW-13		6/9/99	178.22	1183.49	1005.27

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

June 9,1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation[1] (ft msl)	Water Level Elevation (ft msl)
MW-14	1 (top)	6/9/99	163.41	1173.47	1010.06
	2	6/9/99	165.27	1173.47	1008.20
	3	6/9/99	166.15	1173.47	1007.32
	4	6/9/99	166.32	1173.47	1007.15
	5	6/9/99	167.37	1173.47	1006.10
MW-15		6/9/99	32.48	1120.68	1088.20
MW-16		6/9/99	231.05	1236.29	1005.24
MW-17	1 (top)	6/9/99	194.04	1191.21	997.17
	2	6/9/99	213.43	1191.21	977.78
	3	6/9/99	228.14	1191.21	963.07
	4	6/9/99	274.67	1191.21	916.54
	5	6/9/99	284.52	1191.21	906.69
MW-18	1 (top)	6/9/99	234.30	1225.41	991.11
	2	6/9/99	236.27	1225.41	989.14
	3	6/9/99	244.17	1225.41	981.24
	4	6/9/99	271.70	1225.41	953.71
	5	6/9/99	284.45	1225.41	940.96
MW-19	1 (top)	6/9/99	157.91	1142.94	985.03
	2	6/9/99	176.21	1142.94	966.73
	3	6/9/99	181.65	1142.94	961.29
	4	6/9/99	267.66	1142.94	875.28
	5	6/9/99	271.04	1142.94	871.90
MW-20	1 (top)	6/9/99	190.43	1165.05	974.62
	2	6/9/99	191.48	1165.05	973.57
	3	6/9/99	210.51	1165.05	954.54
	4	6/9/99	217.58	1165.05	947.47
	5	6/9/99	192.25	1165.05	972.80

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

June 9,1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation[1] (ft msl)	Water Level Elevation (ft msl)
MW-21	1 (top)	6/9/99	57.99	1059.10	1001.11
	2	6/9/99	58.08	1059.10	1001.02
	3	6/9/99	58.97	1059.10	1000.13
	4	6/9/99	60.35	1059.10	998.75
	5	6/9/99	60.45	1059.10	998.65
MW-22	1 (top)	6/9/99	171.78	1176.98	1005.20
	2	6/9/99	176.35	1176.98	1000.63
	3	6/9/99	176.37	1176.98	1000.61
	4	6/9/99	193.67	1176.98	983.31
	5	6/9/99	204.63	1176.98	972.35
MW-23	1 (top)	6/9/99	105.17	1108.84	1003.67
	2	6/9/99	112.67	1108.84	996.17
	3	6/9/99	113.60	1108.84	995.24
	4	6/9/99	134.87	1108.84	973.97
	5	6/9/99	135.23	1108.84	973.61
MW-24	1 (top)	6/9/99	195.16	1200.94	1005.78
	2	6/9/99	205.03	1200.94	995.91
	3	6/9/99	208.92	1200.94	992.02
	4	6/9/99	232.77	1200.94	968.17
	5	6/9/99	254.27	1200.94	946.67

1: Reference elevations were measured from the top of the Westbay® casings for the deep multi-port wells and from the top of the dedicated pump assemblies for the shallow wells.

FIGURES

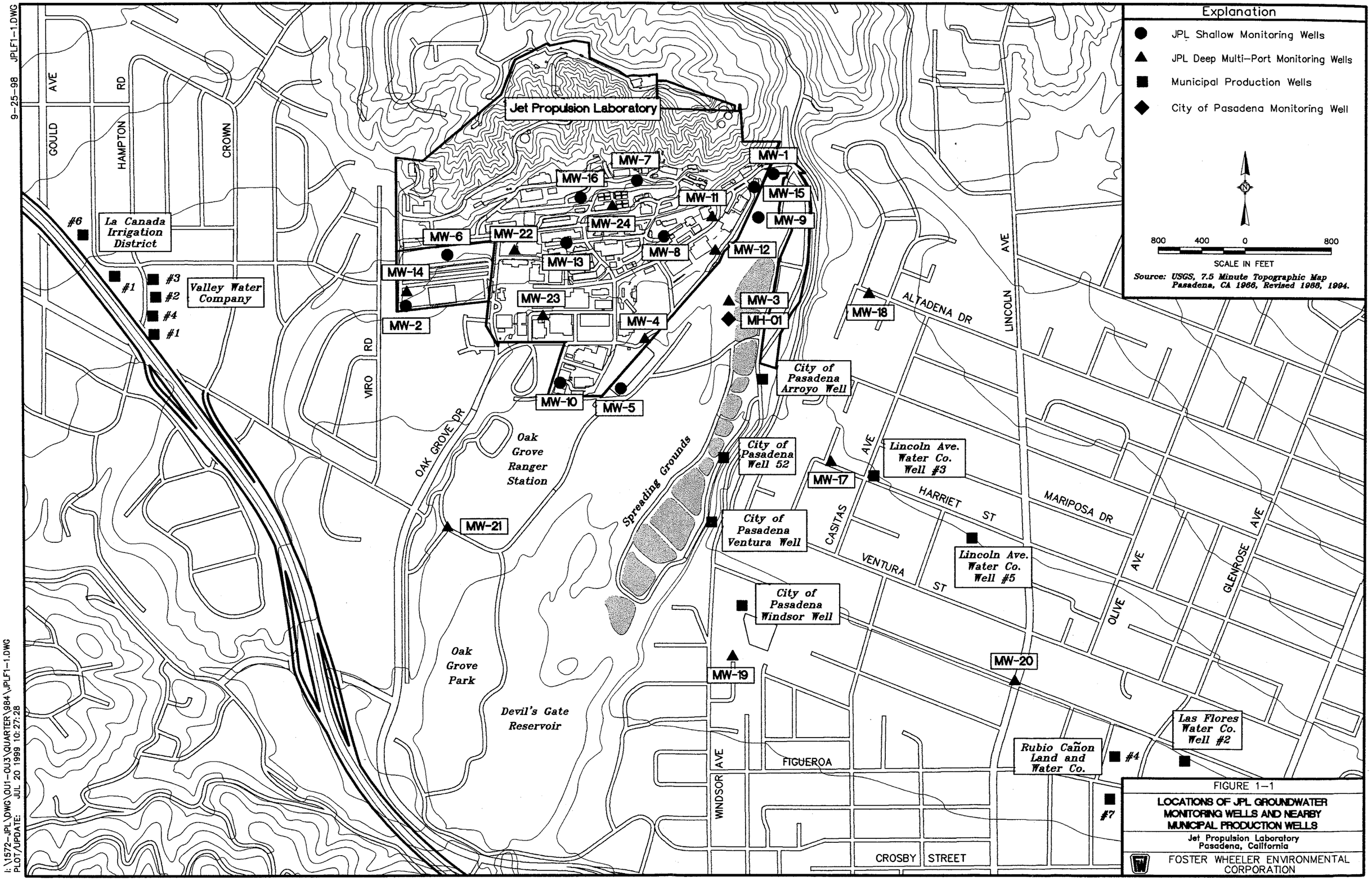

FIGURE 1-1

LOCATIONS OF JPL GROUNDWATER MONITORING WELLS AND NEARBY MUNICIPAL PRODUCTION WELLS

Jet Propulsion Laboratory
Pasadena, California

9-25-98 JPLF1-1.DWG

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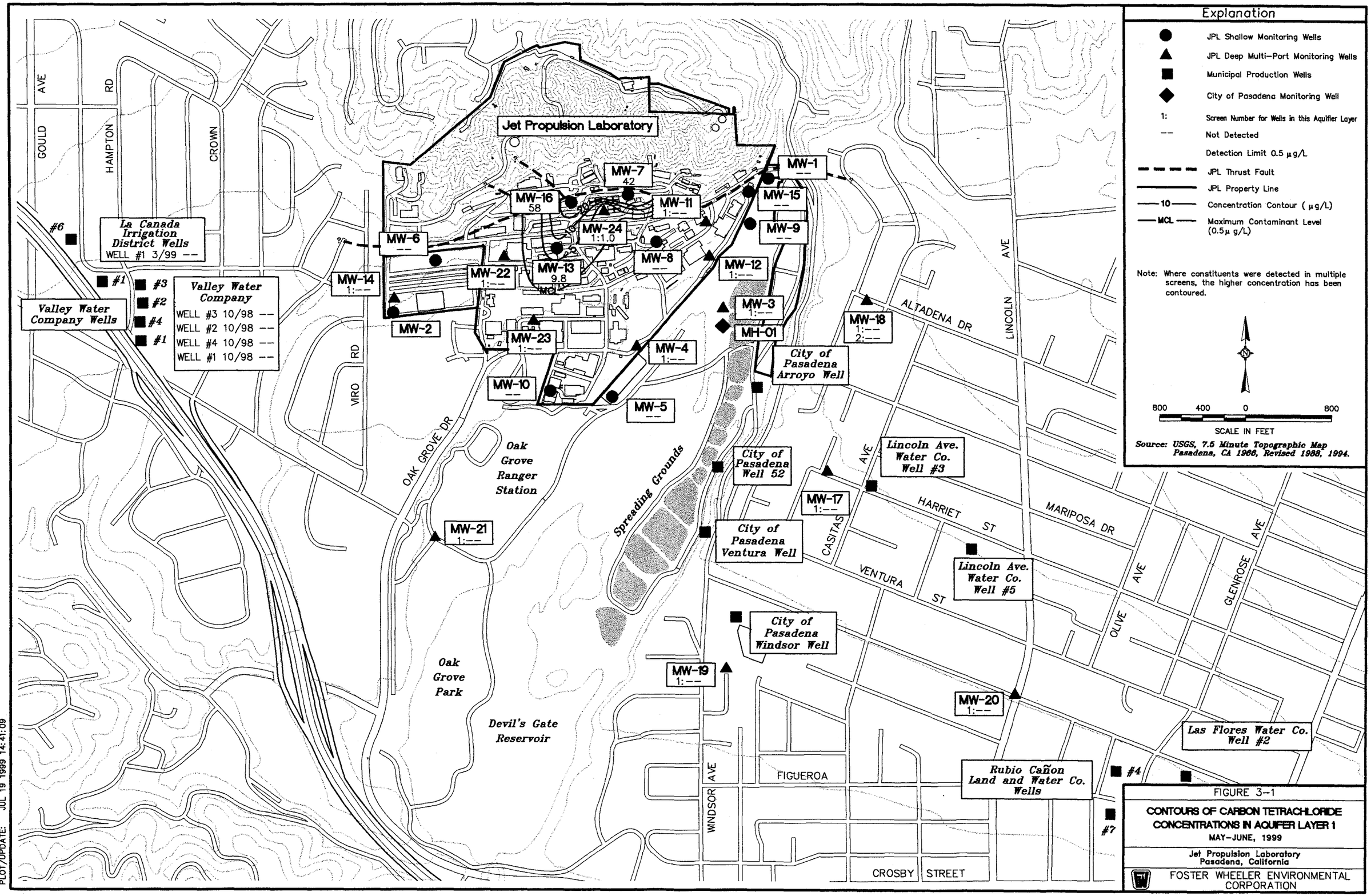

FIGURE 3-1

CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 1

MAY-JUNE, 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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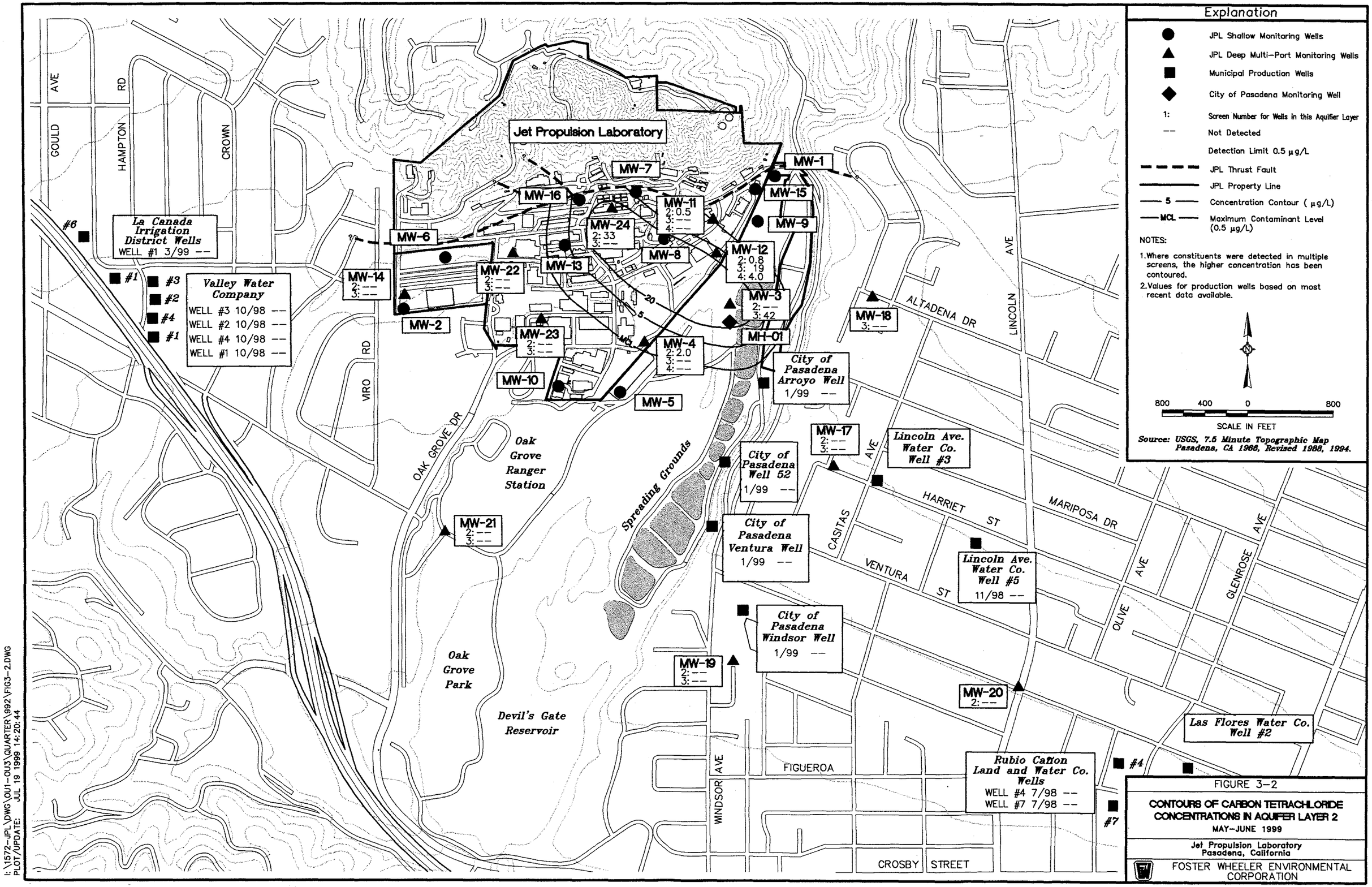

FIGURE 3-2

CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 2

MAY-JUNE 1999

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

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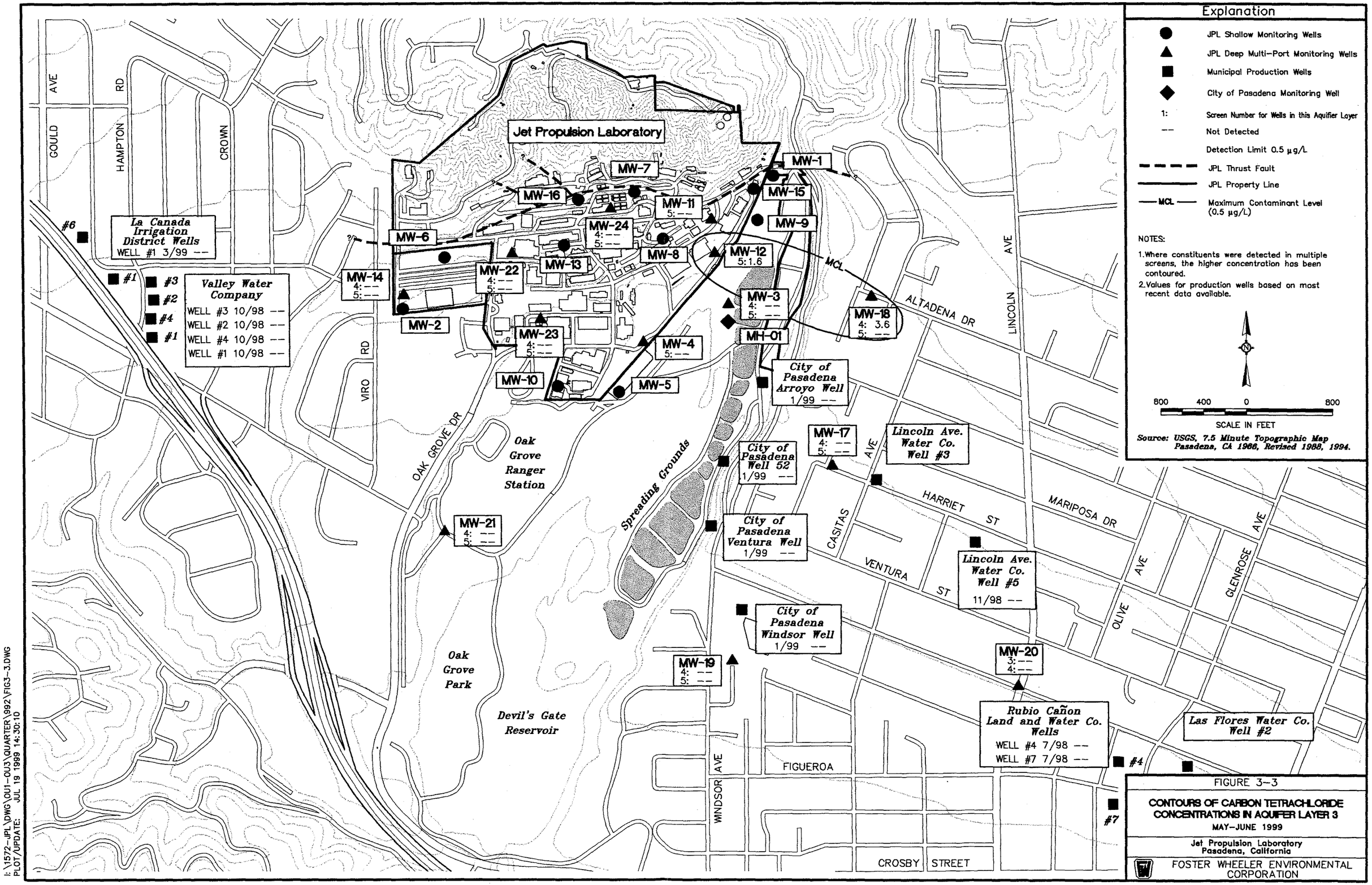

FIGURE 3-3

CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 3

MAY-JUNE 1999

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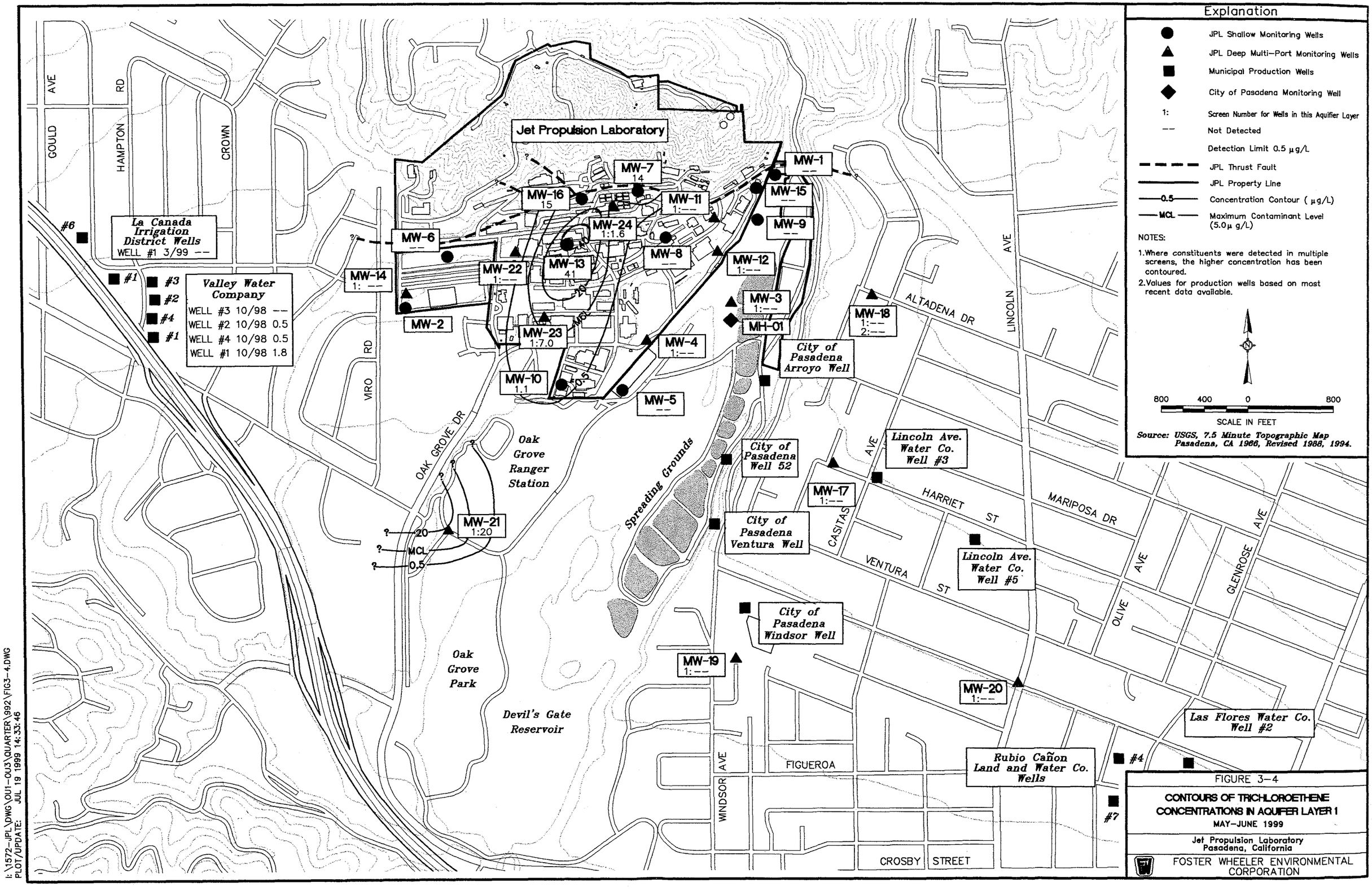

