THIRD ANNUAL REPORT
ON THE
JPL LONG-TERM QUARTERLY GROUNDWATER MONITORING PROGRAM SEPTEMBER 1998 TO AUGUST 1999, REVISED

Prepared for the:

National Aeronautics and Space Administration
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California 91109

May 2000

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LIST OF ACRONYMS AND CHEMICAL SYMBOLS

1,2-DCA	1,2-dichloroethane
As	Arsenic
Ca^{c2}	Calcium
CCl_4	Carbon Tetrachloride
Cl^-	Chloride
ClO_4^-	Perchlorate
COI	Constituent of Interest
Cr	Chromium
Cr(VI)	Hexavalent Chromium
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FSAP	Field Sampling and Analysis Plan
HCO_3^-	Bicarbonate
IAL	interim action level
JPL	Jet Propulsion Laboratory
MCL	Maximum contaminant level
mg/L	Milligrams per liter
MW	Monitoring Well
NA^+	Sodium
NDMA	n-nitrosodimethylamine
NTU	Nephelometric turbidity unit
Pb	Lead
PCE	Tetrachloroethene (Perchloroethene)
QA/QC	Quality Assurance/Quality Control
RWQCB	Regional Water Quality Control Board
SO_4^{-2}	Sulfate
TCE	Trichloroethene
TDS	Total Dissolved Solids
µg/L	Micrograms per liter
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This report summarizes the results from the third year of long-term quarterly groundwater monitoring for the National Aeronautics and Space Administration-Jet Propulsion Laboratory (JPL). The Long-Term Quarterly Groundwater Monitoring Program is part of the Comprehensive Environmental Response, Compensation and Liability Act Remedial Investigation/Feasibility Study and was initiated in August 1996 in response to a request from the U.S. Environmental Protection Agency (EPA). The purpose of this report is to compile and summarize the last year of monitoring data, evaluate the effectiveness of the monitoring system, and to recommend adjustments to the monitoring program, if necessary. During this past year of monitoring, groundwater samples were collected quarterly from all 18 on-site JPL monitoring wells and from all five off-site JPL monitoring wells, and analyzed for organic and inorganic analytes.

Carbon tetrachloride, trichloroethene, 1,2-dichloroethane, and tetrachloroethene were the only volatile organic compounds detected in groundwater samples at concentrations in excess of State and/or Federal Maximum Contaminant Levels (MCLs) for drinking water. One inorganic constituent, perchlorate (ClO_4^-) was detected in groundwater samples at concentrations exceeding the California Department of Health Services interim action level (IAL) of 18 micrograms/liter. These compounds were generally detected at higher concentrations beneath the north-central portion of the site. Lower concentrations were generally detected to the south and east from the north-central portion of the site.

Arsenic (As) and lead (Pb) were rarely detected at concentrations well below State and Federal MCLs. Total chromium was detected in one sample from one on-site well at a concentration above the State MCL, but below the Federal MCL. Hexavalent chromium, for which State and Federal MCLs have not yet been established, was detected consistently in one on-site well (MW-13) only. N-nitrosodimethylamine (NDMA) analysis was performed during the first two quarterly events on samples from selected wells and was not detected. 1,4-Dioxane analyses were performed on samples from selected wells during the first three quarterly events and was detected in only one well at very low levels (near the detection limit).

Groundwater quality data suggest that the constituents of interest at JPL are well defined, and that VOC plumes are predominately stable. However, it is noted that ClO_4^- was detected for the first time in one location (MW-3 Screen 5, up to 140 µg/L) and increased above the ClO_4^- IAL at another location (MW-18 Screen 4).

Three different general water types were identified beneath JPL as suggested by differences in the concentrations of major anions and cations. In general, very little change in water type with time has been observed since the monitoring program began three years ago. Water-elevation data

collected during the year consistently showed that regional groundwater flow has been primarily towards the south and east.

Based on the approved Long-Term Quarterly Monitoring Program Plan (Foster Wheeler, 1996a) and on results from the first two years of long-term monitoring at JPL, it was proposed that the monitoring program be revised to improve monitoring efficiency. Approval was obtained from the regulatory agencies [EPA, California Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board (RWQCB)], and the proposed changes were implemented for the final quarterly event of the past monitoring year.

Based on the approved plan, to identify monitoring points that yield redundant data, each sampling point was categorized relevant to each constituent of interest or plume (i.e., plume well, downgradient well, or upgradient well). Individual monitoring point classification allowed for adjustments in the sampling program in which upgradient points (consistently showing non-detect) were sampled less frequently, thereby improving program efficiency.

Additional changes were implemented irrespective of the program plan as agreed to by the regulatory agencies as follows: analysis for Pb, As, 1,4-dioxane and NDMA will be performed annually due to infrequent detection. Analysis of general water chemistry parameters (major anion/cations) will also be conducted annually based on the consistency of prior results.

To further modify the groundwater monitoring program, we propose that the classification of each well and well screen be based on a two year rolling calendar. Wells will be reclassified each quarter based on analytical results from the previous eight quarters, thereby keeping the monitoring program current with aquifer and plume conditions.

1.0 INTRODUCTION

This report summarizes the results from the third full year (September 1998 through August 1999) of quarterly groundwater monitoring completed as part of the Long-Term Quarterly Groundwater Monitoring Program at the National Aeronautics and Space Administration-Jet Propulsion Laboratory (JPL) for the Comprehensive Environmental Response, Compensation and Liability Act Remedial Investigation/Feasibility Study. The Long-Term Quarterly Groundwater Monitoring Program was initiated in response to a request from the U.S. Environmental Protection Agency (EPA) with the objective of monitoring hydrogeological conditions and the nature and extent of groundwater constituents beneath JPL. The purpose of this report is to compile and summarize the previous years data, to evaluate the effectiveness of the monitoring program, and to recommend adjustments to the program, if necessary.

The monitoring program involves sampling of 23 groundwater monitoring wells (MWs) (located both on- and off-site) and quantification of various analytes in the samples. Additionally, water-level data are collected at each well and used to monitor groundwater gradients and flow directions.

Locations of the JPL 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 at the water table. Deep, multi-port wells MW-17, MW-18, MW-19, MW-20 and MW-21 are located off-site, while all other monitoring wells are located on-site (MW-3 is located just outside the eastern boundary of JPL, but is considered an "on-site" well). Shallow well MW-2 has been replaced with deep multi-port well MW-14 as a JPL sampling point and was not sampled. A summary of the JPL monitoring well construction details is given in Table 1-1.

The four quarterly groundwater sampling events comprising the past monitoring year are designated as follows:

- October/November 1998
- February/March 1999
- May/June 1999
- August 1999

Monitoring points (wells and well screens) sampled and analyses conducted during these four events are identified in Table 1-2. Based on results of previous long-term quarterly monitoring, and guidelines included in the approved Long-Term Quarterly Monitoring Program Plan [Foster

Wheeler Environmental Corporation (Foster Wheeler), 1996a], adjustments were made to the Long-Term Monitoring Program during the fourth quarter of the past monitoring year (August, 1999) (Table 1-2), and included:

- All JPL monitoring points were classified with respect to each constituent of interest (COI) [volatile organic compounds (VOCs), perchlorate (ClO_4^-), total chromium (Cr), and hexavalent chromium (Cr(VI)] as either being plume, downgradient or upgradient points based on previous analytical results and groundwater flow directions.
- Plume and downgradient points (with respect to each constituent) were sampled for the appropriate constituents.
- Upgradient points (with respect to each constituent) were not sampled.

Several additional changes were approved by the regulatory agencies and implemented during the past monitoring year, irrespective of guidance set forth in the Long-Term Groundwater Sampling Plan. These changes were as follows:

- Samples from selected JPL monitoring points were collected and analyzed for NDMA during the first two quarters, but not the second two quarters. NDMA has not been detected in any JPL groundwater samples to date. However, samples will be collected from selected points and analyzed for NDMA on an annual basis beginning with the second event in 2000.
- Samples from selected JPL monitoring points were collected and analyzed for 1,4-dioxane during the first three quarters of this sampling year, but not the final quarter. 1,4-Dioxane has only been detected in samples from one JPL sampling point, at very low concentrations. Collection of samples from selected points for 1,4-dioxane analysis will henceforth be conducted on an annual basis beginning with the second event in 2000.
- Samples from all JPL monitoring points were collected and analyzed for lead, arsenic and general water quality parameters (major anions and cations) during the first three quarters, but not the final quarter. These constituents will be monitored in all wells on an annual basis beginning with the second event in 2000.

Sampling procedures and the sampling QA/QC program are summarized in Section 2.0.0 of this report. All sampling records, field instrument calibration forms, laboratory analytical reports and chain-of-custody forms for each sampling event are included in the appendices of their respective quarterly reports (Foster Wheeler, 1999a, b, c, d) and are not included in this summary report.

The analytical program focused on; (i) quantification of various constituents in the groundwater, and (ii) determination of general water type based on general water quality analyses. Constituents of interest were monitored to determine the nature and extent of contamination in groundwater beneath JPL, and will be discussed in Section 3.0.0. The water-quality data were used to establish generalized groundwater types, and are discussed in Section 4.0.0.

In addition to water quality analyses, hydraulic-head measurements were recorded monthly at each screen in the deep multi-port wells. Water-level measurements were measured daily in the on-site shallow wells through July 28, 1999, and, following regulatory agency approval, on a monthly basis from then on. This data is used to monitor both horizontal and vertical groundwater flow and is presented in Section 5.0.

Section 6.0, Conclusions and Recommendations, presents conclusions regarding site conditions and proposed changes to the monitoring program.

2.0 SAMPLING AND FIELD QUALITY ASSURANCE/ QUALITY CONTROL PROCEDURES

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

2.1 SHALLOW MONITORING WELLS

Dedicated submersible pumps were used to sample the shallow monitoring wells. The pumps were decontaminated prior to installation (Ebasco, 1993a). Prior to sampling, the water in each well casing was purged (by pumping) to remove groundwater that may have been exposed to the atmosphere and thus was not representative of aquifer conditions.

Temperature, pH, electrical conductivity and turbidity of the water were monitored during purging. After these parameters had stabilized (when two successive measurements made approximately 3 minutes apart were within approximately 10 percent of each other) and the turbidity was less than 5 Nephelometric Turbidity Units (NTUs). Groundwater samples were collected directly from the discharge hose of the dedicated pump. A detailed description of the shallow well sampling procedure is included in the Field Sampling and Analysis Plan (FSAP) for Operable Unit-1 (on-site groundwater) (Foster Wheeler, 1993a).

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

2.2 DEEP MULTI-PORT MONITORING WELLS

Sampling of the deep JPL multi-port monitoring wells required specialized sampling equipment manufactured by Westbay. This equipment included a pressure profiling/sampling probe with a surface control unit. Copies of the detailed operations manuals for the Westbay pressure profiling/sampling probe are available elsewhere (Ebasco, 1993a; 1994).

The Westbay sampling probe and sample bottles were decontaminated prior to sampling at each screened interval in each deep multi-port well. Purging before sampling is not required in the deep multi-port monitoring wells because the groundwater sample is collected directly from the aquifer, and is not exposed to the atmosphere. However, at each screened interval an initial sample of groundwater was collected in order to check pH, electrical conductivity, temperature, and turbidity 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 of groundwater was then collected and analyzed again for pH, electrical conductivity, temperature, and turbidity to ensure there was continuity of aquifer conditions during

sampling. A detailed description of the deep well sampling procedures is included in the FSAPs for Operable Unit-1 (on-site groundwater) and Operable Unit-3 (off-site groundwater) (Ebasco, 1993a and 1994).

2.3 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

To verify the quality of the sampling procedures and analytical data, various field and laboratory QA/QC procedures were followed. These included collection of duplicate groundwater samples, equipment blanks, trip blanks, and a field blank during each quarterly sampling event. The laboratory QA/QC program (matrix spikes, surrogate compounds, method blanks, etc.) was conducted according to specific procedural and analytical method requirements. QA/QC program results for each quarter of monitoring are available in the quarterly groundwater monitoring reports for the past monitoring year (1999a,b,c,d). QA/QC procedures are discussed in detail in the Quality Assurance Program Plan for completing the Remedial Investigation (Ebasco, 1993b) and associated addenda (Foster Wheeler, 1996b and 1998). Field QA/QC data (trip blanks, equipment blanks, and field blanks) have consistently shown that the sampling and sample handling procedures are not introducing contamination and, therefore, the data are acceptable for their intended use.

3.0 ANALYTICAL RESULTS - CONSTITUENTS OF INTEREST

The analytical results for the constituents of interest, which include VOCs, ClO_4^-, metals [Pb, As, total Cr, and Cr(VI)], NDMA, and 1,4-dioxane are summarized in this section. Refer to Section 1.0 and Table 1-2 for a summary of changes made to the monitoring program, and analyses performed during each of the four 1998-1999 sampling events. As noted in Section 1.0 and Table 1-2, the following changes were incorporated into the analytical program in the fourth quarter of the past year of monitoring, as agreed upon by the EPA, DTSC and RWQCB:

- A 1,4-dioxane analysis was performed during the first three quarterly events and NDMA analysis was performed during the first two quarterly events on samples from selected wells, pursuant to regulatory agency guidance. NDMA and 1,4-dioxane analyses will henceforth be conducted on samples from the selected wells on an annual basis.
- During the last quarter of the past monitoring year (August 1999), pursuant to the approved monitoring plan (Foster Wheeler, 1996b) only selected wells, including those defined as "plume wells" and wells located "downgradient" of contaminant plumes were sampled. Various samples were analyzed for VOCs, Cr(VI), total Cr and ClO_4^-, depending upon their classification with regard to each constituent of interest.

Results from VOCs and ClO_4^- analyses are compiled in Table 3-1, and results for metals analyses are presented in Table 3-2. Refer to Figure 1-1 for well locations. General discussions of the analytical results are provided in the following sections. In these discussions, where State and Federal regulatory levels differ, the more stringent level is referenced

3.1 VOLATILE ORGANIC COMPOUNDS RESULTS

VOC results are summarized in Table 3-1. The key findings are listed below, and a more complete description is provided in the following paragraphs. The VOC results indicated that:

- Only four VOCs were detected at concentrations exceeding State and/or Federal maximum contaminant levels (MCLs), including carbon tetrachloride (CCl_4), trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), and tetrachloroethene (PCE).
- Highest concentrations of VOCs were identified on-site in the shallow portion of the aquifer beneath the north-central portion of JPL.
- VOCs which have migrated off-site (mainly CCl_4 and TCE) have been detected at lower concentrations than those measured on-site.
- The majority of off-site detections are generally located downgradient of JPL in the deeper portions of the aquifer.
- Except where noted below, trends regarding concentration and locations of detections were consistent with past sampling years.

Carbon Tetrachloride

During the past year of monitoring, relatively high concentrations of CCl_4, compared to those detected elsewhere on- and off-site (up to 70 µg/L), have consistently been present in samples from six on-site wells (Table 3-1). The higher concentrations are generally located in the north central portion of the site. Lower concentrations of CCl_4 [<5.0 micrograms/liter (µg/L)] were detected in samples from three on-site wells, and two off-site wells (Table 3-1). The lower concentrations are generally located in the downgradient portions of the aquifer, southeast of the north-central portion of the site. CCl_4 concentrations have not exceeded 5.0 µg/L in off-site wells. All CCl_4 detects exceed the State MCL of 0.5 µg/L.

It is noted that CCl_4 concentrations have increased in MW-3 Screen 3 over the last two quarters. In addition, CCl_4, which had been present intermittently in the past in MW-8, has not been detected there in the last five quarters.

Trichloroethene

During the past year of monitoring, concentrations of TCE ranging up to 47 µg/L [in excess of the State and Federal MCL (5.0 µg/L)] were detected in samples from six on-site wells, and two off-site wells (Table 3-1). The on-site wells containing TCE above the MCL are located in the north-central portion of the site. One of the off-site wells containing TCE above the MCL (MW-17) is located downgradient to the southeast of JPL, and the other off-site well (MW-21) is located cross-gradient to the southwest. Relatively low TCE concentrations (below the MCL) have been found in samples from five on-site wells, and two off-site wells (Table 3-1). Low concentrations have also been detected in MW-6 and MW-14, which are upgradient to the west.

TCE, which had been detected in MW-8 with relative frequency in the past, was not detected in this well over the last five quarters.

Tetrachloroethene

Concentrations of tetrachloroethene, also known as perchloroethene (PCE), exceeded the State and Federal MCL (5 µg/L) in only one well (MW-21) during the past year of monitoring. This well is located crossgradient, to the southwest of JPL. PCE was detected at concentrations below the MCL in 10 on-site wells, and three off-site wells. The on-site wells in which PCE was detected (below the MCL) were generally located in the north-central portion of the site. However, two of these wells are located upgradient (MW-6 and MW-14). Off-site wells in which PCE was detected (MW-17, MW-18 and MW-19) are downgradient to the east and southeast of JPL.

Finally, PCE, which had been detected in MW-10 in the past, has not been detected in this well in past six quarters.

1,2-Dichloroethane

1,2-DCA was found at concentrations exceeding the State MCL (0.5 µg/L) in samples from on-site wells MW-7, MW-13 and MW-16. 1,2-DCA was not detected in any off-site monitoring well. At MW-7, 1,2 DCA was detected in the initial event (October/November, 1998) of the past year of monitoring, but not in the three subsequent events.

Other VOCs

Other VOCs have been detected in JPL groundwater samples, but these have either been at concentrations well below MCLs, or the detections have been exceedingly rare or attributable to laboratory contamination (see Table 3-1).

3.2 PERCHLORATE RESULTS

During the past year of monitoring, groundwater samples from four on-site wells and three off-site wells contained ClO_4^- at concentrations below the California Department of Health Services interim action level (IAL) of 18 µg/L (Table 3-1). ClO_4^- was detected at concentrations exceeding the IAL (up to 790 µg/L in MW-16) in samples from eight on-site wells and two off-site wells (Table 3-1). ClO_4^- is generally present beneath the north-central and southeastern portions of the site, and off-site in the southeasterly direction. Higher concentrations were generally detected on-site in the shallower portion of the aquifer, and lower concentrations are generally noted off-site (downgradient), in deeper portions of the aquifer. One of the wells containing ClO_4^- (MW-21) is located crossgradient of JPL to the southwest, and two wells (MW-14 and MW-6) are located upgradient.

Perchlorate concentrations have increased in well MW-3 Screen 5 (from non-detect up to 140 µg/L) and in well MW-18 Screen 4 (from just below the IAL to just above the IAL).

3.3 1,4-DIOXANE AND NDMA RESULTS

Pursuant to regulatory agency requests, groundwater samples from six selected locations (MW-4 Screen 2, MW-7, MW-13, MW-16, MW-17 Screen 3, and MW-24 Screen 1) were analyzed for 1,4-dioxane during the first three quarters of the past year of monitoring. NDMA was also sampled in the same wells during the first two quarters of the monitoring year. The selected wells historically contained the highest concentrations of groundwater constituents at JPL. NDMA was not detected in any groundwater sample. 1,4-dioxane was detected twice at a concentration of 3.7 µg/L and once at 3.4 µg/L in well MW-16; it was not detected in any other wells (Table 3-1). No State or Federal MCLs have been established for these two compounds.

3.4 METALS RESULTS

Metals data are summarized in Table 3-2, and include the results for As, Pb, total Cr, and Cr(VI). Lead (Pb) was rarely and randomly detected at levels near the detection limit, well below the State MCL [0.05 milligrams per liter (mg/L)]. Lead was detected at very low levels

(<0.009 mg/L) in samples from two on-site and three off-site wells. Arsenic was detected randomly in three on-site wells during the sampling year at levels well below the State and Federal MCL (0.5 mg/L). These metals occur naturally in JPL soils (Foster Wheeler, 1999e), and their presence in JPL groundwater is believed to have resulted from natural processes.

Total Cr was occasionally detected below its MCL (0.5 mg/L) in seven on-site wells, generally located in the central portion of the site. Total Cr was detected above the State and Federal MCL in upgradient well (MW-6) during the last quarter of the monitoring year (August, 1999). This detection is considerably higher than all previous total Cr detections in MW-6. It is, therefore, believed that this detection is due to unidentified matrix interference in the laboratory and is not representative of conditions upgradient of JPL.

Hexavalent Cr was detected sporadically during the past monitoring year at low concentrations (<0.031 mg/L) in three on-site wells. Cr(VI) was also detected at a concentration of 0.007 mg/L in one downgradient off-site well (MW-18). State and Federal MCLs for Cr(VI) have not yet been established.

3.5 SUMMARY OF RESULTS

Results described above are summarized as follows.

- The VOCs detected and their concentrations are generally consistent with those observed in previous years. On-site shallow wells contained relatively higher concentrations of VOCs than off-site JPL wells.
- ClO_4^- concentrations were also generally consistent with those observed in previous years. However, increases in ClO_4^- concentrations in wells MW-3 Screen 5, and MW-18 Screen 4 may indicate that further migration of ClO_4^- has occurred.
- As in previous years, As and Pb were rarely and randomly detected at low concentrations, and are believed to be naturally occurring.
- NDMA was not detected.
- 1,4-Dioxane was detected in one on-site well at very low concentrations.

4.0 GENERAL WATER CHEMISTRY

As part of the monitoring program, groundwater samples were submitted for analysis of general groundwater parameters for the first three quarters of the past year of monitoring (Table 1-2). Based on the relative consistency of the general chemistry throughout the Long-Term Monitoring Program, sampling for these parameters is now conducted on an annual basis. This analysis was discontinued in the fourth quarter and will continue on an annual basis as agreed to by the EPA, DTSC and RWQCB. Analysis of general groundwater parameters included major cations and anions [sodium Na^+, potassium, calcium (Ca^{2+}), magnesium, sulfate (SO_4^{2-}), nitrate, chloride (Cl^-), carbonate, bicarbonate (HCO_3^-)], total iron, Total Dissolved Solids, and pH. These analyses were performed in order to further understand the natural chemistry of the groundwater beneath JPL and for potential use in interpreting groundwater flow patterns. General groundwater chemistry data for each monitoring event are presented in the respective quarterly reports (Foster Wheeler, 1999a, b, c), and are not shown here. Several QA/QC checks were performed each quarter on the general chemistry data to determine that the data were acceptable for its intended use (Foster Wheeler, 1999a, b, c).

The water chemistry results were summarized using Stiff diagrams, which allowed for a general empirical classification of each sample. This analysis has suggested that the majority of groundwater sampled at JPL can be classified as one of three general water types, based on the predominant cation and anion(s). These types include:

Type 1 Calcium-bicarbonate groundwater: Ca^{2+} as the dominant cation and HCO_3^- as the dominant anion;

Type 2 Sodium-bicarbonate groundwater: Na^+ as the dominant cation and HCO_3^- as the dominant anion;

Type 3 Calcium-bicarbonate/chloride/sulfate groundwater: Ca^{2+} as the dominant cation and HCO_3^- as the dominant anion, but with relatively elevated Cl^- and SO_4^{2-} concentrations.

Compiled in Table 4-1 are the groundwater classification results. In several cases, the data suggested possible blending of water types. It should be noted that there is some subjectivity inherent in this type of analysis. We can therefore make the assumption that the apparent blends may be classifiable as either water type represented.

These results are consistent with results from previous years, and indicate that water types are well-characterized and consistent throughout the site.

5.0 WATER-LEVEL MEASUREMENTS

Water levels in the on-site shallow monitoring wells were measured daily through July 28, 1999, using dedicated pressure transducers and data logging equipment that stored water-level information electronically. The water-level data was retrieved from the data loggers on a monthly basis. In addition, water levels in shallow wells were measured manually each month using a water-level tape/indicator. Beginning in August 1999, the frequency of water-level measurements taken in the shallow wells was reduced to monthly, in agreement with the regulatory agencies. Water levels in the deep, multi-port wells are monitored manually each month using a pressure-transducer probe manufactured by Westbay specifically for the unique casing in these wells. Details of water level measurement procedures have previously been described (Ebasco, 1993a, 1994).

Monthly water-level elevations collected manually for both deep and shallow wells are summarized in Table 5-1. Hydrographs generated from the monthly water-level data collected manually from the deep multi-port wells are presented in Figures 5-1 through 5-13. Data shown on Figures 5-1 through 5-13 indicate that there is an enhanced downward flow of groundwater when the nearby municipal production wells are pumping. This is best illustrated by comparing Figures 5-1 and 5-8 with Figures 5-11 and 5-12. Wells depicted in Figures 5-1 and 5-8 (MW-3 and MW-19, respectively) are located in close proximity to operating City of Pasadena production wells and exhibit a pronounced draw-down in the lower screens. Conversely, wells depicted in Figures 5-11 and 5-12 (MW-22 and MW-23, respectively) are located further from the production wells, and drawdown is not as significant. Hydrographs generated from daily water-level data collected with the dedicated pressure transducers from the shallow wells are presented in Figures 5-14 and 5-15. Daily water-level elevation data collected from the shallow wells are also included as Appendix A.

As part of the quarterly monitoring program, water levels taken immediately prior to, and immediately after each sampling event are contoured to evaluate groundwater flow directions during sampling. These water-elevation contour maps are included in each associated monitoring report and indicate that flow is primarily to the south and east across JPL. In addition, the maps show the continuous presence of a significant groundwater mound located at the mouth of the Arroyo Seco. This typical scenario is illustrated in Figure 5-16, which depicts typical groundwater elevation contours and flow directions that are representative of those observed.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based upon interpretation of analytical data and field measurements collected during the past year of the JPL Long-Term Quarterly Monitoring Program:

- Groundwater contaminants and contaminant plumes are well-defined and relatively stable, with the possible exception of ClO_4^-, which appears to have undergone some additional migration.
- The groundwater flow is generally to the south and east across JPL. A downward vertical component is also present, due largely to pumping by the nearby City of Pasadena municipal production wells.
- General water chemistry analyses indicate a well-defined and relatively stable groundwater chemistry beneath JPL.
- The Long-Term Groundwater Monitoring Program is effectively addressing the objective of monitoring hydrogeological conditions and the nature and distribution of groundwater constituents beneath JPL.

Based on results from the Long-Term Quarterly Monitoring Program, and the guidelines included in the Long-Term Quarterly Monitoring Program Plan (Foster Wheeler, 1996b), adjustments were made to the existing monitoring program with the goal of optimizing sampling and monitoring efficiency. These changes consisted of classifying JPL monitoring points (wells and well screens) based on their proximity to the various groundwater contamination plumes (VOC and ClO_4^-), or wells in which total Cr and Cr (VI) were detected. This was carried out using the classification categories described in the Long-Term Monitoring Program Plan (Foster Wheeler, 1996b) as summarized below:

1. *Plume Well*: Wells or well screens where constituents have been detected above detection limits. If a constituent was detected anytime during the long-term monitoring program, it was classified as a plume well.
2. *Downgradient Well*: Wells or well screens that lie near the "edge" of plumes where constituents have not been detected at any time during the monitoring program, but may appear in the future. For example, multi-port well screens located immediately above and below a screen with a detect are considered "downgradient" well screens.
3. *Upgradient Well*: Wells or well screens that are not likely to be in the path of contaminant plumes. Upgradient wells primarily provide background information.

The classification of monitoring points allowed for adjustments in the sampling program in which upgradient points (consistently showing non-detect) were sampled less frequently, thereby improving program efficiency. These changes were implemented during the final quarter of the past sampling year.

To make groundwater monitoring more efficient, we propose to continue reclassification of all monitoring points quarterly with respect to each constituent, however, based on a two-year rolling calendar. Monitoring points will thus be reclassified using analytical results from the previous eight quarters. This will result in decreasing the sampling frequency of monitoring points consistently showing non-detectable concentrations of constituents of interest, and increasing the sampling frequency of wells which had previously been non-detect but are currently indicating detectable concentrations.

7.0 REFERENCES

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TABLES

TABLE 1-1

SUMMARY OF CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet below ground surface)	Depth of Screened Interval (feet below ground surface)	Elevation Top 4-inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level) [1]	Multi-Port Well Screen Number	Comments
MW-1	Shallow Standpipe	1989	Mud Rotary	120	70-110	1116.7	1006.70-1046.70	-	Installed during upgradient water quality study for U.S. Army Corps of Engineers (see Section 1.3.3.8)
MW-2	Shallow Standpipe	1989	Mud Rotary	177	127-167	1168.85	1001.85-1041.85	-	Installed during upgradient water quality study for U.S. Army Corps of Engineers (see Section 1.3.3.8). Well subsequently replaced by deep well MW-14.
MW-3	Deep Multi-Port	1990	Mud Rotary	700	170-180	1099.82	919.82-929.82	1	Installed during JPL Expanded Site Inspection (see Section 1.3.3.9).
					250-260		839.82-849.82	2	
					344-354		745.82-755.82	3	
					555-565		534.82-544.82	4	
					650-660		433.82-443.82	5	
MW-4	Deep Multi-Port	1990	Mud Rotary	559	147-157	1082.72	925.72-935.72	1	Installed during JPL Expanded Site Inspection (see Section 1.3.3.9).
					237-247		835.72-845.72	2	
					318-328		754.72-764.72	3	
					389-399		683.72-693.72	4	
					509-519		563.72-573.72	5	
MW-5	Shallow Standpipe	1990	Air Percussion	140	85-135	1071.6	936.60-986.60	-	Installed during JPL Expanded Site Inspection (see Section 1.3.3.9).
MW-6	Shallow Standpipe	1990	Air Percussion	245	195-245	1188.52	943.52-993.52	-	Installed during JPL Expanded Site Inspection (see Section 1.3.3.9).
MW-7	Shallow Standpipe	1990	Air Percussion	275	225-275	1212.88	937.88-987.88	-	Installed during JPL Expanded Site Inspection (see Section 1.3.3.9).
MW-8	Shallow Standpipe	1992	Air Percussion	205	155-205	1139.53	934.53-984.53	-	Installed during JPL pre-RI investigation (see Section 1.3.3.14).
MW-9	Shallow Standpipe	1992	Air Percussion	68	18-68	1106.02	1038.02-1088.02	-	Installed during JPL pre-RI investigation (see Section 1.3.3.14).
MW-10	Shallow Standpipe	1992	Air Percussion	155	105-155	1087.71	932.71-982.71	-	Installed during JPL pre-RI investigation (see Section 1.3.3.14).

