REPORT

QUARTERLY GROUNDWATER MONITORING RESULTS, OCTOBER-NOVEMBER, 1996

AT THE

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JET PROPULSION LABORATORY
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EXECUTIVE SUMMARY

Presented in this report are the results of the second long-term groundwater monitoring event (October-November 1996) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation/Feasibility Study (RI/FS) at the NASA-Jet Propulsion Laboratory (JPL). A long-term quarterly groundwater monitoring program was initiated in response to requests from the United States Environmental Protection Agency (USEPA). Between October 17 and November 21, 1996, groundwater samples were collected from 15 JPL on-site monitoring wells and from 5 JPL off-site monitoring wells. A summary of the sampling procedures is included in Section 2.0. Samples were analyzed for volatile organic compounds (VOCs), metals (arsenic, lead, total chromium, and hexavalent chromium), and major anions/cations. Additional analyses for tributyltin (TBT) were performed on samples from MW-13 and from Screen 2 of MW-12.

From these analyses, only three VOCs [carbon tetrachloride (CCl_4), trichloroethene (TCE), and 1,2-dichloroethane (1,2-DCA)], were detected in concentrations above state and federal Maximum Contaminant Levels (MCLs) for drinking water. TBT was not detected in any of the wells that were sampled for that particular compound. Hexavalent chromium was found in two wells. However, to date, MCLs have not been established for hexavalent chromium. None of the other metals analyzed (arsenic, lead, or total chromium) were detected at concentrations above their MCLs. Laboratory and field quality assurance/quality control (QA/QC) results indicate that the accuracy of these data is acceptable for its intended use. A summary of the analytical results is included in Section 3.0.

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

1.0 INTRODUCTION

Presented in this report are the results of the second long-term quarterly groundwater monitoring event completed at the Jet Propulsion Laboratory (JPL) as a result of the JPL Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation/ Feasibility Study (RI/FS). Between October 17 and November 21, 1996, the JPL groundwater monitoring wells (both on and off JPL) were sampled by Foster Wheeler Environmental Corporation (Foster Wheeler) personnel. The purpose of the long-term quarterly groundwater sampling program is to monitor groundwater elevations, flow directions, and quality beneath and adjacent to the JPL site.

The locations of the JPL on-site and off-site groundwater monitoring wells are shown on Figure 1-1. Monitoring wells MW-3, MW-4, MW-11, MW-12, MW-14, MW-17, MW-18, MW-19, MW-20, and MW-21 are deep, multi-port wells containing five screened intervals each and 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 wells, each containing a single screened interval located at the water table. Monitoring well MW-2 was inadvertently installed above the water table by the Army Corps of Engineers in 1989. It has since been replaced as a JPL sampling point with well MW-14 (Figure 1-1). A summary of the well construction details for the JPL groundwater monitoring wells is included in Table 1-1.

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

Analysis	EPA Method
Volatile Organic Compounds (all samples)	524.2
Total Chromium (all wells)	200.8
Hexavalent Chromium (all wells)	7196
Total Lead (all wells)	200.8
Total Arsenic (all wells)	200.9
Major Cations and Major Anions (all wells)	Various
Tributyltin (MW-13 and MW-12, Screen 2 only)	GC/FPD

In addition to groundwater samples, field quality assurance/quality control samples were collected for laboratory analysis. Sampling records for each shallow well are included in Appendix A, sampling records and piezometric pressure profiling records from the deep multi-port wells are included in Appendix B, and field instrument calibration forms are included in Appendix C. Laboratory analytical reports and associated chain-of-custody forms are included in Appendix D.

2.0 SAMPLING PROCEDURES

The collection and handling of groundwater samples at JPL followed two separate procedures, one designed for the shallow wells and the other for the deep multi-port (MP) wells. These procedures are outlined below.

2.1 SHALLOW MONITORING WELLS

The sampling procedure described below was applied to all the JPL shallow monitoring wells, which includes wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, and MW-15. MW-16 could not be sampled during the October-November 1996 event because groundwater was below the screened interval in this well. Long-term pumping from nearby municipal production wells lowered water levels beneath and surrounding JPL to unprecedented lows.

The primary equipment used to sample the shallow wells included dedicated 2-inch Grundfos Redi-Flo2® pumps, a pump controller, and a 220-volt generator. All of the dedicated 2-inch Grundfos Redi-Flo2® pump systems were decontaminated prior to their installation. All pumps were installed before the long-term quarterly monitoring program began. These decontamination procedures are described in detail in the "Field Sampling and Analysis Plan for Performing a Remedial Investigation at Operable Unit 1: On-Site Groundwater" (Ebasco, 1993a).

Prior to sampling each shallow well, the potential volatile organic vapor content of the headspace in each well was measured with a flame-ionization detector for health and safety purposes. The depth to water and the total depth to the bottom of each well from the top of the casing was then measured and recorded. Next, the dedicated 2-inch pump was positioned 3 to 5 feet below the water level measured in each well.

Before groundwater samples were collected in each shallow monitoring well, it was necessary to purge, by pumping, the water in each well casing to remove potentially altered groundwater that may have been exposed to the atmosphere and that was not representative of aquifer conditions. This purged groundwater was discharged into 500- or 1,000-gallon polyethylene storage tanks for disposal pursuant to Environmental Protection Agency (EPA) guidance on the management of investigation-derived wastes (EPA, 1991 and 1992a).

Groundwater parameters, including temperature, pH, conductivity and turbidity, of the water removed from each well were monitored during purging activities. After the measured 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), the groundwater samples were collected with the

dedicated pump. During sampling for volatile organic compounds, the pump rate was reduced to approximately 0.02 gallons per minute (gpm) to minimize sample agitation. All information concerning sampling was noted on Well Development/Well Sampling Log Forms included in Appendix A.

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

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

The Westbay sampling probe and sample bottles were decontaminated prior to sampling each screened interval in the deep MP wells, according to the following procedures:

- Wash each 250-ml stainless steel sample bottle in a solution of non-phosphate detergent (Liquinox®) and deionized water followed by washing each bottle in a solution of an acidic detergent (Citranox®) and deionized water.
- Rinse each bottle twice with deionized water.
- The interior surfaces of the Westbay sampling probe, and the hoses and valves associated with the Westbay sample bottles, were decontaminated by forcing several volumes of a solution of Liquinox® and deionized water through the sampling equipment. This was followed by forcing several volumes of a Citranox® and deionized water solution through the sampling equipment with a clean plastic squeeze bottle used only for this purpose.

Purging before sampling is not required in the deep multi-port monitoring wells because the groundwater is not exposed to the atmosphere. However, the first Westbay sampler with groundwater from each screened interval in the multi-port wells (approximately 1 liter) was not collected for sampling purposes but used to check pH, conductivity, temperature and turbidity in the field.

Since purging is not required to sample the deep multi-port monitoring wells, groundwater parameters (including pH, temperature, conductivity and turbidity) were measured and recorded prior to and immediately after each screen was sampled (Appendix B). The calibration and maintenance of the field instruments followed the procedures described previously in the OU-1 and OU-3 FSAPs (Ebasco, 1993a and 1994). These sampling procedures were applied to all the deep multi-port monitoring wells except for Screen 1 in wells MW-12, MW-18, MW-20 and MW-21 which could not be sampled during this event because of below normal water levels.

2.3 FIELD QA/QC SAMPLES

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

A minimum of one duplicate groundwater sample was collected for approximately every 20 groundwater samples (see Quality Assurance Program for Performing a Remedial Investigation for NASA-JPL; Ebasco, 1993b). Duplicate samples for VOCs and metals analysis were collected from shallow groundwater monitoring wells MW-10 and MW-13, and deep multi-port monitoring wells MW-4 (Screen 2), and MW-18 (Screen 3). The duplicate sample from MW-13 was also analyzed for tributyltin (TBT). In addition, one matrix spike (MS) and matrix spike duplicate (MSD) sample was collected and analyzed for VOCs for every 20 groundwater samples submitted to the laboratory. The MS/MSD samples were used to verify the accuracy of the analytical method.

Equipment blanks were collected during sampling of the deep multi-port wells by running American Society of Testing Materials (ASTM) Type II organic free water (provided by the analytical laboratory) through the sampling equipment as a final rinse after the equipment had been decontaminated. One equipment-blank sample was collected from the Westbay sample bottles during each day of sampling and it was analyzed for the same constituents as the groundwater samples collected to identify potential cross contamination because of inadequate decontamination procedures. Equipment blanks were not collected during sampling of the shallow wells as dedicated sampling equipment was used.

A trip blank, consisting of laboratory reagent grade water placed in two 40-ml glass vials by the laboratory, was transported with the sample bottles to the field. One trip blank was submitted with each shipment of groundwater samples from the field to the laboratory. Trip blanks were used to identify potential cross contamination of groundwater samples during transport. Further details of the field QA/QC program are provided in the Quality Assurance Project Plan (QAPP) (Ebasco, 1993b).

During this sampling event, a field blank was collected at well MW-7. This field blank consisted of sample bottles, filled with ASTM Type II organic free water supplied by the laboratory, left open at the well head during the sampling of the well. After sampling, the field-blank bottles were capped and analyzed for the same constituents as the groundwater samples being collected. The field blank is used to evaluate the influence that ambient conditions, or sample containers, may have on the analytical results.

3.0 ANALYTICAL RESULTS

JPL groundwater monitoring wells MW-1, MW-3 through MW-15, and MW-17 through MW-21 were sampled between October 17 and November 21, 1996. MW-2 was not sampled as it was replaced as a JPL monitoring point by deep multi-port well MW-14. Shallow well MW-16 could not be sampled as the water level was below the bottom of the screened interval during this event. Water levels were also below the uppermost screen (Screen 1) of deep multi-port wells MW-12, MW-18, MW-20, and MW-21, during the October-November 1996 event, prohibiting the collection of samples from these intervals as well.

The groundwater samples were analyzed for VOCs, total chromium, hexavalent chromium, total lead, total arsenic, and TBT (MW-13 and MW-12, Screen 2 only). All samples were also analyzed for general water chemistry parameters that included major cations and anions [sodium (Na), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), alkalinity, chloride (Cl), sulfate (SO_4), nitrate (NO_3) and total phosphate (PO_4)], total dissolved solids (TDS), specific conductivity and pH.

A summary of the samples collected, sample numbers used, and the analyses performed on each sample is presented in Table 3-1. Analytical laboratory reports and associated chain-of-custody forms are included in Appendix D. Results of the analyses for VOCs are summarized in Table-3-2 along with the Maximum Contaminant Levels (MCLs) for drinking water as listed in Title 22 of the California Code of Regulations and in the EPA Health Advisory Guidelines. Also included in Table 3-2 are the results for the first long-term quarterly sampling event completed in August-September 1996. The concentrations of three VOCs were above their MCLs (CCl_4, TCE, and 1,2-DCA). The results for these VOCs are presented on maps in Figures 3-1, 3-2, and 3-3 to illustrate these results. Analytical results for total chromium, hexavalent chromium, lead, and arsenic are summarized in Table 3-3 along with their respective drinking-water MCLs. These metals results are also presented on a map in Figure 3-4. Also included in Table 3-3 are the metals results from the first long-term quarterly sampling event completed in August-September 1996.

3.1 VOC RESULTS

Groundwater samples collected during the October-November 1996 sampling event were analyzed for over 60 different VOCs in accordance with EPA Method 524.2. A small number of compounds were detected in these samples. A summary of all the VOCs detected in the October-November 1996 samples is provided in Table 3-2.

Among the samples collected during the October-November 1996 sampling event, only three VOCs were found in concentrations exceeding the state and federal MCLs. These compounds include CCl_4, TCE, and 1,2-DCA.

CCl_4 in excess of both state and federal MCLs (0.5 µg/l) was found in seven of the on-site wells, and two of the off-site wells (Table 3-2). The location of these wells and the concentration of CCl_4 within them are shown in Figure 3-1. Overall, the highest concentrations of CCl_4 were found in shallow on-site wells MW-7 and MW-13.

TCE in excess of state and federal MCLs (5.0 µg/l) was detected in four on-site wells, and two off-site wells (Table 3-2). The location of those wells containing TCE above the MCLs are presented in Figure 3-2. The highest levels of TCE were found in shallow on-site wells MW-7 and MW-13.

1,2-DCA concentrations above both state and federal MCLs (0.5 µg/l) were found in three on-site wells (Table 3-2). 1,2-DCA was not detected above state and federal MCLs in any of the off-site wells. The location of the wells containing 1,2-DCA at levels above the MCLs are shown in Figure 3-3.

3.2 TRIBUTYLTIN (TBT) RESULTS

Analyses for TBT were performed on groundwater samples collected from Screen 2 of deep multi-port well MW-12 and from shallow well MW-13. A sample could not be collected from the uppermost screen in MW-12 because the water level was below the screened interval. A duplicate sample from MW-13 was also analyzed for TBT. TBT has been used throughout industry as an anti-foulant in cooling towers and, since cooling towers are and have been present at JPL, these TBT analyses were performed. Well MW-13 is the closest well to JPL's central cooling tower system (Building 296) and well MW-12 was chosen by Department of Toxic Substances Control (DTSC) as being downgradient of potential TBT releases.

TBT was not detected in any of the groundwater samples analyzed for that constituent during the October-November 1996 sampling event.

3.3 METALS RESULTS

Groundwater samples from the October-November 1996 sampling event were analyzed for the following suite of metals: total arsenic, total lead, total chromium, and hexavalent chromium. The results of these analyses are summarized in Table 3-3 and are presented by well location in Figure 3-4.

None of the October-November 1996 samples contained total arsenic, total lead, or total chromium in concentrations above the state and federal MCLs (0.05 mg/l). Hexavalent

chromium was detected in samples from shallow on-site wells MW-7 and MW-13 (see Table 3-3 and Figure 3-4). At this time, MCLs for hexavalent chromium have not been established by state or federal agencies.

3.4 QA/QC RESULTS

Review of the QA/QC data provided with the laboratory analytical results (Appendix D) indicates that the results obtained from October-November 1996 samples are acceptable for use. Surrogate compounds, matrix and blank spikes, and method blanks were used by the laboratory to determine the accuracy and precision of the analytical results and to identify any spurious results because of laboratory contamination or instrument malfunction.

In addition to the laboratory QA/QC procedures, QA/QC procedures were implemented in the field by Foster Wheeler personnel. These field procedures included the collection of duplicate samples, equipment blanks, trip blanks, and a field blank.

Duplicate samples were used as an independent means of evaluating the precision of the laboratory analyses. Duplicate groundwater samples for VOC and metals analyses were collected from MW-4 (Screen 2), MW-10, MW-13, and MW-18 (Screen 3). All of the analytical results for the duplicate samples were within an acceptable range for comparison to the results of the original groundwater samples (Tables 3-2 and 3-3).

Equipment blanks were used to determine if contaminants were introduced into the samples by the sampling equipment. Equipment blanks were prepared each day, prior to the sampling of the deep (MP) wells, by pouring ASTM Type II organic free water through the Westbay sampling equipment and collecting the water in sample bottles. These sample bottles were then submitted for the same analyses as the groundwater samples collected on the same day. Equipment blanks were not required from all the shallow wells, except for MW-13, as the 2-inch Grundfos® pump systems used to collect the groundwater samples are dedicated to individual wells. An equipment blank was required for shallow well MW-13 because of pump malfunction and subsequent use of a rental pump to collect groundwater samples.

Nineteen equipment blanks were submitted for analysis during the October-November 1996 sampling event. Acetone was found in 12 of these equipment blanks, tetrahydrofuran was found in 2 of the equipment blanks, chloroform in 2 others. Neither tetrahydrofuran nor chloroform were detected in the associated groundwater samples and, therefore, do not reflect cross-contamination of samples through the sampling equipment.

Lead was detected in three equipment blanks collected the same day as samples from MW-18 (Screens 2, 3, 4, and 5), MW-17 (Screen 5), and MW-13. In all cases, the concentration of lead detected in the equipment blanks was similar to the concentration of lead detected in the

corresponding groundwater samples indicating that the presence of lead in these groundwater samples is not representative of water quality.

Trip blanks were used to determine if contaminants were introduced into the samples during transportation. Trip blanks consisted of 40-ml vials filled with reagent water prepared in advance by the laboratory. One trip blank was submitted for VOCs analysis for each shipment of groundwater samples to the laboratory. A total of 23 trip blanks was submitted along with the October-November 1996 groundwater samples.

Acetone was detected in 15 of the 23 trip blanks, and in 3 of the corresponding laboratory method blanks. The occurrence of acetone in the trip blanks, the equipment blanks, and the laboratory method blanks, and its widespread use in the laboratory indicates that its presence is likely a result of contamination by laboratory procedures.

Low concentrations of methylene chloride were also detected in one trip blank, 1,1-difluoroethane in two others, and naphthalene in yet another. Of these constituents, only naphthalene was also detected in associated groundwater samples (two samples). Naphthalene (0.001 mg/l) was also detected in the laboratory method blank and likely represents contamination by laboratory procedures. Groundwater results for naphthalene associated with the trip blank that contained detectable levels of naphthalene are indicated on Table 3-2.

One field blank was collected during this sampling event at MW-7 to assess on-site ambient conditions during sampling. This field blank was prepared by filling several different sample bottles with ASTM Type II organic free water and leaving them open to the air at the well head during sampling activities. These samples were then submitted for VOCs, metals, and hexavalent chromium analyses. Only a small concentration of lead (0.002 mg/l) was detected in the field blank from the October-November 1996 event. No other compounds were detected in the field blank.

4.0 GENERAL WATER CHEMISTRY

As part of this groundwater monitoring event, groundwater samples were also submitted for analysis of major cations and anions in an effort to further understand the natural water chemistry of the groundwater beneath JPL, and for use in interpreting groundwater flow. Samples from each of the JPL shallow monitoring wells, and each of the deep multi-port wells, were analyzed for major cations (Ca, Mg, Na, and K), major anions (Cl, SO_4, PO_4, and NO_3), alkalinity [bicarbonate (HCO_3) and carbonate (CO_3)], and total dissolved solids (TDS). The water chemistry results for this quarterly sampling event are summarized in Table 4-1.

4.1 ANALYTICAL RESULTS

To better illustrate the relative proportions of the major cations and anions in each groundwater sample, the water chemistry results from the October-November 1996 event have been compiled as stiff diagrams (Figures 4-1 and 4-2). Review of the water chemistry data from previous investigations indicates that the majority of groundwater sampled at JPL can be classified as one of four general types, based on the predominant cation and anion. In the past, these four general water types have included:

1. Calcium-bicarbonate groundwater. Groundwater with Ca as the dominant cation and HCO_3 as the dominant anion.
2. Sodium-bicarbonate groundwater. Groundwater with Na as the dominant cation and HCO_3 as the dominant anion.
3. Calcium-bicarbonate/chloride/sulfate groundwater. Groundwater with Ca as the dominant cation and HCO_3 the dominant anion, but with relatively elevated Cl and SO_4 concentrations.
4. Calcium-bicarbonate/nitrate/chloride groundwater. Groundwater with Ca as the dominant cation and HCO_3 the dominant anion, but with relatively elevated NO_3 and Cl concentrations.

Based on this scheme, waters classified as Type 1 and Type 3 are very similar in that both types contain calcium as the predominant cation and bicarbonate as the predominant anion. Type 3 groundwaters, however, contain slightly higher concentrations of chloride and sulfate anions than those of Type 1.

All of the shallow wells except MW-16, which could not be sampled during this sampling round because of low water levels, contained calcium-bicarbonate or calcium-bicarbonate/chloride sulfate waters during the October-November 1996 sampling event (see Figures 4-1 and 4-2). Calcium-bicarbonate and calcium-bicarbonate/chloride/sulfate waters were the predominant compositional types found in the uppermost screened intervals of all the deep multi-port wells.

However, Screen 1 in wells MW-12, MW-18, MW-20, and MW-21 could not be sampled during this event because of below normal water levels. Those intervals that contain higher concentrations of chloride and sulfate, Type 3 waters, include MW-10, MW-14 (Screens 1, 2, and 3), and MW-21 (Screens 2 and 3).

Sodium-bicarbonate waters were found in the lowermost intervals of wells MW-3 (Screens 3, 4, and 5), MW-4 (Screens 4 and 5), MW-11 (Screen 5), MW-14 (Screen 5), MW-18 (Screen 5), and MW-20 (Screens 3, 4, and 5).

None of the samples obtained during the October-November 1996 event contained a sufficient amount of NO_3 to be considered a calcium-bicarbonate/nitrate/chloride water type.

4.2 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

To evaluate the general quality of the water chemistry data, two independent geochemical quality control checks of the analytical results from the October-November 1996 samples were performed. These checks included calculation of total ion-charge balances, and comparison of measured TDS to calculated TDS. The results of these checks for the October-November 1996 water-chemistry results are presented in Table 4-2. Charge balances are expressed as the percent difference between the sum of the equivalent weights of all of the anions and all of the cations analyzed (Freeze and Cherry, 1979). The ideal range for charge balances is ± 5 percent, although charge balance errors up to ± 10 percent are acceptable.

The charge balances for samples analyzed for major anions and cations during the October-November 1996 sampling round are within the ideal range (± 5 percent) for 52 of the 55 sets of water chemistry results. The charge balance for the remaining three sets of water chemistry analyses fall between 5 and 7 percent, indicating that the results are acceptable for their intended use (Table 4-2).

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

The ratio between measured and calculated TDS values for the October-November 1996 water-chemistry results were within the ideal range (1.0 to 1.2) for 52 of the 55 sets of water chemistry analyses performed (Table 4-2). The ratio for the remaining three sets of water chemistry data fell slightly outside this ideal range suggesting sample inhomogeneity or small error in the measured TDS values. However, these data are suitable for identifying differences in water chemistry across the site.

5.0 WATER-LEVEL MEASUREMENTS

Water-level measurements were taken both before sampling, on October 15, 1996, and after sampling, on November 22, 1996. Water table elevation measurements taken before sampling are provided in Table 5-1 and have been contoured in Figure 5-1. Similarly, water table elevation measurements taken after sampling are provided in Table 5-2 and contoured in Figure 5-2.

Based on the water-level measurements taken prior to sampling, water was not found at the screened interval in MW-16, or Screen 1 of deep wells MW-12, MW-18, MW-20, and MW-21. After sampling, the water-level data indicated that the water level had dropped below Screen 1 in MW-17 as well.

As indicated on Figures 5-1 and 5-2, both before and after sampling, groundwater flow was primarily to the east across JPL except for the area near the groundwater mound at the mouth of the Arroyo Seco. The City of Pasadena municipal production wells were pumping throughout the sampling event as indicated by the "trough of depression" around these wells indicated on Figures 5-1 and 5-2.

Water-level data in the shallow wells were collected using a Solinst® water-level indicator that utilized a water-sensor probe attached to a measuring tape wound onto a reel. As the probe was lowered into a given well, contact with the groundwater created a complete circuit between two electrodes in the probe thus activating a sounding device attached to the reel. Depth to groundwater was then read directly from the measuring tape at the top of the well casing.

In the deep MP wells, the potentiometric head at each sampling port in each screened interval was measured with a pressure-transducer probe manufactured by Westbay specifically for the unique casing used in these wells. The potentiometric heads measured at each deep MP well screen before and after sampling are presented graphically in Figures 5-3 and 5-4, respectively. The potentiometric pressure profile records for the deep MP wells are included in Appendix B.

6.0 REFERENCES

EPA, 1991. Management of Investigation-Derived Wastes During Site Inspections: USEPA Office of Research and Development: EPA/540/G-91/009, May 1991, 35 pp.

EPA, 1992a. Guide to Management of Investigation-Derived Wastes: USEPA Office of Solid Wastes and Emergency Response, Publication: 9345.3-03FS, April 1992.

EPA, 1992b. Environmental Protection Agency, 1992. Drinking Water Standards and Health Advisories Table: USEPA Region 9, Drinking Water and Groundwater Protection Branch, December, 1992, 29 pp.

Ebasco, 1993a. Field Sampling and Analysis Plan for Performing a Remedial Investigation at Operable Unit 1: On-Site Groundwater. NASA-Jet Propulsion Laboratory. December, 1993

Ebasco, 1993b. Quality Assurance Program for Performing a Remedial Investigation for the National Aeronautics and Space Administration-Jet Propulsion Laboratory. December, 1993.

Ebasco, 1994. Field Sampling and Analysis Plan for Performing a Remedial Investigation at Operable Unit 3: Off-Site Groundwater. NASA-Jet Propulsion Laboratory. May, 1994

Freeze, A. R., and Cherry, J. A., 1979. Groundwater. Prentice Hall, Englewood Cliffs, New Jersey, 604 pp.

Oppenheimer, J., and Eaton, D., 1985. Quality Control in Mineral Analysis, WQTC, Houston, Texas. Proceedings, pp. 15-34.

APPENDIX A

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS FOR SHALLOW WELLS

APPENDIX B

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

APPENDIX C

FIELD INSTRUMENT CALIBRATION FORMS

APPENDIX D

LABORATORY ANALYTICAL REPORTS
AND
CHAIN-OF-CUSTODY FORMS

FIGURES

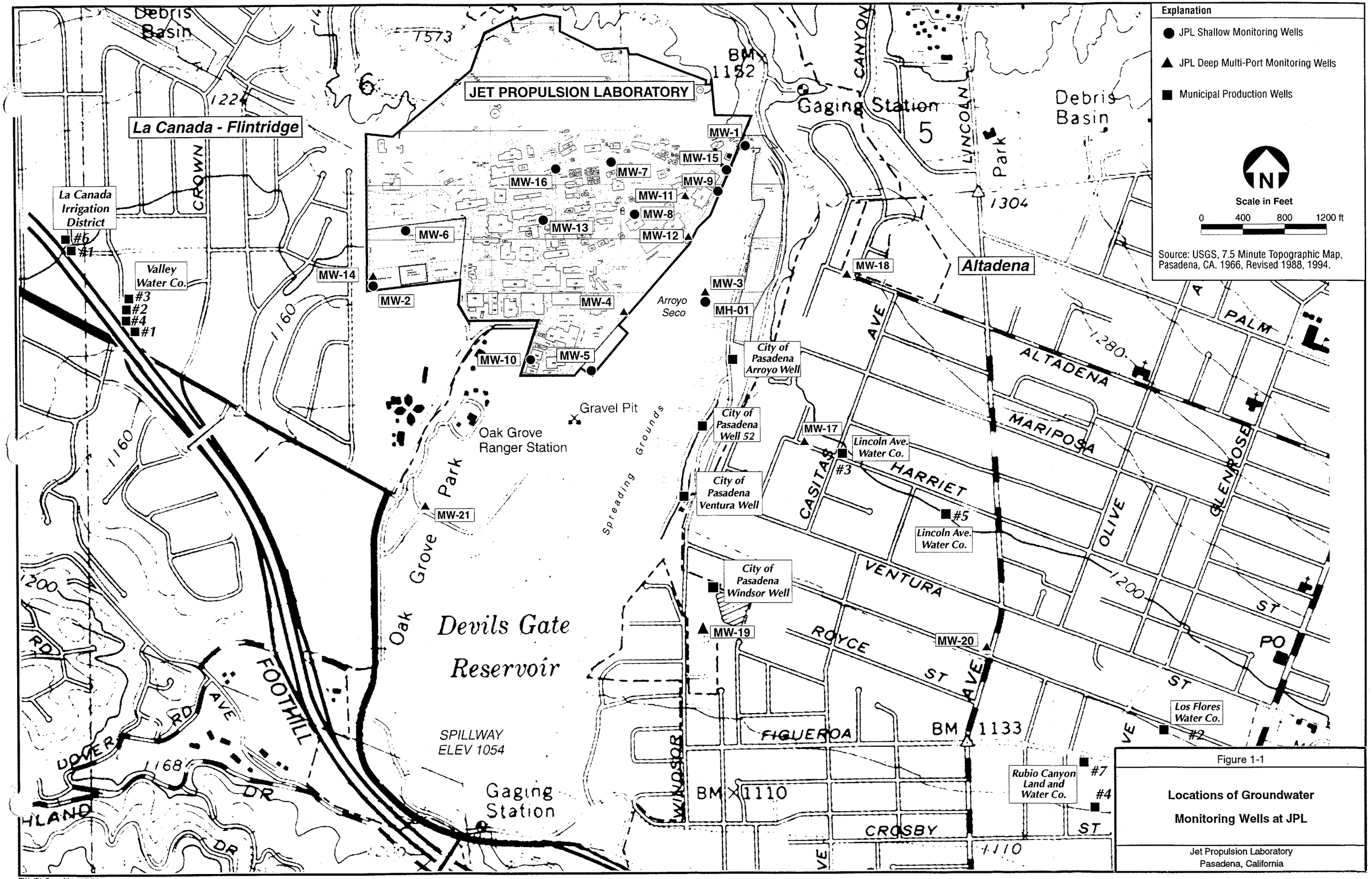


Figure 1-1

Locations of Groundwater Monitoring Wells at JPL

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

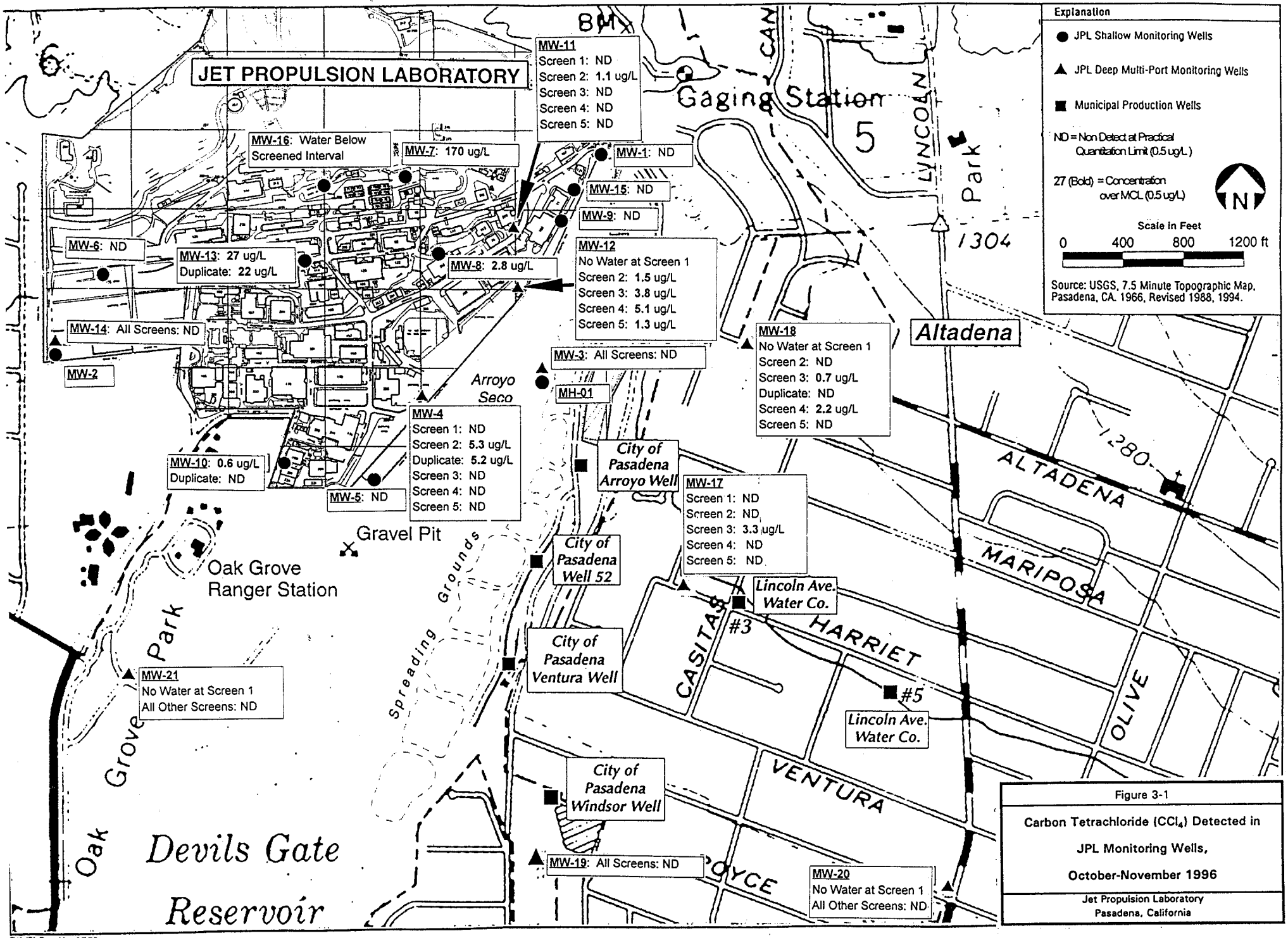


Figure 3-1

Carbon Tetrachloride (CCl_4) Detected in JPL Monitoring Wells, October-November 1996

