

FOSTER WHEELER ENVIRONMENTAL CORPORATION

**SECOND ANNUAL REPORT
ON THE
JPL LONG-TERM QUARTERLY
GROUNDWATER MONITORING PROGRAM
SEPTEMBER 1997 TO AUGUST 1998**

Prepared for the:

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

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TABLE OF CONTENTS

	PAGE
LIST OF TABLES	ii
LIST OF FIGURES	iii
LIST OF ACRONYMS AND CHEMICAL SYMBOLS.....	iv
EXECUTIVE SUMMARY	vi
1.0 INTRODUCTION.....	1-1
2.0 SAMPLING AND FIELD QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES	2-1
2.1 SHALLOW MONITORING WELLS	2-1
2.2 DEEP MULTI-PORT MONITORING WELLS	2-1
2.3 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES	2-2
3.0 ANALYTICAL RESULTS-CONSTITUENTS OF CONCERN.....	3-1
3.1 VOLATILE ORGANIC COMPOUNDS RESULTS	3-1
3.2 PERCHLORATE RESULTS	3-3
3.3 METALS RESULTS	3-3
3.4 TRIBUTYL TIN RESULTS.....	3-3
3.5 NDMA AND 1,4-DIOXANE RESULTS	3-4
4.0 GENERAL WATER CHEMISTRY	4-1
5.0 WATER-LEVEL MEASUREMENTS	5-1
6.0 RECOMMENDATIONS	6-1
6.1 RECOMMENDED ADJUSTMENTS TO THE LONG-TERM MONITORING PROGRAM.....	6-1
6.2 SUMMARY.....	6-3
7.0 REFERENCES	7-1

Appendix A - Daily Water-Level Elevation Data from Shallow JPL Monitoring Wells

LIST OF TABLES

Table 1-1	Summary of Well Construction Details for JPL Groundwater Monitoring Wells
Table 3-1	Summary of Analyses During the Second Year of Long-Term Quarterly Groundwater Monitoring
Table 3-2	Summary of Volatile Organic Compounds and Perchlorate Detected During the First Two Years of Long-Term Quarterly Monitoring
Table 3-3	Summary of Metals Detected During the First Two Years of Long-Term Quarterly Monitoring
Table 4-1	General Water Types Observed During the Second Year of Long-Term Quarterly Monitoring
Table 5-1	Monthly Water-Level Elevations for JPL Groundwater Monitoring Wells, September 1997 to August 1998
Table 6-1	Well/Screen Classifications for JPL Groundwater Monitoring Wells

LIST OF FIGURES

- Figure 1-1 Locations of JPL Groundwater Monitoring Wells and Nearby Municipal Production Wells
- Figure 5-1 Annual Hydrograph for Deep, Multi-Port Well MW-3
- Figure 5-2 Annual Hydrograph for Deep, Multi-Port Well MW-4
- Figure 5-3 Annual Hydrograph for Deep, Multi-Port Well MW-11
- Figure 5-4 Annual Hydrograph for Deep, Multi-Port Well MW-12
- Figure 5-5 Annual Hydrograph for Deep, Multi-Port Well MW-14
- Figure 5-6 Annual Hydrograph for Deep, Multi-Port Well MW-17
- Figure 5-7 Annual Hydrograph for Deep, Multi-Port Well MW-18
- Figure 5-8 Annual Hydrograph for Deep, Multi-Port Well MW-19
- Figure 5-9 Annual Hydrograph for Deep, Multi-Port Well MW-20
- Figure 5-10 Annual Hydrograph for Deep, Multi-Port Well MW-21
- Figure 5-11 Annual Hydrograph for Deep, Multi-Port Well MW-22
- Figure 5-12 Annual Hydrograph for Deep, Multi-Port Well MW-23
- Figure 5-13 Annual Hydrograph for Deep, Multi-Port Well MW-24
- Figure 5-14 Annual Hydrographs for Shallow Monitoring Wells MH-01, MW-5, MW-6, MW-7, MW-8, MW-10, MW-13, and MW-16
- Figure 5-15 Annual Hydrographs for Shallow Monitoring Wells MW-1, MW-9, and MW-15
- Figure 5-16 Typical Water-Table Elevation Contour Map (September 9, 1997)
- Figure 5-17 Water-Table Elevation Contour Map with On-Site Flow Reversal (August 17, 1998)
- Figure 6-1 Locations of Proposed JPL Sampling Point Classifications for Volatile Organic Compounds
- Figure 6-2 Locations of Proposed JPL Sampling Point Classifications for Perchlorate
- Figure 6-3 Locations of Proposed JPL Sampling Point Classifications for Chromium (Total and Hexavalent)

LIST OF ACRONYMS AND CHEMICAL SYMBOLS

1,1-DCA	1,1-Dichloroethane
1,2-DCA	1,2-Dichloroethane
1,1-DCE	1,1-Dichloroethene
As	Arsenic
Ca ⁺²	Calcium
CCl ₄	Carbon Tetrachloride
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Cl ⁻	Chloride
ClO ₄ ⁻	Perchlorate
COC	Constituent of Concern
CO ₃	Carbonate
Cr	Chromium
Cr(VI)	Hexavalent Chromium
DHS	California Department of Health Services
DTSC	California State Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
Fe	Iron
FSAP	Field Sampling and Analysis Plan
HCO ₃ ⁻	Bicarbonate
JPL	Jet Propulsion Laboratory
K ⁺	Potassium
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
mg/L	Milligrams per liter
Mg ⁺²	Magnesium
MP	Multi-Port
MW	Monitoring Well
Na ⁺	Sodium
NA	Not Analyzed or Not Applicable
NASA	National Aeronautics and Space Administration
ND	Not Detected
NDMA	N-nitrosodimethylamine
ng/L	Nanograms per liter
NO ₃ ⁻	Nitrate
NTU	Nephelometric Turbidity Unit
OU-1	Operable Unit - 1 (On-site Groundwater Investigation)
OU-2	Operable Unit - 2 (On-site Contaminant Source Investigation)
OU-3	Operable Unit - 3 (Off-site Groundwater Investigation)

LIST OF ACRONYMS AND CHEMICAL SYMBOLS

(Continued)

Pb	Lead
PCE	Perchloroethene (Tetrachloroethene)
QA/QC	Quality Assurance/Quality Control
RI/FS	Remedial Investigation/Feasibility Study
RWQCB	Regional Water Quality Control Board
SO ₄ ⁻²	Sulfate
TBT	Tributyltin
TCE	Trichloroethene
TDS	Total Dissolved Solids
µg/L	Micrograms per liter
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This report summarizes the results from the second year of long-term quarterly groundwater monitoring for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation/Feasibility Study (RI/FS) at the National Aeronautics and Space Administration-Jet Propulsion Laboratory (JPL). The long-term quarterly groundwater monitoring program was initiated in August 1996 in response to requests from the U.S. Environmental Protection Agency (EPA). During this past year of monitoring, groundwater samples were collected quarterly from all 18 on-site JPL monitoring wells and from all 5 off-site JPL monitoring wells, and analyzed for a variety of organic and inorganic compounds and elements.

Of 60 volatile organic compounds (VOCs) analyzed for during the year, only 4, carbon tetrachloride (CCl_4), trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), and tetrachloroethene (PCE) were detected in groundwater samples at concentrations in excess of state and/or Federal maximum contaminant levels (MCLs) for drinking water.

Perchlorate (ClO_4^-) analyses continued to be performed on groundwater samples from JPL monitoring wells. Groundwater samples from 5 on-site wells and one off-site well contained ClO_4^- at a concentration above the California Department of Health Services (DHS) interim action level of 18 micrograms/liter ($\mu\text{g/L}$).

Arsenic (As) and lead (Pb) were rarely and randomly detected at levels well below state and federal MCLs. Total chromium (Cr) was measured in 2 samples from on-site wells at concentrations above the state MCL, but below the Federal MCL. Hexavalent Cr, for which state and federal MCLs have not yet been established, was detected consistently in on-site well MW-13 only. Tributyltin (TBT) sampling was discontinued following regulatory agency approval after the September/October 1997 event based on nondetect results. N-nitrosodimethylamine (NDMA) and 1,4-dioxane analyses were performed during the last two quarterly events on selected wells as a screening for their presence. NDMA was not detected and 1,4-dioxane was detected in one well near the detection limit. Analyses for these compounds will continue for at least one or more events.

Three different water types were delineated beneath JPL as suggested by differences in the concentrations of major anions and cations. In general, very little change in water type with time was observed during the last two years at JPL. Water-elevation data collected during the year consistently showed that JPL regional groundwater flow was primarily south and east. During operation of Pasadena municipal pumping wells, a zone of depression was formed around the pumping wells.

Conclusions based on interpretation of analytical data and field measurements collected during the first two years of the long-term monitoring program indicate that the groundwater contaminant plumes are well defined, and that contaminant plumes are predominately stable at all depth intervals. In an effort to improve sampling and monitoring efficiency, analytical and groundwater elevation data were analyzed to make recommendations for changing the long-term groundwater monitoring program. During the first 2 years of the program, adjustments involved primarily modifying the list of constituents of concern (COCs) targeted for analysis to address regulatory agency concerns.

Based on the last 2 years of quarterly monitoring and on the long-term quarterly monitoring program plan (Foster Wheeler, 1996b), it is appropriate to provide recommendations for adjustments to the existing monitoring program with the goal of optimizing sampling and monitoring efficiency. To identify sampling points that yield redundant or superfluous data, each sampling point was preliminarily assigned to a category (plume, downgradient, or upgradient). Based on the classification assigned each sample point, changes to the sampling frequency for VOCs at several JPL sampling points are proposed (Section 6.0).

In addition, it is recommended that Pb and As analyses be dropped from the monitoring program and general minerals analyses be performed annually rather than quarterly. Pb and As results indicate there are no Pb or As plumes to monitor, and general minerals analyses indicate water type distribution is stable and can be effectively monitored on an annual basis.

1.0 INTRODUCTION

This report summarizes results from the second year (September 1997 through August 1998) of quarterly groundwater sampling completed as part of a long-term quarterly groundwater monitoring program at the National Aeronautics and Space Administration (NASA)-Jet Propulsion Laboratory (JPL) for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation/Feasibility Study (RI/FS). The long-term quarterly groundwater monitoring program was initiated in response to requests from the USEPA with the objective of monitoring hydrogeological conditions and the nature and extent of groundwater contaminants.

The program integrates monitoring wells (MWs) installed on- and off-site since 1989 into a comprehensive package. The program involves quarterly sampling of 23 groundwater monitoring wells and quantification of various analytes in the samples. Additionally, water-level data are collected at each well and are used to monitor groundwater flow directions and gradients. The purpose of this report is to compile and summarize the data, to evaluate the effectiveness of the monitoring system, and to recommend adjustments to the monitoring program.

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. 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 summarized in this report were completed in September/October, 1997; January/February, 1998; April/May, 1998; and July/August, 1998. Sampling procedures used are summarized in Section 2.0 of this report. The analytical program focused on: (i) quantification of various constituents of concern (COCs) in the groundwater, and (ii) determination of general water type based on general mineral analyses. COCs were monitored to determine the nature and extent of contamination in groundwater beneath JPL, and will be discussed in Section 3.0. The water-quality data were used to establish generalized groundwater types, and are discussed in Section 4.0.

In addition to groundwater samples, quality assurance/quality control (QA/QC) samples were collected for laboratory analyses. The QA/QC program is summarized in Section 2.0. 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, 1997d; 1998c, d, e) and are not included in this summary report.

In addition to water quality analyses, water levels were measured daily in the on-site shallow wells and hydraulic-head measurements were recorded monthly in the deep multi-port wells. 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 based on 2 years of long-term monitoring. Recommendations are presented to reduce the sampling frequency and types of analyses at selected wells based on their classification (downgradient, in plume, etc.) pursuant to the long-term quarterly monitoring program plan outlined in the "Part A Addendum to the Work Plan for Performing a Remedial Investigation/Feasibility Study" (Foster Wheeler, 1996b).

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). Before sample collection, 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 removed during purging at each well were monitored. 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 with 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 volatile organic compounds (VOCs) had zero headspace.

2.2 DEEP MULTI-PORT MONITORING WELLS

Sampling of the deep JPL multi-port (MP) 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 MP well. Purging before sampling is not required in the deep MP 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. If the turbidity was low (less than or near 5 NTUs), samples for laboratory analysis were subsequently collected and transferred to sample containers. 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 Field Sampling and Analyses Plans (FSAPs) for Operable Unit-1 (on-site groundwater) and Operable Unit-3 (off-site groundwater) (Foster Wheeler, 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 procedures are discussed in detail in the Quality Assurance Program plan for completing the Remedial Investigation (Ebasco, 1993b) and associated addenda (Foster Wheeler, 1996c and 1998b). 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 CONCERN

The analytical results for the COCs, which include volatile organic compounds (VOCs), perchlorate (ClO_4^-), metals (lead [Pb], arsenic [As], total chromium [Cr], and hexavalent chromium [Cr(VI)]), tributyltin (TBT), n-nitrosodimethylamine (NDMA), and 1,4-dioxane are summarized in this section. Table 3-1 contains a summary of analyses performed during each of the four 1997/1998 sampling events, and indicates that the analytical schedule was changed during the program as follows:

- TBT analysis was performed on shallow well MW-8 only during September/October 1997 and then dropped pursuant to regulatory agency approval [analysis for TBT was completed on selected wells several times during the previous year of monitoring (Foster Wheeler, 1998a)].
- NDMA and 1,4-dioxane analyses were performed during the last two quarterly events on selected wells, pursuant to regulatory agency requests, to screen for their presence.

Results from VOCs and ClO_4^- analyses are compiled in Table 3-2, and results for metals analyses are presented in Table 3-3. A detailed discussion of the analytical results is provided in the following sections, and can be summarized as follows:

- On-site shallow wells MW-7 and MW-16 contained higher concentrations of more VOCs than the other JPL wells.
- Perchlorate was consistently detected above the interim action level in 5 on-site wells, and intermittently in a few off-site wells.
- Arsenic and lead were rarely and randomly detected. When detected, they were present at low concentrations typically indicative of background levels.
- NDMA was not detected.
- 1,4-Dioxane was detected in only one well at a very low level. A subsequent sample showed no detectable 1,4-dioxane in that well.

3.1 VOLATILE ORGANIC COMPOUNDS RESULTS

The VOCs results are summarized in Table 3-2. The key findings are listed below, and a complete description is provided in the following paragraphs. The VOCs results indicated that:

- Only 4 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 in on-site wells MW-7, MW-13, MW-16, and the upper screens in MW-24.

- PCE, which has not previously been detected above its MCL during the long-term monitoring program, exceeded its MCL during the last 2 quarters in off-site well MW-21 screen 5. In fact, the MCL has not been exceeded since 1991 in monitoring wells located on the JPL property.
- MCLs were exceeded for 1 or more VOCs in off-site wells MW-17 screens 3-5, MW-18 screens 3 and 4, and MW-21 screens 1 and 5.

Carbon Tetrachloride

Relatively low concentrations of CCl₄ have consistently been present in samples from on-site wells MW-3 screen 3, MW-4 screen 2, MW-8, MW-11 screen 2, MW-12 screens 2,4 and 5, MW-23 screen 1, and off-site well MW-18 screen 4. Relatively higher concentrations of CCl₄ were observed in samples from on-site wells MW-7, MW-12 screen 3, MW-13, MW-16, and MW-24 screens 1 and 2. CCl₄ has also been detected intermittently in samples from on-site wells MW-10, MW-11 screens 1 and 3, and off-site wells MW-17 screen 3, and MW-18 screen 3. All CCl₄ detects are at or above the California MCL of 0.5 ug/L because it is the same as the laboratory practical quantitation limit (PQL).

Trichloroethene

The highest concentrations of TCE have consistently been measured in samples from on-site wells MW-7, MW-13, and MW-16. Relatively lower concentrations have been consistently found in samples from on-site wells MW-8, MW-14 screen 2, MW-23 screen 1, MW-24 screens 1 and 2, and from off-site wells MW-17 screens 4 and 5, MW-18 screen 3, MW-19 screen 4 and MW-21 screen 1. TCE concentrations decreased below MCLs during the past year in MW-4 screen 2, MW-10, and MW-17 screen 3. Occasional low level detects below MCLs were also noted in samples from on-site wells MW-3 screen 3, MW-6, MW-12 screen 2, and off-site wells MW-18 screen 4, MW-19 screen 2, and MW-21 screens 3 and 4.

1,2-DCA

1,2-DCA has been found at levels exceeding the state MCL in samples from on-site wells MW-7 and MW-16, and occasionally in wells MW-13 and MW-24 screen 1. 1,2-DCA was not detected in any off-site monitoring wells.

Tetrachloroethene

Tetrachloroethene, also known as perchloroethene (PCE), exceeded MCLs (the first time since the monitoring program began) during the last 2 quarters in off-site well MW-21 screen 5. PCE has consistently been found at levels which do not exceed state or federal MCLs in samples from on-site wells MW-7, MW-14 screen 2, MW-16, and from off-site wells MW-17 screen 5, MW-18 screens 3 and 4, MW-19 screens 2, 3 and 5, and MW-21 screens 2-4. Infrequent low level detects (below MCLs) have also been noted in samples from on-site wells MW-4 screen 2, MW-10, MW-13, MW-14 screen 1, MW-24 screens 1 and 2, and from off-site wells MW-17 screens 3, 4, and 5, MW-19 screen 4, and MW-21 screen 1.

Other VOCs

Other VOCs have been detected in JPL groundwater samples, but these have either been at concentrations far below MCLs or the detects have been exceedingly rare or attributable to laboratory contamination (see Table 3-2).

3.2 PERCHLORATE RESULTS

Perchlorate (ClO_4^-) analysis was initiated during the first year of the monitoring program after the California Department of Health Services (DHS) detected ClO_4^- in nearby City of Pasadena municipal wells and requested ClO_4^- analyses be conducted. Groundwater samples from several on-site wells [MW-4 screen 2, MW-7, MW-13, MW-16 and MW-24 screens 1 and 2 (Table 3-2)] contained ClO_4^- at levels above the DHS interim action level (IAL) of 18 $\mu\text{g}/\text{l}$. ClO_4^- was detected 1 or more times below the IAL in samples from on-site wells MW-3 screen 3, MW-5, MW-6, MW-8, MW-10, MW-12 screens 2-4, MW-14 screens 1-3, MW-22 screens 1-3, MW-23 screens 1 and 2; and in off-site wells MW-17 screens 4 and 5, MW-18 screens 3 and 4, MW-19 screens 3 and 4, MW-20 screen 1, and MW-21 screens 1, 4, and 5.

3.3 METALS RESULTS

Metals data are summarized in Table 3-3, and include the results for arsenic (As), lead (Pb), chromium (Cr), and hexavalent chromium (Cr[VI]). Pb continued to be rarely and randomly detected at levels near the detection limit well below state or federal MCLs. Arsenic was detected in MW-3 screen 5 three of the four quarters this year and was detected in only two other samples at levels close to the detection limit well below the state and federal MCL. These metals are present in typical background concentrations and do not define contaminant plumes.

Total Cr was occasionally detected below its MCL in MW-4 screen 2, MW-6, and MW-7. Total Cr was detected in MW-1 and MW-13 above the state MCL, but below the federal MCL. Backup laboratory data apparently confirmed the reported Cr detect in well MW-1, however, MW-1 is upgradient of JPL influence due to the significant groundwater mound located at the mouth of the Arroyo Seco. It is believed the reported detect of total Cr in MW-1 is due to unidentified matrix interference in the laboratory and is not representative of conditions upgradient of JPL in the Arroyo Seco. Cr(VI) continued to be detected consistently during the second year of the program at low concentrations (<0.045 mg/L) in on-site well MW-13. State and federal MCLs for Cr(VI) have not yet been established.

3.4 TRIBUTYL TIN RESULTS

Tributyltin (TBT) analysis was conducted at JPL because TBT was historically used by industry in cooling towers as an anti-bacterial agent. The DTSC requested that TBT analysis be conducted on samples from selected wells downgradient from JPL's cooling towers, including MW-4 screens 1 and 2, MW-8, MW-12 screens 1 and 2, and MW-13.

All required TBT analyses were completed during the first year of the long-term monitoring program (Foster Wheeler, 1998a), except for MW-8, which was completed during the September/October 1997 event. TBT was not detected in MW-8 at a detection level of 2 nanograms per liter (ng/L). Analysis for TBT was subsequently discontinued after the September/October 1997 event, pursuant to approval from the EPA, DTSC, and RWQCB.

3.5 NDMA AND 1,4-DIOXANE RESULTS

Pursuant to regulatory agency requests, groundwater samples from 6 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 and n-nitrosodimethylamine (NDMA) to screen for their presence in the groundwater during the April/May 1998 and July/August 1998 sampling events. The selected wells historically contained the highest concentrations of contaminants in the groundwater at JPL. 1,4-dioxane was analyzed using EPA Method 8270 (method detection limit [MDL] of 3 µg/L) and NDMA was analyzed using EPA Method 1625C (MDL of 0.005 µg/L). At this time, no state or Federal MCLs have been established for these 2 compounds.

During the first sampling event for NDMA and 1,4-dioxane in April/May 1998, 1,4-dioxane was detected in one well (MW-16) at 5 µg/L, and NDMA was not detected. Neither constituent was detected during the subsequent sampling event in July/August 1998. These same wells are scheduled for at least one more round of 1,4-dioxane and NDMA sampling (September/October, 1998) to confirm that these compounds are not a concern at the site.

4.0 GENERAL WATER CHEMISTRY

As part of the monitoring program, groundwater samples were submitted quarterly for analysis of general groundwater parameters including major cations and anions [sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), sulfate (SO_4^{2-}), nitrate (NO_3^-), chloride (Cl^-), carbonate (CO_3^{2-}), bicarbonate (HCO_3^-)], total iron (Fe), Total Dissolved Solids (TDS), 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. For a summary of analyses performed, refer to Table 3-1. General groundwater chemistry data for each monitoring event are presented in the respective quarterly reports (Foster Wheeler, 1997d; 1998c, d, e), 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, 1997d; 1998c, d, e).

The water chemistry results were compiled as 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:

1. Calcium-bicarbonate groundwater: Ca^{2+} as the dominant cation and HCO_3^- as the dominant anion;
2. Sodium-bicarbonate groundwater: Na^{2+} as the dominant cation and HCO_3^- as the dominant anion;
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 classifications of groundwater from each sampling point, as reported during the four quarterly sampling events completed this year. 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. Based on the relative consistency over the last 2 years of quarterly monitoring of the general chemistry results, annual sampling for these parameters may be sufficient to provide the required water-classification data (see Section 6.0).

5.0 WATER-LEVEL MEASUREMENTS

Water levels in the on-site shallow monitoring wells were measured daily using dedicated pressure transducers and data logging equipment which stored water-level information electronically. The water-level data was retrieved from the data loggers on a monthly basis. In addition, shallow well water levels were measured manually each month using a water-level tape/indicator. Water levels in the deep, multi-port wells were also 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 (September 1997 to August 1998) 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. As shown on Figures 5-1 through 5-13, there is an enhanced downward flow of groundwater when the nearby municipal production wells are pumping. 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 assess groundwater flow directions. These water-elevation contour maps are included in each associated monitoring report. This analysis has shown that flow is primarily to the south and east across JPL during a majority of the year when nearby municipal production wells are producing. In addition, the maps show the continuous presence of the significant groundwater mound located at the mouth of the Arroyo Seco. This typical scenario is illustrated in Figure 5-16, which depicts groundwater elevation contours and flow directions that are representative of those generally observed when nearby City of Pasadena production wells are in operation. However, during the winter of 1997/1998, above normal precipitation was observed due to El Niño weather conditions. Groundwater recharge in the Arroyo Seco was substantial, creating a groundwater high east of JPL. Groundwater flow was to the west across some or most parts of JPL from about February 1998 to August 1998. This scenario is illustrated in Figure 5-17.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on interpretation of analytical data and field measurements collected during the JPL long-term quarterly monitoring program:

- Groundwater contaminant plumes are well-defined and relatively stable.
- The groundwater flow is typically to the south and east across JPL with a downward vertical component.
- Variations in the direction of flow are caused primarily by seasonal recharge and/or periodic periods of no pumping from nearby production wells. These changes in the flow direction do not appear to have a significant effect on plume migration.
- General chemistry analyses indicate a 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 contaminants at JPL.

6.1 RECOMMENDED ADJUSTMENTS TO THE LONG-TERM MONITORING PROGRAM

Based on the results of long-term quarterly monitoring to date, and the guidelines included in the long-term quarterly monitoring program plan (Foster Wheeler, 1996b), it is appropriate to make recommendations for adjustments to the existing monitoring program with the goal of optimizing sampling and monitoring efficiency. It is recommended that the changes proposed below be implemented during the third year of the monitoring program, subsequent to approval by the appropriate regulatory agencies. These proposed optimization adjustments are organized into three categories of changes: 1) target analytes; 2) number of sample points; and 3) sampling frequency.

Target Analytes

The list of target analytes selected for analysis has been modified during the last 2 years of program operation primarily with the addition of perchlorate, and the sampling for tributyltin, NDMA, and 1,4-dioxane. To make the groundwater monitoring more efficient, we propose to discontinue NDMA and 1,4-dioxane analyses after September/October 1998 round, based on obtaining results similar to previous results. This will conclude 3 rounds of sampling for these compounds, where the results so far have indicated they are not constituents of concern. In addition, we propose to discontinue sampling for Pb and As as reported detects are rare, in the low parts per billion range (well below MCLs) just above detection limits, and typically inconsistent from year to year. The data suggests the detects of Pb and As are indicative of naturally-occurring background constituents. There is no suggestion of the presence of a "plume" or "plumes" of Pb or As in JPL groundwater.

Number of Sampling Points

The number of JPL sample points (wells/screens) appears to be adequate for the purpose of monitoring plume actively. For the upcoming third year of the program, it is recommended that the number of sampling points remain unchanged. Adjustments to the sampling frequency, however, are proposed (see below).

Sampling Frequency

During the first 2 years of the quarterly monitoring program, all COCs were sampled every quarter from every sampling point to refine plume delineation, establish temporal trends, and minimize the potential for data gaps. However, at this point in the program it is recommended that optimization adjustments in sampling frequency be implemented. To identify sampling points that yield redundant or superfluous data, each sampling point was assigned to one of the following five categories. Classification was based on proximity of the sampling point to the various groundwater contamination plumes (VOC, perchlorate, total and hexavalent chromium) pursuant to the classification categories described in the long-term monitoring program plan (Foster Wheeler, 1996b) summarized below:

1. *Plume Well*: Wells or well screens where constituents have been detected above detection limits. For this report, if a constituent was detected anytime during the long-term monitoring program (2 years), it was classified as a plume well (with the exception of one Cr detect in upgradient well MW-1, see Section 3.3).
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 last two years 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. *Guard Well*: Wells or well screens located near municipal drinking water supply wells that will provide early warning of plume migration. (*Note*: since a well or well screen becomes a "guard" well based on evaluation of remedial alternatives, no wells or well screens will be given this classification at this time.)
4. *Cross-gradient Well*: Wells or well screens located perpendicular to contaminant plumes. (*Note*: due to the shape of contaminant plumes and changing groundwater flow directions, no wells or well screens were given this classification.)
5. *Upgradient Well*: Wells or well screens that are not likely to be in the path of contaminant plumes. Upgradient wells primarily provide background information.

Pursuant to the analytical results of the long-term monitoring program (Tables 3-2 and 3-3), all sampling points were classified. Table 6-1 includes the classifications for each of the JPL sample points. In addition, each of the sampling point classifications are shown on Figures 6-1, 6-2, and 6-3. The sampling frequencies associated with these classifications, as proposed in the long-term monitoring program plan (Foster Wheeler, 1996b), include sampling plume wells semi-annually, downgradient wells quarterly and upgradient wells annually.

However, due to the variable nature of groundwater flow conditions around JPL, we propose sampling plume wells and upgradient wells more frequently than initially proposed to better monitor plume activity. The new proposed sampling frequencies associated with the well classifications are as follows:

- *Plume wells*: continue to be sampled quarterly.
- *Downgradient wells*: continue to be sampled quarterly.
- *Upgradient wells*: to be sampled semi-annually.

In addition, it is recommended that analyses for general minerals (not target analytes, so therefore not included on Table 6-1) be performed annually rather than quarterly because the analyses have predominately indicated consistent results from event to event, and year to year, with minor variations. Annual sampling would provide the appropriate frequency of data for determining the general water types at this site.

6.2 SUMMARY

Included in this section is a summary of the proposed changes to the long-term quarterly monitoring program at JPL as indicated on Table 6-1. The proposed changes to the monitoring program are very conservative, and for the most part deal with changing the sampling frequency of wells or well screens where contaminants have never been detected and are not likely to be detected in the future based on contaminant migration pathways.

It is proposed that analyses for general minerals (major anions/cations) be completed once a year to monitor general water types since data indicate that water type distribution around JPL is relatively consistent.

It is proposed that analyses for lead (Pb) and arsenic (As) be dropped from the program since there are no Pb or As plumes to monitor. The few random, very low-level detects reported for Pb and As suggest they are present as naturally-occurring background elements.