Notes: (1) All screens, except in wells MW-1 and MW-2, are 4-inch diameter, wire wrap stainless steel with 0.010-inch slot size. Screens in wells MW-1 and MW-2 are 4-inch diameter, schedule 40 PVC with 0.020-inch slot size.

TABLE 1-1

SUMMARY OF CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet below ground surface)	Depth of Screened Interval (feet below ground surface)	Elevation Top 4-inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)[1]	Multi-Port Well Screen Number	Comments
MW-11	Deep Multi-Port	1992	Mud Rotary	680	140-150	1139.35	989.35-999.35	1	Installed during JPL pre-RI investigation (see Section 1.3.3.14).
					250-260		879.35-889.35	2	
					420-430		709.35-719.35	3	
					515-525		614.35-624.35	4	
					630-640		499.35-509.35	5	
MW-12	Deep Multi-Port	1994	Mud Rotary	596	135-145	1102.14	957.14-967.14	1	Installed during OU-1 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
					240-250		852.14-862.14	2	
					315-325		777.14-787.14	3	
					430-440		662.14-672.14	4	
					546-556		546.14-556.14	5	
MW-13	Shallow Standpipe	1994	Air Rotary	235	180-230	1183.47	953.47-1003.47	-	Installed during OU-1 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
MW-14	Deep Multi-Port	1994	Mud Rotary	588	205-215	1173.42	958.42-968.42	1	Installed during OU-1 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
					275-285		888.42-898.42	2	
					380-390		783.42-793.42	3	
					453-463		710.42-720.42	4	
					538-548		625.42-635.42	5	
MW-15	Shallow Standpipe	1994	Air Percussion	74	19-69	1120.66	1051.66-1101.66	-	Installed during OU-1 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
MW-16	Shallow Standpipe	1994	Air Percussion	285	230-280	1236.27	956.27-1006.27	-	Installed during OU-1 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
MW-17	Deep Multi-Port	1995	Mud Rotary	774	246-256	1190.99	934.99-944.99	1	Installed during OU-3 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
					366-376		814.99-824.99	2	
					466-476		714.99-724.99	3	
					578-588		602.99-612.99	4	
					723-733		457.99-467.99	5	

Notes: (1) All screens, except in wells MW-1 and MW-2, are 4-inch diameter, wire wrap stainless steel with 0.010-inch slot size. Screens in wells MW-1 and MW-2 are 4-inch diameter, schedule 40 PVC with 0.020-inch slot size.

TABLE 1-1

SUMMARY OF CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet below ground surface)	Depth of Screened Interval (feet below ground surface)	Elevation Top 4-inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level) [1]	Multi-Port Well Screen Number	Comments
MW-18	Deep Multi-Port	1995	Mud Rotary	732	266-276	1225.34	949.34-959.34	1	Installed during OU-3 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
					326-336		889.34-899.34	2	
					421-431		794.34-804.34	3	
					561-571		654.34-664.34	4	
					681-691		534.34-544.34	5	
MW-19	Deep Multi-Port	1995	Mud Rotary	543	240-250	1143.2	893.20-903.20	1	Installed during OU-3 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
					310-320		823.20-833.20	2	
					390-400		743.20-753.20	3	
					442-452		691.20-701.20	4	
					492-502		641.20-651.20	5	
MW-20	Deep Multi-Port	1995	Mud Rotary	948	228-238	1164.89	926.89-936.89	1	Installed during OU-3 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
					388-398		766.89-776.89	2	
					558-568		596.89-606.89	3	
					698-708		456.89-466.89	4	
					898-908		256.89-266.89	5	
MW-21	Deep Multi-Port	1995	Mud Rotary	416	86-96	1058.99	962.99-972.99	1	Installed during OU-3 RI pursuant to RI/FS Work Plan (Ebasco, 1993a).
					156-166		892.99-902.99	2	
					236-246		812.99-822.99	3	
					306-316		742.99-752.99	4	
					366-376		682.99-692.99	5	
MW-22	Deep Multi-Port	1997	Mud Rotary	634	239-249	1176.81	927.81-937.81	1	Installed during OU-1 RI to fill data gaps pursuant to Addenda to RI/FS Work Plan (Foster Wheeler 1996a, 1996b and JPL 1996).
					324-334		842.81-852.81	2	
					384-394		782.81-792.81	3	
					464-474		702.81-712.81	4	
					584-594		582.81-592.81	5	
MW-23	Deep Multi-Port	1997	Mud Rotary	590	170-180	1108.34	928.34-938.34	1	Installed during OU-1 RI to fill data gaps pursuant to Addenda to RI/FS Work Plan (Foster Wheeler 1996a, 1996b and JPL 1996).
					250-260		843.34-858.34	2	
					315-325		783.34-793.34	3	
					440-450		658.34-668.34	4	
					540-550		558.34-658.34	5	

Notes: (1) All screens, except in wells MW-1 and MW-2, are 4-inch diameter, wire wrap stainless steel with 0.010-inch slot size. Screens in wells MW-1 and MW-2 are 4-inch diameter, schedule 40 PVC with 0.020-inch slot size.

TABLE 1-1

SUMMARY OF CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet below ground surface)	Depth of Screened Interval (feet below ground surface)	Elevation Top 4-inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level) [1]	Multi-Port Well Screen Number	Comments
MW-24	Deep Multi-Port	1997	Mud Rotary	725	275-285	1200.91	915.91-925.91	1	Installed during OU-1 RI to fill data gaps pursuant to Addenda to RI/FS Work Plan (Foster Wheeler 1996a, 1996b and JPL 1996).
					370-380		820.91-830.91	2	
					430-440		760.91-770.91	3	
					550-560		640.91-650.91	4	
					657-685		515.91-525.91	5	

Notes: (1) All screens, except in wells MW-1 and MW-2, are 4-inch diameter, wire wrap stainless steel with 0.010-inch slot size. Screens in wells MW-1 and MW-2 are 4-inch diameter, schedule 40 PVC with 0.020-inch slot size.

TABLE 1-2

SUMMARY OF ANALYSES DURING THE THIRD YEAR OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

Analyses	Analytical Method	Sampling Event			
		October/ November 1998	February/ March 1999	May/ June 1999	August 1999
Constituents of Concern					
Volatile Organic Compounds (VOCs)	524.2	All wells	All wells	All wells	(1)
Perchlorate (ClO_4^-)	300.0 Mod	All wells	All wells	All wells	(2)
Chromium (Cr)	200.8	All wells	All wells	All wells	(3)
Hexavalent Chromium [Cr(VI)]	7196	All wells	All wells	All wells	(3)
Lead (Pb)	200.8	All wells	All wells	All wells	--
Arsenic (As)	200.9	All wells	All wells	All wells	--
NDMA	1625C	(4)	(4)	--	--
1,4-Dioxane	8270	(4)	(4)	(4)	--
General Water Quality Parameters					
Major Anions and Cations [Na, K, Ca, Mg, Fe, SO_4, NO_3, Cl, (CO_3+HCO_3)]	Various	All wells	All wells	All wells	--
Total Dissolved Solids (TDS)	2540-C	All wells	All wells	All wells	--
pH	4500-H	All wells	All wells	All wells	--

Notes:

--: Not analyzed.

(1) All except the following wells and screens: MW-1, MW-3 (Screens 1 and 5), MW-4 (Screens 4 and 5), MW-9, MW-11 (Screen 5), MW-15, MW-17 (Screen 1), MW-18 (Screen 1), MW-22 (Screens 4 and 5), MW-23 (Screens 4 and 5), MW-24 (Screens 4 and 5).

(2) All except the following wells and screens: MW-1, MW-3 (Screen 1), MW-4 (Screens 4 and 5), MW-9, MW-11 (Screen 5), MW-15, MW-17 (Screen 1), MW-18 (Screen 1), MW-22 (Screen 5), MW-24 (Screens 4 and 5).

(3) All except the following wells and screens: MW-1, MW-3 (Screens 1 and 5), MW-9, MW-11 (Screens 4 and 5), MW-12 (Screens 4 and 5), MW-14 (Screen 5), MW-15, MW-17 (Screens 1 and 5), MW-18 (Screens 1 and 5), MW-19, MW-21, MW-22 (Screens 3, 4 and 5), MW-23 (Screen 5), MW-24 (Screen 5).

(4) Wells MW-4 (Screen 2) MW-7, MW-13, MW-16, MW-17 (Screen 3) and MW-24 (Screen 1) only.

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
MW-1												
	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	1.9 Acetone	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	1.3 m, p-xylenes	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
MW-3												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	1.2	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	8.3	0.7(B) Naphthalene	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	2.6 Carbon disulfide	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Screen 2	1st	Aug/Sep 1996	--	--	--	--	--	--	--	5.5	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	4.8	1.9(B) Naphthalene	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	4.4	8.0 Carbon disulfide	(2)
		Jun/Jul 1997	--	--	--	--	--	--	1.0	1.2	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	0.8	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
Screen 3	1st	Aug/Sep 1996	**0.6**	0.8	--	--	--	--	--	1.6	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	0.7	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--	(2)
		Jun/Jul 1997	**1.2**	0.8	0.6	--	--	--	2.8	1.8	--	**21**
	2nd	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
		Jul/Aug 1998	**2.4**	0.6	--	--	--	--	--	3.6	--	10
	3rd	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)[4]	--	8.9
		Aug 1999	**15**	1.0	--	--	--	--	0.8	37	--	--
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	1.2 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	1.0 Hexane	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	4.7 Carbon disulfide[5]	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1 Dichloromethane	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	2.1 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	1.2 Carbon disulfide 1.5 Carbon disulfide 2.7 Sulfur dioxide 1.3 Unknown (RT=2.51)	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	4.5 Carbon disulfide	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	**91**
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	**75**
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	**140**
MW-4												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.9(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.4
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	9.6
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	3.4 Dichloromethane[6]	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.8(B)	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	1st	Aug/Sep 1996	**5.5**	**19**	--	--	**0.9**	0.7	--	6.7	3.2(B) Acetone	(2)
		Oct/Nov 1996	**5.3**	**15**	--	--	**0.6**	0.8	--	5.4	1.8 Acetone	(2)
		Feb/Mar 1997	**7.9**	**19**	--	--	**0.8**	0.8	--	7.8	--	(2)
		Jun/Jul 1997	**4.0**	**5.7**	--	--	--	0.5	--	3.4	--	**51**
	2nd	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**
	3rd	Oct/Nov 1998	**0.9**	2.4	0.7	--	--	--	--	1.6	--	**25**
		Feb/Mar 1999	**1.2**	4.1	0.6	0.5[7]	--	--	--	2.5	--	**38**
		May/Jun 1999	**2.0**	**6.4**	0.7	--	--	--	--	3.7(EB)[4]	--	**56**
		Aug 1999	**1.9**	**5.5**	0.5	--	--	--	--	3.3	--	**69**
Screen 3	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.0(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	1.5 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	1.0 Dichloromethane[6]	--

TABLE 3-1

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(concentrations in µg/L)
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(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.7[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	--
		Oct/Nov 1996	--	--	--	--	--	--	--	--	3.9(B) Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	1.6 Acetone	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	(2)
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.6[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Screen 5	1st	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	(2)
		Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	7.4 Hexane	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.6[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
MW-5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	4.2
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	6.5 Dichloromethane[6]	--

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(concentrations in µg/L)
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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
MW-6	1st	Aug/Sep 1996	--	--	--	--	--	--	--	1.3(TB)	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	0.8	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	5.5
	2nd	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[6]	4.2
	3rd	Oct/Nov 1998	--	--	0.7	--	--	--	--	--	--	--
		Feb/Mar 1999	--	0.8	3.8	1.0	--	--	--	0.6	--	--
		May/Jun 1999	--	--	1.5	--	--	--	--	--	--	--
		Aug 1999	--	--	0.5	--	--	--	--	--	--	4.0
MW-7	1st	Aug/Sep 1996	**90**	**39**	0.8	--	**1.2**	1.1	7.2	13(TB)	--	(2)
		Oct/Nov 1996	**170**	**27**	1.3	--	**0.8**	2.3	7.7	14	4.3(B) 1,1-Difluoroethane 2.8(B) Acetone	(2)
		Feb/Mar 1997	**45**	**27**	0.6	--	**0.8**	0.9	5.1	9.9	--	(2)
		Jun/Jul 1997	**39**	**23**	0.7	--	**0.8**	1.0	4.1	11	10 Unknown	**285**
	2nd	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[6]	**190**
	3rd	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**
		Aug 1999	**40**	**16**	0.5	--	--	0.8	1.9	7.8(FB)	--	**210**
MW-8	1st	Aug/Sep 1996	**4.0**	4.6	--	--	--	--	--	1.3	--	(2)
		Oct/Nov 1996	**2.8**	2.2	--	--	--	--	0.6	0.6	1.7 Acetone	(2)
		Feb/Mar 1997	**1.5**	4.5	--	--	--	--	--	1.3	1.1 Freon 11 1.9 Carbon disulfide	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	6.4

TABLE 3-1

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	2nd	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[6]	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
MW-9	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	3.9 Unknown RT=6.21	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
MW-10	1st	Aug/Sep 1996	**0.7**	**18**	0.5	--	--	--	1.2	1.4(TB)	--	(2)
		Oct/Nov 1996	**0.6**	**6.6**	1.0	1.9	--	--	0.8	1.1	3.0(B) Acetone	(2)
		Feb/Mar 1997	--	**5.2**	--	--	--	--	--	0.6	1.1 Unknown scan #350	
		Jun/Jul 1997	--	2.2	--	--	--	--	--	--	--	(2)
	2nd	Sep/Oct 1997	--	4.3	1.3	1.2	--	--	--	1.0	--	11
		Jan/Feb 1998	--	1.1	2.2	1.6	--	--	--	1.4	--	16
		Apr/May 1998	--	--	--	--	--	--	--	--	--	4.7
		Jul/Aug 1998	--	--	--	--	--	--	--	--	8.2 Dichloromethane[6]	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	**5.7**	--	--	--	--	--	0.9	--	**39**
		May/Jun 1999	--	1.1	--	--	--	--	--	--	--	10
		Aug 1999	--	2.2	--	--	--	--	--	--	--	**21**

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
MW-11												
Screen 1		Aug/Sep 1996	--	--	--	--	--	--	--	--	2.6(B) Acetone	(2)
	1st	Oct/Nov 1996	--	--	--	--	--	--	--	--	7.1 MTBE	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	1.8 Acetone	(2)
		Jun/Jul 1997	**1.4**	--	--	--	--	--	--	--	--	(2)
		Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	**1.5**	--	--	--	--	--	--	--	--	--
		Oct/Nov 1998	**1.4**	--	--	--	--	--	--	--	--	--
	3rd	Feb/Mar 1999	--	--	--	--	--	--	0.9[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 2		Aug/Sep 1996	**2.4**	--	--	--	--	--	--	--	--	--
	1st	Oct/Nov 1996	**1.1**	--	--	--	--	--	--	1.0	--	(2)
		Feb/Mar 1997	**1.7**	--	--	--	--	--	--	1.2	--	(2)
		Jun/Jul 1997	**1.2**	--	--	--	--	--	--	1.0	--	(2)
		Sep/Oct 1997	**0.6**	--	--	--	--	--	--	1.0	--	--
	2nd	Jan/Feb 1998	**0.7**	--	--	--	--	--	--	0.6	--	--
		Apr/May 1998	**1.0**	--	--	--	--	--	--	0.7	--	--
		Jul/Aug 1998	**0.9**	--	--	--	--	--	--	0.7	--	--
		Oct/Nov 1998	**0.6**	--	--	--	--	--	--	0.6	--	--
	3rd	Feb/Mar 1999	--	--	--	--	--	--	0.7[6]	0.7	--	--
		May/Jun 1999	**0.5**	--	--	--	--	--	--	1.1	--	--
		Aug 1999	**0.5**	--	--	--	--	--	--	0.7(EB)[4]	--	--
Screen 3		Aug/Sep 1996	**0.9**	--	--	--	--	--	--	0.6	--	--
	1st	Oct/Nov 1996	--	--	--	--	--	--	--	1.3	2.9(B) Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	1.4	--	(2)
		Jun/Jul 1997	**0.7**	--	--	--	--	--	--	1.1	--	(2)
		Sep/Oct 1997	**0.6**	--	--	--	--	--	--	1.4	--	--
	2nd	Jan/Feb 1998	--	--	--	--	--	--	--	1.3	--	--
		Apr/May 1998	**1.0**	--	--	--	--	--	--	1.4	--	--
		Jul/Aug 1998	**1.5**	--	--	--	--	--	--	1.3	--	--
										1.4	--	--

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	**1.3**	--	--	--	--	--	--	1.1	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.7[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	**0.7**	--	--	--	--	--	--	0.7	--	--
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	0.5	2.4(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	1.5 2-Methyl-1-Propene	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	0.5	--	--
		Apr/May 1998	--	--	--	--	--	--	--	0.5	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	0.5	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	0.6	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.7[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	0.5(EB)[4]	--	--
		Aug 1999	--	--	--	--	--	--	--	0.5	--	(3)
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.4(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	1.1 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	44 Carbon disulfide[4]	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.7[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
MW-12												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	4.1	--	(2)
		Oct/Nov 1996	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Feb/Mar 1997	--	--	--	--	--	--	--	5.8	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	0.5	--	--
	2nd	Sep/Oct 1997	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Jan/Feb 1998	--	--	--	--	--	--	--	0.8	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	1st	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	--	--	--
		Oct/Nov 1996	**1.5**	0.6	--	--	--	--	0.5	--	--	(2)
		Feb/Mar 1997	**1.1**	0.5	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	**1.0**	--	--	--	--	--	--	--	1.1(B) Acetone	(2)
	2nd	Sep/Oct 1997	**0.8**	--	--	--	--	--	--	0.8	--	6.9
		Jan/Feb 1998	**1.1**	--	--	--	--	--	--	0.8	--	5.8
		Apr/May 1998	**1.2**	--	--	--	--	--	--	0.6	--	6.3
		Jul/Aug 1998	**1.4**	--	--	--	--	--	--	0.9	--	6.0
	3rd	Oct/Nov 1998	**1.3**	--	--	--	--	--	--	0.9	--	5.1
		Feb/Mar 1999	**1.3**	--	--	--	--	--	--	1.0	--	4.2
		May/Jun 1999	**0.8**	--	--	--	--	--	--	0.9	--	4.1
		Aug 1999	**0.5**	--	--	--	--	--	--	0.6(EB)[4]	0.8 Dichloromethane(EB)	5.0
Screen 3	1st	Aug/Sep 1996	**4.5**	--	--	--	--	--	--	--	--	--
		Oct/Nov 1996	**3.8**	--	--	--	--	--	--	1.3	--	(2)
		Feb/Mar 1997	**6.4**	--	--	--	--	--	--	1.3	1.6 Acetone	(2)
		Jun/Jul 1997	**20**	--	--	--	--	--	--	1.4	1.3(B) Acetone	(2)
	2nd	Sep/Oct 1997	**14**	--	--	--	--	--	--	1.6	--	5.7
		Jan/Feb 1998	**23E**	--	--	--	--	--	--	1.7	--	6.2
		Apr/May 1998	**25**	--	--	--	--	--	--	2.3	--	5.9
		Jul/Aug 1998	**35**	--	--	--	--	--	--	2.0	--	6.9
	3rd	Oct/Nov 1998	**27**	--	--	--	--	--	--	2.2	--	6.6
		Feb/Mar 1999	**23**	--	--	--	--	--	--	2.2	--	6.9
		May/Jun 1999	**19**	--	--	--	--	--	--	--	--	--
		Aug 1999	**19**	--	--	--	--	--	--	2.0(EB)[4]	--	8.7
Screen 4	1st	Aug/Sep 1996	**6.3**	--	--	--	--	--	--	2.3	--	--
		Oct/Nov 1996	**5.1**	--	--	--	--	--	--	1.4	--	(2)
		Feb/Mar 1997	**4.9**	--	--	--	--	--	--	1.4	2.5 Acetone	(2)
		Jun/Jul 1997	**4.9**	--	--	--	--	--	--	1.3	--	(2)
	2nd	Sep/Oct 1997	**3.8**	--	--	--	--	--	--	1.3	--	7.3
		Jan/Feb 1998	**4.0**	--	--	--	--	--	--	1.0	--	7.6
		Apr/May 1998	**4.3**	--	--	--	--	--	--	1.1	--	8.0
		Jul/Aug 1998	**5.1**	--	--	--	--	--	--	1.2	--	8.0
										1.2	--	6.0

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	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)[4]	--	9.1
		Aug 1999	**3.7**	--	--	--	--	--	--	1.1	--	9.2
Screen 5	1st	Aug/Sep 1996	**3.4**	--	--	--	--	--	--	0.7	--	(2)
		Oct/Nov 1996	**1.3**	--	--	--	--	--	--	--	1.5 Acetone	(2)
		Feb/Mar 1997	**1.7**	--	--	--	--	--	--	0.5	--	(2)
		Jun/Jul 1997	**1.9**	--	--	--	--	--	--	0.5	--	4.1
	2nd	Sep/Oct 1997	**1.3**	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	**1.3**	--	--	--	--	--	--	--	--	--
		Apr/May 1998	**1.7**	--	--	--	--	--	--	0.6	--	--
		Jul/Aug 1998	**2.1**	--	--	--	--	--	--	0.6	--	--
	3rd	Oct/Nov 1998	**2.0**	--	--	--	--	--	--	0.6	--	--
		Feb/Mar 1999	**1.3**	--	--	--	--	--	--	0.7	--	--
		May/Jun 1999	**1.6**	--	--	--	--	--	--	0.5(EB)[4]	--	--
		Aug 1999	**1.9**	--	--	--	--	--	--	0.6	--	--
MW-13	1st	Aug/Sep 1996	**21**	**47**	0.6	--	**2.5**	1.5	0.7	21(TB)	--	(2)
		Oct/Nov 1996	**27**	**27**	--	--	**1.9**	1.5	0.6	14	--	(2)
		Feb/Mar 1997	**18**	**28**	--	--	**0.9**	1.1	0.6	9.2	--	(2)
		Jun/Jul 1997	**6.4**	**24 E**	--	--	**0.9**	0.5	--	11	--	**130**
	2nd	Sep/Oct 1997	**8.2**	**19**	--	--	**1.1**	0.5	--	10	--	**210**
		Jan/Feb 1998	**12**	**5.2**	0.5	--	--	0.5[7]	--	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[6] 0.5 1,1,1-Trichloroethane	**59**
	3rd	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**
		Aug 1999	**11**	**29**	--	--	**0.7**	0.9	--	12	--	**150**
MW-14												
Screen 1	1st	Aug/Sep 1996	--	--	--	2.4	--	--	--	0.6	--	(2)
		Oct/Nov 1996	--	--	--	2.9	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	0.7	1.5	--	--	--	0.7	--	(2)
		Jun/Jul 1997	--	--	--	2.0	--	--	--	--	--	--

TABLE 3-1

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(concentrations in µg/L)
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(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	2nd	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
	3rd	Oct/Nov 1998	--	--	0.5	2.4	--	--	--	0.6	--	4.2
		Feb/Mar 1999	--	--	0.8	1.2	--	--	0.6[6]	0.6	--	4.2
		May/Jun 1999	--	--	0.5	2.6	--	--	--	--	--	--
		Aug 1999	--	--	--	1.7	--	--	--	--	--	--
Screen 2	1st	Aug/Sep 1996	--	2.8	1.6	1.4	--	--	--	1.5	--	(2)
		Oct/Nov 1996	--	1.5	1.6	1.0	--	--	--	0.9	0.6 1,2,3-Trichlorobenzene	(2)
		Feb/Mar 1997	--	0.9	1.9	1.3	--	--	--	0.8	1.1 Acetone 0.8 1,2,3-Trichlorobenzene	(2)
		Jun/Jul 1997	--	1.1	1.7	1.5	--	--	--	0.9	1.1 Acetone 0.5 1,2,3-Trichlorobenzene	--
	2nd	Sep/Oct 1997	--	1.2	1.9	1.6	--	--	--	0.8	--	--
		Jan/Feb 1998	--	--	1.2	0.7	--	--	--	--	8.9 Carbon disulfide[5]	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
	3rd	Oct/Nov 1998	--	0.6	1.5	0.7	--	--	--	0.5	--	4.2
		Feb/Mar 1999	--	0.9	1.6	0.7	--	--	0.6[6]	0.6	--	4.2
		May/Jun 1999	--	1.0	1.2	0.8	--	--	--	0.6(EB)[4]	--	9.6
		Aug 1999	--	--	1.0	--	--	--	--	--	--	--
Screen 3	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	4.3
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	5.6
		Apr/May 1998	--	--	--	--	--	--	--	--	--	5.8
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	5.9
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	6.7
		Feb/Mar 1999	--	--	0.5	--	--	--	0.6[6]	0.5	--	5.9
		May/Jun 1999	--	--	--	--	--	--	--	--	--	7.0
		Aug 1999	--	--	--	--	--	--	--	--	--	6.6

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	0.6[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	9.9
		Aug 1999	--	--	--	--	--	--	--	--	--	4.0
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6(TB) Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	1.3 Carbon disulfide	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	(2)
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	4.6 Carbon disulfide[5]	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
MW-15	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	2.6 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
MW-16		Aug/Sep 1996	**125**	**33**	1.3	--	**2.4**	2.2	2.0	40(TB)	--	(2)
	1st	Oct/Nov 1996	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Feb/Mar 1997	**91**	**23**	1.3	--	**1.7**	2.6	1.6	29	--	(2)
		Jun/Jul 1997	**68**	**25**	1.1	--	**2.1**	1.7	0.6	43	--	**615**
		Sep/Oct 1997	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
	2nd	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	5.0 1,4-Dioxane	**640**
		Jul/Aug 1998	**58**	**19**	1.3	--	**0.8**	2.7	1.2	23	0.6 Dichloromethane[6] 1.0 1,1,1-Trichloroethane	**420**
		Oct/Nov 1998	**51**	**18**	1.0	--	**1.5**	1.6	1.4	29	3.7 1,4-Dioxane 1.1 1,1,1-Trichloroethane 13 Carbon disulfide	**220**
	3rd	Feb/Mar 1999	**67**	**20**	1.4	--	**1.1**	1.8	1.1	24	3.7 1,4-Dioxane	**790**
		May/Jun 1999	**58**	**15**	1.0	--	**0.8**	1.3	1.2	23	3.4 1,4-Dioxane 0.5 Fluorotrichloromethane	**650**
		Aug 1999	**70**	**19**	1.8	--	**1.1**	1.9	1.1	26(EB)	0.6 1,1,1-Trichloroethane	**930**
MW-17												
Screen 1		Aug/Sep 1996	--	--	--	--	--	--	--	--	4.3(B) Acetone	(2)
	1st	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.4 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
		Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Jan/Feb 1998	--	--	--	--	--	--	--	2.9	--	--
		Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
		Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Screen 2		Aug/Sep 1996	--	--	--	--	--	--	--	3.8	4.5(B) Acetone	(2)
	1st	Oct/Nov 1996	--	--	--	--	--	--	--	6.0	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	5.2	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	4.1	--	--
		Sep/Oct 1997	--	--	--	--	--	--	--	6.1	--	--
	2nd	Jan/Feb 1998	--	--	--	--	--	--	--	5.4	--	--
		Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	2.4	--	--

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	3.7	--	--
		Feb/Mar 1999	--	--	--	--	--	--	1.0[6]	3.9	--	--
		May/Jun 1999	--	--	--	--	--	--	--	3.2(EB)[4]	--	--
		Aug 1999	--	--	--	--	--	--	--	2.5	--	--
Screen 3	1st	Aug/Sep 1996	**2.0**	**7.9**	--	--	--	--	--	7.5	--	(2)
		Oct/Nov 1996	**3.3**	**18**	0.8	--	--	--	--	8.7	--	(2)
		Feb/Mar 1997	**5.1**	**23**	1.1	--	--	--	--	6.2	--	(2)
		Jun/Jul 1997	**1.3**	**5.9**	--	--	--	--	--	8.2	--	12
	2nd	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	--	--
	3rd	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)[4]	--	--
		Aug 1999	**0.8**	2.9	--	--	--	--	--	4.6	--	6.1
Screen 4	1st	Aug/Sep 1996	--	**9.5**	0.5	--	--	--	--	1.1	--	(2)
		Oct/Nov 1996	--	**8.9**	--	--	--	--	--	1.5	--	(2)
		Feb/Mar 1997	--	**5.8**	--	--	--	--	--	0.7	--	(2)
		Jun/Jul 1997	--	4.5	--	--	--	--	--	0.6	--	13
	2nd	Sep/Oct 1997	--	**6.8**	0.5	--	--	--	--	1.0	--	16
		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
	3rd	Oct/Nov 1998	--	**6.2**	0.5	--	--	--	--	1.9	--	12
		Feb/Mar 1999	--	3.8	--	--	--	--	1.0[6]	1.8	--	9.8
		May/Jun 1999	--	3.2	--	--	--	--	--	1.4(EB)[4]	--	14
		Aug 1999	--	3.5	--	--	--	--	--	1.5	--	12
Screen 5	1st	Aug/Sep 1996	--	**13**	0.6	--	--	--	--	1.7	3.4(B) Acetone	(2)
		Oct/Nov 1996	--	**16**	0.7	--	--	--	--	1.7	--	(2)
		Feb/Mar 1997	--	**14**	0.7	--	--	--	--	1.3	--	(2)
		Jun/Jul 1997	--	**11**	0.7	--	--	--	--	1.3	--	12
	2nd	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