FIGURE 3-4

CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 1

MAY-JUNE 1999

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Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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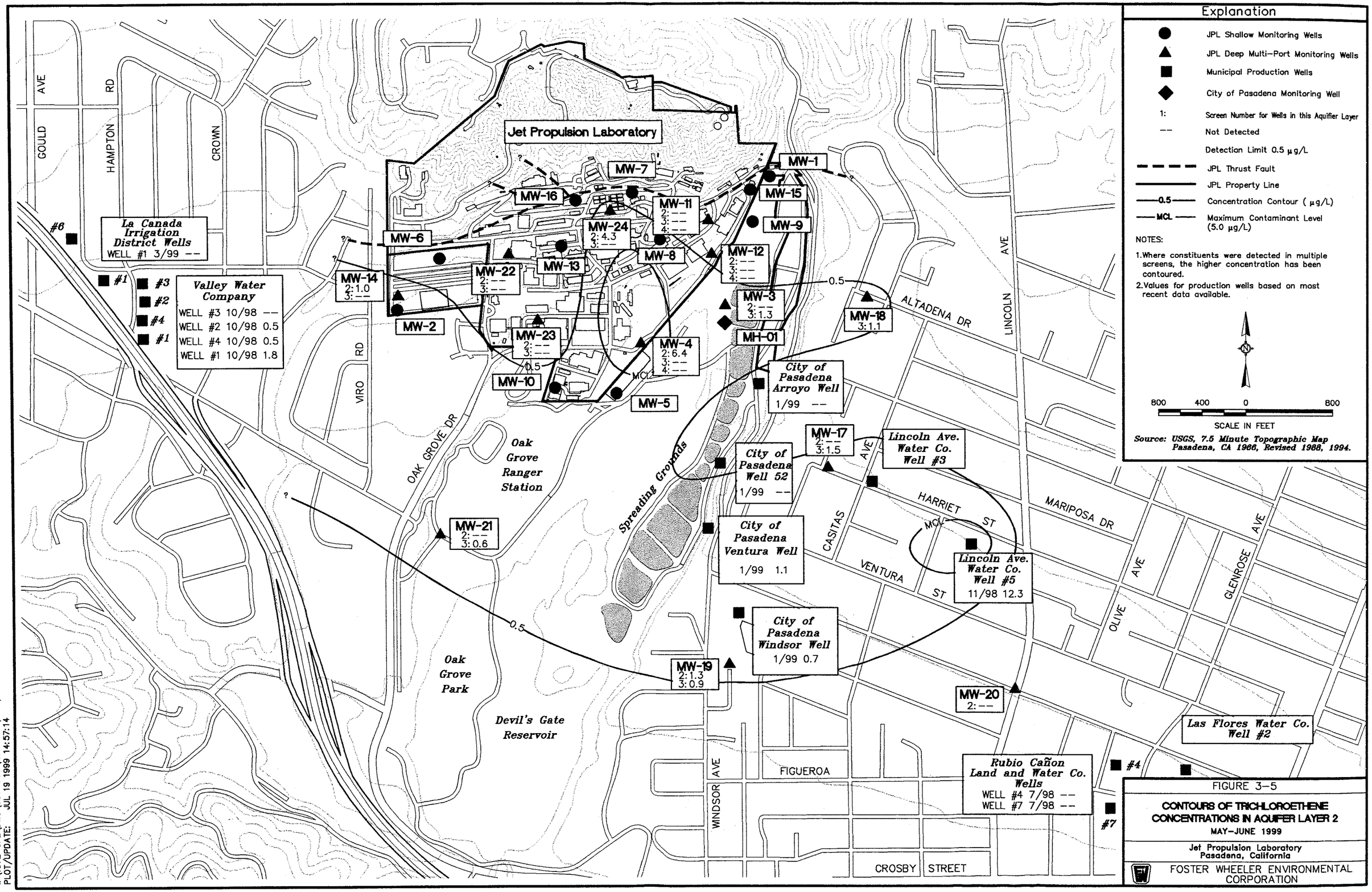

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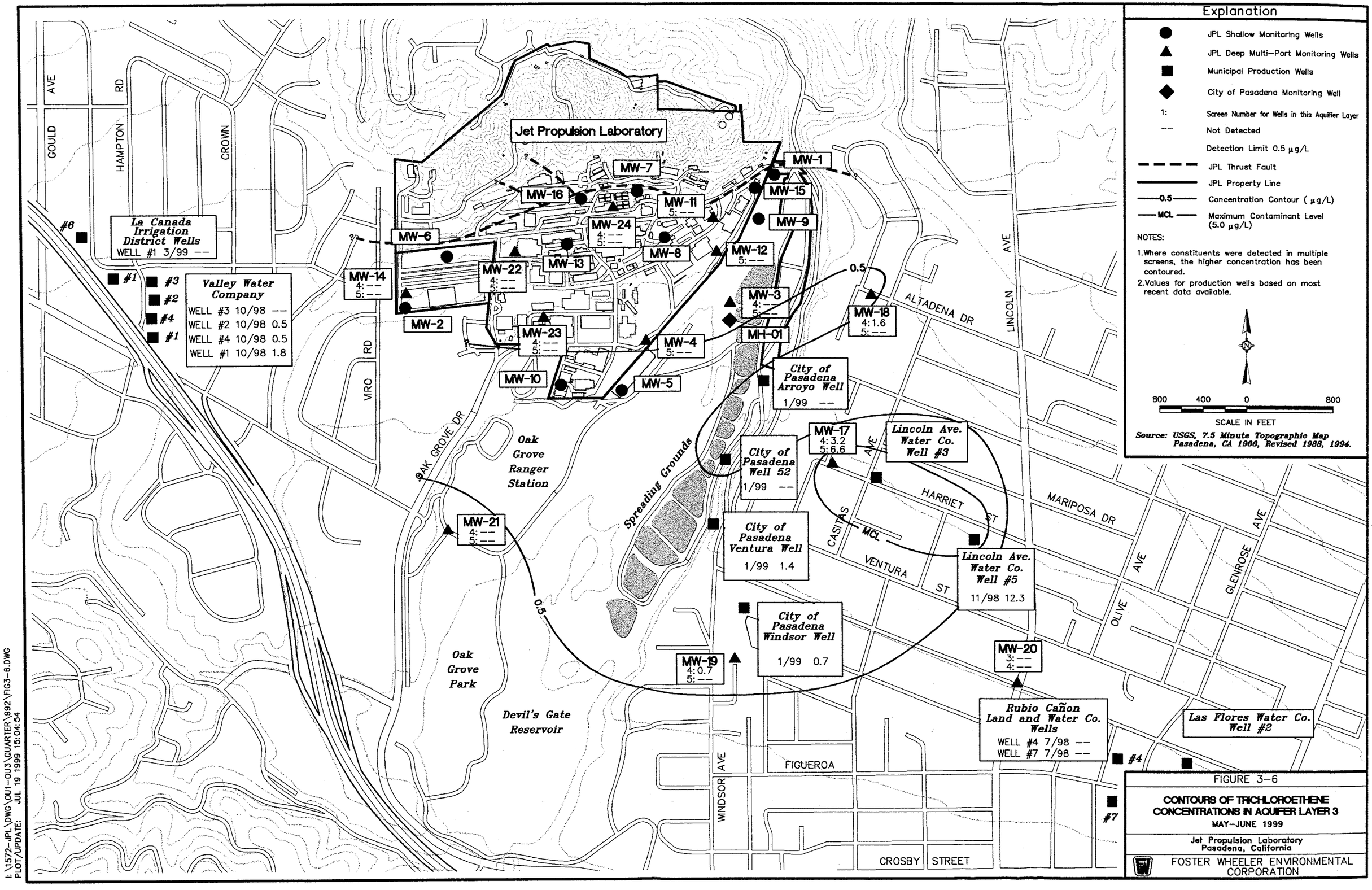

FIGURE 3-6

CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 3

MAY-JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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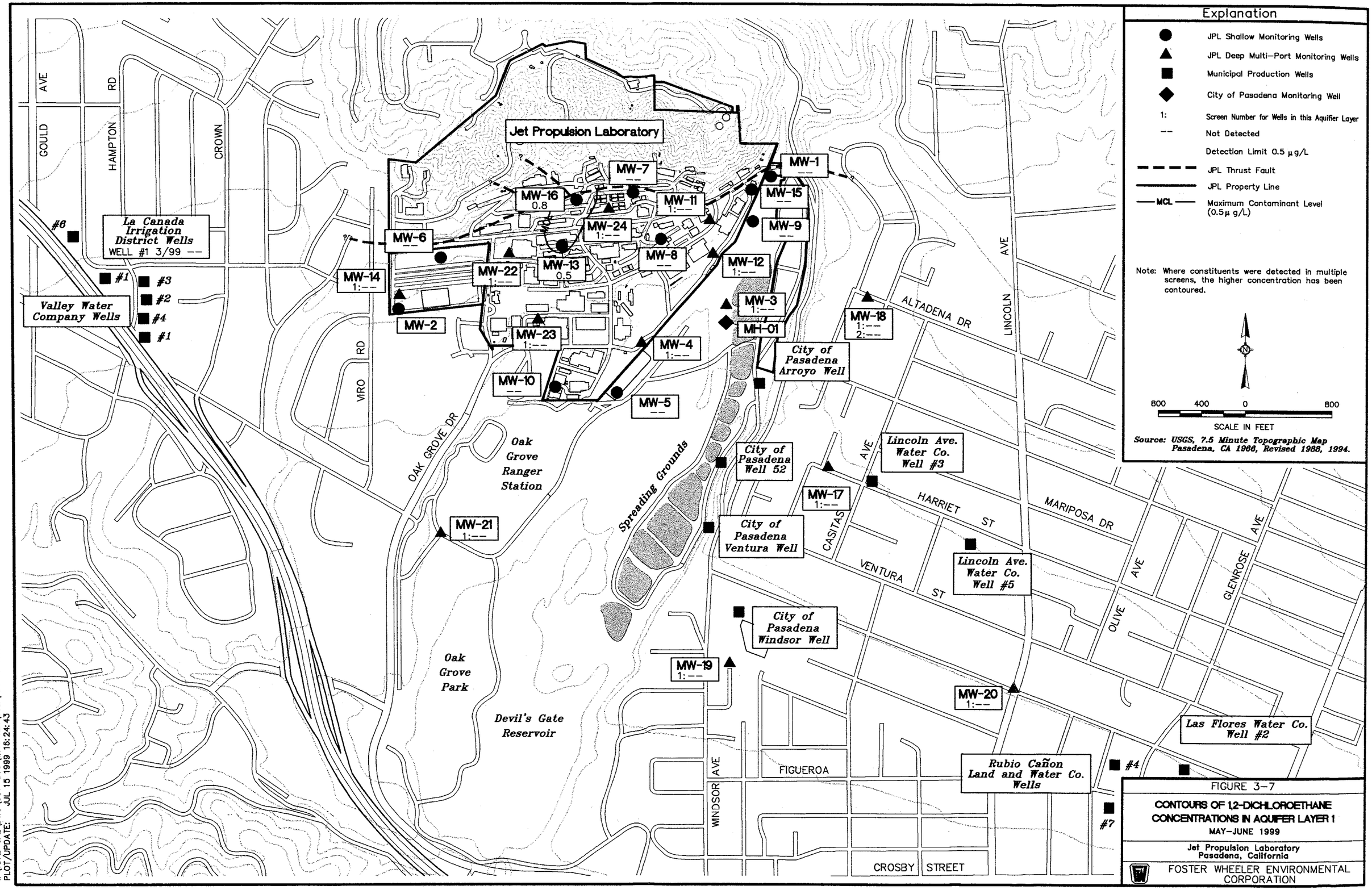
Explanation
JPL Shallow Monitoring Wells
JPL Deep Multi-Port Monitoring Wells
Municipal Production Wells
City of Pasadena Monitoring Well
1: Screen Number for Wells in this Aquifer Layer
-- Not Detected
Detection Limit 0.5 µg/L
JPL Thrust Fault
JPL Property Line
MCL Maximum Contaminant Level (0.5µ g/L)
Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.
800 400 0 800
SCALE IN FEET
Source: USGS, 7.5 Minute Topographic Map Pasadena, CA 1966, Revised 1988, 1994.
Jet Propulsion Laboratory
MW-1 --
MW-2 --
MW-3 1:--
MW-4 1:--
MW-5 --
MW-6 --
MW-7 --
MW-8 --
MW-9 --
MW-10 --
MW-11 1:--
MW-12 1:--
MW-13 0.5
MW-14 1:--
MW-15 --
MW-16 0.8
MW-17 1:--
MW-18 1:-- 2:--
MW-19 1:--
MW-20 1:--
MW-21 1:--
MW-22 1:--
MW-23 1:--
MW-24 1:--
MH-01
La Canada Irrigation District Wells
WELL #1 3/99 --
#6
#1
#3
#2
#4
#1
Valley Water Company Wells
City of Pasadena Arroyo Well
City of Pasadena Well 52
City of Pasadena Ventura Well
City of Pasadena Windsor Well
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
Las Flores Water Co. Well #2
Rubio Cañon Land and Water Co. Wells
#4
#7
Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds
GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET
FIGURE 3-7
CONTOURS OF 1,2-DICHLOROETHANE CONCENTRATIONS IN AQUIFER LAYER 1
MAY-JUNE 1999
Jet Propulsion Laboratory
Pasadena, California
FOSTER WHEELER ENVIRONMENTAL CORPORATION
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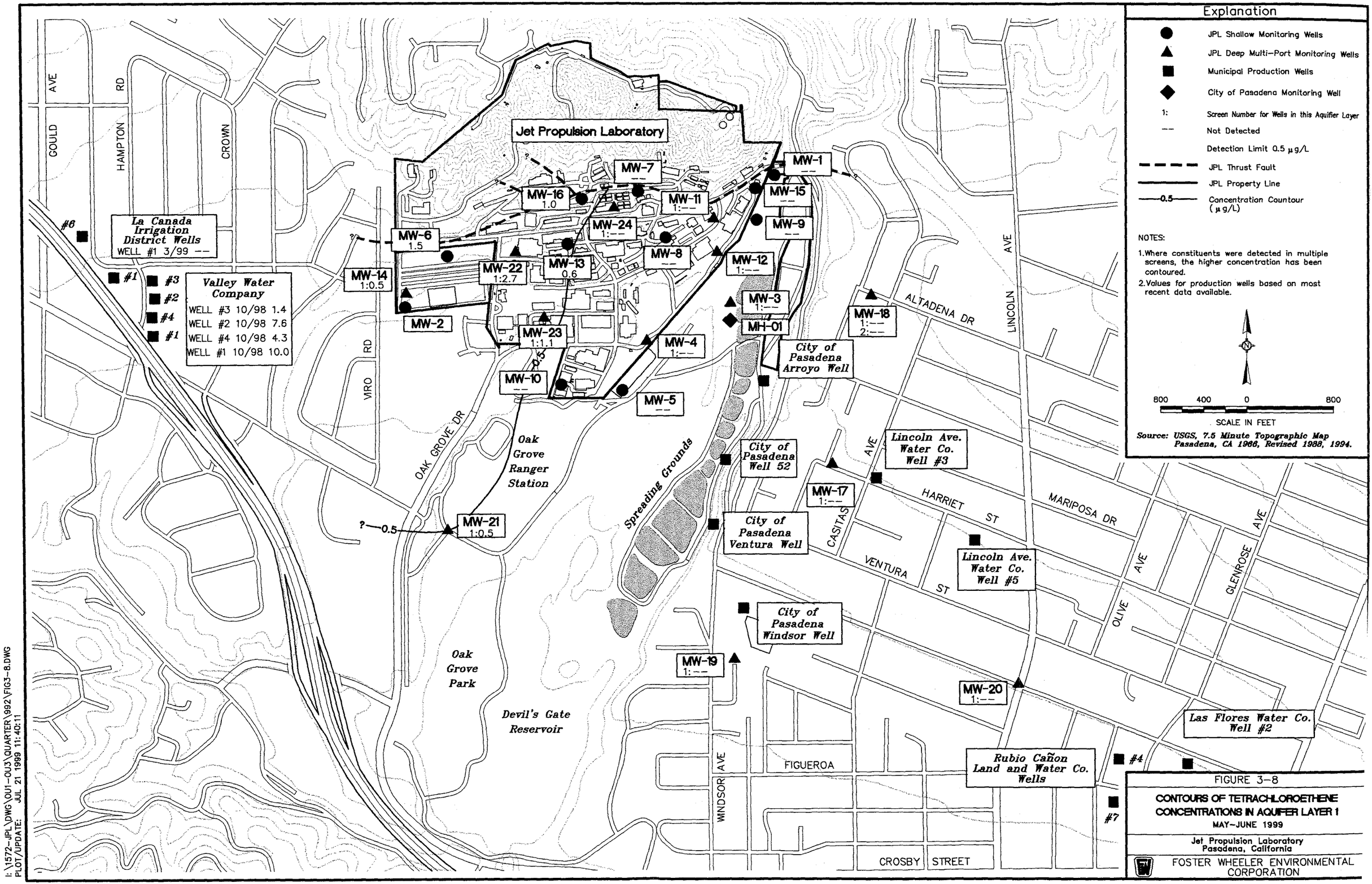

FIGURE 3-8

CONTOURS OF TETRACHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 1

MAY-JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

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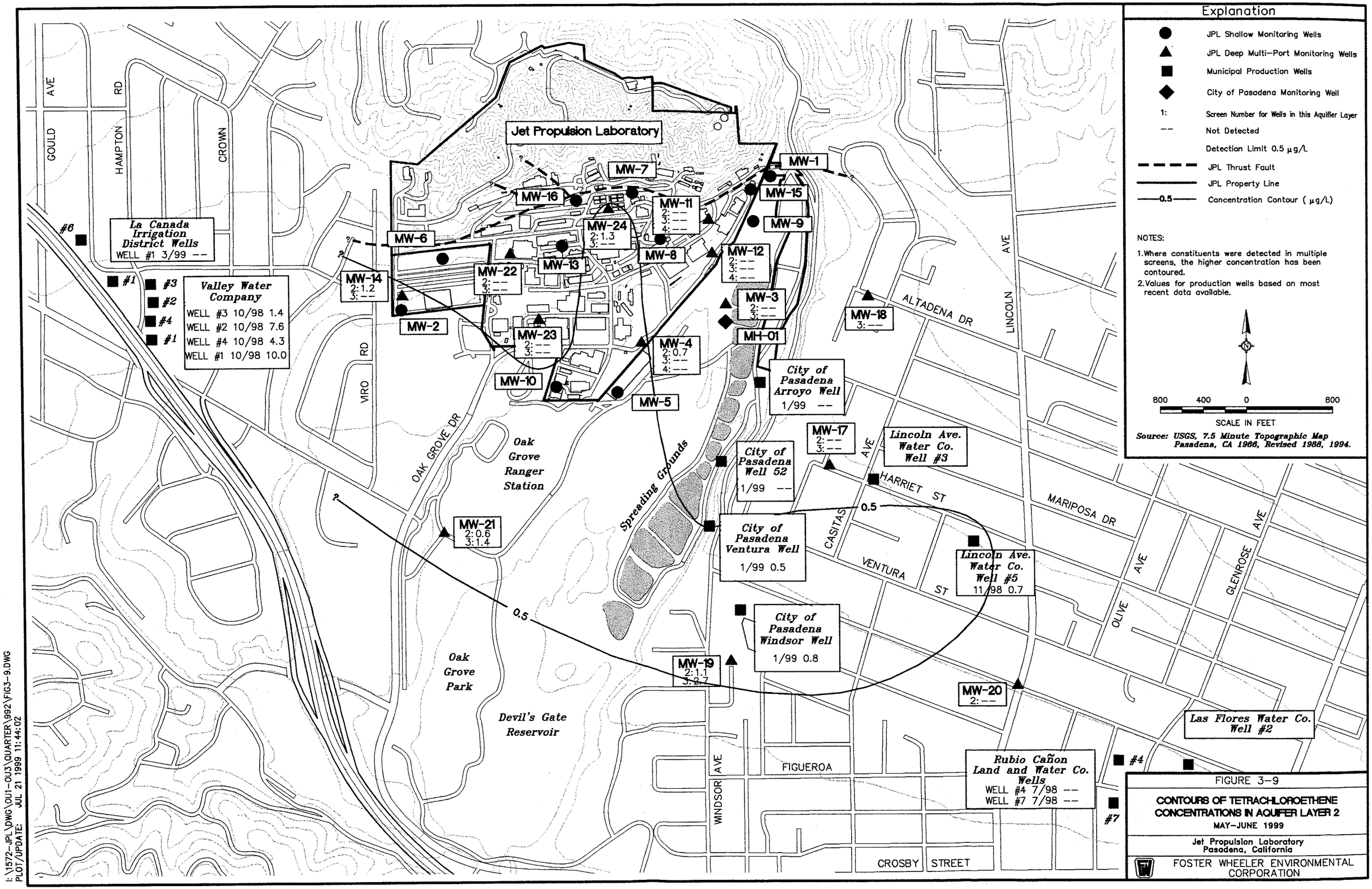