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

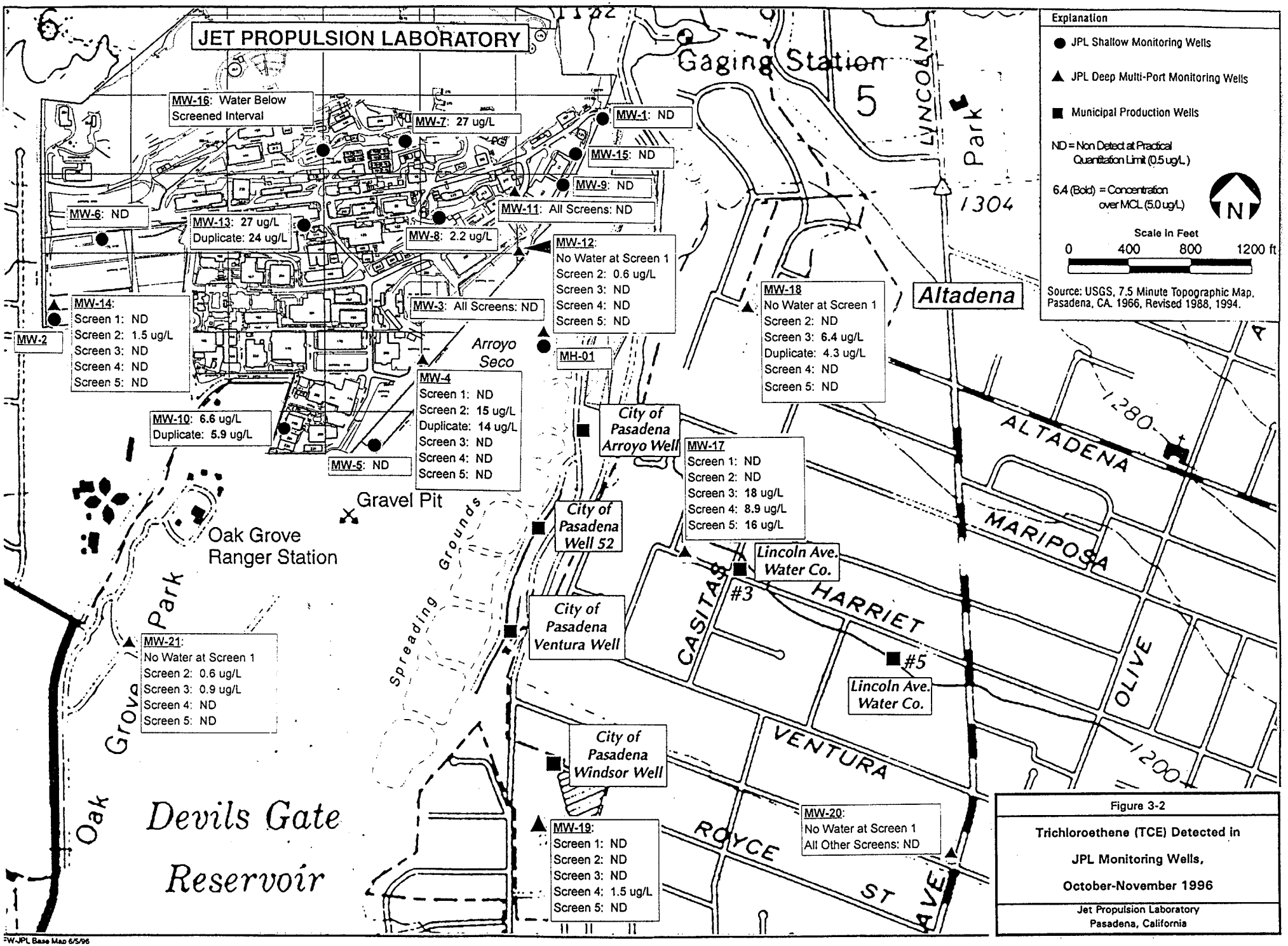


Figure 3-2

Trichloroethene (TCE) Detected in JPL Monitoring Wells, October-November 1996

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

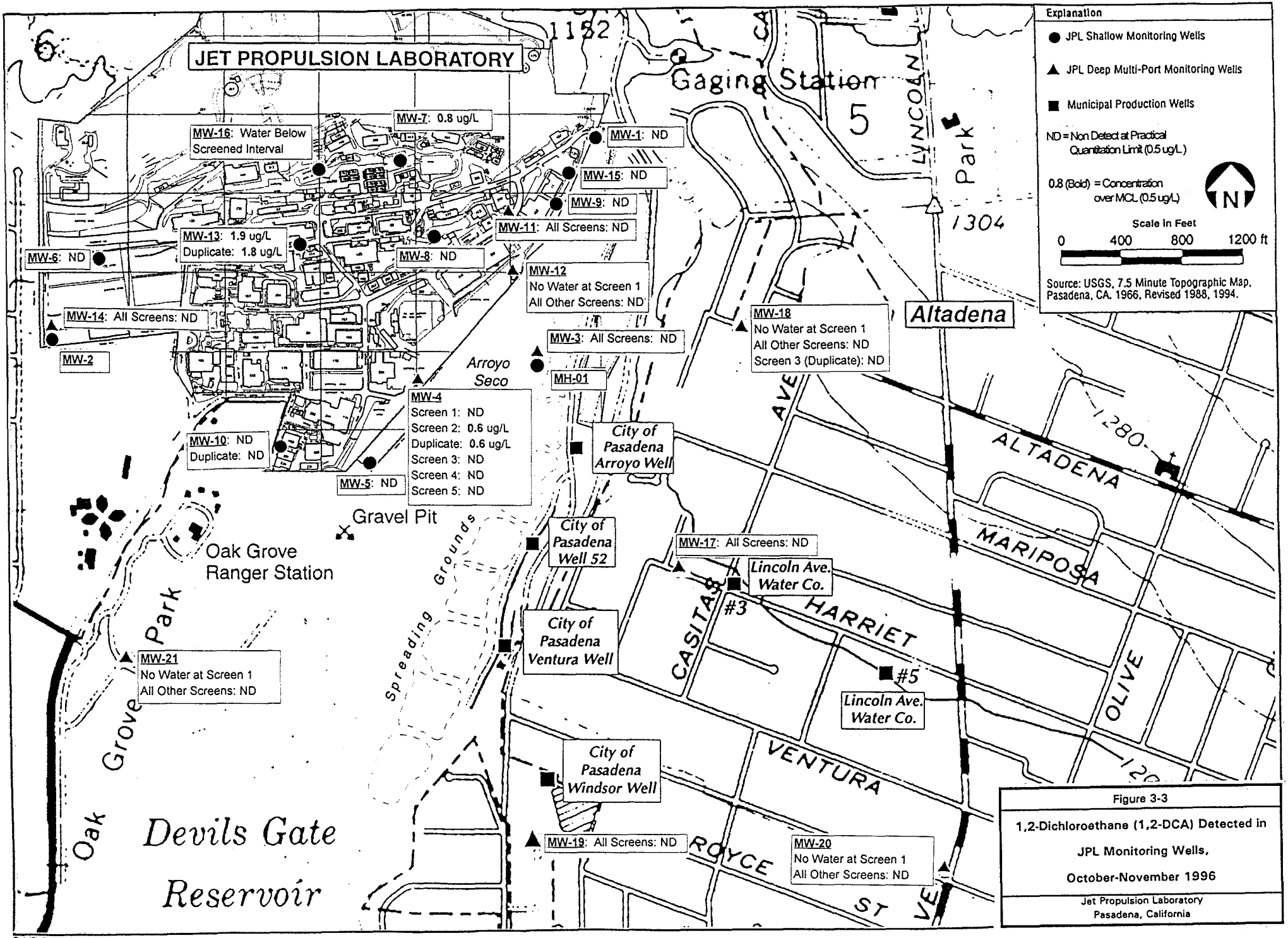


Figure 3-3

1,2-Dichloroethane (1,2-DCA) Detected in JPL Monitoring Wells, October-November 1996

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

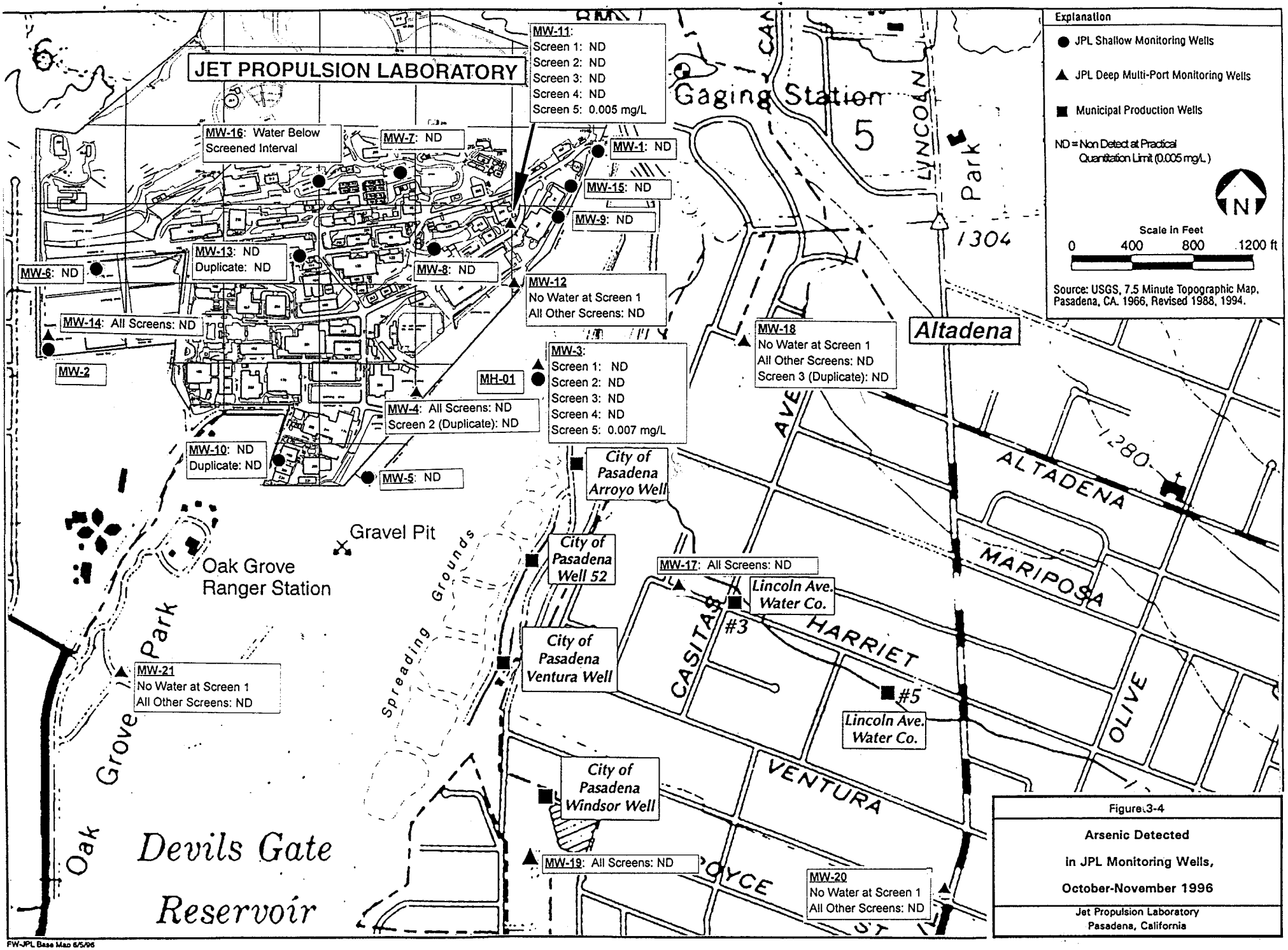


Figure 3-4

Arsenic Detected in JPL Monitoring Wells, October-November 1996

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

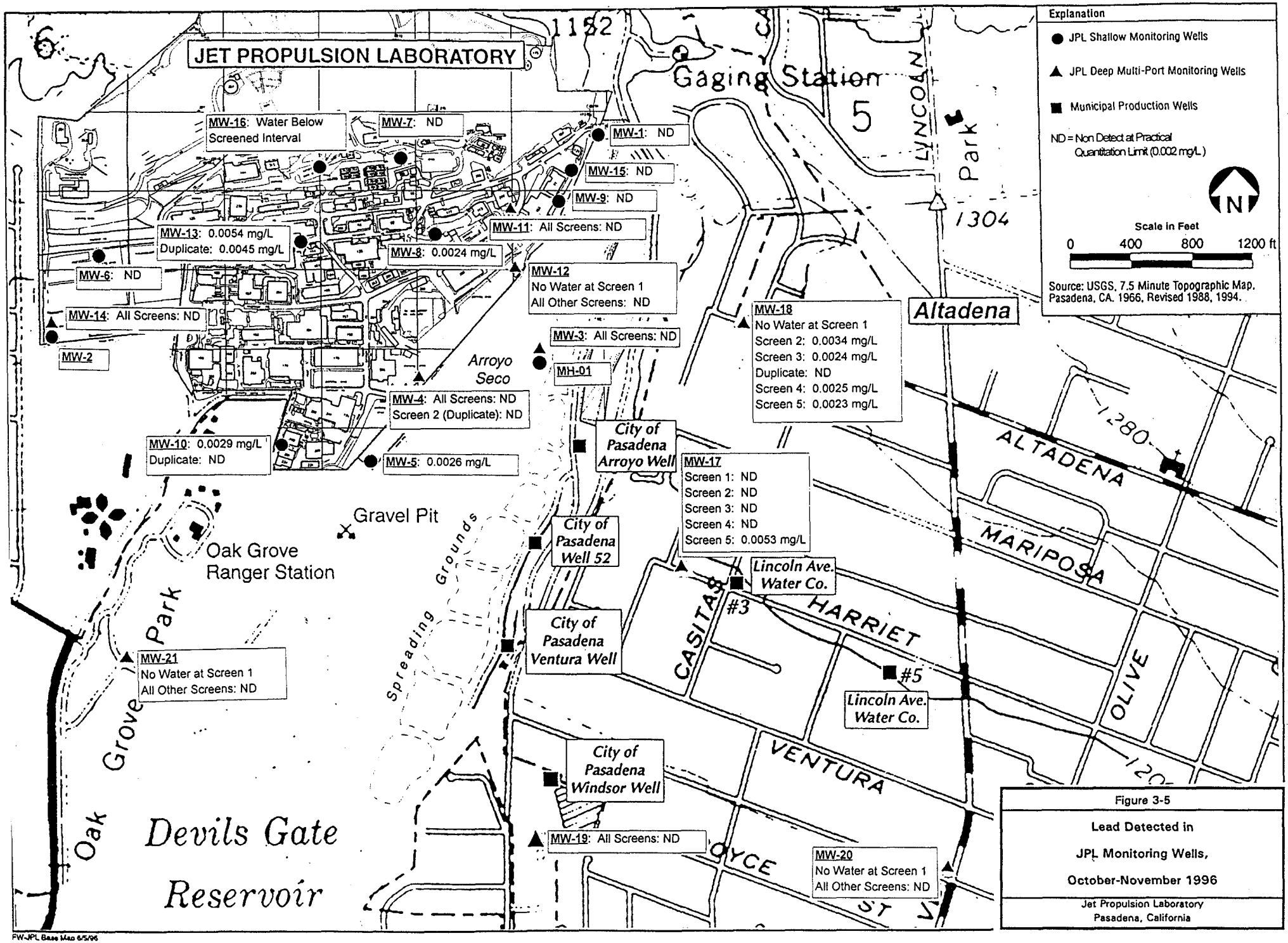


Figure 3-5

Lead Detected in JPL Monitoring Wells, October-November 1996

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

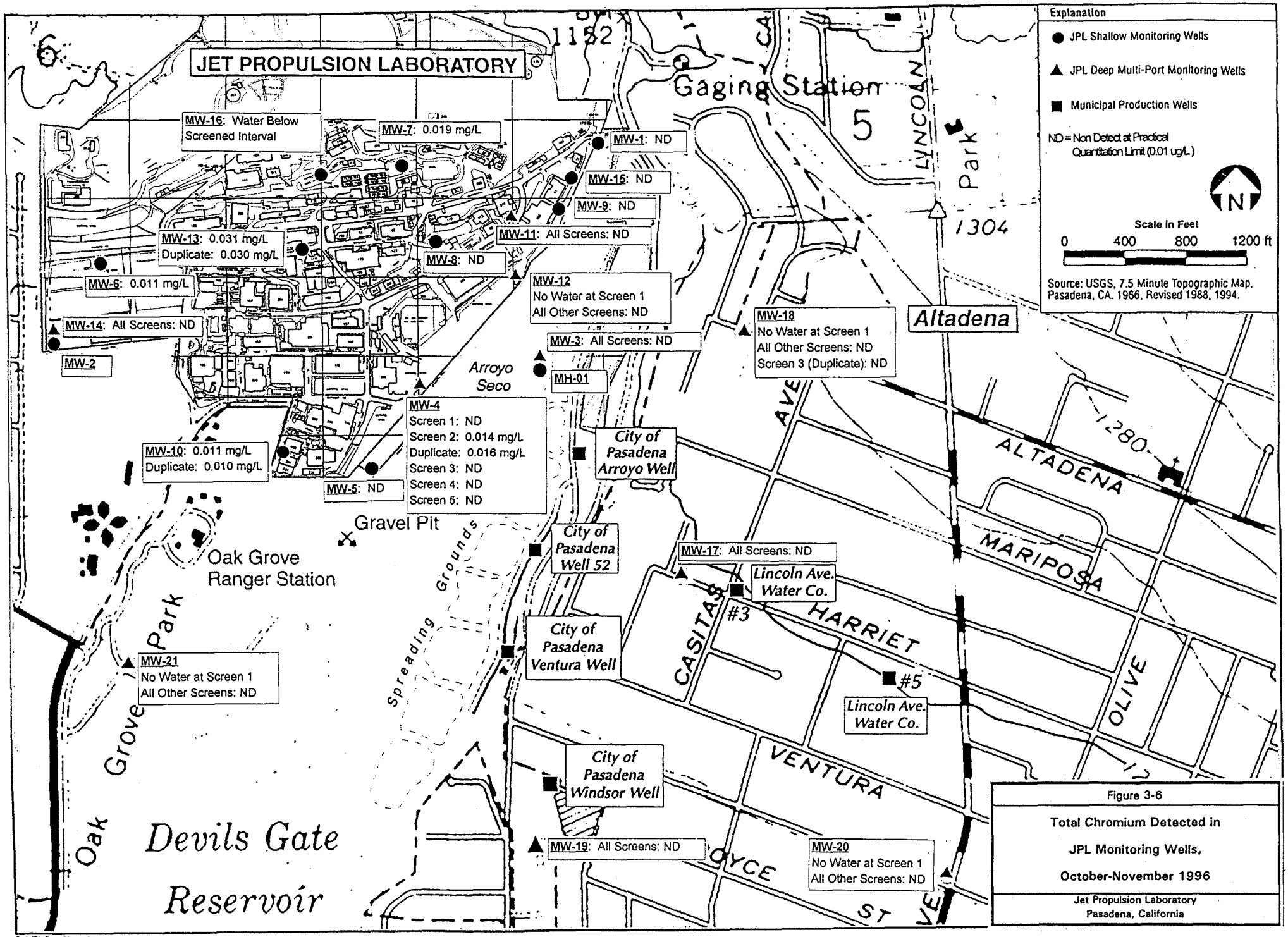


Figure 3-6

Total Chromium Detected in JPL Monitoring Wells, October-November 1996

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

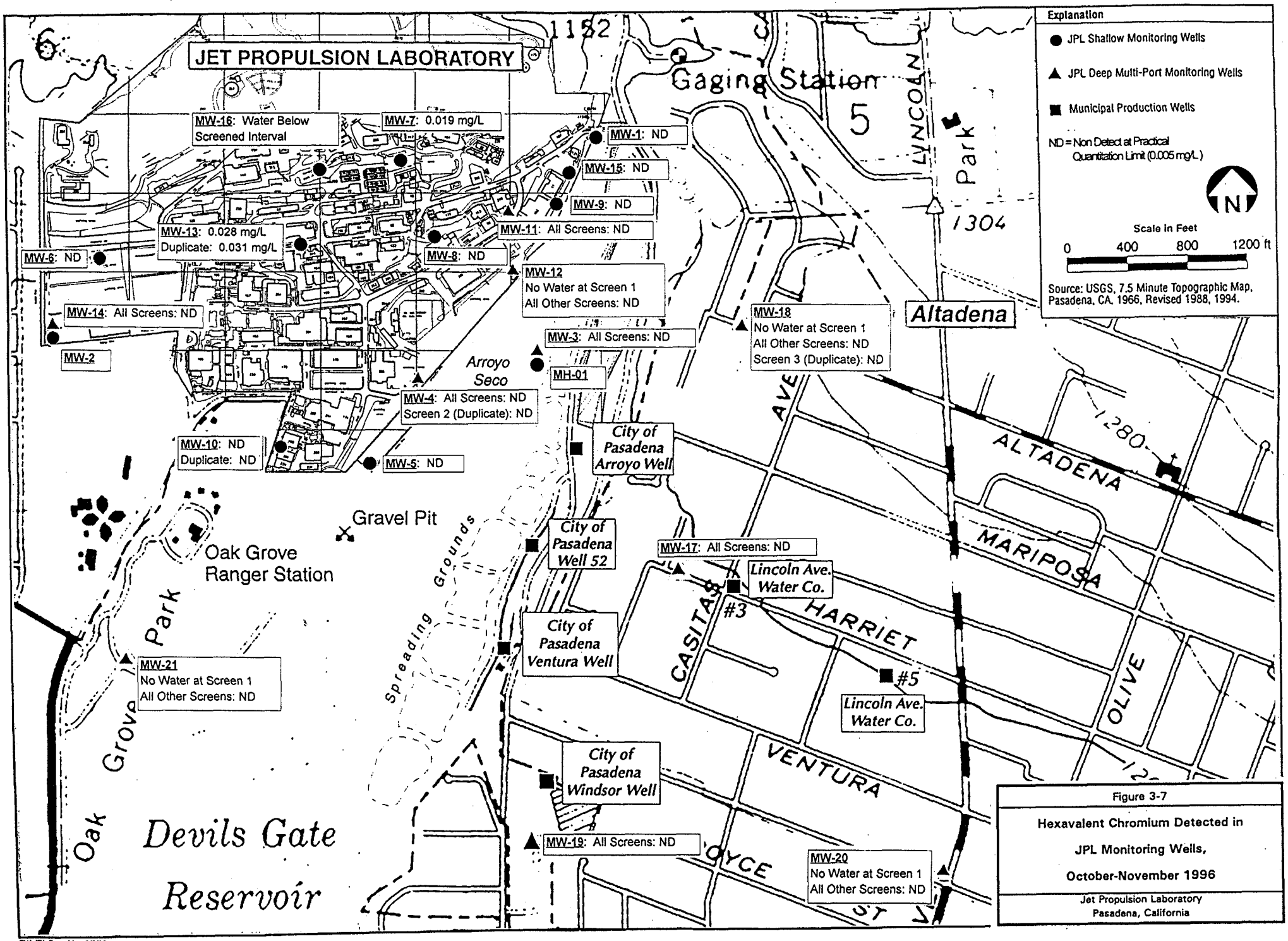


Figure 3-7

Hexavalent Chromium Detected in JPL Monitoring Wells, October-November 1996

Jet Propulsion Laboratory
Pasadena, California

FW-JPL Base Map 6/5/96

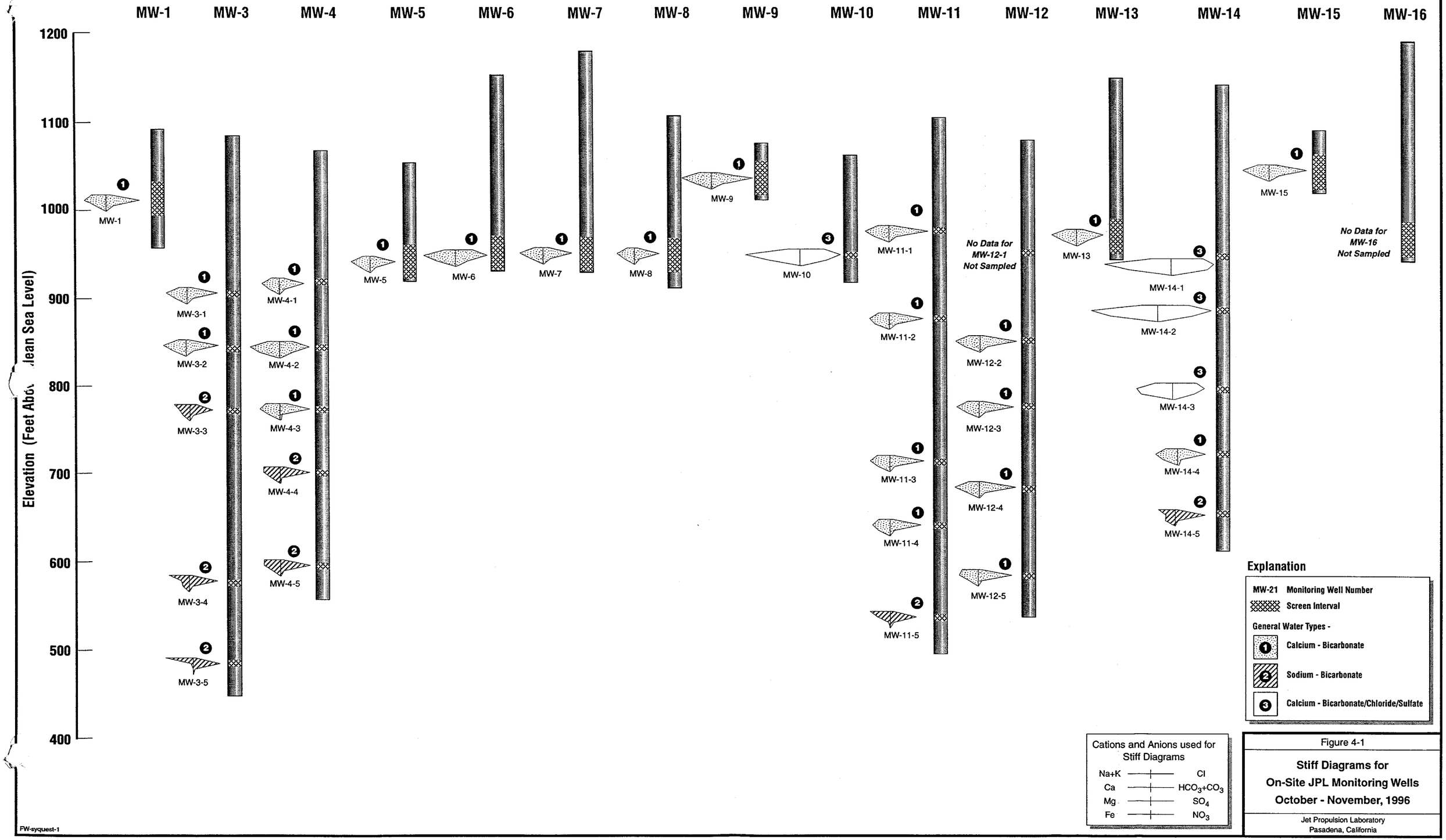
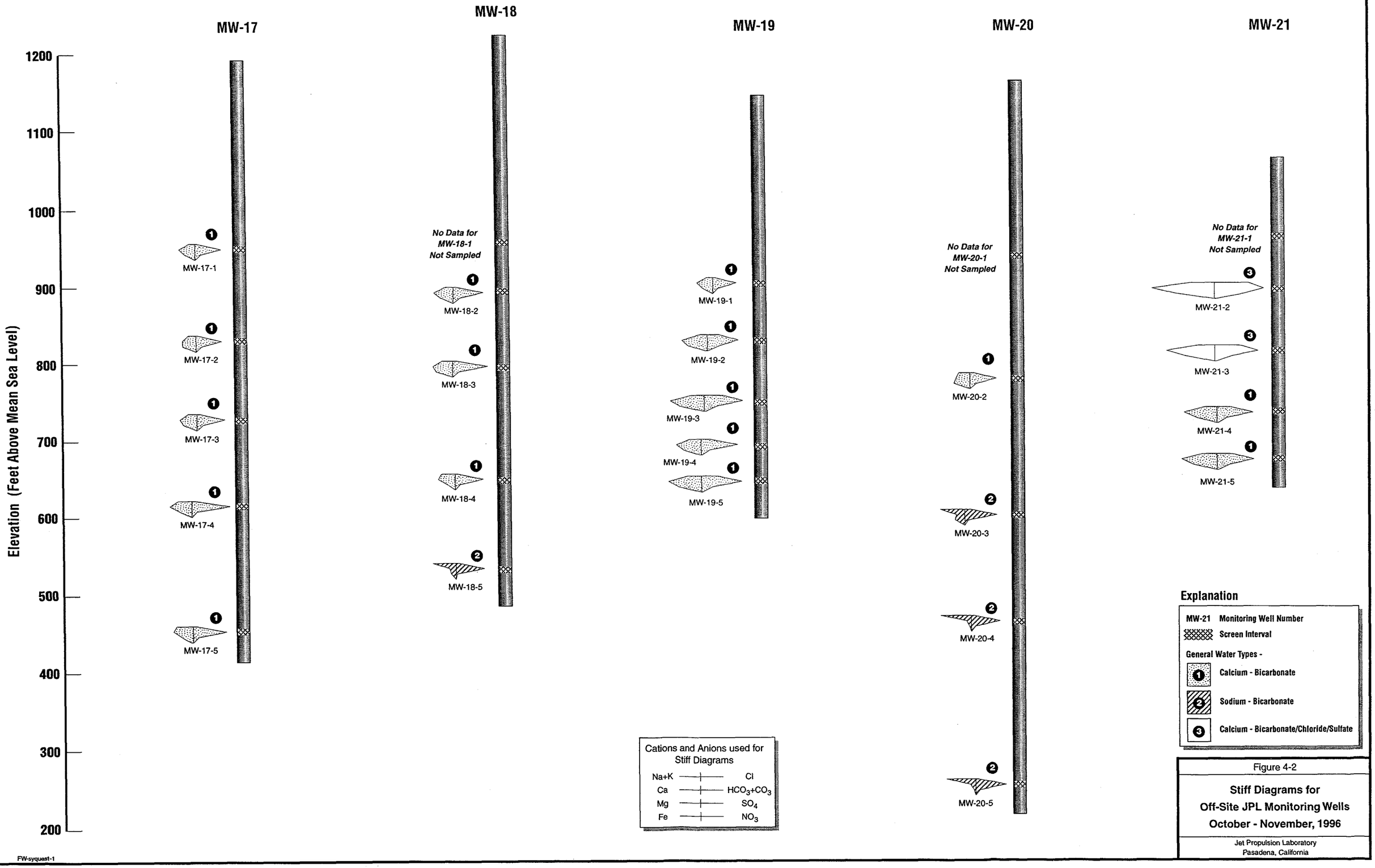