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	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)[4]	--	12
		Aug 1999	--	4.0	--	--	--	--	--	1.6	--	11
MW-18												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	1.6	--	(2)
		Oct/Nov 1996	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Feb/Mar 1997	--	--	--	--	--	--	--	3.0	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	--
	2nd	Sep/Oct 1997	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Jan/Feb 1998	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Apr/May 1998	--	--	--	--	--	--	--	0.7	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	3.4 Unknown Hydrocarbon (RT=7.14)	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Screen 2	1st	Aug/Sep 1996	--	--	--	--	--	--	--	7.3	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	8.2	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	1.9	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	4.5	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	2.5	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	3.7	--	--
		Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	0.9	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	3.0	0.8 Bromodichloromethane	--
		May/Jun 1999	--	--	--	--	--	--	--	0.8(EB)[4]	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 3	1st	Aug/Sep 1996	**0.7**	4.7	2.8	--	--	--	--	5.1	--	(2)
		Oct/Nov 1996	**0.7**	**6.4**	3.2	--	--	--	--	5.6	--	(2)
		Feb/Mar 1997	**0.8**	**6.6**	2.9	--	--	--	--	5.1	--	(2)
		Jun/Jul 1997	**0.6**	2.4	1.8	--	--	--	--	4.4	--	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	2nd	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
	3rd	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)[4]	0.6 Dichloromethane	--
		Aug 1999	--	1.0	--	--	--	--	--	2.8	--	--
Screen 4	1st	Aug/Sep 1996	**2.2**	--	0.7	--	--	--	--	0.5	--	(2)
		Oct/Nov 1996	**2.2**	--	0.7	--	--	--	--	0.5	1.4(TB) Acetone	(2)
		Feb/Mar 1997	**2.2**	--	1.5	--	--	--	--	0.6	--	(2)
		Jun/Jul 1997	**1.9**	--	0.7	--	--	--	--	--	--	11
	2nd	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
	3rd	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)[4]	0.7 Dichloromethane	16
		Aug 1999	**3.6**	1.1	1.9	--	--	--	--	0.8	--	**23**
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	1.1 Carbon disulfide	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	4.6 Hexane	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
		Aug 1999	--	--	--	--	--	--	--	--	1.0 Unknown (RT=4.25)	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
MW-19												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	0.9	3.7(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.9 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	2.5	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	1.4	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	0.8	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 2	1st	Aug/Sep 1996	--	--	0.8	--	--	--	--	--	3.0(B) Acetone	(2)
		Oct/Nov 1996	--	--	1.1	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	0.6	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	0.6	0.9	--	--	--	--	--	--	--
		Apr/May 1998	--	0.9	1.2	--	--	--	--	--	--	--
		Jul/Aug 1998	--	0.6	0.7	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	0.6	--	--	--	--	--	--	--	--
		May/Jun 1999	--	1.3	1.1	--	--	--	--	--	--	4.5
		Aug 1999	--	0.7	--	--	--	--	--	--	--	--
Screen 3	1st	Aug/Sep 1996	--	--	3.1	--	--	--	--	--	2.6(B) Acetone	(2)
		Oct/Nov 1996	--	--	2.5	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	2.1	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	2.0	--	--	--	--	--	--	4.1
	2nd	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
	3rd	Oct/Nov 1998	--	--	2.0	--	--	--	--	--	--	4.2
		Feb/Mar 1999	--	--	1.5	--	--	--	--	--	--	--
		May/Jun 1999	--	0.9	2.7	--	--	--	--	--	--	7.2
		Aug 1999	--	0.6	1.9	--	--	--	--	--	--	4.4

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(concentrations in µg/L)
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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
Screen 4	1st	Aug/Sep 1996	**0.5**	1.5	--	--	--	--	--	2.1	--	(2)
		Oct/Nov 1996	--	1.5	--	--	--	--	--	1.9	--	(2)
		Feb/Mar 1997	--	1.1	0.6	--	--	--	--	1.5	--	(2)
		Jun/Jul 1997	--	0.7	--	--	--	--	--	1.3	--	--
	2nd	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	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	2.2	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	3.0	--	--
		May/Jun 1999	--	0.7	--	--	--	--	--	2.6(EB)[4]	--	--
		Aug 1999	--	0.5	--	--	--	--	--	2.7	--	--
Screen 5	1st	Aug/Sep 1996	--	--	3.0	--	--	--	--	0.6	1.6(B) Unknown scan #940	(2)
		Oct/Nov 1996	--	--	2.4	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	1.7	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	1.5	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	2.2	--	--	--	--	0.8	--	--
		Jan/Feb 1998	--	--	1.4	--	--	--	--	--	--	--
		Apr/May 1998	--	--	0.9	--	--	--	--	0.6	--	--
		Jul/Aug 1998	--	--	1.5	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	1.5	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	1.3	--	--	--	--	--	--	--
		May/Jun 1999	--	--	2.1	--	--	--	--	--	0.7 Dichloromethane	4.4
		Aug 1999	--	--	1.5	--	--	--	--	--	--	4.2
MW-20												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	3.4(B) Acetone	(2)
		Oct/Nov 1996	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Feb/Mar 1997	--	--	--	--	--	--	--	1.4	2.4(EB) Acetone	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	5.7
	2nd	Sep/Oct 1997	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Jan/Feb 1998	--	--	--	--	--	--	--	1.4	--	6.3
		Apr/May 1998	--	--	--	--	--	--	--	2.5	--	5.5
		Jul/Aug 1998	--	--	--	--	--	--	--	1.8	--	5.9
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	0.8	--	7.8
		Feb/Mar 1999	--	--	--	--	--	--	--	2.2	--	4.9
		May/Jun 1999	--	--	--	--	--	--	--	1.9(EB)[4]	--	4.4
		Aug 1999	--	--	--	--	--	--	--	0.6	--	7.5

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(concentrations in µg/L)
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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
Screen 2	1st	Aug/Sep 1996	--	--	--	--	--	--	--	7.7	4.0(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	4.4	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	3.2	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	3.3	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	5.7	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	2.7	--	--
		Apr/May 1998	--	--	--	--	--	--	--	2.7	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	4.2	0.5 Dichlorobromomethane	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	3.6	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	4.2	--	--
		May/Jun 1999	--	--	--	--	--	--	--	4.6(EB)[4]	0.6 Bromodichloromethane	--
		Aug 1999	--	--	--	--	--	--	--	4.8	0.6 Bromodichloromethane	--
Screen 3	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.7(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.3 Acetone	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	3.4 Unknown (RT=6.2)	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.8(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	**20**
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--

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Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.8(B) Acetone	(2)
		Oct/Nov 1996	--	--	--	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	--	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	8.2
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	0.7 Carbonyl sulfide	--
MW-21												
Screen 1	1st	Aug/Sep 1996	--	**33**	0.7	--	--	--	--	1.8	2.3(B) Acetone	(2)
		Oct/Nov 1996	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Feb/Mar 1997	--	**29**	--	--	--	--	--	2.2	--	(2)
		Jun/Jul 1997	--	**20**	--	--	--	--	--	1.6	--	**19**
	2nd	Sep/Oct 1997	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
		Jan/Feb 1998	--	**16**	--	--	--	--	--	1.8	--	14
		Apr/May 1998	--	**16**	--	--	--	--	--	1.8	--	14
		Jul/Aug 1998	--	**16**	0.6	--	--	--	--	1.8	--	13
	3rd	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)[4]	--	15
		Aug 1999	--	**17**	0.5	--	--	--	--	1.7	--	12
Screen 2	1st	Aug/Sep 1996	--	--	0.9	--	--	--	--	0.5	--	(2)
		Oct/Nov 1996	--	0.6	2.3	--	--	--	--	0.6	1.4(TB) Acetone	(2)
		Feb/Mar 1997	--	--	1.1	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	0.7	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	1.1	--	--	--	--	--	--	--
		Apr/May 1998	--	--	1.0	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	0.7	--	--	--	--	0.7	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	0.7	--	--
		Feb/Mar 1999	--	--	0.8	--	--	--	--	--	--	--
		May/Jun 1999	--	--	0.6	--	--	--	--	--	--	--
		Aug 1999	--	--	0.8	--	--	--	--	--	--	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
Screen 3	1st	Aug/Sep 1996	--	0.7	1.5	--	--	--	--	0.5	--	(2)
		Oct/Nov 1996	--	0.9	1.6	--	--	--	--	--	1.2 Acetone	(2)
		Feb/Mar 1997	--	0.8	1.6	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	1.2	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	0.6	1.3	--	--	--	--	--	--	--
		Jan/Feb 1998	--	0.5	1.4	--	--	--	--	--	--	--
		Apr/May 1998	--	--	1.1	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	0.9	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	0.8	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	1.0	--	--	--	--	--	--	4.1
		May/Jun 1999	--	0.6	1.4	--	--	--	--	--	--	--
		Aug 1999	--	0.6	1.3	--	--	--	--	--	--	--
Screen 4	1st	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	--	(2)
		Oct/Nov 1996	--	--	2.5	--	--	--	--	--	1.6 Acetone	(2)
		Feb/Mar 1997	--	--	1.8	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	2.8	--	--	--	--	--	--	4.6
	2nd	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
	3rd	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
		Aug 1999	--	0.7	**6.1**	--	--	--	--	0.6	1.2 cis-1,2-Dichloroethene	--
Screen 5	1st	Aug/Sep 1996	--	--	4.5	--	--	--	--	0.6	--	(2)
		Oct/Nov 1996	--	--	3.1	--	--	--	--	--	--	(2)
		Feb/Mar 1997	--	--	3.0	--	--	--	--	--	--	(2)
		Jun/Jul 1997	--	--	3.0	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	2.9	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	4.1	--	--	--	--	--	0.6 cis-1,2-Dichloroethene 5.0 Carbon disulfide[5]	5.2
		Apr/May 1998	--	--	**6.5**	--	--	--	--	--	1.0 cis-1,2-Dichloroethene	5.8
		Jul/Aug 1998	--	--	**7.6**	--	--	--	--	0.6	1.5 cis-1,2-Dichloroethene	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	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)[4]	1.5 cis-1,2-Dichloroethene	--
		Aug 1999	--	0.6	**9.6**	--	--	--	--	0.8	1.6 cis-1,2-Dichloroethene	--
											1.4 Chlorodifluoromethane	
MW-22[9]												
Screen 1	2nd	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
	3rd	Oct/Nov 1998	--	--	1.7	0.7	--	--	--	--	--	5.0
		Feb/Mar 1999	--	0.6	3.6	1.0	--	--	1.3[6]	0.5	--	6.4
		May/Jun 1999	--	--	2.7	1.0	--	--	--	--	--	4.9
		Aug 1999	--	--	2.1	0.7	--	--	--	--	--	--
Screen 2	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	4.9
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	0.6	--	--	--	--	1.4[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	15
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	1.3[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	1.3[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	--
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	1.3[6]	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
MW-23[9]												
Screen 1	2nd	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[5]	**19**
	3rd	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)[4]	0.7 1,2,3-Trichlorobenzene	7.6
		Aug 1999	--	3.5	1.1	1.0	--	--	--	0.7(EB)	--	--
Screen 2	2nd	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[6]	7.8
	3rd	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)[4]	--	7.8
		Aug 1999	--	--	--	--	--	--	--	0.5(EB)	--	--
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane[6]	--

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	2.3 Dichloromethane[6]	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	--
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane[6] 3.0 Unknown (RT=3.93)	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	3.1 2-Methyl-1-propene	17
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	--
MW-24[9]												
Screen 1	2nd	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**
	3rd	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)[4]	--	14
		Aug 1999	**1.8**	3.6	--	--	--	--	--	1.3	--	**22**
Screen 2	2nd	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**

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	Perchlorate
	3rd	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)[4]	--	**690**
		Aug 1999	**35**	3.6	0.9	--	--	1.4	--	7.5	--	**700**
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	3rd	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
		Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
		May/Jun 1999	--	--	--	--	--	--	--	--	--	--
		Aug 1999	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

TABLE 3-1

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in µg/L)
Values above California and/or Federal MCLs or action levels are in bold and outlined
(see final page of Table for MCLs and notes)

Sampling Location	Program Year	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 (including 1,4-Dioxane)[1]	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[10] 6.0 cis-1,2-Dichloroethene[10] 1,1,1-Trichloroethane[10]	18[11]
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	NE	5.0	7.0	NE		100	5.0 Dichloromethane[10] 70 cis-1,2-Dichloroethene[10] 100 Bromodichloromethane[10] 1,1,1-Trichloroethane[10]	NE

--: Not detected.
B: Compound detected in laboratory method blank.
EB: Compound detected in associated equipment blank.
RT: Retention time.
TB: Compound detected in associated trip blank.
FB: Compound detected in associated field blank.
E: Estimated concentration; result exceeded calibration range.
NE: Not established.

1: 1,4-Dioxane was analyzed from samples collected at MW-4-2, MW-7, MW-13, MW-16, MW-17-3, and MW-24-1 during the April/May 1998, July/August 1998, October/November 1998, February/March 1999, and May/June 1999 quarterly sampling events.
2: Perchlorate not part of monitoring program.
3: Not sampled due to changes to the sampling program as agreed to by the EPA, DTSC and RWQCB.
4: 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.
5: Suspected by the laboratory to have resulted from carry over in analysis (see January/February 1998 report).
6: Attributed to laboratory contamination.
7: Results from duplicate analysis; original sample was non detect.
8: Not sampled, no water over screen.
9: Wells installed June-August 1997.
10: Only VOCs for which MCLs have been established are listed.
11: California Department of Health Services Interim Action Level.

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1		Aug/Sep 1996	--	--	--	--	0.8
	1st	Oct/Nov 1996	--	--	--	--	0.5
		Feb/Mar 1997	--	--	--	--	2.5
		Jun/Jul 1997	--	--	--	--	1.9
		Sep/Oct 1997	--	--	--	--	0.7
	2nd	Jan/Feb 1998	--	--	--	--	1.6
		Apr/May 1998	--	--	--	--	0.5
		Jul/Aug 1998	--	0.009	**0.055**[1]	--	1.0
		Oct/Nov 1998	--	--	--	--	1.1
	3rd	Feb/Mar 1999	--	--	--	--	1.9
		May/Jun 1999	--	--	--	--	0.4
		Aug 1999	Not Sampled[2]				
MW-3							
Screen 1		Aug/Sep 1996	--	--	--	--	7.2
	1st	Oct/Nov 1996	--	--	--	--	3.1
		Feb/Mar 1997	--	--	--	--	6.1
		Jun/Jul 1997	--	--	--	--	2.6
		Sep/Oct 1997	--	--	--	--	2.1
	2nd	Jan/Feb 1998	--	--	--	--	2.9
		Apr/May 1998	--	--	--	--	4.8
		Jul/Aug 1998	--	--	--	--	4.5
		Oct/Nov 1998	--	--	--	--	3.8
	3rd	Feb/Mar 1999	--	--	--	--	4.7
		May/Jun 1999	--	--	--	--	4.6
		Aug 1999	Not Sampled[2]				
Screen 2		Aug/Sep 1996	--	--	--	--	1.7
	1st	Oct/Nov 1996	--	--	--	--	2.7
		Feb/Mar 1997	--	--	--	--	3.8
		Jun/Jul 1997	--	--	--	--	1.1
		Sep/Oct 1997	--	--	--	--	2.1
	2nd	Jan/Feb 1998	--	--	--	--	2.3
		Apr/May 1998	--	--	--	--	4.3
		Jul/Aug 1998	--	0.004	--	--	3.3
		Oct/Nov 1998	--	--	--	--	4.3
	3rd	Feb/Mar 1999	--	--	--	--	2.1
		May/Jun 1999	--	--	--	--	3.1
		Aug 1999	NS	NS	--	--	1.0
Screen 3		Aug/Sep 1996	--	--	--	--	5.2
	1st	Oct/Nov 1996	--	--	--	--	2.7
		Feb/Mar 1997	--	--	--	--	1.7
		Jun/Jul 1997	--	--	--	--	3.4
		Sep/Oct 1997	--	--	--	--	5.0
	2nd	Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.7
		Jul/Aug 1998	--	--	--	--	4.6

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	3.3
		Feb/Mar 1999	--	--	--	--	3.2
		May/Jun 1999	--	--	--	--	1.8
		Aug 1999	NS	NS	--	--	2.5
Screen 4	1st	Aug/Sep 1996	--	--	--	--	4.3
		Oct/Nov 1996	--	--	--	--	2.6
		Feb/Mar 1997	--	--	--	--	4.5
		Jun/Jul 1997	--	--	--	--	2.7
	2nd	Sep/Oct 1997	--	--	--	--	2.5
		Jan/Feb 1998	--	--	--	--	3.0
		Apr/May 1998	--	--	--	--	3.6
		Jul/Aug 1998	--	--	--	--	3.1
	3rd	Oct/Nov 1998	--	--	--	--	1.3
		Feb/Mar 1999	--	--	--	--	3.5
		May/Jun 1999	--	--	--	--	1.5
		Aug 1999	NS	NS	--	--	1.1
Screen 5	1st	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
	2nd	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
	3rd	Oct/Nov 1998	--	--	--	--	4.2
		Feb/Mar 1999	--	--	--	--	4.4
		May/Jun 1999	0.006	--	--	--	4.2
		Aug 1999	NS	NS	NS	NS	5.4
MW-4							
Screen 1	1st	Aug/Sep 1996	--	--	--	--	2.6
		Oct/Nov 1996	--	--	--	--	1.7
		Feb/Mar 1997	--	--	--	--	4.6
		Jun/Jul 1997	--	--	--	--	2.8
	2nd	Sep/Oct 1997	--	--	--	--	4.8
		Jan/Feb 1998	--	--	--	--	3.4
		Apr/May 1998	--	--	--	--	3.7
		Jul/Aug 1998	--	--	--	--	3.0
	3rd	Oct/Nov 1998	--	--	--	--	2.7
		Feb/Mar 1999	--	--	--	--	1.0
		May/Jun 1999	--	--	--	--	1.8
		Aug 1999	NS	NS	--	--	1.2
Screen 2	1st	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

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	2nd	Sep/Oct 1997	--	--	0.012	--	3.5
		Jan/Feb 1998	--	--	--	--	4.8
		Apr/May 1998	--	--	--	--	1.8
		Jul/Aug 1998	--	--	0.011	--	4.9
	3rd	Oct/Nov 1998	--	--	0.010	--	3.4
		Feb/Mar 1999	--	--	--	--	6.1
		May/Jun 1999	--	--	--	--	4.8
		Aug 1999	NS	NS	0.01	--	3.8
Screen 3	1st	Aug/Sep 1996	--	--	--	--	0.6
		Oct/Nov 1996	--	--	--	--	1.5
		Feb/Mar 1997	--	--	--	--	2.8
		Jun/Jul 1997	--	--	--	--	2.0
	2nd	Sep/Oct 1997	--	--	--	--	1.4
		Jan/Feb 1998	--	--	--	--	4.6
		Apr/May 1998	--	--	--	--	3.2
		Jul/Aug 1998	--	--	--	--	3.9
	3rd	Oct/Nov 1998	--	--	--	--	1.2
		Feb/Mar 1999	--	--	--	--	2.9
		May/Jun 1999	--	--	--	--	4.9
		Aug 1999	NS	NS	--	--	2.1
Screen 4	1st	Aug/Sep 1996	--	--	--	--	3.0
		Oct/Nov 1996	--	--	--	--	1.4
		Feb/Mar 1997	--	--	--	--	2.5
		Jun/Jul 1997	--	--	--	--	4.6
	2nd	Sep/Oct 1997	--	--	--	--	3.3
		Jan/Feb 1998	--	--	--	--	4.7
		Apr/May 1998	--	--	--	--	2.0
		Jul/Aug 1998	--	--	0.007	--	3.6
	3rd	Oct/Nov 1998	--	--	--	--	2.7
		Feb/Mar 1999	--	--	--	--	3.3
		May/Jun 1999	--	--	--	--	2.9
		Aug 1999	NS	NS	--	--	1.2
Screen 5	1st	Aug/Sep 1996	--	--	--	--	4.5
		Oct/Nov 1996	--	--	--	--	4.1
		Feb/Mar 1997	--	--	--	--	4.4
		Jun/Jul 1997	--	--	--	--	4.0
	2nd	Sep/Oct 1997	--	--	--	--	3.9
		Jan/Feb 1998	--	--	--	--	4.5
		Apr/May 1998	--	--	--	--	3.8
		Jul/Aug 1998	0.005	--	--	--	4.6
	3rd	Oct/Nov 1998	--	--	--	--	2.9
		Feb/Mar 1999	--	--	--	--	2.4
		May/Jun 1999	--	--	--	--	1.1
		Aug 1999	NS	NS	--	--	2.4

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-5	1st	Aug/Sep 1996	--	--	--	--	2.7
		Oct/Nov 1996	--	0.003	--	--	2.7
		Feb/Mar 1997	--	--	--	--	1.5
		Jun/Jul 1997	--	--	--	--	4.5
	2nd	Sep/Oct 1997	--	--	--	--	1.0
		Jan/Feb 1998	--	--	--	--	0.9
		Apr/May 1998	--	--	--	--	3.1
		Jul/Aug 1998	--	--	--	--	4.6
	3rd	Oct/Nov 1998	--	--	--	--	4.2
		Feb/Mar 1999	--	--	--	--	7.9
		May/Jun 1999	--	--	--	--	1.7
		Aug 1999	NS	NS	--	--	4.3
MW-6	1st	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
	2nd	Sep/Oct 1997	--	--	--	--	1.8
		Jan/Feb 1998	--	--	--	--	0.4
		Apr/May 1998	--	--	0.012	--	2.1
		Jul/Aug 1998	--	--	0.013	--	3.0
	3rd	Oct/Nov 1998	--	--	0.037	--	3.8
		Feb/Mar 1999	--	--	0.017	--	2.7
		May/Jun 1999	--	--	0.036	--	4.1
		Aug 1999	NS	NS	**0.31**[3]	--	2.7
MW-7	1st	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
	2nd	Sep/Oct 1997	--	--	0.018	--	0.8
		Jan/Feb 1998	--	--	0.012	--	1.2
		Apr/May 1998	--	--	--	--	4.1
		Jul/Aug 1998	--	--	--	--	4.7
	3rd	Oct/Nov 1998	--	--	--	--	1.2
		Feb/Mar 1999	--	--	--	--	4.3
		May/Jun 1999	--	--	0.011	--	3.5
		Aug 1999	NS	NS	--	0.005	3.1
MW-8	1st	Aug/Sep 1996	--	--	--	--	4.0
		Oct/Nov 1996	--	0.003	--	--	4.7
		Feb/Mar 1997	--	--	--	--	3.1
		Jun/Jul 1997	--	0.002	--	--	4.6
	2nd	Sep/Oct 1997	--	--	--	--	4.2
		Jan/Feb 1998	--	--	--	--	3.4
		Apr/May 1998	--	--	0.013	--	2.6
		Jul/Aug 1998	--	--	--	--	1.2

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	3.7
		Feb/Mar 1999	--	--	--	--	1.5
		May/Jun 1999	--	--	--	--	1.5
		Aug 1999	NS	NS	0.014	--	0.7
MW-9	1st	Aug/Sep 1996	--	--	--	--	2.1
		Oct/Nov 1996	--	--	--	--	2.5
		Feb/Mar 1997	--	--	--	--	4.2
		Jun/Jul 1997	--	--	--	--	3.2
	2nd	Sep/Oct 1997	--	--	--	--	1.0
		Jan/Feb 1998	--	--	--	--	2.4
		Apr/May 1998	--	--	--	--	1.3
		Jul/Aug 1998	--	--	--	--	3.0
	3rd	Oct/Nov 1998	--	--	--	--	2.1
		Feb/Mar 1999	--	--	--	--	2.8
		May/Jun 1999	--	--	--	--	0.1
		Aug 1999	Not Sampled(2)				
MW-10	1st	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
	2nd	Sep/Oct 1997	--	--	--	--	3.2
		Jan/Feb 1998	--	--	--	--	2.1
		Apr/May 1998	--	0.008	0.010	--	2.6
		Jul/Aug 1998	--	--	--	--	3.8
	3rd	Oct/Nov 1998	--	--	--	--	3.6
		Feb/Mar 1999	--	--	0.014	--	3.3
		May/Jun 1999	--	--	--	--	1.8
		Aug 1999	NS	NS	--	--	3.6
MW-11							
Screen 1	1st	Aug/Sep 1996	--	--	--	--	4.0
		Oct/Nov 1996	--	--	--	--	2.5
		Feb/Mar 1997	--	--	--	--	2.5
		Jun/Jul 1997	--	--	--	--	1.5
	2nd	Sep/Oct 1997	--	--	--	--	4.6
		Jan/Feb 1998	--	--	--	--	1.0
		Apr/May 1998	--	--	--	--	1.0
		Jul/Aug 1998	--	--	--	--	4.6
	3rd	Oct/Nov 1998	--	--	--	--	1.4
		Feb/Mar 1999	--	--	--	--	1.6
		May/Jun 1999	--	--	--	--	1.1
		Aug 1999	NS	NS	--	--	1.2

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above California MCLs are in bold and outlined

(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	1st	Aug/Sep 1996	--	--	--	--	4.5
		Oct/Nov 1996	--	--	--	--	4.7
		Feb/Mar 1997	--	--	--	--	3.1
		Jun/Jul 1997	--	--	--	--	4.7
	2nd	Sep/Oct 1997	--	--	--	--	3.0
		Jan/Feb 1998	--	--	--	--	2.4
		Apr/May 1998	--	--	--	--	1.4
		Jul/Aug 1998	--	--	--	--	3.5
	3rd	Oct/Nov 1998	--	--	--	--	3.7
		Feb/Mar 1999	--	--	--	--	12.8
		May/Jun 1999	--	--	--	--	1.3
		Aug 1999	NS	NS	--	--	1.9
Screen 3	1st	Aug/Sep 1996	--	--	--	--	0.5
		Oct/Nov 1996	--	--	--	--	2.3
		Feb/Mar 1997	--	--	--	--	1.7
		Jun/Jul 1997	--	--	--	--	1.9
	2nd	Sep/Oct 1997	--	--	--	--	3.0
		Jan/Feb 1998	--	--	--	--	1.4
		Apr/May 1998	--	--	--	--	2.1
		Jul/Aug 1998	--	--	--	--	2.6
	3rd	Oct/Nov 1998	--	0.008	--	--	4.5
		Feb/Mar 1999	--	--	--	--	2.6
		May/Jun 1999	--	--	--	--	2.7
		Aug 1999	NS	NS	--	--	3.1
Screen 4	1st	Aug/Sep 1996	--	--	--	--	3.9
		Oct/Nov 1996	--	--	--	--	3.3
		Feb/Mar 1997	--	0.009	--	--	5.2
		Jun/Jul 1997	--	--	--	--	4.8
	2nd	Sep/Oct 1997	--	--	--	--	5.0
		Jan/Feb 1998	--	--	--	--	3.4
		Apr/May 1998	--	--	--	--	4.2
		Jul/Aug 1998	--	--	--	--	3.7
	3rd	Oct/Nov 1998	--	--	--	--	4.5
		Feb/Mar 1999	--	--	--	--	1.4
		May/Jun 1999	--	--	--	--	4.0
		Aug 1999	NS	NS	NS	NS	3.5
Screen 5	1st	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
	2nd	Sep/Oct 1997	--	--	--	--	2.6
		Jan/Feb 1998	--	--	--	--	1.2
		Apr/May 1998	--	--	--	--	1.7
		Jul/Aug 1998	--	--	--	--	1.7

TABLE 3-2

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(concentrations in mg/L)
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(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	1.4
		Feb/Mar 1999	--	--	--	--	4.1
		May/Jun 1999	0.005	--	--	--	1.4
		Aug 1999	Not Sampled(2)				
MW-12							
Screen 1	1st	Aug/Sep 1996	--	0.004	--	--	50.4
		Oct/Nov 1996	Not Sampled*				
		Feb/Mar 1997	--	0.003	--	--	3.8
		Jun/Jul 1997	--	--	--	--	4.8
	2nd	Sep/Oct 1997	Not Sampled*				
		Jan/Feb 1998	--	--	--	--	2.6
		Apr/May 1998	--	--	0.010	--	4.8
		Jul/Aug 1998	--	--	--	--	5.0
	3rd	Oct/Nov 1998	--	--	--	--	7.4
		Feb/Mar 1999	--	--	--	--	7.5
		May/Jun 1999	--	--	--	--	10.5
		Aug 1999	NS	NS	--	--	41.6
Screen 2	1st	Aug/Sep 1996	--	**0.024**	--	--	4.0
		Oct/Nov 1996	--	--	--	--	4.0
		Feb/Mar 1997	--	--	--	--	2.5
		Jun/Jul 1997	--	--	--	--	3.2
	2nd	Sep/Oct 1997	--	--	--	--	3.4
		Jan/Feb 1998	--	--	--	--	4.4
		Apr/May 1998	--	--	--	--	1.6
		Jul/Aug 1998	--	0.006	--	--	3.7
	3rd	Oct/Nov 1998	--	--	--	--	4.9
		Feb/Mar 1999	--	--	--	--	2.5
		May/Jun 1999	--	--	--	--	1.7
		Aug 1999	NS	NS	--	--	1.9
Screen 3	1st	Aug/Sep 1996	--	--	--	--	2.5
		Oct/Nov 1996	--	--	--	--	3.1
		Feb/Mar 1997	--	--	--	--	5.0
		Jun/Jul 1997	--	--	--	--	4.8
	2nd	Sep/Oct 1997	--	--	--	--	4.2
		Jan/Feb 1998	--	--	--	--	2.8
		Apr/May 1998	--	--	--	--	4.4
		Jul/Aug 1998	--	**0.018**	--	--	3.2
	3rd	Oct/Nov 1998	--	--	--	--	4.2
		Feb/Mar 1999	--	--	--	--	4.6
		May/Jun 1999	--	--	--	--	0.8
		Aug 1999	NS	NS	--	--	0.4

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
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(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	1st	Aug/Sep 1996	--	0.005	--	--	1.8
		Oct/Nov 1996	--	--	--	--	0.7
		Feb/Mar 1997	--	--	--	--	2.4
		Jun/Jul 1997	--	--	--	--	2.5
	2nd	Sep/Oct 1997	--	--	--	--	1.6
		Jan/Feb 1998	--	--	--	--	3.4
		Apr/May 1998	--	--	--	--	1.7
		Jul/Aug 1998	--	--	--	--	3.7
	3rd	Oct/Nov 1998	--	--	--	--	4.2
		Feb/Mar 1999	--	--	--	--	3.1
		May/Jun 1999	--	--	--	--	1.1
		Aug 1999	NS	NS	NS	NS	0.9
Screen 5	1st	Aug/Sep 1996	--	--	--	--	2.0
		Oct/Nov 1996	--	--	--	--	2.0
		Feb/Mar 1997	--	--	--	--	1.5
		Jun/Jul 1997	--	--	--	--	5.0
	2nd	Sep/Oct 1997	--	--	--	--	1.0
		Jan/Feb 1998	--	--	--	--	2.2
		Apr/May 1998	--	--	--	--	3.5
		Jul/Aug 1998	--	--	--	--	3.1
	3rd	Oct/Nov 1998	--	--	--	--	1.3
		Feb/Mar 1999	--	--	--	--	5.0
		May/Jun 1999	--	--	--	--	3.2
		Aug 1999	NS	NS	NS	NS	4.8
MW-13	1st	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
	2nd	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
	3rd	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
		Aug 1999	NS	NS	0.037	0.031	0.15
MW-14							
Screen 1	1st	Aug/Sep 1996	--	--	--	--	3.3
		Oct/Nov 1996	--	--	--	--	4.5
		Feb/Mar 1997	--	--	--	--	4.3
		Jun/Jul 1997	--	--	--	--	2.2
	2nd	Sep/Oct 1997	--	--	--	--	3.9
		Jan/Feb 1998	--	0.004	--	--	5.0
		Apr/May 1998	--	--	0.011	--	3.1
		Jul/Aug 1998	--	--	--	--	3.8