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG3-9.DWG
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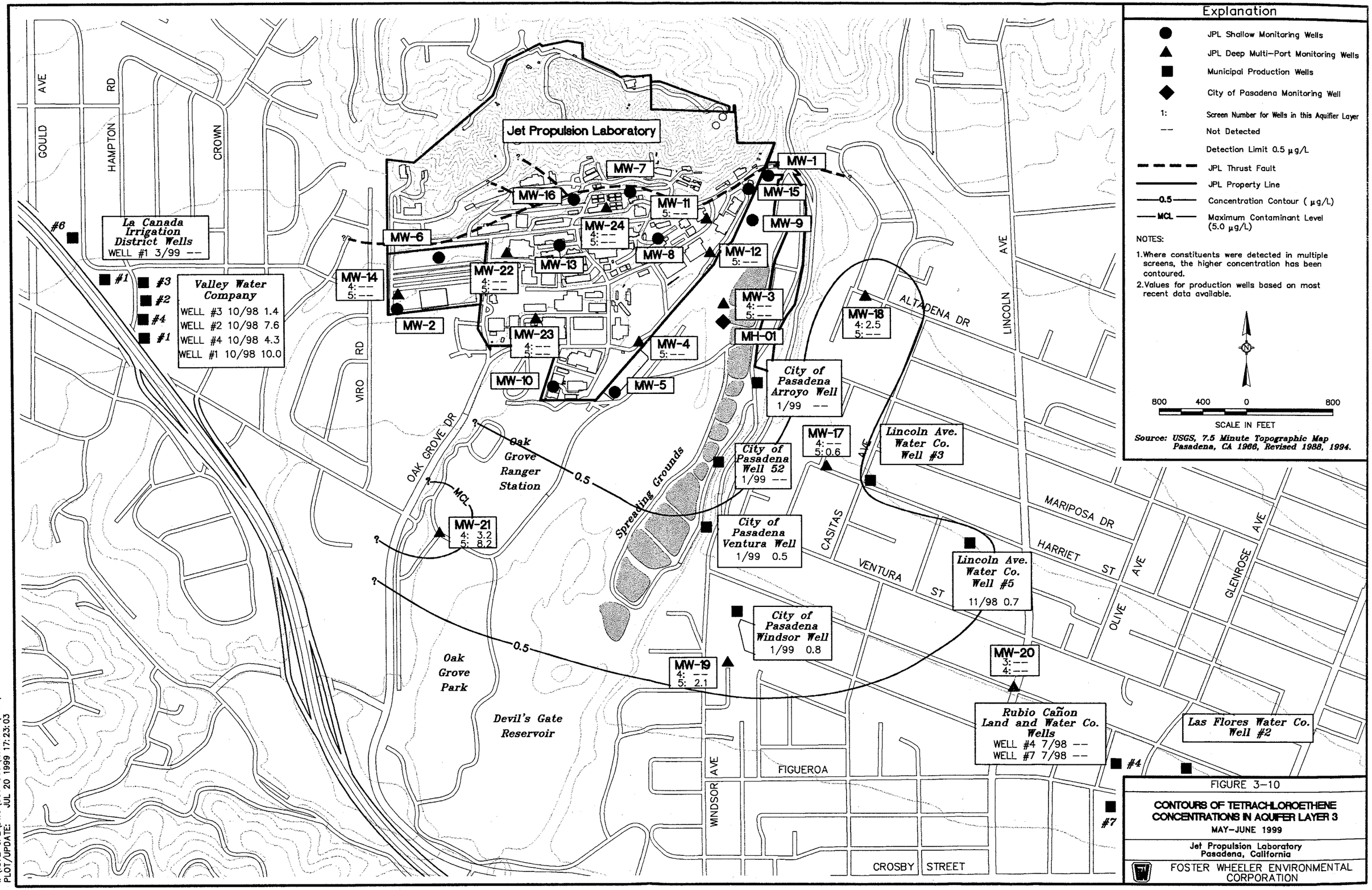

FIGURE 3-10

CONTOURS OF TETRACHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 3

MAY-JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG3-10.DWG
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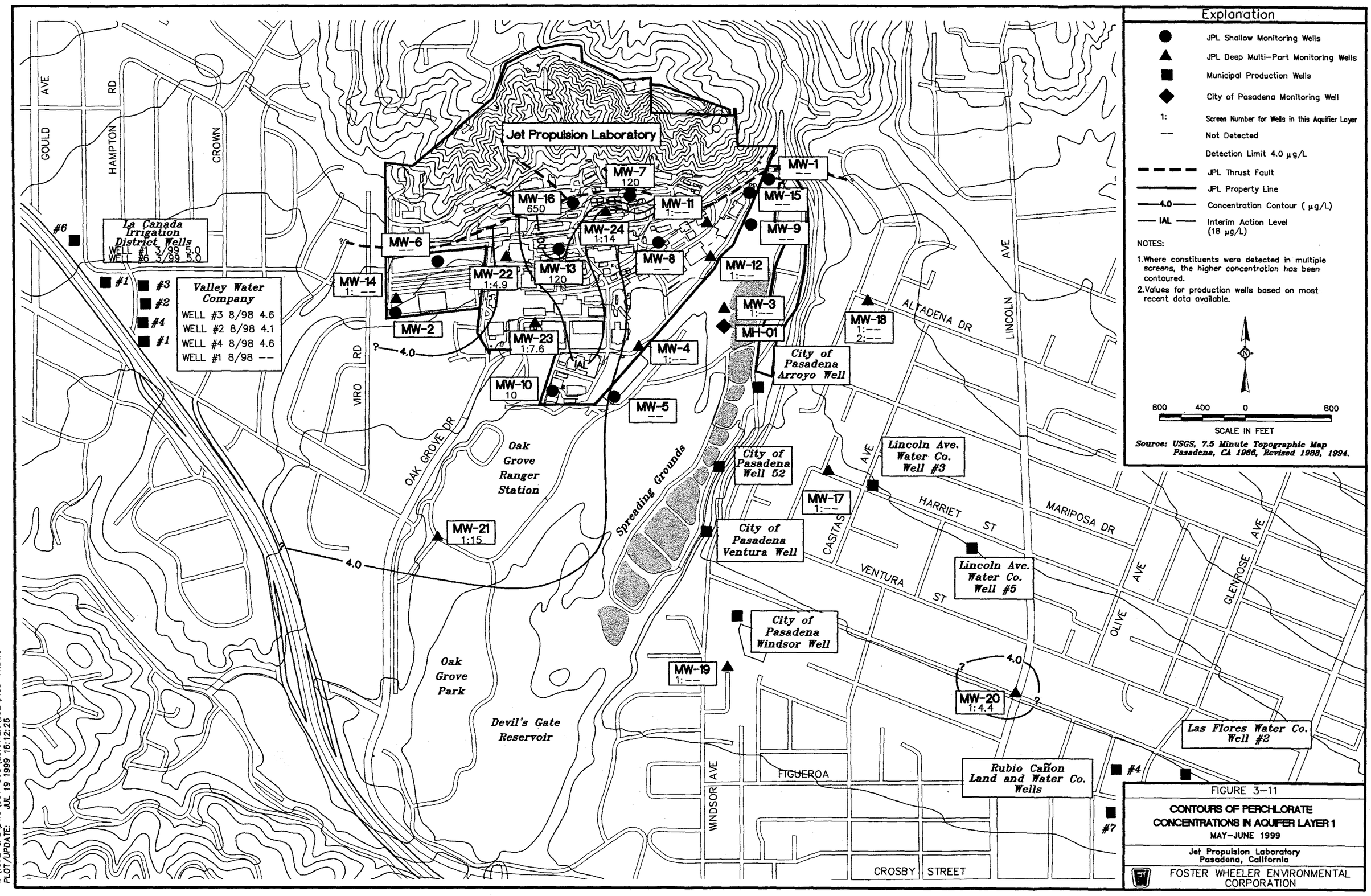


FIGURE 3-11

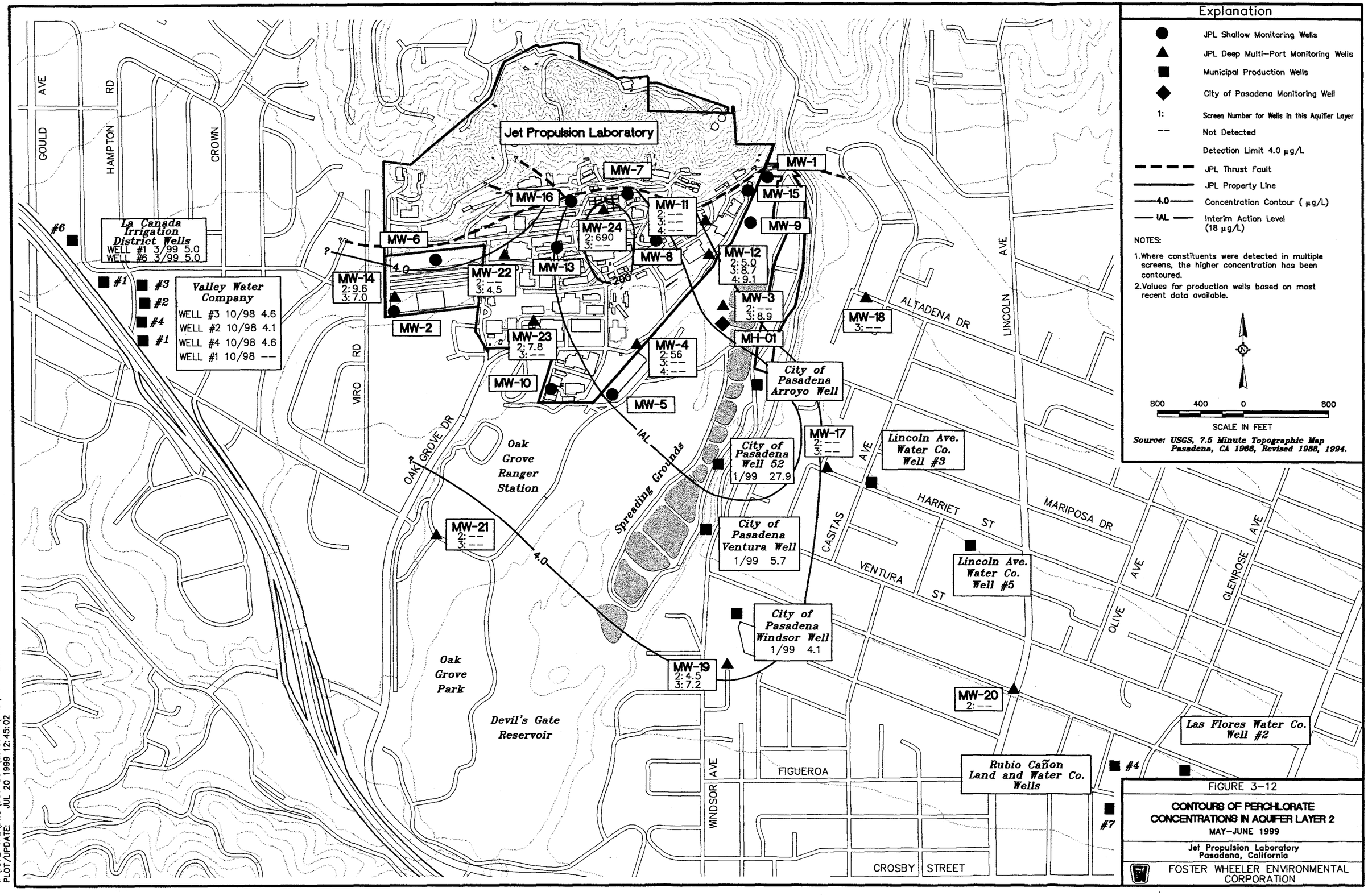
CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 1

MAY-JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG3-11.DWG
PLOT/UPDATE: JUL 19 1999 16:12:26


Explanation
JPL Shallow Monitoring Wells
JPL Deep Multi-Port Monitoring Wells
Municipal Production Wells
City of Pasadena Monitoring Well
1: Screen Number for Wells in this Aquifer Layer
-- Not Detected
Detection Limit 4.0 µg/L
JPL Thrust Fault
JPL Property Line
4.0 Concentration Contour (µg/L)
IAL Interim Action Level (18 µg/L)
NOTES:
1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.
800 400 0 800
SCALE IN FEET
Source: USGS, 7.5 Minute Topographic Map Pasadena, CA 1966, Revised 1988, 1994.
Jet Propulsion Laboratory
MW-1
MW-2
MW-3 2: -- 3: 8.9
MW-4 2: 56 3: -- 4: --
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11 2: -- 3: -- 4: --
MW-12 2: 5.0 3: 8.7 4: 9.1
MW-13
MW-14 2: 9.6 3: 7.0
MW-15
MW-16
MW-17 2: -- 3: --
MW-18 3: --
MW-19 2: 4.5 3: 7.2
MW-20 2: --
MW-21 2: -- 3: --
MW-22 2: -- 3: 4.5
MW-23 2: 7.8 3: --
MW-24 2: 690 3: --
MH-01
IAL
4.0
200
La Canada Irrigation District Wells
WELL #1 3/99 5.0
WELL #6 3/99 5.0
Valley Water Company
WELL #3 10/98 4.6
WELL #2 10/98 4.1
WELL #4 10/98 4.6
WELL #1 10/98 --
City of Pasadena Arroyo Well
City of Pasadena Well 52 1/99 27.9
City of Pasadena Ventura Well 1/99 5.7
City of Pasadena Windsor Well 1/99 4.1
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
Las Flores Water Co. Well #2
Rubio Cañon Land and Water Co. Wells
Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds
GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET
#1
#2
#3
#4
#6
#7
FIGURE 3-12
CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 2
MAY-JUNE 1999
Jet Propulsion Laboratory
Pasadena, California
FOSTER WHEELER ENVIRONMENTAL CORPORATION
I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG3-12.DWG
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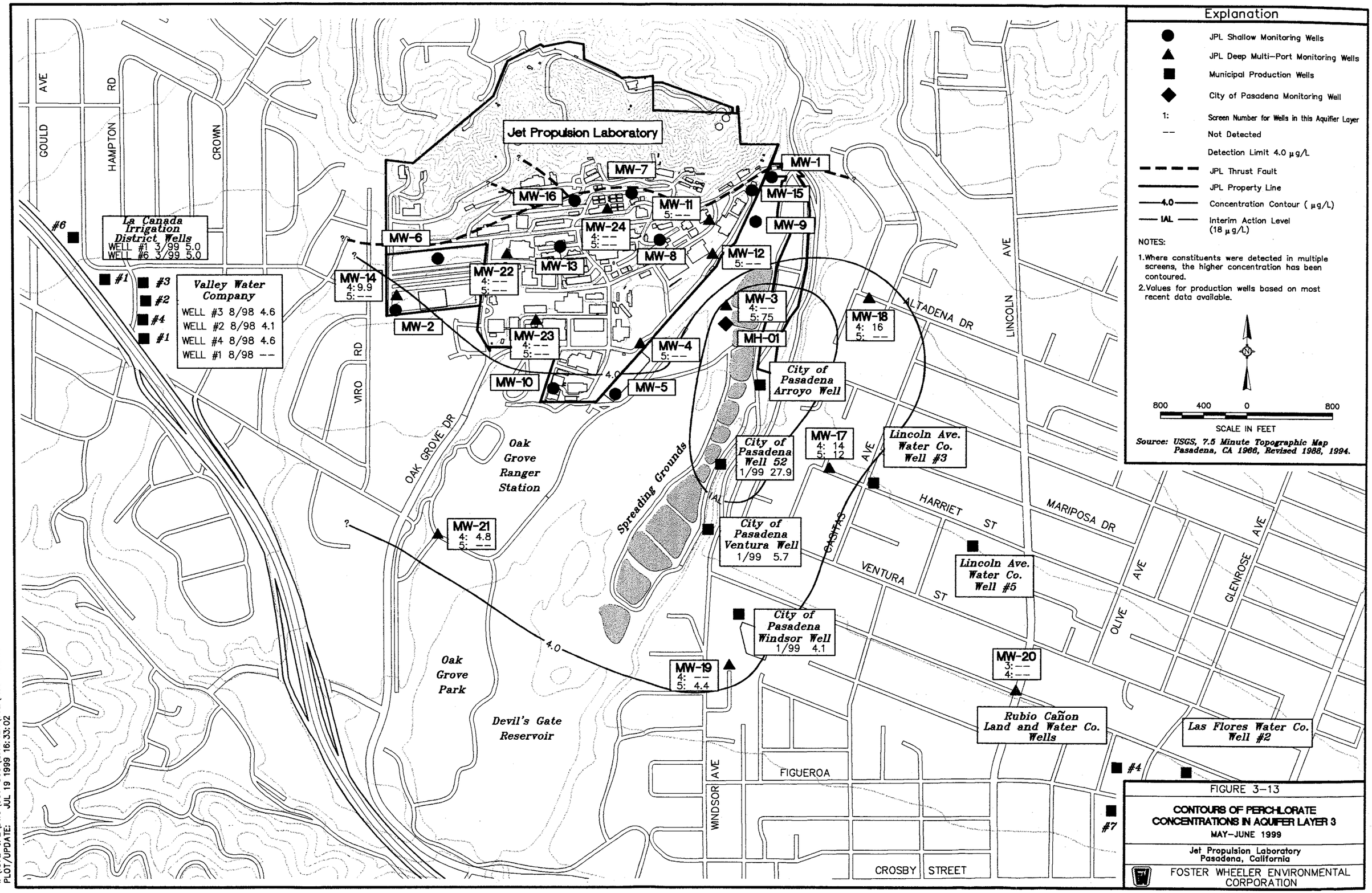

FIGURE 3-13

CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 3

MAY-JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG3-13.DWG
PLOT/UPDATE: JUL 19 1999 16:33:02