Figure 4-1

Stiff Diagrams for On-Site JPL Monitoring Wells October - November, 1996

Jet Propulsion Laboratory
Pasadena, California

FW-syquest-1



FW-syquest-1

Figure 4-2

Stiff Diagrams for Off-Site JPL Monitoring Wells October - November, 1996

Jet Propulsion Laboratory
Pasadena, California

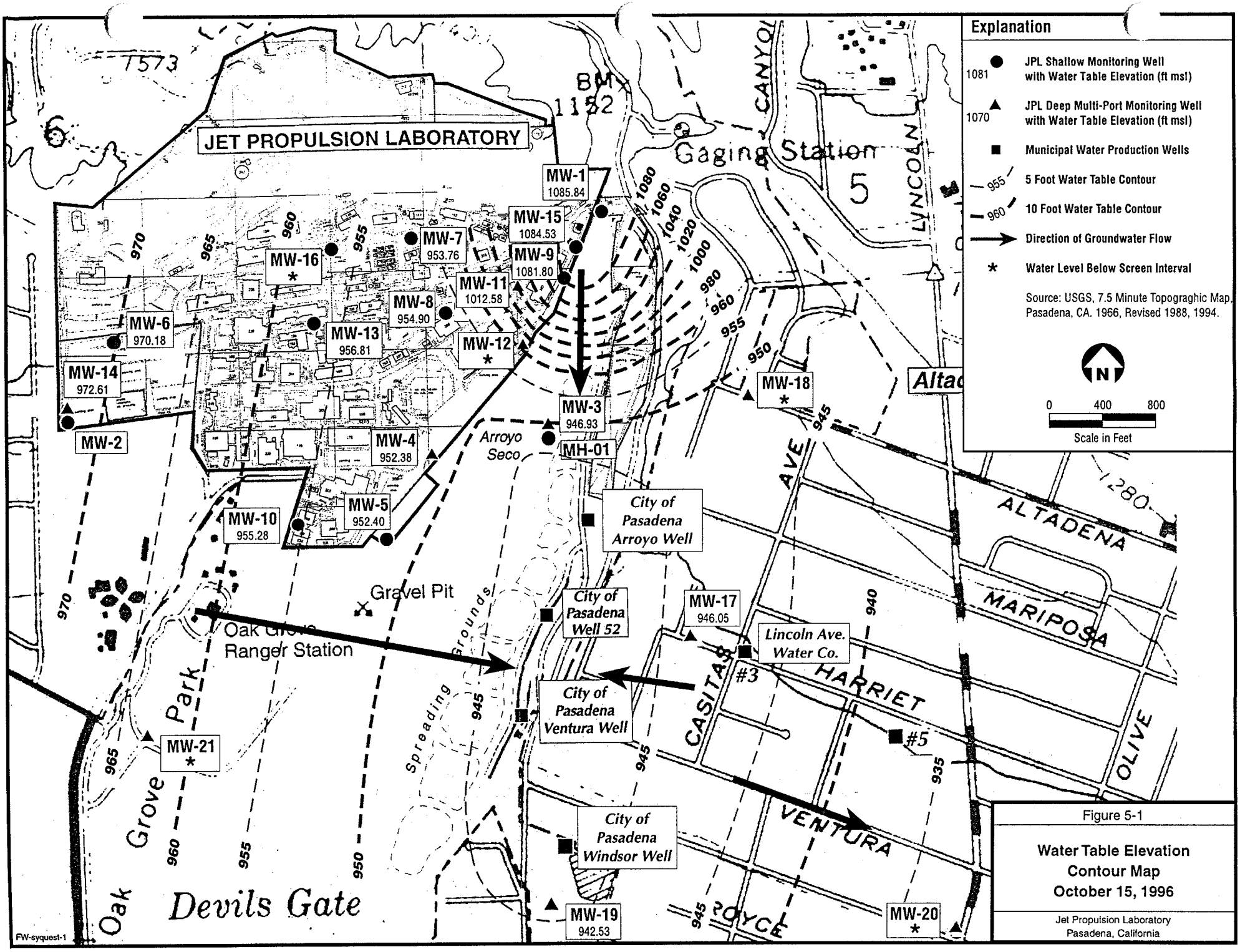


Figure 5-1

Water Table Elevation Contour Map October 15, 1996

Jet Propulsion Laboratory
Pasadena, California

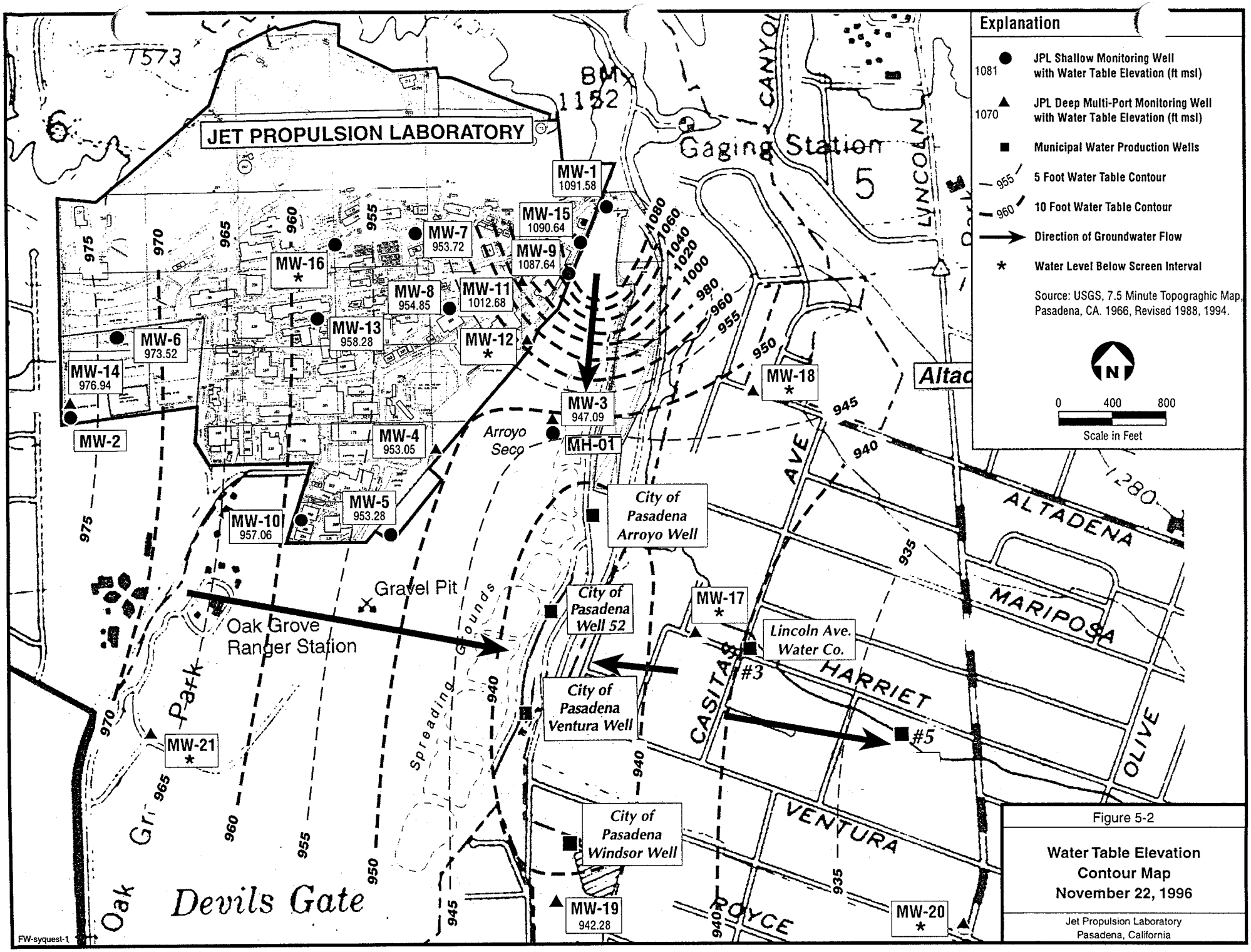
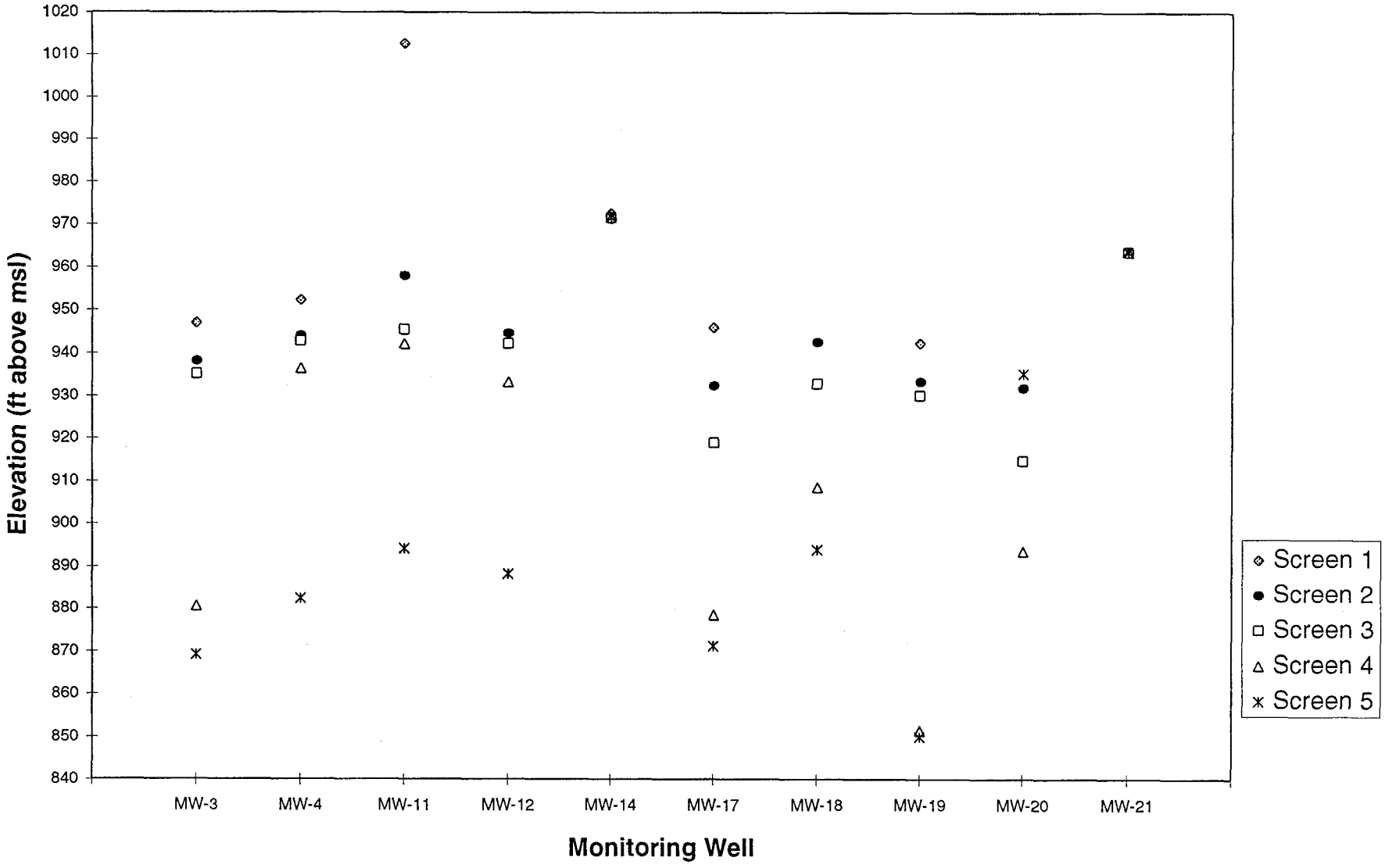


Figure 5-2

Water Table Elevation Contour Map November 22, 1996

Jet Propulsion Laboratory
Pasadena, California



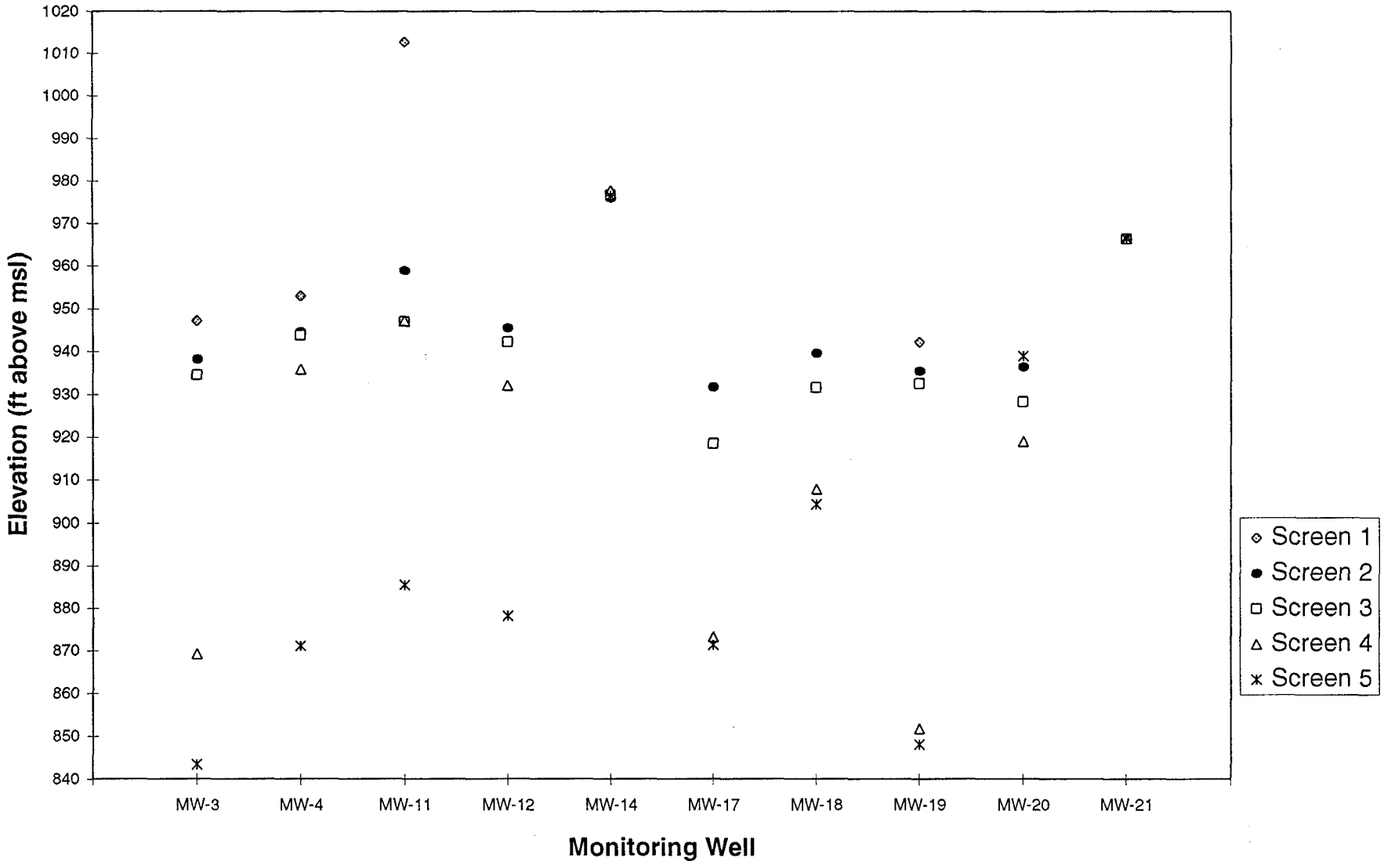
* No Water at Screen 1 in Monitoring Wells MW-12, MW-18, MW-20 and MW-21

Figure 5-3

PIEZOMETRIC WATER LEVELS FROM DEEP (MP) WELLS

October 15, 1996

Jet Propulsion Laboratory
Pasadena, California



* No Water at Screen 1 in Monitoring Wells MW-12, MW-17, MW-18, MW-20 and MW-21

Figure 5-4

PIEZOMETRIC WATER LEVELS FROM DEEP (MP) WELLS

November 22, 1996

Jet Propulsion Laboratory
Pasadena, California

TABLES

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4-inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number
MW-1	Shallow Standpipe	1989	Mud Rotary	120	70-110	1116.70	1006.70-1046.70	-
MW-2	Shallow Standpipe	1989	Mud Rotary	177	127-167	1168.85	1001.85-1041.85	-
MW-3	Deep Multi-Port	1990	Mud Rotary	700	170-180 250-260 344-354 555-565 650-660	1099.82	919.82-929.82 839.82-849.82 745.82-755.82 534.82-544.82 433.82-443.82	1 2 3 4 5
MW-4	Deep Multi-Port	1990	Mud Rotary	559	147-157 237-247 318-328 389-399 509-519	1082.72	925.72-935.72 835.72-845.72 754.72-764.72 683.72-693.72 563.72-573.72	1 2 3 4 5
MW-5	Shallow Standpipe	1990	Air Percussion	140	85-135	1071.60	936.60-986.60	-
MW-6	Shallow Standpipe	1990	Air Percussion	245	195-245	1188.52	943.52-993.52	-
MW-7	Shallow Standpipe	1990	Air Percussion	275	225-275	1212.88	937.88-987.88	-
MW-8	Shallow Standpipe	1992	Air Percussion	205	155-205	1139.53	934.53-984.53	-
MW-9	Shallow Standpipe	1992	Air Percussion	68	18-68	1106.02	1038.02-1088.02	-
MW-10	Shallow Standpipe	1992	Air Percussion	155	105-155	1087.71	932.71-982.71	-
MW-11	Deep Multi-Port	1992	Mud Rotary	680	140-150 250-260 420-430 515-525 630-640	1139.35	989.35-999.35 879.35-889.35 709.35-719.35 614.35-624.35 499.35-509.35	1 2 3 4 5

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4-inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number
MW-12	Deep Multi-Port	1994	Mud Rotary	596	135-145	1102.14	957.14-967.14	1
					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	-
MW-14	Deep Multi-Port	1994	Mud Rotary	588	205-215	1173.42	958.42-968.42	1
					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	-
MW-16	Shallow Standpipe	1994	Air Percussion	285	230-280	1236.27	956.27-1006.27	-
MW-17	Deep Multi-Port	1995	Mud Rotary	774	246-256	1190.99	934.99-944.99	1
					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
MW-18	Deep Multi-Port	1995	Mud Rotary	732	266-276	1225.34	949.34-959.34	1
					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

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4-inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number
MW-19	Deep Multi-Port	1995	Mud Rotary	543	240-250	1143.20	893.20-903.20	1
					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
					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
					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

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

Sample Location	Sample Number	Sampling Date	Sample Type	VOC's EPA 524.2	Total Cr, As, Pb, Major Cations EPA 200 Series	Hexavalent Chrome EPA 7196	Major Anions and TDS EPA 300 Series/160.1	Total Phosphate EPA 365.4	Tributyltin GC/FPD
MW-1	MW-962-67	11/21/96	GW	X	X	X	X	X	
MW-3									
Screen 1	MW-962-66	11/12/96	GW	X	X	X	X	X	
Screen 2	MW-962-65	11/12/96	GW	X	X	X	X	X	
Screen 3	MW-962-64	11/12/96	GW	X	X	X	X	X	
Screen 4	MW-962-63	11/11/96	GW	X	X	X	X	X	
Screen 5	MW-962-62	11/11/96	GW	X	X	X	X	X	
MW-4									
Screen 1	MW-962-61	11/6/96	GW	X	X	X	X	X	
Screen 2	MW-962-59	11/6/96	GW	X	X	X	X	X	
Screen 2	MW-962-60	11/6/96	DUP	X	X	X			
Screen 3	MW-962-58	11/6/96	GW	X	X	X	X	X	
Screen 4	MW-962-57	11/5/96	GW	X	X	X	X	X	
Screen 5	MW-962-56	11/5/96	GW	X	X	X	X	X	
MW-5	MW-962-55	11/19/96	GW	X	X	X	X	X	
MW-6	MW-962-54	11/13/96	GW	X	X	X	X	X	
MW-7	MW-962-52	11/18/96	DUP	X	X	X	X	X	
MW-8	MW-962-51	11/19/96	GW	X	X	X	X	X	
MW-9	MW-962-50	11/21/96	GW	X	X	X	X	X	
MW-10	MW-962-48	11/18/96	GW	X	X	X	X	X	
MW-10	MW-962-49	11/18/96	DUP	X	X	X			
MW-11									
Screen 1	MW-962-47	11/11/96	GW	X	X	X	X	X	
Screen 2	MW-962-46	11/11/96	GW	X	X	X	X	X	
Screen 3	MW-962-45	11/8/96	GW	X	X	X	X	X	
Screen 4	MW-962-44	11/8/96	GW	X	X	X	X	X	
Screen 5	MW-962-43	11/8/96	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
*Not Sampled because there was no water in the screened interval at each of these wells

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

Sample Location	Sample Number	Sampling Date	Sample Type	VOC's EPA 524.2	Total Cr, As, Pb, Major Cations EPA 200 Series	Hexavalent Chrome EPA 7196	Major Anions and TDS EPA 300 Series/160.1	Total Phosphate EPA 365.4	Tributyltin GC/FPD
MW-12									
Screen 1	Not Sampled*								
Screen 2	MW-962-39	11/7/96	GW	X	X	X	X	X	X
Screen 3	MW-962-38	11/7/96	GW	X	X	X	X	X	
Screen 4	MW-962-37	11/7/96	GW	X	X	X	X	X	
Screen 5	MW-962-36	11/6/96	GW	X	X	X	X	X	
MW-13	MW-962-34	11/20/96	GW	X	X	X	X	X	X
MW-13	MW-962-35	11/20/96	DUP	X	X	X			X
MW-14									
Screen 1	MW-962-33	11/5/96	GW	X	X	X	X	X	
Screen 2	MW-962-32	11/5/96	GW	X	X	X	X	X	
Screen 3	MW-962-31	11/4/96	GW	X	X	X	X	X	
Screen 4	MW-962-30	11/4/96	GW	X	X	X	X	X	
Screen 5	MW-962-29	11/4/96	GW	X	X	X	X	X	
MW-15	MW-962-28	11/21/96	GW	X	X	X	X	X	
MW-16	Not Sampled*								
MW-17									
Screen 1	MW-962-26	10/21/96	GW	X	X	X	X	X	
Screen 2	MW-962-25	10/21/96	GW	X	X	X	X	X	
Screen 3	MW-962-24	10/21/96	GW	X	X	X	X	X	
Screen 4	MW-962-23	10/21/96	GW	X	X	X	X	X	
Screen 5	MW-962-22	10/18/96	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
*Not Sampled because there was no water in the screened interval at each of these wells

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

Sample Location	Sample Number	Sampling Date	Sample Type	VOC's EPA 524.2	Total Cr, As, Pb, Major Cations EPA 200 Series	Hexavalent Chrome EPA 7196	Major Anions and TDS EPA 300 Series/160.1	Total Phosphate EPA 365.4	Tributyltin GC/FPD
MW-18									
Screen 1	Not Sampled*								
Screen 2	MW-962-20	10/18/96	GW	X	X	X	X	X	
Screen 3	MW-962-18	10/17/96	GW	X	X	X	X	X	
Screen 3	MW-962-19	10/17/96	DUP	X	X	X			
Screen 4	MW-962-17	10/17/96	GW	X	X	X	X	X	
Screen 5	MW-962-16	10/17/96	GW	X	X	X	X	X	
MW-19									
Screen 1	MW-962-15	10/29/96	GW	X	X	X	X	X	
Screen 2	MW-962-14	10/25/96	GW	X	X	X	X	X	
Screen 3	MW-962-13	10/24/96	GW	X	X	X	X	X	
Screen 4	MW-962-12	10/25/96	GW	X	X	X	X	X	
Screen 5	MW-962-11	10/23/96	GW	X	X	X	X	X	
MW-20									
Screen 1	Not Sampled*								
Screen 2	MW-962-09	10/23/96	GW	X	X	X	X	X	
Screen 3	MW-962-08	10/22/96	GW	X	X	X	X	X	
Screen 4	MW-962-07	10/22/96	GW	X	X	X	X	X	
Screen 5	MW-962-06	10/22/96	GW	X	X	X	X	X	
MW-21									
Screen 1	Not Sampled*								
Screen 2	MW-962-04	11/1/96	GW	X	X	X	X	X	
Screen 3	MW-962-03	10/31/96	GW	X	X	X	X	X	
Screen 4	MW-962-02	10/30/96	GW	X	X	X	X	X	
Screen 5	MW-962-01	10/31/96	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
*Not Sampled because there was no water in the screened interval at each of these wells

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

(concentrations in µg/l)

Values above state and federal MCLs are shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-1	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone
MW-1	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
MW-3										
Screen 1	Oct/Nov 1996	--	--	--	--	--	--	--	8.3	0.7 (B) Naphthalene
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	1.2	--
Screen 2	Oct/Nov 1996	--	--	--	--	--	--	--	4.8	1.9 (B) Naphthalene
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	5.5	--
Screen 3	Oct/Nov 1996	--	--	--	--	--	--	--	0.7	--
Screen 3	Aug/Sep 1996	**0.6**	0.8	--	--	--	--	--	1.6	--
Screen 4	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.2 Acetone
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.1 Acetone 1.2 Carbon disulfide
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1 Methylene chloride
MW-4										
Screen 1	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.9(B) Acetone
Screen 2	Oct/Nov 1996	**5.3**	**15**	--	--	**0.6**	0.8	--	5.4	1.8 Acetone
Screen 2	Aug/Sep 1996	**5.5**	**19**	--	--	**0.9**	0.7	--	6.7	3.2(B) Acetone
Screen 2 (DUP)	Oct/Nov 1996	**5.2**	**14**	--	--	**0.6**	0.7	--	5	1.8 Acetone
Screen 2 (DUP)	Aug/Sep 1996	**4.8**	**14**	--	--	**0.7**	0.6	--	5.1	3.1(B) Acetone
Screen 3	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.5 Acetone
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.0(B) (Acetone
Screen 4	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.9(B) Acetone
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
Screen 5 (RESAMPLE	Aug/Sep 1996	--	--	--	--	--	--	--	--	--

Note: Numbers in Bold are above MCLs

B: Compound detected in the laboratory method blank.

--: Not detected.

TB: Compound detected in associated trip blank.