It is proposed that all wells/well screens where chromium (Cr) or hexavalent chromium (Cr[IV]) were detected 1 or more times during the long-term quarterly monitoring program (2 years) (with the exception of upgradient well MW-1) continue to be sampled quarterly for Cr and CrVI (MW-4 screens 2 and 4, MW-6, MW-7, MW-8, MW-10, MW-12 screen 1, MW-13, MW-14 screens 1 and 3, MW-16, MW-17 screen 3, and MW-18 screen 3). As discussed in Section 3.0, the one Cr detect in well MW-1 has never been repeated and is considered to be anomalous and a probable laboratory error. MW-1 is upgradient of JPL influence due to the groundwater mound located at the mouth of the Arroyo Seco and it is believed that the Cr result is not indicative of conditions upgradient of JPL in the Arroyo Seco. All multi-port well screens adjacent to screens where Cr or CrVI were detected (MW-4 screens 1, 3 and 5, MW-12 screen 2, MW-14 screens 2 and 4, MW-17 screens 2 and 4, and MW-18 screens 2 and 4) and wells or well screens located immediately downgradient of wells or well screens where Cr or CrVI were detected (MW-3

screens 2, 3 and 4, MW-5, MW-11 screens 1, 2 and 3, MW-12 screen 3, MW-20 all 5 screens, MW-22 screens 1 and 2, MW-23 screens 1, 2, 3 and 4, and MW-24 screens 1, 2 and 3) continue to be sampled quarterly for Cr and CrVI. All other JPL wells and well screens will be sampled semi-annually for Cr and CrVI. If for any reason samples from a well or well screen which have never detected Cr or CrVI in the past, located immediately downgradient or adjacent to a well or well screen where Cr or CrVI have been detected in the past, suddenly contain Cr or CrVI, additional nearby wells and well screens will immediately be added to the quarterly sampling program pursuant to regulatory agency approval.

It is proposed that all wells and well screens where VOCs (all VOCs listed on summary of detects Table 3-2 except chloroform and "other VOCs") were detected during the long-term monitoring program (2 years), along with all multi-port screens adjacent to a screen where VOCs were detected, and all wells or well screens immediately downgradient of wells or well screens where VOCs were detected (Table 6-1), continue to be sampled on a quarterly basis for VOCs (EPA Method 524.2). If for any reason samples from a well or well screen which have never detected VOCs in the past, located immediately downgradient or adjacent to a well or well screen where VOCs have been detected in the past, suddenly contain VOCs, additional nearby wells and well screens will immediately be added to the quarterly sampling program pursuant to regulatory agency approval. Only those well screens located relatively far from paths of VOC contaminant migration (MW-1, MW-3 screens 1 and 5, MW-4 screens 4 and 5, MW-9, MW-11 screen 5, MW-14 screens 4 and 5, MW-15, MW-17 screen 1, MW-18 screen 1, MW-22 screens 3, 4 and 5, MW-23 screens 4 and 5, and MW-24 screens 4 and 5) will not be sampled for VOCs on a quarterly basis. These wells and well screens will, however, be sampled on a semi-annual basis unless conditions change as described above.

It is proposed that all wells and well screens where perchlorate was detected during the long-term quarterly monitoring program, along with all multi-port well screens adjacent to a screen where perchlorate was detected, and all wells or well screens immediately downgradient of wells or well screens where perchlorate was detected (Table 6-1), continue to be sampled on a quarterly basis for perchlorate. If for any reason samples from a well or well screen which have never detected perchlorate in the past, suddenly contain perchlorate, additional nearby wells and well screens will immediately be added to the quarterly sampling program pursuant to regulatory agency approval. Only those well screens located relatively far from paths of perchlorate contamination migration (MW-1, MW-3 screens 1 and 5, MW-4 screens 4 and 5, MW-9, MW-11 screens 4 and 5, MW-14 screen 5, MW-15, MW-17 screen 1, MW-18 screen 1, MW-19 screen 1, MW-22 screen 5, MW-23 screens 4 and 5, and MW-24 screens 4 and 5) will not be sampled for perchlorate on a quarterly basis. These wells and well screens will, however, be sampled on a semi-annual basis unless conditions change as described above.

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 3-1
SUMMARY OF ANALYSES DURING THE SECOND YEAR OF
LONG-TERM QUARTERLY GROUNDWATER MONITORING,
JET PROPULSION LABORATORY

Analyses	Analytical Method	Sampling Event			
		September/ October 1997	January/ February 1998	April/ May 1998	July/ August 1998
<u>Constituents of Concern</u>					
Volatile Organic Compounds (VOCs)	524.2	All wells	All wells	All wells	All wells
Perchlorate (ClO ₄ ⁻)	300.0 Mod	All wells	All wells	All wells	All wells
Chromium (Cr)	200.8	All wells	All wells	All wells	All wells
Hexavalent Chromium [Cr(VI)]	7196	All wells	All wells	All wells	All wells
Lead (Pb)	200.8	All wells	All wells	All wells	All wells
Arsenic (As)	200.9	All wells	All wells	All wells	All wells
Tributyltin	GC/FPD	MW-8 only	--	--	--
NDMA	1625C	--	--	(1)	(1)
1,4-Dioxane	8270	--	--	(1)	(1)
<u>General Minerals</u>					
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	All wells
Total Dissolved Solids (TDS)	2540-C	All wells	All wells	All wells	All wells
pH	4500-H	All wells	All wells	All wells	All wells

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

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED
DURING THE FIRST TWO 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	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate	
<i>MW-1</i>	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	1.9 Acetone	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	1.9 Acetone	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	1.3 m,p-xylenes	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
<i>MW-3</i>	Screen 1	Aug/Sep 1996	--	--	--	--	--	--	1.2	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	8.3	0.7(B) Naphthalene	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	2.6 Carbon disulfide	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Screen 2	1st	Aug/Sep 1996	--	--	--	--	--	--	5.5	--	NA
			Oct/Nov 1996	--	--	--	--	--	--	4.8	1.9(B) Naphthalene	NA
			Feb/Mar 1997	--	--	--	--	--	--	4.4	8.0 Carbon disulfide	NA
			Jun/Jul 1997	--	--	--	--	--	--	1.2	1.0 Freon 113	--
2nd		Sep/Oct 1997	--	--	--	--	--	--	0.8	--	--	
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	
		Apr/May 1998	--	--	--	--	--	--	--	--	--	
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
Screen 3	1st	Aug/Sep 1996	0.6	0.8	--	--	--	--	1.6	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	0.7	--	NA	
		Feb/Mar 1997	--	--	--	--	--	--	0.8	--	NA	
		Jun/Jul 1997	1.2	0.8	0.6	--	--	--	1.8	2.8 Freon 113	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	

TABLE 3-2

**SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED
DURING THE FIRST TWO 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	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate	
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	1.2 Acetone	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	1.0 Hexane	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	4.7 Carbon disulfide ⁽⁴⁾	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	2.1 Dichloromethane	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	2.1 Acetone	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	1.2 Carbon disulfide 1.5 Carbon disulfide 2.7 Sulfur dioxide 1.3 Unknown (RT=2.51) 4.5 Carbon disulfide	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
MW-4												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	2.9(B) Acetone	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.4
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	9.6
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	3.4 Dichloromethane ^(b)	--	--
Screen 2	1st	Aug/Sep 1996	5.5	19	--	--	0.9	0.7	6.7	3.2(B) Acetone	NA	
		Oct/Nov 1996	5.3	15	--	--	0.6	0.8	5.4	1.8 Acetone	NA	
		Feb/Mar 1997	7.9	19	--	--	0.8	0.8	7.8	--	NA	
		Jun/Jul 1997	4.0	5.7	--	--	--	0.5	3.4	--	51	
	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	

TABLE 3-2

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate	
Screen 3	1st	Aug/Sep 1996	--	--	--	--	--	--	--	3.0(B) Acetone	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	1.5 Acetone	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	1.0 Dichloromethane(b)	--
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	3.9(B) Acetone	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	1.6 Acetone	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	1st	Oct/Nov 1996	--	--	--	--	--	--	--	1.9 Acetone	NA	
		Aug/Sep 1996	--	--	--	--	--	--	--	--	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	7.4 Hexane	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
MW-5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--	4.2
		Apr/May 1998	--	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	6.5 Dichloromethane(b)	--

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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	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate	
<i>MW-6</i>	1st	Aug/Sep 1996	--	--	--	--	--	--	1.3(TB)	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA	
		Feb/Mar 1997	--	--	--	0.8	--	--	--	--	NA	
		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(b)	4.2	--	
<i>MW-7</i>	1st	Aug/Sep 1996	90	39	0.8	--	1.2	1.1	13(TB)	7.2 Freon 113	NA	
		Oct/Nov 1996	170	27	1.3	--	0.8	2.3	14	4.3(B) 1,1-Difluoroethane 2.8(B) Acetone 7.7 Freon 113	NA	
		Feb/Mar 1997	45	27	0.6	--	0.8	0.9	9.9	5.1 Freon 113	NA	
		Jun/Jul 1997	39	23	0.7	--	0.8	1.0	11	10 Unknown 4.1 Freon 113	285	
	2nd	Sep/Oct 1997	93	22	1.1	--	0.9	1.3	13	4.7 Freon 113	550	
		Jan/Feb 1998	150	24	3.7	--	0.8	2.1	13	6.4 Freon 113	720	
		Apr/May 1998	31	13	0.5	--	--	--	6.1	3.1 Freon 113	130	
		Jul/Aug 1998	43	19	0.8	--	0.6	0.9	9.0	1.0 Dichloromethane(b) 3.4 Freon 113	190	
	<i>MW-8</i>	1st	Aug/Sep 1996	4.0	4.6	--	--	--	--	1.3	--	NA
			Oct/Nov 1996	2.8	2.2	--	--	--	--	0.6	1.7 Acetone 0.6 Freon 113	NA
			Feb/Mar 1997	1.5	4.5	--	--	--	--	1.3	1.1 Freon 11 1.9 Carbon disulfide	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	6.4	
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(b)	--		
<i>MW-9</i>	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 3	1st	Aug/Sep 1996	0.9	--	--	--	--	--	1.3	2.9(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	1.4	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	1.1	--	NA
		Jun/Jul 1997	0.7	--	--	--	--	--	1.4	--	--
	2nd	Sep/Oct 1997	0.6	--	--	--	--	--	1.3	--	--
		Jan/Feb 1998	--	--	--	--	--	--	1.4	--	--
		Apr/May 1998	1.0	--	--	--	--	--	1.3	--	--
		Jul/Aug 1998	1.5	--	--	--	--	1.4	--	--	
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	0.5	2.4(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	1.5 2-Methyl-1-Propene	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	0.5	--	--
		Apr/May 1998	--	--	--	--	--	--	0.5	--	--
		Jul/Aug 1998	--	--	--	--	--	0.5	--	--	
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	2.4(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	1.1 Acetone	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	44 Carbon disulfide ⁽⁴⁾	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	
MW-12											
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	4.1	--	NA
		Oct/Nov 1996	Not Sampled*	--	--	--	--	--	--	--	--
		Feb/Mar 1997	--	--	--	--	--	--	5.8	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	0.5	--	--
	2nd	Sep/Oct 1997	Not Sampled*	--	--	--	--	--	--	--	--
		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	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 2	1st	Aug/Sep 1996	0.9	--	--	--	--	--	--	--	NA
		Oct/Nov 1996	1.5	0.6	--	--	--	--	--	0.5 Freon 113	NA
		Feb/Mar 1997	1.1	0.5	--	--	--	--	--	1.1(B) Acetone	NA
		Jun/Jul 1997	1.0	--	--	--	--	--	0.8	--	6.9
	2nd	Sep/Oct 1997	0.8	--	--	--	--	--	0.8	--	5.8
		Jan/Feb 1998	1.1	--	--	--	--	--	0.6	--	6.3
		Apr/May 1998	1.2	--	--	--	--	--	0.9	--	6.0
		Jul/Aug 1998	1.4	--	--	--	--	--	0.9	--	5.1
Screen 3	1st	Aug/Sep 1996	4.5	--	--	--	--	--	1.3	--	NA
		Oct/Nov 1996	3.8	--	--	--	--	--	1.3	1.6 Acetone	NA
		Feb/Mar 1997	6.4	--	--	--	--	--	1.4	1.3(B) Acetone	NA
		Jun/Jul 1997	20	--	--	--	--	--	1.6	--	5.7
	2nd	Sep/Oct 1997	14	--	--	--	--	--	1.7	--	6.2
		Jan/Feb 1998	23E	--	--	--	--	--	2.3	--	5.9
		Apr/May 1998	25	--	--	--	--	--	2.0	--	6.9
		Jul/Aug 1998	35	--	--	--	--	--	2.2	--	6.6
Screen 4	1st	Aug/Sep 1996	6.3	--	--	--	--	--	1.4	--	NA
		Oct/Nov 1996	5.1	--	--	--	--	--	1.4	2.5 Acetone	NA
		Feb/Mar 1997	4.9	--	--	--	--	--	1.3	--	NA
		Jun/Jul 1997	4.9	--	--	--	--	--	1.3	--	7.3
	2nd	Sep/Oct 1997	3.8	--	--	--	--	--	1.0	--	7.6
		Jan/Feb 1998	4.0	--	--	--	--	--	1.1	--	8.0
		Apr/May 1998	4.3	--	--	--	--	--	1.2	--	8.0
		Jul/Aug 1998	5.1	--	--	--	--	--	1.2	--	6.0
Screen 5	1st	Aug/Sep 1996	3.4	--	--	--	--	--	0.7	--	NA
		Oct/Nov 1996	1.3	--	--	--	--	--	--	1.5 Acetone	NA
		Feb/Mar 1997	1.7	--	--	--	--	--	0.5	--	NA
		Jun/Jul 1997	1.9	--	--	--	--	--	0.5	--	4.1
	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	--	--

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate	
<i>MW-13</i>	1st	Aug/Sep 1996	21	47	0.6	--	2.5	1.5	21(TB)	0.7 Freon 113	NA	
		Oct/Nov 1996	27	27	--	--	1.9	1.5	14	0.6 Freon 113	NA	
		Feb/Mar 1997	18	28	--	--	0.9	1.1	9.2	0.6 Freon 113	NA	
		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 (DUP 3)	2.9	1.8 Freon 11	99	
		Apr/May 1998	13	17	0.6	--	--	0.9	5.7	0.6 Freon 113	100	
		Jul/Aug 1998	15	29	0.6	--	--	1.2	7.7	1.0 Dichloromethane(b) 0.5 1,1,1-Trichloroethane 0.7 Freon 113	59	
		<hr/>										
		<i>MW-14</i>										
Screen 1	1st	Aug/Sep 1996	--	--	--	2.4	--	--	0.6	--	NA	
		Oct/Nov 1996	--	--	--	2.9	--	--	--	--	NA	
		Feb/Mar 1997	--	--	0.7	1.5	--	--	0.7	--	NA	
		Jun/Jul 1997	--	--	--	2.0	--	--	--	--	--	
	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	
Screen 2	1st	Aug/Sep 1996	--	2.8	1.6	1.4	--	--	1.5	--	NA	
		Oct/Nov 1996	--	1.5	1.6	1.0	--	--	0.9	0.6 1,2,3-Trichlorobenzene 1.1 Acetone	NA	
		Feb/Mar 1997	--	0.9	1.9	1.3	--	--	0.8	0.8 1,2,3-Trichlorobenzene 1.1 Acetone	NA	
		Jun/Jul 1997	--	1.1	1.7	1.5	--	--	0.9	0.5 1,2,3-Trichlorobenzene	--	
	2nd	Sep/Oct 1997	--	1.2	1.9	1.6	--	--	0.8	--	--	
		Jan/Feb 1998	--	--	1.2	0.7	--	--	--	8.9 Carbon disulfide(4)	9.0	
		Apr/May 1998	--	--	1.2	0.7	--	--	0.6	--	4.0	
		Jul/Aug 1998	--	0.9	1.8	0.8	--	--	0.6	--	4.9	
Screen 3	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	4.3	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	
		Jan/Feb 1998	--	--	--	--	--	--	--	--	5.6	
Apr/May 1998	--	--	--	--	--	--	--	--	5.8			

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	1st	Jul/Aug 1998	--	--	--	--	--	--	--	--	5.9
		Aug/Sep 1996	--	--	--	--	--	--	--	--	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	2.1(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	1.6(TB) Acetone	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	1.3 Carbon disulfide	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	NA
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	4.6 Carbon disulfide(4)	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
MW-15	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	2.6 Acetone	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
MW-16	1st	Aug/Sep 1996	125	33	1.3	--	2.4	2.2	40(TB)	2.0 Freon 113	NA
		Oct/Nov 1996	Not Sampled*								
		Feb/Mar 1997	91	23	1.3	--	1.7	2.6	29	1.6 Freon 113	NA
		Jun/Jul 1997	68	25	1.1	--	2.1	1.7	43	0.6 Freon 113	615
	2nd	Sep/Oct 1997	Not Sampled*								
		Jan/Feb 1998	30	3.5	1.0	--	--	1.3	14	--	1230
		Apr/May 1998	42	12	0.8	--	1.4	1.6	20	1.2 Freon 113	640
		Jul/Aug 1998	58	19	1.3	--	0.8	2.7	23	0.6 Dichloromethane(b) 1.0 1,1,1-Trichloroethane 1.2 Freon 113	420

TABLE 3-2
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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate	
<i>MW-17</i>												
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	--	4.3(B) Acetone	NA	
		Oct/Nov 1996	--	--	--	--	--	--	--	1.4 Acetone	NA	
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	2.9	--	--	--
		Apr/May 1998	--	--	--	--	--	--	3.2	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 2	1st	Aug/Sep 1996	--	--	--	--	--	--	3.8	4.5(B) Acetone	NA	
		Oct/Nov 1996	--	--	--	--	--	--	6.0	--	NA	
		Feb/Mar 1997	--	--	--	--	--	--	5.2	--	NA	
		Jun/Jul 1997	--	--	--	--	--	--	4.1	--	--	
	2nd	Sep/Oct 1997	--	--	--	--	--	--	6.1	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	5.4	--	--	--
		Apr/May 1998	--	--	--	--	--	--	3.2	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	2.4	--	--	--
Screen 3	1st	Aug/Sep 1996	2.0	7.9	--	--	--	--	7.5	--	NA	
		Oct/Nov 1996	3.3	18	0.8	--	--	--	8.7	--	NA	
		Feb/Mar 1997	5.1	23	1.1	--	--	--	6.2	--	NA	
		Jun/Jul 1997	1.3	5.9	--	--	--	--	8.2	--	12	
	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	--	--	
Screen 4	1st	Aug/Sep 1996	--	9.5	0.5	--	--	--	1.1	--	NA	
		Oct/Nov 1996	--	8.9	--	--	--	--	1.5	--	NA	
		Feb/Mar 1997	--	5.8	--	--	--	--	0.7	--	NA	
		Jun/Jul 1997	--	4.5	--	--	--	--	0.6	--	13	
	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	

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	1st	Aug/Sep 1996	--	13	0.6	--	--	--	1.7	3.4(B) Acetone	NA
		Oct/Nov 1996	--	16	0.7	--	--	--	1.7	--	NA
		Feb/Mar 1997	--	14	0.7	--	--	--	1.3	--	NA
		Jun/Jul 1997	--	11	0.7	--	--	--	1.3	--	12
	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
MW-18											
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	1.6	--	NA
		Oct/Nov 1996	Not Sampled*	--	--	--	--	--	3.0	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	0.8	--	--
		Jun/Jul 1997	--	--	--	--	--	--	0.8	--	--
	2nd	Sep/Oct 1997	Not Sampled*	--	--	--	--	--	--	--	--
		Jan/Feb 1998	Not Sampled*	--	--	--	--	--	0.7	--	--
		Apr/May 1998	--	--	--	--	--	--	--	3.4 Unknown Hydrocarbon (RT=7.14)	--
Jul/Aug 1998	--	--	--	--	--	--	--	--	--		
Screen 2	1st	Aug/Sep 1996	--	--	--	--	--	--	7.3	--	NA
		Oct/Nov 1996	--	--	--	--	--	--	8.2	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	1.9	--	NA
		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	--	--
Screen 3	1st	Aug/Sep 1996	0.7	4.7	2.8	--	--	--	5.1	--	NA
		Oct/Nov 1996	0.7	6.4	3.2	--	--	--	5.6	--	NA
		Feb/Mar 1997	0.8	6.6	2.9	--	--	--	5.1	--	NA
		Jun/Jul 1997	0.6	2.4	1.8	--	--	--	4.4	--	--
	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		

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	1st	Aug/Sep 1996	2.2	--	0.7	--	--	--	0.5	--	NA
		Oct/Nov 1996	2.2	--	0.7	--	--	--	0.5	1.4(TB) Acetone	NA
		Feb/Mar 1997	2.2	--	1.5	--	--	--	0.6	--	NA
		Jun/Jul 1997	1.9	--	0.7	--	--	--	--	--	11
	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
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	--	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	1.6 Acetone	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	1.1 Carbon disulfide	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	4.6 Hexane	--
MW-19											
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	0.9	3.7(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	0.6	2.9 Acetone	NA
		Feb/Mar 1997	--	--	--	--	--	--	0.8	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	2.5	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	1.4	--	--
		Jan/Feb 1998	--	--	--	--	--	--	0.8	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
Screen 2	1st	Aug/Sep 1996	--	--	0.8	--	--	--	--	3.0(B) Acetone	NA
		Oct/Nov 1996	--	--	1.1	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	0.6	--	--	--	--	--	--
	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	--	--	--	--	--	--

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 3	1st	Aug/Sep 1996	--	--	3.1	--	--	--	--	2.6(B) Acetone	NA
		Oct/Nov 1996	--	--	2.5	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	2.1	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	2.0	--	--	--	--	--	4.1
	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
Screen 4	1st	Aug/Sep 1996	0.5	1.5	--	--	--	--	2.1	--	NA
		Oct/Nov 1996	--	1.5	--	--	--	--	1.9	--	NA
		Feb/Mar 1997	--	1.1	0.6	--	--	--	1.5	--	NA
		Jun/Jul 1997	--	0.7	--	--	--	--	1.3	--	--
	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	--	--
Screen 5	1st	Aug/Sep 1996	--	--	3.0	--	--	--	0.6	1.6(B) Unknown scan #940	NA
		Oct/Nov 1996	--	--	2.4	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	1.7	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	1.5	--	--	--	--	--	--
	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	--	--	--	--	--	--
MW-20											
Screen 1	1st	Aug/Sep 1996	--	--	--	--	--	--	0.7	3.4(B) Acetone	NA
		Oct/Nov 1996	Not Sampled*	--	--	--	--	--	--	--	--
		Feb/Mar 1997	--	--	--	--	--	--	1.4	2.4(EB) Acetone	NA
		Jun/Jul 1997	--	--	--	--	--	--	0.8	--	5.7
	2nd	Sep/Oct 1997	Not Sampled*	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	1.4	--	6.3
		Apr/May 1998	--	--	--	--	--	--	2.5	--	5.5
		Jul/Aug 1998	--	--	--	--	--	--	1.8	--	5.9

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 2	1st	Aug/Sep 1996	--	--	--	--	--	--	7.7	4.0(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	4.4	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	3.2	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	3.3	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	5.7	--	--
		Jan/Feb 1998	--	--	--	--	--	--	2.7	--	--
		Apr/May 1998	--	--	--	--	--	--	2.7	--	--
		Jul/Aug 1998	--	--	--	--	--	--	4.2	0.5 Dichlorobromomethane	--
Screen 3	1st	Aug/Sep 1996	--	--	--	--	--	--	--	2.7(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	0.6	2.3 Acetone	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	3.4 Unknown (RT=6.2)	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
Screen 4	1st	Aug/Sep 1996	--	--	--	--	--	--	--	3.8(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	21
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
Screen 5	1st	Aug/Sep 1996	--	--	--	--	--	--	--	4.8(B) Acetone	NA
		Oct/Nov 1996	--	--	--	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	--	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	--	--	--	--	--	--	--
	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	21
		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	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate	
<i>MW-21</i>												
Screen 1	1st	Aug/Sep 1996	--	33	0.7	--	--	--	1.8	2.3(B) Acetone	NA	
		Oct/Nov 1996	Not Sampled*									
		Feb/Mar 1997	--	29	--	--	--	--	2.2	--	NA	
		Jun/Jul 1997	--	20	--	--	--	--	1.6	--	19	
	2nd	Sep/Oct 1997	Not Sampled*									
		Jan/Feb 1998	--	16	--	--	--	--	1.8	--	14	
		Apr/May 1998	--	16	--	--	--	--	1.8	--	14	
		Jul/Aug 1998	--	16	0.6	--	--	--	1.8	--	13	
		Aug/Sep 1996	--	--	0.9	--	--	--	0.5	--	NA	
		Oct/Nov 1996	--	0.6	2.3	--	--	--	0.6	1.4(TB) Acetone	NA	
Screen 2	1st	Feb/Mar 1997	--	--	1.1	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	0.7	--	--	--	--	--	--	
		Sep/Oct 1997	--	--	--	--	--	--	--	--	--	
		Jan/Feb 1998	--	--	1.1	--	--	--	--	--	--	
	2nd	Apr/May 1998	--	--	1.0	--	--	--	--	--	--	
		Jul/Aug 1998	--	--	0.7	--	--	--	0.7	--	--	
		1st	Aug/Sep 1996	--	0.7	1.5	--	--	--	0.5	--	NA
			Oct/Nov 1996	--	0.9	1.6	--	--	--	--	1.2 Acetone	NA
			Feb/Mar 1997	--	0.8	1.6	--	--	--	--	--	NA
			Jun/Jul 1997	--	--	1.2	--	--	--	--	--	--
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	--	--	--	--	--	--		
	Screen 3	1st	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	NA
			Oct/Nov 1996	--	--	2.5	--	--	--	--	1.6 Acetone	NA
Feb/Mar 1997			--	--	1.8	--	--	--	--	--	NA	
Jun/Jul 1997			--	--	2.8	--	--	--	--	--	4.6	
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	
Screen 4	1st	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	NA	
		Oct/Nov 1996	--	--	2.5	--	--	--	--	1.6 Acetone	NA	
		Feb/Mar 1997	--	--	1.8	--	--	--	--	--	NA	
		Jun/Jul 1997	--	--	2.8	--	--	--	--	--	4.6	
	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	

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Sampling Location	Program Year	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	1st	Aug/Sep 1996	--	--	4.5	--	--	--	0.6	--	NA
		Oct/Nov 1996	--	--	3.1	--	--	--	--	--	NA
		Feb/Mar 1997	--	--	3.0	--	--	--	--	--	NA
		Jun/Jul 1997	--	--	3.0	--	--	--	--	--	--
	Sep/Oct 1997	--	--	2.9	--	--	--	--	--	--	--
	2nd	Jan/Feb 1998	--	--	4.1	--	--	--	--	0.6 cis-1,2-Dichloroethene 5.0 Carbon disulfide ⁽⁴⁾	5.2
		Apr/May 1998	--	--	6.5	--	--	--	--	1.0 cis-1,2-Dichloroethene	5.8
Jul/Aug 1998		--	--	7.6	--	--	--	0.6	1.5 cis-1,2-Dichloroethene	--	
MW-22(1)											
Screen 1	2nd	Sep/Oct 1997	--	--	2.0	0.7	--	--	--	--	--
		Jan/Feb 1998	--	--	2.3	0.8	--	--	--	0.5 Freon 113	--
		Apr/May 1998	--	0.9	2.1	0.8	--	--	0.5	--	5.4
		Jul/Aug 1998	--	0.9	1.7	0.6	--	--	--	--	6.4
Screen 2	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	0.8 Dichloromethane	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	4.9
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	15
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
MW-23(1)											
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 ^(b)	19

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED
DURING THE FIRST TWO 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	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
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(b)	7.8
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	1.7 Dichloromethane(b)	--
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	2.3 Dichloromethane(b)	--
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	1.7 Dichloromethane(b) 3.0 Unknown (RT=3.93)	--
MW-24(1)											
Screen 1		Sep/Oct 1997	5.0	5.0	--	--	--	--	3.1	0.6 Freon 113	92
		Jan/Feb 1998	30E	15	0.5	--	0.8	--	15	0.6 Freon 113	330
		Apr/May 1998	6.7	5.4	--	--	--	--	3.3	--	74
		Jul/Aug 1998	--	1.7	--	--	--	--	0.9	--	20
Screen 2		Sep/Oct 1997	13	1.3	--	--	--	--	3.8	--	200
		Jan/Feb 1998	6.9	0.7	--	--	--	--	2.4	--	110
		Apr/May 1998	29	3.3	0.9	--	--	1.4	9.4	--	480
		Jul/Aug 1998	58	4.0	1.5	--	--	2.0	8.4	--	500
Screen 3		Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
Screen 4		Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED
DURING THE FIRST TWO 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	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5		Sep/Oct 1997	--	--	--	--	--	--	--	--	--
		Jan/Feb 1998	--	--	--	--	--	--	--	--	--
		Apr/May 1998	--	--	--	--	--	--	--	--	--
		Jul/Aug 1998	--	--	--	--	--	--	--	--	--
Practical Quantitation Limit			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5 Freon 113	4.0
California Maximum Contaminant Level			0.5	5.0	5.0	5.0	0.5	6.0	100	150 Freon 11(a) 6.0 cis-1,2-Dichloroethene(a) 1,1,1-Trichloroethane(a) 1,200 Freon 113	18(2)
EPA Region IX Maximum Contaminant Level			5.0	5.0	5.0	NE	5.0	7.0	100	5.0 Dichloromethane(a) 70 cis-1,2-Dichloroethene(a) 1,1,1-Trichloroethane(a)	NE