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
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(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	4.2
		Feb/Mar 1999	--	--	--	--	4.8
		May/Jun 1999	--	--	--	--	3.4
		Aug 1999	NS	NS	--	--	1.7
Screen 2	1st	Aug/Sep 1996	--	--	--	--	4.4
		Oct/Nov 1996	--	--	--	--	3.8
		Feb/Mar 1997	--	--	--	--	4.8
		Jun/Jul 1997	--	--	--	--	5.0
	2nd	Sep/Oct 1997	--	--	--	--	3.2
		Jan/Feb 1998	--	0.003	--	--	4.8
		Apr/May 1998	--	--	--	--	4.9
		Jul/Aug 1998	--	--	--	--	4.8
	3rd	Oct/Nov 1998	--	--	--	--	4.3
		Feb/Mar 1999	--	--	--	--	4.7
		May/Jun 1999	--	--	--	--	4.4
		Aug 1999	NS	NS	--	--	2.8
Screen 3	1st	Aug/Sep 1996	--	--	--	--	1.7
		Oct/Nov 1996	--	--	--	--	2.0
		Feb/Mar 1997	--	--	--	--	2.5
		Jun/Jul 1997	--	--	--	--	0.7
	2nd	Sep/Oct 1997	--	--	--	--	2.9
		Jan/Feb 1998	--	0.003	0.026	--	2.1
		Apr/May 1998	--	--	--	--	1.4
		Jul/Aug 1998	--	--	--	--	3.1
	3rd	Oct/Nov 1998	--	--	--	--	0.8
		Feb/Mar 1999	--	--	--	--	0.7
		May/Jun 1999	--	--	--	--	0.8
		Aug 1999	NS	NS	--	--	2.2
Screen 4	1st	Aug/Sep 1996	--	--	--	--	3.1
		Oct/Nov 1996	--	--	--	--	2.5
		Feb/Mar 1997	--	--	--	--	4.1
		Jun/Jul 1997	--	--	--	--	2.3
	2nd	Sep/Oct 1997	--	--	--	--	1.7
		Jan/Feb 1998	--	0.002	--	--	2.7
		Apr/May 1998	--	--	--	--	1.3
		Jul/Aug 1998	--	--	--	--	1.0
	3rd	Oct/Nov 1998	--	--	--	--	2.3
		Feb/Mar 1999	--	--	--	--	2.1
		May/Jun 1999	--	--	--	--	1.7
		Aug 1999	NS	NS	--	--	1.2
Screen 5	1st	Aug/Sep 1996	--	--	--	--	1.5
		Oct/Nov 1996	--	--	--	--	4.1
		Feb/Mar 1997	--	**0.028**	--	--	2.3
		Jun/Jul 1997	--	--	--	--	1.9

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	2nd	Sep/Oct 1997	--	--	--	--	3.8
		Jan/Feb 1998	--	--	--	--	4.7
		Apr/May 1998	--	--	--	--	1.9
		Jul/Aug 1998	--	--	--	--	2.4
	3rd	Oct/Nov 1998	--	--	--	--	4.5
		Feb/Mar 1999	--	--	--	--	4.2
		May/Jun 1999	--	--	--	--	1.9
		Aug 1999	NS	NS	NS	NS	1.4
MW-15	1st	Aug/Sep 1996	--	--	--	--	1.3
		Oct/Nov 1996	--	--	NS	--	0.5
		Feb/Mar 1997	--	--	--	--	2.6
		Jun/Jul 1997	--	--	--	--	0.2
	2nd	Sep/Oct 1997	--	--	--	--	0.9
		Jan/Feb 1998	--	--	--	--	1.4
		Apr/May 1998	--	--	--	--	0.4
		Jul/Aug 1998	--	--	--	--	3.0
	3rd	Oct/Nov 1998	--	--	--	--	2.0
		Feb/Mar 1999	--	--	--	--	0.6
		May/Jun 1999	--	--	--	--	0.4
		Aug 1999	Not Sampled(2)				
MW-16	1st	Aug/Sep 1996	--	--	0.018	--	3.4
		Oct/Nov 1996	Not Sampled*				
		Feb/Mar 1997	--	--	--	0.007	0.2
		Jun/Jul 1997	--	--	--	--	0.1
	2nd	Sep/Oct 1997	Not Sampled*				
		Jan/Feb 1998	--	--	--	--	1.1
		Apr/May 1998	--	--	0.014	--	1.4
		Jul/Aug 1998	--	--	--	--	1.9
	3rd	Oct/Nov 1998	--	--	0.013	--	0.9
		Feb/Mar 1999	--	--	0.013	0.007	1.0
		May/Jun 1999	--	--	--	--	2.2
		Aug 1999	NS	NS	--	0.007	0.5
MW-17							
Screen 1	1st	Aug/Sep 1996	--	--	NS	NS	1.0
		Oct/Nov 1996	--	--	--	--	2.9
		Feb/Mar 1997	--	--	--	--	2.0
		Jun/Jul 1997	--	--	--	--	2.2
	2nd	Sep/Oct 1997	--	--	--	--	1.3
		Jan/Feb 1998	--	--	--	--	5.0
		Apr/May 1998	--	--	--	--	1.7
		Jul/Aug 1998	--	--	--	--	1.5
	3rd	Oct/Nov 1998	--	--	--	--	0.5
		Feb/Mar 1999	--	--	--	--	1.5
		May/Jun 1999	--	--	--	--	0.4
		Aug 1999	Not Sampled(2)				

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	1st	Aug/Sep 1996	--	--	NS	NS	4.5
		Oct/Nov 1996	--	--	--	--	2.5
		Feb/Mar 1997	--	--	--	--	2.7
		Jun/Jul 1997	--	--	--	--	4.5
	2nd	Sep/Oct 1997	--	--	--	--	1.2
		Jan/Feb 1998	--	--	--	--	0.8
		Apr/May 1998	--	--	--	--	2.2
		Jul/Aug 1998	--	0.007	--	--	1.0
	3rd	Oct/Nov 1998	--	--	--	--	1.7
		Feb/Mar 1999	--	--	--	--	1.1
		May/Jun 1999	--	--	--	--	1.6
		Aug 1999	NS	NS	--	--	12.4
Screen 3	1st	Aug/Sep 1996	--	0.002	NS	NS	4.9
		Oct/Nov 1996	--	--	--	--	4.8
		Feb/Mar 1997	--	--	--	--	6.0
		Jun/Jul 1997	--	--	--	--	4.8
	2nd	Sep/Oct 1997	--	--	--	0.006	2.5
		Jan/Feb 1998	--	--	--	--	3.2
		Apr/May 1998	--	--	--	--	3.6
		Jul/Aug 1998	--	--	--	--	4.0
	3rd	Oct/Nov 1998	--	--	--	--	4.4
		Feb/Mar 1999	--	--	--	--	6.3
		May/Jun 1999	--	--	--	--	2.2
		Aug 1999	NS	NS	--	--	2.5
Screen 4	1st	Aug/Sep 1996	--	--	NS	NS	2.8
		Oct/Nov 1996	--	--	--	--	2.6
		Feb/Mar 1997	--	--	--	--	5.6
		Jun/Jul 1997	--	--	--	--	4.1
	2nd	Sep/Oct 1997	--	--	--	--	3.6
		Jan/Feb 1998	--	--	--	--	3.9
		Apr/May 1998	--	--	--	--	3.7
		Jul/Aug 1998	--	--	--	--	4.4
	3rd	Oct/Nov 1998	--	--	--	--	1.8
		Feb/Mar 1999	--	--	--	--	4.8
		May/Jun 1999	--	--	--	--	7.9
		Aug 1999	NS	NS	--	--	4.1
Screen 5	1st	Aug/Sep 1996	--	--	NS	NS	5.0
		Oct/Nov 1996	--	0.005	--	--	5.2
		Feb/Mar 1997	--	0.003	--	--	25
		Jun/Jul 1997	--	--	--	--	34
	2nd	Sep/Oct 1997	--	--	--	--	4.8
		Jan/Feb 1998	--	--	--	--	4.8
		Apr/May 1998	--	0.002	--	--	3.7
		Jul/Aug 1998	--	--	--	--	4.8

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	5.1
		Feb/Mar 1999	--	0.007	--	--	12.4
		May/Jun 1999	--	0.004	--	--	16.3
		Aug 1999	NS	NS	NS	NS	2.4
MW-18							
Screen 1		Aug/Sep 1996	--	--	NS	NS	0.9
	1st	Oct/Nov 1996	Not Sampled*				
		Feb/Mar 1997	--	--	--	--	1.9
		Jun/Jul 1997	--	--	--	--	0.4
		Sep/Oct 1997	Not Sampled*				
	2nd	Jan/Feb 1998	Not Sampled*				
		Apr/May 1998	--	--	--	--	0.1
		Jul/Aug 1998	--	--	--	--	3.8
		Oct/Nov 1998	--	--	--	--	2.3
	3rd	Feb/Mar 1999	--	--	--	--	0.7
		May/Jun 1999	--	--	--	--	2.8
		Aug 1999	Not Sampled(2)				
Screen 2		Aug/Sep 1996	--	--	NS	NS	3.5
	1st	Oct/Nov 1996	--	0.003	--	--	3.4
		Feb/Mar 1997	--	--	--	--	2.8
		Jun/Jul 1997	--	--	--	--	1.5
		Sep/Oct 1997	--	--	--	--	1.4
	2nd	Jan/Feb 1998	--	--	--	--	3.6
		Apr/May 1998	--	--	--	--	0.1
		Jul/Aug 1998	--	--	--	--	3.1
		Oct/Nov 1998	--	--	--	--	1.9
	3rd	Feb/Mar 1999	--	0.005	--	--	2.7
		May/Jun 1999	--	--	--	--	4.1
		Aug 1999	NS	NS	--	--	1.0
Screen 3		Aug/Sep 1996	--	--	NS	NS	4.2
	1st	Oct/Nov 1996	--	0.002	NS	--	4.0
		Feb/Mar 1997	--	--	0.015	0.007	3.3
		Jun/Jul 1997	--	--	--	--	3.9
		Sep/Oct 1997	--	--	--	--	2.1
	2nd	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
	3rd	Feb/Mar 1999	--	--	--	0.007	1.2
		May/Jun 1999	--	--	--	--	2.1
		Aug 1999	NS	NS	--	--	0.8
Screen 4		Aug/Sep 1996	--	--	NS	NS	2.0
	1st	Oct/Nov 1996	--	0.003	--	--	1.9
		Feb/Mar 1997	--	--	--	--	2.8
		Jun/Jul 1997	0.005	--	--	--	3.6

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	2nd	Sep/Oct 1997	--	--	--	--	1.1
		Jan/Feb 1998	--	--	--	--	2.2
		Apr/May 1998	--	--	--	--	0.04
		Jul/Aug 1998	--	--	--	--	2.5
	3rd	Oct/Nov 1998	--	--	--	--	4.6
		Feb/Mar 1999	--	--	--	--	2.7
		May/Jun 1999	--	--	--	--	3.0
		Aug 1999	NS	NS	--	--	0.7
Screen 5	1st	Aug/Sep 1996	--	--	NS	NS	2.8
		Oct/Nov 1996	--	0.002	--	--	3.6
		Feb/Mar 1997	--	--	--	--	2.9
		Jun/Jul 1997	--	--	--	--	4.0
	2nd	Sep/Oct 1997	--	--	--	--	1.7
		Jan/Feb 1998	--	--	--	--	1.6
		Apr/May 1998	--	--	--	--	0.1
		Jul/Aug 1998	--	--	--	--	1.1
	3rd	Oct/Nov 1998	--	--	--	--	2.8
		Feb/Mar 1999	--	--	--	--	2.0
		May/Jun 1999	--	--	--	--	2.4
		Aug 1999	NS	NS	NS	NS	0.6
MW-19							
Screen 1	1st	Aug/Sep 1996	--	--	NS	NS	5.0
		Oct/Nov 1996	--	--	--	--	3.4
		Feb/Mar 1997	--	--	--	--	6.6
		Jun/Jul 1997	--	--	--	--	0.8
	2nd	Sep/Oct 1997	--	--	--	--	4.6
		Jan/Feb 1998	--	--	--	--	4.7
		Apr/May 1998	--	--	--	--	2.2
		Jul/Aug 1998	--	--	--	--	4.9
	3rd	Oct/Nov 1998	--	--	--	--	13.0
		Feb/Mar 1999	--	--	--	--	5.0
		May/Jun 1999	--	--	--	--	5.0
		Aug 1999	NS	NS	NS	NS	1.1
Screen 2	1st	Aug/Sep 1996	--	--	NS	NS	4.5
		Oct/Nov 1996	--	--	--	--	3.6
		Feb/Mar 1997	--	--	--	--	22
		Jun/Jul 1997	--	--	--	--	2.8
	2nd	Sep/Oct 1997	--	--	--	--	4.6
		Jan/Feb 1998	--	--	--	--	4.7
		Apr/May 1998	--	--	--	--	2.3
		Jul/Aug 1998	--	--	--	--	4.9
	3rd	Oct/Nov 1998	--	--	--	--	4.8
		Feb/Mar 1999	--	--	--	--	3.9
		May/Jun 1999	--	--	--	--	2.3
		Aug 1999	NS	NS	NS	NS	0.1

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
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(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	1st	Aug/Sep 1996	--	--	NS	NS	3.0
		Oct/Nov 1996	--	--	--	--	5.0
		Feb/Mar 1997	--	--	--	--	4.9
		Jun/Jul 1997	--	--	--	--	4.9
	2nd	Sep/Oct 1997	--	--	--	--	2.0
		Jan/Feb 1998	--	--	--	--	4.1
		Apr/May 1998	--	--	--	--	2.4
		Jul/Aug 1998	--	--	--	--	3.9
	3rd	Oct/Nov 1998	--	--	--	--	3.4
		Feb/Mar 1999	--	--	--	--	4.1
		May/Jun 1999	--	--	--	--	2.5
		Aug 1999	NS	NS	NS	NS	0.2
Screen 4	1st	Aug/Sep 1996	--	--	NS	NS	4.2
		Oct/Nov 1996	--	--	--	--	8.0
		Feb/Mar 1997	--	0.003	--	--	16
		Jun/Jul 1997	--	--	--	--	4.9
	2nd	Sep/Oct 1997	--	--	--	--	4.8
		Jan/Feb 1998	--	--	--	--	4.8
		Apr/May 1998	--	--	--	--	4.8
		Jul/Aug 1998	--	--	--	--	4.6
	3rd	Oct/Nov 1998	--	--	--	--	1.5
		Feb/Mar 1999	--	--	--	--	4.4
		May/Jun 1999	--	--	--	--	1.7
		Aug 1999	NS	NS	NS	NS	1.0
Screen 5	1st	Aug/Sep 1996	--	--	NS	NS	4.9
		Oct/Nov 1996	--	--	NS	--	4.6
		Feb/Mar 1997	--	--	--	--	3.8
		Jun/Jul 1997	--	--	--	--	2.2
	2nd	Sep/Oct 1997	--	--	--	--	5.0
		Jan/Feb 1998	--	--	--	--	4.0
		Apr/May 1998	--	--	--	--	4.6
		Jul/Aug 1998	--	0.010	--	--	4.8
	3rd	Oct/Nov 1998	--	--	--	--	2.5
		Feb/Mar 1999	--	--	--	--	4.4
		May/Jun 1999	--	--	--	--	1.7
		Aug 1999	NS	NS	NS	NS	0.8
MW-20							
Screen 1	1st	Aug/Sep 1996	--	--	--	NS	3.5
		Oct/Nov 1996	Not Sampled*				
		Feb/Mar 1997	--	--	--	--	2.3
		Jun/Jul 1997	--	--	--	--	0.2
	2nd	Sep/Oct 1997	Not Sampled*				
		Jan/Feb 1998	--	--	--	--	3.2
		Apr/May 1998	--	--	--	--	2.9
		Jul/Aug 1998	--	--	--	--	3.2

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
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(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	1.3
		Feb/Mar 1999	--	--	--	--	0.5
		May/Jun 1999	--	--	--	--	1.1
		Aug 1999	NS	NS	--	--	3.2
Screen 2	1st	Aug/Sep 1996	--	--	NS	NS	3.9
		Oct/Nov 1996	--	--	--	--	1.1
		Feb/Mar 1997	--	--	--	--	2.1
		Jun/Jul 1997	--	--	--	--	2.5
	2nd	Sep/Oct 1997	--	--	--	--	3.6
		Jan/Feb 1998	--	--	--	--	0.4
		Apr/May 1998	--	--	--	--	1.4
		Jul/Aug 1998	--	--	--	--	1.3
	3rd	Oct/Nov 1998	--	--	--	--	2.4
		Feb/Mar 1999	--	--	--	--	0.8
		May/Jun 1999	--	--	--	--	0.9
		Aug 1999	NS	NS	--	--	2.8
Screen 3	1st	Aug/Sep 1996	--	--	NS	NS	1.7
		Oct/Nov 1996	--	--	--	--	1.6
		Feb/Mar 1997	--	--	--	--	1.9
		Jun/Jul 1997	--	--	--	--	2.1
	2nd	Sep/Oct 1997	--	--	--	--	4.6
		Jan/Feb 1998	--	--	--	--	2.2
		Apr/May 1998	--	--	--	--	1.3
		Jul/Aug 1998	--	--	--	--	0.7
	3rd	Oct/Nov 1998	--	--	--	--	2.7
		Feb/Mar 1999	--	0.009	--	--	0.1
		May/Jun 1999	--	--	--	--	1.0
		Aug 1999	NS	NS	--	--	0.7
Screen 4	1st	Aug/Sep 1996	--	--	NS	NS	1.0
		Oct/Nov 1996	--	--	--	--	1.3
		Feb/Mar 1997	--	--	--	--	3.3
		Jun/Jul 1997	--	--	--	--	1.3
	2nd	Sep/Oct 1997	--	--	--	--	1.4
		Jan/Feb 1998	--	--	--	--	0.6
		Apr/May 1998	--	--	--	--	1.7
		Jul/Aug 1998	--	--	--	--	2.1
	3rd	Oct/Nov 1998	--	--	--	--	2.6
		Feb/Mar 1999	--	--	--	--	0.8
		May/Jun 1999	--	--	--	--	2.4
		Aug 1999	NS	NS	--	--	0.3

TABLE 3-2

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 5	1st	Aug/Sep 1996	--	--	NS	NS	1.8
		Oct/Nov 1996	--	--	NS	--	1.3
		Feb/Mar 1997	--	0.004	--	--	1.6
		Jun/Jul 1997	0.006	--	--	--	1.9
	2nd	Sep/Oct 1997	--	--	--	--	3.5
		Jan/Feb 1998	--	--	--	--	0.1
		Apr/May 1998	--	--	--	--	1.1
		Jul/Aug 1998	--	--	--	--	3.3
	3rd	Oct/Nov 1998	--	--	--	--	1.6
		Feb/Mar 1999	--	--	--	--	1.0
		May/Jun 1999	--	--	--	--	2.7
		Aug 1999	NS	NS	--	--	1.7
MW-21							
Screen 1	1st	Aug/Sep 1996	--	--	NS	NS	0.9
		Oct/Nov 1996	Not Sampled*				
		Feb/Mar 1997	--	--	--	--	1.1
		Jun/Jul 1997	--	--	--	--	2.8
	2nd	Sep/Oct 1997	Not Sampled*				
		Jan/Feb 1998	--	--	--	--	0.8
		Apr/May 1998	--	--	--	--	0.7
		Jul/Aug 1998	--	--	--	--	3.4
	3rd	Oct/Nov 1998	--	--	--	--	2.2
		Feb/Mar 1999	--	--	--	--	0.3
		May/Jun 1999	--	--	--	--	2.8
		Aug 1999	NS	NS	NS	NS	1.1
Screen 2	1st	Aug/Sep 1996	--	--	NS	NS	2.1
		Oct/Nov 1996	--	--	--	--	1.2
		Feb/Mar 1997	--	--	--	--	3.9
		Jun/Jul 1997	--	--	--	--	1.7
	2nd	Sep/Oct 1997	--	--	--	--	0.8
		Jan/Feb 1998	--	--	--	--	0.6
		Apr/May 1998	--	--	--	--	1.8
		Jul/Aug 1998	--	--	--	--	3.9
	3rd	Oct/Nov 1998	--	--	--	--	3.5
		Feb/Mar 1999	--	--	--	--	0.04
		May/Jun 1999	--	--	--	--	0.8
		Aug 1999	NS	NS	NS	NS	1.6
Screen 3	1st	Aug/Sep 1996	--	--	NS	NS	4.6
		Oct/Nov 1996	--	--	--	--	4.9
		Feb/Mar 1997	--	0.003	--	--	4.6
		Jun/Jul 1997	--	--	--	--	1.4
	2nd	Sep/Oct 1997	--	--	--	--	3.2
		Jan/Feb 1998	--	0.003	--	--	4.8
		Apr/May 1998	--	--	--	--	4.1
		Jul/Aug 1998	--	--	--	--	4.8

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(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	4.8
		Feb/Mar 1999	--	--	--	--	4.2
		May/Jun 1999	--	--	--	--	2.2
		Aug 1999	NS	NS	NS	NS	1.9
Screen 4	1st	Aug/Sep 1996	--	--	NS	NS	2.5
		Oct/Nov 1996	--	--	--	--	3.3
		Feb/Mar 1997	--	0.004	--	--	4.4
		Jun/Jul 1997	--	--	--	--	2.5
	2nd	Sep/Oct 1997	--	--	--	--	4.5
		Jan/Feb 1998	--	--	--	--	1.1
		Apr/May 1998	--	--	--	--	4.6
		Jul/Aug 1998	--	--	--	--	2.4
	3rd	Oct/Nov 1998	--	--	--	--	4.4
		Feb/Mar 1999	--	--	--	--	13.1
		May/Jun 1999	--	--	--	--	7.6
		Aug 1999	NS	NS	NS	NS	0.5
Screen 5	1st	Aug/Sep 1996	--	--	NS	NS	4.9
		Oct/Nov 1996	--	--	--	--	5.0
		Feb/Mar 1997	--	--	--	--	28
		Jun/Jul 1997	--	--	--	--	26
	2nd	Sep/Oct 1997	--	--	--	--	12
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.6
		Jul/Aug 1998	--	--	--	--	4.2
	3rd	Oct/Nov 1998	--	--	--	--	14.0
		Feb/Mar 1999	--	--	--	--	4.3
		May/Jun 1999	--	--	--	--	3.3
		Aug 1999	NS	NS	NS	NS	1.9
MW-22[4]							
Screen 1	2nd	Sep/Oct 1997	--	--	--	--	34
		Jan/Feb 1998	--	--	--	--	4.5
		Apr/May 1998	--	--	--	--	4.6
		Jul/Aug 1998	--	--	--	--	4.8
	3rd	Oct/Nov 1998	--	--	--	--	4.0
		Feb/Mar 1999	--	--	--	--	20.1
		May/Jun 1999	--	--	--	--	37.6
		Aug 1999	NS	NS	--	--	4.8
Screen 2	2nd	Sep/Oct 1997	--	--	--	--	4.9
		Jan/Feb 1998	--	--	--	--	4.2
		Apr/May 1998	--	--	--	--	4.7
		Jul/Aug 1998	--	--	--	--	4.4
	3rd	Oct/Nov 1998	--	--	--	--	4.1
		Feb/Mar 1999	--	--	--	--	8.1
		May/Jun 1999	--	--	--	--	4.5
		Aug 1999	NS	NS	--	--	8.5

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	3.0
		Jan/Feb 1998	--	--	--	--	3.8
		Apr/May 1998	--	--	--	--	2.9
		Jul/Aug 1998	--	--	--	--	4.9
	3rd	Oct/Nov 1998	--	--	--	--	3.5
		Feb/Mar 1999	--	--	--	--	5.2
		May/Jun 1999	--	--	--	--	3.7
		Aug 1999	NS	NS	NS	NS	5.1
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	2.8
		Jan/Feb 1998	--	--	--	--	3.7
		Apr/May 1998	--	--	--	--	3.0
		Jul/Aug 1998	--	--	--	--	4.0
	3rd	Oct/Nov 1998	--	--	--	--	4.3
		Feb/Mar 1999	--	--	--	--	5.1
		May/Jun 1999	--	--	--	--	4.1
		Aug 1999	NS	NS	NS	NS	2.8
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	4.4
		Jan/Feb 1998	--	--	--	--	2.8
		Apr/May 1998	--	--	--	--	2.9
		Jul/Aug 1998	--	--	--	--	2.3
	3rd	Oct/Nov 1998	--	--	--	--	3.3
		Feb/Mar 1999	--	--	--	--	2.6
		May/Jun 1999	--	--	--	--	4.7
		Aug 1999	Not Sampled[2]				
MW-23[4]							
Screen 1	2nd	Sep/Oct 1997	--	--	--	--	3.4
		Jan/Feb 1998	--	--	--	--	4.1
		Apr/May 1998	--	--	--	--	4.5
		Jul/Aug 1998	--	--	--	--	4.0
	3rd	Oct/Nov 1998	--	--	--	--	6.3
		Feb/Mar 1999	--	--	--	--	4.2
		May/Jun 1999	--	--	--	--	7.0
		Aug 1999	NS	NS	--	--	9.4
Screen 2	2nd	Sep/Oct 1997	--	--	--	--	4.9
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.7
		Jul/Aug 1998	--	--	--	--	3.4
	3rd	Oct/Nov 1998	--	--	--	--	4.1
		Feb/Mar 1999	--	--	--	--	2.5
		May/Jun 1999	--	--	--	--	7.3
		Aug 1999	NS	NS	--	--	1.5
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	3.0
		Jan/Feb 1998	--	--	--	--	4.6
		Apr/May 1998	--	--	--	--	4.6
		Jul/Aug 1998	--	--	--	--	4.7

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
	3rd	Oct/Nov 1998	--	--	--	--	4.5
		Feb/Mar 1999	--	--	--	--	4.3
		May/Jun 1999	--	--	--	--	7.5
		Aug 1999	NS	NS	--	--	13.1
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	4.9
		Jan/Feb 1998	--	--	--	--	4.5
		Apr/May 1998	--	--	--	--	4.9
		Jul/Aug 1998	--	--	--	--	4.6
	3rd	Oct/Nov 1998	--	--	--	--	4.2
		Feb/Mar 1999	--	--	--	--	5.1
		May/Jun 1999	--	--	--	--	2.0
		Aug 1999	NS	NS	--	--	4.2
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	1.8
		Jan/Feb 1998	--	--	--	--	1.8
		Apr/May 1998	--	--	--	--	2.4
		Jul/Aug 1998	--	--	--	--	1.7
	3rd	Oct/Nov 1998	--	--	--	--	2.5
		Feb/Mar 1999	--	--	--	--	3.2
		May/Jun 1999	--	--	--	--	2.4
		Aug 1999	NS	NS	NS	NS	1.7
MW-24[4]							
Screen 1	2nd	Sep/Oct 1997	--	--	--	--	1.6
		Jan/Feb 1998	--	--	--	--	3.8
		Apr/May 1998	--	--	--	--	2.7
		Jul/Aug 1998	--	--	--	--	4.9
	3rd	Oct/Nov 1998	--	--	--	--	3.8
		Feb/Mar 1999	--	--	--	--	7.6
		May/Jun 1999	--	--	--	--	4.3
		Aug 1999	NS	NS	--	--	9.7
Screen 2	2nd	Sep/Oct 1997	--	--	--	--	4.4
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.5
		Jul/Aug 1998	--	--	--	--	4.8
	3rd	Oct/Nov 1998	--	--	--	--	8.3
		Feb/Mar 1999	--	--	--	--	4.2
		May/Jun 1999	--	--	--	--	5.4
		Aug 1999	NS	NS	--	--	33.8
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	4.6
		Jan/Feb 1998	0.006	--	--	--	4.7
		Apr/May 1998	--	--	--	--	4.9
		Jul/Aug 1998	--	--	--	--	4.9
	3rd	Oct/Nov 1998	--	--	--	--	7.8
		Feb/Mar 1999	0.006	--	0.013	--	34.8
		May/Jun 1999	--	--	--	--	27.2
		Aug 1999	NS	NS	--	--	25.2

TABLE 3-2

SUMMARY OF METALS DETECTED DURING THE FIRST THREE YEARS OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

(concentrations in mg/L)
Values equal to or above California MCLs are in bold and outlined
(see final page of Table for MCLs and notes)

Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	4.0
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.3
		Jul/Aug 1998	--	--	--	--	4.8
	3rd	Oct/Nov 1998	--	--	--	--	8.3
		Feb/Mar 1999	--	0.003	--	--	6.1
		May/Jun 1999	--	--	--	--	10.0
		Aug 1999	NS	NS	--	--	10.5
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	4.8
		Jan/Feb 1998	--	--	--	--	4.8
		Apr/May 1998	--	--	--	--	4.0
		Jul/Aug 1998	--	--	--	--	4.0
	3rd	Oct/Nov 1998	--	--	--	--	8.0
		Feb/Mar 1999	--	--	--	--	5.7
		May/Jun 1999	--	--	--	--	5.8
		Aug 1999	Not Sampled(2)				
Practical Quantitation Limit			0.005	0.002	0.01	0.005	
Calif. Maximum Contaminant Level			0.05	0.05	0.05	NE	
EPA Maximum Contaminant Level			0.05	.015(a)	0.10	NE	

NS: Not sampled pursuant to approved monitoring plan.

NE: Not established.

1: Probable lab error. MW-1 is always upgradient of site and downgradient of Arroyo Seco. Lab could not find readily identifiable error. For purposes of future monitoring, MW-1 will continue to be classified as well upgradient of JPL.

2: Wells not sampled due to changes to the sampling program as agreed to by EPA, DTSC, and RWQCB.