DUP: Duplicate

RESAMPLE: Resampled

* Not sampled, no water over screen

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996
(concentrations in µg/l)
Values above state and federal MCLs are shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-5	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
MW-5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
MW-6	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
MW-6	Aug/Sep 1996	--	--	--	--	--	--	--	1.3(TB)	--
MW-7	Oct/Nov 1996	**170**	**27**	1.3	--	**0.8**	2.3	7.7	14	4.3 (B) 1,1 Difluoroethane 2.8 (B) Acetone
MW-7	Aug/Sep 1996	**90**	**39**	0.8	--	**1.2**	1.1	7.2	13(TB)	--
MW-7 (DUP)	Aug/Sep 1996	**87**	**38**	0.9	--	**1.4**	1.3	8.8	14(TB)	--
MW-8	Oct/Nov 1996	**2.8**	2.2	--	--	--	--	0.6	0.6	1.7 Acetone
MW-8	Aug/Sep 1996	**4.0**	4.6	--	--	--	--	--	1.3	--
MW-9	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
MW-9	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
MW-10	Oct/Nov 1996	**0.6**	**6.6**	1.0	1.9	--	--	0.8	1.1	3.0 (B) Acetone 1.1 Unknown scan #350
MW-10	Aug/Sep 1996	0.7	**18**	0.5	--	--	--	1.2	1.4(TB)	--
MW-10 (DUP)	Oct/Nov 1996	--	**5.9**	0.9	1.9	--	--	0.7	1	2.3 (B) Acetone
MW-10 (DUP)	Aug/Sep 1996	0.7	**20**	0.6	--	--	--	1.3	1.6(TB)	--
MW-11										
Screen 1	Oct/Nov 1996	--	--	--	--	--	--	--	--	7.1 MTBE 1.8 Acetone
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.6(B) Acetone
Screen 2	Oct/Nov 1996	**1.1**	--	--	--	--	--	--	1.2	--
Screen 2	Aug/Sep 1996	**2.4**	--	--	--	--	--	--	1.0	--
Screen 3	Oct/Nov 1996	--	--	--	--	--	--	--	1.4	--
Screen 3	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	1.3	2.9(B) Acetone
Screen 4	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	0.5	2.4(B) Acetone
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.1 Acetone
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.4(B) Acetone

Note: Numbers in Bold are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate
RESAMPLE: Resampled
* Not sampled, no water over screen

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996
(concentrations in µg/l)
Values above state and federal MCLs are shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-12										
Screen 1	Not Sampled*	--	--	--	--	--	--	--	--	--
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	4.1	--
Screen 2	Oct/Nov 1996	**1.5**	0.6	--	--	--	--	0.5	--	--
Screen 2	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	--	--
Screen 3	Oct/Nov 1996	**3.8**	--	--	--	--	--	--	1.3	1.6 Acetone
Screen 3	Aug/Sep 1996	**4.5**	--	--	--	--	--	--	1.3	--
Screen 4	Oct/Nov 1996	**5.1**	--	--	--	--	--	--	1.4	2.5 Acetone
Screen 4	Aug/Sep 1996	**6.3**	--	--	--	--	--	--	1.4	--
Screen 5	Oct/Nov 1996	**1.3**	--	--	--	--	--	--	--	1.5 Acetone
Screen 5	Aug/Sep 1996	**3.4**	--	--	--	--	--	--	0.7	--
MW-13	Oct/Nov 1996	**27**	**27**	--	--	**1.9**	1.5	0.6	14	--
MW-13 (DUP)	Oct/Nov 1996	**22**	**24**	--	--	**1.8**	1.9	0.7	12	--
MW-13	Aug/Sep 1996	**21**	**47**	0.6	--	**2.5**	1.5	0.7	21(TB)	--
MW-14										
Screen 1	Oct/Nov 1996	--	--	--	2.9	--	--	--	--	--
Screen 1	Aug/Sep 1996	--	--	--	2.4	--	--	--	0.6	--
Screen 2	Oct/Nov 1996	--	1.5	1.6	1.0	--	--	--	0.9	0.6 1,2,3-Trichlorobenzene 1.1 Acetone
Screen 2	Aug/Sep 1996	--	2.8	1.6	1.4	--	--	--	1.5	--
Screen 3	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
Screen 4	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 (TB) Acetone 1.3 Carbon disulfide
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone
MW-15	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.6 Acetone
MW-15	Aug/Sep 1996	--	--	--	--	--	--	--	--	--

Note: Numbers in Bold are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate
RESAMPLE: Resampled
* Not sampled, no water over screen

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996
(concentrations in µg/l)
Values above state and federal MCLs are shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-16	Not Sampled*	--	--	--	--	--	--	--	--	--
MW-16	Aug/Sep 1996	**125**	**33**	1.3	--	**2.4**	2.2	2.0	40(TB)	--
MW-17										
Screen 1	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.4 Acetone
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.3(B) Acetone
Screen 2	Oct/Nov 1996	--	--	--	--	--	--	--	6.0	--
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	3.8	4.5(B) Acetone
Screen 3	Oct/Nov 1996	**3.3**	**18**	0.8	--	--	--	--	8.7	--
Screen 3	Aug/Sep 1996	**2.0**	**7.9**	--	--	--	--	--	7.5	--
Screen 4	Oct/Nov 1996	--	**8.9**	--	--	--	--	--	1.5	--
Screen 4	Aug/Sep 1996	--	**9.5**	0.5	--	--	--	--	1.1	--
Screen 5	Oct/Nov 1996	--	**16**	0.7	--	--	--	--	1.7	--
Screen 5	Aug/Sep 1996	--	**13**	0.6	--	--	--	--	1.7	3.4(B) Acetone
MW-18										
Screen 1	Not Sampled*	--	--	--	--	--	--	--	--	
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	1.6	--
Screen 2	Oct/Nov 1996	--	--	--	--	--	--	--	8.2	
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.3	--
Screen 3	Oct/Nov 1996	**0.7**	**6.4**	3.2	--	--	--	--	5.6	--
Screen 3	Aug/Sep 1996	**0.7**	4.7	2.8	--	--	--	--	5.1	--
Screen 3 (DUP)	Oct/Nov 1996	--	4.3	2.2	--	--	--	--	4.0	
Screen 3 (DUP)	Aug/Sep 1996	**1.0**	**5.2**	3.5	--	--	--	0.7	5.0	--
Screen 4	Oct/Nov 1996	**2.2**	--	0.7	--	--	--	--	0.5	1.4 (TB) Acetone
Screen 4	Aug/Sep 1996	**2.2**	--	0.7	--	--	--	--	0.5	--
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--

Note: Numbers in Bold are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate
RESAMPLE: Resampled
* Not sampled, no water over screen

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996
(concentrations in µg/l)
Values above state and federal MCLs are shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-19										
Screen 1	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.9 Acetone
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.9	3.7(B) Acetone
Screen 1 (RESAMPLE	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	--
Screen 2	Oct/Nov 1996	--	--	1.1	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	--	0.8	--	--	--	--	--	3.0(B) Acetone
Screen 3	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	--	--	3.1	--	--	--	--	--	2.6(B) Acetone
Screen 4	Oct/Nov 1996	--	1.5	--	--	--	--	--	1.9	--
Screen 4	Aug/Sep 1996	**0.5**	1.5	--	--	--	--	--	2.1	--
Screen 5	Oct/Nov 1996	--	--	2.4	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	3.0	--	--	--	--	0.6	1.6(B) Unknown scan #940
MW-20										
Screen 1	Not Sampled*	--	--	--	--	--	--	--	--	
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	3.4(B) Acetone
Screen 2	Oct/Nov 1996	--	--	--	--	--	--	--	4.4	
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.7	4.0(B) Acetone
Screen 3	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.3 Acetone
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.7(B) Acetone
Screen 4	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.8(B) Acetone
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.8(B) Acetone

Note: Numbers in Bold are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate
RESAMPLE: Resampled
* Not sampled, no water over screen

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996
(concentrations in µg/l)
Values above state and federal MCLs are shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-21										
Screen 1	Not Sampled*	--	--	--	--	--	--	--	--	--
Screen 1	Aug/Sep 1996	--	**33**	0.7	--	--	--	--	1.8	2.3(B) Acetone
Screen 2	Oct/Nov 1996	--	0.6	2.3	--	--	--	--	0.6	1.4 (TB) Acetone
Screen 2	Aug/Sep 1996	--	--	0.9	--	--	--	--	0.5	--
Screen 3	Oct/Nov 1996	--	0.9	1.6	--	--	--	--	--	1.2 Acetone
Screen 3	Aug/Sep 1996	--	0.7	1.5	--	--	--	--	0.5	--
Screen 4	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	1.6 Acetone
Screen 4	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	--
Screen 5	Oct/Nov 1996	--	--	3.1	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	4.5	--	--	--	--	0.6	--
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
California Maximum Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	-- Methylene chloride -- Acetone
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	--	5.0	7.0	--	100	5.0 Methylene chloride -- Acetone

Note: Numbers in Bold are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate
RESAMPLE: Resampled
* Not sampled, no water over screen

TABLE 3-3

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

(concentrations in mg/l)

Sample Location	Sampling Date	Aluminum	Arsenic	Lead	Chromium		Hexavalent Chromium	Field Turbidity (NTUs)
					Total	Dissolved		
MW-1	Oct/Nov 1996	NA	--	--	--	NA	--	0.5
MW-1	Aug/Sep 1996	--	--	--	--	--	--	0.8
MW-3								
Screen 1	Oct/Nov 1996	NA	--	--	--	NA	--	3.1
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	7.2
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	2.7
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	1.7
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	2.7
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	5.2
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	2.6
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	4.3
Screen 5	Oct/Nov 1996	NA	0.007	--	--	NA	--	1.9
Screen 5	Aug/Sep 1996	0.055	0.011	--	--	--	--	1.5
MW-4								
Screen 1	Oct/Nov 1996	NA	--	--	--	NA	--	1.7
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	2.6
Screen 2	Oct/Nov 1996	NA	--	--	0.014	NA	--	4.2
Screen 2	Aug/Sep 1996	--	--	--	0.023	--	--	3.8
Screen 2 (DUP)	Oct/Nov 1996	NA	--	--	0.016	NA	--	4.2
Screen 2 (DUP)	Aug/Sep 1996	--	--	--	0.021	--	--	3.8
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	1.5
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	0.6
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	1.4
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	3.0
Screen 5	Oct/Nov 1996	NA	--	--	--	NA	--	4.1
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	4.5
MW-5	Oct/Nov 1996	NA	--	0.0026	--	NA	--	2.7
MW-5	Aug/Sep 1996	--	--	--	--	--	--	2.7
MW-6	Oct/Nov 1996	NA	--	--	0.011	NA	--	1.1
MW-6	Aug/Sep 1996	--	--	--	0.050	--	--	4.5
MW-7	Oct/Nov 1996	NA	--	--	0.019	NA	0.019	3.5
MW-7	Aug/Sep 1996	--	--	--	0.013	0.010	0.007	4.8
MW-7 DUP	Aug/Sep 1996	--	--	--	0.012	--	0.011	4.8
MW-8	Oct/Nov 1996	NA	--	0.0024	--	NA	--	4.7
MW-8	Aug/Sep 1996	0.160	--	--	--	--	--	4.0
MW-9	Oct/Nov 1996	NA	--	--	--	NA	--	2.5
MW-9	Aug/Sep 1996	0.110	--	--	--	--	--	2.1
MW-10	Oct/Nov 1996	NA	--	0.0029	0.011	NA	--	4.9
MW-10	Aug/Sep 1996	0.190	--	--	0.011	0.020	0.010	4.5
MW-10 DUP	Oct/Nov 1996	NA	--	--	0.010	NA	--	4.9
MW-10 DUP	Aug/Sep 1996	--	--	--	0.012	--	0.017	4.5

TABLE 3-3

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

(concentrations in mg/l)

Sample Location	Sampling Date	Aluminum	Arsenic	Lead	Chromium		Hexavalent Chromium	Field Turbidity (NTUs)
					Total	Dissolved		
MW-11								
Screen 1	Oct/Nov 1996	NA	--	--	--	NA	--	2.5
Screen 1	Aug/Sep 1996	0.052	--	--	--	--	--	4.0
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	4.7
Screen 2	Aug/Sep 1996	0.050	--	--	--	--	--	4.5
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	2.3
Screen 3	Aug/Sep 1996	0.077	--	--	--	--	--	0.5
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	3.3
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	3.9
Screen 5	Oct/Nov 1996	NA	0.005	--	--	NA	--	1.9
Screen 5	Aug/Sep 1996	0.055	0.007	--	--	--	--	0.6
MW-12								
Screen 1	Not Sampled	NA	NA	NA	NA	NA	NA	NA
Screen 1	Aug/Sep 1996	1.10	--	0.0044	--	--	--	50.4
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	4.0
Screen 2	Aug/Sep 1996	--	--	0.024	--	--	--	4.0
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	3.1
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	2.5
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	0.7
Screen 4	Aug/Sep 1996	0.086	--	0.0045	--	--	--	1.8
Screen 5	Oct/Nov 1996	NA	--	--	--	NA	--	2.0
Screen 5	Aug/Sep 1996	0.060	--	--	--	--	--	2.0
MW-13	Oct/Nov 1996	NA	--	0.0054(EB)	0.031	NA	0.028	3.0
MW-13 DUP	Oct/Nov 1996	NA	--	0.0045(EB)	0.03	NA	0.031	3.0
MW-13	Aug/Sep 1996	0.092	--	--	0.046	0.044	0.047	4.1
MW-14								
Screen 1	Oct/Nov 1996	NA	--	--	--	NA	--	4.5
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	3.3
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	3.8
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	4.4
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	2.0
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	1.7
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	2.5
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	3.1
Screen 5	Oct/Nov 1996	NA	--	--	--	NA	--	4.1
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	1.5
MW-15	Oct/Nov 1996	NA	--	--	--	NA	--	0.5
MW-15	Aug/Sep 1996	--	--	--	--	--	--	1.3
MW-16	Not Sampled	NA	NA	NA	NA	NA	NA	NA
MW-16	Aug/Sep 1996	0.11	--	--	0.018	--	--	3.4

TABLE 3-3

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

(concentrations in mg/l)

Sample Location	Sampling Date	Aluminum	Arsenic	Lead	Chromium Total	Chromium Dissolved	Hexavalent Chromium	Field Turbidity (NTUs)
MW-17								
Screen 1	Oct/Nov 1996	NA	--	--	--	NA	--	2.9
Screen 1	Aug/Sep 1996	--	--	--	NA	NA	NA	1.0
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	2.5
Screen 2	Aug/Sep 1996	0.33	--	--	NA	NA	NA	4.5
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	4.8
Screen 3	Aug/Sep 1996	0.12	--	0.0023	NA	NA	NA	4.9
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	2.6
Screen 4	Aug/Sep 1996	0.26	--	--	NA	NA	NA	2.8
Screen 5	Oct/Nov 1996	NA	--	0.0053(EB)	--	NA	--	5.2
Screen 5	Aug/Sep 1996	0.21	--	--	NA	NA	NA	5.0
MW-18								
Screen 1	Not Sampled	NA	NA	NA	NA	NA	NA	NA
Screen 1	Aug/Sep 1996	--	--	--	NA	NA	NA	0.9
Screen 2	Oct/Nov 1996	NA	--	0.0034(EB)	--	NA	--	3.4
Screen 2	Aug/Sep 1996	--	--	--	NA	NA	NA	3.5
Screen 3	Oct/Nov 1996	NA	--	0.0024(EB)		NA	--	4.0
Screen 3 (Dup)	Oct/Nov 1996	NA	--	--	--	NA	--	4.0
Screen 3	Aug/Sep 1996	--	--	--	NA	NA	NA	4.2
Screen 4	Oct/Nov 1996	NA	--	0.0025(EB)	--	NA	--	1.9
Screen 4	Aug/Sep 1996	--	--	--	NA	NA	NA	2.0
Screen 5	Oct/Nov 1996	NA	--	0.0023(EB)	--	NA	--	3.6
Screen 5	Aug/Sep 1996	--	--	--	NA	NA	NA	2.8
MW-19								
Screen 1	Oct/Nov 1996	NA	--	--	--	NA	--	3.4
Screen 1	Aug/Sep 1996	--	--	--	NA	NA	NA	5.0
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	3.6
Screen 2	Aug/Sep 1996	--	--	--	NA	NA	NA	4.5
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	5.0
Screen 3	Aug/Sep 1996	--	--	--	NA	NA	NA	3.0
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	8.0
Screen 4	Aug/Sep 1996	--	--	--	NA	NA	NA	4.2
Screen 5	Oct/Nov 1996	NA	--	--	--	NA	--	4.6
Screen 5	Aug/Sep 1996	--	--	--	NA	NA	NA	4.9
MW-20								
Screen 1	Not Sampled	NA	NA	NA	NA	NA	NA	NA
Screen 1	Aug/Sep 1996	--	--	--	NA	NA	NA	3.5
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	1.1
Screen 2	Aug/Sep 1996	--	--	--	NA	NA	NA	3.9
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	1.6
Screen 3	Aug/Sep 1996	--	--	--	NA	NA	NA	1.7
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	1.3
Screen 4	Aug/Sep 1996	--	--	--	NA	NA	NA	1.0

TABLE 3-3

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1996

(concentrations in mg/l)

Sample Location	Sampling Date	Aluminum	Arsenic	Lead	Chromium Total	Chromium Dissolved	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 5	Oct/Nov 1996	NA	--	--	--	NA	--	1.3
Screen 5	Aug/Sep 1996	--	--	--	NA	NA	NA	1.8
MW-21								
Screen 1	Not Sampled	NA	NA	NA	NA	NA	NA	NA
Screen 1	Aug/Sep 1996	--	--	--	NA	NA	NA	0.9
Screen 2	Oct/Nov 1996	NA	--	--	--	NA	--	1.2
Screen 2	Aug/Sep 1996	--	--	--	NA	NA	NA	2.1
Screen 3	Oct/Nov 1996	NA	--	--	--	NA	--	4.9
Screen 3	Aug/Sep 1996	--	--	--	NA	NA	NA	4.6
Screen 4	Oct/Nov 1996	NA	--	--	--	NA	--	3.3
Screen 4	Aug/Sep 1996	--	--	--	NA	NA	NA	2.5
Screen 5	Oct/Nov 1996	NA	--	--	--	NA	--	5.0
Screen 5	Aug/Sep 1996	0.012	--	--	NA	NA	NA	4.9
Practical Quantitation Limit		0.050	0.005	0.002	0.01	0.01	0.005	
Calif. Maximum Contaminant Level		1.0	0.05	0.05	0.05	--	--	
EPA Maximum Contaminant Level		0.05-0.2(1)	0.05	(2)	0.1	--	--	

NA: Not analyzed

(DUP): Duplicate

--: Not detected at laboratory detection limits

(1): Secondary MCL

(2): Treatment technique and public notification triggered at 0.015 mg/l

TABLE 4-1
SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES
COLLECTED FROM JPL MONITORING WELLS,
OCTOBER-NOVEMBER 1996
(All concentrations in mg/l)

Well Number	ANIONS						CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3	SO_4	PO_4	Na	Mg	K	Ca	Fe		
MW-1	13	0.849	207	1.3	34	<0.05[2]	28	13	9.7	42	0.11	170	7.8
MW-3													
Screen 1	14	0.616	189	1.3	28	<0.05[2]	17	15	2.4	43	0.67	155	7.7
Screen 2	11	0.52	201	0.8	36	<0.05[2]	18	16	2.5	47	0.22	165	7.6
Screen 3	24	2.27	139	<0.1[1]	17	<0.05[2]	36	8.4	2.8	22	0.41	115	8.4
Screen 4	9.4	4.37	169	0.3	17	<0.05[2]	47	8.1	2.1	16	1.2	140	8.6
Screen 5	8.9	9.62	148	<0.1[1]	8.7	<0.05[2]	65	<1.0	1.2	5	0.16	125	9
MW-4													
Screen 1	14	0.197	152	1.1	29	<0.05[2]	17	13	2.6	36	0.82	125	7.3
Screen 2	46	0.188	183	7.7	63	0.06	26	25	2.4	60	4.3	150	7.2
Screen 3	23	0.945	183	7.7	11	0.06	32	14	1.9	41	<0.100[3]	150	7.9
Screen 4	14	1.49	182	4.5	7.9	<0.05[2]	38	11	1.9	34	1.3	150	8.1
Screen 5	8.2	1.49	182	1	16	<0.05[2]	37	9.8	2	34	0.26	150	8.1
MW-5	14	0.065	159	1.7	30	<0.05[2]	15	12	2.8	38	0.16	130	6.8
MW-6	61	0.201	195	7	62	0.07	24	23	1.8	65	0.16	160	7.2
MW-7	20	0.364	177	5.7	36	<0.05[2]	18	15	2.6	47	0.41	145	7.5
MW-8	9.5	0.157	152	1.7	26	<0.05[2]	15	12	2.3	36	0.38	125	7.2
MW-9	21	0.428	262	1.1	54	<0.05[2]	26	20	3.8	61	0.21	215	7.4
MW-10	88	0.129	250	15	130	<0.05[2]	26	38	3.2	110	0.26	205	6.9
MW-11													
Screen 1	14	1.94	237	0.2	35	0.37	24	18	3.3	48	0.21	195	8.1
Screen 2	14	1.69	207	0.3	35	0.1	23	18	3.1	40	0.71	170	8.1
Screen 3	11	2.67	206	<0.1[1]	24	0.05	28	15	2.4	40	0.2	170	8.3
Screen 4	10	1.94	188	<0.1[1]	21	<0.05[2]	25	14	2.3	36	0.98	155	8.2
Screen 5	9.7	1.63	158	<0.1[1]	17	<0.05[2]	47	2.4	1.3	26	0.54	130	8.2
MW-12													
Screen 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Screen 2	13	0.733	225	1.8	36	<0.05[2]	25	19	3.2	50	0.49	185	7.7
Screen 3	15	1.38	213	0.7	31	<0.05[2]	25	16	2.9	46	0.35	175	8
Screen 4	13	0.923	225	1.2	29	<0.05[2]	23	15	2.3	50	0.18	185	7.8
Screen 5	12	1.07	207	0.9	18	<0.05[2]	37	11	2.2	39	<0.100[3]	170	7.9
MW-13	23	0.339	165	8.6	55	0.06	22	17	2.6	50	0.26	135	7.5
MW-14													
Screen 1	115	0.538	262	20	175	<0.05[2]	46	52	2.9	135	0.4	215	7.5
Screen 2	110	1.07	329	14	170	0.08	36	58	2.8	135	0.58	270	7.7
Screen 3	85	1.01	195	13	105	<0.05[2]	39	39	3.2	73	<0.100[3]	160	7.9
Screen 4	25	0.878	170	10	16	0.07	27	18	2	45	0.12	140	7.9
Screen 5	7.8	5.7	175	0.2	15	<0.05[2]	38	12	2.4	19	0.4	145	8.7

Notes:

(1) Based on a detection limit of 0.100 mg/L for NO3

(2) Based on a detection limit of 0.05 mg/L for H2PO4

(3) Based on a detection limit of 0.100 mg/L for Fe

n/d = not detected

N/A = not available; sample not collected during Oct./Nov. 1996 event

TABLE 4-1
SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES
COLLECTED FROM JPL MONITORING WELLS,
OCTOBER-NOVEMBER 1996
(All concentrations in mg/l)

Well Number	ANIONS						CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3	SO_4	PO_4	Na	Mg	K	Ca	Fe		
MW-15	23	0.301	232	1.3	48	<0.05[2]	23	18	3.1	54	0.12	190	7.3
MW-16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-17													
Screen 1	5.7	0.534	164	0.6	28	0.07	14	13	2.2	34	0.19	135	7.7
Screen 2	7.3	2.58	158	0.8	28	0.06	17	17	2.4	29	0.28	130	8.4
Screen 3	13	0.726	177	1.5	31	0.09	21	17	1.9	36	1.5	145	7.8
Screen 4	12	1.25	243	2.1	26	0.07	32	15	1.7	46	0.14	200	7.9
Screen 5	13	1.1	213	2.1	28	0.07	38	14	1.9	40	5.1	175	7.9
MW-18													
Screen 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Screen 2	11	0.489	189	1.3	35	0.07	18	16	2.5	41	0.25	155	7.6
Screen 3	14	1.79	219	0.3	32	<0.05[2]	25	21	3.2	42	0.64	180	8.1
Screen 4	8.7	1.44	176	0.4	24	<0.05[2]	32	9.7	1.5	35	0.15	145	8.1
Screen 5	11	6.89	168	<0.1[1]	6.3	<0.05[2]	55	5.9	1.9	13	0.14	140	8.8
MW-19													
Screen 1	6.4	0.3	146	0.9	26	<0.05[2]	13	13	2.3	33	0.51	120	7.5
Screen 2	44	0.16	195	4.5	63	0.05	16	25	1.8	55	7.2	160	7.1
Screen 3	71	0.316	244	9.9	64	0.05	31	32	2.5	73	1.6	200	7.3
Screen 4	32	0.752	231	4.4	43	<0.05[2]	27	23	2	53	0.8	190	7.7
Screen 5	61	1.05	256	8.7	57	0.05	33	30	2.4	71	0.37	210	7.8
MW-20													
Screen 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Screen 2	15	3.35	163	2.5	32	0.06	25	20	2.2	29	0.14	135	8.5
Screen 3	24	7.87	192	0.6	18	<0.05[2]	57	12	2.4	17	0.16	160	8.8
Screen 4	11	4.53	175	<0.1[1]	21	0.12	72	2.2	1.1	9.3	0.14	145	8.6
Screen 5	8.4	11.2	172	<0.1[1]	23	0.07	69	2.2	1.6	11	<0.100[3]	145	9
MW-21													
Screen 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Screen 2	125	0.403	311	8.8	150	0.05	53	49	3.1	130	0.17	255	7.3
Screen 3	91	0.563	274	9.4	85	<0.05[2]	37	37	3	100	0.54	225	7.5
Screen 4	51	0.464	226	8.6	49	0.05	29	26	2.3	68	0.13	185	7.5
Screen 5	56	0.752	231	9.7	64	<0.05[2]	33	30	2.7	73	2.1	190	7.7

Notes:

(1) Based on a detection limit of 0.200 mg/L for NO3

(2) Based on a detection limit of 0.05 mg/L for H2PO4

(3) Based on a detection limit of 0.100 mg/L for Fe

n/d = not detected

N/A = not available; sample not collected during Oct./Nov. 1996 event

TABLE 4-2
SUMMARY OF QUALITY CONTROL ANALYSES OF WATER CHEMISTRY
DATA FROM GROUNDWATER SAMPLES COLLECTED
FROM JPL MONITORING WELLS,
OCTOBER-NOVEMBER 1996

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-1	4.57	4.64	9.21	0.76	260	243.11	1.1
MW-3							
Screen 1	4.17	4.19	8.36	0.24	240	214.37	1.1
Screen 2	4.42	4.51	8.93	1.01	270	230.52	1.2
Screen 3	3.33	3.43	6.76	1.48	210	179.61	1.2
Screen 4	3.44	3.56	7	1.71	210	185.1	1.1
Screen 5	2.93	3.11	6.04	2.98	210	163.96	1.3
MW-4							
Screen 1	3.58	3.68	7.26	-1.38	220	187.7	1.2
Screen 2	6.16	6.25	12.41	-0.73	380	324.46	1.2
Screen 3	4.43	4.64	9.07	2.32	260	220.66	1.2
Screen 4	3.88	4.31	8.19	5.25	230	202.6	1.1
Screen 5	3.64	4.17	7.81	6.79	230	198.26	1.2
MW-5	3.74	3.61	7.35	-1.77	200	191.66	1.0
MW-6	6.71	6.23	12.94	-3.71	410	340.03	1.2
MW-7	4.62	4.43	9.05	-2.10	250	231.71	1.1
MW-8	3.43	3.5	6.93	-1.01	210	177.88	1.2
MW-9	6.1	5.92	12.02	-1.50	350	316.11	1.1
MW-10	10.4	9.84	20.24	-2.77	600	533.46	1.1
MW-11							
Screen 1	5.04	5.01	10.05	-0.30	300	260.08	1.2
Screen 2	4.55	4.56	9.11	-0.11	260	236.21	1.1
Screen 3	4.21	4.51	8.72	-3.44	240	222.65	1.1
Screen 4	3.82	4.1	7.92	-3.54	220	202.28	1.1
Screen 5	3.23	3.57	6.8	-5.00	210	181.94	1.2

Note: Shaded areas represent values that fall slightly outside the ideal range for each particular QA/QC test.

(1) Could not be sampled due to below normal water levels.

TABLE 4-2
SUMMARY OF QUALITY CONTROL ANALYSES OF WATER CHEMISTRY
DATA FROM GROUNDWATER SAMPLES COLLECTED
FROM JPL MONITORING WELLS,
OCTOBER-NOVEMBER 1996

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-12							
Screen 1	Not Sampled [1]						
Screen 2	4.95	5.23	10.18	2.75	290	259.49	1.1
Screen 3	4.62	4.78	9.4	-1.70	280	241.95	1.2
Screen 4	4.76	4.79	9.55	-0.31	290	244.68	1.2
Screen 5	4.18	4.52	8.7	3.91	260	222.1	1.2
MW-13	5.11	4.92	10.03	-1.89	310	259.52	1.2
MW-14							
Screen 1	12.6	13.1	25.7	-1.95	790	675.3	1.2
Screen 2	13	13.2	26.2	0.76	760	688.46	1.1
Screen 3	8.71	8.64	17.35	0.40	530	453.2	1.2
Screen 4	4.55	4.96	9.51	-4.31	300	227.19	1.3
Screen 5	3.45	3.65	7.1	2.82	200	181.8	1.1
MW-15	5.54	5.26	10.8	-2.59	310	284.52	1.1
MW-16	Not Sampled [1]						
MW-17							
Screen 1	3.49	3.43	6.92	-0.87	190	178.76	1.1
Screen 2	3.45	3.65	7.1	-2.82	180	179.84	1.0
Screen 3	4.02	4.16	8.18	1.71	230	210.59	1.1
Screen 4	5.03	4.97	10	-0.60	260	255.01	1.0
Screen 5	4.6	4.85	9.45	2.65	250	247.17	1.0
MW-18							
Screen 1	Not Sampled [1]						
Screen 2	4.23	4.21	8.44	-0.24	220	218.12	1.0
Screen 3	4.68	5	9.68	3.31	270	246.14	1.1
Screen 4	3.67	3.98	7.65	4.05	250	198.45	1.3
Screen 5	3.24	3.58	6.82	4.99	210	177.24	1.2

Note: Shaded areas represent values that fall slightly outside the ideal range for each particular QA/QC test.

(1) Could not be sampled due to below normal water levels.

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TABLE 4-2
SUMMARY OF QUALITY CONTROL ANALYSES OF WATER CHEMISTRY
DATA FROM GROUNDWATER SAMPLES COLLECTED
FROM JPL MONITORING WELLS,
OCTOBER-NOVEMBER 1996

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-19							
Screen 1	3.19	3.34	6.53	2.30	200	167.11	1.2
Screen 2	6.08	5.55	11.63	4.56	340	312.55	1.1
Screen 3	8.04	7.7	15.74	-2.16	450	405.05	1.1
Screen 4	5.91	5.77	11.68	-1.20	340	299.2	1.1
Screen 5	7.73	7.52	15.25	-1.38	440	389.52	1.1
MW-20							
Screen 1	Not Sampled (1)						
Screen 2	3.97	4.24	8.21	3.29	230	206.9	1.1
Screen 3	4.29	4.38	8.67	1.04	240	227.16	1.1
Screen 4	3.65	3.8	7.45	2.01	200	203.86	1.0
Screen 5	3.62	3.77	7.39	2.03	210	202.27	1.0
MW-21							
Screen 1	Not Sampled (1)						
Screen 2	12.4	12.9	25.3	1.98	730	672.12	1.1
Screen 3	9.51	9.73	19.24	1.14	550	497.94	1.1
Screen 4	6.77	6.86	13.63	0.66	410	345.08	1.2
Screen 5	7.41	7.62	15.03	1.40	440	384.5	1.1

Note: Shaded areas represent values that fall slightly outside the ideal range for each particular QA/QC test.

(1) Could not be sampled due to below normal water levels.