- : Not detected
- *: Not sampled, no water over screen
- a: Only VOCs for which MCLs have been established are listed
- b: Attributed to Laboratory Contamination
- TB: Compound detected in associated trip blank
- B: Compound detected in the laboratory method blank
- E: Estimated concentration; result exceeded calibration range
- NA: Not analyzed
- NE: Not established
- RT: Retention time
- 1: Wells installed June-August 1997
- 2: California Department of Health Services Interim Action Level
- 3: DUP – Results from duplicate analysis; original sample was non-detect.
- 4: Suspected by the laboratory to have resulted from carry over in analysis (see January/February 1998 report)

TABLE 3-3
SUMMARY OF METALS DETECTED DURING
THE FIRST TWO 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)
<i>MW-1</i>	1st	Aug/Sep 1996	--	--	--	--	0.8
		Oct/Nov 1996	--	--	--	--	0.5
		Feb/Mar 1997	--	--	--	--	2.5
		Jun/Jul 1997	--	--	--	--	1.9
	2nd	Sep/Oct 1997	--	--	--	--	0.7
		Jan/Feb 1998	--	--	--	--	1.6
		Apr/May 1998	--	--	--	--	0.5
		Jul/Aug 1998	--	0.009	0.055⁽¹⁾	--	1.0
<i>MW-3</i>							
Screen 1	1st	Aug/Sep 1996	--	--	--	--	7.2
		Oct/Nov 1996	--	--	--	--	3.1
		Feb/Mar 1997	--	--	--	--	6.1
		Jun/Jul 1997	--	--	--	--	2.6
	2nd	Sep/Oct 1997	--	--	--	--	2.1
		Jan/Feb 1998	--	--	--	--	2.9
		Apr/May 1998	--	--	--	--	4.8
		Jul/Aug 1998	--	--	--	--	4.5
Screen 2	1st	Aug/Sep 1996	--	--	--	--	1.7
		Oct/Nov 1996	--	--	--	--	2.7
		Feb/Mar 1997	--	--	--	--	3.8
		Jun/Jul 1997	--	--	--	--	1.1
	2nd	Sep/Oct 1997	--	--	--	--	2.1
		Jan/Feb 1998	--	--	--	--	2.3
		Apr/May 1998	--	--	--	--	4.3
		Jul/Aug 1998	--	0.004	--	--	3.3
Screen 3	1st	Aug/Sep 1996	--	--	--	--	5.2
		Oct/Nov 1996	--	--	--	--	2.7
		Feb/Mar 1997	--	--	--	--	1.7
		Jun/Jul 1997	--	--	--	--	3.4
	2nd	Sep/Oct 1997	--	--	--	--	5.0
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.7
		Jul/Aug 1998	--	--	--	--	4.6
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

TABLE 3-3

**SUMMARY OF METALS DETECTED DURING
THE FIRST TWO 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 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
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
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
	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
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
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

TABLE 3-3

**SUMMARY OF METALS DETECTED DURING
THE FIRST TWO 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 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
<i>MW-5</i>	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
<i>MW-6</i>	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
<i>MW-7</i>	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
<i>MW-8</i>	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 3-3
SUMMARY OF METALS DETECTED DURING
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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)
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
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
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
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
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

TABLE 3-3
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JET PROPULSION LABORATORY

(concentrations in mg/L)

Values equal to or above California MCLs are in bold and outlined
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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
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
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
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
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
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

TABLE 3-3

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JET PROPULSION LABORATORY**

(concentrations in mg/L)

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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
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
<i>MW-13</i>	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
<i>MW-14</i>	Screen 1	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
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

TABLE 3-3
SUMMARY OF METALS DETECTED DURING
THE FIRST TWO YEARS OF LONG-TERM
QUARTERLY GROUNDWATER MONITORING,
JET PROPULSION LABORATORY

(concentrations in mg/L)

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
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
Screen 4	1st	Jul/Aug 1998	--	--	--	--	3.1
		Aug/Sep 1996	--	--	--	--	3.1
		Oct/Nov 1996	--	--	--	--	2.5
		Feb/Mar 1997	--	--	--	--	4.1
	2nd	Jun/Jul 1997	--	--	--	--	2.3
		Sep/Oct 1997	--	--	--	--	1.7
		Jan/Feb 1998	--	0.002	--	--	2.7
Screen 5	1st	Apr/May 1998	--	--	--	--	1.3
		Jul/Aug 1998	--	--	--	--	1.0
		Aug/Sep 1996	--	--	--	--	1.5
		Oct/Nov 1996	--	--	--	--	4.1
	2nd	Feb/Mar 1997	--	0.028	--	--	2.3
		Jun/Jul 1997	--	--	--	--	1.9
		Sep/Oct 1997	--	--	--	--	3.8
MW-15	1st	Jan/Feb 1998	--	--	--	--	4.7
		Apr/May 1998	--	--	--	--	1.9
		Jul/Aug 1998	--	--	--	--	2.4
		Aug/Sep 1996	--	--	--	--	1.3
	2nd	Oct/Nov 1996	--	--	NA	--	0.5
		Feb/Mar 1997	--	--	--	--	2.6
		Jun/Jul 1997	--	--	--	--	0.2
MW-16	1st	Sep/Oct 1997	--	--	--	--	0.9
		Jan/Feb 1998	--	--	--	--	1.4
		Apr/May 1998	--	--	--	--	0.4
		Jul/Aug 1998	--	--	--	--	3.0
	2nd	Aug/Sep 1996	--	--	0.018	--	3.4
		Oct/Nov 1996	Not Sampled*	--	--	--	0.2
		Feb/Mar 1997	--	--	--	0.007	0.1
2nd	Jun/Jul 1997	--	--	--	--	0.1	
	Sep/Oct 1997	Not Sampled*	--	--	--	1.1	
	Jan/Feb 1998	--	--	--	--	1.4	
2nd	Apr/May 1998	--	--	0.014	--	1.4	
	Jul/Aug 1998	--	--	--	--	1.9	

TABLE 3-3
SUMMARY OF METALS DETECTED DURING
THE FIRST TWO YEARS OF LONG-TERM
QUARTERLY GROUNDWATER MONITORING,
JET PROPULSION LABORATORY

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)		
<i>MW-17</i>									
Screen 1	1st	Aug/Sep 1996	--	--	NA	NA	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		
		<hr/>							
		Screen 2	1st	Aug/Sep 1996	--	--	NA	NA	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		
	<hr/>								
	Screen 3		1st	Aug/Sep 1996	--	0.002	NA	NA	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		
		<hr/>							
		Screen 4	1st	Aug/Sep 1996	--	--	NA	NA	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		
	<hr/>								
	Screen 5		1st	Aug/Sep 1996	--	--	NA	NA	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 3-3
SUMMARY OF METALS DETECTED DURING
THE FIRST TWO YEARS OF LONG-TERM
QUARTERLY GROUNDWATER MONITORING,
JET PROPULSION LABORATORY

(concentrations in mg/L)

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-18							
Screen 1	1st	Aug/Sep 1996	--	--	NA	NA	0.9
		Oct/Nov 1996	Not Sampled*				
		Feb/Mar 1997	--	--	--	--	1.9
		Jun/Jul 1997	--	--	--	--	0.4
	2nd	Sep/Oct 1997	Not Sampled*				
		Jan/Feb 1998	Not Sampled*				
		Apr/May 1998	--	--	--	--	0.1
		Jul/Aug 1998	--	--	--	--	3.8
Screen 2	1st	Aug/Sep 1996	--	--	NA	NA	3.5
		Oct/Nov 1996	--	0.003	--	--	3.4
		Feb/Mar 1997	--	--	--	--	2.8
		Jun/Jul 1997	--	--	--	--	1.5
	2nd	Sep/Oct 1997	--	--	--	--	1.4
		Jan/Feb 1998	--	--	--	--	3.6
		Apr/May 1998	--	--	--	--	0.1
		Jul/Aug 1998	--	--	--	--	3.1
Screen 3	1st	Aug/Sep 1996	--	--	NA	NA	4.2
		Oct/Nov 1996	--	0.002	NA	--	4.0
		Feb/Mar 1997	--	--	0.015	0.007	3.3
		Jun/Jul 1997	--	--	--	--	3.9
	2nd	Sep/Oct 1997	--	--	--	--	2.1
		Jan/Feb 1998	--	--	--	--	0.6
		Apr/May 1998	--	--	0.012	0.007	0.04
		Jul/Aug 1998	--	--	0.014	--	2.3
Screen 4	1st	Aug/Sep 1996	--	--	NA	NA	2.0
		Oct/Nov 1996	--	0.003	--	--	1.9
		Feb/Mar 1997	--	--	--	--	2.8
		Jun/Jul 1997	0.005	--	--	--	3.6
	2nd	Sep/Oct 1997	--	--	--	--	1.1
		Jan/Feb 1998	--	--	--	--	2.2
		Apr/May 1998	--	--	--	--	0.04
		Jul/Aug 1998	--	--	--	--	2.5
Screen 5	1st	Aug/Sep 1996	--	--	NA	NA	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

TABLE 3-3
SUMMARY OF METALS DETECTED DURING
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JET PROPULSION LABORATORY

(concentrations in mg/L)

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)		
MW-19									
Screen 1	1st	Aug/Sep 1996	--	--	NA	NA	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		
		<hr/>							
		Screen 2	1st	Aug/Sep 1996	--	--	NA	NA	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		
	<hr/>								
	Screen 3		1st	Aug/Sep 1996	--	--	NA	NA	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		
		<hr/>							
		Screen 4	1st	Aug/Sep 1996	--	--	NA	NA	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		
	<hr/>								
	Screen 5		1st	Aug/Sep 1996	--	--	NA	NA	4.9
Oct/Nov 1996		--		--	NA	--	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		

TABLE 3-3
SUMMARY OF METALS DETECTED DURING
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JET PROPULSION LABORATORY

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)		
<i>MW-20</i>									
Screen 1	1st	Aug/Sep 1996	--	--	--	NA	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		
		<hr/>							
		Aug/Sep 1996	--	--	NA	NA	3.9		
Screen 2	1st	Oct/Nov 1996	--	--	--	--	1.1		
		Feb/Mar 1997	--	--	--	--	2.1		
		Jun/Jul 1997	--	--	--	--	2.5		
		Sep/Oct 1997	--	--	--	--	3.6		
	2nd	Jan/Feb 1998	--	--	--	--	0.4		
		Apr/May 1998	--	--	--	--	1.4		
		Jul/Aug 1998	--	--	--	--	1.3		
		<hr/>							
		Screen 3	1st	Aug/Sep 1996	--	--	NA	NA	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		
	<hr/>								
	Screen 4		1st	Aug/Sep 1996	--	--	NA	NA	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		
		<hr/>							
		Screen 5	1st	Aug/Sep 1996	--	--	NA	NA	1.8
Oct/Nov 1996	--			--	NA	--	1.3		
Feb/Mar 1997	--			0.004	--	--	1.6		
Jun/Jul 1997	0.006			--	--	--	1.9		
2nd	Sep/Oct 1997		--	--	--	--	3.5		
	Jan/Feb 1998		--	--	--	--	0.1		
	Apr/May 1998		--	--	--	--	1.1		
	Jul/Aug 1998		--	--	--	--	3.3		

TABLE 3-3
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JET PROPULSION LABORATORY

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)		
<i>MW-21</i>									
Screen 1	1st	Aug/Sep 1996	--	--	NA	NA	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		
		<hr/>							
		Aug/Sep 1996	--	--	NA	NA	2.1		
Screen 2	1st	Oct/Nov 1996	--	--	--	--	1.2		
		Feb/Mar 1997	--	--	--	--	3.9		
		Jun/Jul 1997	--	--	--	--	1.7		
		Sep/Oct 1997	--	--	--	--	0.8		
	2nd	Jan/Feb 1998	--	--	--	--	0.6		
		Apr/May 1998	--	--	--	--	1.8		
		Jul/Aug 1998	--	--	--	--	3.9		
		<hr/>							
Screen 3	1st	Aug/Sep 1996	--	--	NA	NA	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		
		<hr/>							
		Aug/Sep 1996	--	--	NA	NA	2.5		
Screen 4	1st	Oct/Nov 1996	--	--	--	--	3.3		
		Feb/Mar 1997	--	0.004	--	--	4.4		
		Jun/Jul 1997	--	--	--	--	2.5		
		Sep/Oct 1997	--	--	--	--	4.5		
	2nd	Jan/Feb 1998	--	--	--	--	1.1		
		Apr/May 1998	--	--	--	--	4.6		
		Jul/Aug 1998	--	--	--	--	2.4		
		<hr/>							
		Screen 5	1st	Aug/Sep 1996	--	--	NA	NA	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		

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
<i>MW-22⁽²⁾</i>							
Screen 1	2nd	Sep/Oct 1997	--	--	--	--	34
		Jan/Feb 1998	--	--	--	--	4.5
		Apr/May 1998	--	--	--	--	4.6
		Jul/Aug 1998	--	--	--	--	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
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	3.0
		Jan/Feb 1998	--	--	--	--	3.8
		Apr/May 1998	--	--	--	--	2.9
		Jul/Aug 1998	--	--	--	--	4.9
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	2.8
		Jan/Feb 1998	--	--	--	--	3.7
		Apr/May 1998	--	--	--	--	3.0
		Jul/Aug 1998	--	--	--	--	4.0
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	4.4
		Jan/Feb 1998	--	--	--	--	2.8
		Apr/May 1998	--	--	--	--	2.9
		Jul/Aug 1998	--	--	--	--	2.3
<i>MW-23⁽²⁾</i>							
Screen 1	2nd	Sep/Oct 1997	--	--	--	--	3.4
		Jan/Feb 1998	--	--	--	--	4.1
		Apr/May 1998	--	--	--	--	4.5
		Jul/Aug 1998	--	--	--	--	4.0
Screen 2	2nd	Sep/Oct 1997	--	--	--	--	4.9
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.7
		Jul/Aug 1998	--	--	--	--	3.4
Screen 3	2nd	Sep/Oct 1997	--	--	--	--	3.0
		Jan/Feb 1998	--	--	--	--	4.6
		Apr/May 1998	--	--	--	--	4.6
		Jul/Aug 1998	--	--	--	--	4.7
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	4.9
		Jan/Feb 1998	--	--	--	--	4.5
		Apr/May 1998	--	--	--	--	4.9
		Jul/Aug 1998	--	--	--	--	4.6
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	1.8
		Jan/Feb 1998	--	--	--	--	1.8
		Apr/May 1998	--	--	--	--	2.4
		Jul/Aug 1998	--	--	--	--	1.7

TABLE 3-3

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

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Sample Location	Program Year	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
<i>MW-24⁽²⁾</i>							
Screen 1	2nd	Sep/Oct 1997	--	--	--	--	1.6
		Jan/Feb 1998	--	--	--	--	3.8
		Apr/May 1998	--	--	--	--	2.7
		Jul/Aug 1998	--	--	--	--	4.9
Screen 2	2nd	Sep/Oct 1997	--	--	--	--	4.4
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.5
		Jul/Aug 1998	--	--	--	--	4.8
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
Screen 4	2nd	Sep/Oct 1997	--	--	--	--	4.0
		Jan/Feb 1998	--	--	--	--	4.9
		Apr/May 1998	--	--	--	--	4.3
		Jul/Aug 1998	--	--	--	--	4.8
Screen 5	2nd	Sep/Oct 1997	--	--	--	--	4.8
		Jan/Feb 1998	--	--	--	--	4.8
		Apr/May 1998	--	--	--	--	4.0
		Jul/Aug 1998	--	--	--	--	4.0
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	(a)	0.10	NE	

NA: Not analyzed.

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 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 SECOND YEAR OF LONG-TERM
QUARTERLY GROUNDWATER MONITORING,
JET PROPULSION LABORATORY

Well/Screen Number	Water Type ¹			
	Sep/Oct 1997	Jan/Feb 1998	Apr/May 1998	Jul/Aug 1998
MW-1	Type 1	Type 1	Type 1	Type 1
MW-3				
Screen 1	Type 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1	Type 1
Screen 3	Type 2	Type 2	Type 2	Type 2
Screen 4	Type 2	Type 2	Type 2	Type 2
Screen 5	Type 2	Type 2	Type 2	Type 2
MW-4				
Screen 1	Type 1	Type 1	Type 1	Type 1
Screen 2	Type 3	Type 3	Type 1/3	Type 3/1
Screen 3	Type 1/2	Type 1/2	Type 1/2/3	Type 1/2/3
Screen 4	Type 1/2	Type 2	Type 2/1	Type 2/1
Screen 5	Type 1/2	Type 2	Type 1/2	Type 1/2
MW-5	Type 1	Type 1	Type 1	Type 1
MW-6	Type 1	Type 3	Type 1/3	Type 3/1
MW-7	Type 1	Type 1	Type 1	Type 1
MW-8	Type 1	Type 1	Type 1	Type 1
MW-9	Type 1	Type 1	Type 1	Type 1
MW-10	Type 3	Type 3	Type 1	Type 1
MW-11				
Screen 1	Type 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1	Type 1
Screen 4	Type 1	Type 1	Type 1	Type 1
Screen 5	Type 2	Type 2	Type 2	Type 2
MW-12				
Screen 1	Not Sampled ²	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1	Type 1
Screen 4	Type 1	Type 1	Type 1	Type 1
Screen 5	Type 1/2	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

- 2: No water over screen

TABLE 4-1
GENERAL WATER TYPES OBSERVED DURING
THE SECOND YEAR OF LONG-TERM
QUARTERLY GROUNDWATER MONITORING,
JET PROPULSION LABORATORY

Well/Screen Number	Water Type ¹			
	Sep/Oct 1997	Jan/Feb 1998	Apr/May 1998	Jul/Aug 1998
MW-13	Type 1	Type 1/3	Type 1/3	Type 1/3
MW-14				
Screen 1	Type 3	Type 3	Type 3	Type 3
Screen 2	Type 3	Type 3	Type 3	Type 3
Screen 3	Type 3	Type 3	Type 3/1	Type 1/3
Screen 4	Type 1	Type 2/3	Type 1/3	Type 1/3
Screen 5	Type 2	Type 2	Type 2	Type 2
MW-15	Type 1	Type 1	Type 1	Type 1
MW-16	Not Sampled ²	Type 1	Type 1/3	Type 1/3
MW-17				
Screen 1	Type 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1	Type 1
Screen 4	Type 1/2	Type 1	Type 1/2	Type 1/2
Screen 5	Type 1/2	Type 1	Type 1/2	Type 1/2
MW-18				
Screen 1	Not Sampled ²	Not Sampled ²	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 1	Type 1
Screen 3	Type 1	Type 1	Type 1	Type 1
Screen 4	Type 1/2	Type 1	Type 1/2	Type 1/2
Screen 5	Type 2	Type 2	Type 2	Type 2
MW-19				
Screen 1	Type 1	Type 1	Type 1	Type 1
Screen 2	Type 1	Type 1	Type 3/1	Type 3/1
Screen 3	Type 3	Type 1	Type 3/1	Type 3/1
Screen 4	Type 3	Type 1	Type 1/3	Type 1/3
Screen 5	Type 3	Type 1	Type 1/3	Type 1/3
MW-20				
Screen 1	Not Sampled ²	Type 3	Type 3	Type 3
Screen 2	Type 2	Type 1	Type 3/1	Type 1
Screen 3	Type 2	Type 2	Type 2	Type 2
Screen 4	Type 2	Type 2	Type 2	Type 2
Screen 5	Type 2	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

2: No water over screen

TABLE 4-1
GENERAL WATER TYPES OBSERVED DURING
THE SECOND YEAR OF LONG-TERM
QUARTERLY GROUNDWATER MONITORING,
JET PROPULSION LABORATORY

Well/Screen Number	Water Type ¹			
	Sep/Oct 1997	Jan/Feb 1998	Apr/May 1998	Jul/Aug 1998
MW-21				
Screen 1	Not Sampled ²	Type 3	Type 1/3	Type 1/3
Screen 2	Type 3	Type 3	Type 1/3	Type 1/3
Screen 3	Type 3	Type 3	Type 1/3	Type 1/3
Screen 4	Type 3	Type 1	Type 1/3	Type 1/3
Screen 5	Type 3	Type 1	Type 1/3	Type 1/3
MW-22				
Screen 1	Type 3	Type 3	Type 3	Type 3
Screen 2	Type 3	Type 1/3	Type 1/3	Type 1/3
Screen 3	Type 1/2	Type 1	Type 1/2/3	Type 1/2/3
Screen 4	Type 1/2	Type 1/2	Type 1/2/3	Type 1/2/3
Screen 5	Type 2	Type 2	Type 2	Type 2
MW-23				
Screen 1	Type 3	Type 3	Type 3	Type 1/3
Screen 2	Type 3	Type 3	Type 3	Type 3
Screen 3	Type 1/2	Type 1	Type 1/2/3	Type 1/2/3
Screen 4	Type 1/2	Type 1/2	Type 1/2	Type 1/2
Screen 5	Type 2	Type 2	Type 2	Type 2
MW-24				
Screen 1	Type 1	Type 1/2	Type 1	Type 1
Screen 2	Type 1/2	Type 2	Type 2/3	Type 2/3
Screen 3	Type 1/2	Type 2	Type 2/3	Type 2/3
Screen 4	Type 1/2	Type 2	Type 2	Type 2/3
Screen 5	Type 1/2	Type 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

2: No water over screen

TABLE 5-1

**MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS,
SEPTEMBER 1997 TO AUGUST 1998**
(feet above mean sea level)

Well #	Sep-97	Oct-97	Nov-97	Dec-97	Jan-98	Feb-98	Mar-98	Apr-98	May-98	Jun-98	Jul-98	Aug-98
MW-1	1081.00	1085.91	1089.74	1088.71	1090.72	1093.06	1094.30	1094.06	1094.72	1094.27	1094.00	1093.01
MW-3												
Screen 1	950.69	944.14	946.36	949.95	957.74	976.90	996.19	1007.19	1010.47	1012.65	1010.59	1006.29
Screen 2	942.47	938.00	943.14	946.69	946.31	968.61	984.78	994.08	996.93	999.43	997.27	990.15
Screen 3	938.67	935.12	942.38	945.95	942.93	968.72	981.66	989.29	991.35	993.50	991.09	984.33
Screen 4	867.27	863.31	898.71	902.30	869.89	963.46	935.15	922.14	916.88	914.94	909.94	900.69
Screen 5	839.60	834.60	893.02	896.52	841.26	960.46	906.90	895.59	886.75	883.47	879.27	871.63
MW-4												
Screen 1	953.79	950.18	951.02	959.32	961.88	979.94	1007.23	1020.00	1023.41	1023.67	1020.68	1010.53
Screen 2	946.04	942.93	948.03	952.64	949.94	971.42	985.59	998.37	1000.88	1001.77	999.39	991.58
Screen 3	943.53	941.02	947.30	951.75	947.42	971.34	981.42	993.69	995.33	996.39	994.19	986.78
Screen 4	935.15	932.82	942.32	946.39	938.91	970.54	974.37	985.19	985.90	986.48	983.90	976.63
Screen 5	862.53	858.91	894.75	898.05	864.35	964.10	919.18	918.03	912.63	909.82	905.26	895.40
MW-5	955.62	950.49	952.23	957.54	959.85	976.28	1008.81	1022.76	1025.01	1025.01	1021.54	1010.74
MW-6	968.74	969.87	974.57	976.61	975.82	981.03	997.16	1011.33	1013.71	1013.03	1010.98	1006.05
MW-7	957.14	951.44	952.67	957.22	960.13	969.62	994.10	1011.99	1018.00	1018.76	1017.19	1009.80
MW-8	958.28	952.34	953.47	959.27	962.14	973.42	998.21	1015.04	1020.46	1021.09	1019.17	1011.35
MW-9	1078.13	1082.12	1086.76	1084.30	1086.83	1087.72	1087.36	1086.90	1087.52	1087.00	1086.55	1085.45
MW-10	957.58	954.01	956.63	959.80	961.27	972.33	1000.65	1016.76	1019.12	1019.04	1016.41	1007.62
MW-11												
Screen 1	1012.67	1010.17	1011.45	1014.72	1015.89	1018.04	1024.46	1032.05	1036.62	1037.79	1037.18	1032.81
Screen 2	960.66	957.38	961.02	965.34	965.03	979.89	995.13	1007.59	1011.40	1012.12	1010.37	1003.59
Screen 3	944.87	943.39	950.91	954.12	949.82	974.44	981.83	993.59	994.15	994.01	991.56	985.11
Screen 4	939.90	938.56	950.20	951.32	945.94	976.74	979.13	986.53	983.72	982.39	980.05	974.43
Screen 5	879.32	876.09	905.84	909.03	882.46	961.86	935.72	933.54	928.86	926.89	922.64	913.77

1: ND: No data due to datalogger malfunction
2: No water over screen interval

TABLE 5-1

**MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS,
SEPTEMBER 1997 TO AUGUST 1998**
(feet above mean sea level)

Well #	Sep-97	Oct-97	Nov-97	Dec-97	Jan-98	Feb-98	Mar-98	Apr-98	May-98	Jun-98	Jul-98	Aug-98
MW-12												
Screen 1	N/W	N/W	N/W	968.38	971.73	987.93	1010.52	1022.34	1025.96	1026.27	1023.31	1015.43
Screen 2	948.81	945.00	949.05	954.65	952.69	972.18	987.78	1000.49	1003.81	1005.36	1002.88	996.61
Screen 3	945.73	942.50	947.86	952.97	949.55	971.66	984.00	995.99	998.76	1000.34	997.59	991.64
Screen 4	933.36	930.81	941.46	945.83	937.18	971.32	972.93	983.15	983.45	984.26	980.92	975.26
Screen 5	875.78	872.54	904.66	908.15	878.33	965.48	929.46	930.76	925.62	923.42	918.01	910.36
MW-13	959.52	955.52	957.81	961.10	963.08	971.72	994.49	1011.79	1016.81	1017.19	1015.56	1008.50
MW-14												
Screen 1	971.19	973.11	977.68	979.42	978.77	983.94	998.98	1012.80	1013.85	1013.44	1011.11	1007.52
Screen 2	970.30	972.91	977.48	979.20	978.27	984.78	999.86	1013.64	1013.89	1013.24	1009.98	1006.37
Screen 3	970.12	973.41	978.08	979.65	978.52	985.74	1000.23	1014.13	1013.62	1012.59	1008.93	1005.36
Screen 4	970.03	973.46	978.14	979.74	978.51	985.86	1000.02	1014.09	1013.48	1012.42	1008.58	1005.15
Screen 5	968.94	973.07	978.25	979.64	977.91	986.10	999.93	1013.57	1012.16	1011.14	1007.15	1003.76
MW-15	1079.98	1084.43	1088.64	1087.95	1090.16	1091.73	1092.01	1091.75	1092.57	1091.78	1091.43	1090.52
MW-16	958.99	955.95	956.52	959.92	962.22	970.62	992.64	1010.99	1016.51	1017.05	1015.50	1008.64
MW-17												
Screen 1	949.54	N/W	N/W	N/W	943.16	955.12	986.63	1008.00	1014.97	1016.47	1015.37	1015.50
Screen 2	935.34	929.51	934.18	942.93	936.80	957.34	973.79	983.26	987.98	994.13	990.87	985.75
Screen 3	922.61	917.05	923.14	937.06	923.73	946.49	961.65	963.16	968.67	979.64	974.17	970.74
Screen 4	876.29	872.40	900.21	905.30	880.04	958.07	929.80	928.55	926.13	926.42	919.91	911.00
Screen 5	866.99	863.04	894.69	898.25	871.15	954.78	921.36	920.78	915.93	914.84	908.86	900.52
MW-18												
Screen 1	N/W	N/W	N/W	N/W	N/W	N/W	962.06	981.98	991.43	995.20	996.75	993.20
Screen 2	945.29	938.68	938.06	941.73	942.23	943.53	964.86	981.83	990.35	994.27	994.74	991.02
Screen 3	937.68	933.04	936.43	943.28	938.95	957.78	970.21	981.74	987.77	991.83	989.16	984.37
Screen 4	911.62	908.53	921.03	927.06	914.29	953.92	950.08	955.65	959.18	960.79	955.92	948.84
Screen 5	897.34	897.52	913.89	914.65	904.96	949.40	942.77	945.57	941.70	941.75	937.55	928.68