3: Believed to be a laboratory error.

4: 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

GENERAL WATER TYPES OBSERVED DURING THE THIRD YEAR OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

Well/Screen Number	Water Type[1]		
	October/November 1998	February/March 1999	May/June 1999
MW-1	Type 1	Type 1	Type 1
MW-3			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1
Screen 3	Type 2	Type 2	Type 2
Screen 4	Type 2	Type 2	Type 2
Screen 5	Type 2	Type 2	Type 2
MW-4			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 3/1	Type 3/1	Type 1/3
Screen 3	Type 1/2/3	Type 1/2/3	Type 2/1
Screen 4	Type 2/1	Type 2/1	Type 2/1
Screen 5	Type 1/2	Type 1/2	Type 2/1
MW-5	Type 1	Type 1	Type 1
MW-6	Type 3/1	Type 3/1	Type 1/3
MW-7	Type 1	Type 1	Type 1
MW-8	Type 1	Type 1	Type 1
MW-9	Type 1	Type 1	Type 1
MW-10	Type 1	Type 1	Type 1
MW-11			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1
Screen 4	Type 1	Type 1	Type 1
Screen 5	Type 2	Type 2	Type 2
MW-12			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1
Screen 4	Type 1	Type 1	Type 1
Screen 5	Type 1/2	Type 1/2	Type 1/2

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

NOTE: General water chemistry analysis was not conducted in the fourth quarter of the past monitoring year.

TABLE 4-1

GENERAL WATER TYPES OBSERVED DURING THE THIRD YEAR OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

Well/Screen Number	Water Type[1]		
	October/November 1998	February/March 1999	May/June 1999
MW-13	Type 1/3	Type 1/3	Type 1
MW-14			
Screen 1	Type 3	Type 3	Type 3
Screen 2	Type 3	Type 3	Type 3
Screen 3	Type 3	Type 3	Type 3
Screen 4	Type 1/3	Type 1/3	Type 1/3
Screen 5	Type 2	Type 2	Type 2
MW-15	Type 1/3	Type 1/3	Type 1
MW-16	Type 1/3	Type 1/3	Type 1
MW-17			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1
Screen 4	Type 1/2	Type 1/2	Type 1/2
Screen 5	Type 1/2	Type 1/2	Type 1/2
MW-18			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1
Screen 4	Type 1/2	Type 1/2	Type 1/2
Screen 5	Type 2	Type 2	Type 2
MW-19			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 1/3	Type 1/3	Type 3
Screen 3	Type 3/1	Type 3/1	Type 3
Screen 4	Type 1/3	Type 1/3	Type 1/3
Screen 5	Type 1/3	Type 1/3	Type 1/3
MW-20			
Screen 1	Type 3	Type 3	Type 1/3
Screen 2	Type 1	Type 1	Type 1/2
Screen 3	Type 2	Type 2	Type 2
Screen 4	Type 2	Type 2	Type 2
Screen 5	Type 2	Type 2	Type 2

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

NOTE: General water chemistry analysis was not conducted in the fourth quarter of the past monitoring year.

TABLE 4-1

GENERAL WATER TYPES OBSERVED DURING THE THIRD YEAR OF LONG-TERM QUARTERLY GROUNDWATER MONITORING, JET PROPULSION LABORATORY

Well/Screen Number	Water Type[1]		
	October/November 1998	February/March 1999	May/June 1999
MW-21			
Screen 1	Type 1/3	Type 1/3	Type 1/3
Screen 2	Type 1/3	Type 1/3	Type 1/3
Screen 3	Type 1/3	Type 1/3	Type 1/3
Screen 4	Type 1/3	Type 1/3	Type 1/3
Screen 5	Type 1/3	Type 1/3	Type 1/3
MW-22			
Screen 1	Type 3	Type 3	Type 3
Screen 2	Type 1/3	Type 1/3	Type 1/3
Screen 3	Type 1/2/3	Type 1/2/3	Type 1/2/3
Screen 4	Type 1/2/3	Type 1/2/3	Type 1/2/3
Screen 5	Type 2	Type 2	Type 2
MW-23			
Screen 1	Type 1/3	Type 1/3	Type 3
Screen 2	Type 3	Type 3	Type 3
Screen 3	Type 1/2/3	Type 1/2/3	Type 1/2/3
Screen 4	Type 1/2	Type 1/2	Type 1/2
Screen 5	Type 2	Type 2	Type 2
MW-24			
Screen 1	Type 1	Type 1	Type 1
Screen 2	Type 2/3	Type 2/3	Type 2/3
Screen 3	Type 1/2	Type 1/2	Type 2/1
Screen 4	Type 2/3	Type 2/3	Type 2
Screen 5	Type 1/2	Type 1/2	Type 2/1

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

NOTE: General water chemistry analysis was not conducted in the fourth quarter of the past monitoring year.

TABLE 5-1

MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS, SEPTEMBER 1998 TO AUGUST 1999

(feet above mean sea level)

Well #	Sep-98	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99
MW-1	1090.48	1086.13	1094.37	1093.01	1093.01	1093.43	1092.82	1091.62	1090.23	1090.12	1086.65	1085.35
MW-3												
Screen 1	996.19	989.92	986.32	991.38	988.70	1000.25	1003.20	1011.79	1009.75	996.21	983.91	971.32
Screen 2	985.11	981.07	977.72	991.13	978.67	994.30	998.86	1007.14	1004.31	986.09	981.43	964.05
Screen 3	979.59	976.83	973.24	991.49	974.40	996.07	998.64	1006.64	1002.72	981.17	981.36	960.15
Screen 4	897.08	907.30	892.41	985.82	895.86	983.76	991.96	1000.18	985.25	908.13	967.28	881.39
Screen 5	870.80	868.48	866.85	981.83	867.72	975.60	987.16	999.30	980.95	878.21	956.09	852.48
MW-4												
Screen 1	1004.22	996.35	992.88	995.85	995.88	1002.96	1005.70	1014.85	1014.14	1004.46	988.54	979.24
Screen 2	986.87	982.40	980.01	993.71	981.55	995.68	1000.14	1007.88	1006.00	988.30	984.51	967.72
Screen 3	982.42	979.13	976.89	993.82	978.32	995.50	1000.09	1007.38	1004.69	984.40	984.26	964.50
Screen 4	972.63	970.45	967.24	995.47	969.11	994.10	999.36	1007.02	1001.76	975.70	982.23	955.55
Screen 5	891.73	897.70	887.04	986.67	891.04	984.77	992.44	998.84	987.88	903.82	968.74	877.04
MW-5	1003.94	995.73	992.85	996.12	996.12	1000.51	1003.54	1013.57	1012.83	1003.72	988.49	979.57
MW-6	1002.32	1000.33	999.64	1004.08	1004.08	1006.68	1010.49	1017.35	1015.03	1008.54	998.87	992.04
MW-7	1003.88	ND	ND	ND	ND	ND	ND	1012.87	1013.46	1005.60	990.54	982.23
MW-8	1005.31	997.23	993.59	995.96	995.96	1001.83	1005.77	1014.44	1015.03	1006.60	991.43	982.80
MW-9	1082.69	1087.59	1087.68	1085.84	1085.84	1086.19	1086.09	1084.94	1083.36	1084.20	1082.91	1081.75
MW-10	1001.60	994.59	992.08	996.12	996.12	998.27	1002.35	1011.83	1011.40	1002.63	989.76	981.44
MW-11												
Screen 1	1028.88	1023.80	1023.64	1024.68	1024.08	1025.84	1028.64	1032.02	1032.45	1028.13	1021.41	1018.09
Screen 2	998.85	993.59	991.49	999.99	993.71	1002.60	1007.56	1014.56	1012.82	1000.13	992.90	980.52
Screen 3	981.05	978.08	975.89	996.06	978.82	996.60	1002.65	1010.40	1005.35	984.36	985.36	964.82
Screen 4	970.83	968.88	967.08	996.63	971.25	992.44	1001.09	1012.73	1007.07	977.37	980.16	957.51
Screen 5	910.15	912.28	904.96	984.33	909.64	982.36	990.70	998.25	986.77	919.26	967.07	894.19

TABLE 5-1

MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS, SEPTEMBER 1998 TO AUGUST 1999

(feet above mean sea level)

Well #	Sep-98	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99
MW-12												
Screen 1	1008.62	1001.03	996.72	998.89	1002.88	1010.90	1011.52	1019.74	1018.59	1008.87	992.41	983.30
Screen 2	991.01	985.56	983.14	994.71	985.30	997.89	1001.98	1010.47	1007.99	992.12	985.85	970.54
Screen 3	986.49	981.86	979.61	994.40	981.64	996.87	1001.21	1009.57	1006.31	987.98	984.83	967.02
Screen 4	970.77	968.49	965.36	994.02	967.55	994.76	1000.12	1008.35	1001.52	973.79	982.34	953.22
Screen 5	906.13	910.44	901.29	988.13	905.48	986.33	993.79	1003.27	988.88	916.56	969.91	890.43
MW-13	1002.89	995.91	993.16	996.55	996.55	999.28	1003.99	1012.90	1013.39	1005.27	991.54	983.71
MW-14												
Screen 1	1003.44	1001.88	1001.60	1006.78	1006.41	1008.89	1012.88	1018.71	1015.11	1010.06	1000.64	994.32
Screen 2	1001.83	1001.11	1001.01	1007.07	1006.03	1009.37	1013.26	1019.34	1015.60	1008.20	999.13	992.34
Screen 3	1000.75	1000.89	1000.79	1007.70	1006.20	1010.08	1013.89	1019.99	1015.43	1007.32	998.77	991.60
Screen 4	1000.52	1000.90	1000.88	1007.69	1006.14	1010.25	1013.98	1020.07	1015.37	1007.15	998.71	991.47
Screen 5	999.26	999.97	1000.07	1007.13	1005.62	1010.43	1014.14	1020.33	1014.72	1006.10	998.25	990.38
MW-15	1087.74	1091.62	1091.92	1090.71	1090.71	1090.18	1090.58	1089.61	1088.21	1088.20	1085.18	1084.09
MW-16	1002.98	996.63	992.74	995.41	995.41	ND	1003.54	1012.46	1013.14	1005.24	991.11	983.27
MW-17												
Screen 1	999.27	990.79	985.57	985.85	950.23	990.71	996.30	1007.17	1007.07	997.17	979.48	970.92
Screen 2	979.92	974.53	972.54	985.66	969.77	987.78	992.81	1000.82	998.82	977.78	971.97	955.14
Screen 3	965.84	961.53	960.54	981.76	955.70	982.93	989.09	996.39	993.88	963.07	960.90	937.76
Screen 4	906.48	903.78	902.61	982.94	906.50	980.77	989.06	997.76	985.82	916.54	960.22	887.41
Screen 5	896.66	894.34	892.63	978.59	895.52	973.05	984.13	996.28	982.63	906.69	950.30	878.41
MW-18												
Screen 1	987.87	980.55	976.62	978.57	978.86	983.52	989.72	998.76	999.79	991.11	975.05	966.79
Screen 2	985.95	979.20	975.73	980.02	977.54	984.35	990.27	998.90	999.29	989.14	974.70	964.64
Screen 3	979.63	974.07	971.96	984.08	972.43	986.97	992.46	1001.00	999.13	981.24	973.96	957.71
Screen 4	945.41	941.05	940.56	979.80	944.35	978.75	987.41	996.07	988.28	953.71	961.64	926.08
Screen 5	926.45	924.06	924.85	972.25	932.94	964.74	977.28	991.49	983.19	940.96	942.39	910.48

TABLE 5-1

MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS, SEPTEMBER 1998 TO AUGUST 1999

(feet above mean sea level)

Well #	Sep-98	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99
MW-19												
Screen 1	986.38	979.59	977.33	984.26	976.85	984.57	988.58	996.78	995.15	985.03	977.03	965.60
Screen 2	967.02	962.74	962.07	984.54	961.82	985.05	989.59	997.26	989.32	966.73	975.19	948.56
Screen 3	959.51	955.68	954.56	985.70	955.57	985.98	990.78	998.01	988.60	961.29	975.46	942.29
Screen 4	853.39	852.74	847.88	983.92	856.01	982.21	989.62	998.07	970.26	875.28	967.30	844.38
Screen 5	849.84	849.11	844.11	983.81	852.53	982.09	989.58	998.12	970.26	871.90	967.16	840.83
MW-20												
Screen 1	964.37	962.41	963.50	967.65	969.76	971.26	975.57	979.37	978.61	974.62	960.49	952.81
Screen 2	963.96	962.29	962.66	917.53	969.23	973.18	977.44	981.52	979.81	973.57	959.81	950.67
Screen 3	937.04	944.30	948.05	973.99	958.43	972.90	978.27	982.78	971.20	954.54	942.45	922.27
Screen 4	930.21	928.62	933.75	963.45	943.24	950.91	965.47	981.57	979.72	947.47	927.27	915.02
Screen 5	967.23	963.55	962.99	970.92	966.96	970.14	974.97	981.93	981.86	972.80	962.72	954.86
MW-21												
Screen 1	1001.16	996.72	995.15	998.55	997.96	999.90	1003.37	1011.24	1009.72	1001.11	994.35	987.72
Screen 2	1000.25	997.05	995.62	1001.00	998.81	1002.66	1005.97	1012.98	985.07	1001.02	994.74	987.05
Screen 3	998.93	996.38	995.01	1001.24	1000.85	1003.10	1006.41	1013.07	1010.50	1000.13	994.36	986.09
Screen 4	997.34	995.06	993.69	1000.32	997.31	1002.26	1005.65	1012.23	1009.38	998.75	993.27	984.64
Screen 5	997.22	994.84	993.62	1000.20	997.50	1002.34	1005.58	1012.28	1009.37	998.65	993.16	984.59
MW-22												
Screen 1	1001.59	995.95	994.45	999.00	997.84	1000.48	1005.19	1013.38	1013.26	1005.20	993.11	985.01
Screen 2	996.13	993.04	992.71	1002.35	996.25	1004.42	1008.45	1015.79	1012.75	1000.63	994.19	982.09
Screen 3	995.89	993.12	992.71	1002.47	996.56	1004.65	1008.66	1015.97	1012.62	1000.61	994.31	982.29
Screen 4	977.40	974.76	974.26	999.73	977.93	1000.70	1005.64	1013.36	1006.34	983.31	988.95	963.55
Screen 5	966.18	963.04	962.51	996.92	966.15	997.47	1002.94	1011.08	1003.01	972.35	985.00	965.48

TABLE 5-1

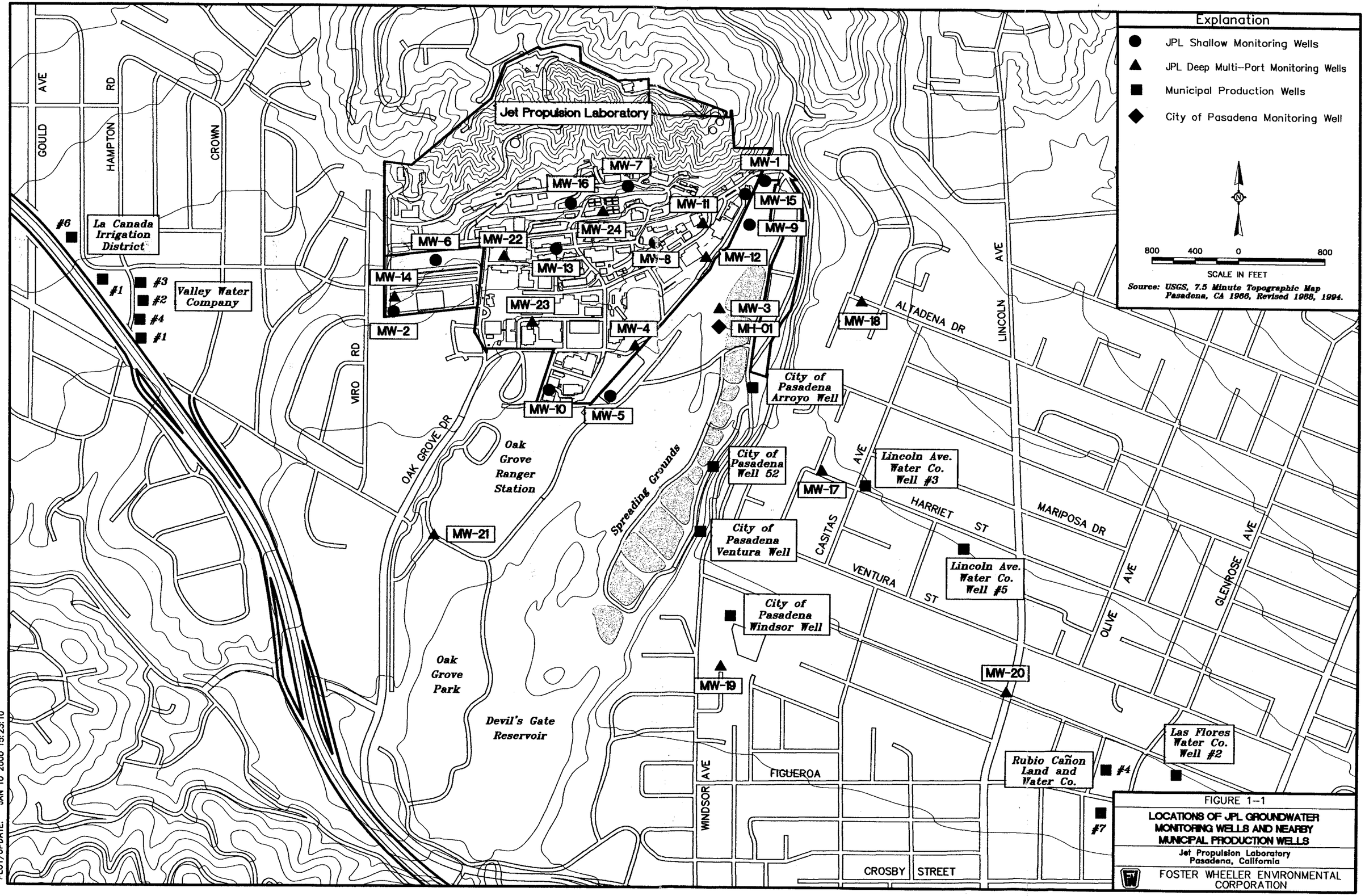
MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS, SEPTEMBER 1998 TO AUGUST 1999

(feet above mean sea level)

Well #	Sep-98	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Jul-99	Aug-99
MW-23												
Screen 1	1001.65	995.06	992.88	997.67	995.89	999.08	1003.92	1013.72	1012.21	1003.67	991.33	ND
Screen 2	993.23	989.62	987.75	998.61	990.69	1000.18	1004.84	1013.80	1009.66	996.17	990.44	977.29
Screen 3	992.03	988.89	987.20	998.96	990.17	1000.43	1005.05	1013.93	1009.27	995.24	990.49	976.63
Screen 4	968.55	967.70	964.17	996.29	967.73	996.34	1002.13	1011.39	1002.14	973.97	984.53	953.90
Screen 5	968.31	966.13	963.77	995.80	967.53	995.21	1001.49	1011.02	1001.63	973.61	982.06	953.76
MW-24												
Screen 1	1004.14	996.33	993.29	996.10	996.43	999.64	1004.50	1013.69	1013.69	1005.78	991.46	983.03
Screen 2	993.20	988.39	986.77	996.66	989.49	999.22	1003.46	1011.80	1009.70	995.91	989.25	975.79
Screen 3	988.82	984.97	983.69	997.25	986.52	999.26	1003.54	1011.58	1008.27	992.02	988.78	972.75
Screen 4	962.28	959.09	958.10	994.87	961.57	995.26	1000.83	1009.49	1000.86	968.17	982.74	947.35
Screen 5	938.89	939.31	934.44	991.90	938.29	991.34	997.82	1006.18	996.17	946.67	977.47	923.87

ND: No data due to equipment malfunction.

FIGURES



I:\1572-JPL\DWG\OU1-OU3\99ANNUAL\JPLF1-1.DWG
PLOT/UPDATE: JAN 10 2000 15:23:10

FIGURE 1-1

LOCATIONS OF JPL GROUNDWATER MONITORING WELLS AND NEARBY MUNICIPAL PRODUCTION WELLS

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

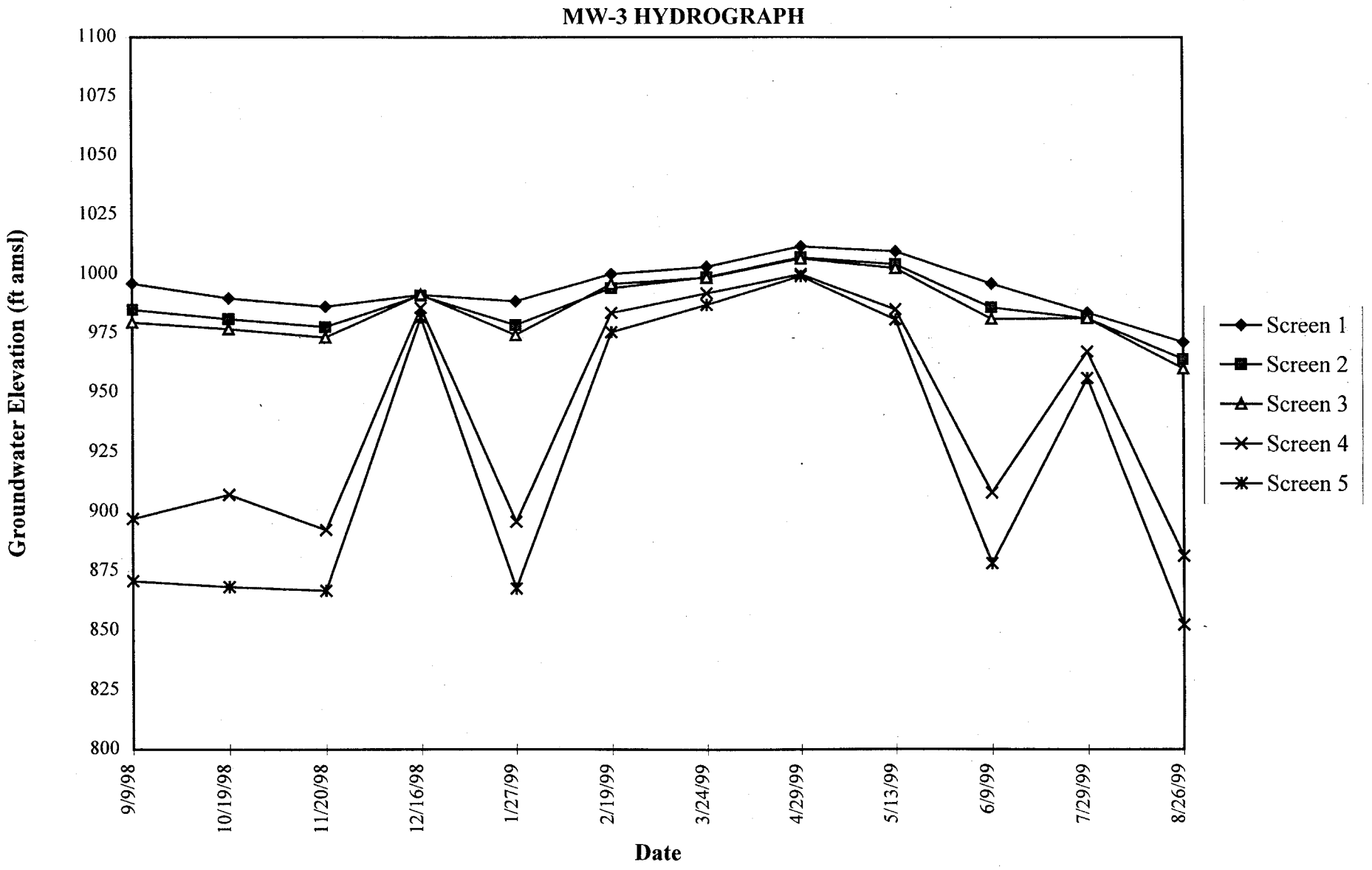


Figure 5-1

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-3 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

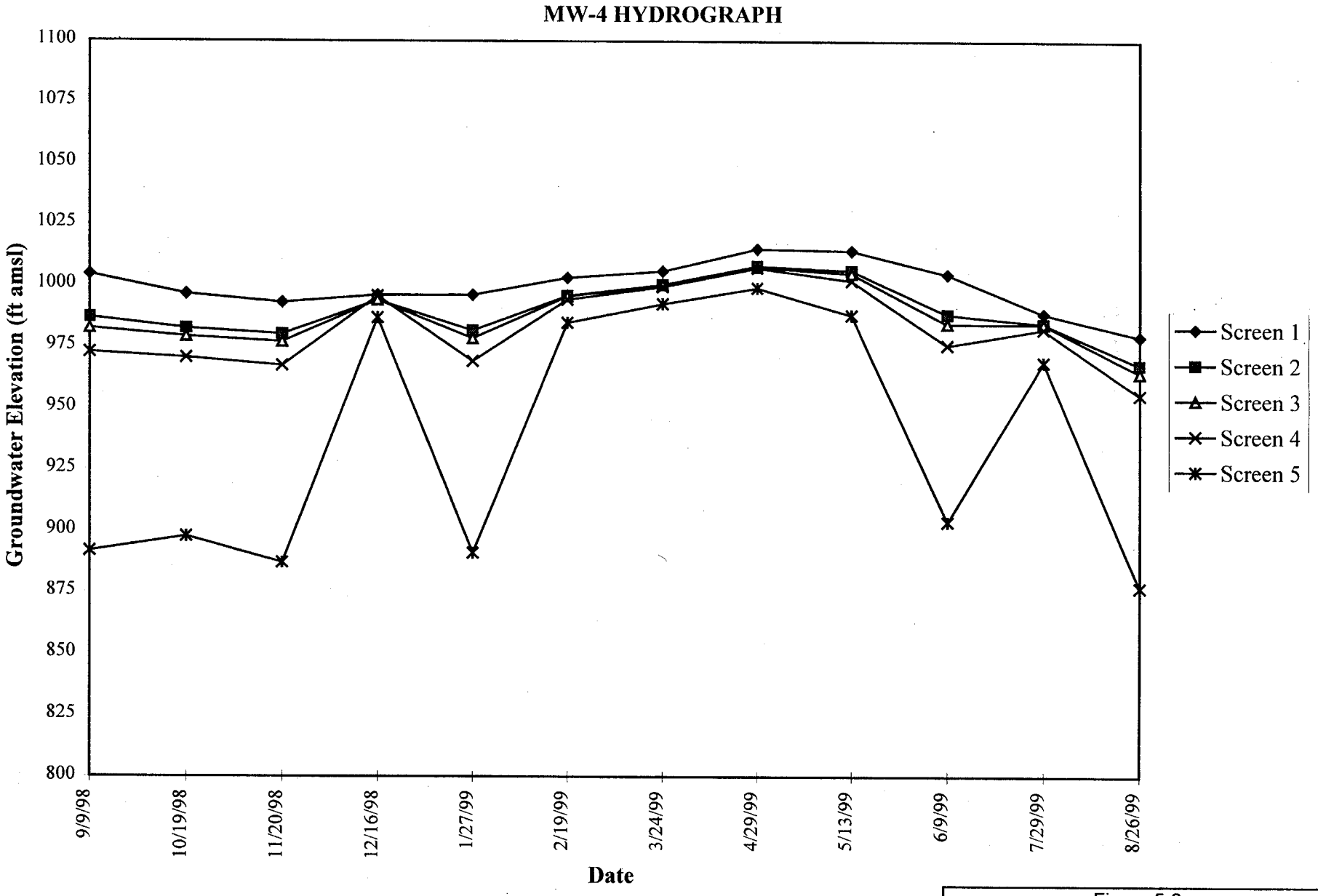


Figure 5-2

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-4 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

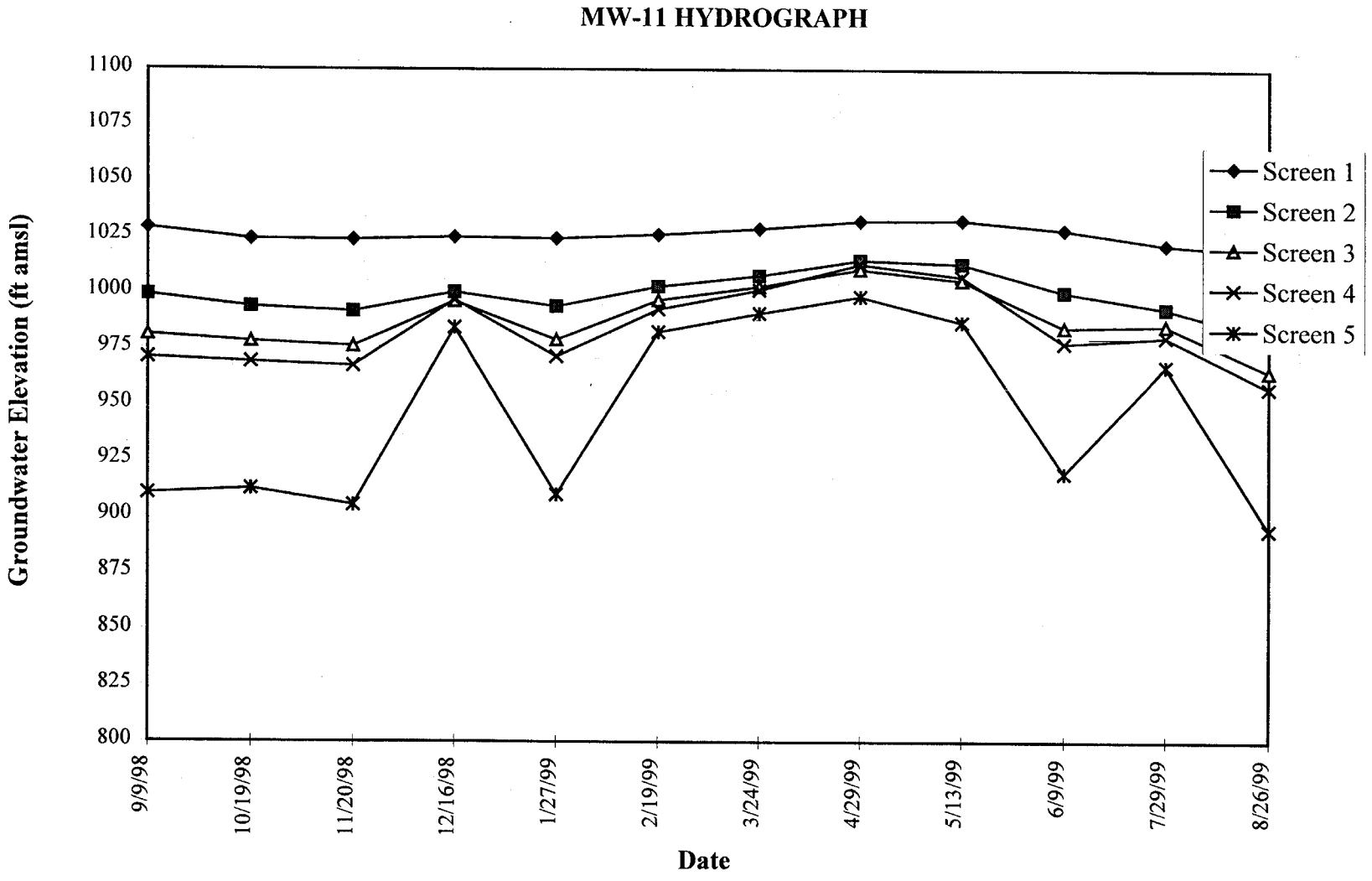


Figure 5-3
Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-11 (Sep. 1998 - Aug. 1999)
Jet Propulsion Laboratory