TABLE 5-1
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS, OCTOBER 15, 1996

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	-	10/15/96	30.86	1116.70	1085.84
MW-3	1 (top)	10/15/96	153.41	1100.34	946.93
	2	10/15/96	162.24	1100.34	938.10
	3	10/15/96	165.35	1100.34	934.99
	4	10/15/96	219.87	1100.34	880.47
	5	10/15/96	231.15	1100.34	869.19
MW-4	1 (top)	10/15/96	130.46	1082.84	952.38
	2	10/15/96	138.80	1082.84	944.04
	3	10/15/96	140.05	1082.84	942.79
	4	10/15/96	146.36	1082.84	936.48
	5	10/15/96	200.52	1082.84	882.32
MW-5	-	10/15/96	119.20	1071.60	952.40
MW-6	-	10/15/96	218.34	1188.52	970.18
MW-7	-	10/15/96	259.12	1212.88	953.76
MW-8	-	10/15/96	184.63	1139.53	954.90
MW-9	-	10/15/96	24.22	1106.02	1081.80
MW-10	-	10/15/96	132.43	1087.71	955.28
MW-11	1 (top)	10/15/96	126.72	1139.30	1012.58
	2	10/15/96	181.31	1139.30	957.99
	3	10/15/96	193.85	1139.30	945.45
	4	10/15/96	197.16	1139.30	942.14
	5	10/15/96	245.09	1139.30	894.21
MW-12	1 (top)	10/15/96	NW	1102.14	NW
	2	10/15/96	157.49	1102.14	944.65
	3	10/15/96	160.00	1102.14	942.14
	4	10/15/96	168.82	1102.14	933.32
	5	10/15/96	213.88	1102.14	888.26
MW-13	-	10/15/96	226.66	1183.47	956.81
MW-14	1 (top)	10/15/96	200.86	1173.47	972.61
	2	10/15/96	202.22	1173.47	971.25
	3	10/15/96	201.91	1173.47	971.56
	4	10/15/96	201.82	1173.47	971.65
	5	10/15/96	201.80	1173.47	971.67
MW-15	-	10/15/96	36.13	1120.66	1084.53

NW: No Water Over Screened Interval

TABLE 5-1
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS, OCTOBER 15, 1996

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-16	-	10/15/96	NW	1236.27	NW
MW-17	1 (top)	10/15/96	245.16	1191.21	946.05
	2	10/15/96	258.79	1191.21	932.42
	3	10/15/96	272.19	1191.21	919.02
	4	10/15/96	312.70	1191.21	878.51
	5	10/15/96	320.00	1191.21	871.21
MW-18	1 (top)	10/15/96	NW	1225.41	NW
	2	10/15/96	282.76	1225.41	942.65
	3	10/15/96	292.44	1225.41	932.97
	4	10/15/96	316.86	1225.41	908.55
	5	10/15/96	331.45	1225.41	893.96
MW-19	1 (top)	10/15/96	200.41	1142.94	942.53
	2	10/15/96	209.41	1142.94	933.53
	3	10/15/96	212.71	1142.94	930.23
	4	10/15/96	291.49	1142.94	851.45
	5	10/15/96	292.93	1142.94	850.01
MW-20	1 (top)	10/15/96	NW	1165.05	NW
	2	10/15/96	233.04	1165.05	932.01
	3	10/15/96	250.28	1165.05	914.77
	4	10/15/96	271.41	1165.05	893.64
	5	10/15/96	229.65	1165.05	935.40
MW-21	1 (top)	10/15/96	NW	1059.10	NW
	2	10/15/96	95.38	1059.10	963.72
	3	10/15/96	95.36	1059.10	963.74
	4	10/15/96	95.24	1059.10	963.86
	5	10/15/96	95.33	1059.10	963.77

NW: No Water Over Screened Interval

TABLE 5-2
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS, NOVEMBER 22, 1996

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	-	11/22/96	25.12	1116.70	1091.58
MW-3	1 (top)	11/22/96	153.25	1100.34	947.09
	2	11/22/96	162.27	1100.34	938.07
	3	11/22/96	165.89	1100.34	934.45
	4	11/22/96	231.08	1100.34	869.26
	5	11/22/96	256.91	1100.34	843.43
MW-4	1 (top)	11/22/96	129.79	1082.84	953.05
	2	11/22/96	138.27	1082.84	944.57
	3	11/22/96	139.07	1082.84	943.77
	4	11/22/96	146.92	1082.84	935.92
	5	11/22/96	211.58	1082.84	871.26
MW-5	-	11/22/96	118.32	1071.60	953.28
MW-6	-	11/22/96	215.00	1188.52	973.52
MW-7	-	11/22/96	259.16	1212.88	953.72
MW-8	-	11/22/96	184.68	1139.53	954.85
MW-9	-	11/22/96	18.38	1106.02	1087.64
MW-10	-	11/22/96	130.65	1087.71	957.06
MW-11	1 (top)	11/22/96	126.62	1139.30	1012.68
	2	11/22/96	180.43	1139.30	958.87
	3	11/22/96	192.46	1139.30	946.84
	4	11/22/96	192.16	1139.30	947.14
	5	11/22/96	253.81	1139.30	885.49
MW-12	1 (top)	11/22/96	NW	1102.14	NW
	2	11/22/96	156.61	1102.14	945.53
	3	11/22/96	159.99	1102.14	942.15
	4	11/22/96	170.03	1102.14	932.11
	5	11/22/96	223.94	1102.14	878.20
MW-13	-	11/22/96	225.19	1183.47	958.28
MW-14	1 (top)	11/22/96	196.53	1173.47	976.94
	2	11/22/96	197.53	1173.47	975.94
	3	11/22/96	196.74	1173.47	976.73
	4	11/22/96	195.69	1173.47	977.78
	5	11/22/96	196.91	1173.47	976.56
MW-15	-	11/22/96	30.02	1120.66	1090.64

NW: No Water Over Screened Interval

TABLE 5-2
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS, NOVEMBER 22, 1996

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-16	-	11/22/96	NW	1236.27	NW
MW-17	1 (top)	11/22/96	NW	1191.21	NW
	2	11/22/96	259.50	1191.21	931.71
	3	11/22/96	272.66	1191.21	918.55
	4	11/22/96	317.94	1191.21	873.27
	5	11/22/96	319.71	1191.21	871.50
MW-18	1 (top)	11/22/96	NW	1225.41	NW
	2	11/22/96	285.76	1225.41	939.65
	3	11/22/96	293.77	1225.41	931.64
	4	11/22/96	317.46	1225.41	907.95
	5	11/22/96	321.03	1225.41	904.38
MW-19	1 (top)	11/22/96	200.66	1142.94	942.28
	2	11/22/96	207.41	1142.94	935.53
	3	11/22/96	210.39	1142.94	932.55
	4	11/22/96	291.21	1142.94	851.73
	5	11/22/96	294.88	1142.94	848.06
MW-20	1 (top)	11/22/96	NW	1165.05	NW
	2	11/22/96	228.56	1165.05	936.49
	3	11/22/96	236.64	1165.05	928.41
	4	11/22/96	245.98	1165.05	919.07
	5	11/22/96	226.00	1165.05	939.05
MW-21	1 (top)	11/22/96	NW	1059.10	NW
	2	11/22/96	92.74	1059.10	966.36
	3	11/22/96	92.64	1059.10	966.46
	4	11/22/96	92.54	1059.10	966.56
	5	11/22/96	92.46	1059.10	966.64

NW: No Water Over Screened Interval

APPENDIX A

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS FOR SHALLOW WELLS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/21/96
Site Engineer : T. BLANEY

Well Number : MW-1
Equipment : DRT-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	22.4	TOP OF 4" CASING	22.4
Depth to Sediment (ft)	119.6	TOP OF 4" CASING	119.6
Thickness of Sediment (ft)	0.4		0.4

Depth of Well (ft) 120.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 97.2

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 63.3

Casing Volumes Purged 0.66

Total Volume Purged (gals) 42

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1215	7.91	* 5.5	17.9	425	2.8	BEGAN PUMPING AT MW-1;
						CONTROL BOX AT 27 HZ
1220	7.95	* 0.52	16.6	405	2.8	WATER VERY CLEAR
1223	7.93	* 0.50	17.3	413	2.8	READY TO SAMPLE
1230					0.02	FLOW REDUCED, CONTROL
						BOX AT 21 HZ; COLLECT MW-962-67

Notes Sampling Procedures: * TURBIDITY METER AFFECTED BY HIGH HUMIDITY ASSOCIATED WITH HEAVY RAINS TODAY. TURBIDITY VALUES WERE CALCULATED AS DIFFERENCE BETWEEN THE INSTRUMENT RESPONSE TO THE 0.02 NTU STANDARD AND THE GROUNDWATER SAMPLE.

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WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 11/19/96
Site Engineer : T. BLANEY
Well Number : MW-5
Equipment : DRT-15C
YSI 3560
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	118.90 FT.	TOP OF 4" CASING	118.90 FT.
Depth to Sediment (ft)	137.6 FT.	TOP OF 4" CASING	137.6 FT.
Thickness of Sediment (ft)	2.4 FT		2.4 FT.

Depth of Well (ft) 140 FT.
Diameter of Casing (ft) 0.333 FT.
Water Column Height (ft) 21.1 FT
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 13.7 GALS
Casing Volumes Purged 6.3
Total Volume Purged (gals) 86.4

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1140	7.11	153.8	16.8	518	1.8	BEGIN PUMPING / CONTROL BOX SET AT 263 Hz
1150	6.97	34.8	17.1	308	1.8	WATER DIRTY
1200	6.71	9.01	17.1	313	1.8	WATER NEARLY CLEAR
1205	6.83	4.52	17.2	312	1.8	WATER CLEAR
1208	6.86	2.73	17.1	310	1.8	READY TO SAMPLE
1210					0.02	SAMPLE MW-962-55 COLLECTED; CONTROL BOX AT 231 Hz

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name :	JPL	Well Number :	MW-6
Project Number :	1572	Equipment :	DRT-15C, YSI 3500
Date :	11/13/96		TVA 1000
Site Engineer :	T. BLANEY	Contractor :	NONE

	Before	Reference Point	After
Depth to Water (ft)	216.38 FT.	TOP OF 4" CASING	216.45 FT.
Depth to Sediment (ft)	245.10 FT.	TOP OF 4" CASING	245.10 FT
Thickness of Sediment (ft)			

Depth of Well (ft): 245.00
Diameter of Casing (ft): 0.333
Water Column Height (ft): 28.72

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 5.95

Total Volume Purged (gals): 58.1

Casing Volumes Purged: 9.76

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	7.44	11.08	21.8	619	2	START PUMPING AT MW-6 / CONTROL BOX AT 38 OHZ
0925	6.95	1.54	21.4	614	2	WATER VERY CLEAR
0930	6.96	1.35	21.5	616	2	WATER VERY CLEAR
0935	6.95	0.95	21.4	615	2	WATER VERY CLEAR
0938	6.95	1.07	21.4	616	2	READY TO SAMPLE
0939					0.02	FLOW RATE REDUCED; CONTROL BOX AT 27 OHZ
0940					0.02	COLLECT MW-9G2-5A

Notes Sampling Procedures:

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WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0207
Date : 11/18/96
Site Engineer : T. BLANEY
Well Number : MW-7
Equipment : YSI 30 (M)
DAT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	259.90 FT.	TOP OF 4" CASING	259.90
Depth to Sediment (ft)	273.58 FT.	TOP OF 4" CASING	273.58 FT.
Thickness of Sediment (ft)	1.42 FT		1.42 FT

Depth of Well (ft) 275 FT.
Diameter of Casing (ft) 0.333 FT.
Water Column Height (ft) 15.10 FT.
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 9.83 GALS
Casing Volumes Purged 9.76
Total Volume Purged (gals) 95.9

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1130	7.75	32.8	19.7	417	1.74	BEGIN PUMPING; CONTROL BOX AT 393 HZ
1135	7.50	21.8	20.8	423	1.74	WATER CLOUDY
1140	7.46	32.6	21.1	428	1.74	WATER CLOUDY
1145	7.43	37.6	20.6	427	1.74	" "
1150	7.34	33.2	21.4	425	1.74	" "
1155	7.43	16.68	20.6	424	1.74	WATER SLIGHTLY CLOUDY
1200	7.40	13.54	21.0	425	1.74	" " "
1205	7.40	9.20	21.2	426	1.74	WATER CLEARING
1210	7.54	6.38	21.1	423	1.74	" "
1215	7.49	6.16	21.2	423	1.74	" "
1220	7.31	3.69	20.9	423	1.74	WATER CLEAR
1223	7.42	3.54	21.1	424	1.74	READY TO SAMPLE
1225					0.02	SAMPLE MW-962-S2 COLLECTED; CONTROL BOX AT 352 HZ
1230					0.02	SAMPLE MW-962-S2MS COLLECTED
1235					0.02	SAMPLE MW-962-S2MSD COLLECTED

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/19/96
Site Engineer : T. BLANEY

Well Number : MW-8
Equipment : PRT-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	185.34	TOP OF 4" CASING	185.32
Depth to Sediment (ft)	203.40	TOP OF 4" CASING	203.40
Thickness of Sediment (ft)	1.6		1.6

Depth of Well (ft) 205
Diameter of Casing (ft) 0.333
Water Column Height (ft) 19.66
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 12.8
Casing Volumes Purged 9.2
Total Volume Purged (gals) 117.2

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0925	7.07	171.9	15.1	298	1.8	BRIAN PUMPING AT MW-8;
						CONTROL BOX AT 334 Hz
0930	7.05	57.3	16.8	296	1.8	WATER DIRTY
0935	7.07	39.1	18.1	302	1.8	-11- -11-
0940	7.15	26.5	17.4	303	1.8	-11- -11-
0945	7.15	19.6	18.2	296	1.8	WATER CLOUDY
0950	7.16	15.3	18.0	302	1.8	-11- -11-
0955	7.17	13.3	18.1	303	1.8	-11- -11-
1000	7.14	10.8	17.7	296	1.8	-11- -11-
1005	7.15	9.65	18.2	294	1.8	-11- -11-
1010	7.04	7.19	17.2	304	1.8	-11- -11-
1015	7.08	6.40	17.7	297	1.8	WATER CLEARING
1020	7.07	5.20	18.5	304	1.8	WATER CLEAR
1025	7.08	4.80	17.2	297	1.8	WATER CLEAR
1028	7.05	4.67	18.3	304	1.8	READY TO SAMPLE
1030					0.02	FLOW REDUCED; CONTROL BOX
						AT 304 Hz; COLLECT MW-962-51
1035					0.02	COLLECT MW-962-51MS;
						CONTROL BOX AT 304 Hz
1040					0.02	COLLECT MW-962-51MSD;
						CONTROL BOX AT 304 Hz

Notes Sampling Procedures:

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/21/96
Site Engineer : T. BLANEY

Well Number : MW-9
Equipment : DRT-15C, YSI 3500, TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	18.42	TOP OF 4" CASING	18.42
Depth to Sediment (ft)	70.60	TOP OF 4" CASING	70.60
Thickness of Sediment (ft)			

Depth of Well (ft) = 70.0
Diameter of Casing (ft) = 0.333
Water Column Height (ft) = 52.18

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 33.98
Casing Volumes Purged = 1.96

Total Volume Purged (gals) = 66.6

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1120	7.24	* 25.0	18.8	515	3.33	BEGIN PUMPING AT MW-9; CONTROL BOX AT 27 HZ
1125	7.11	* 16.0	18.8	525	3.33	WATER SLIGHTLY CLOUDY
1130	7.00	* 8.10	18.3	517	3.33	WATER CLEARING
1135	7.04	* 4.8	18.7	532	3.33	WATER CLEAR
1138	7.03	* 2.5	18.6	520	3.33	READY TO SAMPLE
1140					0.02	FLOW REDUCED; CONTROL BOX AT 21.6 HZ; COLLECT MW-962-50

Notes Sampling Procedures: * TURBIDITY METER AFFECTED BY HIGH HUMIDITY ASSOCIATED WITH HEAVY RAINS TODAY. TURBIDITY VALUES CALCULATED AS DIFFERENCE BETWEEN THE INSTRUMENT RESPONSE TO THE 0.02 NTU STANDARDS AND THE GROUNDWATER SAMPLE.

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WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 11/18/96
Site Engineer : T. BLANEY
Well Number : MW-10
Equipment : YSI 3500
DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	131.39 FT	TOP OF 4" CASING	131.38 FT.
Depth to Sediment (ft)	154.40 FT.	TOP OF 4" CASING	154.40 FT.
Thickness of Sediment (ft)	0.6 FT		0.6 FT.

Depth of Well (ft) 155 FT.
Diameter of Casing (ft) 0.333 FT.
Water Column Height (ft) 23.61 FT.
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 15.37 GALS
Casing Volumes Purged 5.33
Total Volume Purged (gals) 81.9 GALS

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0930	6.59	38.6	18.8	857	1.82	BEGAN PUMPING; CONTROL BOX
						AT 275 Hz
0935	6.61	26.8	19.0	875	1.82	WATER CLOUDY
0940	6.79	16.13	19.3	882	1.82	WATER CLOUDY
0945	6.55	11.80	19.2	867	1.82	WATER SLIGHTLY CLOUDY
0950	6.60	9.90	19.3	869	1.82	" " "
0955	6.52	8.18	19.2	877	1.82	" " "
1000	6.53	7.07	18.6	874	1.82	WATER CLEARING
1005	6.51	6.69	18.3	873	1.82	WATER CLEARING
1010	6.51	4.69	18.9	871	1.82	WATER CLEAR
1013	6.53	4.93	18.9	868	1.82	READY TO SAMPLE
1015					0.02	SAMPLE MW-962-48 COLLECTED;
						CONTROL BOX SET AT 247 Hz
1020					0.02	SAMPLE MW-962-49 COLLECTED;
						CONTROL BOX SET AT 247 Hz

Notes Sampling Procedures:

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name :	JPL	Well Number :	MW-13
Project Number :	1572	Equipment :	YSI-3500
Date :	11/20/96		DRT-1SC
Site Engineer :	T. BLANEY	Contractor :	NONE

	Before	Reference Point	After
Depth to Water (ft)	225.68 FT.	TOP OF 4" CASING	225.62 FT.
Depth to Sediment (ft)	235.35 FT.	TOP OF 4" CASING	235.35 FT.
Thickness of Sediment (ft)	0.15 FT.		0.15 FT.

Depth of Well (ft): 235.50
Diameter of Casing (ft): 0.333
Water Column Height (ft): 9.82

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 6.39 GALS

Casing Volumes Purged: 6.6

Total Volume Purged (gals): 42.2 GALS

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1255	6.91	166.9	22.7	521	2.1	BEGAN PUMPING / CONTROL BOX AT 38.9 Hz
1300	7.10	23.1	22.4	498	2.1	WATER DIRTY
1305	7.09	7.53	22.6	493	2.1	WATER CLEARING
1310	7.16	3.11	22.4	489	2.1	WATER CLEAR
1313	7.13	3.01	22.5	486	2.1	READY TO SAMPLE
1315					0.02	SAMPLE MW-962-34 COLLECTED, CONTROL BOX AT 32.3 Hz
1320					0.02	SAMPLE MW-962-35 COLLECTED, CONTROL BOX AT 32.3 Hz

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/21/96
Site Engineer : T. BLANEY

Well Number : MW-15
Equipment : DRT-15C, YSI 3560
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	30.05	TOP OF 4" CASING	30.05
Depth to Sediment (ft)	75.31	TOP OF 4" CASING	75.31
Thickness of Sediment (ft)			

Depth of Well (ft) 75.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 45.26

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 29.5

Casing Volumes Purged 1.61

Total Volume Purged (gals) 47.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0920	7.29	*0.45	16.5	460	1.9	BEGAN PUMPING AT MW-15;
						CONTROL BOX AT 179 Hz
0925	6.96	*0.50	16.5	451	1.9	WATER VERY CLEAR
0928	6.98	*0.50	16.7	457	1.9	READY TO SAMPLE
0945					0.02	FLOW REDUCED; CONTROL
						BOX AT 119 Hz; COLLECTED
						MW-962-28

Notes Sampling Procedures: *TURBIDITY METER AFFECTED BY HIGH HUMIDITY ASSOCIATED WITH HEAVY RAINS TODAY. TURBIDITY VALUES CALCULATED AS DIFFERENCE BETWEEN THE INSTRUMENT RESPONSE TO THE 0.02 NTU STANDARD AND THE GROUNDWATER SAMPLE.

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APPENDIX B

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

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/12/96
Site Engineer : T. BLANEY
Well Number : MW-3
Equipment : DRT-15C, YSI-3500, TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0905	8.15	2.69	20.2	312	N/A	1ST RUN PRIOR TO SAMPLING
						AT SCREEN #3, INITIAL PARAMS.
0930						COLLECT MW-962-64
0935						COLLECT MW-962-64MS
0940						COLLECT MW-962-64MSD
0950	8.98	2.84	20.7	315	N/A	LAST RUN AT SCREEN #3,
						FINAL PARAMETERS
1010	7.51	2.65	19.8	392	N/A	1ST RUN AT SCREEN #2, PRIOR
						TO SAMPLING
1030						COLLECT MW-962-65
1050	7.36	1.94	19.4	392	N/A	LAST RUN AT SCREEN #2,
						FINAL PARAMETERS
1110	7.75	3.08	20.0	366	N/A	1ST RUN PRIOR TO SAMPLING
						AT SCREEN #1
1130						COLLECT MW-962-66
1205	7.47	5.06	20.4	342	N/A	FINAL RUN AT SCREEN #1,
						FINAL PARAMETERS

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURE/LEVEL SHEET FOR MW-3

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 11/11/96
Site Engineer : T. BLANEY

Well Number : MW-3
Equipment : DRT-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1145	9.11	1.90	21.9	305	N/A	1ST Run @ Screen #5; Prior to Sampling
1215						Sample MW-962-62
1250	9.12	1.18	21.9	304	N/A	LAST Run @ Screen #5; AFTER Sampling
1320	8.54	2.60	22.9	331	N/A	1ST Run @ Screen #4; Prior to Sampling
1345						Sample MW-962-63
1415	8.52	1.89	22.7	332	N/A	LAST Run @ Screen # 4 AFTER Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-3.

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : IPL
Project Number : 1572
Date : 11/6/96
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-4
Equipment : DRT-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0855	7.55	1.53	18.7	404	N/A	1ST RUN AT SCREEN #3, INITIAL PARAMETERS, PRIOR TO SAMPLING
0915						COLLECT SAMPLE MW-962-58
0930	7.57	0.72	18.1	403	N/A	FINAL RUN TO SCREEN #3; FINAL PARAMETERS
0950	7.13	4.17	18.0	532	N/A	1ST RUN AT SCREEN #2, PRIOR TO SAMPLING, INITIAL PARAM'S
1015						COLLECT MW-962-59
1020						COLLECT MW-962-60 (DUP.)
1050	6.99	28.4	19.2	533	N/A	FINAL RUN AT SCREEN # 2, FINAL PARAMETERS
1115	7.18	1.69	17.6	311	N/A	1ST RUN PRIOR TO SAMPLING AT SCREEN # 1, INITIAL PARAM'S
1145						COLLECT MW-962-61
1150	7.23	1.07	18.1	313	N/A	FINAL RUN AT SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 11/5/96
Site Engineer : T. Chai, J. Brennan

Well Number : MW-4
Equipment : DRG-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1210	7.82	4.12	21.0	370	N/A	1ST RUN@SCREEN#5 PRIOR SAMPLING
						INITIAL PARAMETERS
1240						2ND RUN, SCREEN#5, COLLECT SAMPLE
						#MW-962-56
1300	7.91	3.85	21.1	349	N/A	3RD FINISH SAMPLING MW-962-56, FINAL PARAMETERS
1330	7.89	1.38	19.9	362	N/A	1ST RUN@SCREEN#4 PRIOR SAMPLING; INITIAL
						PARAMETERS
1345						Sample MW-962-57
1410	7.80	1.62	20.5	366	N/A	LAST Run@ Screen#4 AFTER Sampling

Notes Sampling Procedures: *SEE Piezometric Pressures / Levels FOR MW-4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/11/96
Site Engineer : T. BLANEY

Well Number : MW-11
Equipment : DRT-15C, YSI 3500, TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0835	7.84	4.71	20.0	308	N/A	1ST RUN PRIOR TO SAMPLING
						SCREEN #2, INITIAL PARAMS
0900						COLLECT MW-962-46
0917	7.93	2.47	20.8	389	N/A	LAST RUN AT SCREEN #2,
						FINAL PARAMETERS
0945	8.18	2.54	22.5	440	N/A	1ST RUN PRIOR TO SAMPLING
						SCREEN #1
1005						COLLECT MW-962-47
1055	8.18	3.13	22.8	321	N/A	LAST RUN AT SCREEN #1,
						FINAL PARAMETERS

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES / LEVELS SHEET FOR MW-11

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 11/8/96
Site Engineer : T. BLANEY
Well Number : MW-11
Equipment : DRT-15C, YSI 3500 TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0850	8.06	0.99	21.5	322	N/A	1ST Run @ Screen #5 Prior to Sampling **
1010	8.18	1.93	21.7	305	N/A	2ND Run @ Screen #5 AFTER Replacing Sample Bottles
1035						SAMPLE MW-962-43
1100	8.43	1.88	22.2	307	N/A	LAST Run @ Screen #5 AFTER Sampling
1120	8.29	3.28	20.6	347	N/A	1ST Run @ Screen #4 Prior to Sampling
1200						SAMPLE MW-962-44
1235	8.30	2.59	21.1	343	N/A	LAST Run @ Screen #4 AFTER Sampling
1255	8.30	2.34	21.1	383	N/A	1ST Run @ Screen #3 Prior to Sampling
1315						SAMPLE MW-962-45
1340	8.30	1.93	21.3	384	N/A	LAST Run @ Screen #3 AFTER Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-11.

** LOOSE FITTING ON BOTTOM OF SAMPLE TOOL. REPLACED BOTTLES WITH NEW DECONTAMINATED BOTTLES. FIXED LOOSE FITTING

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.020L
Date : 11/7/96
Site Engineer : T. BLANEY

Well Number : MW-12
Equipment : DRT-15C, YSI 350
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0915	7.74	0.72	18.6	412	N/A	1ST Run @ Screen #4 Prior to Sampling
0940						SAMPLE MW-962-37
1010	7.76	2.11	19.7	409	N/A	LAST Run @ Screen #4 AFTER Sampling
1030	7.55	3.89	19.7	426	N/A	1ST Run @ Screen #2 Prior to Sampling
1050						Sampled MW-962-35
1230	7.57	4.25	19.5	430	N/A	LAST Run @ Screen #2 AFTER Sampling
1300	7.92	3.08	18.7	389	N/A	1ST Run @ Screen #3 Prior to Sampling
1315						Sample MW-962-38
1320						Sample MW-962-38-MS
1325						Sample MW-962-38-MSD
1350	7.88	3.52	21.8	412	N/A	LAST Run @ Screen #3 AFTER Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-12

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/6/96
Site Engineer : T. CHOI, N. BRENNER

Well Number : MW-12
Equipment : DRT-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1315	7.97	2.06	19.1	366	N/A	1ST RUN PRIOR TO SAMPLING AT
						SCREEN #5; INITIAL PARAMETERS
1340						COLLECTED MW-962-36
1400	7.76	1.06	19.2	363	N/A	FINAL RUN AT SCREEN #5;
						FINAL PARAMETERS

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-12

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 11/4/92
Site Engineer : T. BLANEY

Well Number : MW-14
Equipment : DRT-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1048	8.35	4.14	20.4	305	N/A	1ST RUN SCREEN #5 PRIOR TO SAMPLING
1110						2ND RUN @ SCREEN #5 ; COLLECT
						MW-962-29
1145	8.66	3.46	20.1	307	N/A	3RD RUN @ SCREEN #5 ; LAST RUN
						SURFACE SAMPLING OF FIELD PARAMETERS
1205	8.83	2.51	20.5	427	N/A	1ST RUN @ SCREEN #4 PRIOR TO SAMPLING
1230						SAMPLE MW-962-30
1250	7.78	3.58	20.5	446	N/A	LAST RUN; AFTER SAMPLING SCREEN #4
1315	8.88	1.98	20.7	748	N/A	1ST RUN @ SCREEN #3 PRIOR TO SAMPLING
1335						SAMPLE MW-962-31
1355	3.88	0.94	20.7	748	N/A	LAST RUN; AFTER SAMPLING SCREEN #3

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES / LEVELS SHEET FOR MW-14.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/5/96
Site Engineer : T. CHOI, J. BRENNER

Well Number : MW-14
Equipment : DRT-15C, YSI 3500
TVA 1000
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0900	7.54	3.78	18.8	997	N/A	1ST RUN @ SCREEN 2, PRIOR TO
						SAMPLING, INITIAL PARAM
0925						COLLECT SAMPLE MW-962-32
0950	7.25	2.37	18.6	1003	N/A	FINAL RUN @ SCREEN #2, FINAL
						PARAMETERS
1015	7.52	4.47	19.3	1027	N/A	1ST RUN @ SCREEN #1, PRIOR TO
						SAMPLING, INITIAL PARAMETERS
1040						COLLECT SAMPLE MW-962-33
1100	7.76	4.95	18.8	1153	N/A	FINAL RUN @ SCREEN #1, FINAL
						PARAMETERS

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-14

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/18/96
Site Engineer : T. Choi / J. Brenner

Well Number : MW-17
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1135	7.95	43.0	19.9	396	N/A	1ST Rem Screen #5 Prior to Sampling
1150	7.95	43.0	19.9	396	N/A	2ND Rem Screen #5 Reducing Turbidity
1220	7.94	88.0	20.0	395	N/A	3RD Rem Screen #5 Reducing Turbidity
1300	7.94	58.2	19.9	398	N/A	4TH Rem Screen #5 Reducing Turbidity
1335	8.00	45.2	19.4	39	N/A	5TH Rem Screen #5 Reducing Turbidity
1405	8.03	31.3	19.3	39.1	N/A	6TH Rem Screen #5 Reducing Turbidity
1442	8.01	52.3	19.4	394	N/A	7TH Rem Screen #5 Reducing Turbidity
1550	8.15	5.23	19.4	394	N/A	8TH Rem Screen #5 Reducing Turbidity
1555						Sampled MW-962-22
1630	8.27	2.93	19.2	381	N/A	LAST Rem Screen #5 After Sampling

Notes Sampling Procedures: * See Piezometric Pressures/Levels sheet for MW-17

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/21/96
Site Engineer : T. Choi / J. BRENNER

Well Number : MW-17
Equipment : YSI 3500
DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	X		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0940	7.86	2.59	18.3	413	N/A	1ST Run Screen #4 PRIOR TO Sampling
0940						Sample MW-962-23
1010	7.84	3.10	19.3	404	N/A	LAST Run Screen #4 AFTER Sampling
1050	7.91	10.75	18.9	350	N/A	1ST Run Screen #3 PRIOR TO Sampling
1115	7.90	9.71	19.4	354	N/A	2ND Run Screen #3 Reducing TURBIDITY
1150	7.89	1080	18.5	335	N/A	3RD Run Screen #3 Reducing TURBIDITY
1220	7.86	4.76	21.0	357	N/A	4TH Run Screen #3 Reducing TURBIDITY
1220						Sample MW-962-24
1245	7.83	4.02	18.5	339	N/A	LAST Run Screen #3 AFTER Sampling
1315	8.28	2.48	17.6	284	N/A	1ST Run Screen #2 PRIOR to Sampling
1315						Sample MW-962-25
1345	8.52	3.26	20.0	312	N/A	LAST Run Screen #2 AFTER Sampling
1410	7.99	2.86	17.9	298	N/A	1ST Run Screen #1 PRIOR to Sampling
1410						Sample MW-962-26
1450	7.76	2.14	18.6	296	N/A	LAST Run Screen #1 AFTER Sampling

Notes Sampling Procedures: X SEE PIEZOMETRIC PRESSURES / LEVELS SHEET FOR MW-17

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/17/96
Site Engineer : T. Choi / J. Brennan

Well Number : MW-18
Equipment : DRT-15C, YSI 350
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0915	8.38	3.62	17.7	291	N/A	1ST Run Screen #5 Prior to Sampling
1005						SAMPLE MW-962-16
1041	8.64	2.23	19.8	290	N/A	LAST Run Screen #5 AFTER Sampling
1115	8.36	1.93	19.3	339	N/A	1ST Run Screen #4 Prior to Sampling
1120						Sample MW-962-17
1149	8.05	1.08	20.7	352	N/A	LAST Run Screen #4 AFTER Sampling
1220	8.01	3.99	20.1	404	N/A	1ST Run Screen #3 Prior to Sampling
1250						Sample MW-962-18
1300						Sample MW-962-19 (Dup. of MW-962-18)
1320	8.15	4.04	20.2	415	N/A	LAST Run Screen #3 AFTER Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-18

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/18/96
Site Engineer : T. Choi / S. Brenner

Well Number : MW-18
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0935	6.55	3.43	18.2	351	N/A	1ST Pump Screen=2 Prior to Sampling
0935						Sample MW-962-20
1000	7.09	2.20	19.2	368	N/A	LAST Pump Screen=2 After Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES / LEVELS SHEET FOR MW-18.