1: ND: No data due to datalogger malfunction
2: No water over screen interval

TABLE 5-1

**MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS,
SEPTEMBER 1997 TO AUGUST 1998**
(feet above mean sea level)

Well #	Sep-97	Oct-97	Nov-97	Dec-97	Jan-98	Feb-98	Mar-98	Apr-98	May-98	Jun-98	Jul-98	Aug-98
MW-19												
Screen 1	944.33	939.54	940.82	944.33	943.95	961.18	984.40	1000.12	1002.36	1004.27	1001.22	992.00
Screen 2	933.95	930.33	934.20	938.67	935.61	960.44	967.56	973.75	975.46	978.40	976.94	970.79
Screen 3	929.16	925.76	931.10	935.62	931.04	961.47	964.71	969.22	969.89	971.84	969.66	963.09
Screen 4	831.35	826.94	853.96	858.22	833.55	960.70	911.03	890.93	882.73	878.22	870.69	859.12
Screen 5	828.30	823.85	850.71	854.86	830.66	960.68	910.66	888.35	879.85	875.16	867.35	855.62
MW-20												
Screen 1	N/W	N/W	N/W	936.26	937.16	940.32	937.26	960.11	966.01	971.74	971.31	967.36
Screen 2	932.30	931.09	933.86	936.89	936.95	942.85	950.60	962.93	968.64	974.40	972.38	968.12
Screen 3	907.50	922.72	928.80	932.06	928.38	945.99	949.05	956.98	957.58	965.53	949.58	945.99
Screen 4	898.24	907.28	917.88	915.19	917.18	941.61	947.75	950.59	941.04	944.97	937.75	929.56
Screen 5	936.30	933.86	935.66	936.94	937.36	946.23	957.28	969.59	972.29	974.70	974.38	969.95
MW-21												
Screen 1	N/W	N/W	N/W	N/W	N/W	975.66	996.97	1016.42	1014.95	1014.34	1011.69	1006.15
Screen 2	965.06	964.73	968.03	970.11	970.07	978.73	1000.15	1015.72	1014.54	1013.67	1010.78	1005.60
Screen 3	964.74	964.71	968.03	970.05	969.80	979.27	999.35	1014.17	1012.74	1012.26	1009.24	1004.31
Screen 4	963.46	963.69	967.11	969.00	968.63	978.45	995.55	1012.57	1010.89	1010.41	1007.40	1002.72
Screen 5	963.44	963.58	966.96	968.96	969.54	978.35	997.61	1012.46	1010.80	1010.35	1007.26	1002.41
MW-22												
Screen 1	962.31	960.12	963.02	967.45	966.85	974.64	994.15	1010.42	1014.54	1014.79	1012.85	1006.62
Screen 2	960.64	960.61	965.20	969.64	966.61	979.62	994.30	1008.09	1009.55	1009.51	1006.43	1000.47
Screen 3	960.83	961.12	965.68	970.01	967.05	979.96	994.42	1008.28	1009.29	1009.18	1006.01	1000.41
Screen 4	943.68	943.39	953.57	957.99	949.31	977.33	981.51	992.52	992.13	991.34	987.73	981.55
Screen 5	932.39	931.39	944.44	948.88	937.32	974.44	972.86	982.53	981.37	980.50	976.75	970.31

1: ND: No data due to datalogger malfunction

2: No water over screen interval

TABLE 5-1

**MONTHLY WATER-LEVEL ELEVATIONS FOR JPL GROUNDWATER MONITORING WELLS,
SEPTEMBER 1997 TO AUGUST 1998**
(feet above mean sea level)

Well #	Sep-97	Oct-97	Nov-97	Dec-97	Jan-98	Feb-98	Mar-98	Apr-98	May-98	Jun-98	Jul-98	Aug-98
MW-23												
Screen 1	960.08	956.94	959.70	963.04	963.87	973.48	996.03	1012.77	1016.24	1016.52	1014.27	1006.85
Screen 2	955.60	954.17	958.84	962.69	960.48	975.89	991.01	1005.17	1006.57	1006.97	1004.39	997.54
Screen 3	955.26	954.22	959.14	962.77	960.31	976.37	990.24	1004.07	1005.01	1005.47	1002.71	996.13
Screen 4	934.27	932.95	945.24	948.26	938.77	973.71	973.86	984.03	982.93	982.51	979.08	972.26
Screen 5	932.05	932.57	944.68	947.34	938.50	972.95	973.38	984.06	982.56	981.73	978.46	971.93
MW-24												
Screen 1	959.18	953.62	955.24	956.18	962.36	968.45	995.97	1012.70	1018.00	1018.56	1016.70	1009.19
Screen 2	953.58	950.77	955.34	956.22	958.28	974.08	991.60	1004.24	1006.74	1007.12	1004.68	997.48
Screen 3	951.12	949.36	955.21	956.09	956.22	974.73	989.37	1000.58	1001.95	1002.27	999.59	992.69
Screen 4	927.94	926.25	940.68	941.60	932.76	972.59	971.00	978.67	977.25	976.42	972.84	965.95
Screen 5	906.27	903.83	925.77	926.74	910.26	969.47	956.83	958.53	955.65	954.09	950.05	942.33

1: ND: No data due to datalogger malfunction

2: No water over screen interval

TABLE 6-1
WELL/SCREEN CLASSIFICATIONS FOR JPL GROUNDWATER MONITORING WELLS

Well and Screen Number	CONSTITUENTS OF CONCERN											
	VOCs				Perchlorate				Total and Hexavalent Chromium			
	COC Detect Last 2 Years	Plume	Down- gradient	Up- gradient	COC Detect Last 2 Years	Plume	Down- gradient	Up- gradient	COC Detect Last 2 Years	Plume	Down- gradient	Up- gradient
MW-1	No			X	No			X	Yes ⁽¹⁾			X
MW-3												
Screen 1	No			X	No			X	No			X
Screen 2	No		X		No		X		No		X	
Screen 3	Yes	X			Yes	X			No		X	
Screen 4	No		X		No		X		No		X	
Screen 5	No			X	No			X	No			X
MW-4												
Screen 1	No		X		Yes	X			No		X	
Screen 2	Yes	X			Yes	X			Yes	X		
Screen 3	No		X		No		X		No		X	
Screen 4	No			X	No			X	Yes	X		
Screen 5	No			X	No			X	No		X	
MW-5	No		X		Yes	X			No		X	
MW-6	Yes	X			Yes	X			Yes	X		
MW-7	Yes	X			Yes	X			Yes	X		
MW-8	Yes	X			Yes	X			Yes	X		
MW-9	No			X	No			X	No			X
MW-10	Yes	X			Yes	X			Yes	X		
MW-11												
Screen 1	Yes	X			No		X		No		X	
Screen 2	Yes	X			No		X		No		X	
Screen 3	Yes	X			No		X		No		X	
Screen 4	No		X		No			X	No			X
Screen 5	No			X	No			X	No			X

1: Probable lab error. For purposes of future monitoring, MW-1 will continue to be classified as a well upgradient of JPL.

**TABLE 6-1
WELL/SCREEN CLASSIFICATIONS FOR JPL GROUNDWATER MONITORING WELLS**

Well and Screen Number	CONSTITUENTS OF CONCERN											
	VOCs				Perchlorate				Total and Hexavalent Chromium			
	COC Detect Last 2 Years	Plume	Down-gradient	Up-gradient	COC Detect Last 2 Years	Plume	Down-gradient	Up-gradient	COC Detect Last 2 Years	Plume	Down-gradient	Up-gradient
MW-12												
Screen 1	No		X		No		X		Yes	X		
Screen 2	Yes	X			Yes	X			No		X	
Screen 3	Yes	X			Yes	X			No		X	
Screen 4	Yes	X			Yes	X			No			X
Screen 5	Yes	X			Yes	X			No			X
MW-13	Yes	X			Yes	X			Yes	X		
MW-14												
Screen 1	Yes	X			Yes	X			Yes	X		
Screen 2	Yes	X			Yes	X			No		X	
Screen 3	No		X		Yes	X			Yes	X		
Screen 4	No			X	No		X		No		X	
Screen 5	No			X	No			X	No			X
MW-15	No			X	No			X	No			X
MW-16	Yes	X			Yes	X			Yes	X		
MW-17												
Screen 1	No			X	No			X	No			X
Screen 2	No		X		No		X		No		X	
Screen 3	Yes	X			Yes	X			Yes	X		
Screen 4	Yes	X			Yes	X			No		X	
Screen 5	Yes	X			Yes	X			No			X
MW-18												
Screen 1	No			X	No			X	No			X
Screen 2	No		X		No		X		No		X	
Screen 3	Yes	X			Yes	X			Yes	X		
Screen 4	Yes	X			Yes	X			No		X	
Screen 5	No		X		No		X		No			X

1: Probable lab error. For purposes of future monitoring, MW-1 will continue to be classified as a well upgradient of JPL.

TABLE 6-1

WELL/SCREEN CLASSIFICATIONS FOR JPL GROUNDWATER MONITORING WELLS

Well and Screen Number	CONSTITUENTS OF CONCERN											
	VOCs				Perchlorate				Total and Hexavalent Chromium			
	COC Detect Last 2 Years	Plume	Down- gradient	Up- gradient	COC Detect Last 2 Years	Plume	Down- gradient	Up- gradient	COC Detect Last 2 Years	Plume	Down- gradient	Up- gradient
MW-19												
Screen 1	No		X		No			X	No			X
Screen 2	Yes	X			No		X		No			X
Screen 3	Yes	X			Yes	X			No			X
Screen 4	Yes	X			Yes	X			No			X
Screen 5	Yes	X			No		X		No			X
MW-20												
Screen 1	No		X		Yes	X			No		X	
Screen 2	No		X		No		X		No		X	
Screen 3	No		X		No		X		No		X	
Screen 4	No		X		Yes	X			No		X	
Screen 5	No		X		Yes	X			No		X	
MW-21												
Screen 1	Yes	X			Yes	X			No			X
Screen 2	Yes	X			No		X		No			X
Screen 3	Yes	X			No		X		No			X
Screen 4	Yes	X			Yes	X			No			X
Screen 5	Yes	X			Yes	X			No			X
MW-22												
Screen 1	Yes	X			Yes	X			No		X	
Screen 2	No		X		Yes	X			No		X	
Screen 3	No			X	Yes	X			No			X
Screen 4	No			X	No		X		No			X
Screen 5	No			X	No			X	No			X

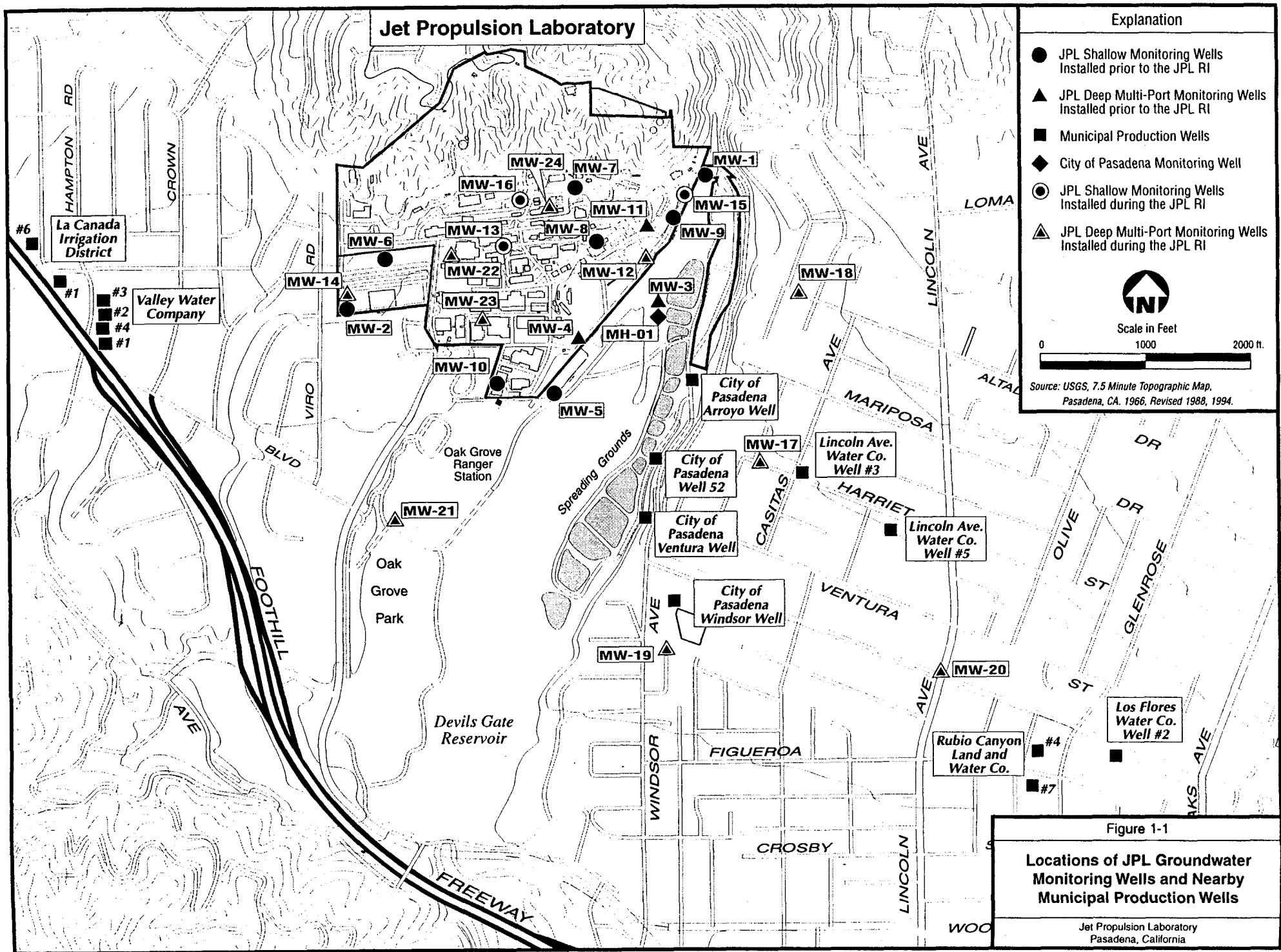
1: Probable lab error. For purposes of future monitoring, MW-1 will continue to be classified as a well upgradient of JPL.

TABLE 6-1
WELL/SCREEN CLASSIFICATIONS FOR JPL GROUNDWATER MONITORING WELLS

Well and Screen Number	CONSTITUENTS OF CONCERN											
	VOCs				Perchlorate				Total and Hexavalent Chromium			
	COC Detect Last 2 Years	Plume	Down-gradient	Up-gradient	COC Detect Last 2 Years	Plume	Down-gradient	Up-gradient	COC Detect Last 2 Years	Plume	Down-gradient	Up-gradient
MW-23												
Screen 1	Yes	X			Yes	X			No		X	
Screen 2	Yes	X			Yes	X			No		X	
Screen 3	No		X		No		X		No		X	
Screen 4	No			X	No			X	No		X	
Screen 5	No			X	No			X	No			X
MW-24												
Screen 1	Yes	X			Yes	X			No		X	
Screen 2	Yes	X			Yes	X			No		X	
Screen 3	No		X		No		X		No		X	
Screen 4	No			X	No			X	No			X
Screen 5	No			X	No			X	No			X

1: Probable lab error. For purposes of future monitoring, MW-1 will continue to be classified as a well upgradient of JPL.

FIGURES



Jet Propulsion Laboratory

Explanation

- JPL Shallow Monitoring Wells Installed prior to the JPL RI
- ▲ JPL Deep Multi-Port Monitoring Wells Installed prior to the JPL RI
- Municipal Production Wells
- ◆ City of Pasadena Monitoring Well
- ⊙ JPL Shallow Monitoring Wells Installed during the JPL RI
- ▲ JPL Deep Multi-Port Monitoring Wells Installed during the JPL RI



Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA, 1966. Revised 1988, 1994.

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

Los Flores Water Co. Well #2

Rubio Canyon Land and Water Co.

HAMPTON RD

CROWN

VIRO RD

BLVD

FOOTHILL AVE

FREEWAY

WINDSOR AVE

FIGUEROA

CROSBY

LINCOLN

WOOD

LINCOLN AVE

AVE

MARIPOSA

HARRIET

VENTURA

LOMA

ALTA

DR

DR

ST

ST

ST

ST

AKS AVE

#6

#1

#3

#2

#4

#1

#4

#7

MW-3 HYDROGRAPH

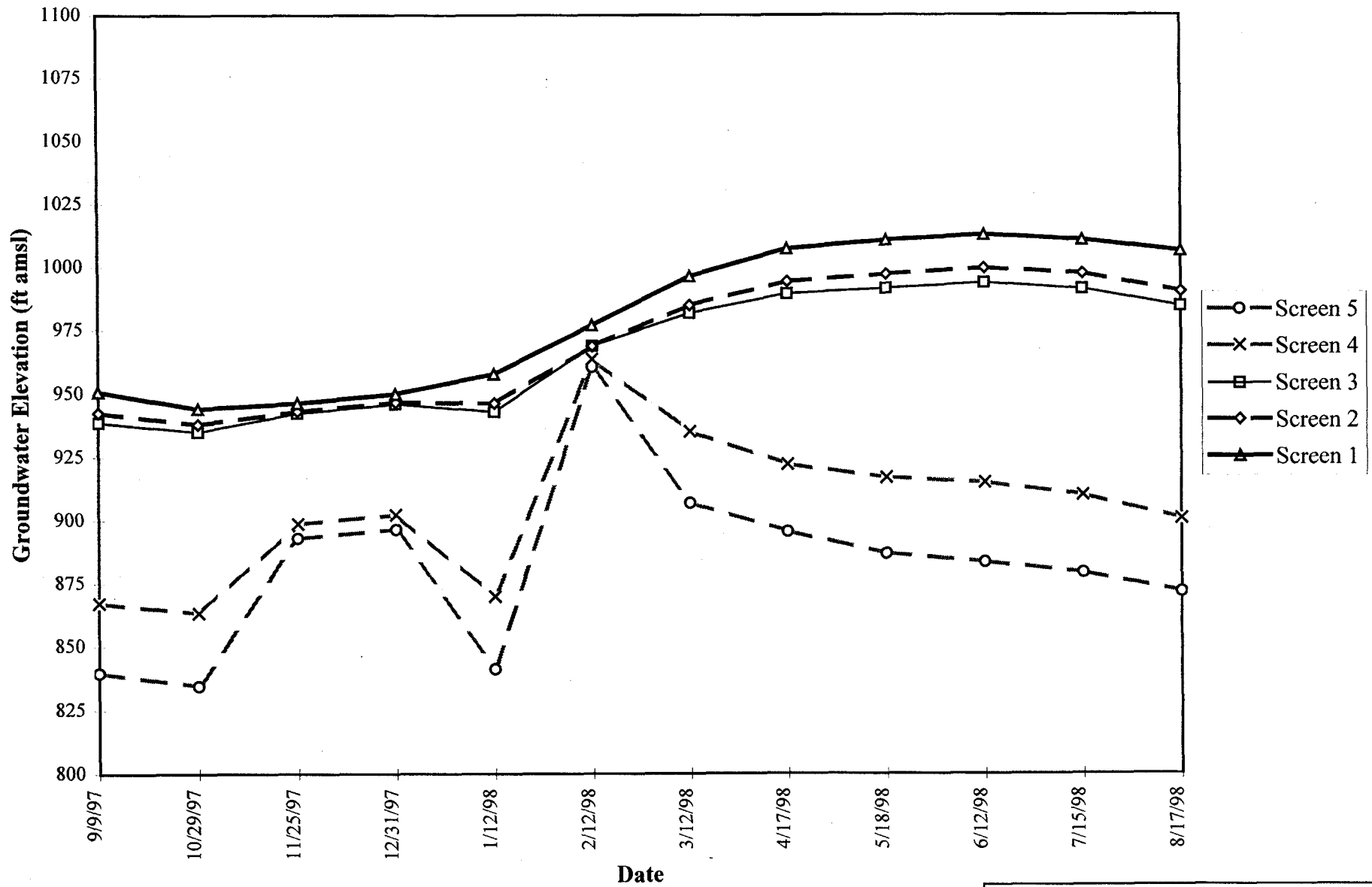


Figure 5-1
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-3
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-4 HYDROGRAPH

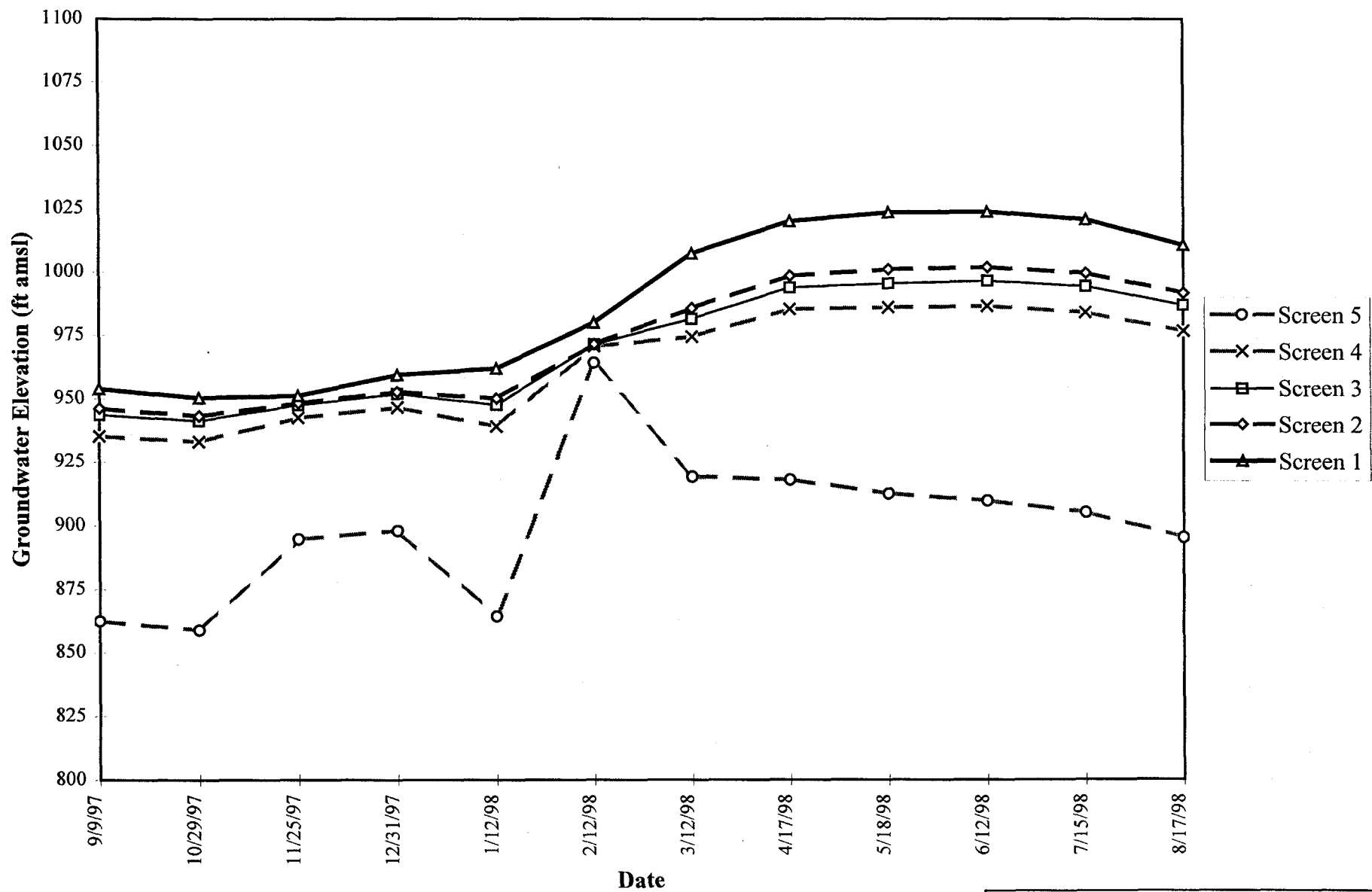


Figure 5-2
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-4
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-11 HYDROGRAPH

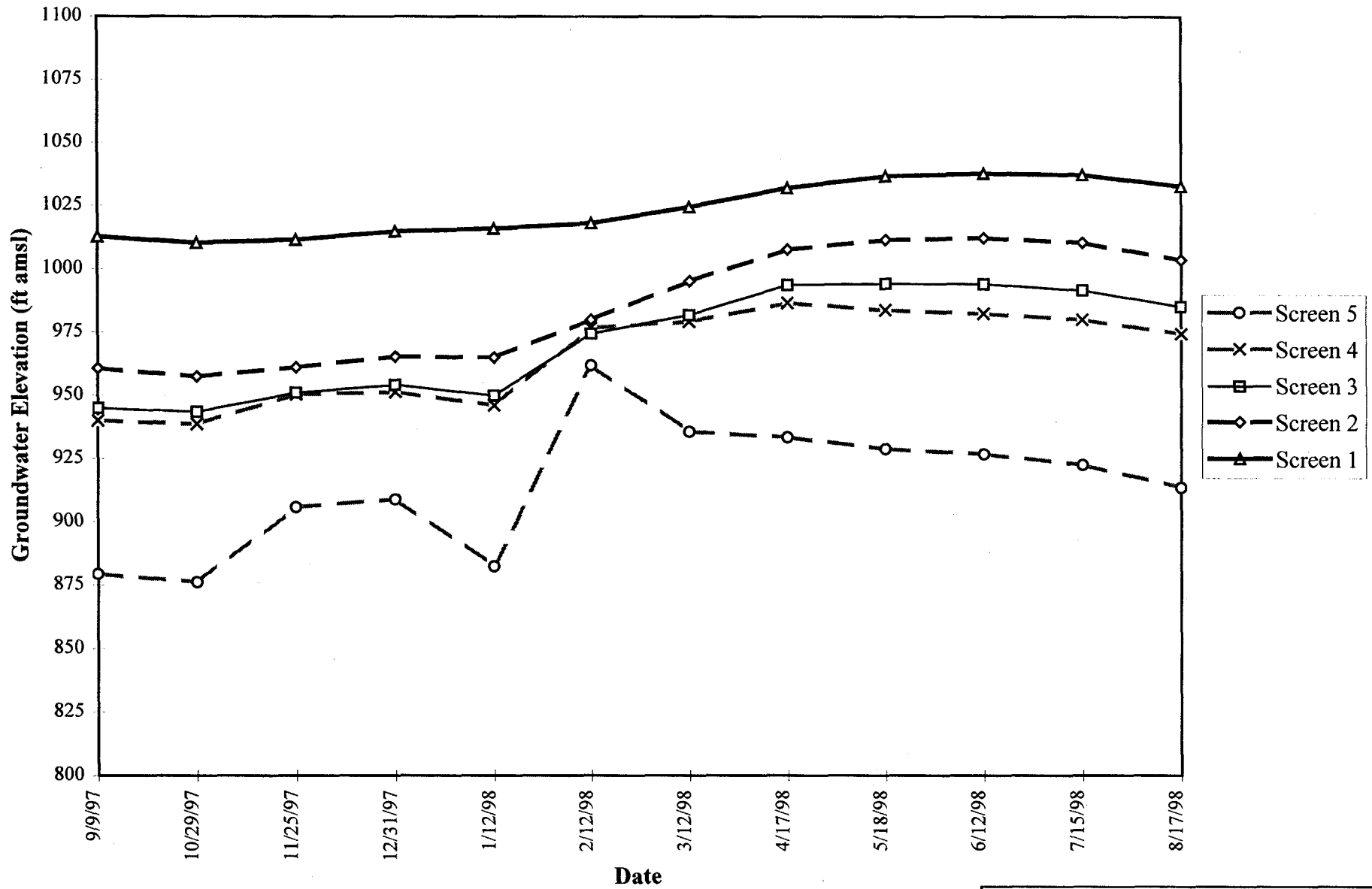
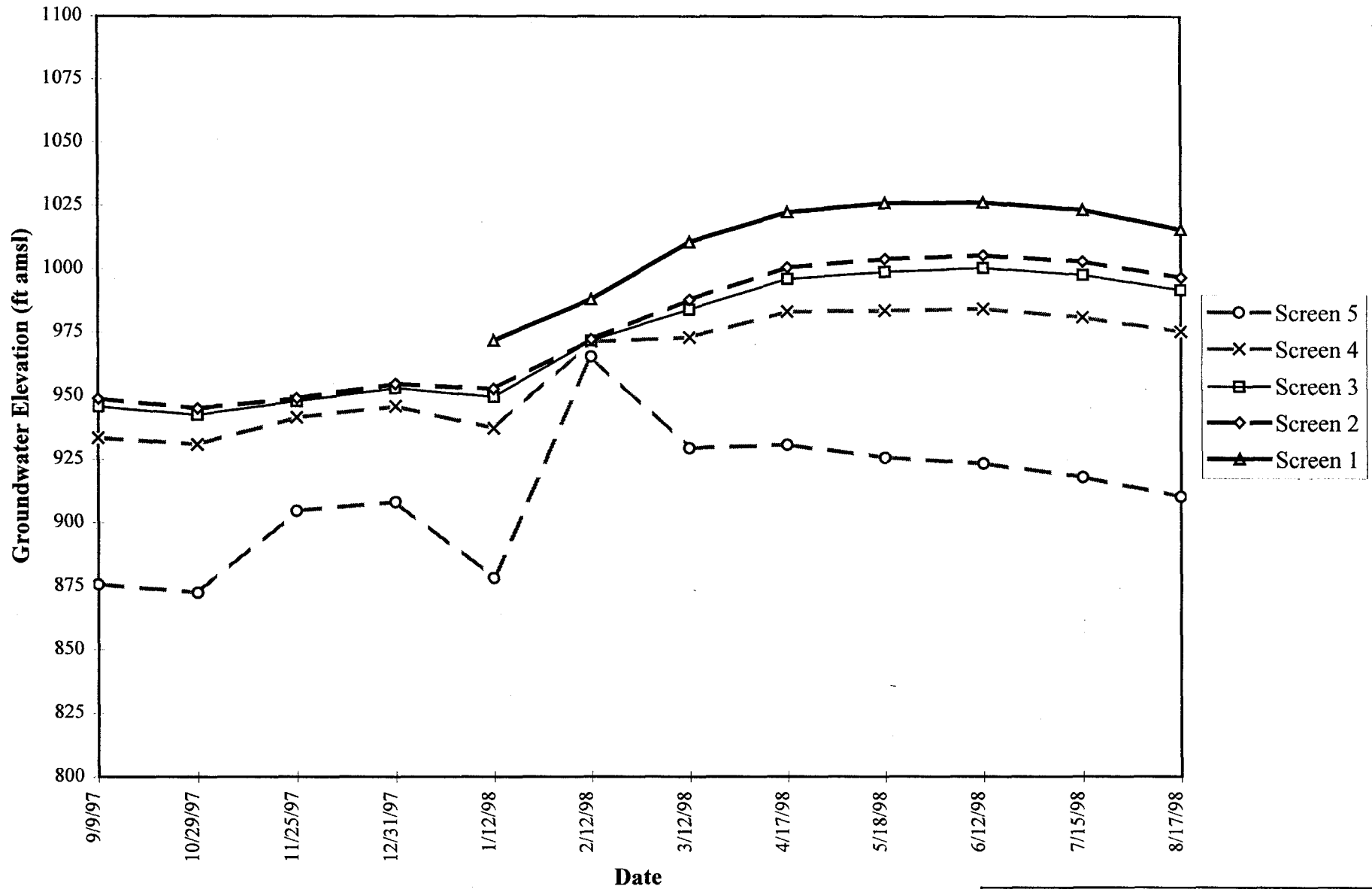