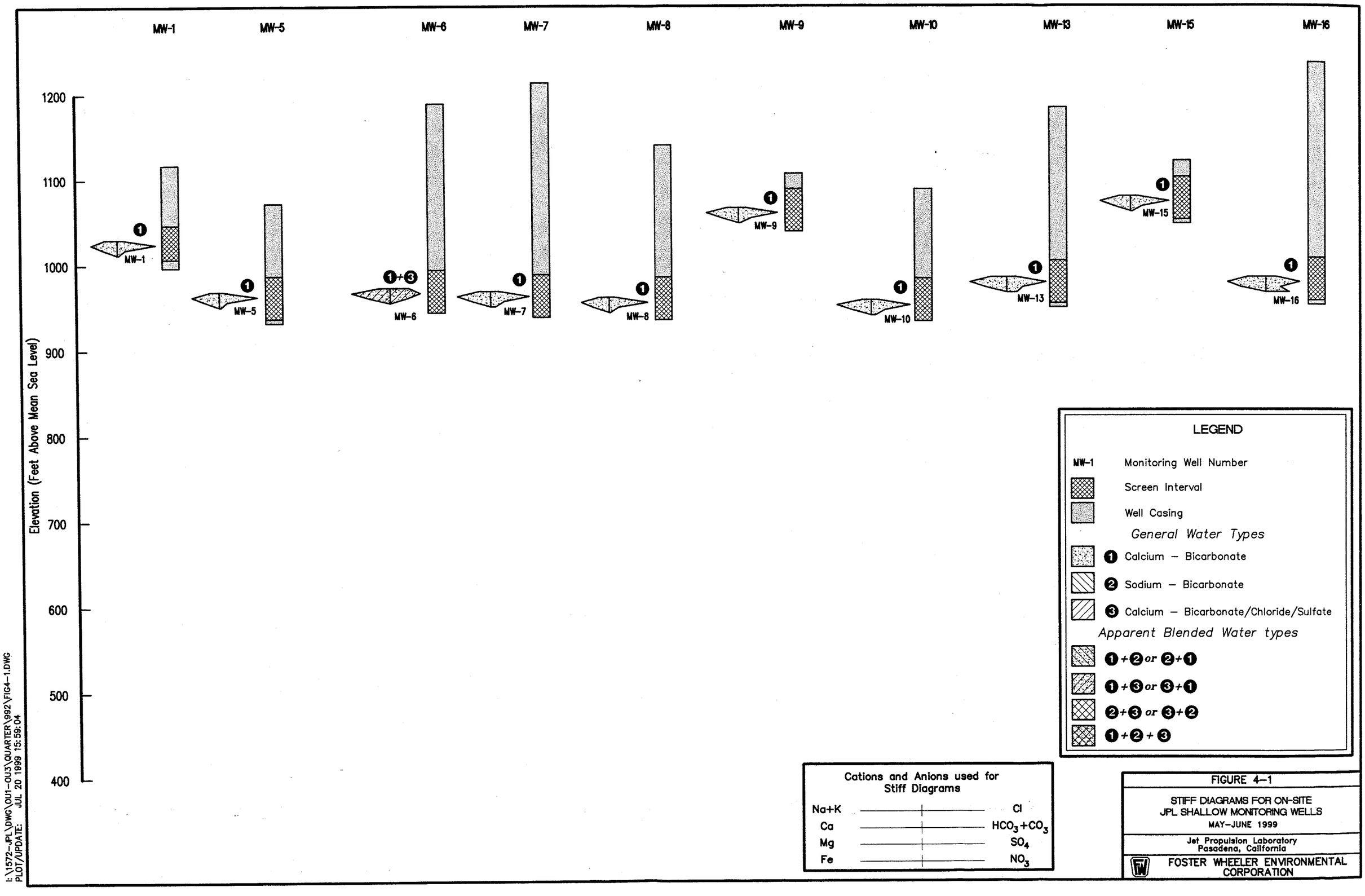

FIGURE 4–1

STIFF DIAGRAMS FOR ON-SITE JPL SHALLOW MONITORING WELLS

MAY–JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG4-1.DWG
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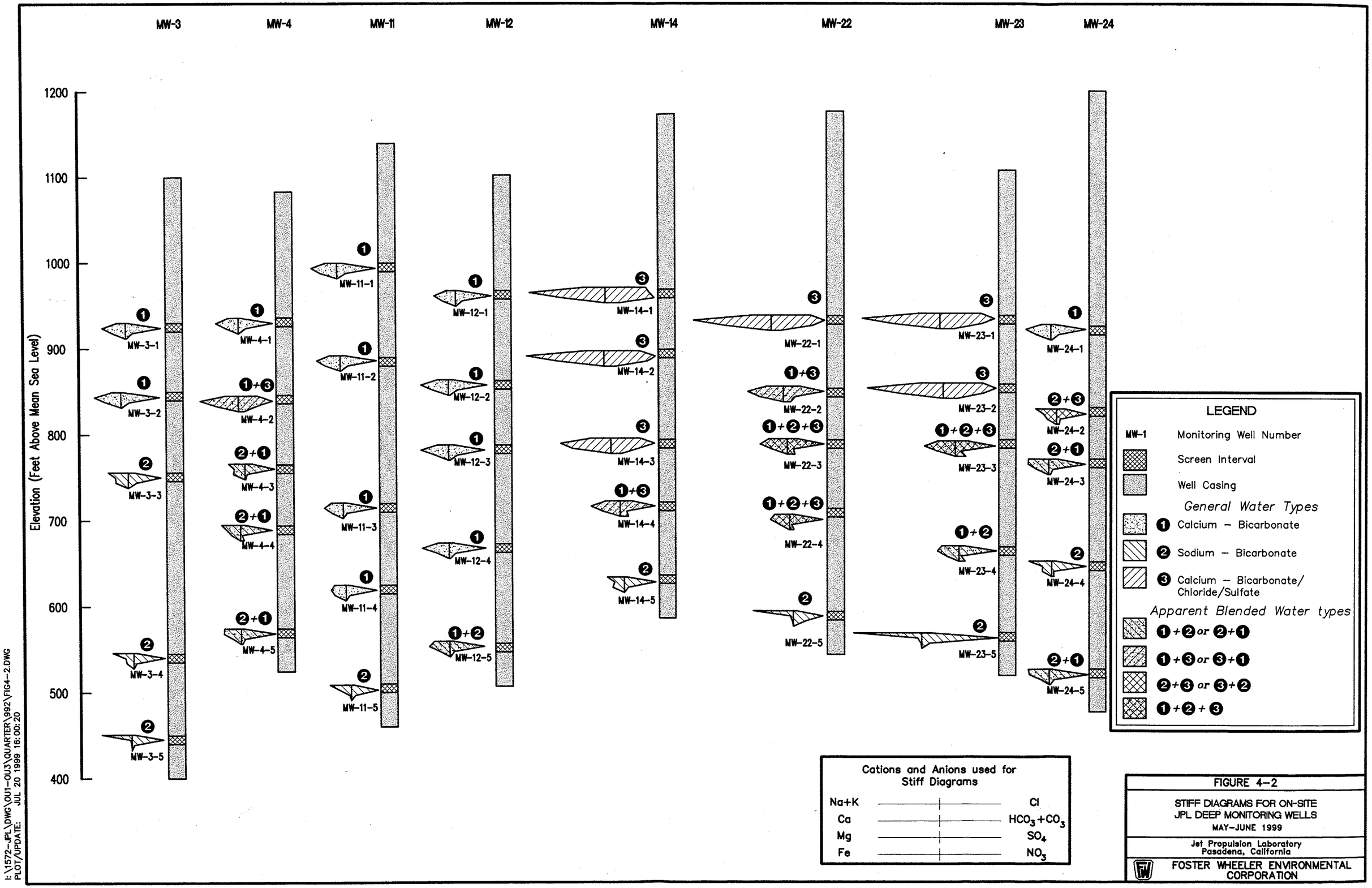

FIGURE 4–2

STIFF DIAGRAMS FOR ON-SITE JPL DEEP MONITORING WELLS
MAY–JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572–JPL\DWG\OU1–OU3\QUARTER\992\FIG4–2.DWG
PLOT/UPDATE: JUL 20 1999 16:00:20

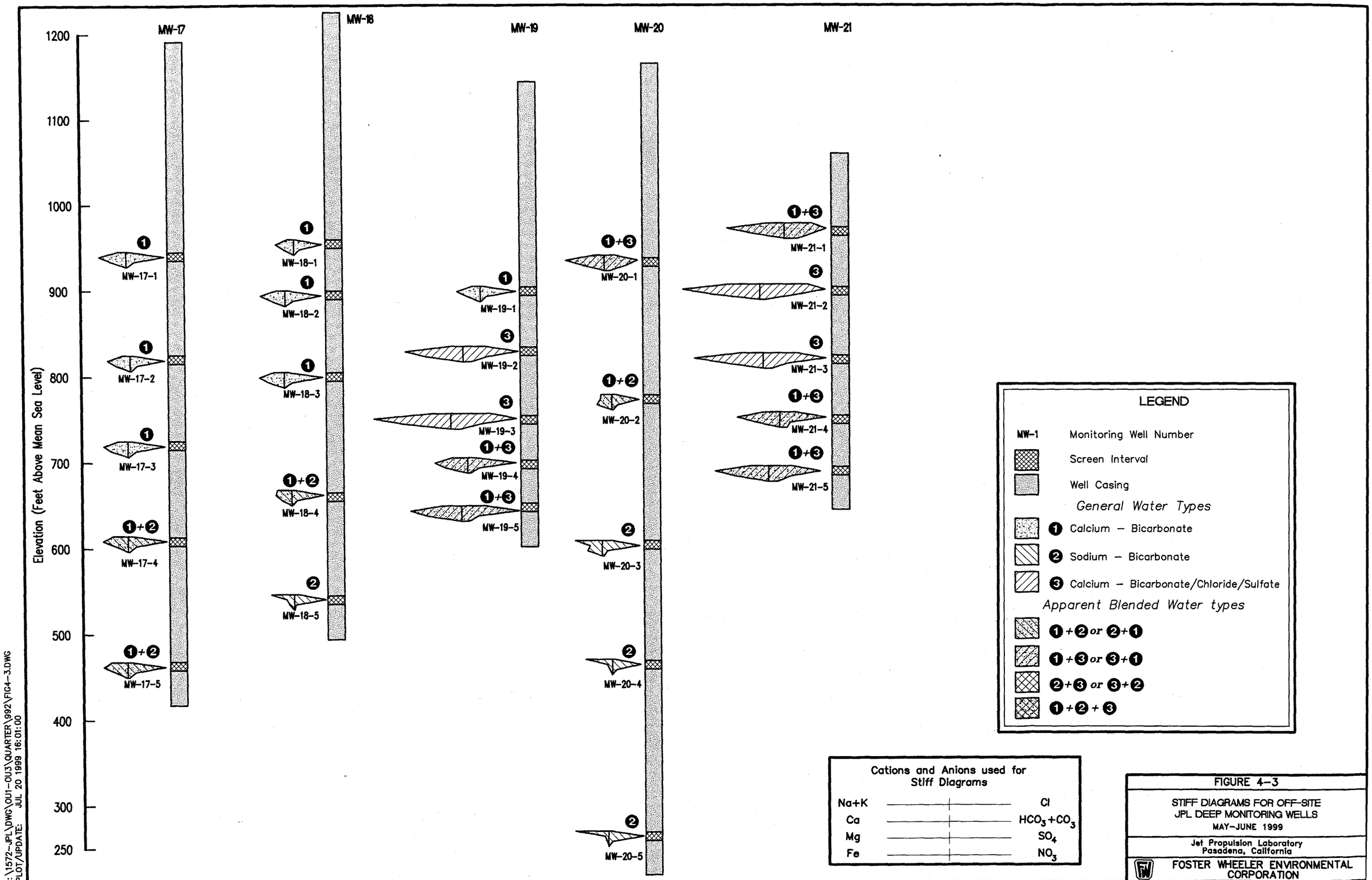

FIGURE 4-3

STIFF DIAGRAMS FOR OFF-SITE JPL DEEP MONITORING WELLS
MAY-JUNE 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG4-3.DWG
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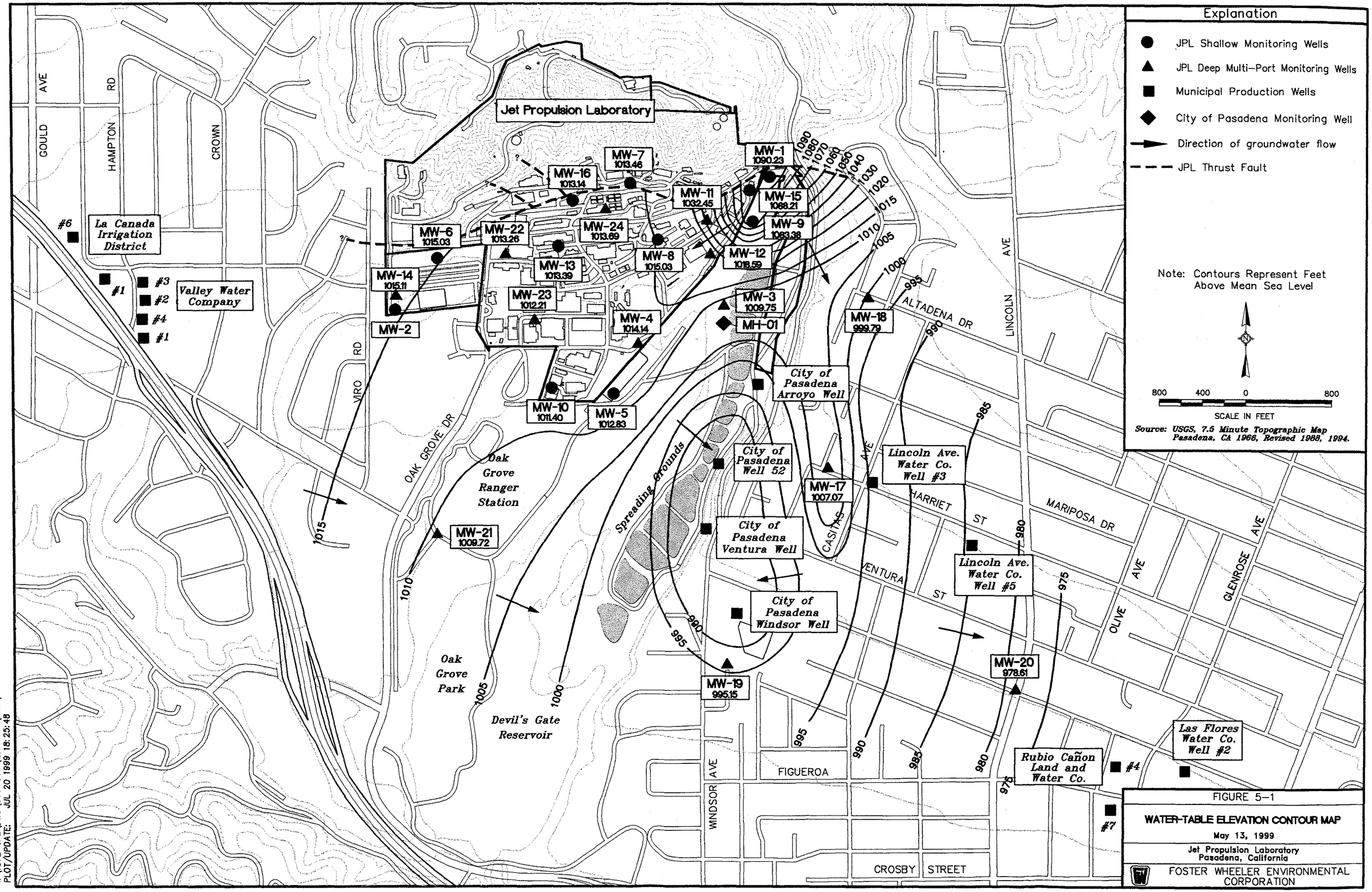

FIGURE 5-1

WATER-TABLE ELEVATION CONTOUR MAP

May 13, 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG5-1.DWG
PLOT/UPDATE: JUL 20 1999 18:25:48

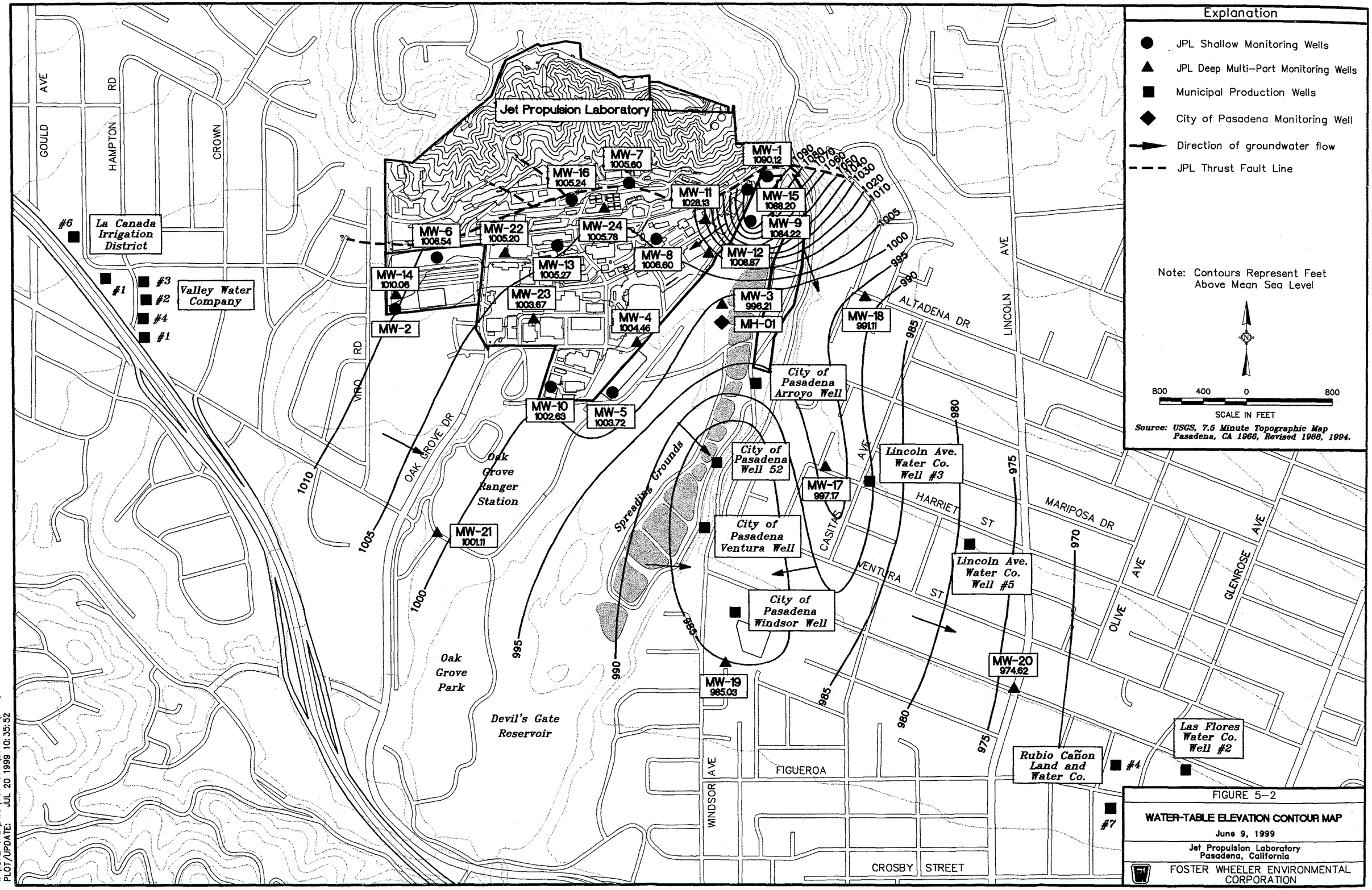

FIGURE 5-2

WATER-TABLE ELEVATION CONTOUR MAP

June 9, 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\992\FIG5-2.DWG
PLOT/UPDATE: JUL 20 1999 10:35:52