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : ΔPL
Project Number : 1572.0202
Date : 10/28/96
Site Engineer : T. BLANEY

Well Number : MW-19
Equipment : DRT-15C
YSI 350C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	X		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0840	7.17	40.1	16.3	269	N/A	1ST Pump Screen #1 Prior to Sampling
1330	7.33	50.3	19.3	236	N/A	2ND Pump Screen #1 Reducing Turbidity
1400	7.19	40.0	18.7	237	N/A	3RD Pump Screen #1 Reducing Turbidity
1420	7.18	32.8	18.1	239	N/A	4TH Pump Screen #1 Reducing Turbidity
1440	7.24	32.7	18.3	248	N/A	5TH Pump Screen #1 Reducing Turbidity

Notes Sampling Procedures: * See Piezometric Pressures / Levels Sheet for MW-19

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 157202.02
Date : 10/29/96
Site Engineer : T. BLANEY

Well Number : MW-19
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1245	8.03	3.38	19.2	303	N/A	1ST RUN AT SCREEN # 1; INITIAL
						PARAMETER PRIOR TO SAMPLE COLLECTION
1310						COLLECT MW-96I-15
1330	7.2	4.71	18.8	294	N/A	LAST RUN AT SCREEN # 1; FINAL
						PARAMETERS AFTER SAMPLING

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES / LEVELS SHEET FOR MW-19

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/25/96
Site Engineer : T. BLANEY

Well Number : MW-19
Equipment : DRT-15C
YSI
Contractor : 3500

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0925	7.18	3.61	17.8	501	N/A	1ST Run Screen #2 Prior to Sampling
0950						Sampled MW-962-14
1015	7.05	7.28	18.0	470	N/A	LAST Run Screen #2 AFTER Sampling
1350	7.37	6.40	19.7	499	N/A	1ST Run Screen #4 Prior to Sampling
1440	7.57	7.97	19.1	483	N/A	2ND Run Screen #4 Reducing TURBIDITY
1500						Sampled MW-962-12
1530	7.83	9.67	19.7	501	N/A	LAST Run Screen #4 AFTER Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-19

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/24/96
Site Engineer : T. DLANEY

Well Number : MW-19
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0855	7.94	9.42	16.6	465	N/A	1ST Run Screen #4 Prior to Sampling
0920	7.68	9.84	17.2	468	N/A	2ND Run Screen #4 Reducing Turbidity
0945	7.63	20.5	16.8	461	N/A	3RD Run Screen #4 Reducing Turbidity
1015	7.51	20.3	16.8	468	N/A	4TH Run Screen #4 Reducing Turbidity
1040	7.53	12.16	18.2	478	N/A	5TH Run Screen #4 Reducing Turbidity
1225	7.53	11.67	18.8	486	N/A	6TH Run Screen #4 Reducing Turbidity
1315	7.09	5.00	19.2	640	N/A	1ST Run Screen #3 Prior to Sampling
1340						Sample: MW-962-13
1400	7.00	3.23	20.6	679	N/A	LAST Run Screen #3 After Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-19

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/23/96
Site Engineer : T. BLANEY / T. Chi

Well Number : MW-19
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1305	7.91	4.60	20.1	640	N/A	1ST Run Screen #5 Prior to Sampling
1305						Sample MW-962-11
1330	7.50	3.20	22.3	635	N/A	LAST Run Screen #5 AFTER Sampling
1400	7.80	17.7	20.0	472	N/A	1ST Run Screen #4 Prior to Sampling
1430	7.95	21.0	20.2	477	N/A	2ND Run Screen #4 Reducing Turbidity
1450	7.95	16.8	20.2	477	N/A	3RD Run Screen #4 Reducing Turbidity

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-19.

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.020L
Date : 10/22/96
Site Engineer : T. BLANEY

Well Number : MW-20
Equipment : DRT-15C, YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0908	9.02	1.30	17.0	324	N/A	1ST Run Screen #5 Prior to Sampling
0910						Sample MW-962-06
0950	9.07	0.06	17.0	309	N/A	LAST Run Screen #5 AFTER Sampling
1030	8.84	1.25	17.6	304	N/A	1ST Run Screen #4 Prior to Sampling
1030						Sample MW-962-07
1106	8.69	0.96	18.7	285	N/A	LAST Run Screen #4 AFTER Sampling
1140	8.77	1.62	18.1	367	N/A	1ST Run Screen #3 Prior to Sampling
1145						Sample MW-962-08
1215	8.85	1.98	18.5	375	N/A	LAST Run Screen #3 AFTER Sampling
1235						Resampled VOA Bottle for MW-962-06 Due to Bottle Seal Breakage in Cooler.

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES / LEVELS FOR MW-20.

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0202
Date : 10/23/96
Site Engineer : T. Blaney / T. Choi

Well Number : MW-20
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0845	9.40	1.08	16.3	315	N/A	1ST Run Screen #2 Prior to Sampling
0845						Sample MW-962-09
0910						Sample MW-962-09-MS
0920						Sample MW-962-09-MSD
0920	8.70	0.58	15.7	322	N/A	LAST Run Screen #2 AFTER Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES / LEVELS SHEET FOR MW-20

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572-0202
Date : 10/30/96
Site Engineer : T. Blaney

Well Number : MW-21
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	7.96	10.72	17.5	613	~~N/A~~	1ST RUN @ SCREEN #5, INITIAL PARAMETER PRIOR TO SAMPLE COLLECTION.
0940	7.76	27.51	17.3	613	N/A	2ND RUN TO SCREEN #5, CONTINUED TESTING FOR PARAMETERS PRIOR TO SAMPLING
1005	7.59	25.7	17.4	619	N/A	3RD RUN, STILL TESTING PARAMETERS
1030	7.57	34.7	18.2	617	N/A	4TH RUN, CONTINUE TRYING TO REDUCE TURBIDITY
1055	7.66	42.2	17.6	612	N/A	5TH RUN, CONTINUE TRYING TO REDUCE TURBIDITY
1115	7.57	38.6	17.2	623	N/A	6TH RUN, TRYING TO REDUCE TURBIDITY
1140	7.49	42.4	17.2	618	N/A	7TH RUN, CONTINUED PARAMETERS, ABANDONED SCREEN #5 AT 1145
1200	7.31	13.8	17.6	582	N/A	1ST RUN TO SCREEN #4, INITIAL PARAM. PRIOR TO SAMPLING

Notes Sampling Procedures: * See Piezometric Pressures / Levels Sheet For MW-21.

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/30/96
Site Engineer : T. BLANEY
Well Number : MW-21
Equipment : PRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	X		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1220	7.49	14.13	18.1	579	N/A	2ND Rinse @ Screen #4; Reducing Turbidity
1240	7.38	9.95	18.1	575	N/A	3RD Rinse @ Screen #4; Reducing Turbidity
1305	7.35	3.34	18.1	569	N/A	4TH Rinse @ Screen #4; Reducing Turbidity
1305						Sampled MW-962-02
1345	7.17	9.28	18.6	589	N/A	LAST Rinse @ Screen #4 After Sampling
1400	7.25	7.05	18.2	758	N/A	1ST Rinse @ Screen #3 Prior to Sampling
1420	7.32	25.0	18.3	766	N/A	2ND Rinse @ Screen #3 Reducing Turbidity
1440	7.24	19.5	18.4	782	N/A	3RD Rinse @ Screen #3 Reducing Turbidity

Notes Sampling Procedures: X SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-21.

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 10/31/96
Site Engineer : T. BLANEY

Well Number : MW-21
Equipment : DRT-15C, YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1055	7.07	8.00	19.7	647	N/A	1ST Run @ Screen #5; Prior to Sampling
1120	7.22	5.00	19.0	641	N/A	2ND Run @ Screen #5; Readings Turb. prior
1140						Sample MW-962-01
1200	7.22	4.97	18.9	644	N/A	LAST Run @ Screen #5; AFTER Sampling
1300	7.29	4.89	18.2	770	N/A	1ST RUN @ SCREEN #3; PRIOR TO SAMPLING
1320						2ND RUN @ SCREEN #3; SAMPLED MW-962-03
1325						SAMPLED MW-962-03MS
1330						SAMPLED MW-962-03MSD
1345	7.32	4.75	18.4	782	N/A	3RD RUN / LAST RUN AFTER Sampling

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES/LEVELS SHEET FOR MW-21

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 11/1/96
Site Engineer : T. BLANEY
Well Number : MW-21
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0855	7.34	1.20	14.9	930	N/A	RE RUN @ SCREEN #2; PRIOR TO SAMPLING
0915						COLLECT SAMPLE #MW-96Z-04
0945	6.98	1.72	17.7	982	N/A	LAST RUN AT SCREEN #2

Notes Sampling Procedures: * SEE PIEZOMETRIC PRESSURES / LEVELS SHEET FOR MW-21

F4

Parameters:

Dmp = Depth to water inside the MP Casing (ft) above MP
Dz = Depth to static water level (ft)
Dp = Depth of MP
Pi = Pressure reading inside the MP Casing (ft)
Po = Pressure reading outside the MP Casing (ft)
Patm = Atmospheric Pressure
H = Pressures outside the MP Casing minus Pressure inside the MP Casing divided by the weight of pure water (w)
w = Weight of pure water = 0.4335 psi/ft
Ez = Elevation of static water level
R = Reference elevation

Calculations:

H = Po-Pi/w (When water is above MP)
H = Po-Patm/w (When water is below MP)
Dz = Dmp - H (When water is above MP)
Dz = Dp - H (When water is below MP)
Ez = R - Dz

Date	Well #	Screen	R	Dp	Dmp	Pi or Patm	Po	H	Dz	Ez	
10/15/96	MW-3	5	1100.34	653	309.86	163.36	197.48	78.71	231.15	869.19	
		4	1100.34	558	310.32	122.15	161.36	90.45	219.87	880.47	
		3	1100.34	346	311.37	30.14	93.44	146.02	165.35	934.99	
		2	1100.34	252	0.00	14.79	53.70	89.76	162.24	938.10	
		1	1100.34	172	0.00	14.73	22.79	18.59	153.41	946.93	
10/15/96	MW-4	5	1082.84	513	253.02	127.20	149.96	52.50	200.52	882.32	
		4	1082.84	392	253.60	74.60	121.09	107.24	146.36	936.48	
		3	1082.84	322	253.94	44.19	93.56	113.89	140.05	942.79	
		2	1082.84	240	0.00	14.82	58.69	101.20	138.80	944.04	
		1	1082.84	150	0.00	14.73	23.20	19.54	130.46	952.38	
10/15/96	MW-11	5	1139.30	639	300.18	160.14	184.02	55.09	245.09	894.21	
		4	1139.30	524	300.74	110.70	155.60	103.58	197.16	942.14	
		3	1139.30	429	301.23	69.88	116.43	107.38	193.85	945.45	
		2	1139.30	259	0.00	14.79	48.47	77.69	181.31	957.99	
		1	1139.30	149	0.00	14.71	24.37	22.28	126.72	1012.58	
10/15/96	MW-12	5	1102.14	548	201.98	164.73	159.57	-11.90	213.88	888.26	
		4	1102.14	436	202.57	116.15	130.78	33.75	168.82	933.32	
		3	1102.14	323	203.09	67.03	85.71	43.09	160.00	942.14	
		2	1102.14	243	203.49	32.20	52.14	46.00	157.49	944.65	
		1	1102.14	140	0.00	14.67	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port
10/15/96	MW-14	5	1173.47	540	230.29	149.07	161.42	28.49	201.80	971.67	
		4	1173.47	456	230.72	112.60	125.13	28.90	201.82	971.65	
		3	1173.47	382	231.07	80.43	93.07	29.16	201.91	971.56	
		2	1173.47	277	231.59	34.74	47.47	29.37	202.22	971.25	
		1	1173.47	207	0.00	14.70	17.36	6.14	200.86	972.61	
10/15/96	MW-17	5	1191.21	726	386.25	162.50	191.22	66.25	320.00	871.21	
		4	1191.21	582	386.75	100.03	132.13	74.05	312.70	878.51	
		3	1191.21	468	387.39	50.47	100.41	115.20	272.19	919.02	
		2	1191.21	370	0.00	14.74	62.95	111.21	258.79	932.42	
		1	1191.21	250	0.00	14.64	16.74	4.84	245.16	946.05	
10/15/96	MW-18	5	1225.41	684	368.82	151.41	167.61	37.37	331.45	893.96	
		4	1225.41	564	369.41	99.30	122.08	52.55	316.86	908.55	
		3	1225.41	424	370.09	38.54	72.20	77.65	292.44	932.97	
		2	1225.41	330	0.00	14.73	35.21	47.24	282.76	942.65	
		1	1225.41	270	0.00	14.70	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port
10/15/96	MW-19	5	1142.94	498	352.12	78.00	103.66	59.19	292.93	850.01	
		4	1142.94	444	354.44	54.60	81.89	62.95	291.49	851.45	
		3	1142.94	392	352.66	31.95	92.62	139.95	212.71	930.23	
		2	1142.94	314	0.00	14.75	60.09	104.59	209.41	933.53	
		1	1142.94	242	0.00	14.73	32.76	41.59	200.41	942.53	
10/15/96	MW-20	5	1165.05	900	293.11	277.41	304.92	63.46	229.65	935.40	
		4	1165.05	700	294.04	190.61	200.42	22.63	271.41	893.64	
		3	1165.05	562	294.64	130.70	149.93	44.36	250.28	914.77	
		2	1165.05	392	295.42	56.88	83.92	62.38	233.04	932.01	
		1	1165.05	230	0.00	14.67	NA	#VALUE!	#VALUE!	#VALUE!	
10/15/96	MW-21	5	1059.10	372	118.86	124.61	134.81	23.53	95.33	963.77	
		4	1059.10	310	119.14	97.61	107.97	23.90	95.24	963.86	
		3	1059.10	240	119.49	67.63	78.09	24.13	95.36	963.74	
		2	1059.10	161	119.88	33.30	43.92	24.50	95.38	963.72	
		1	1059.10	90	0.00	14.69	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-3

Elevation of Datum(ft msl): 1100.34 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75°F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.67/23.42/1352 | Finish: 14.66/19.67/1417

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	653	163.36			23.81	1356	309.86	231.15	869.19
			197.48			1356			
			197.47			1357			
			197.48			1358			
				163.35		1400			
4	558	122.13			23.93	1400	310.32	219.87	880.47
			161.36			1400			
			161.36			1401			
			161.37			1402			
				122.16		1403			
3	346	30.13			22.62	1405	311.37	165.35	934.99
			93.43			1405			
			93.44			1406			
			93.44			1407			
				30.15		1408			
2	252	14.79			21.57	1409	0.00	162.24	938.10
			53.73			1409			
			53.69			1410			
			53.69			1411			
				14.78		1412			
1	172	14.74			20.46	1413	0.00	153.41	946.93
			22.78			1413			
			22.81			1414			
			22.79			1415			
				14.71		1416			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-4

Elevation of Datum(ft msl): 1082.84 | Range: 0 to 750 psia | Weather: Sunny and 75 °F | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.72/24.47/1500 | Finish: 14.72/20.52/1525

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	513	127.18			23.67	1504	253.02	200.52	882.32
			149.94			1504			
			149.99			1505			
			149.96			1506			
				127.21		1507			
4	392	74.61			23.01	1509	253.60	146.36	936.48
			121.09			1509			
			121.09			1510			
			121.09			1511			
				74.59		1512			
3	322	44.18			22.12	1515	253.94	140.05	942.79
			93.57			1515			
			93.55			1516			
			93.57			1517			
				44.19		1518			
2	240	14.81			21.74	1519	0.00	138.80	944.04
			58.69			1519			
			58.69			1520			
			58.69			1521			
				14.82		1522			
1	150	14.75			21.16	1522	0.00	130.46	952.38
			23.21			1522			
			23.19			1523			
			23.19			1524			
				14.71		1525			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-11

Elevation of Datum(ft msl): 1139.30 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.63/21.97/1603 | Finish: 14.75/19.15/1630

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	639	160.13			22.17	1610	300.18	245.09	894.21
			184.02			1610			
			184.04			1611			
			184.01			1612			
				160.15		1613			
4	524	110.69			22.27	1615	300.74	197.16	942.14
			155.61			1615			
			155.61			1616			
			155.59			1617			
				110.70		1618			
3	429	69.88			21.29	1619	301.23	193.85	945.45
			116.42			1619			
			116.45			1620			
			116.43			1621			
				69.87		1622			
2	259	14.79			20.26	1623	0.00	181.31	957.99
			48.47			1623			
			48.48			1624			
			48.46			1625			
				14.78		1626			
1	149	14.72			19.51	1626	0.00	126.72	1012.58
			24.39			1626			
			24.34			1627			
			24.37			1628			
				14.70		1629			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-12

Elevation of Datum(ft msl): 1102.14 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.66/22.82/1531 | Finish: 14.60/18.37/1554

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	548	164.72			22.58	1536	201.98	213.88	888.26
			159.58			1536			
			159.55			1537			
			159.57			1538			
				164.74		1538			
4	436	116.13			22.37	1538	202.57	168.82	933.32
			130.76			1538			
			130.79			1539			
			130.79			1540			
				116.17		1541			
3	323	67.03			20.99	1541	203.09	160.00	942.14
			85.72			1541			
			85.70			1542			
			85.71			1543			
				67.03		1544			
2	243	32.21			19.70	1544	203.49	157.49	944.65
			52.15			1544			
			52.13			1545			
			52.14			1546			
				32.18		1547			
1	140	14.67			19.02	1550	No Water Over Measurement Port		
			14.67			1550			
			14.67			1551			
			14.67			1552			
				14.67		1554			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-14

Elevation of Datum(ft msl): 1173.47 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.67/24.26/1428 | Finish: 14.53/20.16/1448

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	540	149.05			22.99	1430	230.29	201.80	971.67
			161.41			1430			
			161.43			1431			
			161.41			1432			
				149.08		1433			
4	456	112.60			22.58	1433	230.72	201.82	971.65
			125.14			1433			
			125.12			1434			
			125.13			1435			
				112.59		1436			
3	382	80.42			21.52	1438	231.07	201.91	971.56
			93.08			1438			
			93.07			1439			
			93.07			1440			
				80.43		1441			
2	277	34.75			20.60	1442	231.59	202.22	971.25
			47.47			1442			
			47.45			1443			
			47.48			1444			
				34.73		1445			
1	207	14.70			20.21	1445	0.00	200.86	972.61
			17.35			1445			
			17.38			1446			
			17.35			1447			
				14.70		1448			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-17

Elevation of Datum(ft msl): 1191.21 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.60/19.50/1128 | Finish: 14.50/16.24/1154

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	726	162.49			20.58	1133	386.25	320.00	871.21
			191.22			1133			
			191.22			1134			
			191.22			1135			
				162.51		1136			
4	582	100.03			19.88	1137	386.75	312.70	878.51
			132.14			1137			
			132.12			1138			
			132.13			1139			
				100.03		1140			
3	468	50.48			17.83	1142	387.39	272.19	919.02
			100.42			1142			
			100.42			1143			
			100.40			1144			
				50.46		1145			
2	370	14.73			16.96	1146	0.00	258.79	932.42
			62.95			1146			
			62.95			1147			
			62.95			1148			
				14.74		1149			
1	250	14.67			16.37	1150	0.00	245.16	946.05
			16.75			1150			
			16.73			1151			
			16.73			1152			
				14.60		1153			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-18

Elevation of Datum(ft msl): 1225.41 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.60/22.09/0906 | Finish: 14.72/22.13/945

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	684	151.39			22.11	914	368.82	331.45	893.96
			167.61			914			
			167.61			915			
			167.60			916			
				151.43		917			
4	564	99.28			21.74	921	369.41	316.86	908.55
			122.08			921			
			122.08			922			
			122.08			923			
				99.32		924			
3	424	38.54			20.37	925	370.09	292.44	932.97
			72.21			925			
			72.19			926			
			72.20			927			
				38.54		928			
2	330	14.75			18.16	934	0.00	282.76	942.65
			35.23			934			
			35.20			935			
			35.21			936			
				14.71		937			
1	270	14.71			17.79	938	No Water Over Measurement Port		
			14.66			938			
			14.66			939			
			14.66			940			
				14.69		941			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-19

Elevation of Datum(ft msl): 1142.94 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.62/19.57/1205 | Finish: 14.60/18.17/1228

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	498	77.98			19.43	1207	352.12	292.93	850.01
			103.67			1207			
			103.67			1208			
			103.65			1209			
				78.01		1210			
4	444	54.68			18.66	1212	354.44	291.49	851.45
			81.89			1212			
			81.90			1213			
			81.87			1214			
				54.51		1215			
3	392	31.95			18.46	1215	352.66	212.71	930.23
			92.62			1215			
			92.64			1216			
			92.61			1217			
				31.94		1218			
2	314	14.76			18.70	1220	0.00	209.41	933.53
			60.09			1220			
			60.09			1221			
			60.09			1222			
				14.74		1223			
1	242	14.74			18.56	1224	0.00	200.41	942.53
			32.77			1224			
			32.77			1225			
			32.74			1226			
				14.72		1227			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-20

Elevation of Datum(ft msl): 1165.05 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.71/20.13/1016 | Finish: 14.72/20.15/1105

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	900	277.39			22.98	1031	293.11	229.65	935.40
			304.91			1031			
			304.93			1032			
			304.92			1033			
				277.43		1034			
4	700	190.63			23.32	1039	294.04	271.41	893.64
			200.43			1039			
			200.41			1040			
			200.41			1041			
				190.59		1042			
3	562	130.69			21.99	1046	294.64	250.28	914.77
			149.95			1046			
			149.93			1047			
			149.91			1048			
				130.70		1049			
2	392	56.89			19.85	1052	295.42	233.04	932.01
			83.92			1052			
			83.95			1053			
			83.90			1054			
				56.86		1055			
1	230	14.69			17.57	1101	No Water Over Measurement Port		
			14.69			1101			
			14.69			1102			
			14.69			1103			
				14.64		1104			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/15/96 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-21

Elevation of Datum(ft msl): 1059.10 | Range: 0 to 750 psia | Weather: Sunny and 75 °F | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.76/25.56/1313 | Finish: 14.64/19.74/1336

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	372	124.62			23.27	1316	118.86	95.33	963.77
			134.81			1316			
			134.82			1317			
			134.80			1318			
				124.60		1319			
4	310	97.61			22.00	1320	119.14	95.24	963.86
			107.97			1320			
			107.98			1321			
			107.95			1322			
				97.60		1323			
3	240	67.63			20.84	1325	119.49	95.36	963.74
			78.11			1325			
			78.08			1326			
			78.09			1327			
				67.62		1328			
2	161	33.32			20.06	1328	119.88	95.38	963.72
			43.91			1328			
			43.92			1329			
			43.92			1330			
				33.28		1331			
1	90	14.69			19.72	1332	No Water Over Measurement Port		
			14.79			1332			
			14.79			1333			
			14.79			1334			
				14.69		1335			

Parameters:

Dmp = Depth to water inside the MP Casing (ft) above MP
Dz = Depth to static water level (ft)
Dp = Depth of MP
Pi = Pressure reading inside the MP Casing (ft)
Po = Pressure reading outside the MP Casing (ft)
Patm = Atmospheric Pressure
H = Pressures outside the MP Casing minus Pressure inside the MP Casing divided by the weight of pure water (w)
w = Weight of pure water = 0.4335 psi/ft
Ez = Elevation of static water level
R = Reference elevation

Calculations:

H = Po-Pi/w (When water is above MP)
H = Po-Patm/w (When water is below MP)
Dz = Dmp - H (When water is above MP)
Dz = Dp - H (When water is below MP)
Ez = R - Dz

Date	Well #	Screen	R	Dp	Dmp	Pi or Patm	Po	H	Dz	Ez	
11/22/96	MW-3	5	1100.34	653	310.38	162.17	185.35	53.47	256.91	843.43	
		4	1100.34	558	310.85	120.84	155.42	79.77	231.08	869.26	
		3	1100.34	346	311.86	28.78	92.06	145.97	165.89	934.45	
		2	1100.34	252	0.00	13.73	52.63	89.73	162.27	938.07	
		1	1100.34	172	0.00	13.63	21.76	18.75	153.25	947.09	
11/22/96	MW-4	5	1082.84	513	253.38	126.03	144.15	41.80	211.58	871.26	
		4	1082.84	392	253.98	73.33	119.74	107.06	146.92	935.92	
		3	1082.84	322	254.29	42.76	92.71	115.22	139.07	943.77	
		2	1082.84	240	0.00	13.66	57.76	101.73	138.27	944.57	
		1	1082.84	150	0.00	13.63	22.39	20.21	129.79	953.05	
11/22/96	MW-11	5	1139.30	639	300.96	158.91	179.35	47.15	253.81	885.49	
		4	1139.30	524	301.50	109.45	156.85	109.34	192.16	947.14	
		3	1139.30	429	302.08	68.58	116.10	109.62	192.46	946.84	
		2	1139.30	259	0.00	13.73	47.79	78.57	180.43	958.87	
		1	1139.30	149	0.00	13.69	23.39	22.38	126.62	1012.68	
11/22/96	MW-12	5	1102.14	548	253.72	141.50	154.41	29.78	223.94	878.20	
		4	1102.14	436	254.30	92.80	129.33	84.27	170.03	932.11	
		3	1102.14	323	254.85	43.62	84.74	94.86	159.99	942.15	
		2	1102.14	243	0.00	13.71	51.16	86.39	156.61	945.53	
		1	1102.14	140	0.00	13.69	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port
11/22/96	MW-14	5	1173.47	540	238.41	144.60	162.59	41.50	196.91	976.56	
		4	1173.47	456	238.85	107.58	126.29	43.16	195.69	977.78	
		3	1173.47	382	239.21	75.77	94.18	42.47	196.74	976.73	
		2	1173.47	277	239.74	30.13	48.43	42.21	197.53	975.94	
		1	1173.47	207	0.00	13.63	18.17	10.47	196.53	976.94	
11/22/96	MW-17	5	1191.21	726	372.21	167.71	190.47	52.50	319.71	871.50	
		4	1191.21	582	372.80	105.15	128.93	54.86	317.94	873.27	
		3	1191.21	468	373.54	55.61	99.34	100.88	272.66	918.55	
		2	1191.21	370	0.00	13.70	61.60	110.50	259.50	931.71	
		1	1191.21	250	0.00	13.69	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port
11/22/96	MW-18	5	1225.41	684	369.54	150.21	171.24	48.51	321.03	904.38	
		4	1225.41	564	370.15	98.11	120.95	52.69	317.46	907.95	
		3	1225.41	424	370.82	37.25	70.65	77.05	293.77	931.64	
		2	1225.41	330	0.00	13.73	32.91	44.24	285.76	939.65	
		1	1225.41	270	0.00	13.66	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port
11/22/96	MW-19	5	1142.94	498	260.60	116.46	101.60	-34.28	294.88	848.06	
		4	1142.94	444	260.88	93.00	79.85	-30.33	291.21	851.73	
		3	1142.94	392	261.16	70.52	92.53	50.77	210.39	932.55	
		2	1142.94	314	261.57	36.36	59.84	54.16	207.41	935.53	
		1	1142.94	242	0.00	13.69	31.61	41.34	200.66	942.28	
11/22/96	MW-20	5	1165.05	900	308.54	270.17	305.95	82.54	226.00	939.05	
		4	1165.05	700	309.53	183.15	210.70	63.55	245.98	919.07	
		3	1165.05	562	310.20	123.16	155.05	73.56	236.64	928.41	
		2	1165.05	392	311.10	49.23	85.01	82.54	228.56	936.49	
		1	1165.05	230	0.00	13.70	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port
11/22/96	MW-21	5	1059.10	372	148.03	111.06	135.15	55.57	92.46	966.64	
		4	1059.10	310	148.36	84.06	108.26	55.82	92.54	966.56	
		3	1059.10	240	148.70	54.10	78.40	56.06	92.64	966.46	
		2	1059.10	161	149.23	19.67	44.16	56.49	92.74	966.36	
		1	1059.10	90	0.00	13.64	NA	#VALUE!	#VALUE!	#VALUE!	No Water Above Port

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-3

Elevation of Datum(ft msl): 1100.34 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Partly cloudy and 75° | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.59/20.14/1540 | Finish: 13.55/20.96/1556

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	653	162.18			22.69	1542	310.38	256.91	843.43
			185.36			1543			
			185.33			1544			
			185.36			1544			
				162.16		1544			
4	558	120.82			23.77	1545	310.85	231.08	869.26
			155.44			1546			
			155.41			1547			
			155.41			1547			
				120.85		1547			
3	346	28.78			22.71	1548	311.86	165.89	934.45
			92.05			1549			
			92.05			1550			
			92.08			1550			
				28.77		1550			
2	252	13.72			21.71	1551	0.00	162.27	938.07
			53.28			1551			
			52.31			1552			
			52.31			1552			
				13.74		1552			
1	172	13.66			21.33	1553	0.00	153.25	947.09
			21.76			1554			
			21.76			1555			
			21.76			1556			
				13.59		1556			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-4

Elevation of Datum(ft msl): 1082.84 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Cloudy and 70 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.50/20.65/1448 | Finish: 13.55/21.39/1458

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	513	126.05			22.53	1449	253.38	211.58	871.26
			144.15			1449			
			144.15			1449			
			144.14			1450			
				126.01		1450			
4	392	73.33			22.91	1450	253.98	146.92	935.92
			119.76			1450			
			119.73			1451			
			119.74			1451			
				73.33		1451			
3	322	42.75			22.72	1452	254.29	139.07	943.77
			92.70			1452			
			92.73			1453			
			92.70			1454			
				42.76		1554			
2	240	13.66			22.27	1455	0.00	138.27	944.57
			57.77			1455			
			57.74			1456			
			57.77			1456			
				13.65		1456			
1	150	13.64			21.87	1457	0.00	129.79	953.05
			22.39			1457			
			22.39			1548			
			22.38			1548			
				13.62		1548			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-11

Elevation of Datum(ft msl): 1139.30 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Partly sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.54/19.82/1518 | Finish: 13.54/19.87/1535

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	639	158.88			21.53	1518	300.96	253.81	885.49
			179.35			1518			
			179.35			1519			
			179.34			1520			
				158.93		1520			
4	524	109.46			22.22	1521	301.50	192.16	947.14
			156.86			1521			
			156.83			1522			
			156.86			1523			
				109.43		1523			
3	429	68.58			21.03	1524	302.08	192.46	946.84
			116.11			1524			
			116.11			1525			
			116.08			1526			
				68.58		1526			
2	259	13.74			20.38	1527	0.00	180.43	958.87
			47.78			1528			
			47.81			1529			
			47.78			1530			
				13.72		1530			
1	149	13.69			20.07	1531	0.00	126.62	1012.68
			23.39			1532			
			23.38			1533			
			23.39			1534			
				13.69		1534			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 11/22/96
Job No.: 1572
Serial No.: 1576
Well Name: MW-12
Elevation of Datum(ft msl): 1102.14
Range: 0 to 750 psia
Client: Jet Propulsion Laboratory
Weather: Partly sunny and 75 °F
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner, T. Choi
Ambient Reading (Pressure/Temperature/Time) Start: 13.54/20.91/1500
Finish: 13.55/19.97/1515

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	548	141.50			21.75	1501	253.72	223.94	878.20
			154.40			1501			
			154.40			1502			
			154.43			1503			
				141.49		1503			
4	436	92.80			21.88	1504	254.30	170.03	932.11
			129.33			1504			
			129.33			1505			
			129.33			1506			
				92.80		1506			
3	323	43.61			21.10	1507	254.85	159.99	942.15
			84.74			1507			
			84.71			1508			
			84.77			1509			
				43.63		1509			
2	243	13.71			20.44	1510	0.00	156.61	945.53
			51.15			1510			
			51.18			1511			
			51.15			1512			
				13.70		1512			
1	140	13.69			20.15	1513	No Water Over Measurement Port		
			13.68			1513			
			13.65			1514			
			13.65			1515			
				13.68		1515			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-14

Elevation of Datum(ft msl): 1173.47 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Partly cloudy and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.57/20.90/1430 | Finish: 13.54/20.94/1441

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	540	144.61			22.15	1432	238.41	196.91	976.56
			162.59			1432			
			162.61			1432			
			162.58			1433			
				144.59		1433			
4	456	107.12			22.40	1433	238.85	195.69	977.78
			126.30			1433			
			126.27			1433			
			126.30			1434			
				108.03		1434			
3	382	75.78			21.95	1434	239.21	196.74	976.73
			94.16			1435			
			94.17			1435			
			94.20			1435			
				75.75		1436			
2	277	30.13			21.38	1436	239.74	197.53	975.94
			48.44			1436			
			48.41			1437			
			48.44			1437			
				30.12		1437			
1	207	13.64			20.93	1438	0.00	196.53	976.94
			18.16			1439			
			18.19			1440			
			18.16			1440			
				13.61		1440			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-17