Figure 5-3
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-11
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-12 HYDROGRAPH



Note: No water over Screen 1 from September, 1997 to January, 1998

Figure 5-4
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-12
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-14 HYDROGRAPH

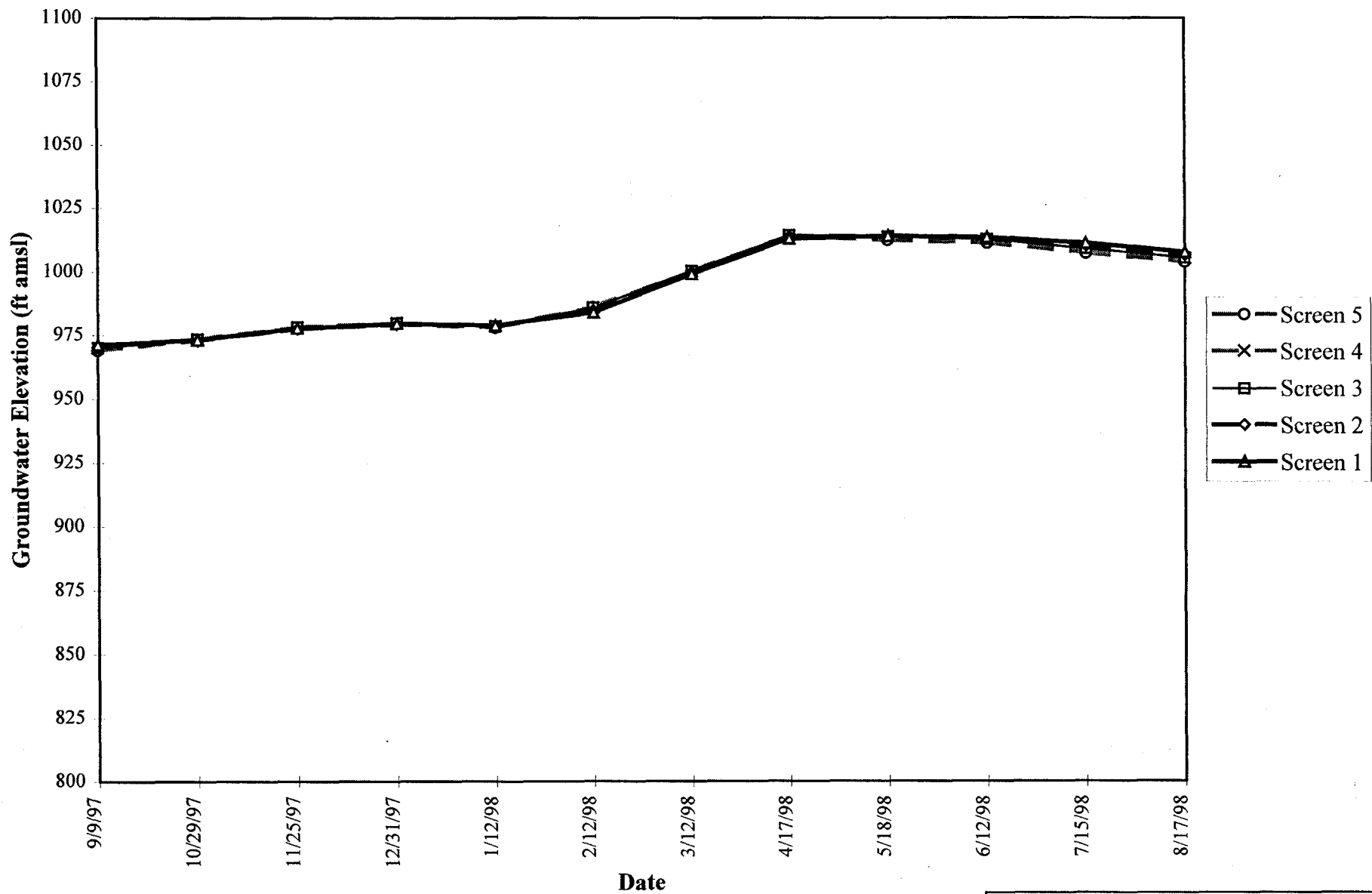
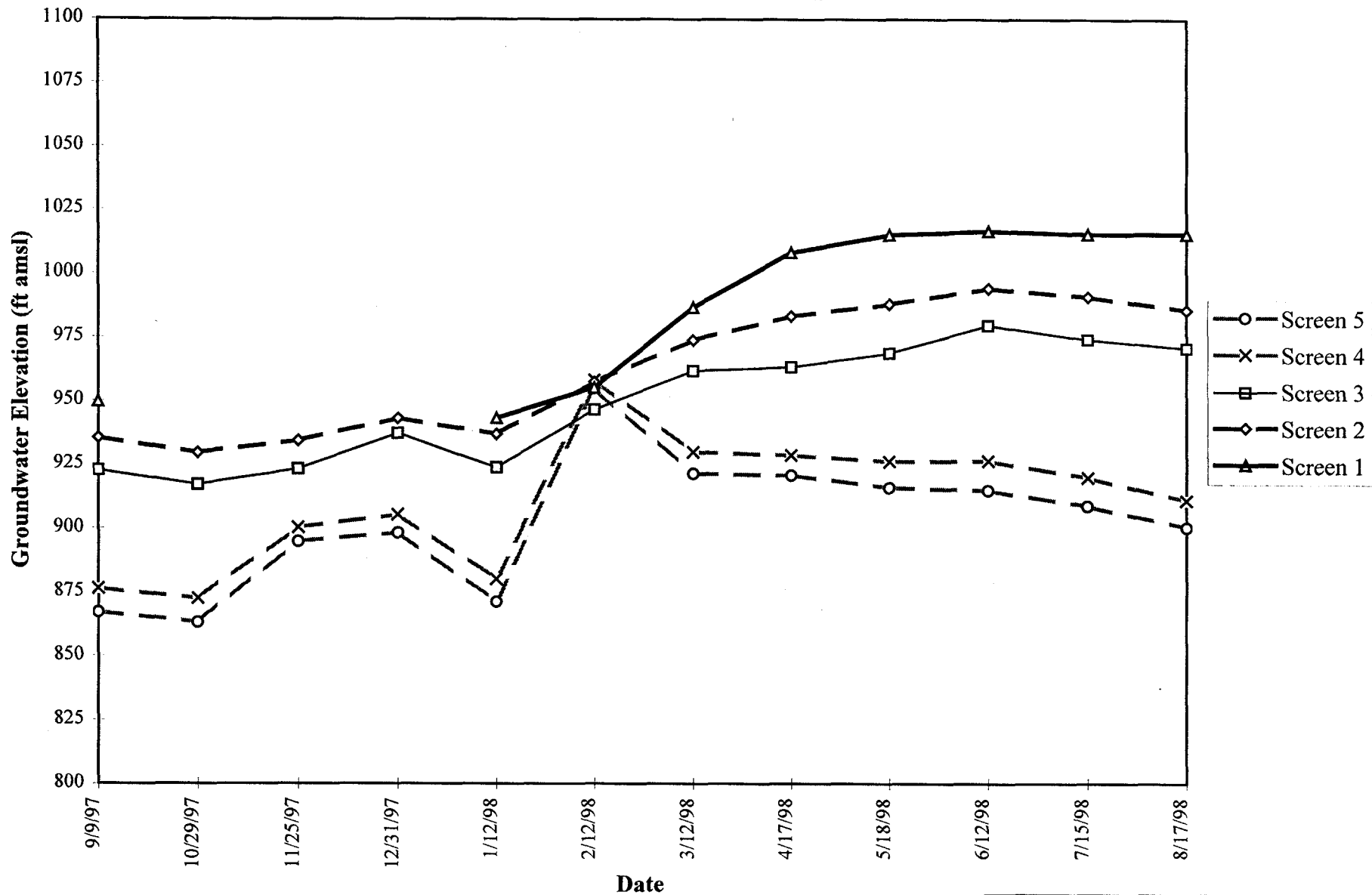


Figure 5-5
Annual Hydrograph for Deep,
Multi-Port Monitoring Well MW-14
(Sep. 1997 - Aug. 1998)
Jet Propulsion Laboratory

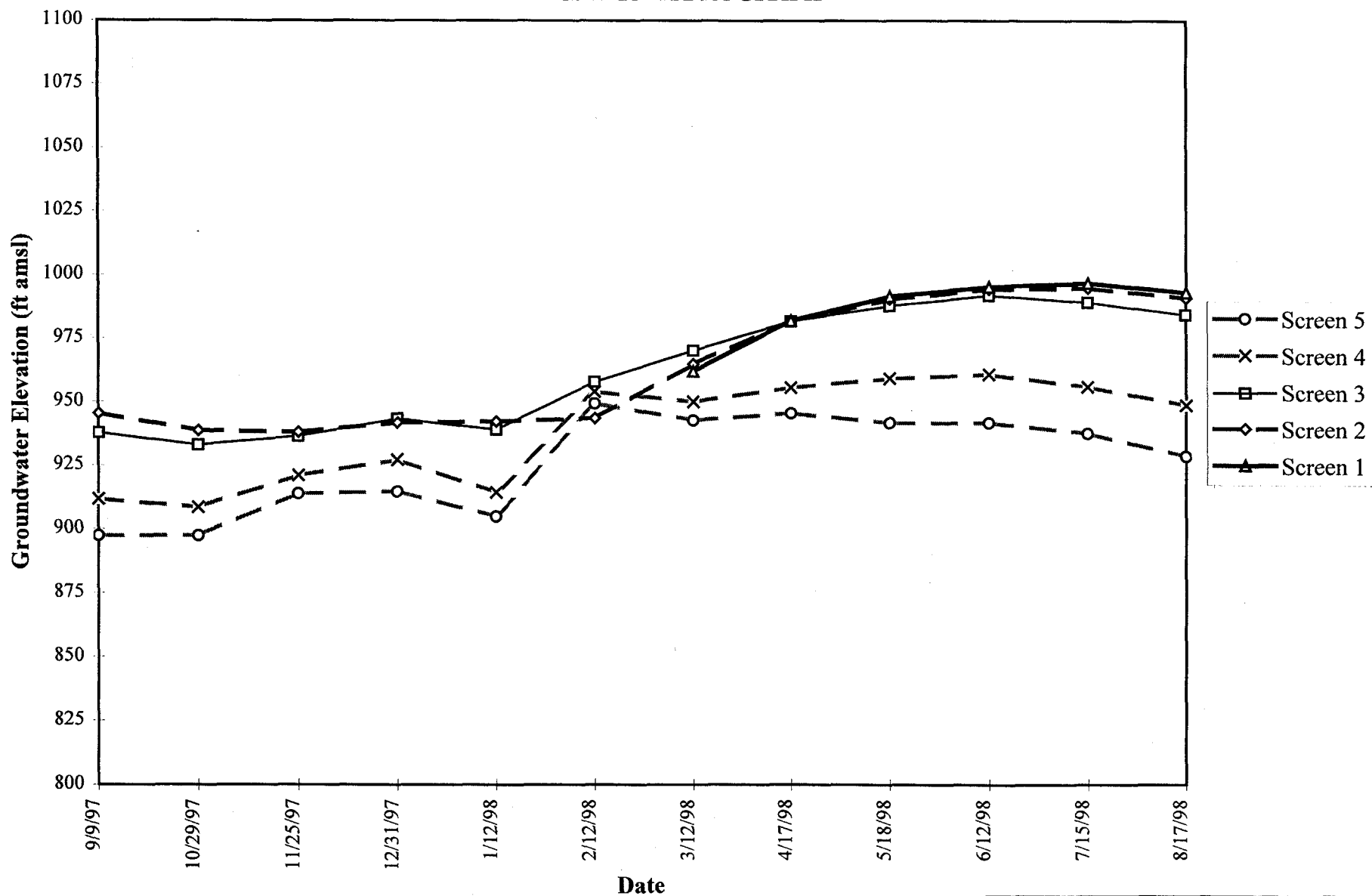
MW-17 HYDROGRAPH



Note: No water over Screen 1 from October, 1997 to January, 1998

Figure 5-6
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-17
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-18 HYDROGRAPH



Note: No water over Screen 1 from September, 1997 to March, 1998

Figure 5-7
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-18
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-19 HYDROGRAPH

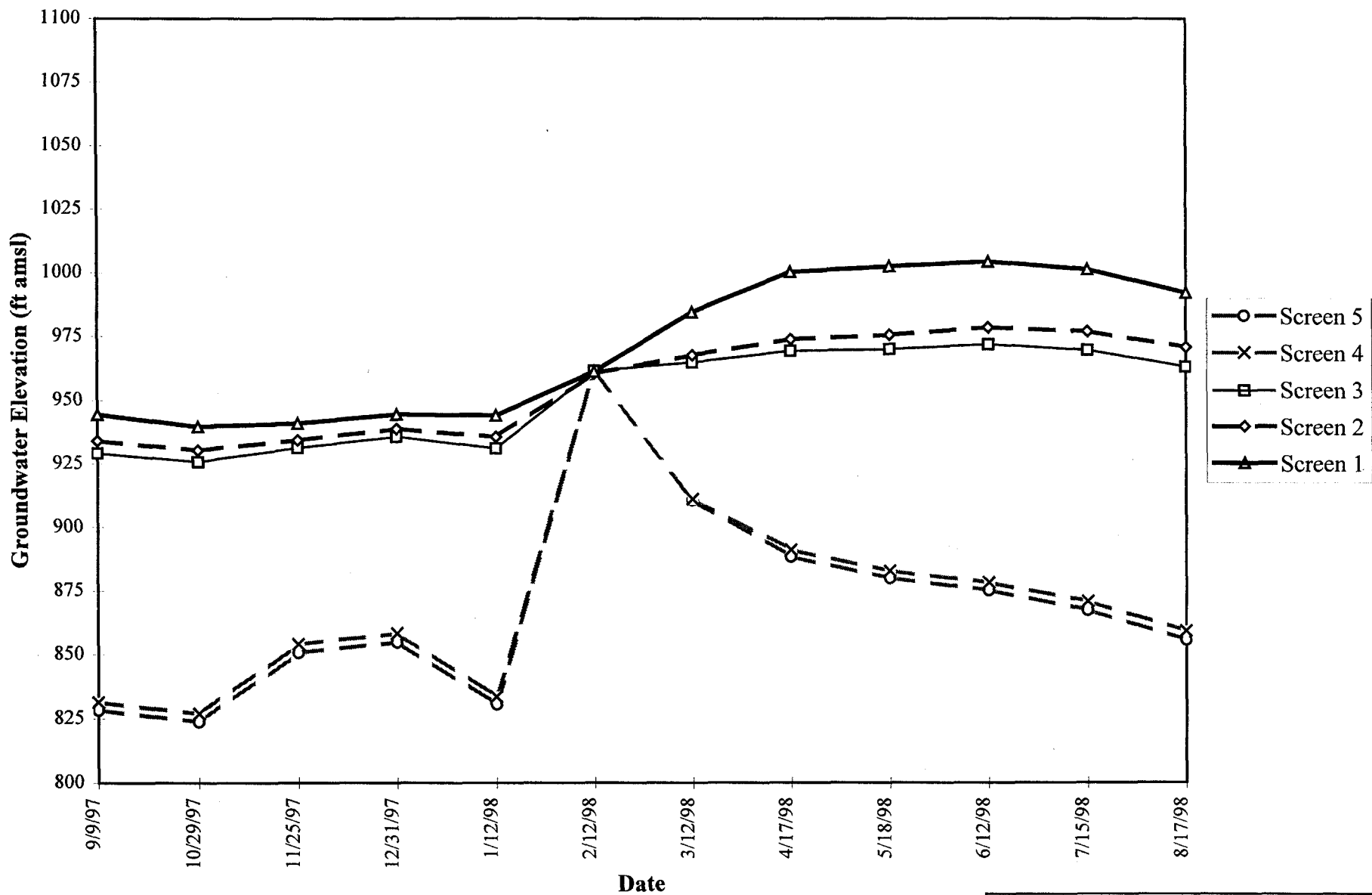
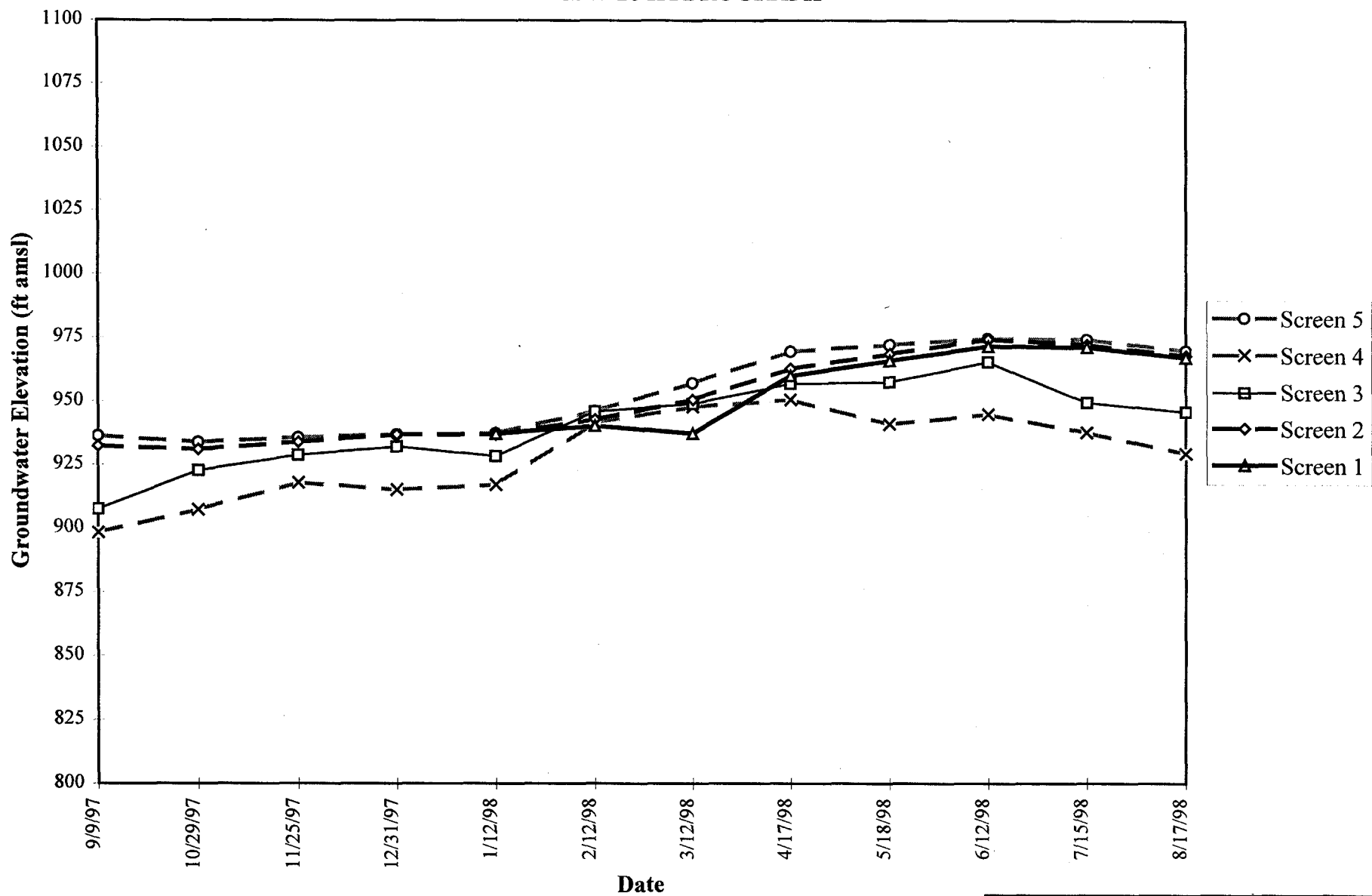


Figure 5-8
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-19
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

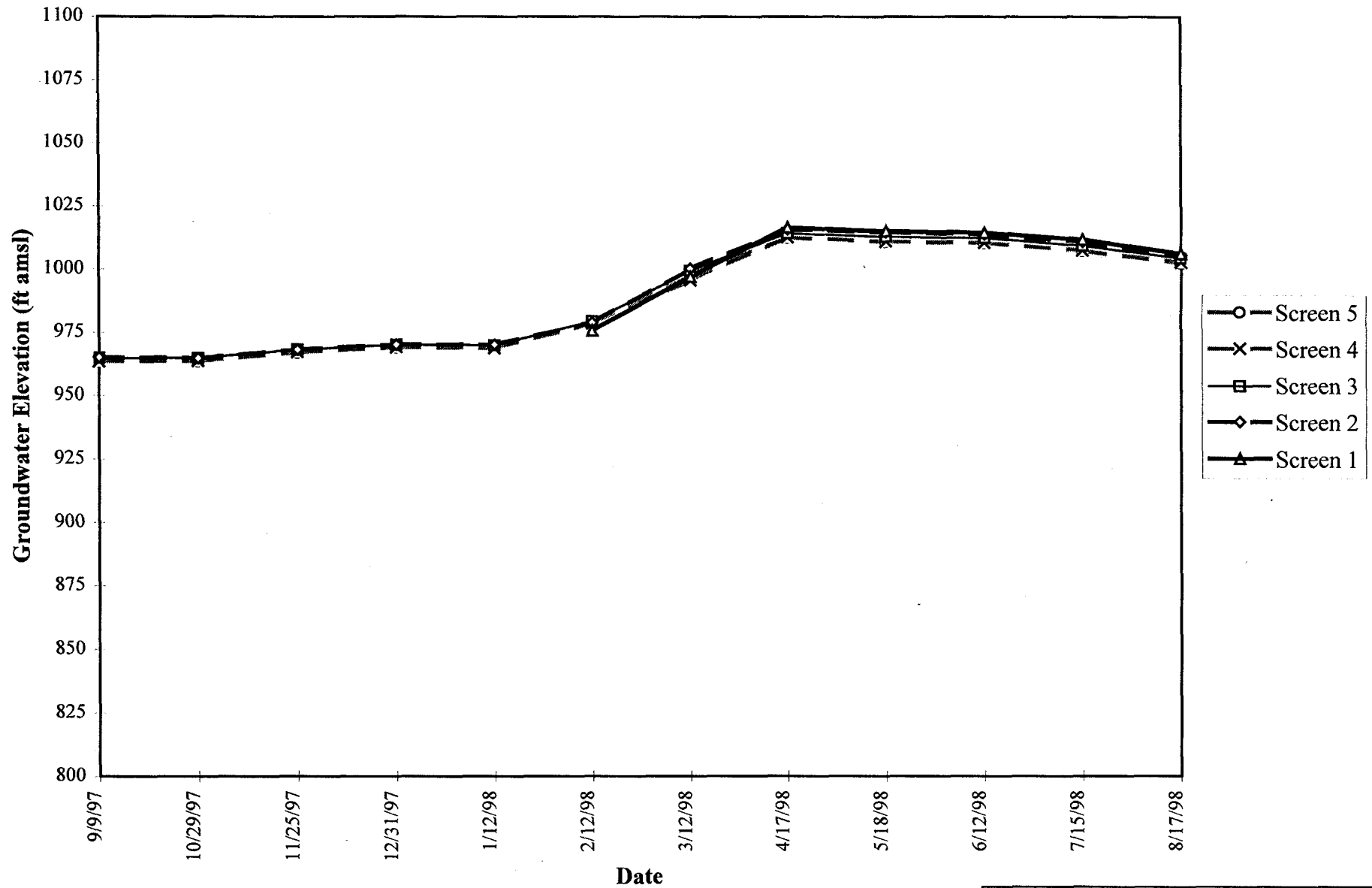
MW-20 HYDROGRAPH



Note: No water over Screen 1 from September, 1997 to January, 1998

Figure 5-9
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-20
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-21 HYDROGRAPH



Note: No water over Screen 1 from September, 1997 to February, 1998

Figure 5-10
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-21
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

MW-22 HYDROGRAPH

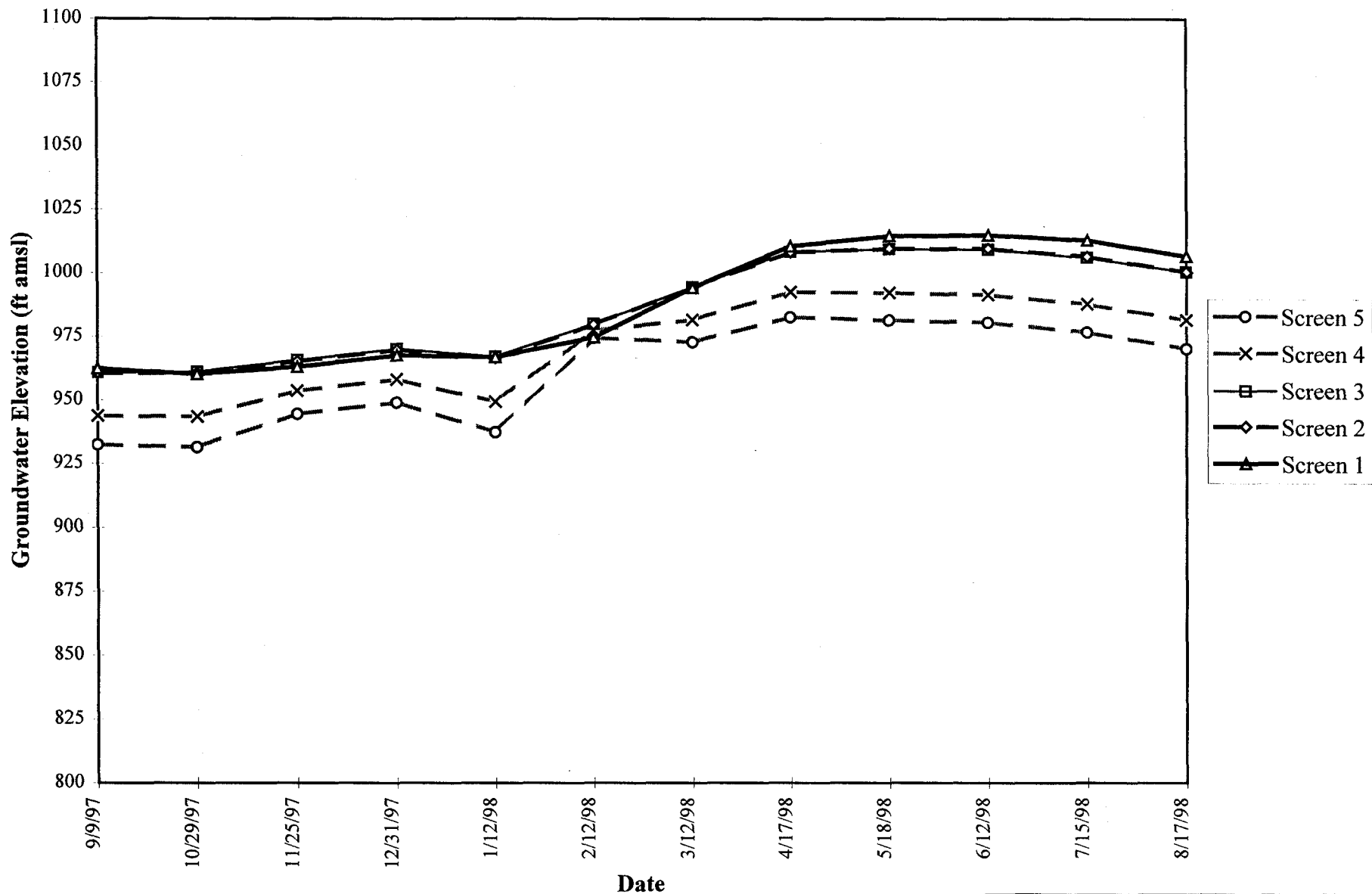


Figure 5-11
Annual Hydrograph for Deep,
Multi-Port Monitoring Well MW-22
(Sep. 1997 - Aug. 1998)
Jet Propulsion Laboratory