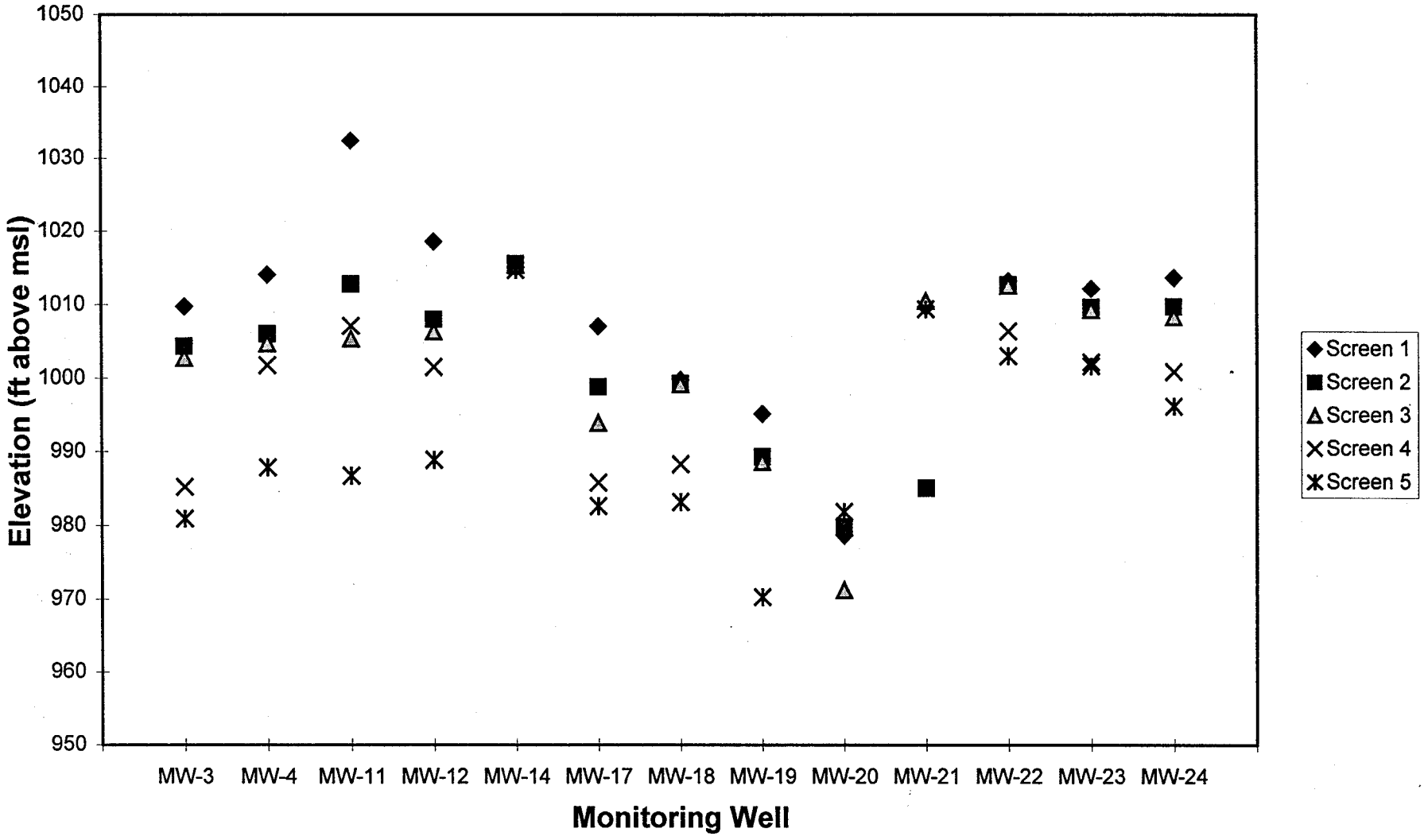

Figure 5-3

HYDRAULIC HEAD ELEVATIONS FROM DEEP (MP) WELLS

May 13, 1999

Jet Propulsion Laboratory
Pasadena, California

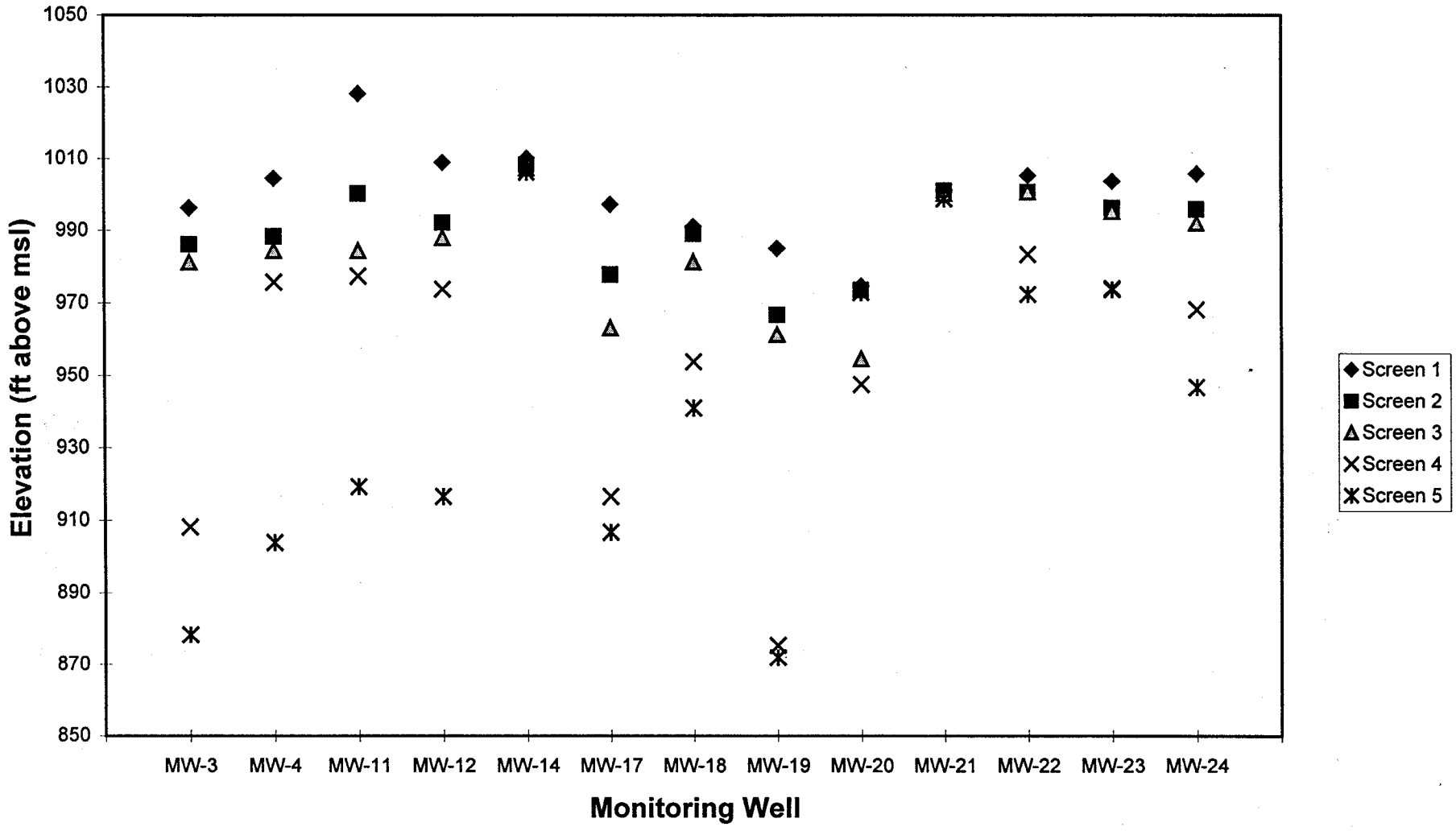

Figure 5-4

HYDRAULIC HEAD ELEVATIONS FROM DEEP (MP) WELLS

June 9,1999

Jet Propulsion Laboratory
Pasadena, California

APPENDIX A

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS FOR SHALLOW WELLS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6/8/99
Site Engineer: T. Mayes, J. Brenner, M. Hunt
Well Number: MW-1
Equipment: YSI 3500, Horiba U-10
Contractor: None

	Before	Reference Point	After
Depth to Water (ft)	26.61	Top of 4" casing	
Depth to Sediment (ft)	74.91	Top of 4" casing	
Thickness of Sediment (ft)	45.09		

Depth of Well (ft) 120
Diameter of Casing (ft) 0.333
Water Column Height (ft) 48.3

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 31.44

Casing Volumes Purged 1.91

Total Volume Purged (gals) 60

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1000	—	—	—	—	—	—	pump on, control set at 196 Hz; flow rate 2 gpm
1005	6.40	1.0	15.1	385	10.85	+166	Water Clear
1010	7.09	0.3	14.9	376	11.11	+159	Water Clear
1015	7.29	0.3	15.5	376	10.80	+159	Water Clear
1020	7.40	0.2	15.9	375	10.68	+153	Water Clear
1025	7.47	0.4	16.0	376	10.71	+144	Ready to Sample
1030	—	—	—	—	—	—	Collect MW-992-001
1032	—	—	—	—	—	—	Pump off

Notes Sampling Procedures: pump set @ approx 32 ft BTOC
Flow rate = 2 gpm

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572-0276
Date: 6/7/99
Site Engineer: J. Brenner, I. Mayes, M. Chin
Well Number: MW-5
Equipment: YSI 3500; DRT-15CE HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	67.41	Top of 4" casing	
Depth to Sediment (ft)	139.86	top of 4" casing	
Thickness of Sediment (ft)	0.14		

Depth of Well (ft) 140
Diameter of Casing (ft) 0.333
Water Column Height (ft) 72.45

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 47.16

Casing Volumes Purged 1.21

Total Volume Purged (gals) 57

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1330	—	—	—	—	—	—	Pump on; Control set at 218 Hz; Flow rate 1.9 gpm
1335	5.82	103	17.8	366	12.7	123	Water Cloudy
1340	6.27	261	18.6	366	13.37	122	Water Cloudy
1345	7.23	212	24.5	363	10.49	142	Water clearing
1350	7.42	2.6	18.0	362	12.45	171	water clear
1355	7.45	1.76	18.2	361	12.13	172	water clear
1358	7.47	1.65	18.1	360	12.13	168	ready to sample
1400	—	—	—	—	—	—	~~Ready to~~ Collect MW-992-013
1405	—	—	—	—	—	—	pump off

Notes Sampling Procedures: Pump set at Approx 76' BTOC
Flow RATE = ~~[illegible]~~ 1.9 gpm

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.026
Date: 6/7/99
Site Engineer: J. Breaux, I Mayes, M. Chin
Well Number: MW-6
Equipment: YSI 3500; DRT-15LE Horiba
Contractor: None

	Before	Reference Point	After
Depth to Water (ft)	179.45	TOP OF 4" CASING	179.45
Depth to Sediment (ft)	244.00	TOP OF 4" CASING	244.00
Thickness of Sediment (ft)	1.00		1.00

Depth of Well (ft) 245.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 64.55

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 42.08

Casing Volumes Purged 1.61

Total Volume Purged (gals) 67.5

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0925	—	—	—	—	—	—	Pump on; control set
							at 355 Hz Flowrate 1.5 gpm
0930	6.55	87.1	19.9	795	7.93	+020	water cloudy
0935	6.65	41.4	20.9	776	7.86	+022	water cloudy
0940	6.67	31.8	20.8	788	7.95	+023	water cloudy
0945	6.68	25.0	20.9	784	8.10	+025	water less cloudy
0950	6.69	13.0	20.6	775	8.07	+029	water clearing
0955	6.70	7.1	21.0	772	8.12	+028	water clear
1000	6.70	7.1	20.9	776	8.24	+031	water clear
1003	6.71	5.1	21.0	775	8.19	+031	water clear
1006	6.71	4.1	21.1	776	8.27	+32	Ready to Sample
1010	—	—	—	—	—	—	collect MW-992-014
1013	—	—	—	—	—	—	pump off

Notes Sampling Procedures: PUMP SET AT 180' BTOC
FLOW RATE = 1.5 gpm

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6/4/99
Site Engineer: J. Brenner, J. Mayes, M. Hunt
Well Number: MW-7
Equipment: YSI 3500; DRT ISUE HORIBA
Contractor: None

	Before	Reference Point	After
Depth to Water (ft)	206.52	TOP OF 4" CASING	206.52
Depth to Sediment (ft)	273.61	TOP OF 4" CASING	273.61
Thickness of Sediment (ft)	1.39		1.39

Depth of Well (ft) 275.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 67.11

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 43.69

Casing Volumes Purged 1.80

Total Volume Purged (gals) 78.75

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1040	—	—	—	—	—	—	Pump on; control set at 323 Hz. Flow rate 1.75 gpm
1045	6.69	23.0	23.0	.475	8.93	112	water cloudy
1105	6.76	149.2	23.0	.497	8.53	106	water cloudy
1110	6.79	49.6	22.9	.471	8.57	102	water clearing up
1115	6.76	5.72	22.5	.464	8.98	097	water clear
1120	6.73	4.76	22.3	.459	9.14	093	water clear
1123	6.78	3.48	22.3	.459	9.13	091	ready to sample
1125							collect MW-992-015
1126	—	—	—	—	—	—	PUMP OFF
1130	—	—	—	—	—	—	FIELD BLANK MW-992-200 COLLECTED AT MW-7

Notes Sampling Procedures: Pump set at approx 220' BTOC
Flow Rate = 1.75 gpm

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572-0276
Date: 6/7/99
Site Engineer: I. Mayes, J. Brenner, M. Child
Well Number: MW-8
Equipment: YSI 3500
HORIBA U-10
Contractor: None

	Before	Reference Point	After
Depth to Water (ft)	132.48	Top of 4" Casing	132.48
Depth to Sediment (ft)	202.25	Top of 4" Casing	202.25
Thickness of Sediment (ft)	2.75		2.75

Depth of Well (ft) 205
Diameter of Casing (ft) 0.333
Water Column Height (ft) 69.77

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 45.42

Casing Volumes Purged 1.10

Total Volume Purged (gals) 50

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1440	—	—	—	—	—	—	pump on; control set at
							280Hz; Flow rate 2.0 gpm
1445	7.09	4.5	20.7	347	11.90	+123	water clear
1450	7.15	3.4	21.1	339	11.88	+143	water clear
1455	7.14	1.3	21.2	342	11.84	+139	water clear
1500	7.16	1.5	22.0	343	11.83	+148	water clear
1503	7.17	1.5	21.5	343	12.06	+145	ready to sample
1505	—	—	—	—	—	—	collect MW-992-016
1507	—	—	—	—	—	—	pump off

Notes Sampling Procedures: Pump set at approx 140' BTOC
Flowrate = 2.0 gpm

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6-8-99
Site Engineer: M. Hunt, J. Brenner, & I. Mayes
Well Number: MW-9
Equipment: YSI 3500, Horiba U-10
Contractor: none

	Before	Reference Point	After
Depth to Water (ft)	21.88	Top of 4" casing	21.88
Depth to Sediment (ft)	69.57	Top of 4" casing	69.57
Thickness of Sediment (ft)	—		—

Depth of Well (ft) 68
Diameter of Casing (ft) 0.333
Water Column Height (ft) 47.69

Casing Volume (gals) =π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 31.05 (MZP)

Casing Volumes Purged 1.63

Total Volume Purged (gals) 50.75

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0856	—	—	—	—	—	—	pump on; control set at
0 (MZP)							190 Hz; Flow rate 1.75 gpm
0901	7.49	1	18.5	332	9.06	+043	Water Clear
0906	6.95	1	17.7	432	9.49	+68	Water Clear
0912	6.95	1.38	17.4	433	9.66	+57	Water Clear
0917	6.95	0.10	17.3	434	9.65	+58	Water Clear (MZP)
0922	6.96	0.07	17.3	435	9.55	+59	~~Water Clear~~ Ready to Sample
0924	—	—	—	—	—	—	Collect MW-992-017
0926	—	—	—	—	—	—	Pump off

Notes Sampling Procedures: pump set @ approx 27 ft BTOC
Flow rate = 1.75 gpm

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572-0276
Date: 6/7/99
Site Engineer: J. Bremner, I. Mayes, M. Chia
Well Number: MW-10
Equipment: YSI 3500, DRT-15CE, HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	84.65	Top of 4" casing	84.65
Depth to Sediment (ft)	154.4	Top of 4" casing	154.4
Thickness of Sediment (ft)	0.6		0.6

Depth of Well (ft) ~~2~~ 155
Diameter of Casing (ft) 0.333
Water Column Height (ft) 69.75
Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 45.40
Casing Volumes Purged 1.38
Total Volume Purged (gals) 62.5

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1100	—	—	—	—	—	—	Pump on; control set at
~~1105~~							259 Hz; Flow rate 2.5 gpm
1105	6.91	3.7	21.8	483	9.71	+064	water clear
1110	6.97	0.39	21.6	476	10.24	+058	water clear
1115	6.96	0.34	21.2	483	10.79	+057	water clear
1120	6.98	1.11	21.2	501	10.57	+058	water clear
1123	7.01	1.8	20.8	503	10.49	+056	ready to sample
1125	—	—	—	—	—	—	collect MW-992018
1130	—	—	—	—	—	—	~~pump off~~ collect MW-992-019
1133	—	—	—	—	—	—	pump off

Notes Sampling Procedures: Pump set at approx 90' BTOC
FLOW RATE = 2.5 gpm

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6/4/99
Site Engineer: J. BRONNER, M. HUNT, I. MAYES
Well Number: MW-13
Equipment: YSI 3500; DRT-15CE HORIBA
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	177.02	TOP OF 4" CASING	177.02
Depth to Sediment (ft)	234.92	TOP OF 4" CASING	234.92
Thickness of Sediment (ft)	0.08		0.08

Depth of Well (ft) 235.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 57.9

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 37.7

Casing Volumes Purged 1.27

Total Volume Purged (gals) 48

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0800	—	—	—	—	—	—	PUMP ON; CONTROL SET AT
							325 Hz; FLOW RATE = 1.6 gpm
0805	6.36	1.79	18.6	.510	7.95	143	WATER CLEAR
0810	6.35	0.71	20.7	.529	7.39	144	WATER CLEAR
0815	6.34	0.74	21.5	.538	7.37	140	WATER CLEAR
0820	6.38	0.68	21.3	.541	7.43	134	WATER CLEAR
0825	6.39	0.38	21.9	.543	7.59	128	WATER CLEAR
0825	6.41	0.38	21.9	.543	7.62	124	READY TO SAMPLE
0830	—	—	—	—	—	—	COLLECT MW-992-031
0835	—	—	—	—	—	—	COLLECT MW-992-032
~~0836~~	—	—	—	—	—	—	PUMP OFF
0840 MJH							

Notes Sampling Procedures: PUMP SET AT APPROX 190' BTOC
FLOW RATE = 1.6 gpm

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6/8/99
Site Engineer: M. Hunt, J. Brenner, I. Mayes
Well Number: MW-15
Equipment: YSI 3500, Horiba U-10
Contractor: None

	Before	Reference Point	After
Depth to Water (ft)	32.52	Top of 4" casing	32.52
Depth to Sediment (ft)	74.80	Top of 4" casing	74.80
Thickness of Sediment (ft)	—		—

Depth of Well (ft) 74
Diameter of Casing (ft) 0.333
Water Column Height (ft) 42.28

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 27.52

Casing Volumes Purged 1.91

Total Volume Purged (gals) 52.5

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1105	—	—	—	—	—	—	pump on; control set at 181 Hz flow rate 2.1 gpm
1110	5.75	0.80	17.2	425	10.20	+182	water clear
1115	6.62	0.10	17.2	434	10.16	+171	water clear
1120	6.99	0.40	17.1	436	10.24	+166	water clear
1125	7.10	0.80	17.3	437	10.28	+164	water clear
1128	7.16	0.40	17.2	438	10.19	+158	ready to sample
1130	—	—	—	—	—	—	collect MW-992-038
1133	—	—	—	—	—	—	pump off

Notes Sampling Procedures: Pump set at approx 40' BTOC
flow rate = ~~[illegible]~~ 2.1 gpm

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6/4/99
Site Engineer: J. Mayes, J. Bremer, M. Hurt
Well Number: MW-16
Equipment: YSI, 3500; DRT-15UE HORIBA
Contractor: None

	Before	Reference Point	After
Depth to Water (ft)	229.86	Top of 4" casing	229.86
Depth to Sediment (ft)	285	Top of 4" casing	285
Thickness of Sediment (ft)	0		0

Depth of Well (ft) 285
Diameter of Casing (ft) 0.333
Water Column Height (ft) 55.14

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 35.90

Casing Volumes Purged 0.84

Total Volume Purged (gals) 30

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1345	—	—	—	—	—	—	Pump on; control set at 354 Hz; Flow rate 1.5 gpm
1350	5.84	5.38	22.3	.493	9.01	089	water clear
1353	6.30	3.29	24.0	.511	8.43	083	water clear
1356	6.41	2.03	23.6	.514	8.31	081	water clear
1359	6.50	2.24	22.8	.511	8.40	079	water clear
1402	6.58	2.16	22.9	.509	8.38	077	ready to sample
1405							collect MW-992-039
1406	—	—	—	—	—	—	Pump off

Notes Sampling Procedures: Pump set at 240' BTOC
Flow rate = 1.5 gpm

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APPENDIX B

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS, PIEZOMETRIC PRESSURE PROFILE RECORDS, AND GROUNDWATER SAMPLING FIELD DATA SHEETS FOR DEEP MULTI-PORT WELLS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5/19/99
Site Engineer: J. BRENNER, T. TURPION, M. HUNT
Well Number: MW-3
Equipment: DRT-15CE, YSI 3500, HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0840	9.64	4.22	19.0	669	8.72	-265	1st RUN TO SCREEN 5 INITIAL PARAMETERS
0900	—	—	—	—	—	—	COLLECT MW-992-006
0940	9.65	3.19	18.7	725	9.20	-251	3rd RUN TO SCREEN #5; FINAL PARAMETERS
1015	8.65	1.51	19.7	771	8.94	-181	1st RUN TO SCREEN #4; INITIAL PARAMETERS
1045	—	—	—	—	—	—	COLLECT MW-992-005
1110	8.54	1.39	20.3	777	9.62	-136	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1135	8.57	1.76	19.9	968	10.03	-79	1st RUN TO SCREEN #3 INITIAL PARAMETER
1200	—	—	—	—	—	—	COLLECT MW-992-004
1220	8.54	1.70	21.1	979	10.19	-14	3RD RUN TO SCREEN #3 FINAL PARAMETERS
1240	8.07	3.14	19.2	443	11.26	-6	1st RUN TO SCREEN #2; INITIAL PARAMETERS
1305	—	—	—	—	—	—	COLLECT MW-992-003
1330	7.61	3.39	20.7	452	10.61	+23	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1344	7.88	4.60	20.4	950	~~950~~ 10.69	+32	1st run to Screen #1 initial parameters
1400	—	—	—	—	—	—	COLLECT MW-992-002, 002MS? -002MSD
1427	7.59	2.86	21.5	~~680~~ 950	10.08	+34	3RD RUN TO SCREEN 1; FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5/28/99
Site Engineer: M. HUNT, M. LOSI, I. MAYES
Well Number: MW-4
Equipment: DRT-15CE YSI 3500 HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0825	6.92	1.12	20.1	364	8.70	+150	1st run to screen #5, initial parameters
0845	—	—	—	—	—	—	Collect MW-992-012
0915	7.94	1.56	20.5	365	9.17	+135	3rd run to screen #5, final parameters
0935	8.17	2.90	20.3	356	9.28	+120	1st run to screen #4, initial parameters
1000	—	—	—	—	—	—	Collect MW-992-011
1020	8.30	3.25	20.6	360	9.50	+110	3rd run to screen #4, final parameters
1040	8.41	4.90	21.3	340	9.15	+103	1st run to screen #3, initial parameters
1100	—	—	—	—	—	—	Collect MW-992-010
1125	8.47	4.20	21.8	332	9.32	+97	3rd run to screen #3, final parameters
1145	7.55	1.80	20.0	374	9.37	+105	1st run to screen #1, initial parameters
1200	—	—	—	—	—	—	Collect MW-992-007
1220	7.33	2.05	19.5	~~201~~ 384	10.39	+092	3rd run to screen #1, final parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6/3/99
Site Engineer: J. BRENNER, M. HUNT