Elevation of Datum(ft msl): 1191.21 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Sunny and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.51/20.43/1135 | Finish: 13.54/17.70/1215

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	726	167.72			21.22	1138	372.21	319.71	871.50
			190.47			1139			
			190.46			1140			
			190.48			1141			
				167.70		1142			
4	582	105.12			20.82	1146	372.80	317.94	873.27
			128.94			1147			
			128.96			1148			
			128.90			1149			
				105.18		1150			
3	468	55.60			18.81	1154	373.54	272.66	918.55
			99.33			1155			
			99.36			1156			
			99.33			1157			
				55.61		1158			
2	370	13.70			18.70	1202	0.00	259.50	931.71
			61.58			1203			
			61.61			1204			
			61.61			1205			
				13.69		1206			
1	250	13.66			17.88	1210	No Water Over Measurement Port		
			13.67			1211			
			13.64			1212			
			13.65			1213			
				13.71		1214			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-18

Elevation of Datum(ft msl): 1225.41 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Partly sunny and 70 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.67/18.32/0950 | Finish: 13.67/18.49/1025

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	684	150.20			22.66	957	369.54	321.03	904.38
			171.24			958			
			171.23			959			
			171.24			1000			
				150.22		1000			
4	564	98.11			22.19	1004	370.15	317.46	907.95
			120.95			1005			
			120.95			1006			
			120.96			1007			
				98.11		1008			
3	424	37.23			20.79	1009	370.82	293.77	931.64
			70.63			1010			
			70.66			1011			
			70.65			1012			
				37.26		1013			
2	330	13.74			19.43	1014	0.00	285.76	939.65
			32.90			1015			
			32.92			1016			
			32.91			1017			
				13.71		1018			
1	270	13.67			18.74	1019	No Water Over Measurement Port		
			13.67			1020			
			13.69			1021			
			13.69			1022			
				13.65		1023			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing
Probe Type: Westbay
Date: 11/22/96
Job No.: 1572
Serial No.: 1576
Well Name: MW-19
Elevation of Datum(ft msl): 1142.94
Range: 0 to 750 psia
Weather: Partly cloudy and 75 °F
Client: Jet Propulsion Laboratory
Casing Size: 1.5-inch Westbay Casing
Operator: J. Brenner, T. Choi
Ambient Reading (Pressure/Temperature/Time) Start: 13.54/19.29/1230
Finish: 13.59/18.56/1407

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	498	116.41			19.97	1232	260.60	294.88	848.06
			101.59			1233			
			101.62			1234			
			101.59			1235			
				116.50		1236			
4	444	93.00			18.95	1350	260.88	291.21	851.73
			79.84			1350			
			79.85			1351			
			79.86			1352			
				93.00		1353			
3	392	70.51			19.11	1354	261.16	210.39	932.55
			92.56			1354			
			92.50			1355			
			92.53			1356			
				70.52		1357			
2	314	36.35			18.85	1359	261.57	207.41	935.53
			59.84			1359			
			59.87			1400			
			59.81			1401			
				36.37		1402			
1	242	13.69			18.59	1404	0.00	200.66	942.28
			31.62			1404			
			31.59			1405			
			31.63			1406			
				13.68		1407			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-20

Elevation of Datum(ft msl): 1165.05 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Partly cloudy and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.54/20.32/1045 | Finish: 13.56/20.58/1127

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	900	269.95			23.80	1050	308.54	226.00	939.05
			305.92			1051			
			305.98			1052			
			305.95			1053			
				270.39		1054			
4	700	183.13			23.83	1058	309.53	245.98	919.07
			210.69			1059			
			210.70			1100			
			210.70			1101			
				183.17		1102			
3	562	123.14			22.71	1106	310.20	236.64	928.41
			155.03			1107			
			155.05			1108			
			155.06			1109			
				123.17		1110			
2	392	49.20			20.17	1114	311.10	228.56	936.49
			85.02			1115			
			85.02			1116			
			84.99			1117			
				49.25		1118			
1	230	13.72			18.63	1122	No Water Over Measurement Port		
			13.88			1123			
			13.81			1124			
			13.84			1125			
				13.68		1126			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/22/96 | Job No.: 1572

Serial No.: 1576 | Well Name: MW-21

Elevation of Datum(ft msl): 1059.10 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: Partly cloudy and 75 °F | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 13.62/20.48/1407 | Finish: 13.58/20.42/1425

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	372	111.05			20.84	1407	148.03	92.46	966.64
			135.15			1408			
			135.14			1409			
			135.17			1410			
				111.07		1410			
4	310	84.06			21.34	1411	148.36	92.54	966.56
			108.26			1412			
			108.29			1413			
			108.23			1414			
				84.06		1414			
3	240	54.10			20.88	1414	148.70	92.64	966.46
			78.42			1415			
			78.39			1416			
			78.39			1417			
				54.09		1418			
2	161	19.66			20.41	1418	149.23	92.74	966.36
			44.17			1418			
			44.14			1419			
			44.17			1420			
				19.67		1421			
1	90	13.64			20.38	1421	No Water Over Measurement Port		
			13.64			1422			
			13.67			1423			
			13.64			1424			
				13.64		1425			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: J.P.L. Location: MW-18 Depth: 698 Date: 10-17-96

Well Name: MW-18 Sampling Zone No.: SCREEN 5 Starting Time: 0930 Finishing Time: 1030

Technicians T. BLANEY / J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 153.32 PSIA (End of Session) 153.33 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	153.32	✓	0940	0943	✓	153.33	1 L	1ST RUN; NTUs = 3.62, PARAMETERS, METALS, ½ ANIONS
2	✓	✓	✓	✓	✓	✓	153.31	✓	1021	1023	✓	153.33	1	2 VOAS, HEX-CHROME, T-P, ½ ANIONS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments:

Total Volume: 2.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 578 Date: 10-17-96

Well Name: MW-18 Sampling Zone No.: SCREEN 4 Starting Time: 1045 Finishing Time: 1145

Technicians T. BLANEY / J. BREDNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 101.24 PSIA (End of Session) 101.18 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	101.24	✓	1100	1103	✓	101.24	1	1ST RUN: NTU'S = 1.93 ; PARAMETERS, METALS, ANIONS
2	✓	✓	✓	✓	✓	✓	101.21	✓	1132	1135	✓	101.18	1	ANIONS, Cr^{+6}, T-P, ZODAS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 438 Date: 10-17-96

Well Name: MW-18 Sampling Zone No.: SCREEN 3 Starting Time: 12:02 Finishing Time: 1320

Technicians T. BLANEY / J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 40.47 PSIA (End of Session) 40.42 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	40.47	✓	12:12	1215	✓	40.44	1	1ST RUN; NTUS = 3.99; PARAMETERS HIGH NTUS >5 IN 1ST 3 bottles
2	✓	✓	✓	✓	✓	✓	40.46	✓	1243	1245	✓	40.44	1	~~2ND RUN; NTUS = 2.99~~ 2ND RUN; 4 VOAS 2 METALS, ½ ANIONS
3	✓	✓	✓	✓	✓	✓	40.43	✓	1308	1311	✓	40.42	1	3RD RUN; ½ ANIONS; 2 CrVI, T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Total Volume: 3.0L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 330 Date: 10-18-96

Well Name: MW-18 Sampling Zone No.: SCREEN 2 Starting Time: 0915 Finishing Time: 1005

Technicians: T. Blamey / S. Brenner / T. Chen

Water Level Inside MP Casing (Beginning of Session) 14.82 PSIA (End of Session) 14.84 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.82	✓	923	928	✓	14.82	1	1ST RUN: NTU'S = 3.13', PARAMETERS, METALS, 1/3 ANIONS
2	✓	✓	✓	✓	✓	✓	14.84	✓	948	0953	✓	14.84	1	2ND RUN: 2/3 ANIONS, ALK, T-P, FINAL PARAMETERS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: _____ Total Volume: 2.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 270 Date: 10-18-96

Well Name: MW-18 Sampling Zone No.: SCREEN 1 Starting Time: 1009 Finishing Time: 1015

Technicians T. BLANEY / J. BRENNAN / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.84 (FS, A) (End of Session) 14.84 (FS, A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.84	✓	—	—	—	—	Ø	CHECKED PRESSURE, NO
2														WATER ABOVE PORT
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments:

Total Volume: Ø

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL. Location: MW-17 Depth: 726 Date: 10-18-96

Well Name: MW-17 Sampling Zone No.: SCREEN 5 Starting Time: 1038 Finishing Time: 1630

Technicians T. Blaney / J. Brenner / T. Qui

Water Level Inside MP Casing (Beginning of Session) 164.58 PSIA (End of Session) * 169.77 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	164.58	✓	1051	1054	✓	164.59	1	1ST RUN; NTUs = 178;
2	✓	✓	✓	✓	✓	✓	164.53	✓	1128	1131	✓	164.54	1	2ND RUN; NTUs = 43;
3	✓	✓	✓	✓	✓	✓	164.47	✓	1205	1208	✓	164.49	1	3RD RUN; NTUs = 88.4
4	✓	✓	✓	✓	✓	✓	164.45	✓	1240	1243	✓	164.42	1	4TH RUN; NTUs = 58.2
5	✓	✓	✓	✓	✓	✓	164.41	✓	1312	1315	✓	164.39	1	5TH RUN; NTUs = 46.2
6	✓	✓	✓	✓	✓	✓	164.33	✓	1346	1349	✓	164.34	1	6TH RUN; NTUs = 31.3
7	✓	✓	✓	✓	✓	✓	164.33	✓	1420	1423	✓	164.32	1	7TH RUN; NTUs = 52.3
8	✓	✓	✓	✓	✓	✓	170.80 *	✓	1542	1544	✓	170.80 *	1	8TH RUN; NTUs = 523
9	✓	✓	✓	✓	✓	✓	169.78	✓	1612	1614	✓	169.77	0.5	9TH RUN; NTUs = 2.93
10														
11														
12														

Comments: @ 1500 HRS purged Sample port in an effort to reduce the turbidity of the Sample. THE Purge increased the water level inside the Westbay Casing. Purged 3 gallons.

Total Volume: 8.5L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 582 Date: 10/21/96

Well Name: MW-17 Sampling Zone No.: SCREEN 4 Starting Time: 0910 Finishing Time: 1010

Technicians T. BLANEY / J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 108.29 (PSIA) (End of Session) 108.29 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	108.29	✓	0923	0926	✓	108.29	1	1ST RUN; NTU'S = 2.59; PARAMETERS, METALS, 1/2 ANIONS
2	✓	✓	✓	✓	✓	✓	108.29	✓	0952	0955	✓	108.29	1	2ND RUN; VOA'S, 1/2 ANIONS, CrVI, TP, FINAL PARAMETERS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: Total Volume: 20 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 468 Date: 10/21/96

Well Name: MW-17 Sampling Zone No.: SCREEN 3 Starting Time: 1025 Finishing Time: 1250

Technicians: T. BLANEY / J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 58.84 (PSIA) (End of Session) 58.74 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	58.84	✓	1034	1038	✓	58.84	1	1ST RUN; NTUS = 10.37; PARAMETERS
2	✓	✓	✓	✓	✓	✓	58.83	✓	1104	1107	✓	58.82	1	2ND RUN; NTUS = 9.71 PARAMETERS
3	✓	✓	✓	✓	✓	✓	58.82	✓	1135	1139	✓	58.81	1	3RD RUN; NTUS = 10.8 PARAMETERS
4	✓	✓	✓	✓	✓	✓	58.81	✓	1204	1208	✓	58.79	1	4TH RUN; NTUS = 4.76; METALS, ANIONS 1/2 C_{16}
5	✓	✓	✓	✓	✓	✓	58.76	✓	1232	1235	✓	58.74	1	5TH RUN; NTUS = 4.02; VOAS, 1/2 C_{16}, TOP
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 5.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: J.P.L. Location: MW-17 Depth: 370 Date: 10-21-96

Well Name: MW-17 Sampling Zone No.: SCREEN 2 Starting Time: 12:55 Finishing Time: 1342

Technicians T. Blaney / J. Brenner / K. Choi

Water Level Inside MP Casing (Beginning of Session) 16.10 (PSIA) (End of Session) 16.05 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	16.10	✓	1300	1304	—	16.10	1	1ST RUN NTUs = 2.50 ; PARAMETERS METALS, 1/3 ANIONS
2	✓	✓	✓	✓	✓	✓	16.06	✓	1327	1331	✓	16.05	1	2ND RUN, 2 VOAs, ~~Cr+6~~ 2/3 ANIONS, Cr+6 T-P, FINAL PARAMETERS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: J.P.L. Location: MW-17 Depth: 249 Date: 10-21-96

Well Name: MW-17 Sampling Zone No.: SCREEN 1 Starting Time: 1346 Finishing Time: 1500

Technicians: T. Blakney / J. Brenner / T. Choi

Water Level Inside MP Casing (Beginning of Session) 14.90 (PSIA) (End of Session) 14.88 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.90	✓	1353	1400	✓	14.92	1	1ST RUN: NTUs = 2.36; PARAMETERS, METALS, 1/4 ANIONS
2	✓	✓	✓	✓	✓	✓	14.86	✓	1416	1420	✓	14.85	1	2ND RUN: ZVOAs, 3/4 ANIONS, Cr+6, T-P,
3	✓	✓	✓	✓	✓	✓	14.85	✓	1441	1449	✓	14.88	0.5	3RD RUN: FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.5 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 900 Date: 10/22/96

Well Name: MW-20 Sampling Zone No.: 5 Starting Time: 0835/1215 Finishing Time: 1000/1250

Technicians: T. CHOI, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 273.15 PSIA (End of Session) 273.17 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	273.15	✓	0849	0851	✓	273.18	1	1ST RUN; NTU'S = 1.30; PARAMETERS, METALS, 1/2 ANIONS
2	✓	✓	✓	✓	✓	✓	273.15	✓	0924	0926	✓	273.17	1	2ND RUN; VOA'S, 1/2 ANIONS, Cr+6, T-P, & FINAL PARAMETERS
3														
4	✓	✓	✓	✓	✓	✓	271.49	✓	1231	1232	✓	271.49	0.25	VOA'S; RESAMPLED BECAUSE BOTTLE SEAL BROKE INSIDE COOLER
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.25L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 700 Date: 10/22/96

Well Name: MW-20 Sampling Zone No.: 4 Starting Time: 1005 Finishing Time: 1055

Technicians T. Choi, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 186.29 psia (End of Session) 186.33 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	186.24	✓	1015	1017	✓	186.30	1	1ST Run; Nos = 1.25; PARAMETERS, METALS, 3/3 ANIONS
2	✓	✓	✓	✓	✓	✓	186.30	✓	1048	1051	✓	186.33	1	2nd RUN; VOA, 3/3 ANIONS; CATS T-P + Final Parameters
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 563 Date: 10/22/96

Well Name: MW-20 Sampling Zone No.: 3 Starting Time: 1120 Finishing Time: 1215

Technicians T. Choi, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 126.38 psia (End of Session) 126.34 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	126.38	✓	1128	1130	✓	126.38	1	1ST Run; NTUs = 1,62.; PARAMETERS, METALS, 2/3 ANIONS
2	✓	✓	✓	✓	✓	✓	126.35	✓	1156	1159	✓	126.34	1	2ND RUN; VOAS, 1/3 ANIONS, Cr+6, T-P & Final Parameters
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0C

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 390 Date: 10/23/96

Well Name: MW-20 Sampling Zone No.: 2 Starting Time: 0825 Finishing Time: 0920

Technicians T. BLANKEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 52.22 PSIA (End of Session) 52.23 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	52.22	✓	0833	0836	✓	52.22	1	1ST RUN; NTU'S = 1.08, PARAMETERS, METALS, 1/2 ANIONS
2	✓	✓	✓	✓	✓	✓	52.24	✓	0901	0904	✓	52.23	1	2ND RUN; 6 VOA'S, 1/2 ANIONS, Cr^{+6}, T-P, FINAL PARAMETERS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 230 Date: 10/23/96

Well Name: MW-20 Sampling Zone No.: 1 Starting Time: 1148 Finishing Time: 1200

Technicians T. Blaney, T. Choi

Water Level Inside MP Casing (Beginning of Session) 14.83 ~~PSIA~~ (End of Session) 14.83 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.83	✓	—	—	—	—	0	No water above Port
2														Will try to sample
3														later on the sample
4														Round.
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Total Volume: 0

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 498 Date: 10/23/96

Well Name: MW-19 Sampling Zone No.: 5 Starting Time: 1245 Finishing Time: 1395

Technicians T. BLANEY, T. CHEN

Water Level Inside MP Casing (Beginning of Session) 80.08 psia (End of Session) 80.03 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft) ~~(ft)~~ psia	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	80.08	✓	1253	1256	✓	80.07	1	1ST Run; NTU's = 4.60; PARAMETERS, METALS, V3 ANIONS
2	✓	✓	✓	✓	✓	✓	80.04	✓	1319	1323	✓	80.03	1	2ND RUN 2.0 NTU, V3 ANION, Cr^{+6}, T-P, FINAL PARAMETERS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 444 Date: 10/23/96

Well Name: MW-19 Sampling Zone No.: 4 Starting Time: 1340 Finishing Time: 1450

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 56.53 FS/A (End of Session) 56.48 FS/A

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	56.53	✓	1349	1352	✓	56.54	1	1ST RUN; NTU'S = 17.70, PARAMETERS
2	✓	✓	✓	✓	✓	✓	56.53	✓	1414	1418	✓	56.51	1	2ND RUN, NTU'S = 21.0, PARAMETERS
3	✓	✓	✓	✓	✓	✓	56.49	✓	1439	1442	✓	56.48	1	3RD RUN; NTU'S = 16.8, PARAMETERS
4														* FINISHED FOR TODAY,
5														WILL RETURN TO
6														SCREEN #4 ON 10/24/96
7														
8														
9														
10														
11														
12														

Comments: _____

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 444 Date: 10/24/96

Well Name: MW-19 Sampling Zone No.: 4 Starting Time: 0834 Finishing Time: 1250

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 56.41 (PSIA) (End of Session) 56.01 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	56.41	✓	0842	0845	✓	56.43	1	1ST RUN; NTU'S = 9.42, PARAMETERS PRIOR TO SAMPLING
2	✓	✓	✓	✓	✓	✓	56.45	✓	0910	0913	✓	56.43	1	2ND RUN; NTU'S = 9.84, PARAMETERS PRIOR TO SAMPLING; TRYING TO REDUCE
3	✓	✓	✓	✓	✓	✓	56.44	✓	0936	0939	✓	56.45	1	3RD RUN; NTU'S = 20.5 PRIOR TO SAMPLING TRYING TO REDUCE TURBIDITY
4	✓	✓	✓	✓	✓	✓	56.45	✓	1002	1005	✓	56.44	1	4TH RUN; NTU'S = 10.33 PRIOR TO SAMPLING TRYING TO REDUCE TURBIDITY
5	✓	✓	✓	✓	✓	✓	56.44	✓	1027	1030	✓	56.44	1	5TH RUN; NTU'S = 12.16 PRIOR TO SAMPLING TRYING TO REDUCE TURBIDITY
6	✓	✓	✓	✓	✓	✓	57.22	✓	1109	*1110	✓	57.22	Ø	6TH RUN; PROBLEM SUSPECTED W/ARM SAMPLE TOOL BROUGHT UP TO CHECK
7	✓	✓	✓	✓	✓	✓	57.23	✓	1129	1135	✓	57.23	Ø	7TH RUN; VALVE OPENED IN WRONG PORT - BOTTLES BROUGHT UP & REPLACED → NEW ARM INSTALLED
8	✓	✓	✓	✓	✓	✓	56.42	✓	1212	1215	✓	56.41	1	8TH RUN; NTU'S = 11.67 PARAMETERS PRIOR TO SAMPLING
9	✓	✓	✓	✓	✓	✓	56.42	✓	1235	*1236	✓	56.01	Ø	9TH RUN; VALVE OPENED INSIDE CASING. BROUGHT UP TO REPLACE BOTTLES
10														// WILL RETURN TO SCREEN #4
11														ON 10/25/96. WILL MOVE TO
12														SCREEN # 3 TO TRY AND SAMPLE TODAY

F-2

Comments: Total Volume: 6.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 392 Date: 10/24/96

Well Name: MW-19 Sampling Zone No.: 3 Starting Time: 1255 Finishing Time: 1355

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 33.70 (PSIA) (End of Session) 32.68 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	33.70	✓	1301	1304	✓	33.70	1	1ST RUN; FOR INITIAL PARAMETERS NTU'S = 5.00; PRIOR TO SAMPLING
2	✓	✓	✓	✓	✓	✓	33.77	✓	1330	1333	✓	33.78	1	2ND RUN; VOA'S, METALS, ANIONS, HEX. CHROM.
3	✓	✓	✓	✓	✓	✓	32.65	✓	1353	1354	✓	32.68	0.5	3RD RUN; T-P FINAL PARAMETERS NTU'S = 3.23
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: _____ Total Volume: 2.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 314 Date: 10/24/96

Well Name: MW-19 Sampling Zone No.: 2 Starting Time: 1405 Finishing Time: 1440

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.92 (PSIA) (End of Session) 14.98 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.92	✓	1412	1414	✓	14.98	0.5	1ST RUN; PARAMETERS PRIOR TO SAMPLING NTUS = 20
2														1, WILL STOP FOR TODAY,
3														WILL RETURN TO SAMPLE
4														ON 10/25/96
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 0.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 314 Date: 10/25/96

Well Name: MW-19 Sampling Zone No.: 2 Starting Time: 0900 Finishing Time: 1015

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.84 (PSIA) (End of Session) 14.87 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.84	✓	0908	0913	✓	14.86	1	1ST RUN; NTU'S = 3.161 INITIAL PARAMETERS PRIOR TO SAMPLING
2	✓	✓	✓	✓	✓	✓	14.82	✓	0935	0940	✓	14.87	1	2ND RUN; VOA'S, METALS, 1/2 ANIONS
3	✓	✓	✓	✓	✓	✓	14.83	✓	1003	1008	✓	14.87	1	3RD RUN; 1/2 ANIONS, HEX. CHROM., T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: _____ Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 444 Date: 10/25/96

Well Name: MW-19 Sampling Zone No.: 4 Starting Time: 1315 Finishing Time: 1545

Technicians J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 55.52 (FS1A) (End of Session) 55.39 (FS1A)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	55.52	✓	1335	1340	✓	55.50	1	1ST RUN; INITIAL PARAMETERS PRIOR TO SAMPLING NTU'S = 6.4
2	✓	✓	✓	✓	✓	✓	~~55.52~~	✓	1424	1428	✓	55.49	1	2ND RUN; SECOND CHECK FOR PARAMETERS NTU'S = 7.97
3	✓	✓	✓	✓	✓	✓	55.37	✓	1448	1452	✓	55.38	1	3RD RUN; VOA'S, METALS, ANIONS
4	✓	✓	✓	✓	✓	✓	55.35	✓	1517	1521	✓	55.39	1	4TH RUN HEX. CHROM, T-P, FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments:

Total Volume: 4.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 242 Date: 10/28/96

Well Name: MW-19 Sampling Zone No.: SCREEN 1 Starting Time: 0815 Finishing Time: 1445

Technicians: T. BLANEY / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.78 (PSIA) (End of Session) 14.92 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.78	✓	0826	0833	✓	14.83	1	1ST RUN; NTUS = 40.1; PRIOR TO SAMPLING; TRYING TO REDUCE TURBIDITY
2	✓	✓	✓	✓	✓	✓	14.81	✓	0921	0925	✓	14.81	1	2ND RUN PRIOR TO SAMPLING
3	✓	✓	✓	✓	✓	✓	14.95	✓	1325	1330	✓	14.95	1	3RD RUN AFTER UNPLUGGING PORT; PRIOR TO SAMPLING; NTUS = 50.3
4	✓	✓	✓	✓	✓	✓	14.95	✓	1344	1349	✓	14.95	1	4TH RUN PRIOR TO SAMPLING; TRYING TO REDUCE TURBITY; NTU'S = 40.0
5	✓	✓	✓	✓	✓	✓	14.92	✓	1405	1410	✓	14.93	1	5TH RUN; PRIOR TO SAMPLING. TRYING TO REDUCE TURBIDITY; NTU'S = 32.8
6	✓	✓	✓	✓	✓	✓	14.92	✓	1427	1432	✓	14.92	1	6TH RUN PRIOR TO SAMPLING; TRYING TO REDUCE TURB; NTU'S = 32.7
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 6.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JDL Location: MW-19 Depth: 242 Date: 10/24/96

Well Name: MW-19 Sampling Zone No.: 1 Starting Time: 1230 Finishing Time: 1330

Technicians T. Casi, J. Brennan

Water Level Inside MP Casing (Beginning of Session) 14.89 TOIA (End of Session) 14.89 TOIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.89	✓	1233	12.51	✓	14.90	1.0	1ST RUN TO SCREEN IT, INITIAL PARAMETERS, NTU'S = 3.38
2	✓	✓	✓	✓	✓	✓	14.88	✓	1253	1301	✓	14.90	1.0	2ND RUN, VOA'S, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.89	✓	1316	1321	✓	14.85	1.0	3RD RUN, HEX CHROM, TOP, FINAL PARAMETERS, NTU'S = 4.71
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 370 Date: 10/30/96

Well Name: MW-21 Sampling Zone No.: 5 Starting Time: 0850 Finishing Time: 1140

Technicians T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 120.35 (FSLA) (End of Session) 120.43 (FSLA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	120.35	✓	0905	0908	✓	120.41	1	1ST RUN; INITIAL PARAMETERS PRIOR TO SAMPLING; NTU'S = 10.72
2	✓	✓	✓	✓	✓	✓	120.44	✓	0929	0932	✓	120.43	1	2ND RUN; PARAMETERS, NTU'S = 27.51 TRYING TO REDUCE TURBIDITY
3	✓	✓	✓	✓	✓	✓	120.45	✓	0950	0953	✓	120.43	1	3RD RUN; PARAMETERS, NTU'S = 25.5 TRYING TO REDUCE TURBIDITY
4	✓	✓	✓	✓	✓	✓	120.44	✓	1013	1016	✓	120.45	1	4TH RUN; PARAMETERS, NTU'S = 31.7 TRYING TO REDUCE TURBIDITY
5	✓	✓	✓	✓	✓	✓	120.46	✓	1040	1043	✓	120.47	1	5TH RUN; PARAMETERS, NTU'S = 42.2 TRYING TO REDUCE TURBIDITY
6	✓	✓	✓	✓	✓	✓	120.42	✓	1107	1110	✓	120.43	1	6TH RUN; PARAMETERS, NTU'S = 38.6 TRYING TO REDUCE TURBIDITY
7	✓	✓	✓	✓	✓	✓	120.41	✓	1131	1134	✓	120.43	1	7TH RUN; PARAMETERS, NTU'S = 42.4 STILL TRYING TO REDUCE TURBIDITY
8														
9														// WILL MOVE ON TO SCREEN #4,
10														RETURN TO SCREEN #5 ON
11														10/31/96
12														

Comments: _____

Total Volume: 7.0L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 310 Date: 10/30/96

Well Name: MW-21 Sampling Zone No.: 4 Starting Time: 1145 Finishing Time: 1345

Technicians: T. Choi, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 93.41 PSIA (End of Session) 92.44 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	93.41	✓	1154	1157	✓	93.41	1.0	1ST RUN TO SCREEN SET; INITIAL PARAMETERS NTUs = 13.8
2	✓	✓	✓	✓	✓	✓	93.40	✓	1213	1216	✓	93.43	1.0	2ND RUN; PARAMETERS NTUs = 14.13
3	✓	✓	✓	✓	✓	✓	93.41	✓	1234	1237	✓	93.43	1.0	3RD RUN; PARAMETERS NTUs = 9.95
4	✓	✓	✓	✓	✓	✓	93.40	✓	1254	1257	✓	93.41	1.0	4TH RUN; PARAMETERS NTUs = 3.34, METALS
5	✓	✓	✓	✓	✓	✓	93.35	✓	1316	1319	✓	93.30	1.0	5TH RUN, VOAs, BN/AS, HEX. CHROM, T-P
6	✓	✓	✓	✓	✓	✓	92.43	✓	1337	1339	✓	92.44	1.0	6TH RUN; FINAL PARAMETERS NTUs = 9.8
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 6.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 241 ft. Date: 10/30/96

Well Name: MW-21 Sampling Zone No.: 3 Starting Time: 1350 Finishing Time: 1500

Technicians: T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 63.34 (PSIA) (End of Session) 63.32 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	63.34	✓	1355	1359	✓	63.35	1	1ST RUN; INITIAL PARAMETERS PRIOR TO SAMPLING, NTU'S = 7.05
2	✓	✓	✓	✓	✓	✓	63.35	✓	1412	1416	✓	63.35	1	2ND RUN; PARAMETERS, NTU'S = 25.0 TRYING TO REDUCE TURBIDITY
3	✓	✓	✓	✓	✓	✓	63.33	✓	1429	1433	✓	63.32	1	3RD RUN; PARAMETERS, NTU'S = 19.5 TRYING TO REDUCE TURBIDITY
4														
5														* FINISHED AT MW-21 FOR
6														TODAY, WILL RETURN TO
7														SAMPLE SCREEN #3 ON
8														10/31/96
9														
10														
11														
12														

Comments: _____

Total Volume: 30L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 370 Date: 10/31/96

Well Name: MW-21 Sampling Zone No.: 5 Starting Time: 1045 Finishing Time: 1200

Technicians T. Blaney, T. Chai

Water Level Inside MP Casing (Beginning of Session) 100.41 psia (End of Session) 100.38 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (~~ft~~) psia	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (~~ft~~) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	100.41	✓	1050	1053	✓	100.42	1	1ST Run to Screen #5; Prior to Sampling; NTU's = 8.0
2	✓	✓	✓	✓	✓	✓	100.42	✓	1110	1112	✓	100.43	1	2ND Run @ Screen #5; Reducing TURBIDITY; NTU's = 5.0
3	✓	✓	✓	✓	✓	✓	100.42	✓	1129	1131	✓	100.41	1	3RD Run; Sample MW-96Z-01 VOA's, METALS, ANIONS, ½ Cr+6
4	✓	✓	✓	✓	✓	✓	100.37	✓	1150	1152	✓	100.38	1	4th Run; ½ Cr+6 + T-P + Parameters after Sampling
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 4.0L F2

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FW FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling

Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 241 Date: 10/31/96

Well Name: MW-21 Sampling Zone No.: 3 Starting Time: 1250 Finishing Time: 1340

Technicians: T. Blaney, T. Choi

Water Level Inside MP Casing (Beginning of Session): 57.21 (psia) (End of Session): 57.24 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	~~57.21~~	57.21	✓	1259	1302	✓	57.21	1.0	1st run to screen #3; prior to sampling, NTUs = 4.59, initial parameters
2	✓	✓	✓	✓	✓	✓	57.21	✓	1315	1318	✓	57.24	1.0	2nd run to screen #3; 6 VOAs, metals, anions, sample no. 962-01
3	✓	✓	✓	✓	✓	✓	57.24	✓	1335	1338	✓	57.24	1.0	3rd run to screen #3; Cr+6, T-P, parameters after sampling
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 162 Date: 11/1/96