MW-23 HYDROGRAPH

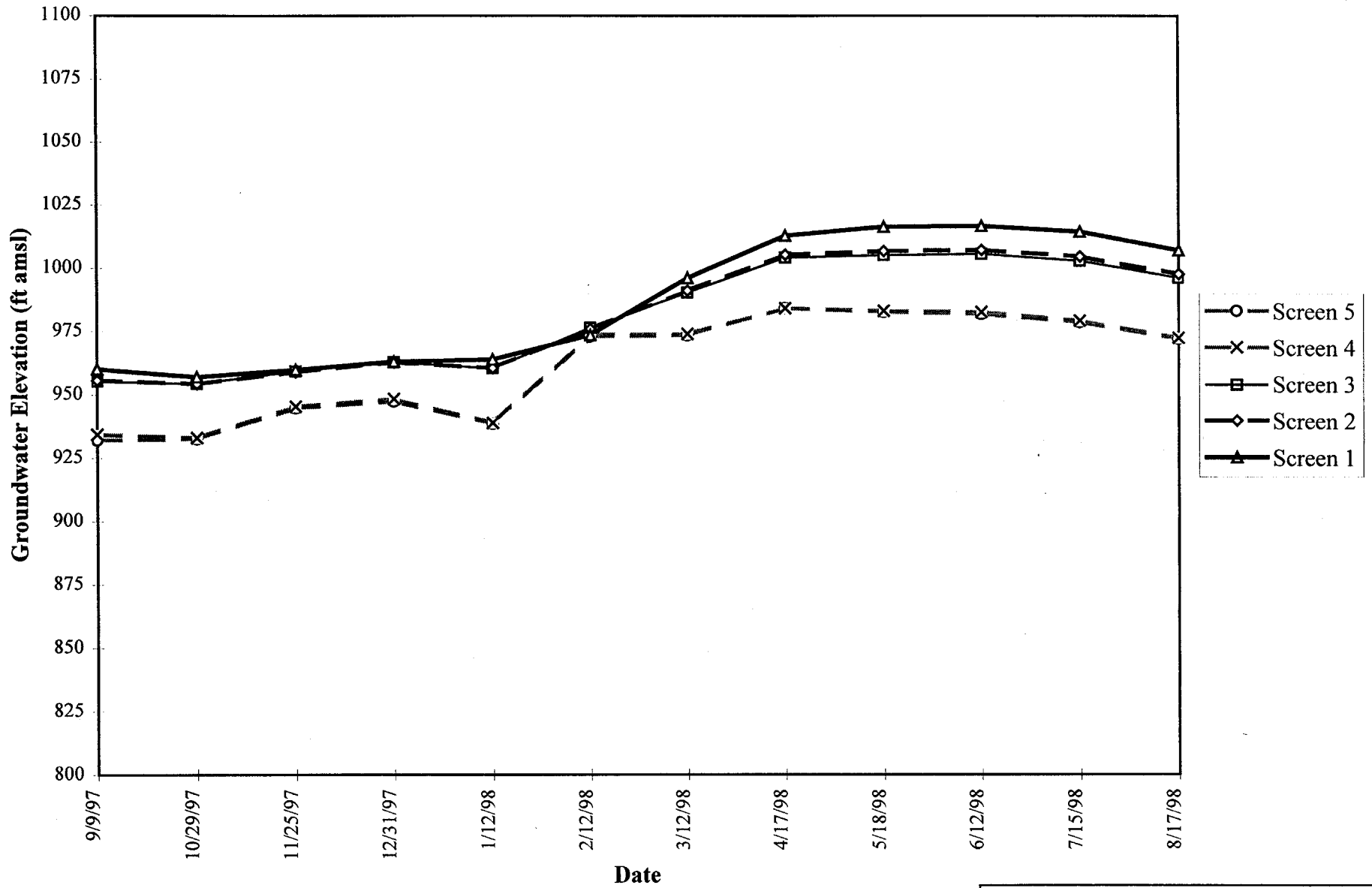


Figure 5-12

Annual Hydrograph for Deep,
Multi-Port Monitoring Well MW-23
(Sep. 1997 - Aug. 1998)

Jet Propulsion Laboratory

MW-24 HYDROGRAPH

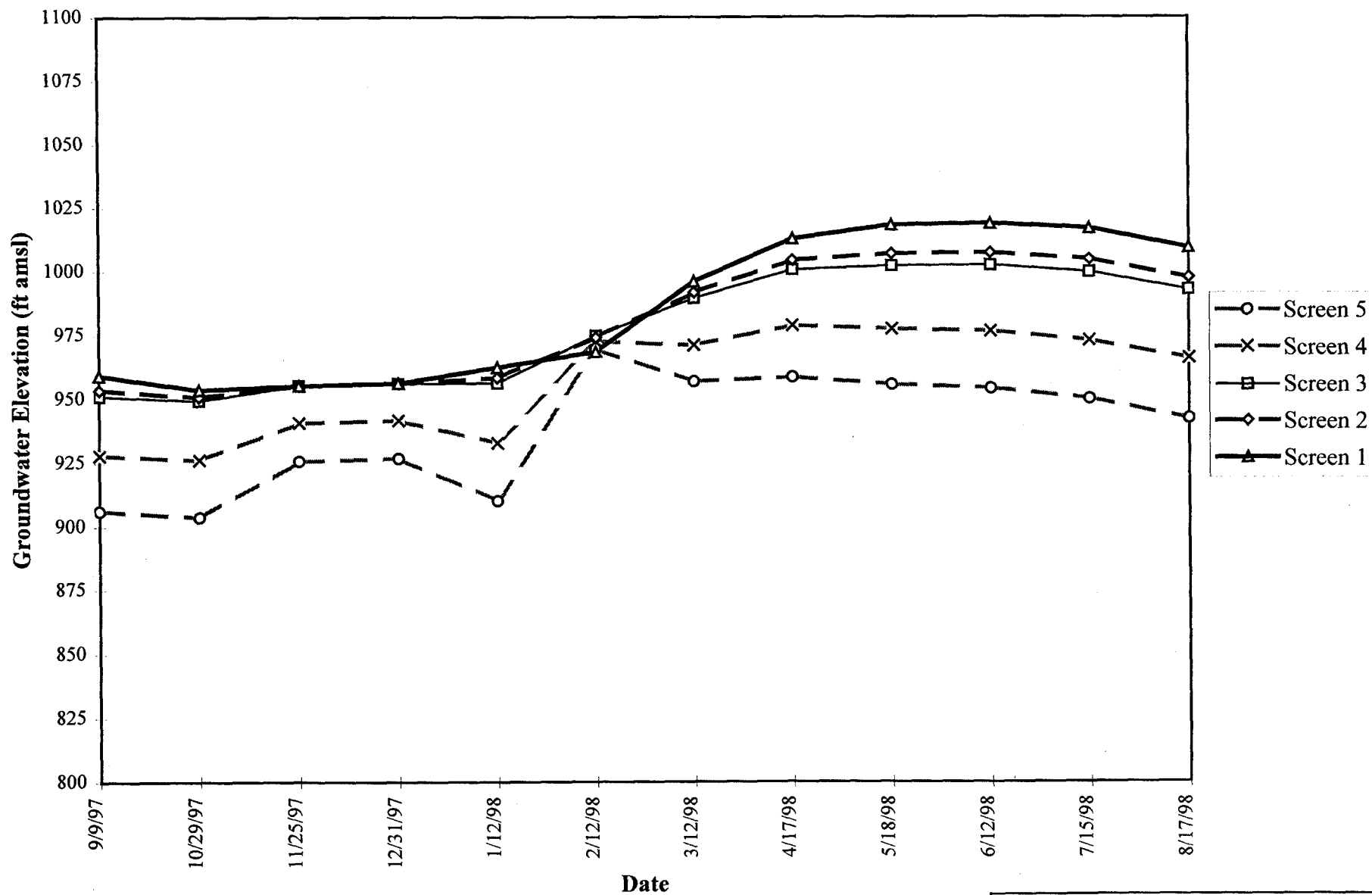


Figure 5-13
 Annual Hydrograph for Deep,
 Multi-Port Monitoring Well MW-24
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

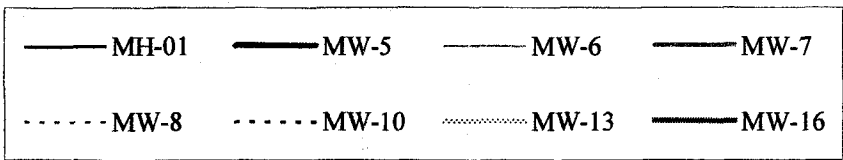
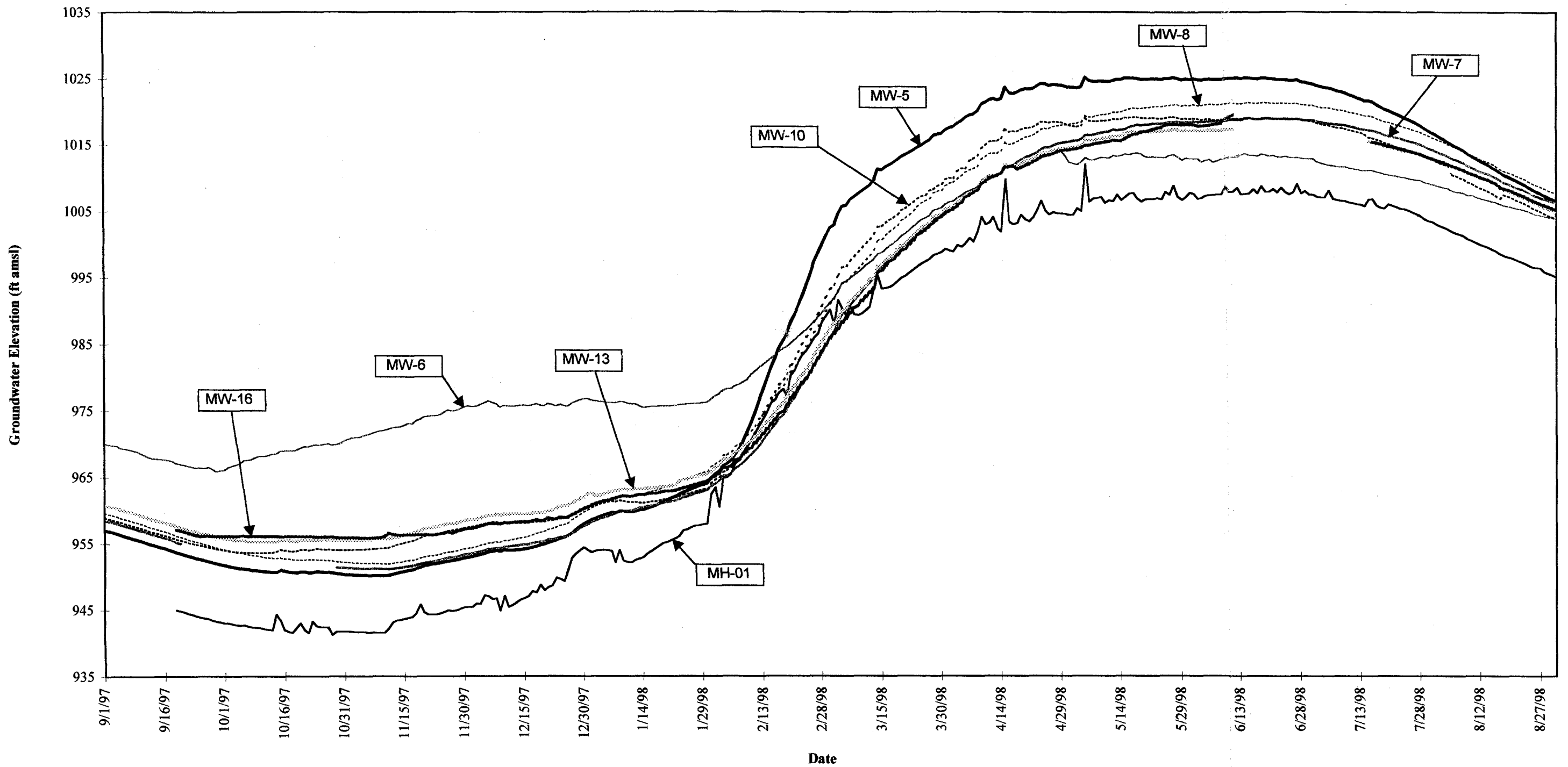
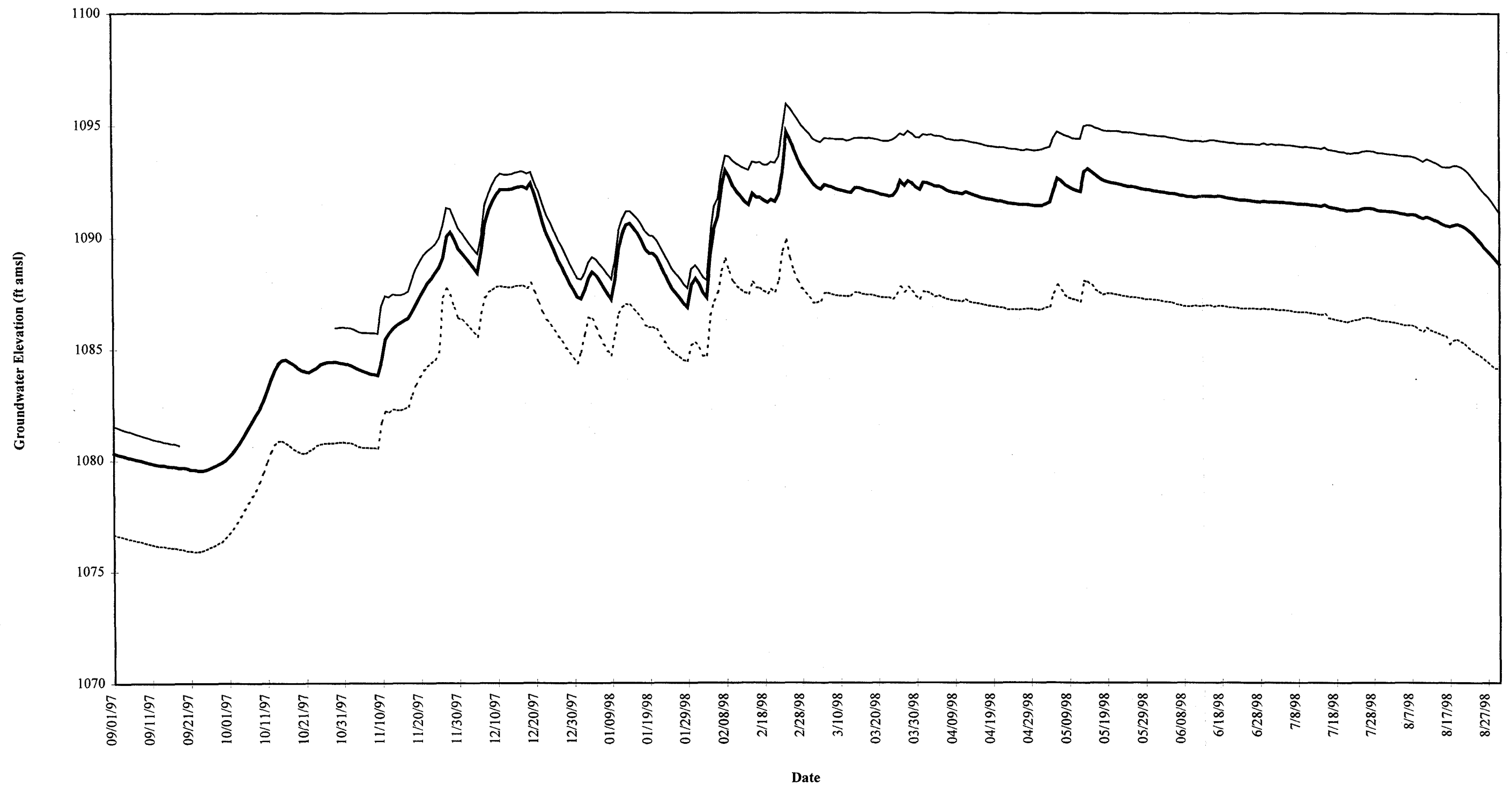


Figure 5-14
 Annual Hydrograph for Shallow
 Monitoring Wells MH-01, MW-5,
 MW-6, MW-7, MW-8, MW-10,
 MW-13 and MW-16
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory



— MW-1 MW-9 — MW-15

Figure 5-15
 Annual Hydrograph for Shallow
 Monitoring Wells MW-1,
 MW-9 and MW-15
 (Sep. 1997 - Aug. 1998)
 Jet Propulsion Laboratory

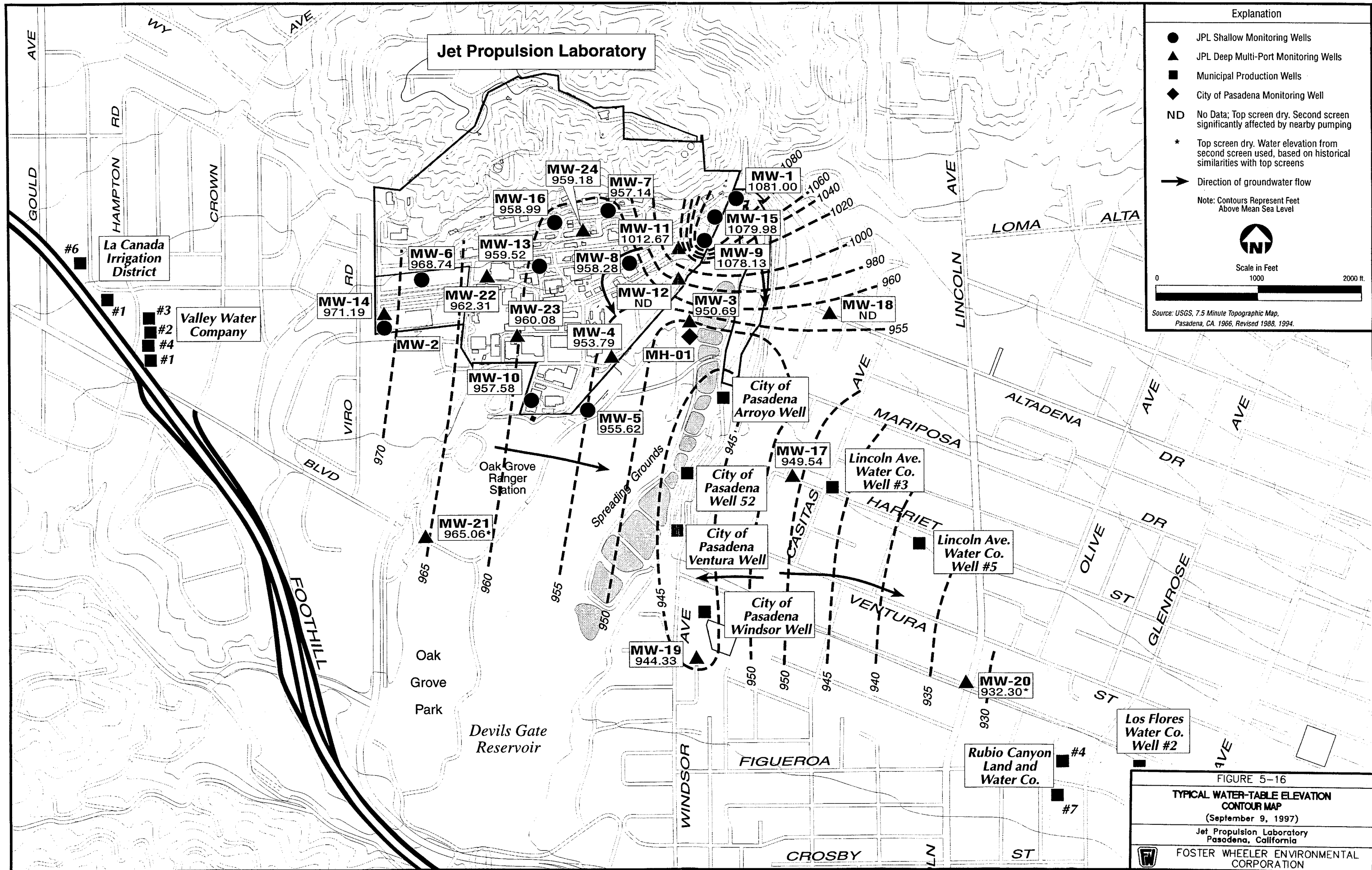
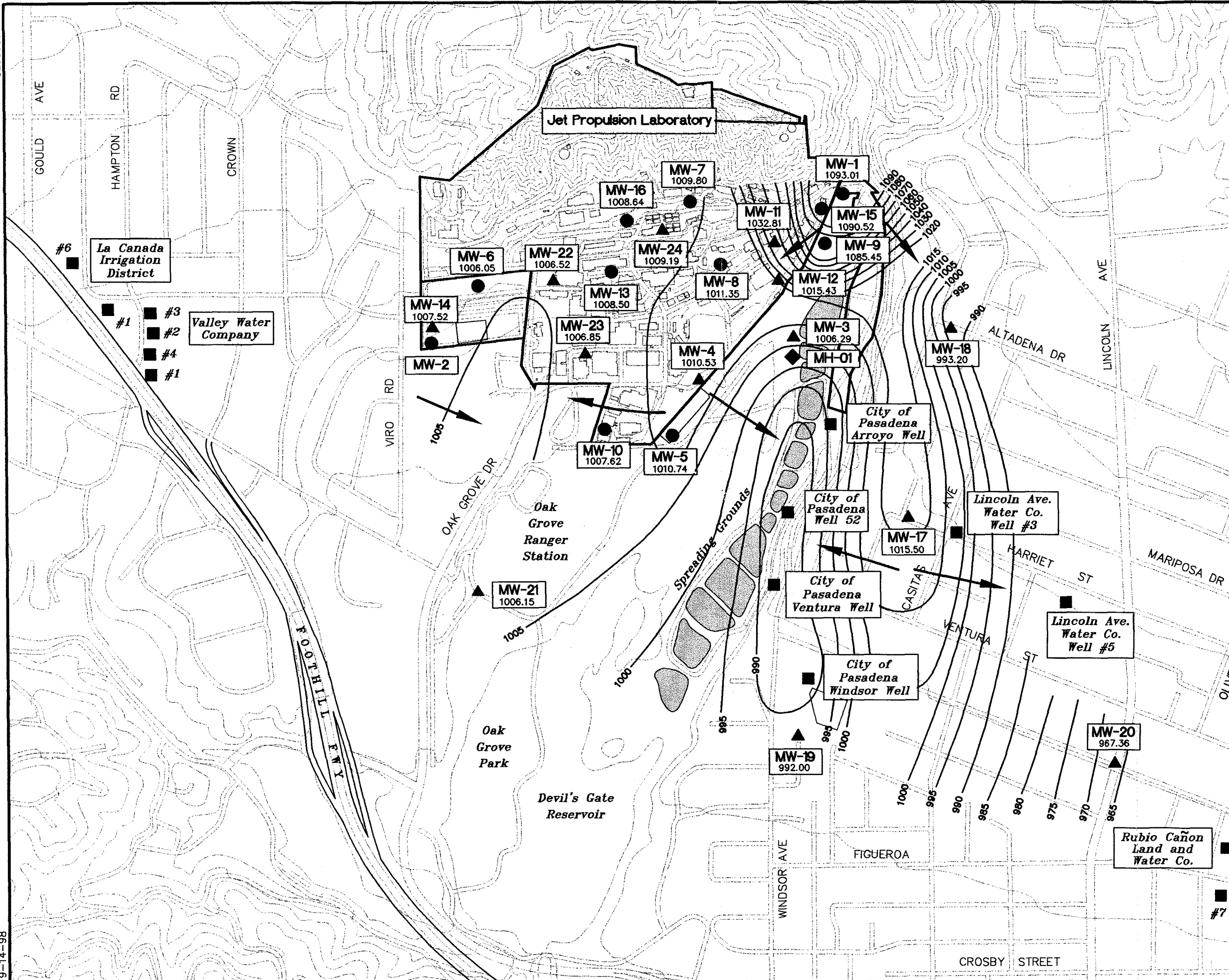


FIGURE 5-16
TYPICAL WATER-TABLE ELEVATION CONTOUR MAP
 (September 9, 1997)
 Jet Propulsion Laboratory
 Pasadena, California
 FOSTER WHEELER ENVIRONMENTAL CORPORATION



Explanation

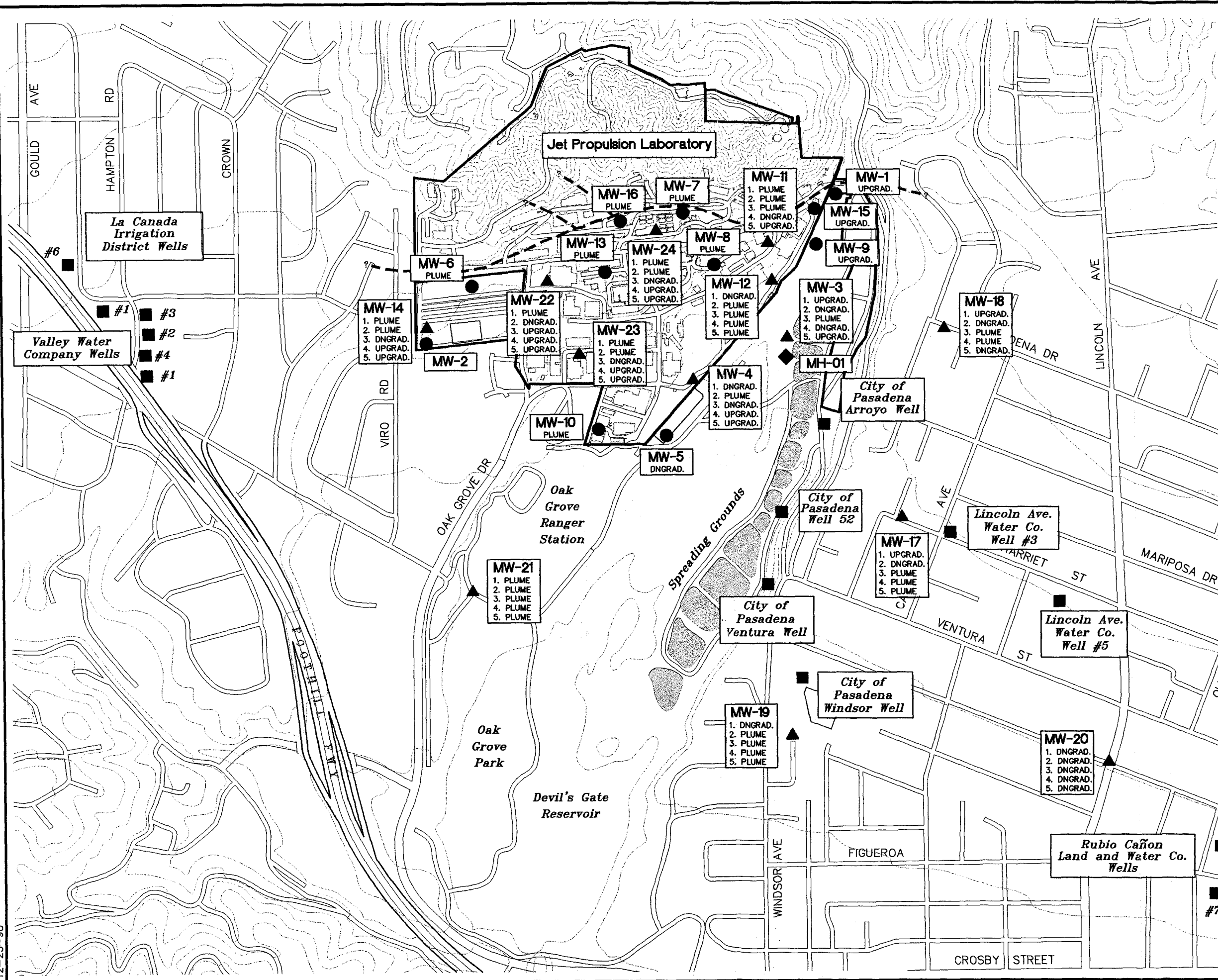
- JPL Shallow Monitoring Wells
- ▲ JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- ◆ City of Pasadena Monitoring Well
- ➔ Direction of groundwater flow

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.