Well Number: MW-4
Equipment: DRT-15C, YSI 3500, HORIBA U-10
Contractor: MONS

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) $=\pi(\text{Diam. of Casing (ft)}/2)^2$ (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1540	6.07	4.50	17.6	608	8.91	+065	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1550	—	—	—	—	—	—	COLLECT MW-992-008
1610	—	—	—	—	—	—	COLLECT MW-992-009
1625	6.15	3.72	17.4	611	8.88	+071	4TH RUN TO SCREEN #2, FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Well Number: MW-11
Project Number: 1572.0276
Equipment: DRT-15CE, YSI 3500, Horiba U-10
Date: 5-25-99
Site Engineer: J. Brenner, M. Hunt, I. Mayes
Contractor: None

	Before	Reference Point	After
Depth to Water (ft)	*See Press. Profile Sheets		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1045	8.05	1.38	20.7	311	10.78	+72	1st run to screen 5, initial parameters
1115	—	—	—	—	—	—	Collect MW-992-024
1145	8.11	2.56	22.0	316	10.00	+59	3rd run to screen 5, final parameters
(MIN)	8.33	4.03	20.7	326	10.27	+10	
1220	~~8.10~~	~~2.28~~	~~22.3~~	~~320~~ (MAX)	~~9.67~~	~~+56~~	1st run to screen 4, initial parameters
1245	—	—	—	—	—	—	Collect MW-992-023
(MIN) 1310	8.28	2.47	21.7	343	9.64	+24	3rd run to screen 4, final parameters
1345	8.37	2.73	20.7	355	10.49	-72	1st run to screen 3, initial parameters
1410	—	—	—	—	—	—	Collect MW-992-022
1435	8.26	1.83	21.8	363	10.35	-101	3rd run to Screen 3, final parameters
1455	8.15	1.32	20.1	412	11.24	-82	1st RUN TO SCREEN #2, INITIAL PARAMETERS
1510	—	—	—	—	—	—	COLLECT MW-992-021, 021MS, -021MSD
1525	7.92	3.15	21.0	430	10.32	-50	3RD RUN TO SCREEN #2, FINAL PARAMETERS
1545	7.94	1.12	21.0	458	10.32	-52	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1600	—	—	—	—	—	—	COLLECT MW-992-020
1615	7.92	1.	19.0	453	10.70	-30	3RD RUN TO SCREEN #1, FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Well Number: MW-12
Project Number: 1572.0276
Equipment: DRT-15CE, YSI-3500, HORIBA
Date: 5/14/99
Site Engineer: J. BRENNAN, T. TURPIN
Contractor:

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) $=\pi(\text{Diam. of Casing (ft)}/2)^2$ (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
1330	8.42	1.66	20.4	502	11.40	93	1ST RUN TO SCREEN # 2; INITIAL PARAMETERS
1350	—	—	—	—	~~10.97~~	—	COLLECT MW-992-026
1355	—	—	—	—	—	—	COLLECT MW-992-027
1435	8.41	1.39	21.0	516	10.89	91	4TH RUN TO SCREEN # 2 FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6/1/99
Site Engineer: M. Hunt, J. Brenner, & I. Mayes
Well Number: MW-12
Equipment: YSI-3500, DRT-15CE, Horiba U-10
Contractor: none

	Before	Reference Point	After
Depth to Water (ft)	* See Press. Profile Sheets		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0930	7.49	3.15	19.5	392	10.02	+37	1st run to screen #5, initial parameters
0950	—	—	—	—	—	—	2nd run, collect MW-992-030
1020	7.70	3.60	20.0	396	9.73	+6	3rd run to screen #5, final parameters
1045	7.71	1.06	19.4	422	10.17	+6	1st run to screen #4, initial parameters
1100	—	—	—	—	—	—	2nd run, collect MW-992-029
1130	7.70	1.10	20.0	429	9.91	+6	3rd run to screen #4, final parameters
1150	7.73	0.75	19.0	454	10.24	+7	1st run to screen #3, initial parameters
1200	—	—	—	—	—	—	2nd run, collect MW-992-028
1230	7.55	0.74	21.0	475	10.72	+5	3rd run to screen #3, final parameters
1250	7.38	10.50	20.0	390	10.26	+5	1st run to screen #1, initial parameters
1305	—	—	—	—	—	—	2nd run, collect MW-992-025
1325	7.29	10.16	19.1	377	10.85	+7	3rd run to screen #1, final parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5/24/99
Site Engineer: J. BREWER, M. HUNT
Well Number: MW-14
Equipment: DRT-15CE, YSI 3500, HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) =π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0850	7.50	1.88	19.9	296	9.01	+122	1ST RUN TO SCREEN #5, INITIAL PARAMETERS
0920	—	—	—	—	—	—	COLLECT MW-992-037
0940	8.42	1.90	20.1	298	9.37	+50	3RD RUN TO SCREEN #5, FINAL PARAMETERS
1005	7.90	1.73	19.9	510	9.42	+61	1ST RUN TO SCREEN #4, INITIAL PARAMETERS
1030	—	—	—	—	—	—	COLLECT MW-992-036
1045	7.72	1.96	21.1	518	9.48	+44	3RD RUN TO SCREEN #4, FINAL PARAMETERS
1110	7.70	0.84	20.6	879	9.72	+112	1ST RUN TO SCREEN #3, INITIAL PARAMETERS
1130	—	—	—	—	—	—	COLLECT MW-992-035, -035MS, -035MSD
1145	7.61	1.18	20.8	895	9.63	+75	3RD RUN TO SCREEN #3, FINAL PARAMETERS
1210	7.03	4.37	20.3	1104	9.89	+55	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1225	—	—	—	—	—	—	COLLECT MW-992-034
1245	6.92	4.55	20.7	1114	9.76	+041	3RD RUN TO SCREEN #2, FINAL PARAMETERS
1300	6.72	3.36	20.3	1140	9.84	+039	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1320	—	—	—	—	—	—	COLLECT MW-992-033
1335	6.84	2.79	20.8	1159	9.61	+36	3RD RUN TO SCREEN #1, FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6-2-99
Site Engineer: M. Hunt, J. Brenner, + I. Mayes
Well Number: MW-17
Equipment: YSI-3500, DRT-15CE, Horiba U-10
Contractor: none

	Before	Reference Point	After
Depth to Water (ft)	* See Press. Profile Sheets		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0825	7.66	16.3	15.5	340	9.23	+149	1st run to screen #5, initial parameters
0850	—	—	—	—	—	—	2nd run, collect MW-992-044
0930	8.15	61.3	15.4	350	9.49	+131	3rd run to screen #5, final parameters
0955	8.02	7.91	15.4	351	9.47	+127	1st run to screen #4, initial parameters
1020	—	—	—	—	—	—	2nd run, collect MW-992-043
1045	8.07	10.7	13.6	336	9.49	+107	3rd run to screen #4, final parameters
1115	7.96	2.23	15.5	331	9.62	+111	1st run to screen #3, initial parameters
1130	—	—	—	—	—	—	2nd run to screen #3, collect MW-992-042
1130	—	—	—	—	—	—	3rd run to screen #3, collect MW-992-042
1200	7.97	2.71	15.6	334	9.69	+97	4th run to screen #3, final parameters
1225	7.92	1.63	15.5	302	9.79	+90	1st run to screen #2 initial parameters
1300	—	—	—	—	—	—	Collect MW-992-041 ~~044~~ 041
1320	7.93	4.67	15.4	300	9.65	+90	3rd run to screen #2, final parameters
1340	7.99	0.36	14.2	322	10.06	+89	1st run to screen #1, initial parameters
1400	—	—	—	—	—	—	Collect MW-992-040
1420	7.39	0.09	14.2	320	10.31	+84	3rd run to screen #1, final parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5/17/99
Site Engineer: J. BRENNER, M. HUNT
Well Number: MW-18
Equipment: DIP-15CE, YSI 3500, HORIBA U-10
Contractor: MONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0920	7.19	2.37	18.9	360	10.65	122	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
0950	—	—	—	—	—	—	COLLECT MW-992-049
1020	8.30	2.61	20.0	303	9.78	118	3RD RUN TO SCREEN # 5; FINAL PARAMETERS
1055	8.31	3.03	19.9	332	10.09	51	1ST RUN TO SCREEN # 4; INITIAL PARAMETERS
1120	—	—	—	—	—	—	COLLECT MW-992-048
1150	8.19	2.95	21.3	346	10.25	22	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1220	8.31	2.07	20.5	418	10.95	-53	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1300	—	—	—	—	—	—	COLLECT MW-992-047; -047MS; -047MSD
1320	8.17	1.96	21.0	435	10.21	-42	3RD RUN TO SCREEN # 3; FINAL PARAMETERS
1350	7.37	4.07	21.1	415	10.20	-46	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1410	—	—	—	—	—	—	COLLECT MW-992-046
1430	7.74	4.09	21.3	416	10.52	-23	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1455	7.54	2.79	21.0	314	10.60	-10	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1515	—	—	—	—	—	—	COLLECT MW-992-045
1535	7.53	3.55	20.5	310	11.64	-003	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0274
Date: 5/18/99
Site Engineer: J. BRENNER, T. TURPIN, M. HUST
Well Number: MW-19
Equipment: DRT-15CE, YSI 3500, HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0858	6.95	1.66	18.3	337	9.49	62	1ST RUN TO SCREEN 5 initial parameters
	—	—	—	—	—	—	collect MW-992-054
0955	7.78	0.23	18.8	716	10.21	69	3RD RUN TO SCREEN 5 Final Parameters
1030	7.79	1.70	19.0	469	10.57	67	1ST RUN TO SCREEN #4. INITIAL PARAMETERS
1050	—	—	—	—	—	—	COLLECT MW-992-053
1125	8.02	1.88	21.1	970	10.53	50	3RD RUN TO SCREEN #4, FINAL PARAMETERS
1150	7.04	2.45	21.2	990	10.51	67	1ST RUN TO SCREEN # 3, INITIAL PARAMETERS
1210	—	—	—	—	—	—	COLLECT MW-992-052
1235	7.11	1.96	22.3	990	1050	56	3RD RUN TO SCREEN #3; FINAL PARAMETERS
1300	7.13	2.34	21.0	739	11.18	103	1ST RUN TO SCREEN # 2; INITIAL PARAMETERS
1315	—	—	—	—	—	—	COLLECT MW-992-051
1346	6.85	7.21	22.0	739	12.13	106	3RD RUN TO SCREEN # 2; FINAL PARAMETERS
1407	7.72	5.03	23.4	711	11.73	95	1ST RUN TO SCREEN 1
1430	—	—	—	—	—	—	COLLECT MW-992-050
1446	7.71	5.52	23.4	679	13.31	110	3RD RUN TO SCREEN #1. FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5/20/99
Site Engineer: J. BRENNAR, M. HUNT
Well Number: MW-20
Equipment: DRT-15CE, YSI 3500, HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0850	9.06	2.72	17.5	320	8.83	-173	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0920	—	—	—	—	—	—	COLLECT MW-992-059
1000	9.37	2.54	17.2	314	9.39	-192	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1030	8.94	2.36	17.6	261	9.40	-179	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1100	—	—	—	—	—	—	COLLECT MW-992-058
1125	8.86	2.33	17.9	289	9.65	-164	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1155	8.55	0.97	18.0	432	9.81	-120	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1215	—	—	—	—	—	—	COLLECT MW-992-057
1240	8.54	1.43	18.9	457	9.78	-49	3RD RUN TO SCREEN #3; FINAL PARAMETERS
1305	8.83	0.89	18.3	312	10.69	-76	1ST RUN; TO SCREEN #2; INITIAL PARAMETERS
1330	—	—	—	—	—	—	COLLECT MW-992-056
1350	8.79	1.40	18.8	316	10.86	-060	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1415	7.89	1.09	19.3	595	10.83	-21	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1430	—	—	—	—	—	—	COLLECT MW-992-055; 055MS + 055MSD
1450	7.91	0.98	19.5	587	10.73	-26	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5/21/99
Site Engineer: J. BRUNNER, M. HUNT
Well Number: MW-21
Equipment: YSI 3500, DRT-15CE, HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0840	7.36	3.27	18.2	716	8.97	+137	1ST RUN TO SCREEN #5, INITIAL PARAMETERS
0900	—	—	—	—	—	—	COLLECT MW-992-064
0915	7.62	10.1	18.7	712	8.89	+130	3RD RUN TO SCREEN #5, FINAL PARAMETERS
0945	7.32	7.63	18.9	577	9.12	+121	1ST RUN TO SCREEN #4
1000	—	—	—	—	—	—	COLLECT MW-992-063
1020	7.29	3.11	18.4	567	9.27	+113	3RD RUN TO SCREEN #4, FINAL PARAMETERS
1045	7.33	2.21	18.3	874	9.29	+114	1ST RUN TO SCREEN #3
1100	—	—	—	—	—	—	COLLECT MW-992-062
1115	7.25	1.43	19.5	887	9.44	+108	3RD RUN TO SCREEN #3 FINAL PARAMETERS
1135	7.67	0.83	18.5	1047	9.59	+105	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1145	—	—	—	—	—	—	COLLECT MW-992-061, 061MS, 061MSD
1205	7.43	1.09	18.9	1035	9.45	+102	3RD RUN TO SCREEN #2 FINAL PARAMETERS
1220	7.27	2.83	18.9	776	9.75	+102	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1240	—	—	—	—	—	—	COLLECT MW-992-060
1255	6.81	1.57	19.3	789	9.92	+100	3RD RUN TO SCREEN #1, FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5-27-99
Site Engineer: J. Brenner + M. Hunt
Well Number: MW-22
Equipment: YSI 3500, DRT-ECE Horiba U-10
Contractor: none

	Before	Reference Point	After
Depth to Water (ft)	*See Press. Profile Sheets		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____

Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____

Casing Volumes Purged _____

Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0855	8.77	4.71	19.6	335	8.65	-167	1st run to screen #5, initial parameters
0920	—	—	—	—	—	—	Collect MW-992-069
0950	8.96	2.53	20.4	356	8.73	-175	3rd run to screen #5, final parameters
1015	7.92	4.08	20.6	339	8.88	-106	1st run to screen #4, initial parameters
1030	—	—	—	—	—	—	Collect MW-992-068
1100	7.67	5.37	21.4	344	9.03	-46	3rd run to screen #4, final parameters
1125	7.86	3.68	21.5	476	9.23	-41	1st run to screen #3, initial parameters
1145	—	—	—	—	—	—	Collect MW-992-067
1210	7.80	4.42	23.7	506	9.01	-26	3rd run to screen #3, final parameters
1230	7.81	4.50	22.4	602	9.59	-21	1st run to screen #2, initial parameters
1250	—	—	—	—	—	—	Collect MW-992-066
1315	7.73	7.51	23.6	623	9.57	-10	3rd run to screen #2, final parameters
1340	6.99	37.6	22.9	1102	10.06	-7	1st run to screen #1, initial parameters
1355	—	—	—	—	—	—	Collect MW-992-065
1420	6.79	35.4	25.3	1201	10.14	-10	3rd run to screen #1, final parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 5/26/99
Site Engineer: J. BRENNER, M. HUNT, I. MAYES
Well Number: MW-23
Equipment: DRI-ISC, YSI 3500, HORIBA U-10
Contractor: NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) $=\pi$(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0910	9.37	2.41	20.0	486	8.67	-130	1st run to screen #5, initial parameters
0930	—	—	—	—	—	—	Collect MW-992-074
1005	9.47	2.46	21.8	514	9.12	-160	3rd run to screen #5, final parameters
1025	8.12	1.98	22.0	362	9.32	-86	1st run to screen #4, initial parameters
1045	—	—	—	—	—	—	Collect MW-992-073
1115	7.81	3.79	22.1	355	9.57	-26	3rd run to screen #4, final parameters
1130	7.74	7.52	21.9	467	9.95	-29	1st run to screen #3, initial parameters
1145	—	—	—	—	—	—	Collect MW-992-072
1210	7.54	5.89	24.5	259	9.41	-14	3rd run to screen #3, final parameters
1230	7.31	0.85	21.8	964	10.33	-17	1st run to screen #2, initial parameters
1245	—	—	—	—	—	—	Collect MW-992-071
1310	7.22	1.10	24.6	567	9.62	-16	3rd run to screen #2, final parameters
1325	6.99	3.89	22.5	1021	10.11	-11	1st run to screen #1, initial parameters
1345	—	—	—	—	—	—	Collect MW-992-070
1405	6.76	6.50	23.6	1048	10.54	+7	3rd run to screen #1, final parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name: JPL
Project Number: 1572.0276
Date: 6-3-99
Site Engineer: M. Hunt, J. Brenner, + M. Chin
Well Number: MW-24
Equipment: YSI-3500, DRT-15CE, Horiba U-10
Contractor: none

	Before	Reference Point	After
Depth to Water (ft)	*See Press. Profile	Sheets	
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) =π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp (°C)	Conductivity (µmhos)	Dissolved Oxygen (mg/L)	Eh (mV)	Comments
0850	7.52	5.80	18.3	360	8.47	+142	1st run to screen #5, initial parameters
0915	—	—	—	—	—	—	2nd run, collect MW-992-079
0945	7.55	4.50	17.8	358	8.64	+122	3rd run to screen #5, final parameters
1015	8.31	10.00	18.6	306	8.41	+99	1st run to screen #4, initial parameters
1030	—	—	—	—	—	—	2nd run, collect MW-992-078
1105	8.41	11.65	19.9	319	8.41	+88	3rd run to screen #4, final parameters
1135	7.69	27.2	19.5	398	8.59	+87	1st run to screen #3, initial parameters
1145	—	—	—	—	—	—	2nd run, collect MW-992-077
1215	7.50	12.6	18.9	402	8.70	+73	3rd run to screen #3, final parameters
		5.4 MJH					
1245	7.99	~~15.4~~	18.8	349	8.64	+63	1st run to screen #2, initial parameters
1300	—	—	—	—	—	—	2nd run, collect MW-992-076
1325	8.07	5.83	18.6	342	8.52	+57	3rd run to screen #2, final parameters
1350	7.39	4.30	18.1	361	8.90	+61	1st run to screen #1, initial parameters
1400	—	—	—	—	—	—	2nd run, collect MW-992-075
1400	—	—	—	—	—	—	3rd run, collect MW-992-075
1450	7.20	6.50	18.5	360	8.66	+54	~~3rd~~ 4th run to screen #1, final parameters MJH

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-3
Elevation of atum(ft msl): 1100.34
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.13/20.97/1144
Finish: 14.09/20.44/1543

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	653	163.08			22.42	1147		119.39	980.95
			245.45						
			245.43						
			245.41						
				163.06					
4	558	121.59			24.44	1533		115.09	985.25
			206.12						
			206.10						
			206.12						
				121.58					
3	346	29.63			22.66	1537		97.62	1002.72
			121.77						
			121.79						
			121.79						
				29.64					
2	252	14.19			21.59	1539		96.03	1004.31
			81.73						
			81.71						
			81.73						
				18.18					
1	172	14.18			20.55	1541		90.59	1009.75
			49.41						
			49.39						
			49.41						
				14.16					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-4
Elevation of atum(ft msl): 1082.84
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.11/20.47/1625
Finish: 14.09/20.49/1639

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	513	125.53			21.73	1628		94.96	987.88
			195.33						
			195.30						
			195.33						
				125.53					
4	392	72.93			22.06	1630		81.08	1001.76
			148.89						
			148.87						
			148.89						
				72.91					
3	322	42.52			21.42	1633		78.15	1004.69
			119.78						
			119.81						
			119.84						
				42.50					
2	240	14.25			21.08	1635		76.84	1006.00
			84.84						
			84.79						
			84.86						
				14.25					
1	150	14.21			20.69	1637		68.70	1014.14
			49.32						
			49.34						
			49.37						
				14.23					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing Probe Type: Westbay Date: 5/13/99 Job No.: 1572