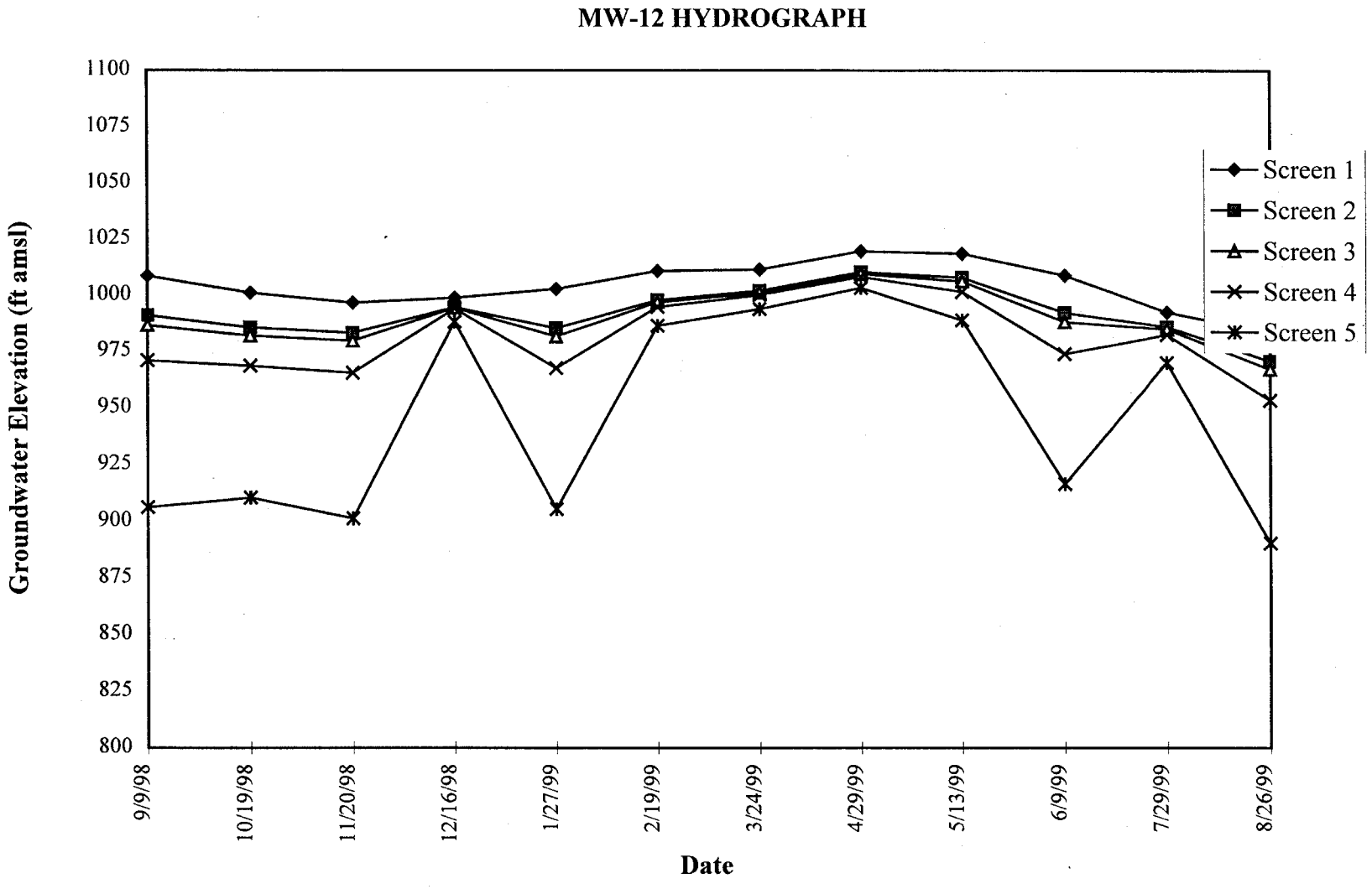


Figure 5-4
Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-12 (Sep. 1998 - Aug. 1999)
Jet Propulsion Laboratory

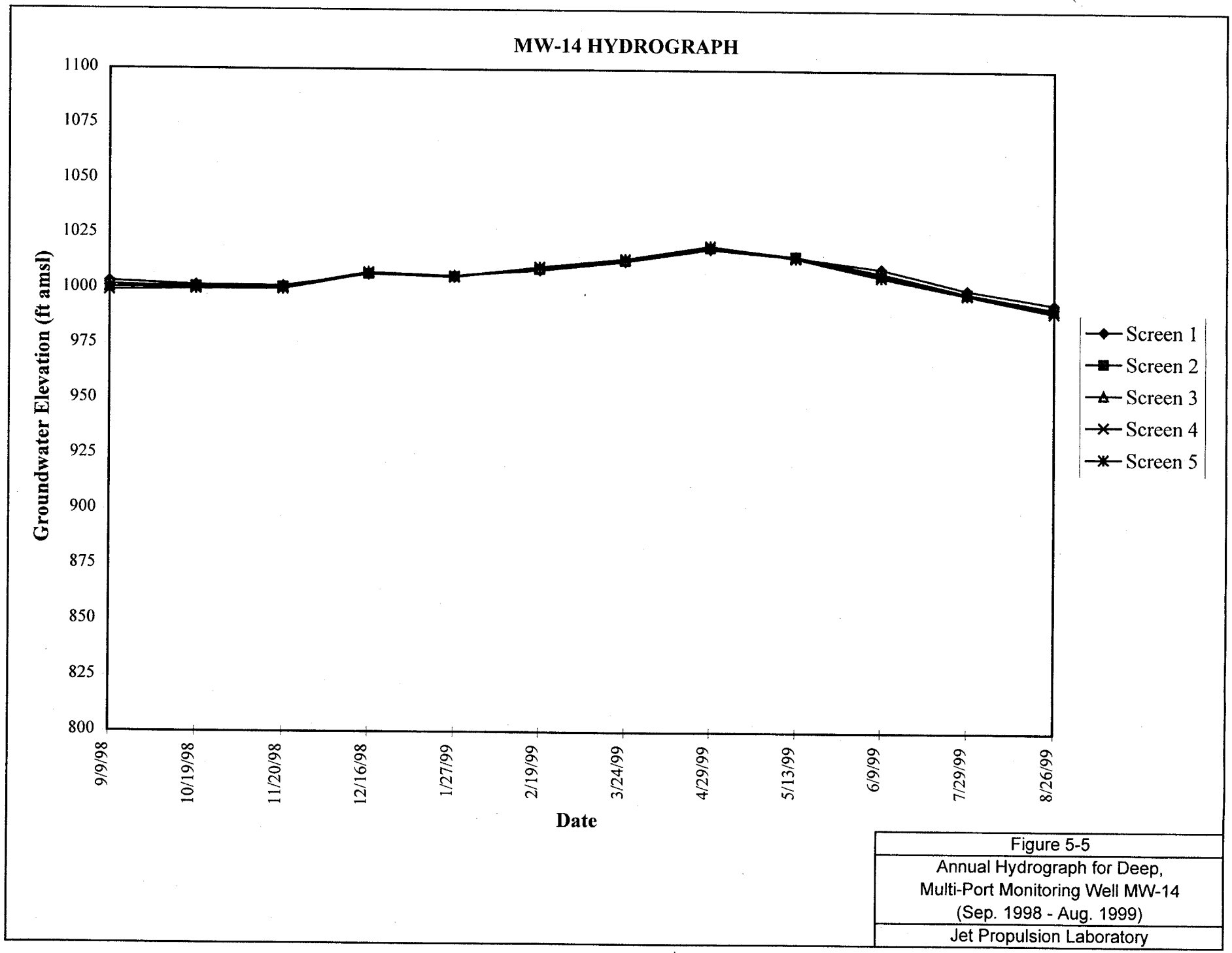


Figure 5-5

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-14 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

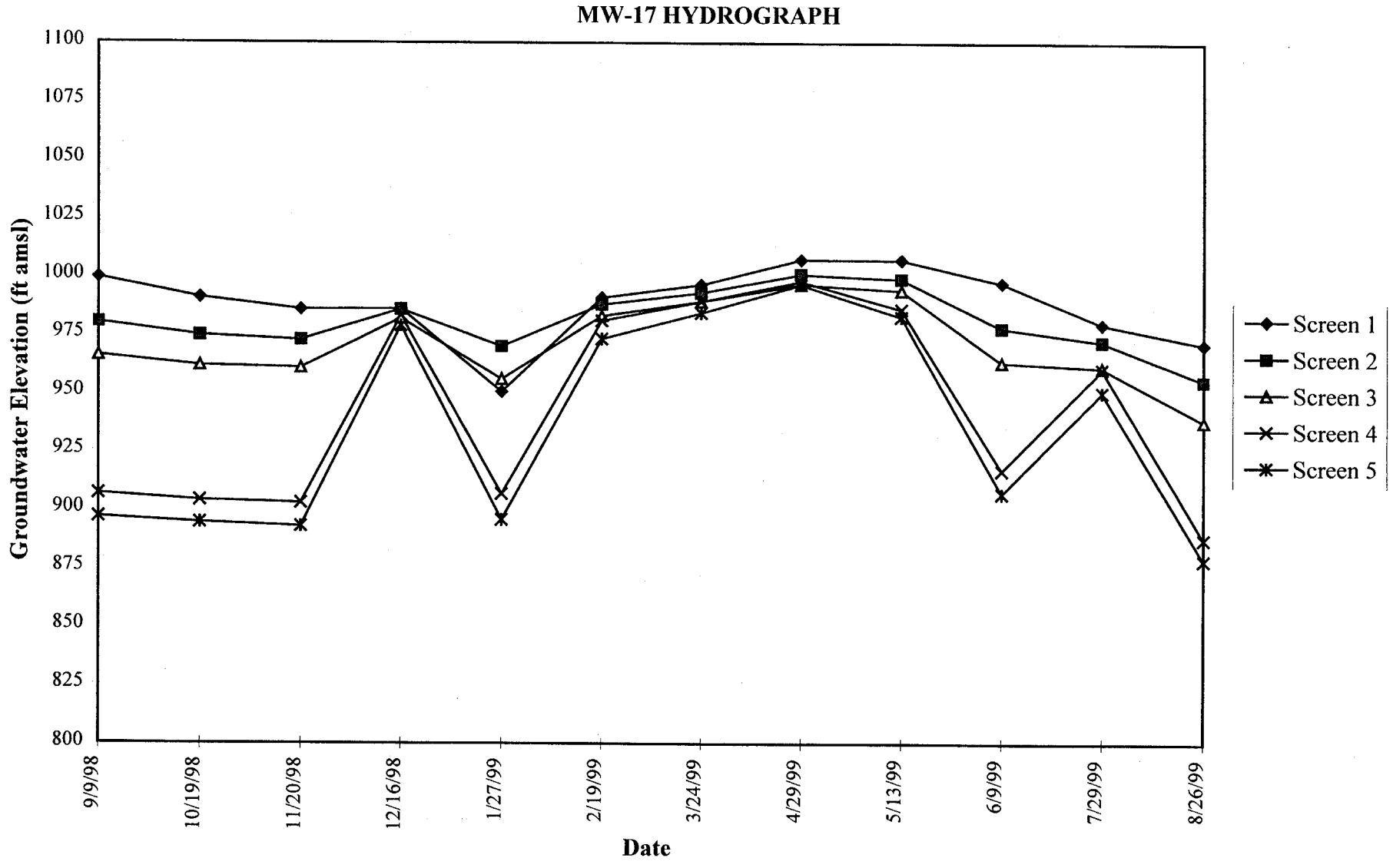


Figure 5-6

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-17 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

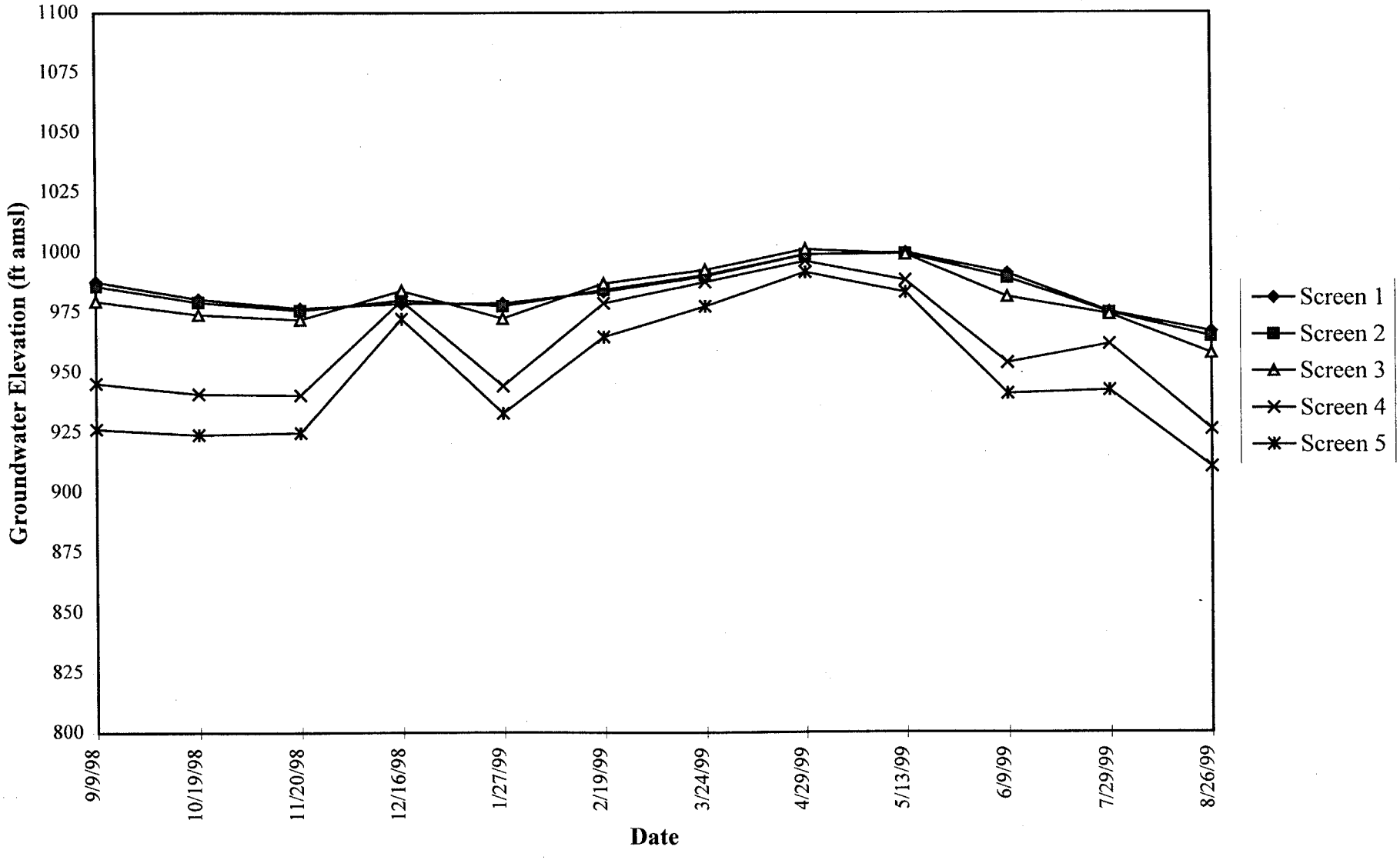


Figure 5-7

Annual Hydrograph for Deep,
Multi-Port Monitoring Well MW-18
(Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

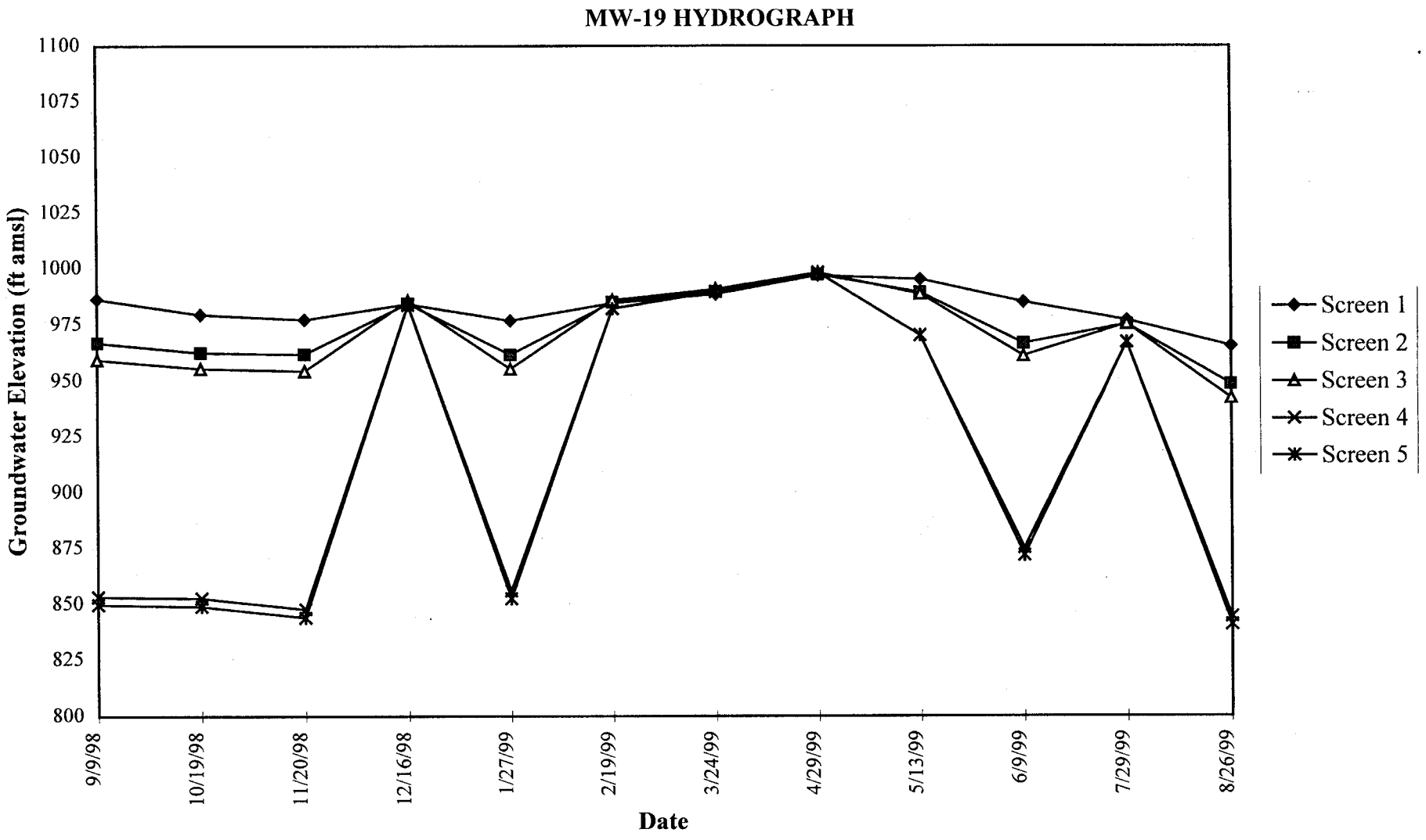


Figure 5-8
Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-19 (Sep. 1998 - Aug. 1999)
Jet Propulsion Laboratory

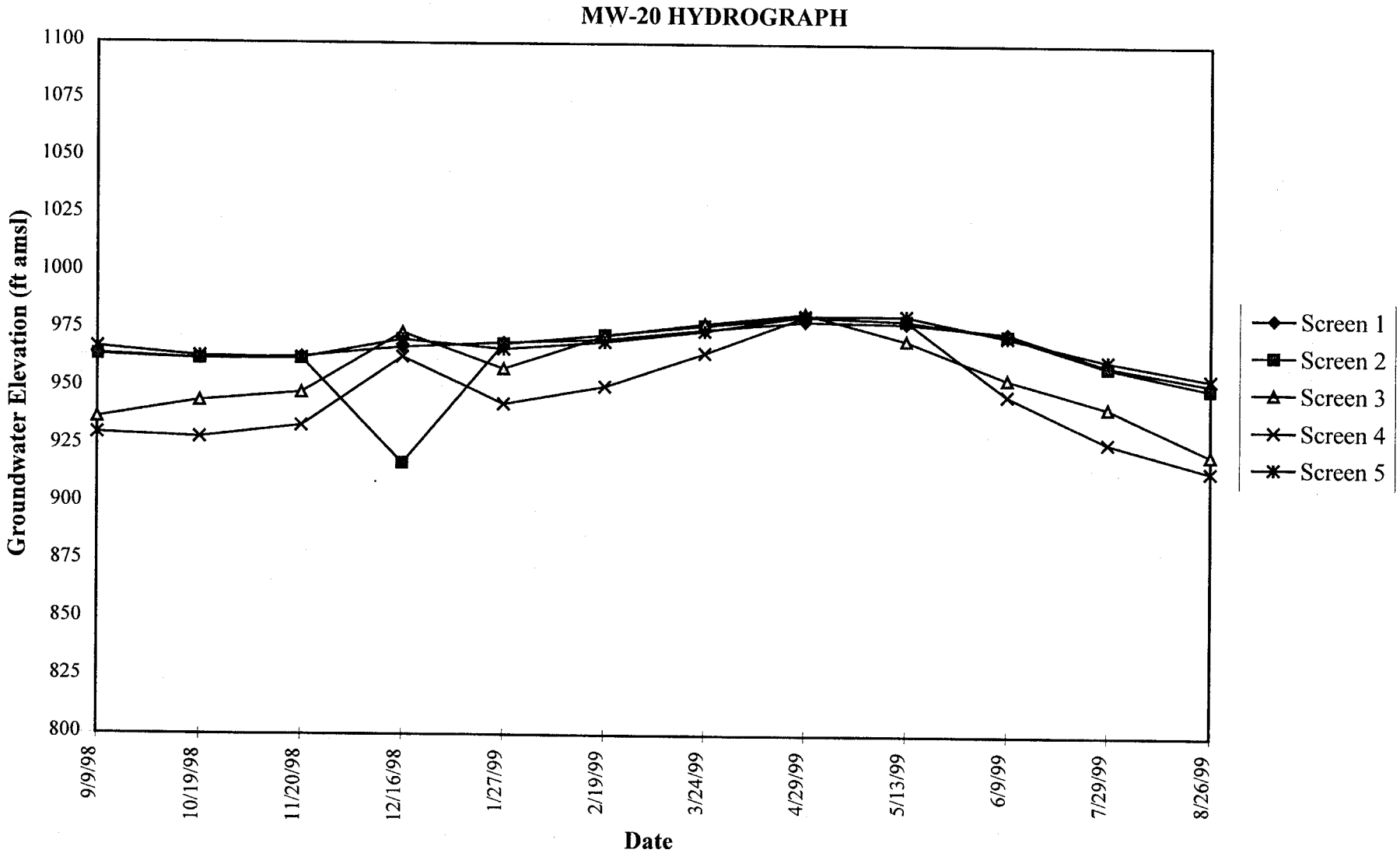


Figure 5-9

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-20 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

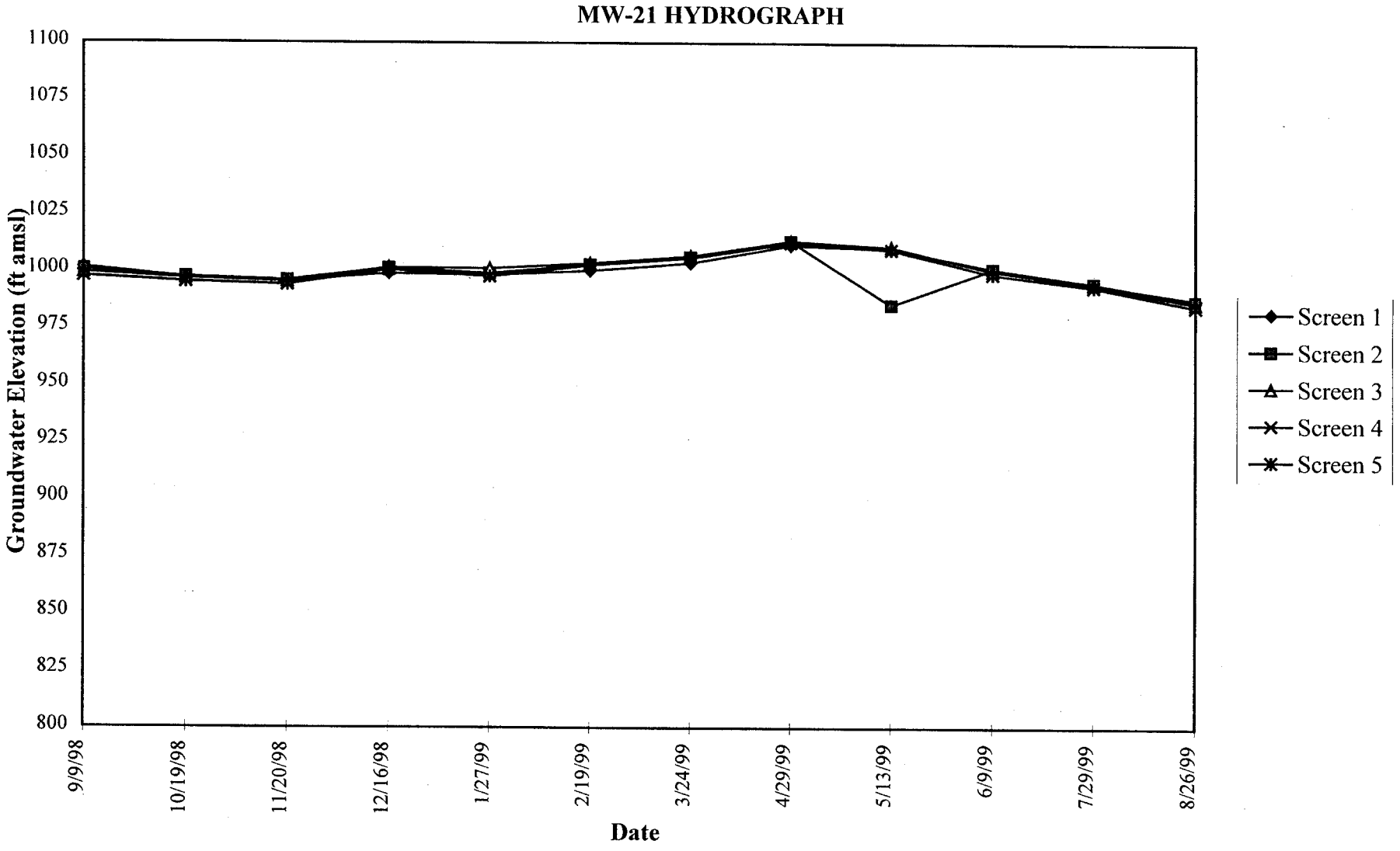


Figure 5-10

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-21 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

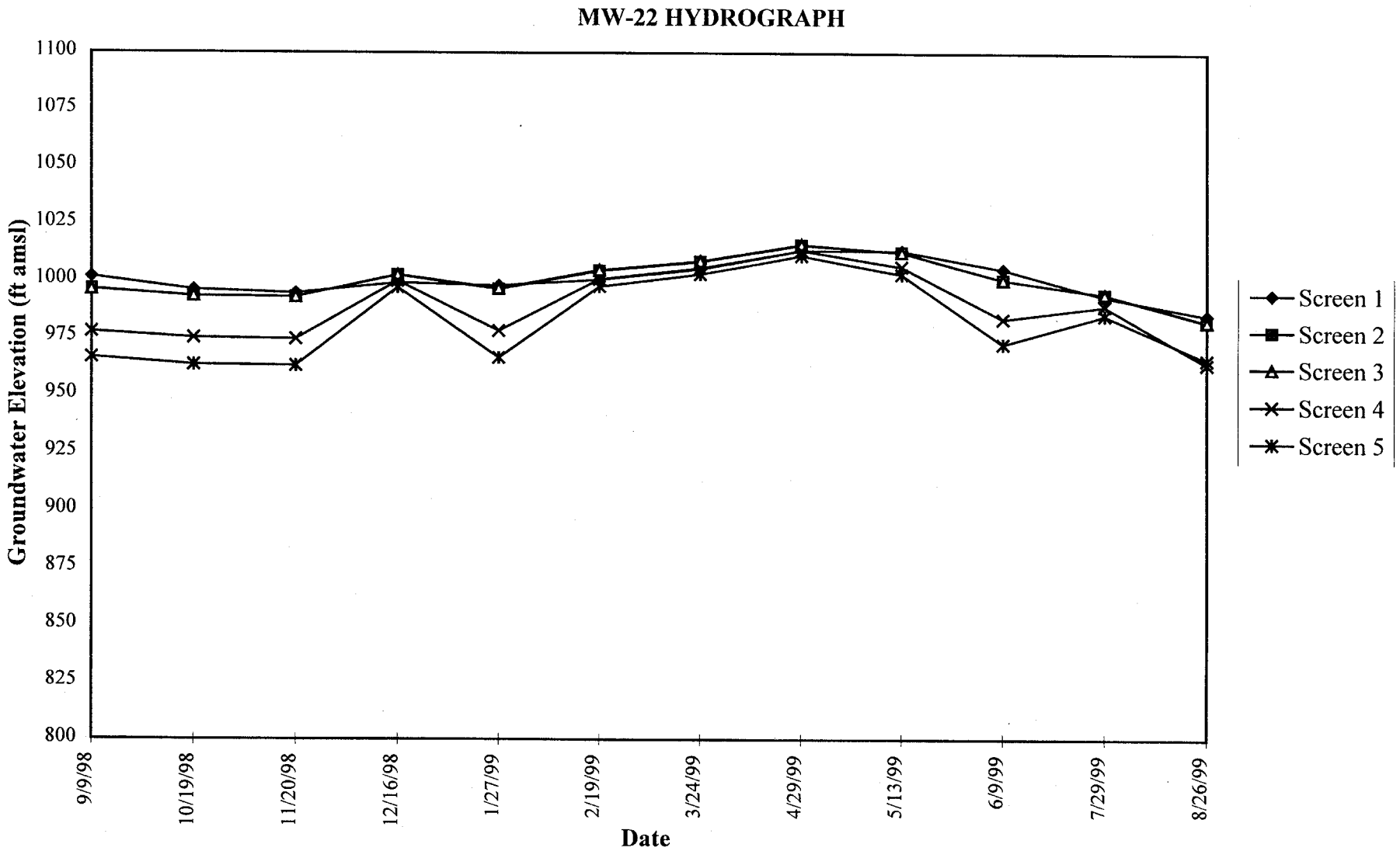


Figure 5-11

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-22 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