FIGURE 5-17
WATER-TABLE ELEVATION CONTOUR MAP WITH ON-SITE FLOW REVERSAL
 (August 17, 1998)
 Jet Propulsion Laboratory
 Pasadena, California
 FOSTER WHEELER ENVIRONMENTAL CORPORATION

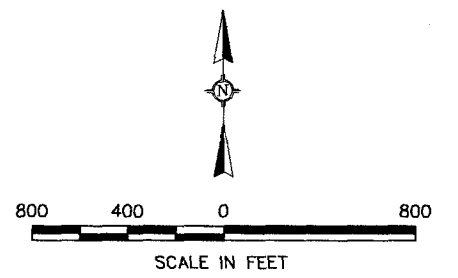


Explanation

- JPL Shallow Monitoring Wells
- ▲ JPL Deep Multi-Part Monitoring Wells
- Municipal Production Wells
- ◆ City of Pasadena Monitoring Well
- - - JPL Thrust Fault
- JPL Property Line

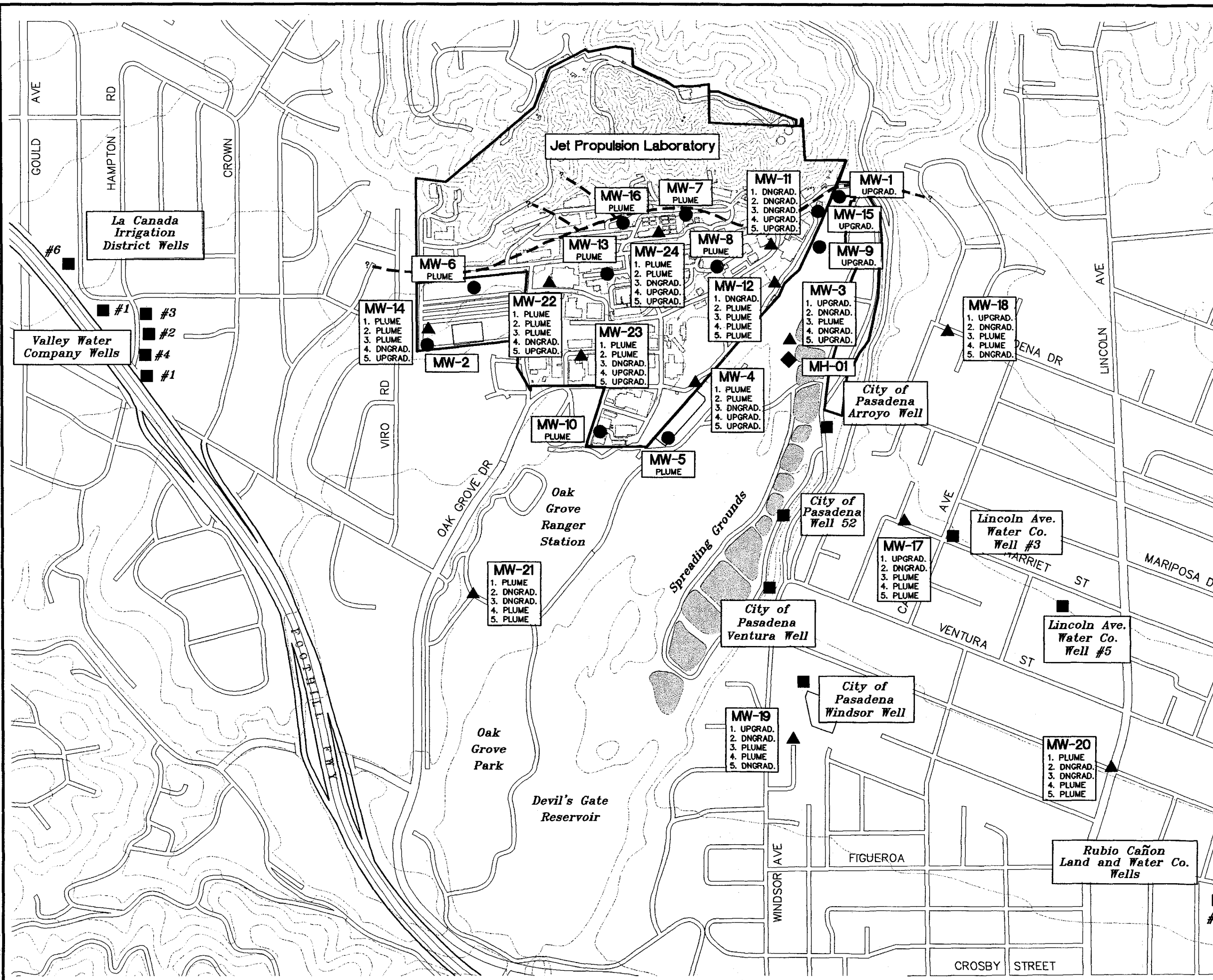
SAMPLING POINT CLASSIFICATION (See section 6.0 in text)

- PLUME **PLUME:** Sampling Point Where Constituent Detected 1 or More Times During Monitoring Program.
- DNGRAD. **DOWNGRADIENT:** Sampling Point Near Edge of Plume Where Constituent Has Never Been Detected.
- UPGRAD. **UPGRADIENT:** Sampling Point Not Likely to be in Immediate Path of Contaminant Migration.



Source: USGS, 7.5 Minute Topographic Map Pasadena, CA 1966, Revised 1988, 1994.

FIGURE 6-1
LOCATIONS OF PROPOSED JPL SAMPLING POINT CLASSIFICATIONS FOR VOLATILE ORGANIC COMPOUNDS
 Jet Propulsion Laboratory
 Pasadena, California
 FOSTER WHEELER ENVIRONMENTAL CORPORATION



Explanation

- JPL Shallow Monitoring Wells
- ▲ JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- ◆ City of Pasadena Monitoring Well
- - - JPL Thrust Fault
- JPL Property Line

SAMPLING POINT CLASSIFICATION (See section 6.0 in text)

- PLUME **PLUME:** Sampling Point Where Constituent Detected 1 or More Times During Monitoring Program.
- DNGRAD. **DOWNGRADIENT:** Sampling Point Near Edge of Plume Where Constituent Has Never Been Detected.
- UPGRAD. **UPGRADIENT:** Sampling Point Not Likely to be In Immediate Path of Contaminant Migration.

N

800 400 0 800

SCALE IN FEET

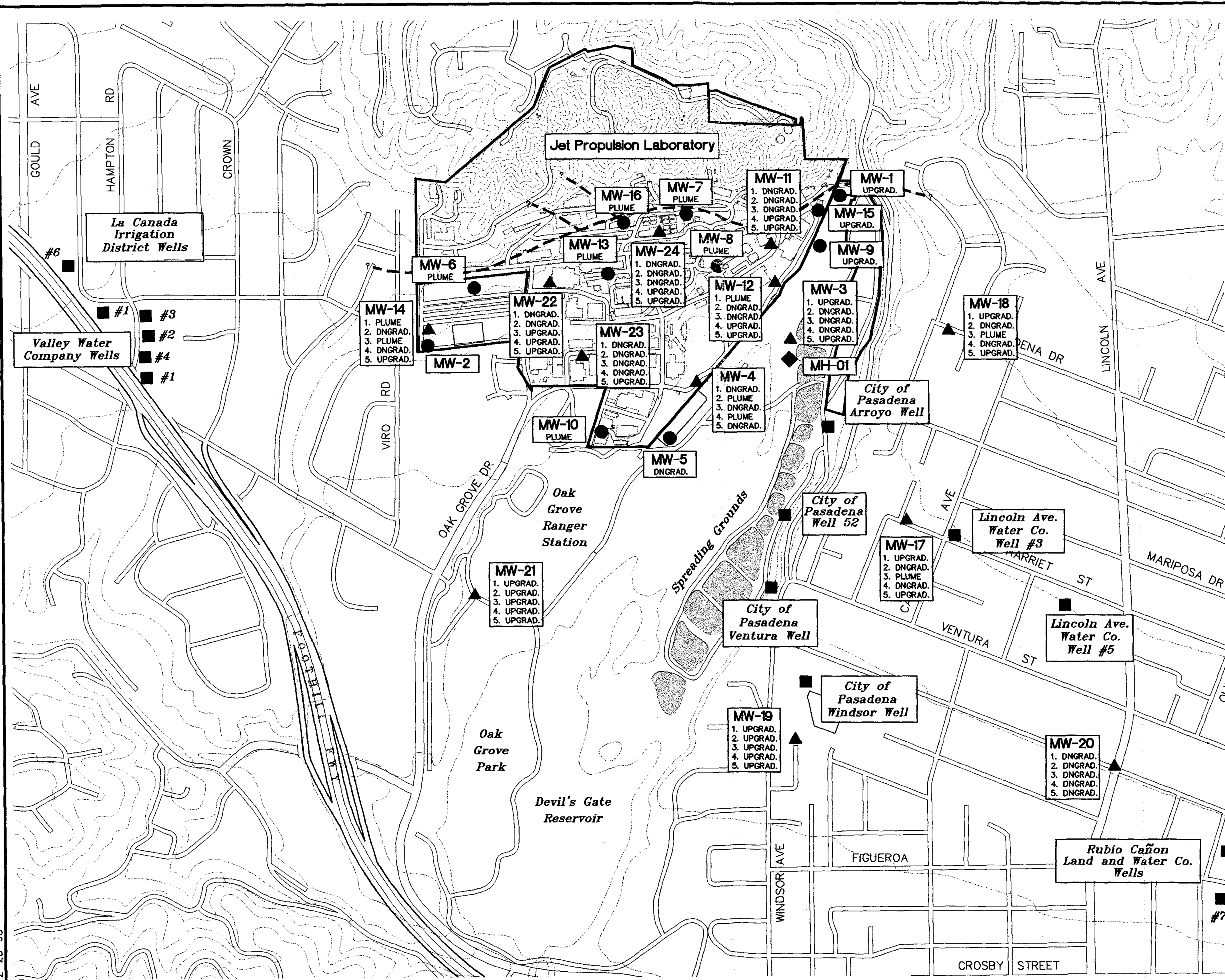
Source: USGS, 7.5 Minute Topographic Map Pasadena, CA 1966, Revised 1966, 1994.

FIGURE 6-2

LOCATIONS OF PROPOSED JPL SAMPLING POINT CLASSIFICATIONS FOR PERCHLORATE

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

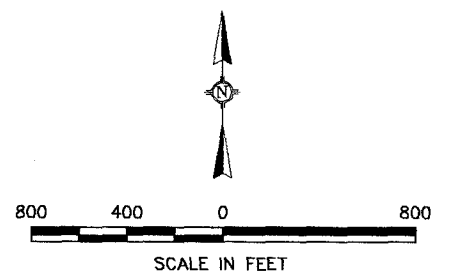


Explanation

- JPL Shallow Monitoring Wells
- ▲ JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- ◆ City of Pasadena Monitoring Well
- JPL Thrust Fault
- JPL Property Line

SAMPLING POINT CLASSIFICATION (See section 6.0 in text)

- PLUME **PLUME:** Sampling Point Where Constituent Detected 1 or More Times During Monitoring Program.
- DNGRAD. **DOWNGRADIENT:** Sampling Point Near Edge of Plume Where Constituent Has Never Been Detected.
- UPGRAD. **UPGRADIENT:** Sampling Point Not Likely to be in Immediate Path of Contaminant Migration.



Source: USGS, 7.5 Minute Topographic Map Pasadena, CA 1966, Revised 1988, 1994.

FIGURE 6-3
LOCATIONS OF PROPOSED JPL SAMPLING POINT CLASSIFICATIONS FOR CHROMIUM (TOTAL AND HEXAVALENT)
 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, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
9/1/97		1081.55	957.02	970.07	958.52	959.65	1076.69	958.91	960.79	1080.34	
9/2/97		1081.48	956.85	969.85	958.34	959.45	1076.63	958.74	960.62	1080.27	
9/3/97		1081.42	956.68	969.75	958.19	959.28	1076.58	958.56	960.49	1080.23	
9/4/97		1081.35	956.48	969.64	958.02	959.11	1076.54	958.39	960.34	1080.19	
9/5/97		1081.31	956.29	969.36	957.82	958.89	1076.48	958.22	960.14	1080.12	
9/6/97		1081.25	956.09	969.23	957.63	958.69	1076.43	958.05	959.95	1080.08	
9/7/97		1081.18	955.92	969.16	957.48	958.54	1076.39	957.87	959.82	1080.04	
9/8/97		1081.14	955.73	969.01	957.30	958.33	1076.37	957.70	959.62	1080.01	
9/9/97		1081.07	955.55	968.84	957.11	958.17	1076.30	957.53	959.45	1079.95	
9/10/97		1081.03	955.38	968.56	956.96	958.02	1076.26	957.37	959.30	1079.91	
9/11/97		1080.96	955.18	968.25	956.76	957.81	1076.22	957.16	959.08	1079.86	
9/12/97		1080.92	954.99	968.01	956.57	957.59	1076.17	956.94	958.86	1079.82	
9/13/97		1080.90	954.79	967.78	956.35	957.37	1076.15	956.75	958.67	1079.80	
9/14/97		1080.83	954.60	967.73	956.16	957.16	1076.15	956.57	958.45	1079.80	
9/15/97		1080.81	954.43	967.71	956.00	957.03	1076.11	956.38	958.32	1079.75	
9/16/97		1080.77	954.25	967.67	955.83	956.85	1076.09	956.25	958.17	1079.73	
9/17/97		1080.75	954.06	967.54	955.66	956.68	1076.06	956.05	958.02	1079.71	
9/18/97		1080.68	953.86	967.36	955.46	956.44	1076.02	955.88	957.82	1079.67	
9/20/97	945.01		953.65	967.05	955.14	956.18	1076.01	955.64	957.60	1079.68	957.13
9/21/97	944.88		953.48	966.95	955.01	956.01	1075.94	955.49	957.43	1079.66	956.98
9/21/97	944.70		953.28	966.82		955.82	1075.94	955.34	957.27	1079.59	956.78
9/22/97	944.51		953.13	966.64		955.62	1075.90	955.16	957.08	1079.59	956.61
9/23/97	944.34		952.96	966.53		955.47	1075.90	955.03	956.93	1079.55	956.46
9/24/97	944.16		952.78	966.40		955.30	1075.94	954.88	956.78	1079.55	956.30
9/25/97	943.95		952.63	966.38		955.10	1076.01	954.75	956.49	1079.59	956.07
9/26/97	943.82		952.46	966.30		954.93	1076.10	954.62	956.45	1079.66	956.15
9/27/97	943.75		952.33	966.53		954.78	1076.16	954.49	956.41	1079.74	956.17
9/28/97	943.49		952.16	966.19		954.58	1076.25	954.36	956.21	1079.81	956.13
9/29/97	943.30		952.00	965.84		954.41	1076.36	954.23	956.04	1079.89	956.13
9/30/97	943.21		951.85	965.97		954.26	1076.53	954.15	955.95	1080.00	956.13
10/1/97	943.06		951.72	965.97		954.10	1076.72	954.00	955.80	1080.18	956.13
10/2/97	943.04		951.59	966.45		954.00	1076.94	953.89	955.71	1080.37	956.15
10/3/97	942.88		951.48	966.69		953.84	1077.20	953.82	955.58	1080.59	956.11
10/4/97	942.80		951.38	966.86		953.71	1077.48	953.78	955.54	1080.85	956.13
10/5/97	942.71		951.29	967.05		953.63	1077.78	953.71	955.50	1081.13	956.15
10/6/97	942.73		951.18	967.51		953.54	1078.09	953.69	955.52	1081.43	956.17
10/7/97	942.52		951.09	967.55		953.39	1078.39	953.67	955.33	1081.74	956.09

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
 MONITORING WELLS AT THE JET PROPULSION LABORATORY
 (September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
10/8/97	942.45		950.99	967.68		953.28	1078.65	953.67	955.35	1082.04	956.11
10/9/97	942.41		950.94	967.99		953.22	1079.02	953.67	955.37	1082.30	956.13
10/10/97	942.34		950.86	968.16		953.11	1079.47	953.65	955.35	1082.67	956.13
10/11/97	942.17		950.79	968.16		953.00	1079.97	953.65	955.26	1083.12	956.09
10/12/97	942.08		950.75	968.29		952.91	1080.40	953.63	955.26	1083.62	956.11
10/13/97	942.04		950.68	968.46		952.85	1080.71	953.63	955.28	1084.05	956.11
10/14/97	944.42		950.73	968.55		952.80	1080.86	953.80	955.33	1084.36	956.11
10/15/97	943.40		951.05	968.96		952.93	1080.88	954.17	955.56	1084.51	956.09
10/16/97	942.04		950.88	968.92		952.78	1080.77	954.02	955.56	1084.53	956.09
10/17/97	941.74		950.73	968.92		952.70	1080.66	953.91	955.45	1084.42	956.09
10/18/97	941.63		950.64	968.96		952.61	1080.51	953.82	955.39	1084.31	956.07
10/19/97	942.32		950.60	969.03		952.57	1080.40	953.84	955.35	1084.16	956.07
10/20/97	943.04		950.75	969.37		952.57	1080.34	954.08	955.52	1084.05	956.07
10/21/97	942.04		950.77	969.59		952.57	1080.32	954.13	955.58	1083.99	956.09
10/22/97	941.54		950.60	969.54		952.59	1080.43	954.02	955.50	1083.97	956.07
10/23/97	943.30		950.64	969.74		952.59	1080.51	954.08	955.56	1084.07	956.09
10/24/97	942.60		950.81	969.87		952.61	1080.66	954.26	955.63	1084.16	956.04
10/25/97	942.47		950.75	969.80		952.54	1080.73	954.19	955.58	1084.31	956.04
10/26/97	942.47		950.68	969.96		952.54	1080.77	954.17	955.65	1084.38	956.07
10/27/97	942.43		950.68	970.02		952.50	1080.77	954.17	955.63	1084.42	956.04
10/28/97	941.30		950.57	969.80		952.44	1080.79	954.08	955.54	1084.42	956.02
10/30/97	941.84	1085.96	950.47	969.92	951.42	952.33	1080.80	954.08	955.50	1084.44	955.91
10/31/97	941.82	1085.98	950.43	970.01	951.39	952.29	1080.82	954.04	955.50	1084.39	955.91
10/31/97	941.84	1086.00	950.37	970.42	951.37	952.24	1080.84	954.04	955.50	1084.37	955.91
11/1/97	941.80	1085.96	950.32	970.68	951.33	952.20	1080.80	954.06	955.52	1084.33	955.91
11/2/97	941.78	1085.95	950.28	970.88	951.31	952.16	1080.78	954.08	955.52	1084.26	955.91
11/3/97	941.73	1085.87	950.26	970.94	951.27	952.11	1080.71	954.10	955.54	1084.18	955.91
11/4/97	941.71	1085.78	950.24	971.01	951.24	952.09	1080.62	954.12	955.54	1084.09	955.89
11/5/97	941.71	1085.75	950.21	971.27	951.24	952.07	1080.59	954.12	955.58	1084.03	955.89
11/6/97	941.63	1085.75	950.19	971.42	951.20	952.03	1080.59	954.19	955.58	1083.96	955.89
11/7/97	941.67	1085.73	950.19	971.57	951.20	952.03	1080.57	954.21	955.63	1083.90	955.89
11/8/97	941.63	1085.73	950.19	971.77	951.20	951.98	1080.57	954.23	955.69	1083.87	955.89
11/9/97	941.63	1085.71	950.19	971.92	951.20	951.98	1080.55	954.28	955.71	1083.83	955.91
11/10/97	941.60	1086.94	950.17	972.05	951.18	951.96	1081.78	954.32	955.71	1084.48	956.08
11/11/97	942.25	1087.39	950.21	972.20	951.18	951.96	1082.23	954.38	955.78	1085.46	956.58
11/12/97	943.18	1087.34	950.39	972.39	951.22	952.07	1082.17	954.56	955.87	1085.72	956.39
11/13/97	943.47	1087.46	950.56	972.52	951.33	952.16	1082.30	954.77	956.00	1085.93	956.32

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
11/14/97	943.51	1087.43	950.71	972.57	951.37	952.22	1082.26	954.93	956.08	1086.08	956.30
11/15/97	943.66	1087.43	950.82	972.74	951.48	952.33	1082.26	955.08	956.28	1086.19	956.32
11/16/97	943.86	1087.48	950.95	973.00	951.59	952.44	1082.32	955.23	956.45	1086.30	956.34
11/17/97	943.96	1087.59	951.08	973.02	951.70	952.52	1082.43	955.38	956.58	1086.39	956.34
11/18/97	944.48	1088.13	951.25	973.41	951.78	952.63	1082.97	955.57	956.73	1086.67	956.34
11/19/97	945.83	1088.58	951.45	973.69	951.94	952.80	1083.42	955.83	956.95	1086.99	956.34
11/20/97	944.72	1088.92	951.71	974.04	952.11	953.00	1083.76	956.12	957.21	1087.34	956.36
11/21/97	944.35	1089.21	951.80	974.15	952.22	953.11	1084.05	956.22	957.36	1087.64	956.34
11/22/97	944.33	1089.39	951.93	974.19	952.33	953.17	1084.23	956.31	957.45	1087.95	956.30
11/23/97	944.38	1089.54	952.01	974.23	952.41	953.28	1084.38	956.42	957.53	1088.16	956.36
11/24/97	944.51	1089.68	952.12	974.39	952.54	953.39	1084.52	956.53	957.66	1088.40	956.47
11/25/97	944.70	1089.96	952.24	974.71	952.76	953.58	1084.84	956.59	957.82	1088.65	956.57
11/26/97	944.98	1090.51	952.37	975.10	952.91	953.71	1087.34	956.89	957.99	1089.08	956.78
11/27/97	944.85	1091.31	952.45	974.95	952.91	953.74	1087.72	956.98	957.95	1090.05	956.54
11/28/97	944.98	1091.27	952.54	975.01	953.04	953.89	1087.43	957.09	958.08	1090.23	956.87
11/29/97	945.16	1090.84	952.67	975.19	953.17	954.02	1086.85	957.17	958.25	1089.88	956.96
11/30/97	945.37	1090.42	952.82	975.53	953.34	954.17	1086.40	957.30	958.45	1089.49	957.17
12/1/97	945.42	1090.19	952.93	975.64	953.45	954.28	1086.31	957.41	958.54	1089.30	957.22
12/2/97	945.42	1089.93	953.02	975.53	953.49	954.34	1086.11	957.52	958.54	1089.08	957.24
12/3/97	945.94	1089.69	953.19	975.60	953.65	954.49	1085.93	957.63	958.64	1088.86	957.41
12/4/97	945.89	1089.47	953.32	975.86	953.82	954.67	1085.73	957.76	958.86	1088.65	957.63
12/5/97	947.21	1089.25	953.51	976.12	953.97	954.84	1085.54	957.93	959.03	1088.41	957.80
12/6/97	947.04	1090.08	953.73	976.40	954.14	955.04	1086.60	958.10	959.21	1089.38	957.99
12/7/97	946.63	1091.46	953.82	976.23	954.21	955.10	1087.32	958.19	959.23	1090.60	957.97
12/8/97	946.72	1091.98	953.95	975.97	954.32	955.23	1087.56	958.26	959.36	1091.22	957.99
12/9/97	944.90	1092.35	953.86	975.51	954.34	955.19	1087.66	958.08	959.27	1091.61	957.91
12/10/97	947.08	1092.68	954.03	975.69	954.47	955.38	1087.79	958.23	959.40	1091.92	958.08
12/11/97	945.46	1092.85	953.95	975.58	954.51	955.40	1087.83	958.08	959.34	1092.13	958.06
12/12/97	945.70	1092.81	953.97	975.58	954.64	955.56	1087.79	958.06	959.42	1092.13	958.15
12/13/97	946.13	1092.81	954.01	975.66	954.69	955.64	1087.77	958.04	959.42	1092.13	958.21
12/14/97	946.52	1092.83	954.08	975.75	954.77	955.79	1087.77	958.06	959.36	1092.16	958.25
12/15/97	946.80	1092.89	954.16	975.79	954.86	955.92	1087.83	958.08	959.49	1092.22	958.28
12/16/97	947.02	1092.94	954.27	975.71	954.90	956.03	1087.85	958.10	959.49	1092.26	958.23
12/17/97	947.82	1092.94	954.42	975.82	955.05	956.25	1087.85	958.21	959.51	1092.26	958.38
12/18/97	947.63	1092.85	954.58	975.99	955.18	956.46	1087.74	958.23	959.71	1092.18	958.60
12/19/97	948.79	1092.91	954.79	975.82	955.27	956.64	1087.97	958.30	959.66	1092.42	958.47
12/20/97	947.97	1092.44	954.92	975.71	955.36	956.79	1087.56	958.32	959.71	1091.90	958.51

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
12/21/97	948.38	1092.01	955.12	975.99	955.59	957.07	1087.09	958.41	959.83	1091.31	958.84
12/22/97	948.62	1091.46	955.29	975.88	955.62	957.16	1086.65	958.45	959.92	1090.68	958.64
12/23/97	949.81	1090.99	955.53	975.64	955.70	957.35	1086.29	958.54	960.31	1090.14	958.67
12/24/97	949.64	1090.66	955.79	975.90	955.96	957.70	1086.08	958.69	960.59	1089.77	958.95
12/25/97	949.31	1090.25	955.92	975.73	956.03	957.79	1085.82	958.71	960.64	1089.38	958.88
12/26/97	950.87	1089.86	956.16	975.58	956.11	957.98	1085.55	958.84	960.70	1088.97	958.90
12/27/97	952.84	1089.56	956.61	976.08	956.53	958.50	1085.34	959.16	961.07	1088.67	959.32
12/28/97	953.43	1089.19	957.04	976.34	956.81	958.87	1085.03	959.49	961.35	1088.28	959.55
12/29/97	953.97	1088.82	957.55	976.57	957.27	959.29	1084.80	959.80	961.76	1087.91	959.97
12/30/97	954.40	1088.50	957.96	976.75	957.61	959.70	1084.56	960.15	962.00	1087.64	960.25
12/31/97	954.01	1088.16	958.29	976.77	957.87	960.00	1084.35	960.36	962.48	1087.33	960.45
1/1/98	953.65	1088.11	958.55	976.47	958.20	960.31	1084.85	960.56	962.54	1087.25	960.77
1/2/98	953.93	1088.39	958.78	976.40	958.44	960.57	1085.68	960.73	962.11	1087.64	960.99
1/3/98	953.95	1088.87	959.04	976.34	958.69	960.83	1086.40	960.88	962.26	1088.18	961.18
1/4/98	953.99	1089.11	959.24	976.29	958.93	961.09	1086.35	961.04	962.46	1088.44	961.38
1/5/98	953.97	1089.00	959.41	976.19	959.08	961.24	1085.95	961.17	962.63	1088.29	961.44
1/6/98	953.84	1088.78	959.63	976.19	959.32	961.48	1085.54	961.34	962.80	1088.03	961.64
1/7/98	952.15	1088.59	959.54	976.14	959.52	961.61	1085.19	961.23	962.93	1087.74	961.85
1/8/98	953.99	1088.33	959.84	976.27	959.76	961.89	1084.89	961.43	963.00	1087.46	962.03
1/9/98	952.41	1088.11	959.82	976.25	959.86	961.95	1084.69	961.36	963.13	1087.20	962.16
1/10/98	952.22	1088.91	959.76	976.06	959.84	961.95	1085.66	961.25	963.04	1088.11	962.05
1/11/98	952.15	1090.28	959.74	975.97	959.93	962.00	1086.62	961.21	963.04	1089.48	962.09
1/12/98	952.44	1090.80	959.78	975.93	960.06	962.13	1086.86	961.21	963.09	1090.17	962.18
1/13/98	952.65	1091.14	959.99	975.58	960.31	962.34	1087.01	961.07	963.20	1090.54	962.33
1/14/98	952.89	1091.16	960.05	975.39	960.35	962.38	1086.97	961.04	963.20	1090.61	962.26
1/15/98	953.45	1090.99	960.25	975.43	960.54	962.60	1086.75	961.15	963.25	1090.39	962.41
1/16/98	953.82	1090.82	960.44	975.54	960.63	962.73	1086.57	961.22	963.29	1090.15	962.46
1/17/98	954.19	1090.58	960.68	975.54	960.72	962.90	1086.36	961.30	963.31	1089.85	962.50
1/18/98	954.65	1090.25	960.98	975.58	960.91	963.12	1086.07	961.41	963.44	1089.46	962.63
1/19/98	955.04	1090.08	961.26	975.62	961.09	963.33	1085.98	961.54	963.55	1089.29	962.78
1/20/98	955.21	1090.04	961.55	975.62	961.19	963.55	1085.98	961.65	963.61	1089.27	962.85
1/21/98	955.45	1089.84	961.78	975.67	961.28	963.70	1085.87	961.74	963.66	1089.09	962.85
1/22/98	955.77	1089.54	962.04	975.69	961.45	963.92	1085.58	961.84	963.81	1088.75	962.98
1/23/98	956.03	1089.21	962.30	975.73	961.63	964.14	1085.31	961.97	964.24	1088.38	963.11
1/24/98	956.90	1088.91	962.65	975.84	961.87	964.42	1085.06	962.21	964.59	1088.01	963.30
1/25/98	957.07	1088.59	962.89	975.91	962.00	964.61	1084.89	962.36	964.65	1087.69	963.39
1/26/98	957.37	1088.37	963.17	975.95	962.23	964.89	1084.75	962.54	964.78	1087.49	963.61