Serial No.: 1455 Well Name: MW-11

Elevation of Range: 0 to 750 psia Client: Jet Propulsion Laboratory

atum(ft msl): 1139.30 Weather: 65 degrees, overcast Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/T. Turpijn-Keasler

Ambient Reading (Pressure/Temperature/Time) Start: 14.14/20.52/1714 Finish: 14.16/18.37/1727

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	639	224.76			21.35	1717		152.53	986.77
			225.04						
			225.02						
			225.04						
				224.75					
4	524	175.23			21.34	1720		132.23	1007.07
			183.99						
			183.97						
			183.99						
				175.23					
3	429	134.33			20.89	1722		133.95	1005.35
			142.04						
			142.06						
			142.06						
				134.33					
2	259	60.77			19.74	1724		126.48	1012.82
			71.62						
			71.57						
			71.60						
				60.78					
1	149	14.20			18.71	1726		106.85	1032.45
			32.43						
			32.41						
			32.43						
				14.20					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-12
Elevation of atum(ft msl): 1102.14
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.13/22.99/1609
Finish: 14.11/17.96/1621

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	548	244.59			21.78	1612		113.26	988.88
			202.57						
			202.55						
			202.62						
				244.62					
4	436	195.87			21.90	1614		100.62	1001.52
			159.51						
			159.48						
			159.53						
				195.89					
3	323	146.68			20.61	1616		95.83	1006.31
			112.57						
			112.61						
			112.62						
				146.68					
2	243	111.91			19.50	1618		94.15	1007.99
			78.65						
			78.61						
			78.68						
				111.88					
1	140	67.10			18.55	1620		83.55	1018.59
			38.58						
			38.61						
			38.58						
				67.07					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-14
Elevation of atum(ft msl): 1173.47
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.12/20.36/1832
Finish: 14.14/19.85/1841

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	540	174.93			20.94	1833		158.75	1014.72
			179.41						
			179.39						
			179.41						
				174.94					
4	456	138.42			21.29	1835		158.10	1015.37
			143.29						
			143.26						
			143.26						
				138.39					
3	382	106.20			20.88	1837		158.04	1015.43
			111.21						
			111.23						
			111.21						
				106.19					
2	277	60.50			20.30	1838		157.87	1015.60
			65.78						
			65.76						
			65.78						
				60.51					
1	207	30.11			19.95	1840		158.36	1015.11
			35.21						
			35.23						
			35.21						
				30.13					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-17
Elevation of atum(ft msl): 1191.21
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.13/18.85/0900
Finish: 14.14/15.94/0938

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	726	188.35			20.24	908		208.58	982.63
			238.44						
			238.43						
			238.44						
				188.34					
4	582	125.79			17.30	930		205.39	985.82
			177.42						
			177.37						
			177.39						
				125.79					
3	468	76.20			17.20	932		197.33	993.88
			131.48						
			131.45						
			131.48						
				76.20					
2	370	33.66			16.47	934		192.39	998.82
			91.14						
			91.11						
			91.14						
				33.66					
1	250	14.24			16.16	936		184.14	1007.07
			42.66						
			42.68						
			42.71						
				14.26					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-18
Elevation of atum(ft msl): 1225.41
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.11/16.60/0947
Finish: 14.11/17.58/1006

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	684	148.32			21.04	952		242.22	983.19
			205.60						
			205.62						
			205.65						
				148.32					
4	564	96.22			21.15	956		237.13	988.28
			155.81						
			155.78						
			155.83						
				96.22					
3	424	35.43			19.64	958		226.28	999.13
			99.81						
			99.84						
			99.81						
				35.41					
2	330	14.25			18.52	1000		226.12	999.29
			59.16						
			59.14						
			59.12						
				14.23					
1	270	14.21			18.09	1002		225.62	999.79
			33.34						
			33.36						
			33.34						
				14.23					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-19
Elevation of atum(ft msl): 1142.94
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.21/17.82/1109
Finish: 14.15/19.79/1134

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	498	91.79			18.14	1111		172.68	970.26
			155.23						
			155.18						
			155.21						
				91.79					
4	444	68.32			18.25	1113		172.68	970.26
			131.79						
			131.81						
			131.79						
				68.34					
3	392	45.74			18.17	1114		154.34	988.60
			117.20						
			117.22						
			117.20						
				45.74					
2	314	14.35			18.18	1116		153.62	989.32
			83.68						
			83.73						
			83.70						
				14.33					
1	242	14.22			20.02	1132		147.79	995.15
			55.04						
			55.01						
			55.01						
				14.21					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-20
Elevation of atum(ft msl): 1165.05
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.23/18.64/1021
Finish: 14.14/17.44/1100

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	900	264.19			22.55	1028		183.19	981.86
			324.93						
			324.91						
			324.93						
				264.18					
4	700	177.22			22.40	1033		185.33	979.72
			237.28						
			237.30						
			237.30						
				177.20					
3	562	117.20			20.06	1052		193.85	971.20
			173.77						
			173.80						
			173.77						
				117.19					
2	392	43.50			19.13	1055		185.24	979.81
			103.82						
			103.79						
			103.84						
				43.42					
1	230	14.23			17.69	1058		186.44	978.61
			33.09						
			33.05						
			33.07						
				14.23					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-21
Elevation of atum(ft msl): 1059.10
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.20/19.53/1856
Finish: 14.20/19.26/1909

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	372	135.89			19.98	1859		49.73	1009.37
			153.91						
			153.89						
			153.91						
				135.89					
4	310	108.91			20.16	1901		49.72	1009.38
			127.04						
			127.02						
			127.04						
				108.93					
3	240	78.95			19.97	1903		48.60	1010.50
			97.17						
			97.15						
			97.20						
				78.92					
2	161	45.12			19.48	1904		74.03	985.07
			51.91						
			51.89						
			51.91						
				45.12					
1	90	14.22			19.25	1906		49.38	1009.72
			31.80						
			31.82						
			31.80						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-22
Elevation of atum(ft msl): 1176.98
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.15/19.69/1810
Finish: 14.16/20.68/1624

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	588	178.04			21.09	1813		173.97	1003.01
			193.63						
			193.65						
			193.63						
				178.02					
4	467	125.66			21.79	1815		170.64	1006.34
			142.65						
			142.63						
			142.60						
				125.66					
3	389	91.82			21.73	1819		164.36	1012.62
			111.53						
			111.53						
			111.55						
				91.80					
2	329	65.83			21.43	1821		164.23	1012.75
			85.59						
			85.57						
			85.59						
				65.83					
1	245	29.02			20.93	1823		163.72	1013.26
			49.39						
			49.37						
			49.41						
				29.03					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-23
Elevation of atum(ft msl): 1108.84
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.18/20.73/1650
Finish: 14.19/20.44/1702

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	542	191.84			21.38	1652		107.21	1001.63
			202.64						
			202.67						
			202.69						
				191.88					
4	445	149.87			21.95	1654		106.70	1002.14
			160.83						
			160.85						
			160.83						
				149.87					
3	319	95.29			21.52	1656		99.57	1009.27
			109.30						
			109.32						
			109.30						
				95.29					
2	254	67.19			21.13	1658		99.18	1009.66
			81.29						
			81.32						
			81.29						
				67.17					
1	174	32.49			20.60	1700		96.63	1012.21
			47.71						
			47.73						
			47.73						
				32.50					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 5/13/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-24
Elevation of atum(ft msl): 1200.94
Range: 0 to 750 psia
Weather: 65 degrees, overcast
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/T. Turpijn-Keasler
Ambient Reading (Pressure/Temperature/Time) Start: 14.18/18.53/1744
Finish: 14.16/20.76/1756

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	678	205.71			20.71	1746		204.77	996.17
			219.32						
			219.30						
			219.33						
				205.70					
4	554	152.04			21.53	1748		200.08	1000.86
			167.60						
			167.58						
			167.60						
				152.02					
3	435	100.48			21.71	1750		192.67	1008.27
			119.23						
			119.20						
			119.23						
				100.43					
2	373	73.57			21.65	1752		191.24	1009.70
			92.97						
			92.95						
			92.97						
				73.55					
1	279	32.83			21.25	1754		187.25	1013.69
			53.95						
			53.93						
			53.95						
				32.83					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-3
Elevation of atum(ft msl): 1100.34
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.35/21.03/1100
Finish: 14.29/19.98/1118

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	653	163.16			23.21	1107		222.13	878.21
			201.14						
			201.07						
			201.09						
				163.13					
4	558	121.92			23.38	1109		192.21	908.13
			172.92						
			172.90						
			172.85						
				121.89					
3	346	29.86			22.13	1111		119.17	981.17
			112.67						
			112.65						
			112.63						
				29.87					
2	252	14.37			20.97	1113		114.25	986.09
			74.06						
			74.04						
			74.01						
				14.38					
1	172	14.31			20.31	1115		104.13	996.21
			43.78						
			43.75						
			43.70						
				14.34					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-4
Elevation of atum(ft msl): 1082.84
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.33/24.25/1335
Finish: 14.26/20.92/1350

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	513	125.36			23.46	1338		179.02	903.82
			159.05						
			159.07						
			159.10						
				125.39					
4	392	72.78			22.88	1340		107.14	975.70
			137.74						
			137.79						
			137.81						
				72.78					
3	322	42.39			22.29	1342		98.44	984.40
			111.18						
			111.21						
			111.23						
				42.37					
2	240	14.39			21.64	1344		94.54	988.30
			77.31						
			77.36						
			77.38						
				14.39					
1	150	14.35			21.16	1346		78.38	1004.46
			45.29						
			45.36						
			45.38						
				14.42					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-11
Elevation of atum(ft msl): 1139.30
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.35/21.13/1420
Finish: 14.33/18.39/1434

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	639	188.56			21.44	1422		220.04	919.26
			195.94						
			195.96						
			195.98						
				188.60					
4	524	139.08			21.66	1424		161.93	977.37
			171.27						
			171.30						
			171.32						
				139.11					
3	429	98.25			20.94	1426		154.94	984.36
			133.11						
			133.14						
			133.18						
				98.23					
2	259	24.71			19.28	1428		139.17	1000.13
			66.25						
			66.29						
			66.32						
				24.74					
1	149	14.28			18.55	1430		111.17	1028.13
			30.70						
			30.75						
			30.77						
				14.30					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-12
Elevation of atum(ft msl): 1102.14
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.35/22.70/1354
Finish: 14.28/18.18/1410

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	548	165.67			22.11	1357		185.58	916.56
			171.40						
			171.42						
			171.45						
				165.70					
4	436	117.00			20.62	1359		128.35	973.79
			147.66						
			147.68						
			147.71						
				117.02					
3	323	67.88			19.97	1401		114.16	987.98
			104.82						
			104.85						
			104.87						
				67.88					
2	243	33.07			18.79	1403		110.02	992.12
			71.98						
			71.96						
			71.94						
				33.09					
1	140	14.33			18.14	1405		93.27	1008.87
			34.53						
			34.56						
			34.63						
				14.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-14
Elevation of atum(ft msl): 1173.47
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.30/21.48/1537
Finish: 14.27/19.90/1550

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	540	159.75			21.42	1539		167.37	1006.10
			175.80						
			175.82						
			175.84						
				159.72					
4	456	123.24			21.50	1541		166.32	1007.15
			139.84						
			139.86						
			139.89						
				123.21					
3	382	91.02			21.07	1543		166.15	1007.32
			107.83						
			107.86						
			107.88						
				91.04					
2	277	45.39			20.37	1545		165.27	1008.20
			62.68						
			62.73						
			62.75						
				45.36					
1	207	15.00			19.98	1547		163.41	1010.06
			33.13						
			33.18						
			33.23						
				15.02					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-17
Elevation of atum(ft msl): 1191.21
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.18/19.12/0835
Finish: 14.21/1609/0900

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	726	187.90			19.43	840		284.52	906.69
			205.59						
			205.57						
			205.57						
				187.91					
4	582	125.38			19.60	842		274.67	916.54
			147.41						
			147.43						
			147.43						
				125.37					
3	468	75.82			16.72	844		228.14	963.07
			118.16						
			118.18						
			118.18						
				75.81					
2	370	33.31			16.41	856		213.43	977.78
			82.05						
			82.08						
			82.08						
				33.29					
1	250	14.29			16.16	858		194.04	997.17
			38.46						
			38.44						
			38.46						
				14.24					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-18
Elevation of atum(ft msl): 1225.41
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.26/17.50/0930
Finish: 14.16/17.99/0945

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	684	147.99			19.81	933		284.45	940.96
			187.40						
			187.42						
			187.42						
				147.02					
4	564	95.88			20.75	935		271.70	953.71
			140.91						
			140.93						
			140.93						
				95.86					
3	424	35.16			20.02	937		244.17	981.24
			92.17						
			92.14						
			92.19						
				35.18					
2	330	14.35			18.89	939		236.27	989.14
			54.84						
			54.87						
			54.82						
				14.32					
1	270	14.30			18.33	941		234.30	991.11
			29.92						
			29.90						
			29.24						
				14.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-19
Elevation of atum(ft msl): 1142.94
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.27/19.26/1030
Finish: 14.28/17.69/1045

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	498	92.70			19.00	1033		271.04	871.90
			112.64						
			112.66						
			112.69						
				92.72					
4	444	69.22			18.40	1035		267.66	875.28
			90.69						
			90.72						
			90.74						
				69.25					
3	392	46.71			18.05	1037		181.65	961.29
			105.42						
			105.49						
			105.47						
				46.74					
2	314	14.40			18.12	1039		176.21	966.73
			74.01						
			74.03						
			73.98						
				14.45					
1	242	14.35			17.80	1041		157.91	985.03
			50.79						
			50.72						
			50.67						
				14.38					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-20
Elevation of atum(ft msl): 1165.05
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.25/19.45/1000
Finish: 14.18/18.15/1015

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	900	263.66			21.63	1005		192.25	972.80
			321.01						
			321.04						
			321.02						
				263.67					
4	700	176.78			22.41	1007		217.58	947.47
			223.37						
			223.34						
			223.32						
				176.76					
3	562	116.76			21.84	1010		210.51	954.54
			166.58						
			166.60						
			166.58						
				116.73					
2	392	42.89			20.26	1012		191.48	973.57
			101.13						
			101.16						
			101.13						
				42.92					
1	230	14.27			18.65	1014		190.43	974.62
			31.36						
			31.38						
			31.36						
				14.30					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-21
Elevation of atum(ft msl): 1059.10
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.33/21.00/1555
Finish: 16.10/19.45/1610

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	372	135.58			20.97	1600		60.45	998.65
			150.25						
			150.28						
			150.28						
				135.61					
4	310	108.71			20.86	1602		60.35	998.75
			123.43						
			123.45						
			123.43						
				108.69					
3	240	78.70			20.04	1604		58.97	1000.13
			93.70						
			93.68						
			93.70						
				78.70					
2	161	44.37			19.68	1606		58.08	1001.02
			59.82						
			59.85						
			59.82						
				44.39					
1	90	14.37			19.46	1608		57.99	1001.11
			29.06						
			29.11						
			29.11						
				14.29					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-22
Elevation of atum(ft msl): 1176.98
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.25/21.61/1515
Finish: 14.23/20.68/1530

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	588	177.93			22.40	1518		204.63	972.35
			180.41						
			180.43						
			180.45						
				177.96					
4	467	125.54			22.37	1520		193.67	983.31
			132.70						
			132.73						
			132.75						
				125.56					
3	389	91.75			22.04	1522		176.37	1000.61
			106.39						
			106.42						
			106.44						
				91.73					
2	329	65.73			21.51	1524		176.35	1000.63
			80.39						
			80.41						
			80.44						
				65.70					
1	245	28.92			20.92	1526		171.78	1005.20
			45.95						
			45.97						
			46.02						
				28.93					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-23
Elevation of atum(ft msl): 1108.84
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.24/15.72/0805
Finish: 14.31/20.06/1820

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	542	183.22			19.33	810		135.23	973.61
			190.62						
			190.59						
			190.62						
				183.24					
4	445	141.20			20.57	812		134.87	973.97
			148.71						
			148.73						
			148.71						
				141.23					
3	319	86.64			20.66	814		113.60	995.24
			103.33						
			103.31						
			103.31						
				86.67					
2	254	58.48			20.44	816		112.67	996.17
			75.55						
			75.53						
			75.55						
				58.50					
1	174	23.88			20.09	818		105.17	1003.67
			44.10						
			44.14						
			44.10						
				23.91					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 6/9/99
Job No.: 1572
Serial No.: 1455
Well Name: MW-24
Elevation of atum(ft msl): 1200.94
Range: 0 to 750 psia
Weather: 70 degrees, sunny
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner/M. Hunt/I. Mayes
Ambient Reading (Pressure/Temperature/Time) Start: 14.24/19.96/1449
Finish: 14.28/20.89/1504

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	678	205.51			21.94	1452		254.27	946.67
			197.92						
			197.95						
			197.97						
				205.54					
4	554	151.83			22.16	1454		232.77	968.17
			153.49						
			153.51						
			153.54						
				151.80					
3	435	100.28			22.13	1456		208.92	992.02
			112.23						
			112.26						
			112.31						
				100.26					
2	373	73.42			22.04	1458		205.03	995.91
			87.03						
			87.07						
			87.13						
				73.45					
1	279	32.73			21.41	1500		195.16	1005.78
			50.58						
			50.61						
			50.63						
				32.71					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 172 Date: 5/19/99

Well Name: MW-3 Sampling Zone No.: 1 Starting Time: 1327 Finishing Time: 1430

Technicians J. BRENNER, T. TURPIN-KEASLER, M. HUNT

Water Level Inside MP Casing (Beginning of Session) 14.07 (PSIA) (End of Session) 1417 (PSIA)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.07	✓	1334	1337	✓	14.12	1	1ST RUN TO SCREEN 1; INITIAL PARAMETERS. NTUs = 4.6
2	✓	✓	✓	✓	✓	✓	14.30	✓	1354	1358	✓	14.20	1	2ND RUN; COLLECT SAMPLE MW-992-002 VOCs, METALS, ~~ANIONS~~ (II) 002MS 002MSD
3	✓	✓	✓	✓	✓	✓	14.26	✓	1413	1417	✓	14.18	1	3RD RUN; COLLECT ANIONS, Cr6+ ClO4; FINAL PARAMETERS, NTUs = 2.86
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 46.65 PSIA

Total Volume: 3

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 252 Date: 5/19/99

Well Name: MW-3 Sampling Zone No.: 2 Starting Time: 1225 Finishing Time: 1325

Technicians J. BRENNER; T. TURPIN - KEASLER; M. HUNT

Water Level Inside MP Casing (Beginning of Session) 14.28 (PS.A) (End of Session) 14.17 (PS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.28	✓	1234	1237	✓	14.31	1.0	1ST RUN; INITIAL PARAMETERS NTU'S = 3.44
2	✓	✓	✓	✓	✓	✓	14.25	✓	1250	1254	✓	14.28	1.0	2ND RUN; COLLECT SAMPLE MW-992-003 2 VOCs, METALS, ANIONS, Cr^{6+}
3	✓	✓	✓	✓	✓	✓	14.13	✓	1313	1316	✓	14.17	1.0	3RD RUN; COLLECT ClO4 FINAL PARAMETERS NTU'S = 3.39
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 77.10 PS.A

Total Volume: 3 l

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 346 Date: 5/19/99

Well Name: MW-3 Sampling Zone No.: 3 Starting Time: 1113 Finishing Time: 1220

Technicians J. BRENNER, T. TURPIN-KEASLER, M. HUNT

Water Level Inside MP Casing (Beginning of Session) 31.74 (PSIA) (End of Session) 31.71 (PSIA)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	31.74	✓	1123	1125	✓	31.76	1.0	1ST RUN TO SCREEN 3; INITIAL PARAMETERS, NTU = 1.76
2	✓	✓	✓	✓	✓	✓	31.74	✓	1151	1154	✓	31.71	1.0	2ND RUN; COLLECT MW-992-0004 2 VOAS, METALS, ANIONS, GG
3	✓	✓	✓	✓	✓	✓	31.76	✓	1213	1215	✓	31.71	1.0	3RD RUN, ClO4, FNAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 115.65 PSIA

Total Volume: 3.0 L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 558 Date: 5/19/99

Well Name: MW-3 Sampling Zone No.: 4 Starting Time: 0949 Finishing Time: 1105

Technicians: J. BRENNER, T. TURPIJN-IGASLER, M. HUNT

Water Level Inside MP Casing (Beginning of Session) 123.82 (End of Session) 125.77

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	123.82	✓	1000	1003	✓	123.80	1	1ST RUN TO SCREEN 4 INITIAL PARAMETERS; NTU'S = 1.51
2	✓	✓	✓	✓	✓	✓	123.80	✓	1026	1029	✓	123.82	1	2ND RUN; COLLECT SAMPLE MW-92-005 2 VOC'S, ANIONS, METALS, Cr 6+
3	✓	✓	✓	✓	✓	✓	123.77	✓	1054	1056	✓	123.77	1	3RD RUN; COLLECT ClO4 FINAL PARAMETERS; NTU'S = 1.39
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 177.59 PSIA