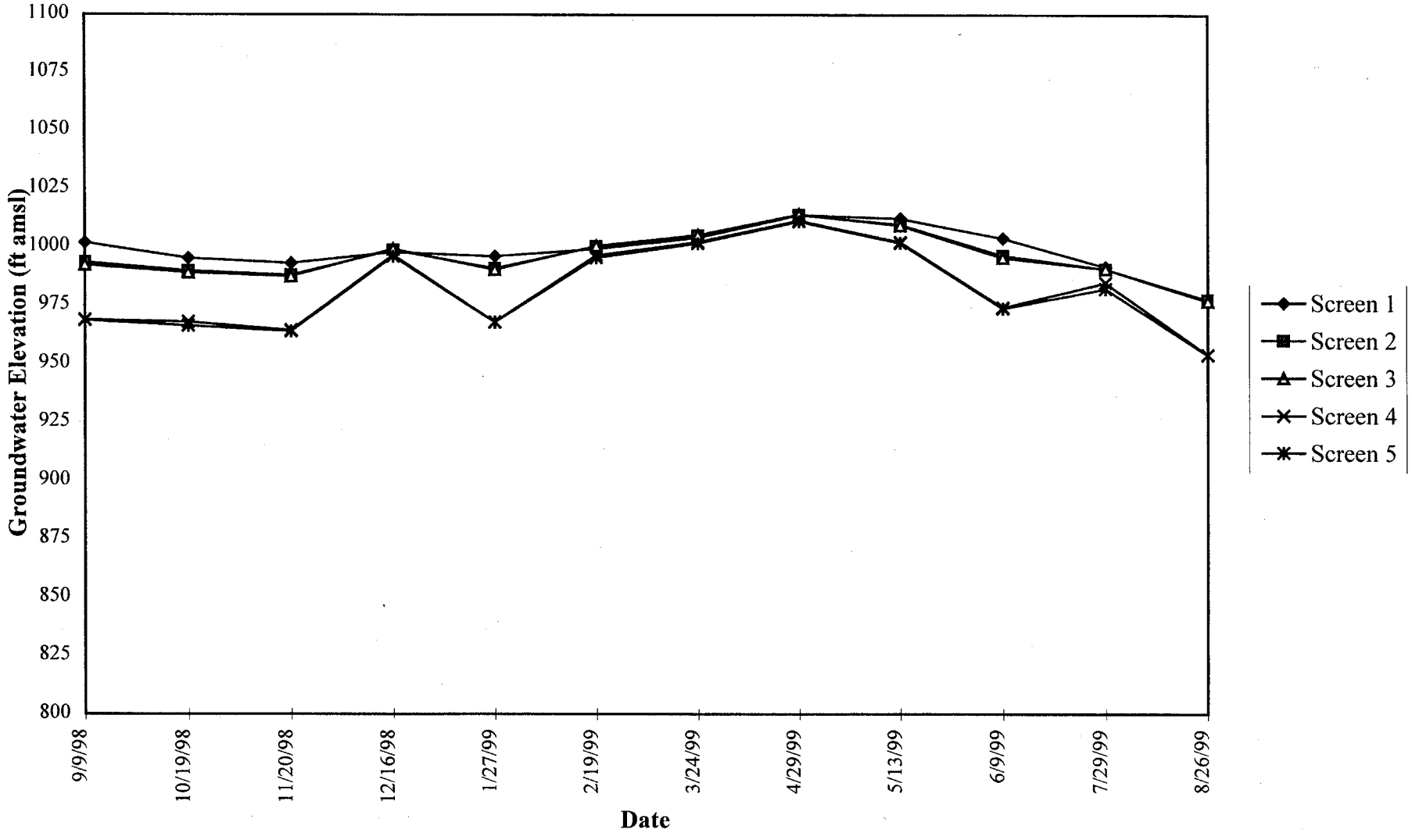


Figure 5-12

Annual Hydrograph for Deep,
Multi-Port Monitoring Well MW-23
(Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

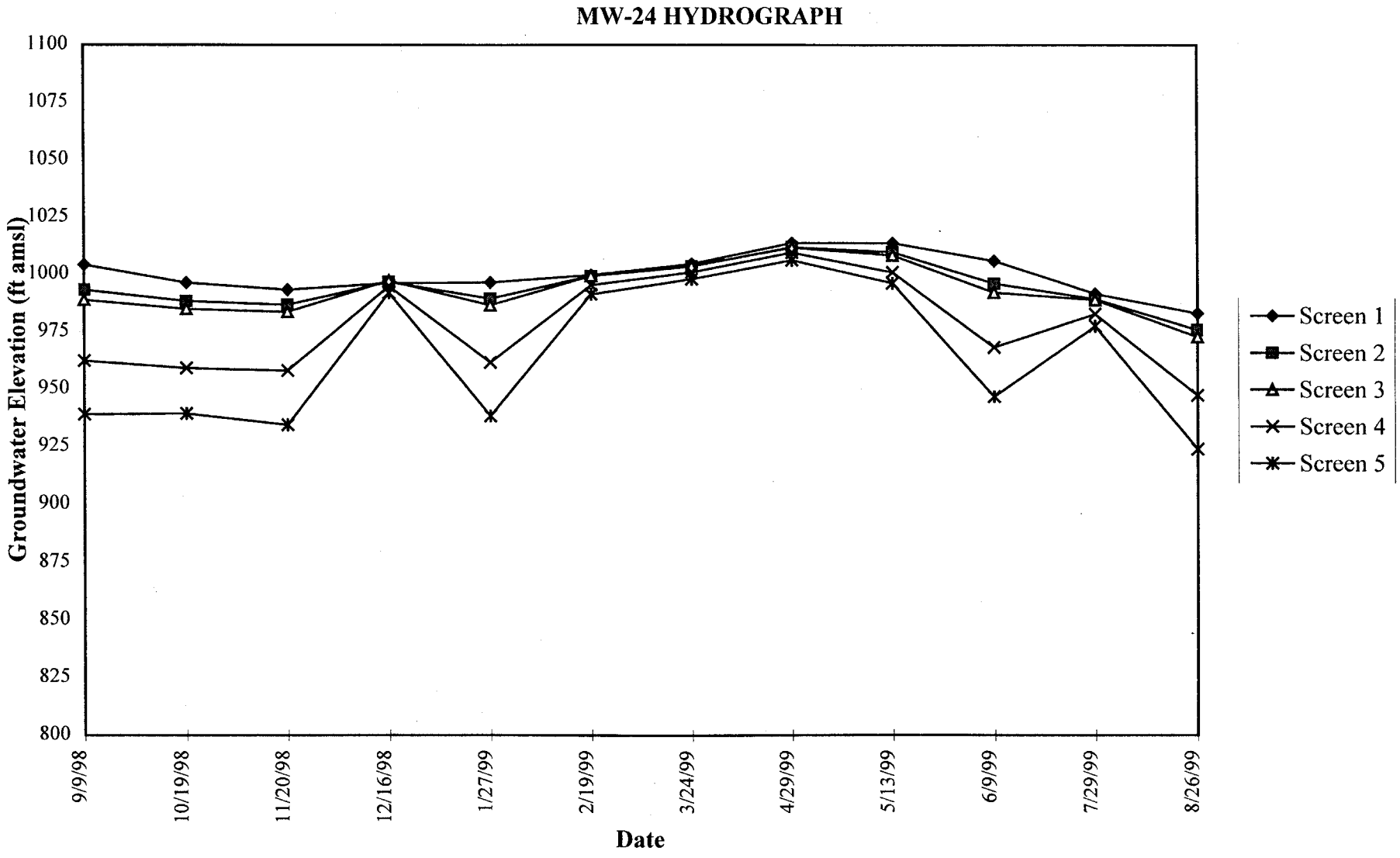


Figure 5-13

Annual Hydrograph for Deep, Multi-Port Monitoring Well MW-24 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory

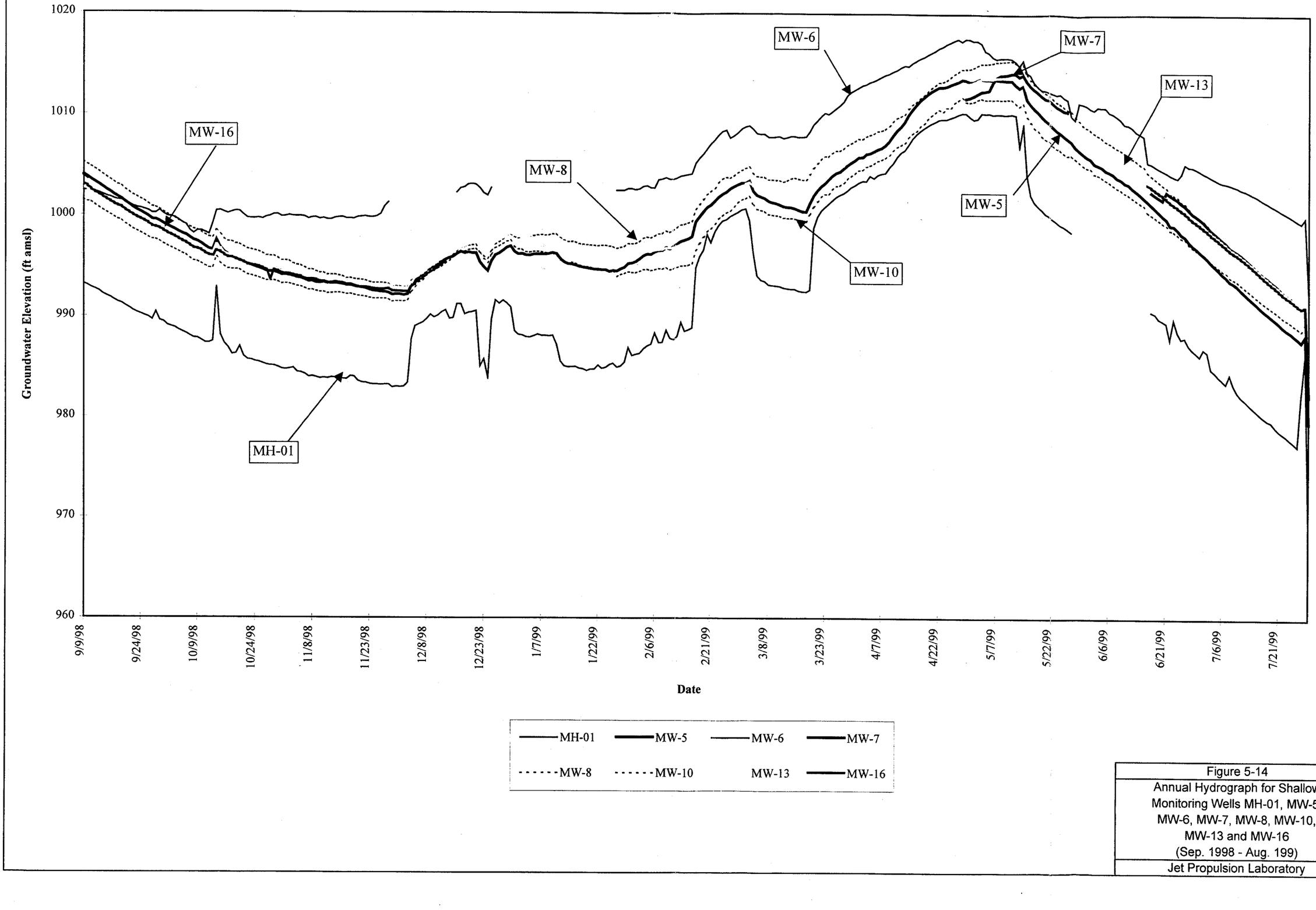


Figure 5-14

Annual Hydrograph for Shallow Monitoring Wells MH-01, MW-5, MW-6, MW-7, MW-8, MW-10, MW-13 and MW-16 (Sep. 1998 - Aug. 199)

Jet Propulsion Laboratory

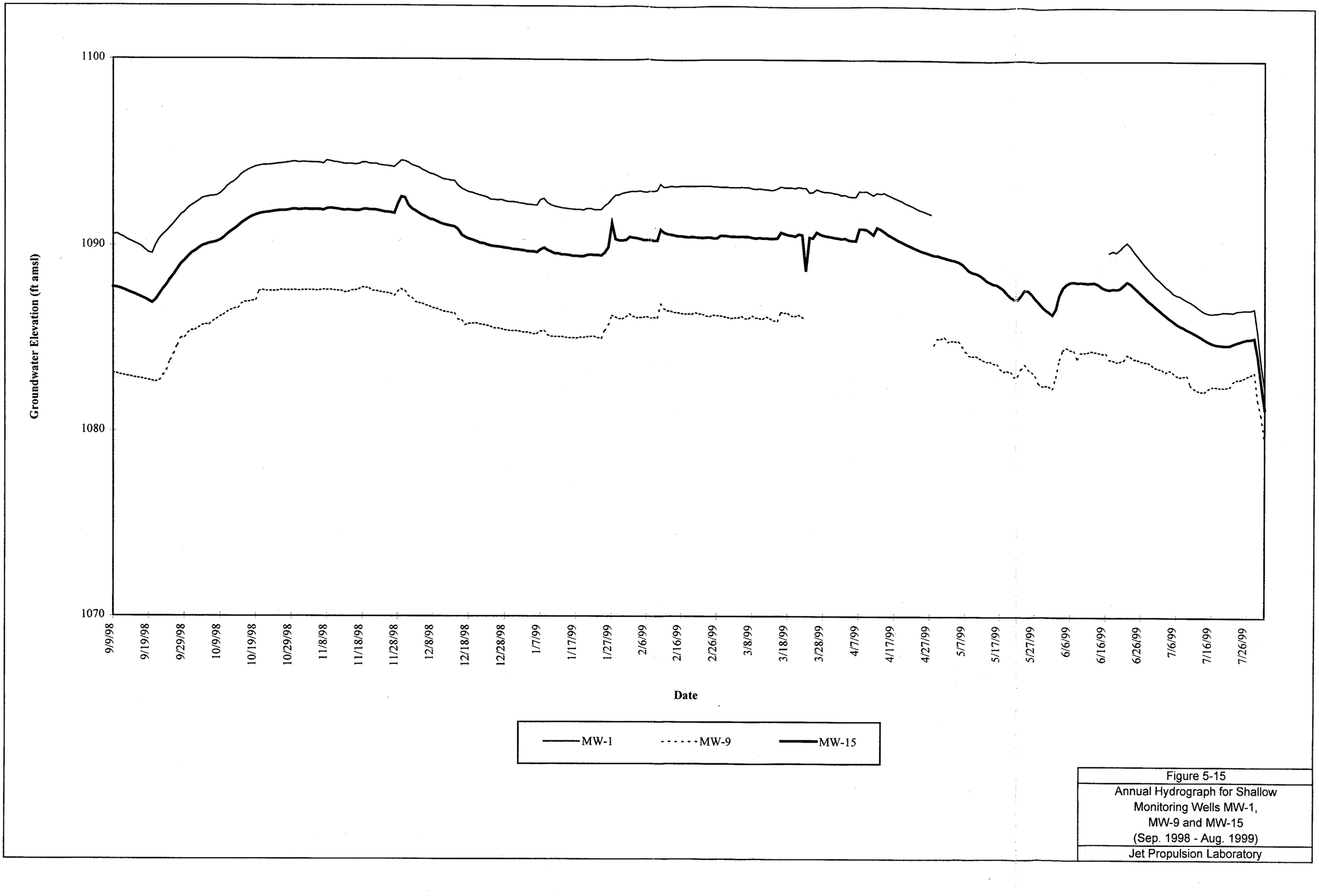
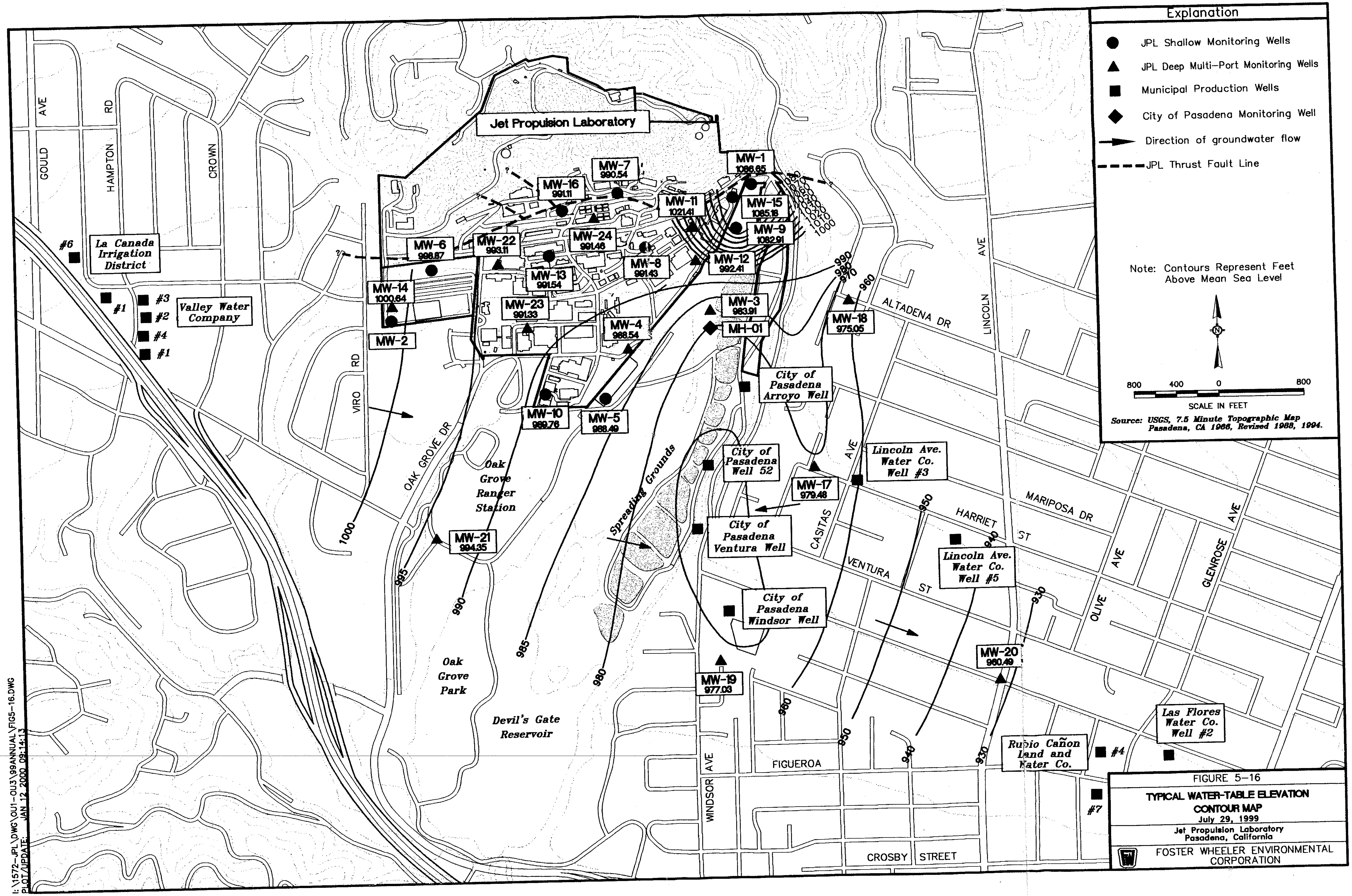


Figure 5-15

Annual Hydrograph for Shallow Monitoring Wells MW-1, MW-9 and MW-15 (Sep. 1998 - Aug. 1999)

Jet Propulsion Laboratory



Explanation
JPL Shallow Monitoring Wells
JPL Deep Multi-Port Monitoring Wells
Municipal Production Wells
City of Pasadena Monitoring Well
Direction of groundwater flow
JPL Thrust Fault Line
Note: Contours Represent Feet Above Mean Sea Level
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 1086.65
MW-7 990.54
MW-16 991.11
MW-11 1021.41
MW-15 1085.18
MW-9 1082.91
MW-6 996.87
MW-22 993.11
MW-24 991.46
MW-8 991.43
MW-12 992.41
MW-13 991.54
MW-14 1000.64
MW-23 991.33
MW-3 983.91
MH-01
MW-4 988.54
MW-2
MW-18 975.05
MW-10 989.76
MW-5 988.49
MW-17 979.48
MW-21 994.35
MW-19 977.03
MW-20 960.49
La Canada Irrigation District
#6
#1
#3
#2
#4
#1
Valley Water Company
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.
#4
#7
Oak Grove Ranger Station
Spreading Grounds
Oak Grove Park
Devil's Gate Reservoir
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
1000
995
990
985
980
970
960
950
940
930
1010
1020
1030
1040
1050
1060
1070
1080
I:\1572-JPL\DWG\OU1-OU3\99ANNUAL\FIG5-16.DWG
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FIGURE 5-16

TYPICAL WATER-TABLE ELEVATION CONTOUR MAP

July 29, 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

APPENDIX A

DAILY WATER-LEVEL ELEVATION DATA FROM SHALLOW JPL MONITORING WELLS

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
9/9/98	993.200	1090.565	1003.988	1002.396	1003.897	1005.274	1083.126	1001.492	1002.710	1087.759	1003.080
9/10/98	993.027	1090.630	1003.729	1002.483	1003.616	1004.993	1083.090	1001.319	1002.559	1087.737	1002.850
9/11/98	992.810	1090.522	1003.477	1002.374		1004.776	1083.036	1001.264	1002.371	1087.679	1002.473
9/12/98	992.658	1090.435	1003.239	1002.288		1004.538	1083.000	1001.004	1002.163	1087.614	1002.239
9/13/98	992.485	1090.306	1003.001	1002.180		1004.300	1082.964	1000.744	1001.954	1087.527	1002.022
9/14/98	992.182	1090.219	1002.741	1002.006		1004.018	1082.928	1000.485	1001.702	1087.441	1001.770
9/15/98	991.987	1090.132	1002.481	1001.855		1003.758	1082.874	1000.246	1001.471	1087.376	1001.535
9/16/98	991.814	1090.046	1002.243	1001.746		1003.498	1082.856	1000.030	1001.241	1087.289	1001.318
9/17/98	991.576	1089.937	1001.983	1001.595		1003.260	1082.820	999.792	1001.032	1087.203	1001.084
9/18/98	991.381	1089.764	1001.766	1001.487		1003.000	1082.766	999.575	1000.802	1087.116	1000.885
9/19/98	991.251	1089.613	1001.550	1001.465		1002.870	1082.748	999.445	1000.701	1087.008	1000.777
9/20/98	990.991	1089.569	1001.246	1001.227		1002.502	1082.693	999.099	1000.363	1086.899	1000.434
9/21/98	990.774	1090.024	1000.987	1001.053		1002.264	1082.639	998.882	1000.154	1087.073	1000.218
9/22/98	990.515	1090.349	1000.705	1000.858		1001.982	1082.729	998.601	999.902	1087.354	999.965
9/23/98	990.341	1090.565	1000.488	1000.729		1001.788	1083.000	998.427	999.737	1087.636	999.766
9/24/98	990.190	1090.739	1000.294	1000.664		1001.593	1083.271	998.232	999.572	1087.874	999.586
9/25/98	990.038	1090.955	1000.077	1000.555		1001.398	1083.812	998.037	999.406	1088.177	999.405
9/26/98	989.886	1091.172	999.860	1000.425		1001.138	1084.155	997.799	999.176	1088.415	999.189
9/27/98	989.627	1091.410	999.557	1000.187		1000.835	1084.624	997.604	998.902	1088.718	998.882
9/28/98	990.385	1091.648	999.536	1000.187		1000.748	1085.003	997.583	998.845	1089.000	998.792
9/29/98	989.562	1091.778	999.362	1000.447		1000.575	1085.058	997.409	998.701	1089.173	998.666
9/30/98	989.432	1091.995	999.124	1000.122		1000.315	1085.274	997.150	998.471	1089.390	998.431
10/1/98	989.085	1092.146	998.908	999.884		1000.077	1085.418	996.955	998.262	1089.585	998.196
10/2/98	988.955	1092.255	998.734	999.841		999.882	1085.436	996.760	998.097	1089.693	998.016
10/3/98	988.847	1092.385	998.539	999.732		999.687	1085.563	996.586	997.931	1089.845	997.835
10/4/98	988.609	1092.536	998.344	999.494		999.449	1085.689	996.392	997.723	1089.975	997.619
10/5/98	988.436	1092.579	998.150	999.234		999.254	1085.743	996.197	997.557	1090.040	997.402
10/6/98	988.262	1092.623	997.998	999.039		999.081	1085.725	996.045	997.414	1090.104	997.222
10/7/98	988.024	1092.644	997.738	998.455		998.821	1085.906	995.720	997.183	1090.148	996.969
10/8/98	987.829	1092.666	997.500	998.173		998.626	1086.032	995.482	997.018	1090.191	996.716
10/9/98	987.807	1092.774	997.370	998.455		998.517	1086.158	995.395	996.938	1090.278	996.644
10/10/98	987.591	1092.948	997.153	998.455		998.323	1086.249	995.222	996.774	1090.408	996.500
10/11/98	987.353	1093.164	996.872	998.281		998.063	1086.393	994.984	996.543	1090.581	996.229
10/12/98	987.331	1093.316	996.634	998.108		997.846	1086.501	994.767	996.356	1090.733	996.013
10/13/98	987.504	1093.424	996.547	999.148		997.781	1086.591	994.811	996.320	1090.862	995.959
10/14/98	992.918	1093.597	997.522	1000.404		998.474	1086.628	995.829	997.043	1091.014	996.446
10/15/98	988.132	1093.814	996.764	1000.469		998.063	1086.844	995.265	996.661	1091.187	996.338

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
10/16/98	987.288	1093.944	996.330	1000.295		997.630	1086.952	994.919	996.258	1091.317	996.013
10/17/98	986.876	1094.052	996.071	1000.165		997.391	1086.970	994.681	996.048	1091.447	995.814
10/18/98	986.205	1094.139	995.962	1000.295		997.370	1087.007	994.637	996.057	1091.555	995.814
10/19/98	986.273	1094.225	995.754	1000.415		997.177	1087.061	994.614	995.852	1091.627	995.603
10/20/98	986.966	1094.260	995.667	1000.372		997.090	1087.555	994.570	995.766	1091.692	995.476
10/21/98	985.992	1094.304	995.386	1000.026		996.873	1087.591	994.332	995.593	1091.735	995.314
10/22/98	985.689	1094.304	995.126	999.722		996.657	1087.555	994.094	995.376	1091.757	995.098
10/23/98	985.624	1094.325	995.018	999.679		996.570	1087.555	994.007	995.311	1091.779	995.025
10/24/98	985.494	1094.347	994.866	999.679		996.484	1087.555	993.899	995.224	1091.822	994.971
10/25/98	985.429	1094.369	994.736	999.701		996.375	1087.555	993.791	995.159	1091.844	994.881
10/26/98	985.277	1094.390	994.606	999.636		996.202	1087.609	993.639	995.008	1091.865	994.719
10/27/98	985.147	1094.412	994.433	999.809		995.985	1087.591	993.509	994.835	1091.865	994.538
10/28/98	985.082	1094.434	994.390	999.896		995.942	1087.591	993.487	994.813	1091.887	993.672
10/29/98	985.060	1094.477	994.368	1000.069		995.942	1087.591	993.509	994.791	1091.930	994.538
10/30/98	984.909	1094.498	994.238	1000.069		995.769	1087.609	993.401	994.705	1091.952	994.430
10/31/98	984.736	1094.455	994.065	999.852		995.509	1087.573	993.206	994.510	1091.909	994.213
11/1/98	984.714	1094.477	994.086	999.896		995.509	1087.591	993.228	994.466	1091.930	994.177
11/2/98	984.757	1094.477	994.022	999.982		995.444	1087.609	993.184	994.423	1091.952	994.159
11/3/98	984.844	1094.455	993.935	999.917		995.206	1087.609	993.098	994.380	1091.930	994.051
11/4/98	984.432	1094.455	993.805	999.896		995.076	1087.609	992.968	994.293	1091.930	993.961
11/5/98	984.389	1094.455	993.762	999.917		995.011	1087.573	992.903	994.250	1091.930	993.906
11/6/98	984.238	1094.434	993.610	999.852		994.816	1087.591	992.773	994.163	1091.930	993.672
11/7/98	983.956	1094.390	993.437	999.657		994.599	1087.627	992.578	994.012	1091.887	993.636
11/8/98	984.021	1094.563	993.458	999.766		994.621	1087.609	992.621	993.990	1091.974	993.672
11/9/98	983.913	1094.520	993.307	999.787		994.448	1087.627	992.470	993.925	1091.995	993.600
11/10/98	983.804	1094.477	993.285	999.636		994.296	1087.591	992.405	993.795	1091.974	993.419
11/11/98	983.869	1094.455	993.350	999.701		994.296	1087.573	992.405	993.773	1091.952	993.437
11/12/98	983.804	1094.412	993.242	999.592		994.101	1087.573	992.275	993.665	1091.909	993.293
11/13/98	983.913	1094.369	993.285	999.571		994.101	1087.483	992.275	993.579	1091.887	993.203
11/14/98	983.869	1094.369	993.350	999.722		994.101	1087.501	992.318	993.622	1091.909	993.239
11/15/98	983.826	1094.369	993.285	999.787		994.036	1087.591	992.318	993.579	1091.887	993.203
11/16/98	983.761	1094.347	993.242	999.809		993.950	1087.591	992.275	993.535	1091.865	993.148
11/17/98	983.739	1094.369	993.112	999.679		993.755	1087.645	992.166	993.449	1091.865	993.040
11/18/98	984.021	1094.455	993.134	999.679		993.777	1087.753	992.210	993.427	1091.930	993.022
11/19/98	983.978	1094.455	993.004	999.657		993.690	1087.735	992.123	993.384	1091.952	992.950
11/20/98	983.545	1094.390	992.883	999.816		993.622	1087.699	992.005	993.349	1091.924	992.834
11/21/98	983.406	1094.380	992.818	999.860		993.600	1087.561	991.983	993.284	1091.924	992.877