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
1/27/98	957.63	1088.15	963.41	976.01	962.49	965.15	1084.64	962.73	965.06	1087.27	963.82
1/28/98	957.66	1087.89	963.65	976.04	962.64	965.37	1084.50	962.88	965.13	1087.04	963.95
1/29/98	957.85	1087.72	963.84	976.10	962.84	965.59	1084.44	963.06	965.35	1086.86	964.15
1/30/98	957.92	1088.59	964.01	976.17	963.03	965.78	1085.18	963.21	965.39	1087.88	964.30
1/31/98	962.38	1088.74	964.84	976.66	963.55	966.45	1085.25	963.95	965.91	1088.14	964.75
2/1/98	963.35	1088.52	965.40	977.12	963.92	966.89	1085.04	964.51	966.28	1087.90	965.10
2/2/98	960.45	1088.20	965.83	977.44	964.36	967.30	1084.68	964.94	966.75	1087.51	965.60
2/3/98	964.74	1088.07	966.66	977.98	965.11	968.16	1084.70	965.63	967.55	1087.30	966.38
2/4/98	964.93	1090.04	966.98	978.20	965.14	968.25	1086.52	965.96	967.58	1089.25	966.31
2/5/98	965.43	1091.38	967.48	978.20	965.55	968.71	1087.15	966.39	967.99	1090.41	966.72
2/6/98	967.03	1091.73	968.41	978.63	966.26	969.49	1087.53	967.09	968.70	1090.91	967.44
2/7/98	967.42	1092.85	969.21	978.87	966.59	969.85	1088.52	967.63	969.01	1092.19	967.72
2/8/98	968.57	1093.63	970.38	979.22	967.19	970.55	1089.04	968.34	969.63	1092.97	968.35
2/9/98	969.54	1093.59	971.68	979.57	967.76	971.20	1088.45	969.14	970.05	1092.69	968.87
2/10/98	970.37	1093.39	973.14	980.35	968.30	971.87	1087.98	970.44	970.28	1092.28	969.39
2/11/98	971.47	1093.26	974.60	980.83	968.95	972.56	1087.80	971.48	971.00	1092.00	970.08
2/12/98	972.63	1093.15	976.47	981.38	969.61	973.61	1087.66	972.91	971.70	1091.80	970.68
2/13/98	973.69	1093.06	978.14	981.85	970.51	974.61	1087.54	974.42	972.50	1091.58	971.41
2/14/98	974.73	1093.00	979.76	982.33	971.31	975.52	1087.46	975.53	973.20	1091.45	972.15
2/15/98	976.07	1093.37	981.43	982.78	972.11	976.45	1087.99	976.67	974.00	1091.95	972.84
2/16/98	976.53	1093.32	982.82	983.24	972.81	977.19	1087.75	977.67	974.70	1091.78	973.51
2/17/98	977.54	1093.34	984.33	983.74	973.71	978.18	1087.73	978.80	975.50	1091.78	974.36
2/18/98	978.11	1093.24	985.46	984.26	974.31	978.72	1087.61	979.60	976.10	1091.65	974.90
2/19/98	977.05	1093.24	986.52	984.47	975.11	979.53	1087.50	980.31	977.00	1091.56	975.75
2/20/98	980.23	1093.37	988.25	985.06	976.21	980.72	1087.70	981.72	978.00	1091.69	976.76
2/21/98	981.03	1093.32	989.42	985.56	976.91	981.52	1087.57	982.63	978.70	1091.60	977.46
2/22/98	982.29	1093.60	990.70	986.10	977.91	982.45	1088.11	983.65	979.60	1091.93	978.32
2/23/98	983.28	1094.73	992.06	986.60	978.91	983.51	1089.41	984.88	980.40	1092.88	979.04
2/24/98	983.91	1095.94	993.84	987.12	979.91	984.55	1089.88	985.97	981.10	1094.70	979.73
2/25/98	984.86	1095.75	995.55	987.68	980.71	985.44	1089.05	986.94	982.10	1094.35	980.68
2/26/98	985.82	1095.49	997.31	988.33	981.81	986.63	1088.46	988.20	983.20	1093.90	981.74
2/27/98	986.45	1095.25	998.65	988.96	982.71	987.60	1088.02	989.39	984.20	1093.49	982.76
2/28/98	988.24	1094.99	999.90	989.65	983.71	988.64	1087.72	990.58	985.20	1093.14	983.76
3/1/98	989.17	1094.80	1001.27	990.41	984.81	989.86	1087.50	991.92	986.30	1092.88	984.78
3/2/98	990.04	1094.62	1002.46	991.10	985.91	990.98	1087.30	993.18	987.30	1092.64	985.79
3/3/98	987.83	1094.38	1002.83	991.79	986.71	991.63	1087.07	993.74	988.10	1092.41	986.51
3/4/98	991.51	1094.30	1004.54	992.79	988.31	992.89	1087.07	995.30	988.80	1092.23	987.20

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
3/5/98	990.34	1094.23	1005.62	994.07	989.41	993.88	1087.16	996.36	989.80	1092.15	988.18
3/6/98	989.13	1094.41	1005.75	994.37	990.01	994.29	1087.50	996.62	990.40	1092.34	988.76
3/7/98	990.60	1094.38	1006.60	994.80	990.61	994.99	1087.50	997.40	991.30	1092.28	989.58
3/8/98	989.33	1094.38	1007.07	995.24	991.41	995.64	1087.45	998.09	991.90	1092.23	990.21
3/9/98	989.24	1094.36	1007.51	995.67	992.01	996.24	1087.39	998.72	992.50	1092.15	990.80
3/10/98	989.48	1094.36	1007.92	996.19	992.81	996.89	1087.37	999.39	993.20	1092.10	991.40
3/11/98	990.00	1094.36	1008.39	996.77	993.51	997.59	1087.37	1000.08	993.80	1092.06	992.03
3/12/98	990.47	1094.30	1008.81	997.16	994.11	998.21	1087.36	1000.65	994.50	1092.02	992.64
3/13/98	993.29	1094.34	1009.61	997.68	994.91	998.99	1087.37	1001.49	995.10	1091.99	993.29
3/14/98	995.18	1094.42	1011.25	998.44	996.12	1000.41	1087.54	1002.46	996.54	1092.21	995.56
3/15/98	993.21	1094.44	1011.12	998.65	996.51	1000.67	1087.54	1002.63	996.81	1092.21	996.04
3/16/98	993.32	1094.44	1011.58	999.22	997.14	1001.28	1087.47	1003.15	997.44	1092.17	996.73
3/17/98	993.47	1094.42	1011.90	999.67	997.70	1001.77	1087.45	1003.52	997.95	1092.10	997.28
3/18/98	993.84	1094.42	1012.27	1000.10	998.18	1002.25	1087.43	1003.93	998.45	1092.06	997.73
3/19/98	994.30	1094.39	1012.66	1000.57	998.72	1002.77	1087.40	1004.39	998.98	1092.02	998.29
3/20/98	994.84	1094.37	1013.14	1001.18	999.39	1003.42	1087.36	1004.97	999.65	1091.97	998.92
3/21/98	995.18	1094.31	1013.44	1001.56	999.83	1003.85	1087.32	1005.30	1000.10	1091.91	999.25
3/22/98	995.64	1094.29	1013.79	1002.06	1000.37	1004.39	1087.31	1005.75	1000.66	1091.89	999.92
3/23/98	996.12	1094.29	1014.13	1002.60	1001.00	1004.98	1087.31	1006.25	1001.26	1091.84	1000.57
3/24/98	996.59	1094.35	1014.57	1003.14	1001.60	1005.56	1087.25	1006.73	1001.86	1091.87	1001.22
3/25/98	996.98	1094.46	1014.83	1003.59	1002.14	1006.06	1087.47	1007.10	1002.38	1092.08	1001.69
3/26/98	997.31	1094.63	1015.28	1003.87	1002.45	1006.39	1087.79	1007.33	1002.72	1092.52	1002.10
3/27/98	997.63	1094.55	1015.63	1004.23	1002.88	1006.80	1087.56	1007.94	1003.15	1092.32	1002.67
3/28/98	998.30	1094.74	1016.34	1005.03	1003.75	1007.64	1087.78	1008.18	1004.01	1092.52	1003.21
3/29/98	998.48	1094.63	1016.49	1005.20	1003.98	1007.86	1087.58	1008.63	1004.24	1092.43	1003.71
3/30/98	998.67	1094.46	1016.62	1005.35	1004.22	1008.05	1087.38	1008.98	1004.45	1092.23	1004.05
3/31/98	999.19	1094.44	1017.12	1005.91	1004.89	1008.66	1087.25	1009.63	1005.07	1092.13	1004.57
4/1/98	998.97	1094.59	1017.49	1006.30	1005.35	1009.09	1087.56	1009.89	1005.53	1092.45	1004.94
4/2/98	998.80	1094.55	1017.66	1006.38	1005.52	1009.22	1087.56	1009.85	1005.67	1092.43	1005.22
4/3/98	999.78	1094.59	1018.16	1006.88	1006.13	1009.76	1087.49	1010.89	1006.23	1092.36	1005.76
4/4/98	999.52	1094.52	1018.51	1007.29	1006.58	1010.22	1087.34	1011.32	1006.70	1092.28	1006.22
4/5/98	1000.04	1094.52	1019.03	1007.74	1007.12	1010.72	1087.40	1011.32	1007.22	1092.28	1006.91
4/6/98	1000.86	1094.48	1019.42	1008.06	1007.49	1011.09	1087.32	1012.42	1007.60	1092.21	1007.35
4/7/98	1000.30	1094.39	1019.57	1008.23	1007.77	1011.30	1087.25	1012.79	1007.83	1092.10	1007.74
4/8/98	1001.85	1094.37	1020.00	1008.55	1008.08	1011.67	1087.20	1013.29	1008.22	1092.04	1008.15
4/9/98	1004.02	1094.33	1021.06	1009.52	1008.97	1012.69	1087.18	1014.35	1009.25	1092.00	1008.95
4/10/98	1002.85	1094.31	1021.30	1009.87	1009.46	1013.08	1087.16	1014.81	1009.66	1091.97	1009.40

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
4/11/98	1003.20	1094.33	1021.71	1010.32	1009.98	1013.58	1087.11	1015.37	1010.18	1091.93	1009.90
4/12/98	1004.00	1094.29	1021.86	1010.32	1010.03	1013.62	1087.22	1015.50	1010.24	1092.02	1010.10
4/13/98	1002.24	1094.26	1021.67	1010.29	1010.20	1013.64	1087.11	1015.48	1010.27	1091.95	1010.31
4/14/98	1001.77	1094.22	1021.89	1010.61	1010.61	1014.01	1087.07	1015.82	1010.66	1091.89	1010.70
4/15/98	1009.67	1094.20	1023.62	1011.80	1011.52	1015.24	1087.05	1017.36	1011.91	1091.84	1011.48
4/16/98	1003.24	1094.16	1022.75	1011.48	1011.54	1014.96	1087.02	1016.86	1011.65	1091.78	1011.61
4/17/98	1002.92	1094.11	1022.64	1011.52	1011.74	1015.05	1086.98	1016.97	1011.75	1091.74	1011.79
4/18/98	1003.15	1094.07	1022.93	1011.71	1012.32	1015.36	1086.94	1016.90	1011.73	1091.70	1011.23
4/19/98	1004.38	1094.05	1023.23	1012.01	1012.71	1015.74	1086.92	1017.23	1012.12	1091.68	1011.49
4/20/98	1003.63	1094.03	1023.36	1012.25	1013.03	1016.03	1086.90	1017.45	1012.41	1091.64	1011.75
4/21/98	1003.32	1094.00	1023.32	1011.99	1013.18	1016.13	1086.87	1017.45	1012.52	1091.62	1011.96
4/22/98	1003.97	1094.00	1023.45	1012.49	1013.44	1016.37	1086.85	1017.60	1012.76	1091.57	1012.35
4/23/98	1005.12	1093.96	1023.82	1012.94	1013.81	1016.76	1086.76	1017.97	1013.16	1091.53	1012.68
4/24/98	1006.46	1093.94	1024.19	1013.38	1014.29	1017.24	1086.78	1018.36	1013.64	1091.51	1013.09
4/25/98	1005.01	1093.94	1024.14	1013.57	1014.55	1017.43	1086.78	1018.40	1013.84	1091.49	1013.31
4/26/98	1004.41	1093.90	1023.91	1013.55	1014.57	1017.37	1086.76	1018.25	1013.78	1091.46	1013.39
4/27/98	1004.80	1093.87	1024.06	1013.74	1014.87	1017.67	1086.78	1018.40	1014.08	1091.46	1013.63
4/28/98	1004.60	1093.92	1024.01	1013.94	1015.11	1017.82	1086.81	1018.42	1014.24	1091.46	1013.91
4/29/98	1004.56	1093.90	1023.95	1013.92	1015.24	1017.91	1086.81	1018.38	1014.33	1091.44	1014.11
4/30/98	1004.51	1093.87	1023.80	1013.22	1015.35	1017.98	1086.78	1018.16	1014.40	1091.42	1014.19
5/1/98	1004.34	1093.90	1023.62	1012.23	1015.39	1018.02	1086.76	1017.84	1014.44	1091.42	1014.15
5/2/98	1004.38	1093.92	1023.58	1012.08	1015.54	1018.13	1086.78	1017.75	1014.56	1091.42	1014.30
5/3/98	1005.34	1093.98	1023.54	1011.90	1015.54	1018.17	1086.85	1017.64	1014.60	1091.49	1014.32
5/4/98	1004.95	1094.03	1023.69	1012.32	1015.78	1018.41	1086.88	1017.84	1014.84	1091.57	1014.50
5/5/98	1011.96	1094.44	1025.14	1012.99	1016.41	1019.30	1087.52	1018.94	1015.74	1092.11	1014.86
5/6/98	1006.35	1094.72	1024.62	1012.68	1016.43	1019.14	1087.88	1018.57	1015.59	1092.63	1014.86
5/7/98	1006.83	1094.63	1024.53	1012.64	1016.47	1019.17	1087.62	1018.51	1015.61	1092.53	1015.04
5/8/98	1006.92	1094.55	1024.51	1012.83	1016.60	1019.30	1087.43	1018.49	1015.75	1092.35	1015.15
5/9/98	1007.05	1094.50	1024.56	1013.05	1016.78	1019.45	1087.30	1018.57	1015.90	1092.24	1015.25
5/10/98	1006.18	1094.42	1024.49	1012.99	1016.86	1019.51	1087.24	1018.59	1015.97	1092.16	1015.38
5/11/98	1006.57	1094.39	1024.49	1012.94	1016.99	1019.62	1087.21	1018.64	1016.08	1092.09	1015.49
5/12/98	1006.38	1094.39	1024.64	1013.31	1017.21	1019.84	1087.12	1018.81	1016.30	1092.05	1015.62
5/13/98	1007.39	1094.96	1024.84	1013.18	1017.14	1019.84	1088.06	1018.79	1016.31	1092.94	1015.56
5/14/98	1006.57	1095.00	1024.84	1013.29	1017.21	1019.88	1088.02	1018.79	1016.35	1093.05	1015.54
5/15/98	1007.07	1094.98	1025.01	1013.55	1017.27	1020.14	1087.86	1019.03	1016.62	1092.92	1015.90
5/16/98	1007.57	1094.89	1025.01	1013.44	1017.66	1020.34	1087.66	1019.05	1016.81	1092.79	1016.25
5/17/98	1007.70	1094.85	1025.05	1013.68	1017.79	1020.47	1087.55	1019.11	1016.95	1092.66	1016.58

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
5/18/98	1006.84	1094.77	1024.98	1013.71	1017.99	1020.51	1087.44	1019.15	1016.86	1092.55	1016.55
5/19/98	1006.38	1094.75	1024.83	1013.58	1017.93	1020.45	1087.49	1019.02	1016.78	1092.49	1016.90
5/20/98	1006.68	1094.75	1024.89	1013.15	1017.99	1020.55	1087.49	1019.00	1016.88	1092.45	1016.97
5/21/98	1006.73	1094.75	1024.89	1013.08	1018.01	1020.58	1087.46	1018.95	1016.89	1092.42	1017.07
5/22/98	1006.77	1094.75	1024.94	1013.15	1018.14	1020.68	1087.44	1019.04	1016.99	1092.38	1017.27
5/23/98	1006.86	1094.70	1024.89	1013.04	1018.10	1020.68	1087.39	1018.95	1016.98	1092.34	1017.46
5/24/98	1006.71	1094.70	1024.85	1012.99	1018.14	1020.68	1087.37	1018.91	1016.97	1092.29	1017.55
5/25/98	1007.81	1094.68	1024.96	1012.99	1018.21	1020.77	1087.33	1018.93	1017.04	1092.27	1017.94
5/26/98	1007.40	1094.66	1025.00	1013.36	1018.36	1020.88	1087.31	1019.08	1017.14	1092.25	1018.01
5/27/98	1008.76	1094.62	1025.15	1013.45	1018.38	1020.97	1087.30	1019.13	1017.22	1092.21	1017.98
5/28/98	1007.12	1094.59	1025.00	1013.08	1018.45	1020.99	1087.28	1019.04	1017.23	1092.16	1018.07
5/29/98	1006.62	1094.59	1024.78	1012.63	1018.32	1020.81	1087.22	1018.82	1017.04	1092.14	1017.94
5/30/98	1007.03	1094.55	1024.91	1012.93	1018.45	1020.97	1087.24	1018.95	1017.18	1092.12	1018.01
5/31/98	1007.75	1094.55	1024.83	1012.86	1018.34	1020.86	1087.20	1018.84	1017.06	1092.08	1017.98
6/1/98	1007.55	1094.53	1024.94	1012.82	1018.47	1021.01	1087.20	1018.93	1017.20	1092.06	1018.01
6/2/98	1006.86	1094.51	1024.81	1012.84	1018.45	1020.92	1087.17	1018.87	1017.11	1092.03	1017.88
6/3/98	1006.92	1094.51	1024.72	1012.30	1018.38	1020.86	1087.13	1018.69	1017.03	1092.01	1017.77
6/4/98	1007.27	1094.46	1024.81	1012.56	1018.40	1020.94	1087.11	1018.76	1017.11	1091.97	1017.85
6/5/98	1007.36	1094.44	1024.89	1012.73	1018.51	1021.03	1087.10	1018.84	1017.18	1091.97	1017.92
6/6/98	1007.40	1094.40	1024.85	1012.30	1018.51	1021.05	1087.01	1018.71	1017.19	1091.93	1018.05
6/7/98	1007.46	1094.36	1024.81	1012.56	1018.49	1021.01	1086.99	1018.69	1017.14	1091.88	1018.14
6/8/98	1007.46	1094.33	1024.85	1012.78	1018.53	1021.05	1086.93	1018.76	1017.17	1091.86	1018.29
6/9/98	1008.59	1094.31	1024.91	1012.86	1018.58	1021.12	1086.92	1018.80	1017.22	1091.82	1018.72
6/10/98	1007.77	1094.29	1024.96	1013.04	1018.68	1021.18	1086.92	1018.93	1017.28	1091.82	1019.11
6/11/98	1007.81	1094.31	1024.96	1013.04	1018.71	1021.20	1086.95	1018.91	1017.29	1091.80	1019.50
6/12/98	1008.42	1094.30	1025.03	1013.11	1018.72	1021.15	1086.92	1018.91		1091.82	
6/13/98	1007.42	1094.28	1024.94	1013.35	1018.68	1021.08	1086.93	1018.82		1091.84	
6/14/98	1007.49	1094.30	1025.03	1013.57	1018.85	1021.19	1086.95	1018.95		1091.84	
6/15/98	1007.55	1094.34	1025.03	1013.37	1018.94	1021.30	1086.97	1019.02		1091.84	
6/16/98	1008.22	1094.34	1024.96	1013.37	1018.90	1021.28	1086.90	1018.93		1091.82	
6/17/98	1007.64	1094.30	1024.92	1013.26	1018.83	1021.19	1086.93	1018.82		1091.84	
6/18/98	1008.72	1094.28	1025.05	1013.57	1018.85	1021.26	1086.93	1018.95		1091.82	
6/19/98	1007.84	1094.25	1025.01	1013.42	1018.92	1021.30	1086.92	1018.95		1091.78	
6/20/98	1007.84	1094.23	1024.94	1013.22	1018.92	1021.28	1086.88	1018.89		1091.76	
6/21/98	1008.27	1094.23	1024.86	1013.31	1018.85	1021.19	1086.88	1018.87		1091.74	
6/22/98	1007.73	1094.19	1024.79	1013.11	1018.83	1021.17	1086.86	1018.82		1091.69	
6/23/98	1008.46	1094.19	1024.77	1013.05	1018.85	1021.19	1086.83	1018.82		1091.67	

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
6/24/98	1007.77	1094.17	1024.77	1013.22	1018.88	1021.19	1086.83	1018.82		1091.67	
6/25/98	1007.42	1094.17	1024.60	1013.00	1018.79	1021.08	1086.81	1018.69		1091.65	
6/26/98	1007.73	1094.17	1024.60	1012.96	1018.79	1021.08	1086.83	1018.71		1091.63	
6/27/98	1008.96	1094.15	1024.70	1012.98	1018.83	1021.17	1086.81	1018.82		1091.61	
6/28/98	1007.58	1094.15	1024.40	1012.92	1018.75	1021.02	1086.79	1018.67		1091.58	
6/29/98	1007.92	1094.19	1024.36	1012.79	1018.64	1020.93	1086.81	1018.61		1091.61	
6/30/98	1007.40	1094.12	1024.21	1012.79	1018.62	1020.87	1086.77	1018.52		1091.58	
7/1/98	1007.40	1094.17	1024.10	1012.81	1018.62	1020.89	1086.79	1018.48		1091.58	
7/2/98	1007.12	1094.12	1023.90	1012.40	1018.49	1020.74	1086.77	1018.28		1091.58	
7/3/98	1007.01	1094.15	1023.73	1012.16	1018.38	1020.61	1086.74	1018.09		1091.56	
7/4/98	1007.01	1094.12	1023.60	1012.03	1018.29	1020.54	1086.75	1017.98		1091.56	
7/5/98	1008.05	1094.10	1023.56	1011.88	1018.18	1020.52	1086.74	1017.89		1091.54	
7/6/98	1006.75	1094.10	1023.30	1011.75	1018.07	1020.32	1086.72	1017.70		1091.54	
7/7/98	1006.58	1094.08	1023.06	1011.62	1017.99	1020.22	1086.68	1017.57		1091.52	
7/8/98	1006.51	1094.06	1022.95	1011.60	1017.97	1020.15	1086.66	1017.48		1091.50	
7/9/98	1006.43	1094.04	1022.75	1011.60	1017.90	1020.06	1086.66	1017.37		1091.50	
7/10/98	1006.25	1094.04	1022.52	1011.45	1017.73	1019.89	1086.65	1017.18		1091.48	
7/11/98	1006.12	1094.02	1022.28	1011.32	1017.62	1019.78	1086.61	1017.09		1091.45	
7/12/98	1005.99	1093.99	1022.04	1011.23	1017.51	1019.67	1086.59	1016.94		1091.43	
7/13/98	1005.91	1093.97	1021.82	1011.10	1017.36	1019.50	1086.56	1016.74		1091.41	
7/14/98	1005.67	1093.95	1021.59	1011.03	1017.25	1019.37	1086.54	1016.57		1091.39	
7/15/98	1006.69	1094.02	1021.58	1011.09	1017.11	1019.29	1086.56	1016.05	1015.46	1091.45	
7/16/98	1006.75	1093.90	1021.43	1011.07	1017.07	1019.24	1086.39	1016.01	1015.40	1091.37	1015.39
7/17/98	1005.76	1093.88	1020.97	1010.83	1016.85	1018.87	1086.35	1015.75	1015.12	1091.32	1015.19
7/18/98	1005.45	1093.86	1020.67	1010.72	1016.70	1018.72	1086.31	1015.57	1015.01	1091.30	1015.12
7/19/98	1005.34	1093.82	1020.32	1010.53	1016.42	1018.46	1086.28	1015.29	1014.77	1091.26	1014.89
7/20/98	1005.95	1093.82	1020.13	1010.38	1016.31	1018.36	1086.24	1015.12	1014.62	1091.24	1014.74
7/21/98	1005.78	1093.75	1019.89	1010.29	1016.20	1018.20	1086.21	1014.92	1014.51	1091.19	1014.65
7/22/98	1005.56	1093.73	1019.61	1010.18	1016.05	1018.03	1086.24	1014.66	1014.36	1091.19	1014.51
7/23/98	1005.32	1093.77	1019.33	1010.07	1015.88	1017.84	1086.30	1014.51	1014.19	1091.22	1014.34
7/24/98	1005.26	1093.77	1019.04	1009.99	1015.66	1017.64	1086.31	1014.38	1014.01	1091.22	1014.18
7/25/98	1005.04	1093.84	1018.79	1009.86	1015.53	1017.47	1086.39	1014.17		1091.28	1014.04
7/26/98	1004.78	1093.86	1018.53	1009.75	1015.36	1017.29	1086.42	1013.97		1091.30	1013.89
7/27/98	1004.54	1093.86	1018.22	1009.66	1015.20	1017.10	1086.40	1013.73		1091.30	1013.73
7/28/98	1004.24	1093.84	1017.88	1009.51	1014.97	1016.86	1086.37	1013.45		1091.28	1013.53
7/29/98	1003.70	1093.77	1017.44	1009.25	1014.68	1016.54	1086.31	1013.28		1091.22	1013.24
7/30/98	1003.44	1093.77	1017.10	1009.12	1014.47	1016.34	1086.28	1013.08		1091.19	1013.06

GROUNDWATER ELEVATION DATA FOR THE SHALLOW
MONITORING WELLS AT THE JET PROPULSION LABORATORY
(September, 1997 - August, 1998)

Date	Well Number										
	MH-01	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-13	MW-15	MW-16
7/31/98	1003.27	1093.75	1016.71	1008.91	1014.19	1016.04	1086.26	1012.71		1091.19	1012.86
8/1/98	1002.94	1093.73	1016.38	1008.78	1013.90	1015.80	1086.24	1012.48		1091.17	1012.65
8/2/98	1002.68	1093.71	1016.06	1008.60	1013.67	1015.56	1086.21	1012.19		1091.15	1012.43
8/3/98	1002.46	1093.69	1015.75	1008.45	1013.47	1015.37	1086.17	1011.98		1091.13	1012.29
8/4/98	1002.18	1093.66	1015.39	1008.36	1013.19	1015.09	1086.13	1011.78		1091.09	1012.03
8/5/98	1001.84	1093.64	1015.00	1007.97	1012.86	1014.78	1086.08	1010.40		1091.06	1011.75
8/6/98	1001.60	1093.64	1014.67	1007.84	1012.65	1014.54	1086.08	1010.25		1091.02	1011.55
8/7/98	1001.42	1093.62	1014.37	1007.76	1012.41	1014.33	1086.08	1009.96		1091.04	1011.37
8/8/98	1001.10	1093.58	1013.98	1007.56	1012.11	1014.00	1086.03	1009.75		1091.02	1011.08
8/9/98	1000.75	1093.49	1013.54	1007.32	1011.76	1013.66	1085.88	1009.31		1090.93	1010.77
8/10/98	1000.49	1093.40	1013.22	1007.39	1011.50	1013.42	1085.81	1009.10		1090.87	1010.55
8/11/98	1000.23	1093.51	1012.87	1007.11	1011.22	1013.16	1085.99	1008.77		1090.93	1010.34
8/12/98	999.95	1093.45	1012.55	1006.89	1010.94	1012.85	1085.86	1008.47		1090.87	1010.07
8/13/98	999.71	1093.36	1012.22	1006.70	1010.72	1012.57	1085.79	1008.23		1090.78	1009.83
8/14/98	999.52	1093.27	1011.94	1006.61	1010.55	1012.38	1085.72	1007.97		1090.72	1009.67
8/15/98	999.22	1093.17	1011.57	1006.44	1010.27	1012.12	1085.65	1007.69		1090.61	1009.40
8/16/98	998.93	1093.14	1011.23	1006.26	1010.01	1011.81	1085.57	1007.39		1090.54	1009.13
8/17/98	998.51	1093.14	1010.84	1006.00	1009.66	1011.34	1085.23	1006.91	1008.52	1090.50	1008.63
8/18/98	998.30	1093.21	1010.40	1005.82	1009.29	1011.08	1085.39	1007.45	1008.26	1090.55	1008.36
8/19/98	998.04	1093.21	1010.10	1005.65	1009.01	1010.82	1085.44	1007.19	1008.00	1090.60	1008.15
8/20/98	997.84	1093.14	1009.81	1005.52	1008.75	1010.56	1085.33	1006.95	1007.74	1090.53	1007.91
8/21/98	997.58	1093.03	1009.51	1005.36	1008.51	1010.32	1085.24	1006.67	1007.50	1090.44	1007.68
8/22/98	997.37	1092.88	1009.23	1005.23	1008.29	1010.06	1085.08	1006.41	1007.24	1090.31	1007.44
8/23/98	997.15	1092.67	1008.95	1005.15	1008.12	1009.84	1084.94	1006.17	1007.03	1090.16	1007.23
8/24/98	996.85	1092.43	1008.56	1004.93	1007.80	1009.49	1084.81	1005.85	1006.68	1089.97	1006.90
8/25/98	996.52	1092.19	1008.23	1004.67	1007.49	1009.17	1084.70	1005.50	1006.35	1089.77	1006.61
8/26/98	996.46	1092.00	1007.95	1004.50	1007.25	1008.93	1084.56	1005.26	1006.12	1089.56	1006.38
8/27/98	996.41	1091.84	1007.69	1004.35	1006.99	1008.69	1084.43	1005.00	1005.88	1089.38	1006.11
8/28/98	995.87	1091.63	1007.37	1004.19	1006.84	1008.43	1084.27	1004.65	1005.62	1089.21	1005.91
8/29/98	995.57	1091.37	1007.04	1004.04	1006.63	1008.13	1084.14	1004.39	1005.32	1089.02	1005.64
8/30/98	995.33	1091.11	1006.76	1003.91	1006.41	1007.89	1084.12	1004.13	1005.08	1088.82	1005.42
8/31/98	995.07	1090.78	1006.48	1003.78	1006.21	1007.65	1083.96	1003.88	1004.84	1088.58	1005.19