Total Volume: 3

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 653 Date: 5/19/99

Well Name: MW-3 Sampling Zone No.: 5 Starting Time: 0810 Finishing Time: 0935 (MJH)

Technicians: J. BRENNER; T. TURPIN; M. HUNT

Water Level Inside MP Casing (Beginning of Session) 165.16 (End of Session) 165.09

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	165.16	✓	0825	0827	✓	165.14	1.0	1ST RUN; INITIAL PARAMETERS, MW'S = 4.22
2	✓	✓	✓	✓	✓	✓	165.11	✓	0851	0853 (MJH)	✓	165.12	1.0	2ND RUN; COLLECT SAMPLE MW-992-0006 2 VOCs, METALS, 1 bottle anions
3	✓	✓	✓	✓	✓	✓	165.11	✓	0921	0923	✓	165.09	1.0	3RD RUN; anions, Cr6+, ClO4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 207.61 PSIA

Total Volume: 3 L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 150 Date: 5/29/99

Well Name: MW-4 Sampling Zone No.: 1 Starting Time: 1130 Finishing Time: 1220

Technicians: M. HUNT, M. LOSI, I. MAYES

Water Level Inside MP Casing (Beginning of Session) 14.09 psia (End of Session) 14.07 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.09	✓	1132	1135	✓	14.12	1	1st run, initial parameters, NTU's = 1.80
2	✓	✓	✓	✓	✓	✓	14.09	✓	1149	1152	✓	14.17	1	2nd run, collect MW-992-007 VOAs, Metals, Anions, Cr6+
3	✓	✓	✓	✓	✓	✓	13.98	✓	1207	1211	✓	14.07	1	3rd run, CH4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 46.63 PSIA

Total Volume: 3

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 240 Date: 6/3/99

Well Name: ~~J-8~~ J.B MW-4 Sampling Zone No.: 2 Starting Time: 1520 Finishing Time: 1625

Technicians: J. BRENNER, M. HUNT, M. CHIN

Water Level Inside MP Casing (Beginning of Session) 14.42 (PSIA) (End of Session) 14.48 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.42	✓	1527	1531	✓	14.52	1.0	1ST RUN TO SCREEN #2 INITIAL PARAMETERS NTUS - 4.80
2	✓	✓	✓	✓	✓	✓	14.62	✓	1547	1547	✓	14.57	1.0	2ND RUN COLLECT MW-992-008 AND MW-992-009; 4 VOAS 1/4 DIOXANE
3	✓	✓	✓	✓	✓	✓	14.65	✓	1600	1604	✓	14.53	1.0	3RD RUN; 1/4 DIOXANE; 2 METALS, 1/2 ANIONS
4	✓	✓	✓	✓	✓	✓	14.45	✓	1616	1620	✓	14.49	1.0	4TH RUN; 1/2 ANIONS; 2 Cr6+, 2ClO4; FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 79.43 PSIA

Total Volume: 4.0 L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 322 Date: 5/25/99

Well Name: MW-4 Sampling Zone No.: 3 Starting Time: 1025 Finishing Time: 1125

Technicians: M. HUNT, M. LOSI, T. MATES

Water Level Inside MP Casing (Beginning of Session) 44.33 psia (End of Session) 44.27 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	44.33	✓	1027	1030	✓	44.38	1	1st run, initial parameters, NTUs=4.90
2	✓	✓	✓	✓	✓	✓	44.32	✓	1047	1050	✓	44.33	1	2nd run, collect MW-992-010 VOAs, Metals, Anions, Cr^{6+}
3	✓	✓	✓	✓	✓	✓	44.23	✓	1107	1109	✓	44.27	1	3rd run, ClO_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 112.26 PSIA

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 392 Date: 5/25/99

Well Name: MW-4 Sampling Zone No.: 4 Starting Time: 0920 Finishing Time: 1020

Technicians M. HUNT, M. LOSI, I. MAYES

Water Level Inside MP Casing (Beginning of Session) 74.82 psia (End of Session) 74.81 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	74.82	✓	0923	0925	✓	74.86	1	1st run, initial parameters, NTU's = 2.90
2	✓	✓	✓	✓	✓	✓	74.82	✓	0943	0945	✓	74.86	1	2nd run, collect MW-992-011 VOAs, Metals, Anions, Cr^{6+}
3	✓	✓	✓	✓	✓	✓	74.69	✓	1006	1008	✓	74.81	1	3rd run, CH_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CAS. SG = 138.89 PSIA

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 513 Date: 5/28/99

Well Name: MW-4 Sampling Zone No.: 5 Starting Time: 0800 Finishing Time: 0915

Technicians: M. HUNT, M. LOSI, J. MAYES

Water Level Inside MP Casing (Beginning of Session) 127.54 psia (End of Session) 127.52 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	127.54	✓	0807	0809	✓	127.54	1	1st run, initial parameters, NTU's = 1.12
2	✓	✓	✓	✓	✓	✓	127.49	✓	0830	0832	✓	127.52	1	2nd run, Collect MW-992-012 VOAs, Metals, Anions, Cr 6+
3	✓	✓	✓	✓	✓	✓	127.52	✓	0854	0856	✓	127.52	1	3rd run, ClO_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 160.73 PSIA

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 149 ft Date: 5-25-99

Well Name: MW-11 Sampling Zone No.: 1 Starting Time: 1530 Finishing Time: 1615

Technicians Mathew Hunt Jeff Brenner Iris Mayes

Water Level Inside MP Casing (Beginning of Session) 14.14 (PSIA) (End of Session) 14.16

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.14	✓	1535	1540	✓	14.18	1.0	1ST RUN; INITIAL PARAMETERS; NN's = 1.12
2	✓	✓	✓	✓	✓	✓	14.10	✓	1550	1555	✓	14.14	1.0	2ND RUN; COLLECT MW-992-020; 2 VOAS METALS ANIONS
3	✓	✓	✓	✓	✓	✓	14.16	✓	1607	1612	✓	14.16	1.0	3RD RUN; Cr6+ C104 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 31.69 PSIA

Total Volume: 3.0 l

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 259 ft Date: 5-25-99

Well Name: MW-11 Sampling Zone No.: 2 Starting Time: 1440 Finishing Time: 1525

Technicians: Mathew Hunt Jeff Brenner Iris Mayes

Water Level Inside MP Casing (Beginning of Session) 26.73 (PS.A) (End of Session) 26.71 (PS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	26.73	✓	1444	1448	✓	26.74	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 1.32
2	✓	✓	✓	✓	✓	✓	26.74	✓	1500	1504	✓	26.74	1.0	2ND RUN; COLLECT MW-5912-021, -021MS, -021MSD 6 VOAS 2 METALS
3	✓	✓	✓	✓	✓	✓	26.70	✓	1518	1522	✓	26.71	1.0	3RD RUN; ANIONS, Cr6+ ClO4 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 68.02 PS.A

Total Volume: 3.0 ℓ

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 429 ft Date: 5-25-99

Well Name: MW-11 Sampling Zone No.: 3 Starting Time: 1315 (1317) Finishing Time: 1435

Technicians: Matthew Hunt Jeff Brenner Iris Mayes

Water Level Inside MP Casing (Beginning of Session) 100.38 psia (End of Session) 10.37

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	100.38	✓	1329	1331	✓	100.37	1	1st run, initial parameters, NTU's = 2.73
2	✓	✓	✓	✓	✓	✓	100.35	✓	1350	1400	✓	100.36	1.0	2ND RUN; Collect MW-992-022 2 VOAs, Metals, Anions, Cr 6+
3	✓	✓	✓	✓	✓	✓	100.35	✓	1425	1428	✓	100.37	1.0	3RD RUN; ClO4 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Press. outside MP casing = 135.23 psia

Total Volume: 3.0 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 524 ft Date: 5-25-99

Well Name: MW-11 Sampling Zone No.: 4 Starting Time: 1150 Finishing Time: 1310 (MZH)

Technicians: Mathew Hunt Jeff Brenner Iris Mayes

Water Level Inside MP Casing (Beginning of Session) 141.26 psia (End of Session) 141.23 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	141.26	✓	1201	1204	✓	141.28	1	1st run, initial parameters, NTU's = ~~2.28~~ 4.03
2	✓	✓	✓	✓	✓	✓	141.28	✓	1226	1228	✓	141.30	1	2nd run, collect MW-992-023 2 VOAs, Metals, Anions, Cr 6+
3	✓	✓	✓	✓	✓	✓	141.18	✓	1254	1257	✓	141.23	1	3rd run, ClO_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Press. outside MP casing = 174.18 psia

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 639 ft Date: 5-25-99

Well Name: MW-11 Sampling Zone No.: 5 Starting Time: 0835 Finishing Time: 1145

Technicians Matthew Hunt Jeff Bremner Iris Mayes

Water Level Inside MP Casing (Beginning of Session) 190.87 psia (End of Session) 190.98 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	212.07	X	X	X	X	X	X	ABORT RUN: PRESS. INSIDE MP TOO HIGH WILL NEED TO BAIL
2														MP CASING APPROX. 30 PSIA
3	✓	✓	✓	✓	✓	✓	190.87	✓	1026	1028	✓	190.86	1	1st run, initial parameters, NTUs = 1.38
4	✓	✓	✓	✓	✓	✓	190.90	✓	1058	1100	✓	190.93	1	2nd run, Collect MW-992-024 210As, Metals, Anions, Cr^{6+}
5	✓	✓	✓	✓	✓	✓	190.88	✓	1130	1132	✓	190.98	1	3rd run, CN^-, final parameters
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 199.91 PSIA

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 140 ft Date: 6/1/99

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 1235 Finishing Time: 1325

Technicians: M. Hunt, J. Brenner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 14.30 psia (End of Session) 14.28 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.30	✓	1235	1240	✓	14.32	1	1st run, initial parameters, NTU's = 10.50
2	✓	✓	✓	✓	✓	✓	14.29	✓	1253	1258	✓	14.33	1	2nd run, Collect MW-992-025 VOAs, Metals, Anions, Cr^{6+}
3	✓	✓	✓	✓	✓	✓	14.32	✓	1312	1316	✓	14.28	1	3rd run, CCl_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Pressure outside MP casing = 35.60 psia

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 161 Date: 5/14/99

Well Name: MW-12 Sampling Zone No.: 2 Starting Time: 1300 Finishing Time: 1445

Technicians: J. BRENNER, T. TURPIN, N. KEASLER

Water Level Inside MP Casing (Beginning of Session) 113.8 (End of Session) 113.76 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	113.83	✓	1315	1317	✓	113.90	1.0	1st run; initial parameters
2	✓	✓	✓	✓	✓	✓	113.77	✓	1345	1347	✓	113.81	1.0	2nd run: collect MW-992-076 & MW-992-027: 4 VOAs, 2 metals, anions
3	✓	✓	✓	✓	✓	✓	113.74	✓	1401	—	—	—	X	Valve opened in casing - leaking to surface
4	✓	✓	✓	✓	✓	✓	113.74	✓	1430	1432	✓	113.76	1.0	3rd run: 2 Cr6+, 2 Cl04, final parameters
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 79.36

Total Volume: 3.0 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 323 ft Date: 6/1/99

Well Name: MW-12 Sampling Zone No.: 3 Starting Time: 1135 Finishing Time: 1230

Technicians M. Hunt, J. Brenner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 70.03 psia (End of Session) 70.01 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	70.03	✓	1136	1138	✓	70.06	1	1st run, initial parameters, NTU's = 0.75
2	✓	✓	✓	✓	✓	✓	69.98	✓	1154	1156	✓	70.01	1	2nd run, collect MW-992-028 VOAs, Metals
3	✓	✓	✓	✓	✓	✓	69.98	✓	1214	1217	✓	70.01	1	3rd run, Anions, Cr^{6+}, ClO_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Pressure outside MP casing = 106.58 psia

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 436 ft Date: 6/1/99

Well Name: MW-12 Sampling Zone No.: 4 Starting Time: 1025 Finishing Time: 1130

Technicians: M. Hunt, J. Brenner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 119.14 psia (End of Session) 119.20 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	119.14	✓	1030	1033	✓	119.17	1	1st run, initial parameters, NTUs = 1.06
2	✓	✓	✓	✓	✓	✓	119.09	✓	1051	1053	✓	119.19	1	2nd run, collect MW-992-029 VOAs, Metals, Anions, Cr6+
3	✓	✓	✓	✓	✓	✓	119.15	✓	1115	1117	✓	119.20	1	3rd run, CH4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Pressure outside MP casing = 148.41 psia

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 548 ft Date: 6/1/99

Well Name: MW-12 Sampling Zone No.: 5 Starting Time: 0755 Finishing Time: 1020

Technicians: M. Hunt, J. Brenner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 167.94 psia (End of Session) 167.88 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	192.13	✓	—	—	—	—	—	Pressure outside MP casing was 172 psia → pulled tool + bottles up so we could bail
2	✓	✓	✓	✓	✓	✓	167.94	✓	0913	0915	✓	167.92	1	1st run, initial parameters, NTU's = 3.15
3	✓	✓	✓	✓	✓	✓	167.91	✓	0938	0940	✓	167.92	1	2nd run, collect MW-992-030 VOAs, Metals, Anions, Cr^{6+}
4	✓	✓	✓	✓	✓	✓	167.89	✓	1004	1006	✓	167.88	1	3rd run, ClO_4, final parameters
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Pressure outside MP casing = 172.49 psia

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPC Location: MW-14 Depth: 207 Date: 5/24/99

Well Name: MW-14 Sampling Zone No.: 1 Starting Time: 1250 Finishing Time: 1335

Technicians: J. BRENNEC, M. HUNT

Water Level Inside MP Casing (Beginning of Session) 17.07 (PS.A) (End of Session) 17.05 (PS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	17.07	✓	1254	1258	✓	17.09	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 336
2	✓	✓	✓	✓	✓	✓	17.10	✓	1310	1315	✓	17.07	1.0	2ND RUN; COLLECT MW-SA2033 2 VOAS METALS ANIONS
3	✓	✓	✓	✓	✓	✓	17.08	✓	1327	1332	✓	17.05	1.0	3RD RUN; Cr6+ C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP. CASING = 34.56 PS.A

Total Volume: 3.0 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 277 Date: 5/24/99

Well Name: MW-14 Sampling Zone No.: 2 Starting Time: 1150 Finishing Time: 1245

Technicians: J. BRENNER, M. HUNT

Water Level Inside MP Casing (Beginning of Session) 47.56 ~~[illegible]~~ (PS.A) (End of Session) 47.56 (PS.A)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in ~~MP (ft)~~	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	~~[illegible]~~ 47.56	✓	1200	1203	✓	47.59	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 4.37
2	✓	✓	✓	✓	✓	✓	47.51	✓	1217	1221	✓	47.51	1.0	2ND RUN; COLLECT MW-972-034 2 VOAS METALS, ANIONS C-6+
3	✓	✓	✓	✓	✓	✓	47.53	✓	1235	1239	✓	47.56	1.0	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 64.36 PS.A

Total Volume: 3.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 382 Date: 5/24/99

Well Name: MW-14 Sampling Zone No.: 3 Starting Time: 1050 Finishing Time: 1145

Technicians: J. BRENNER, M. HUNT

Water Level Inside MP Casing (Beginning of Session) 93.15 (PSIA) (End of Session) 93.17 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	93.15	✓	1050	1101	✓	93.19	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 0.84
2	✓	✓	✓	✓	✓	✓	93.17	✓	1117	1120	✓	93.17	1.0	2ND RUN; COLLECT MW-992-035; -035MS; -035MSD; 6 VOAS, 2 METALS
3	✓	✓	✓	✓	✓	✓	93.17	✓	1135	1141	✓	93.17	1.0	3RD RUN; ANIONS, CrO_4, ClO_4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 109.42 PSIA

Total Volume: 3.0 l

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 456 Date: 5/24/99

Well Name: MW-14 Sampling Zone No.: 4 Starting Time: 0945 Finishing Time: 1045

Technicians: J. BRENNER; M. HUNT

Water Level Inside MP Casing (Beginning of Session) 125.45 (PS.A) (End of Session) 125.46 (PS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	125.45	✓	0955	0957	✓	125.46	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 1.73
2	✓	✓	✓	✓	✓	✓	125.45	✓	1015	1017	✓	125.46	1.0	2ND RUN; COLLECT MW-992-036 2 VOAS, METALS, ANIONS, Cr^{6+}
3	✓	✓	✓	✓	✓	✓	125.46	✓	1037	1039	✓	125.46	1.0	3RD RUN; ClO_4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 141.45 PS.A

Total Volume: 3.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 540 Date: 5/24/99

Well Name: MW-14 Sampling Zone No.: 5 Starting Time: 0825 Finishing Time: 0940

Technicians J. BRENNER, M. HUNT

Water Level Inside MP Casing (Beginning of Session) 162.09 (PSIA) (End of Session) 162.05

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	162.09	✓	0837	0839	✓	162.10	1.0	1ST RUN, INITIAL PARAMETERS, NTUS = 1.88
2	✓	✓	✓	✓	✓	✓	162.09	✓	0906	0908	✓	162.08	1.0	2ND RUN, COLLECT MW-992-037 2 VOAS METALS, ANIONS, C_{6+}
3	✓	✓	✓	✓	✓	✓	162.04	✓	0930	0932	✓	162.05	1.0	3RD RUN, ClO_4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 177.65 PSIA

Total Volume: 3.0 ℓ

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 250 ft Date: 6-2-99

Well Name: MW-17 Sampling Zone No.: 1 Starting Time: 1325 Finishing Time: 1420

Technicians: M. Hunt, J. Bremner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 14.19 psia (End of Session) 14.31 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.19	✓	1329	1334	✓	14.29	1	1st run, initial parameters, NTU's=0.36
2	✓	✓	✓	✓	✓	✓	14.24	✓	1348	1352	✓	14.33	1	2nd run, collect MW-992-040 VOAs, Metals, Anions, Cr6+
3	✓	✓	✓	✓	✓	✓	14.26	✓	1408	1412	✓	14.31	1	3rd run, CCl_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Press. outside MP casing = 39.22 psia

Total Volume: 3

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 370 ft Date: 6-2-99

Well Name: MW-17 Sampling Zone No.: 2 Starting Time: 1225 Finishing Time: 1320

Technicians: M. Hunt, J. Brenner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 35.36 (PS.a) (End of Session) 35.36 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	35.36	✓	1231	1235	✓	35.36	1.0	1ST RUN, INITIAL PARAMETERS, NTUS = 1.63
2	✓	✓	✓	✓	✓	✓	35.34	✓	1249	1253	✓	35.34	1.0	2ND RUN, COLLECT MW-992-041, -041 MS & 041 MSD, 6 VOAS, 2 METALS
3	✓	✓	✓	✓	✓	✓	35.36	✓	1309	1312	✓	35.36	1.0	3rd run collect MW-992-041 Anions, Cr6+, Alk, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Press. outsid MP casing = 82.27 psia

Total Volume: 3

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 468 ft Date: 6-2-99

Well Name: MW-17 Sampling Zone No.: 3 Starting Time: 1050 Finishing Time: 1220

Technicians M. Hunt, J. Brenner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 78.02 psia (End of Session) 77.95 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft) ~~78.02~~	Activate (MAH)	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	~~78.85~~	✓	1059	1102	✓	78.05	1	1st run, initial parameters, NTU's=
2	✓	✓	✓	✓	✓	✓	78.00	✓	1122	1125	✓	78.02	1	2nd run, collect MW-992-042 VOAs, Dioxane
3	✓	✓	✓	✓	✓	✓	77.95	✓	1145	1148	✓	77.95	1	3rd run, collect MW-992-042 Metals, Anions, Cr6+
4	✓	✓	✓	✓	✓	✓	77.95	✓	1209	1212	✓	77.98	1	4th run, ClO_4, final parameters
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Press. outside MP casing = 117.44 psia

Total Volume: ~~83~~ 84 (MAH)

F-2

Continue

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 582 ft Date: 6-2-99

Well Name: MW-17 Sampling Zone No.: 4 Starting Time: 0935 Finishing Time: 1045

Technicians: M. Hunt, J. Brenner, + I. Mayes

Water Level Inside MP Casing (Beginning of Session) 127.61 psia (End of Session) 127.57 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	127.61	✓	0940	0943	✓	127.62	1	1st run, initial parameters, NTU's = 7.91
2	✓	✓	✓	✓	✓	✓	127.58	✓	1005	1008	✓	127.57	1	2nd run, collect MW-992-043 VOAs, Metals, Anions, Cr^{6+}
3	✓	✓	✓	✓	✓	✓	127.58	✓	1032	1035	✓	127.57	1	3rd run, CCl_4, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Press. outside MP casing = 146.89 psia

Total Volume: 3

F-2