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
11/22/98	983.363	1094.380	992.753	999.881		993.535	1087.561	991.918	993.262	1091.902	992.856
11/23/98	983.255	1094.315	992.601	999.816		993.383	1087.507	991.810	993.176	1091.859	992.791
11/24/98	983.190	1094.294	992.493	999.795		993.297	1087.471	991.745	993.089	1091.815	992.704
11/25/98	983.190	1094.272	992.472	999.881		993.297	1087.453	991.745	993.067	1091.794	992.683
11/26/98	983.168	1094.250	992.407	1000.120		993.297	1087.417	991.723	993.067	1091.772	992.683
11/27/98	983.190	1094.207	992.385	1000.878		993.275	1087.309	991.723	993.046	1091.729	992.683
11/28/98	983.190	1094.380	992.298	1001.289		993.210	1087.507	991.658	993.024	1092.227	992.726
11/29/98	982.908	1094.553	992.103			992.885	1087.669	991.420	992.851	1092.617	992.488
11/30/98	982.995	1094.532	992.168			992.950	1087.525	991.485	992.807	1092.573	992.466
12/1/98	982.951	1094.445	992.147			992.950	1087.309	991.485	992.807	1092.162	992.466
12/2/98	982.973	1094.315	992.060			992.820	1087.164	991.442	992.764	1091.967	992.423
12/3/98	983.363	1094.250	992.147			992.907	1086.966	991.572	992.786	1091.859	992.423
12/4/98	987.694	1094.185	992.991			993.448	1086.911	992.416	993.284	1091.729	992.856
12/5/98	988.994	1094.055	993.446			993.773	1086.875	992.871	993.717	1091.620	993.202
12/6/98	989.188	1093.969	993.858			994.141	1086.785	993.326	994.063	1091.534	993.570
12/7/98	989.362	1093.860	994.074			994.228	1086.731	993.542	994.258	1091.426	993.722
12/8/98	989.708	1093.817	994.486			994.618	1086.641	994.040	994.583	1091.382	994.090
12/9/98	990.141	1093.731	994.724			994.791	1086.605	994.322	994.951	1091.296	994.393
12/10/98	989.881	1093.644	994.832			994.834	1086.532	994.474	995.103	1091.209	994.523
12/11/98	990.055	1093.557	995.135			995.116	1086.460	994.733	995.384	1091.144	994.827
12/12/98	990.380	1093.536	995.395			995.376	1086.424	994.885	995.688	1091.101	995.130
12/13/98	990.596	1093.492	995.590			995.549	1086.388	995.188	995.969	1091.057	995.368
12/14/98	989.752	1093.471	995.763			995.722	1086.334	995.491	996.207	1091.014	
12/15/98	989.816	1093.232	995.893			995.809	1086.045	996.011	996.402	1090.862	
12/16/98	991.202	1093.059	996.170	1002.250		996.055	1085.955	996.379	996.641	1090.563	
12/17/98	991.198	1092.966	996.386	1002.680		996.385	1085.725	996.747	996.820	1090.454	
12/18/98	990.201	1092.879	996.256	1002.770		996.365	1085.797	996.834	996.950	1090.368	
12/19/98	990.353	1092.836	996.321	1003.060		996.555	1085.815	997.007	997.140	1090.303	
12/20/98	990.418	1092.771	996.256	1003.100		996.625	1085.833	997.029	997.230	1090.238	
12/21/98	990.526	1092.706	996.256	1003.030		996.705	1085.779	997.050	997.320	1090.151	
12/22/98	985.026	1092.663	995.325	1002.700		996.335	1085.743	996.206	997.010	1090.129	
12/23/98	985.740	1092.598	994.870	1002.190		995.995	1085.706	995.664	996.670	1090.064	
12/24/98	983.856	1092.489	994.481	1001.960		995.685	1085.652	995.253	996.450	1089.999	
12/25/98	989.638	1092.468	995.455	1002.720		996.465	1085.562	996.141	996.880	1089.978	
12/26/98	991.587	1092.446	996.061			997.115	1085.562	996.747	997.340	1089.956	
12/27/98	991.263	1092.468	996.235			997.335	1085.526	996.920	997.600	1089.934	
12/28/98	991.566	1092.403	996.516			997.595	1085.472	997.158	997.790	1089.891	

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
12/29/98	991.284	1092.360	996.819			997.945	1085.436	997.397	998.050	1089.870	
12/30/98	990.894	1092.360	996.949			998.155	1085.418	997.505	998.270	1089.826	
12/31/98	988.534	1092.338	996.408			997.875	1085.418	996.942	998.050	1089.805	
1/1/99	988.187	1092.295	996.170			997.725	1085.400	996.660	997.920	1089.783	
1/2/99	988.122	1092.273	996.213			997.855	1085.346	996.639	997.880	1089.761	
1/3/99	987.949	1092.230	996.083			997.765	1085.346	996.379	997.840	1089.718	
1/4/99	987.927	1092.208	996.040			997.765	1085.309	996.336	997.750	1089.696	
1/5/99	988.057	1092.186	996.148			997.965	1085.255	996.422	997.770	1089.696	
1/6/99	988.209	1092.165	996.170			998.045	1085.255	996.422	997.810	1089.653	
1/7/99	988.101	1092.468	996.170			998.095	1085.400	996.401	997.840	1089.805	
1/8/99	988.101	1092.533	996.148			998.045	1085.400	996.314	997.790	1089.891	
1/9/99	988.036	1092.295	996.213			998.045	1085.201	996.249	997.770	1089.761	
1/10/99	988.101	1092.186	996.300			998.155	1085.129	996.292	997.810	1089.675	
1/11/99	987.191	1092.121	996.213			998.175	1085.111	995.967	997.840	1089.588	
1/12/99	985.524	1092.078	995.715			997.815	1085.093	995.578	997.580	1089.588	
1/13/99	985.069	1092.035	995.390			997.575	1085.111	995.383	997.360	1089.523	
1/14/99	984.961	1092.013	995.217			997.405	1085.075	995.188	997.170	1089.523	
1/15/99	984.982	1091.991	995.174			997.425	1085.039	995.361	997.100	1089.501	
1/16/99	985.004	1091.970	995.087			997.375	1085.039	995.253	997.040	1089.458	
1/17/99	984.831	1091.948	994.957			997.205	1085.021	995.079	996.860	1089.458	
1/18/99	984.766	1091.948	994.870			997.145	1085.075	994.950	996.750	1089.436	
1/19/99	984.592	1091.926	994.805			997.095	1085.057	994.906	996.670	1089.436	
1/20/99	984.744	1092.013	994.740			997.075	1085.093	994.863	996.600	1089.501	
1/21/99	984.744	1092.013	994.675			997.035	1085.111	994.755	996.520	1089.523	
1/22/99	985.134	1091.948	994.654			996.985	1085.129	994.668	996.450	1089.501	
1/23/99	984.831	1091.948	994.611			997.035	1085.057	994.646	996.410	1089.501	
1/24/99	984.917	1091.948	994.611			997.055	1085.021	994.668	996.410	1089.480	
1/25/99	985.199	1092.165	994.459			996.965	1085.454	994.495	996.360	1089.631	
1/26/99	985.329	1092.295	994.546			996.925	1085.743	994.473	996.260	1089.934	
1/27/99	984.939	1092.533	994.502	1002.463		996.732	1086.266	993.952	996.022	1091.229	
1/28/99	985.057	1092.721	994.719	1002.481		996.840	1086.178	994.147	996.087	1090.363	
1/29/99	985.425	1092.743	994.870	1002.481		996.927	1086.087	994.233	996.044	1090.298	
1/30/99	986.876	1092.829	995.239	1002.662		997.230	1086.069	994.428	996.174	1090.298	
1/31/99	986.118	1092.873	995.304	1002.662		997.230	1086.178	994.363	996.217	1090.319	
2/1/99	986.227	1092.916	995.433	1002.554		997.230	1086.340	994.342	996.152	1090.493	
2/2/99	986.313	1092.938	995.715	1002.626		997.404	1086.214	994.450	996.174	1090.449	
2/3/99	986.768	1092.938	996.018	1002.879		997.750	1086.142	994.645	996.347	1090.428	

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
2/4/99	987.071	1092.959	996.191	1002.951		997.880	1086.142	994.688	996.455	1090.384	
2/5/99	987.245	1092.916	996.170	1002.752		997.793	1086.160	994.558	996.477	1090.319	
2/6/99	988.349	1092.894	996.408	1002.734		997.967	1086.196	994.645	996.607	1090.319	
2/7/99	987.396	1092.938	996.560	1003.546		998.205	1086.105	994.775	996.628	1090.319	
2/8/99	987.439	1092.916	996.560	1003.600		998.226	1086.142	994.710	996.672	1090.276	
2/9/99	988.631	1092.959	996.863	1003.745		998.486	1086.124	994.861	996.823	1090.276	
2/10/99	987.851	1093.306	996.711	1003.600		998.356	1086.863	994.645	996.802	1090.861	
2/11/99	987.699	1093.154	996.949	1003.582		998.530	1086.629	994.731	996.823	1090.709	
2/12/99	988.024	1093.176	997.188	1003.709		998.811	1086.521	994.861	996.953	1090.644	
2/13/99	989.410	1093.219	997.469	1003.907		999.071	1086.502	995.013	997.126	1090.622	
2/14/99	988.544	1093.198	997.577	1003.979		999.158	1086.430	995.056	997.191	1090.579	
2/15/99	988.695	1093.198	997.707	1004.052		999.266	1086.430	995.078	997.256	1090.536	
2/16/99	988.890	1093.219	997.946	1004.142		999.439	1086.376	995.273	997.386	1090.536	
2/17/99	994.846	1093.219	999.418	1005.189		1000.652	1086.358	996.572	998.166	1090.514	
2/18/99	995.950	1093.219	999.916	1005.694		1001.128	1086.358	997.265	998.707	1090.493	
2/19/99	996.622	1093.219	1000.414	1006.109		1001.626	1086.340	997.893	999.140	1090.514	
2/20/99	998.159	1093.219	1000.848	1006.596		1002.081	1086.430	998.435	999.595	1090.493	
2/21/99	997.380	1093.219	1001.064	1007.101		1002.384	1086.358	998.759	999.963	1090.471	
2/22/99	998.419	1093.219	1001.454	1007.499		1002.731	1086.340	999.193	1000.332	1090.449	
2/23/99	999.069	1093.219	1001.865	1007.986		1003.251	1086.250	999.691	1000.808	1090.471	
2/24/99	999.502	1093.219	1002.147	1008.347		1003.619	1086.214	1000.016	1001.198	1090.471	
2/25/99	999.632	1093.198	1002.342	1008.473		1003.814	1086.286	1000.275	1001.501	1090.428	
2/26/99	999.935	1093.198	1002.669	1007.692		1003.719	1086.268	1000.514	1001.946	1090.428	
2/27/99	1000.15	1093.177	1002.886	1007.909		1003.935	1086.261	1000.925	1002.227	1090.568	
2/28/99	1000.35	1093.177	1003.080	1008.198		1004.238	1086.207	1001.293	1002.531	1090.568	
3/1/99	1000.61	1093.177	1003.254	1008.595		1004.477	1086.171	1001.596	1002.877	1090.546	
3/2/99	1000.69	1093.155	1003.254	1008.793		1004.693	1086.117	1001.705	1003.180	1090.524	
3/3/99	999.52	1093.155	1003.470	1008.902		1004.823	1086.153	1001.943	1003.332	1090.524	
3/4/99	996.34	1093.155	1002.452	1008.577		1004.260	1086.135	1001.098	1003.007	1090.503	
3/5/99	994.07	1093.177	1002.041	1008.144		1003.913	1086.225	1000.687	1002.747	1090.524	
3/6/99	993.63	1093.155	1001.889	1008.071		1003.870	1086.099	1000.557	1002.660	1090.503	
3/7/99	993.50	1093.155	1001.738	1008.071		1003.849	1086.117	1000.449	1002.617	1090.503	
3/8/99	993.18	1093.090	1001.456	1007.783		1003.589	1086.261	1000.167	1002.401	1090.459	
3/9/99	993.11	1093.069	1001.326	1007.765		1003.567	1086.153	1000.102	1002.357	1090.438	
3/10/99	993.07	1093.090	1001.240	1007.819		1003.545	1086.117	1000.037	1002.292	1090.459	
3/11/99	993.03	1093.069	1001.110	1007.855		1003.524	1086.080	999.994	1002.249	1090.438	
3/12/99	992.88	1093.047	1000.937	1007.674		1003.372	1086.207	999.821	1002.119	1090.438	

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
3/13/99	992.81	1093.025	1000.872	1007.765		1003.480	1086.117	999.777	1002.076	1090.416	
3/14/99	992.77	1093.025	1000.850	1007.891		1003.697	1085.990	999.777	1002.076	1090.416	
3/15/99	992.75	1093.090	1000.742	1007.873		1003.784	1085.972	999.756	1002.097	1090.438	
3/16/99	992.57	1093.199	1000.590	1007.783		1003.675	1086.441	999.604	1001.924	1090.741	
3/17/99	992.51	1093.155	1000.438	1007.801		1003.567	1086.423	999.452	1001.816	1090.676	
3/18/99	992.49	1093.155	1000.417	1007.855		1003.567	1086.405	999.431	1001.751	1090.611	
3/19/99	992.68	1093.155	1001.240	1008.342		1004.108	1086.261	1000.189	1002.119	1090.589	
3/20/99	998.79	1093.112	1001.998	1009.046		1004.736	1086.225	1000.925	1002.682	1090.546	
3/21/99	999.89	1093.177	1002.517	1009.425		1005.213	1086.315	1001.445	1003.072	1090.654	
3/22/99	1000.52	1093.134	1002.929	1009.840		1005.581	1086.207	1001.900	1003.483	1090.611	
3/23/99	1000.89	1093.134	1003.232	1010.183		1005.928	1086.062	1002.138	1003.700	1088.684	
3/24/99	1001.21	1092.89	1003.609	1010.057		1005.884		1002.181	1004.040	1090.476	
3/25/99	1001.553	1092.91	1003.977	1010.327		1006.209		1002.636	1004.408	1090.454	
3/26/99	1001.877	1093.06	1004.258	1010.634		1006.469		1002.961	1004.733	1090.757	
3/27/99	1002.094	1092.99	1004.388	1010.923		1006.447		1003.026	1004.754	1090.649	
3/28/99	1002.267	1092.93	1004.691	1011.284		1006.642		1003.307	1005.036	1090.584	
3/29/99	1002.527	1092.93	1005.038	1011.934		1006.988		1003.675	1005.383	1090.541	
3/30/99	1002.852	1092.91	1005.276	1012.258		1007.183		1003.935	1005.642	1090.519	
3/31/99	1003.068	1092.86	1005.536	1012.475		1007.400		1004.217	1005.902	1090.476	
4/1/99	1003.307	1092.84	1005.818	1012.674		1007.660		1004.542	1006.184	1090.454	
4/2/99	1003.480	1092.76	1005.839	1012.908		1007.595		1004.563	1006.184	1090.411	
4/3/99	1003.458	1092.78	1006.142	1013.016		1007.876		1004.888	1006.487	1090.433	
4/4/99	1003.978	1092.69	1006.229	1013.233		1008.006		1004.996	1006.639	1090.346	
4/5/99	1003.761	1092.67	1006.424	1013.359		1008.158		1005.213	1006.833	1090.324	
4/6/99	1004.086	1092.67	1006.619	1013.558		1008.396		1005.451	1007.072	1090.303	
4/7/99	1004.216	1092.97	1006.749	1013.774		1008.461		1005.581		1090.952	
4/8/99	1004.281	1092.95	1007.030	1013.955		1008.613		1005.754		1090.952	
4/9/99	1004.844	1092.97	1007.442	1014.099		1008.959		1006.079		1090.909	
4/10/99	1005.256	1092.86	1008.005	1014.316		1009.371		1006.491		1090.779	
4/11/99	1005.884	1092.76	1008.503	1014.478		1009.717		1006.837		1090.628	
4/12/99	1006.317	1092.89	1008.871	1014.713		1009.869		1007.032		1091.017	
4/13/99	1006.555	1092.84	1009.347	1014.893		1010.107		1007.292		1090.931	
4/14/99	1007.075	1092.89	1010.040	1014.839		1010.670		1007.790		1090.801	
4/15/99	1007.681	1092.78	1010.560	1015.146		1011.038		1008.158		1090.649	
4/16/99	1008.114	1092.69	1011.015	1015.363		1011.298		1008.461		1090.541	
4/17/99	1008.439	1092.60	1011.448	1015.579		1011.644		1008.851		1090.433	
4/18/99	1008.721	1092.52	1011.773	1015.741		1011.948		1009.198		1090.324	

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
4/19/99	1008.959	1092.43	1012.076	1015.958		1012.294		1009.588		1090.238	
4/20/99	1009.197	1092.32	1012.358	1016.157		1012.662		1009.956		1090.129	
4/21/99	1009.370	1092.24	1012.574	1016.373		1012.944		1010.259		1090.043	
4/22/99	1009.565	1092.15	1012.769	1016.626		1013.247		1010.562		1089.956	
4/23/99	1009.609	1092.04	1012.769	1016.788		1013.290		1010.389		1089.870	
4/24/99	1009.609	1091.95	1012.834	1017.041		1013.442		1010.757		1089.783	
4/25/99	1009.760	1091.89	1013.007	1017.221		1013.723		1010.757		1089.718	
4/26/99	1009.890	1091.80	1013.159	1017.402		1014.027		1011.212		1089.653	
4/27/99	1010.063	1091.74	1013.289	1017.546		1014.265		1011.450		1089.588	
4/28/99	1010.193		1013.505	1017.318		1014.532	1084.716	1011.710		1089.523	
4/29/99	1010.179		1013.437	1017.57	1011.621	1014.576	1085.023	1011.325	1013.021	1089.515	
4/30/99	1009.833		1013.285	1017.552	1011.73	1014.576	1085.041	1011.26	1013.107	1089.45	
5/1/99	1009.573		1013.307	1017.372	1011.903	1014.705	1085.095	1011.325	1013.237	1089.406	
5/2/99	1009.66		1013.502	1017.39	1012.12	1014.922	1084.879	1011.542	1013.454	1089.342	
5/3/99	1010.201		1013.632	1017.173	1012.336	1015.117	1084.933	1011.672	1013.649	1089.298	
5/4/99	1010.158		1013.545	1016.397	1012.379	1015.139	1084.915	1011.542	1013.605	1089.255	
5/5/99	1010.179		1013.545	1016.217	1012.466	1015.16	1084.897	1011.563	1013.627	1089.19	
5/6/99	1010.071		1013.545	1015.82	1013.246	1015.204	1084.626	1011.542	1013.627	1089.082	
5/7/99	1010.114		1013.567	1015.621	1013.765	1015.333	1084.355	1011.585	1013.735	1088.908	
5/8/99	1010.114		1013.502	1015.693	1013.982	1015.333	1084.139	1011.542	1013.735	1088.713	
5/9/99	1010.049		1013.48	1015.693	1014.025	1015.355	1084.102	1011.563	1013.757	1088.627	
5/10/99	1010.071		1013.458	1015.711	1014.069	1015.398	1084.121	1011.585	1013.8	1088.584	
5/11/99	1010.114		1013.458	1015.639	1014.177	1015.442	1084.012	1011.607		1088.497	
5/12/99	1010.006		1013.068	1015.387	1014.177	1015.312	1083.904	1011.26	1013.649	1088.367	
5/13/99	1006.866		1012.744	1014.935	1013.874	1014.965	1083.814	1010.892		1088.194	
5/14/99	1009.075		1012.982	1015.477	1014.047	1015.074	1083.832	1011.174	1013.346	1088.107	
5/15/99	1004.116		1011.596	1014.286	1013.419	1014.099	1083.724	1009.852	1012.609	1088.02	
5/16/99	1002.166		1011.098	1014.033	1012.964	1013.579	1083.669	1009.333	1012.133	1087.977	
5/17/99	1001.452		1010.665	1013.293	1012.618	1013.19	1083.453	1008.856	1011.743	1087.869	
5/18/99	1001.04		1010.318	1012.878	1012.314	1012.951	1083.29	1008.488	1011.418	1087.717	
5/19/99	1000.715		1009.907	1012.553	1011.968	1012.583	1083.326	1008.055	1011.007	1087.501	
5/20/99	1000.304		1009.539	1012.499	1011.665	1012.28	1083.254	1007.73	1010.682	1087.306	
5/21/99	1000.087		1009.257	1012.355	1011.578	1012.107	1083.002	1007.492	1010.53	1087.198	
5/22/99	999.784		1008.889	1012.192	1011.232	1011.76	1083.056	1007.124	1010.162	1087.176	
5/23/99	999.503		1008.542	1012.066	1010.928	1011.414	1083.435	1006.799	1009.816	1087.392	
5/24/99	999.221		1008.326	1012.156	1010.755	1011.24	1083.651	1006.669	1009.664	1087.674	
5/25/99	999.07		1008.044	1011.849	1010.517	1010.981	1083.417	1006.366	1009.361	1087.652	

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1998 - August, 1999)

	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
5/26/99	998.81		1007.741	1011.633	1010.43	1010.677	1083.254	1006.084	1009.101	1087.479	
5/27/99	998.528		1007.463	1010.034		1010.48	1083.038	1006.135	1008.961	1087.241	
5/28/99			1006.944	1009.655		1009.96	1082.674	1005.832	1008.528	1087.038	
5/29/99			1006.597	1011.279		1009.55	1082.512	1005.507	1008.16	1086.822	
5/30/99			1006.251	1011.189		1009.18	1082.53	1005.161	1007.77	1086.649	
5/31/99			1005.947	1011.026		1008.9	1082.512	1004.901	1007.51	1086.519	
6/1/99			1005.752	1010.737		1008.68	1082.367	1004.749	1007.272	1086.367	
6/2/99			1005.276	1010.557		1008.34	1082.999	1004.295	1006.99	1086.67	
6/3/99			1005.103	1010.864		1008.1	1083.955	1004.165	1006.731	1087.407	
6/4/99			1004.93	1010.81		1007.88	1084.443	1003.948	1006.536	1087.818	
6/5/99			1004.605	1010.81		1007.53	1084.587	1003.688	1006.254	1088.013	
6/6/99			1004.431	1010.358		1007.34	1084.479	1003.472	1006.038	1088.121	
6/7/99			1004.237	1010.196		1007.1	1084.406	1003.19	1005.799	1088.143	
6/8/99			1003.868	1009.925		1006.82	1083.991	1002.909	1005.583	1088.1	
6/9/99			1003.695	1009.6		1006.65	1084.298	1002.714	1005.323	1088.121	
6/10/99			1003.37	1009.167		1006.36	1084.316	1002.41	1005.041	1088.1	
6/11/99			1003.219	1009.095		1006.19	1084.334	1002.237	1004.825	1088.078	
6/12/99			1002.851	1008.861		1005.82	1084.406	1001.934	1004.5	1088.1	
6/13/99			1002.569	1008.464		1005.61	1084.37	1001.696	1004.305	1088.1	
6/14/99			1002.244	1008.229		1005.3	1084.334	1001.436	1004.023	1088.013	
6/15/99			1001.876	1007.994		1004.98	1084.28	1001.133	1003.72	1087.861	
6/16/99			1001.565	1005.383		1004.479	1084.262	1000.518		1087.776	1003.257
6/17/99	990.582	1089.718	1001.175	1005.256	1002.432	1004.132	1083.953	1000.259		1087.733	1002.954
6/18/99	990.387	1089.805	1000.828	1005.004	1002.162	1003.829	1083.917	999.999	1002.717	1087.776	1002.673
6/19/99	989.91	1089.740	1000.482	1004.787	1001.927	1003.526	1083.826	999.739	1002.458	1087.755	1002.413
6/20/99	989.715	1089.891	1000.114	1004.589	1001.692	1003.223	1083.844	999.457	1002.198	1087.798	1002.153
6/21/99	989.477	1090.108	999.811	1004.408	1002.486	1002.898	1083.935	999.176	1001.895	1087.971	1001.850
6/22/99	987.831	1090.259	999.183	1004.174	1002.216	1002.356	1084.187	998.743	1001.526	1088.145	1001.503
6/23/99	989.802	1090.064	999.118	1003.993	1001.981	1002.248	1084.133	998.613	1001.310	1088.058	1001.222
6/24/99	988.611	1089.783	998.793	1003.849	1001.765	1001.988	1083.989	998.353	1001.072	1087.863	1001.005
6/25/99	987.918	1089.545	998.338	1004.282	1001.422	1001.598	1083.953	998.006	1000.768	1087.690	1000.680
6/26/99	988.026	1089.307	998.100	1005.220	1001.187	1001.360	1083.881	997.790	1000.530	1087.495	1000.464
6/27/99	987.29	1089.068	997.623	1004.986	1000.790	1000.905	1083.826	997.422	1000.205	1087.322	1000.095
6/28/99	986.857	1088.852	997.234	1004.950	1000.393	1000.516	1083.808	997.075	999.859	1087.127	999.749
6/29/99	986.532	1088.635	996.930	1004.769	1000.140	1000.234	1083.682	996.815	999.577	1086.975	999.489
6/30/99	986.186	1088.419	996.584	1004.571	999.870	999.952	1083.538	996.577	999.317	1086.802	999.229
7/1/99	986.879	1088.267	996.281	1004.354	999.563	999.649	1083.465	996.317	999.036	1086.650	998.926

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
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	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
7/2/99	986.597	1088.072	995.934	1004.174	999.148	999.238	1083.429	996.014	998.819	1086.477	998.645
7/3/99	984.929	1087.877	995.501	1003.957	998.751	998.826	1083.267	995.667	998.495	1086.326	998.276
7/4/99	984.605	1087.747	995.155	1003.758	998.444	998.480	1083.393	995.364	998.191	1086.174	997.995
7/5/99	984.193	1087.552	994.786	1003.560	998.119	998.133	1083.285	995.083	997.910	1086.044	997.713
7/6/99	983.868	1087.444	994.418	1003.434	997.794	997.809	1083.105	994.801	997.607	1085.892	997.410
7/7/99	983.478	1087.401	994.093	1003.361	997.487	997.462	1083.032	994.498	997.303	1085.784	997.107
7/8/99	984.366	1087.271	993.682	1003.253	997.072	997.072	1083.050	994.108	996.957	1085.697	996.760
7/9/99	983.305	1087.163	993.487	1003.109	996.820	996.834	1083.086	993.913	996.697	1085.589	996.501
7/10/99	982.612	1087.076	993.205	1002.982	996.603	996.617	1082.599	993.718	996.480	1085.503	996.284
7/11/99	982.157	1086.946	992.837	1002.766	996.332	996.293	1082.419	993.415	996.177	1085.394	996.002
7/12/99	981.833	1086.794	992.469	1002.658	995.990	995.924	1082.292	993.090	995.896	1085.286	995.699
7/13/99	981.464	1086.664	992.123	1002.477	995.647	995.600	1082.238	992.809	995.571	1085.178	995.396
7/14/99	981.075	1086.535	991.776	1002.279	995.286	995.210	1082.220	992.484	995.268	1085.048	995.050
7/15/99	980.728	1086.470	991.430	1002.098	994.925	994.863	1082.383	992.159	994.943	1084.940	994.725
7/16/99	980.403	1086.448	991.083	1001.864	994.600	994.538	1082.491	991.878	994.618	1084.853	994.400
7/17/99	980.1	1086.470	990.758	1001.629	994.275	994.214	1082.491	991.574	994.250	1084.788	994.032
7/18/99	979.819	1086.491	990.455	1001.448	994.041	993.932	1082.455	991.293	993.925	1084.766	993.729
7/19/99	979.667	1086.535	990.152	1001.214	993.716	993.607	1082.455	991.011	993.622	1084.745	993.404
7/20/99	979.191	1086.535	989.849	1001.015	993.427	993.347	1082.455	990.773	993.319	1084.745	993.122
7/21/99	978.801	1086.535	989.524	1000.799	993.084	992.979	1082.509	990.470	993.037	1084.745	992.797
7/22/99	978.541	1086.513	989.177	1000.582	992.687	992.611	1082.762	990.167	992.712	1084.831	992.472
7/23/99	978.259	1086.599	988.874	1000.384	992.398	992.351	1082.888	989.907	992.431	1084.896	992.169
7/24/99	977.913	1086.621	988.636	1000.167	992.164	992.091	1082.888	989.690	992.171	1084.961	991.931
7/25/99	977.61	1086.643	988.311	999.932	991.821	991.745	1082.960	989.387	991.868	1085.026	991.628
7/26/99	977.263	1086.643	988.008	999.680	991.496	991.442	1083.068	989.127	991.565	1085.069	991.325
7/27/99	982.309	1086.643	987.683	999.481	991.171	991.138	1083.141	988.824	991.305	1085.091	991.043
7/28/99	986.099	1086.708	988.268	999.987	991.171	991.377	1083.249	989.452	991.521	1085.134	991.173
8/26/99	969.27	1085.350	979.570	992.040	982.230	982.800	1081.730	981.440	983.710	1084.090	983.270
9/20/99	964.560	1083.710	973.990	988.350	976.180	976.840	1080.940	976.200	978.210	1082.650	977.680
10/26/99	959.210	1082.340	968.150	985.910	970.030	970.600	1079.450	971.080	972.970	1081.280	972.250