Well Name: MW-21 Sampling Zone No.: 2 Starting Time: 0840 Finishing Time: 1000

Technicians: T. Choi, S. Brenner

Water Level Inside MP Casing (Beginning of Session) 22.38 (PSIA) (End of Session) 22.35 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	22.38	✓	0845	0850	✓	22.38	1.0	1ST RUN PRIOR TO SAMPLING; INITIAL PARAMETERS NTU'S = 1.20
2	✓	✓	✓	✓	✓	✓	22.38	✓	0903	0908	✓	22.39	1.0	2ND RUN, SAMPLE MW-21-62-01 (VOCs, METALS, ANIONS)
3	✓	✓	✓	✓	✓	✓	22.35	✓	0936	0940	✓	22.35	0.75	3RD RUN, Cr^{+6}, T-P, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 90 Date: 11/1/96

Well Name: MW-21 Sampling Zone No.: 1 Starting Time: 0954 Finishing Time: 1000

Technicians T. Choi, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 14.86 (PSIA) (End of Session) 14.86 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.86	✓	—	—	—	—	Ø	1ST RUN PRIOR TO SAMPLING; PARAMETERS, MW21 = * CHECKED PRESSURE,
2														NO WATER ABOVE
3														SCREEN #1
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Total Volume: Ø

FW **FOSTER WHEELER ENVIRONMENTAL CORPORATION**

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 540 Date: 11/4/96

Well Name: MW-14 Sampling Zone No.: 5 Starting Time: 1025 Finishing Time: 1140

Technicians T. Choi, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 147.03 psia (End of Session) (146.96) psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP ~~(ft)~~ psia	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	147.03	✓	1032	1034	✓	147.03	1.0	1st Run [illegible] Sampling; NTUs = 4.14
2	✓	✓	✓	✓	✓	✓	147.02	✓	1059	1102	✓	147.03	1.0	2nd RUN [illegible] SAMPLE MW-962-29 COLLECTED (VOAs, METALS, ANIONS, Cr, ½ T-P)
3	✓	✓	✓	✓	✓	✓	146.96	✓	1125	1128	✓	146.96	1.0	3rd RUN (½ T-P) FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 456 Date: 11/4/96

Well Name: MW-14 Sampling Zone No.: 4 Starting Time: 1145 Finishing Time: 1250

Technicians: T. Blaney, T. Choi

Water Level Inside MP Casing (Beginning of Session) 110.37 (PSIA) (End of Session) 110.27 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	110.37	✓	1155	1158	✓	110.36	1.0	1ST RUN; PRIOR SAMPLING, INITIAL PARAMETERS: NTUS = 2.51
2	✓	✓	✓	✓	✓	✓	110.33	✓	1217	1219	✓	110.33	1.0	2nd RUN. VOAS, metals, Anions 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	110.27	✓	1239	1241	✓	110.27	1.0	1/2 Cr+6 + T-P + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 30L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 382 Date: 11/4/96

Well Name: MW-14 Sampling Zone No.: 3 Starting Time: 1300 Finishing Time: 1355

Technicians: T. Blaney, T. Choi

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

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	78.02	✓	1303	1306	✓	78.02	1.0	1ST RUN PRIOR TO SAMPLING; INITIAL PARAMETERS; NTU's = 1.98
2	✓	✓	✓	✓	✓	✓	78.02	✓	1323	1326	✓	78.02	1.0	2nd RUN; SAMPLE MW-362-31 COLLECTED (2 VOAs, METALS, ANIONS, $\frac{1}{2}Cr^{+6}$)
3	✓	✓	✓	✓	✓	✓	78.02	✓	1343	1346	✓	78.02	1.0	3rd RUN; $\frac{1}{2}Cr^{+6}$, T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 277 Date: 11/5/96

Well Name: MW-14 Sampling Zone No.: 2 Starting Time: 0840 Finishing Time: 0950

Technicians T. CHOI, J. BRENNAN

Water Level Inside MP Casing (Beginning of Session) 32.25 (PSIA) (End of Session) 32.24 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	32.25	✓	0847	0854	✓	32.26	1	1ST RUN; INITIAL PARAMETERS PRIOR TO SAMPLING NTU'S = 3.78
2	✓	✓	✓	✓	✓	✓	32.25	✓	0910	0917	✓	32.25	1	2ND RUN; VOA'S, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	32.25	✓	0933	0940	✓	32.24	1	3RD RUN; HEX. CHROM., TDP & FINAL PARAMETERS NTU'S = 4.95
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 207 Date: 11/5/96

Well Name: MW-14 Sampling Zone No.: 1 Starting Time: 0955 Finishing Time: 1105

Technicians T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 13.54 (PSIA) (End of Session) 13.63 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.54	✓	1000	1008	✓	13.62	1	1ST RUN; INITIAL PARAMETERS PRIOR TO SAMPLING, NTU'S = 4.47
2	✓	✓	✓	✓	✓	✓	13.54	✓	1023	1035	✓	13.56	1	2ND RUN; VOAS, METALS, 1/2 ANIONS
3	✓	✓	✓	✓	✓	✓	13.54	✓	1049	1058	✓	13.63	1	3RD RUN; 1/2 ANIONS, HEX. CHROM., TIP FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 512 Date: 11/5/96

Well Name: MW-4 Sampling Zone No.: 5 Starting Time: 1145 Finishing Time: 1300

Technicians: T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 128.23 (FS/A) (End of Session) 128.13 (FS/A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	128.23	✓	1157	1200	✓	128.24	1	1ST RUN; INITIAL PARAMETERS PRIOR TO SAMPLING; NTU'S = 4.12
2	✓	✓	✓	✓	✓	✓	128.17	✓	1224	1227	✓	128.16	1	2ND RUN; VOAS, METALS, ANIONS 1/2 HEX. CHROM.
3	✓	✓	✓	✓	✓	✓	128.14	✓	1251	1254	✓	128.13	1	3RD RUN; 1/2 HEX. CHROM., TP FINAL PIEZOMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 391 Date: 11/5/96

Well Name: MW-4 Sampling Zone No.: 4 Starting Time: 1310 Finishing Time: 1415

Technicians T. Choi, J Brenner

Water Level Inside MP Casing (Beginning of Session) 75.42 (PSIA) (End of Session) 75.32 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	75.42	✓	1318	1321	✓	75.42	1	1ST RUN PRIOR TO SAMPLING; INITIAL PARAMETERS; NTUS = 1.38
2	✓	✓	✓	✓	✓	✓	75.38	✓	1339	1342	✓	75.38	1	2ND Run, VOA's, METALS, ANIONS, 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	75.32	✓	1400	1403	✓	75.32	1	3RD Run: 1/2 Cr+6, T-P + FINAL PARAMETERS NTUS = 1.62
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4, SCREEN 3 Depth: 321 Date: 11-6-96

Well Name: MW-4 Sampling Zone No.: SCREEN 3 Starting Time: 0835 Finishing Time: 0930

Technicians T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 44.90 PSIA (End of Session) 44.97 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	44.90	✓	0840	0843	✓	44.92	1.0	1ST RUN PRIOR TO SAMPLING NTU's = 1.53
2	✓	✓	✓	✓	✓	✓	44.93	✓	0900	0903	✓	44.94	1.0	2ND RUN; SAMPLE MW-96-2-58 (2 VOA's, METALS, ANIONS, ½ Cr^{+6})
3	✓	✓	✓	✓	✓	✓	44.97	✓	0920	0923	✓	44.97	1.0	3RD RUN; ½ Cr^{+6}, T-P & FINAL PARAMETERS NTU's = 0.72
4														
5														
6														
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12														

F-2

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 240 FT Date: 11/6/96

Well Name: MW-4 Sampling Zone No.: SCREEN 2 Starting Time: 0940 Finishing Time: 1055

Technicians T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 13.75 (PSIA) (End of Session) 13.70 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.75	✓	0943	0946	✓	13.76	1.0	1ST RUN PRIOR TO SAMPLING, INITIAL PARAMETERS, NTU's = 4.18
2	✓	✓	?	✓	✓	✓	13.75	✓	1001	1005	✓	13.77	1.0	2ND RUN, SAMPLE MW-962-59 (ZVOA's, METALS, ANIONS)
3	✓	✓	✓	✓	✓	✓	13.62	✓	1020	1024	✓	13.83	1.0	3RD RUN, FINISH SAMPLE MW-962-59 (CN, TOC, TPH) SAMPLE MW-962-60 (ZVOA's, METALS, CN)
4	✓	✓	✓	✓	✓	✓	13.69	✓	1042	1045	✓	13.70	1.0	4TH RUN, FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 4.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: IPL Location: MW-4 Depth: 149.6 FT. Date: 11/6/96

Well Name: MW-4 Sampling Zone No.: SCREEN 1 Starting Time: 1055 Finishing Time: 1205

Technicians T.CHOI, J.BRANNER

Water Level Inside MP Casing (Beginning of Session) 13.70 (PSIA) (End of Session) 13.75 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.70	✓	1102	1110	✓	13.72	1.0	1ST RUN PRIOR TO SAMPLING, INITIAL PARAMETERS, NTU'S = 1.69
2	✓	✓	✓	✓	✓	✓	13.65	✓	1124	1133	✓	13.75	1.0	2ND RUN, SAMPLE MW-96Z-61 COLLECTED (TVOA's, metals, ANIONS)
3	✓	✓	✓	✓	✓	✓	13.64	✓	1150	1200	✓	13.75	1.0	3RD RUN FINISH SAMPLING MW-96Z-61 (Cr+6, T-P), FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 548 Date: 11-6-96

Well Name: MW-12 Sampling Zone No.: 5 Starting Time: 1250 Finishing Time: 1400

Technicians T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 144.35 PSIA (End of Session) 143.21 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	144.35	✓	1305	1307	✓	144.36	1.0	1ST RUN TO SCREEN 5; INITIAL PARAMETERS PRIOR TO SAMPLING; NTU'S = 2.06
2	✓	✓	✓	✓	✓	✓	144.33	✓	1328	1330	✓	144.34	1.0	2ND RUN TO SCREEN 5; VOA'S, METALS, ANIONS, ½ HEX CHROME
3	✓	✓	✓	✓	✓	✓	143.19	✓	1352	1354	✓	143.21	0.75	3RD RUN TO SCREEN 5; ½ Cr^{+6}, T-P, FINAL PARAMETERS
4														
5														
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F-2

Comments: Total Volume: 2.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 436 Date: 11/7/96

Well Name: MW-12 Sampling Zone No.: SCREEN #4 Starting Time: 0850 Finishing Time: 1005

Technicians T. BLAKEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 95.08 (PSIA) (End of Session) 95.04 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	95.08	✓	0902	0906	✓	95.07	1.0	1ST RUN PRIOR TO SAMPLING : INITIAL PARAMETERS, NTU's = 0.72
2	✓	✓	✓	✓	✓	✓	95.07	✓	0928	0932	✓	95.07	1.0	2ND RUN, SAMPLE MW-962-37 (2 VOA's, METALS, ANIONS,
3	✓	✓	✓	✓	✓	✓	95.08	✓	0952	0956	✓	95.04	1.0	3RD RUN, SAMPLE MW-962-37 (C+S, T-P) & FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: _____

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 323 Date: 12/1/96

Well Name: MW-12 Sampling Zone No.: SCREEN #3 Starting Time: 1240 Finishing Time: 1350

Technicians T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 45.81 (PSIA) (End of Session) 45.73 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	45.81	✓	1241	1250	✓	45.85	1.0	1ST RUN; INITIAL PARAMETERS; NTUs = 3.08
2	✓	✓	✓	✓	✓	✓	45.80	✓	1306	1309	✓	45.80	1.0	2nd RUN; SAMPLE MW-962-38 (2 VOAs, METALS 1/2 ANIONS) MW-962-38MS, MW-962-38MSD
3	✓	✓	✓	✓	✓	✓	45.76	✓	1330	1334	✓	45.73	1.0	3RD RUN 1/2 ANIONS, HEX. CHROME, TIP FINAL PARAMETERS NTUs = 3.52
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 243 Date: 11-7-96

Well Name: MW-12 Sampling Zone No.: SCREEN 2 Starting Time: 1015 Finishing Time: 1230

Technicians T.BLANEY, J.BRENNER, T.CHOI

Water Level Inside MP Casing (Beginning of Session) 13.76 PSIA (End of Session) 13.80 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.76	✓	1020	1025	✓	13.82	1.0	1ST RUN @ SCREEN 2. PRIOR TO SAMPLING; INITIAL PARAMETERS; NTUs = 3.89
2	✓	✓	✓	✓	✓	✓	13.70	✓	1040	1045	✓	13.80	1.0	2ND RUN; SAMPLE MW-96-2-39 (2 VOAs, 3/4 TBT)
3	✓	✓	✓	✓	✓	✓	13.69	✓	1100	1105	✓	13.83	1.0	3RD RUN; TBT
4	✓	✓	✓	✓	✓	✓	13.67	✓	1120	1125	✓	13.80	1.0	4TH RUN; TBT
5	✓	✓	✓	✓	✓	✓	13.67	✓	1142	1147	✓	13.71	1.0	5TH RUN; TBT, METALS
6	✓	✓	✓	✓	✓	✓	13.69	✓	1203	1208	✓	13.82	1.0	6TH RUN; ANIONS, Cr^{+6}, T-P
7	✓	✓	✓	✓	✓	✓	13.69	✓	1225	1228	✓	13.80	0.5	7TH FINAL PARAMETERS
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 6.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 130 Date: 11-7-96

Well Name: MW-12 Sampling Zone No.: SCREEN 1 Starting Time: 1350 Finishing Time: 1350

Technicians J. BROWNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 13.76 PSIA (End of Session) 13.76 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.76	✓	—	—	—	—	—	CHECKED PRESSURE; NO WATER
2														OUTSIDE CASING OVER SCREEN 1
3														
4														
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12														

F-2

Comments: Total Volume: 0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 639 Date: 11-8-96

Well Name: MW-11 Sampling Zone No.: SCREEN 5 Starting Time: 0815 Finishing Time: 1100

Technicians T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 161.38 PSIA (End of Session) 161.31 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	161.38	✓	0835	0837	✓	161.41	1.0	1ST RUN TO SCREEN 5 PRIOR TO SAMPLING; INITIAL PARAMETERS; NTU'S = 0.99
2	✓	✓	✓	✓	✓	✓	161.44	✓	0851	0853	✓	161.42	1.0	2ND RUN; NEW SET OF SAMPLE BOTTLES; INITIAL PARAMETERS; NTU'S = 1.93
3	✓	✓	✓	✓	✓	✓	161.34	✓	1021	1023	✓	161.37	1.0	3RD RUN; VOA'S, METALS, ANIONS, 1/2 Cr^{+6}
4	✓	✓	✓	✓	✓	✓	161.33	✓	1050	1052	✓	161.31	1.0	4TH RUN; 1/2 Cr^{+6}, T+P, FINAL PARAMETERS, NTU'S = 1.88
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6														
7														
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10														
11														
12														

F-2

Comments: Total Volume: 4.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 524 Date: 11/8/96

Well Name: MW-11 Sampling Zone No.: SCREEN 4 Starting Time: 1110 Finishing Time: 1235

Technicians T. Blaney, J. Brenner, T. Chui

Water Level Inside MP Casing (Beginning of Session) 111.67 (PSIA) (End of Session) 111.63 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	111.67	✓	1131	1133	✓	111.66	1.0	1ST RUN, INITIAL PARAMETERS NTU'S = 3.28
2	✓	✓	✓	✓	✓	✓	111.67	✓	1155	1157	✓	111.64	1.0	2ND RUN, VOA'S, METALS, ANIONS, 1/2 HEX. CHROM.
3	✓	✓	✓	✓	✓	✓	111.69	✓	1121	1123	✓	111.63	1.0	3RD RUN, 1/2 HEX. CHROM, T-P FINAL PARAMETERS
4														
5														
6														
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8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 429 Date: 11-8-96

Well Name: MW-11 Sampling Zone No.: SCREEN 3 Starting Time: 1240 Finishing Time: 1340

Technicians T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 70.68 PSIA (End of Session) 70.08 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	70.68	✓	1245	1247	✓	70.70	1.0	1ST RUN PRIOR TO SAMPLING; INITIAL PARAMETERS; NTU'S = 2.34
2	✓	✓	✓	✓	✓	✓	70.69	✓	1307	1309	✓	70.70	1.0	2nd RUN: VOA'S, METALS, ANIONS, ½ Cr^{+6}
3	✓	✓	✓	✓	✓	✓	70.05	✓	1329	1331	✓	70.08	0.75	3rd RUN; ½ Cr^{+6}, T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments:

Total Volume: 2.75 L

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FW FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 259 Date: 11/11/96

Well Name: MW-11 Sampling Zone No.: SCREEN 2 Starting Time: 0800 Finishing Time: 0918

Technicians: T. BLANEY, J. BRENNER

Water Level Inside MP Casing (Beginning of Session): 13.63 psia (ATmospheric) (End of Session): 13.59 PSIA (ATMOSPHERIC)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP ~~(ft)~~ psia	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP ~~(ft)~~ Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.63	✓	0817	0820	✓	13.70	1	1ST Run; Prior to Sampling Initial Parameters; NTU's =
2	✓	✓	✓	✓	✓	✓	13.55	✓	0845	0848	✓	13.74	1	2ND Run; VOAS, metals, Anions 1/2 Cr+6 (MW-962-46)
3	✓	✓	✓	✓	✓	✓	13.59	✓	0906	0907	✓	13.75	1	LAST Run, 1/2 Cr+6, T.P + Final Parameters
4														
5														
6														
7														
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10														
11														
12														

F-2

Comments: ______

Total Volume: 3OL

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 149 Date: 11/11/96

Well Name: MW-11 Sampling Zone No.: SCREEN 1 Starting Time: 0930 Finishing Time: 1055

Technicians T. BLANEY, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 13.57 (P3,A) (End of Session) 13.65 (P3,A)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	13.57	✓	0931	0931	✓	13.72	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S =
2	✓	✓	✓	✓	✓	✓	13.51	✓	0950	0957	✓	13.74	1.0	2ND RUN; VOA'S, METALS, 1/3 ANIONS
3	✓	✓	✓	✓	✓	✓	13.58	✓	1016	1027	✓	13.67	1.0	3RD RUN; 2/3 ANIONS, HEX. CHROM., TP
4	✓	✓	✓	✓	✓	✓	13.60	✓	1037	1046	✓	13.65	0.5	4TH RUN; FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.5 L [F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 653 Date: 11-11-96

Well Name: MW-3 Sampling Zone No.: SCREEN 5 Starting Time: 1115 Finishing Time: 1245

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 164.52 PSIA (End of Session) 164.34 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	164.52	✓	1133	1136	✓	164.49	1.0	1ST RUN: INITIAL PARAMETERS PRIOR TO SAMPLING; NTUs = 1.90
2	✓	✓	✓	✓	✓	✓	164.48	✓	1204	1206	✓	164.48	1.0	2ND RUN: VOAs, METALS, ANIONS, ½ Cr^{+6}
3	✓	✓	✓	✓	✓	✓	164.31	✓	1234	1236	✓	164.34	1.0	3RD RUN; ½ Cr^{+6}, T-P, FINAL PARAMETERS
4														
5														
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11														
12														

F-2

Comments: Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 558 Date: 11/11/96

Well Name: MW-3 Sampling Zone No.: SCREEN #4 Starting Time: 1250 Finishing Time: 1415

Technicians T. BLANEY, J. BRENNAN

Water Level Inside MP Casing (Beginning of Session) 123.04 (PSIA) (End of Session) 121.95 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	123.04	✓	1306	1307	✓	123.03	1.0	1ST RUN; INITIAL PARAMETERS, NTVS =
2	✓	✓	✓	✓	✓	✓	123.03	✓	1339	1341	✓	123.03	1.0	2ND RUN; VOAS, METALS, ANIONS, 1/2 HEX, CHROM.
3	✓	✓	✓	✓	✓	✓	121.93	✓	1405	1407	✓	121.95	0.5	3RD RUN; 1/2 HEX. CHROM. TOP FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.5L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling

Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 346 Date: 11/12/96

Well Name: MW-3 Sampling Zone No.: SCREEN 3 Starting Time: 0845 Finishing Time: 0950

Technicians T. BLANEY, J. BRONNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 30.90 (PSIA) (End of Session) 30.90 (PSIA)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	30.90	✓	0856	0859	✓	30.88	1.0	1ST RUN PRIOR TO SAMPLING; INITIAL PARAMETERS NTU'S = 2.69
2	✓	✓	✓	✓	✓	✓	30.88	✓	0918	0921	✓	30.89	1.0	2ND RUN; SAMPLE MW-962-64MS, MW-962-64MSD, MW-962-64 (2VOA'S, METALS, ANIONS)
3	✓	✓	✓	✓	✓	✓	30.89	✓	0938	0941	✓	30.90	1.0	3RD RUN; FINISH SAMPLING MW-962-64 ([illegible] T-P) & FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 252 Date: 11/12/96

Well Name: MW-3 Sampling Zone No.: SCREEN 2 Starting Time: 0955 Finishing Time: 1050

Technicians TIBLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 13.72 PSIA (End of Session) 13.84 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.72	✓	1001	1005	✓	13.80	1.0	1ST RUN PRIOR SAMPLING; INITIAL PARAMETERS; NTUS = 2.65
2	✓	✓	✓	✓	✓	✓	13.69	✓	1020	1024	✓	13.80	1.0	2ND RUN; SAMPLE MW-962-65 (VOCS, METALS, ANIONS)
3	✓	✓	✓	✓	✓	✓	13.61	✓	1040	1044	✓	13.84	1.0	3RD RUN; FINISH SAMPLING MW-962-65 (CR+6, T-P) FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 30L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 172 Date: 11-12-96

Well Name: MW-3 Sampling Zone No.: SCREEN 1 Starting Time: 1055 Finishing Time: 1155

Technicians T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 13.62 PSIA (End of Session) 13.76 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	13.62	✓	1101	1107	✓	13.76	1.0	1ST RUN PRIOR TO SAMPLING; INITIAL PARAMETERS, NTU's = 3.08
2	✓	✓	✓	✓	✓	✓	13.59	✓	1119	1125	✓	13.78	1.0	2ND RUN; SAMPLE: MW-962-66 (2 VOA's, METALS, ½ ANIONS)
3	✓	✓	✓	✓	✓	✓	13.56	✓	1138	1148	✓	13.76	1.0	3RD RUN; SAMPLE: MW-962-66 (½ ANIONS, Cr+6, T-P) FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 3.0L

APPENDIX C

FIELD INSTRUMENT CALIBRATION FORMS

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JRL

Calibration by: T. Choi Date: 10/17/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µ S/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0910 Temperature of Solution: 17.7

Temperature Compensated Solution Conductivity (µ S/cm) * 860

Instrument Response to Calibration Solution: 868

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1330 Temperature of Solution: 22.9

Temperature Compensated Solution Conductivity (µ S/cm) * 959

Instrument Response to Calibration Solution: 966

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Choi Date: 10-18-96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 09/97

FIELD CALIBRATION

Time: 0830 Temperature of Solution: 14.6

Temperature Compensated Solution Conductivity (µ S/cm) * 802

Instrument Response to Calibration Solution: 827

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1645 Temperature of Solution: 24.3

Temperature Compensated Solution Conductivity (µ S/cm) * 986

Instrument Response to Calibration Solution: 1029

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T Choi Date: 10-21-96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16853

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µ S/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0850 Temperature of Solution: 13.7

Temperature Compensated Solution Conductivity (µ S/cm) * 786

Instrument Response to Calibration Solution: 812

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:

Time: 1505 Temperature of Solution: 25.0

Temperature Compensated Solution Conductivity (µ S/cm) * 1000

Instrument Response to Calibration Solution: 1054

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/22/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16963

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 10.2

Temperature Compensated Solution Conductivity (µ S/cm) * 722

Instrument Response to Calibration Solution: 709

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1300 Temperature of Solution: 25.0

Temperature Compensated Solution Conductivity (µ S/cm) * 1,000

Instrument Response to Calibration Solution: 988

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/23/96

Instrument Manufacturer: YSI Model: 3520

Serial Number: 94C16865

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A 94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 mS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0740 Temperature of Solution: 9.3

Temperature Compensated Solution Conductivity (µ S/cm) * 705

Instrument Response to Calibration Solution: 710

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1455 Temperature of Solution: 23.7

Temperature Compensated Solution Conductivity (µ S/cm) * 975

Instrument Response to Calibration Solution: 991

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Blaney Date: 10/24/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0810 Temperature of Solution: 9.4

Temperature Compensated Solution Conductivity (µ S/cm) * 707

Instrument Response to Calibration Solution: 724

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:

Time: 1440 Temperature of Solution: 21.8

Temperature Compensated Solution Conductivity (µ S/cm) * 938

Instrument Response to Calibration Solution: 950

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/25/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C1 6863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A 94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0830 Temperature of Solution: 15.5

Temperature Compensated Solution Conductivity (µ S/cm) * 819

Instrument Response to Calibration Solution: 841

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1535 Temperature of Solution: 22.0

Temperature Compensated Solution Conductivity (µ S/cm) * 942

Instrument Response to Calibration Solution: 968

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/28/96

Instrument Manufacturer: YSI Model: 33a

Serial Number: 94C16463

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: _____

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0750 Temperature of Solution: 23

Temperature Compensated Solution Conductivity (µ S/cm) * 696

Instrument Response to Calibration Solution: 708

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: _____

Time: 1445 Temperature of Solution: 17.7

Temperature Compensated Solution Conductivity (µ S/cm) * 860

Instrument Response to Calibration Solution: 876

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: _____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/29/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C168863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0815 Temperature of Solution: 9.7

Temperature Compensated Solution Conductivity (µ S/cm) * 712

Instrument Response to Calibration Solution: 746

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1445 Temperature of Solution: 18.9

Temperature Compensated Solution Conductivity (µ S/cm) * 883

Instrument Response to Calibration Solution: 917

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/30/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 6835 Temperature of Solution: 11.7

Temperature Compensated Solution Conductivity (µ S/cm) * 749

Instrument Response to Calibration Solution: 781

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1455 Temperature of Solution: 17.1

Temperature Compensated Solution Conductivity (µ S/cm) * 849

Instrument Response to Calibration Solution: 871

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/31/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C168863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0910 Temperature of Solution: 10.4

Temperature Compensated Solution Conductivity (µ S/cm) * 725

Instrument Response to Calibration Solution: 744

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1350 Temperature of Solution: 13.8

Temperature Compensated Solution Conductivity (µ S/cm) * 787

Instrument Response to Calibration Solution: 815

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 11/1 196

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 mS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 8.6

Temperature Compensated Solution Conductivity (µ S/cm) * 693

Instrument Response to Calibration Solution: 730

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1126 Temperature of Solution: 15.9

Temperature Compensated Solution Conductivity (µ S/cm) * 827

Instrument Response to Calibration Solution: 872

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 11/4/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 11/4/96

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 1000 Temperature of Solution: 15.3

Temperature Compensated Solution Conductivity (µ S/cm) * 815

Instrument Response to Calibration Solution: 848

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1405 Temperature of Solution: 20.8

Temperature Compensated Solution Conductivity (µ S/cm) * 919

Instrument Response to Calibration Solution: 965

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Chol Date: 11/5/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C168863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 12.5

Temperature Compensated Solution Conductivity (µ S/cm) * 764

Instrument Response to Calibration Solution: 801

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1415 Temperature of Solution: 19.4

Temperature Compensated Solution Conductivity (µ S/cm) * 892

Instrument Response to Calibration Solution: 947

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.Cao Date: 11/6/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 9.1

Temperature Compensated Solution Conductivity (µ S/cm) * 707

Instrument Response to Calibration Solution: 751

Instrument Response within Instrument and Probe Limits of Error: ** Yes:____ No: ✓

Time: 1408 Temperature of Solution: 24.1

Temperature Compensated Solution Conductivity (µ S/cm) * 983

Instrument Response to Calibration Solution: 1037

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 11/7/96

Instrument Manufacturer: YSI Model: 3560

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0815 Temperature of Solution: 9.1

Temperature Compensated Solution Conductivity (µ S/cm) * 701

Instrument Response to Calibration Solution: 744

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1400 Temperature of Solution: 23.6

Temperature Compensated Solution Conductivity (µ S/cm) * 973

Instrument Response to Calibration Solution: 1047

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ✓

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 11/3/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0800 Temperature of Solution: 10.5

Temperature Compensated Solution Conductivity (µ S/cm) * 727

Instrument Response to Calibration Solution: 798

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ✓

Time: 1350 Temperature of Solution: 32.5

Temperature Compensated Solution Conductivity (µ S/cm) * 1148

Instrument Response to Calibration Solution: 1237

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ✓

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:

± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.

± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.

± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: J. BRENNER Date: 11/11/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0725 Temperature of Solution: 13.4

Temperature Compensated Solution Conductivity (µ S/cm) * 780

Instrument Response to Calibration Solution: 808

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ~~✓~~

Time: 1430 Temperature of Solution: 30.4

Temperature Compensated Solution Conductivity (µ S/cm) * 1106

Instrument Response to Calibration Solution: 1209

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ✓

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Choi Date: 11/12/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 15.5

Temperature Compensated Solution Conductivity (µ S/cm) * 819

Instrument Response to Calibration Solution: 894

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ✓

Time: 1210 Temperature of Solution: 25.2

Temperature Compensated Solution Conductivity (µ S/cm) * 1004

Instrument Response to Calibration Solution: 1092

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ✓

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 11/13/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3920

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0900 Temperature of Solution: 16.6

Temperature Compensated Solution Conductivity (µ S/cm) *: 839.7

Instrument Response to Calibration Solution: 832

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1515 Temperature of Solution: 25.5

Temperature Compensated Solution Conductivity (µ S/cm) *: 1008

Instrument Response to Calibration Solution: 980

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 11/14/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C6863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A9443

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0805 Temperature of Solution: 10.5

Temperature Compensated Solution Conductivity (µ S/cm) * 727

Instrument Response to Calibration Solution: 701

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1300 Temperature of Solution: ~~22.2~~ 10.5 (NO MEASUREMENTS TAKEN)

Temperature Compensated Solution Conductivity (µ S/cm) * 727

Instrument Response to Calibration Solution: 701

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 11/18/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C168863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0850 Temperature of Solution: 11.1

Temperature Compensated Solution Conductivity (µ S/cm) * 728

Instrument Response to Calibration Solution: 688

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1242 Temperature of Solution: 15.6

Temperature Compensated Solution Conductivity (µ S/cm) * 821

Instrument Response to Calibration Solution: 786

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 11/19/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A9440B

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0915 Temperature of Solution: 20.6

Temperature Compensated Solution Conductivity (µ S/cm) * 729

Instrument Response to Calibration Solution: 710

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1230 Temperature of Solution: 24.4

Temperature Compensated Solution Conductivity (µ S/cm) * 988

Instrument Response to Calibration Solution: 974

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Choi Date: 11/20/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0930 Temperature of Solution: 18.3

Temperature Compensated Solution Conductivity (µ S/cm) * 872

Instrument Response to Calibration Solution: 849

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1345 Temperature of Solution: 34.5

Temperature Compensated Solution Conductivity (µ S/cm) * 1188

Instrument Response to Calibration Solution: 1195

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Choi, J. Brenner Date: 11/21/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

Probe Manufacturer: YSI Model: 3520

Serial Number: 95A94403

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0835 Temperature of Solution: 16.8

Temperature Compensated Solution Conductivity (µ S/cm) * 843

Instrument Response to Calibration Solution: 843

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1400 Temperature of Solution: 17.6

Temperature Compensated Solution Conductivity (µ S/cm) * 858

Instrument Response to Calibration Solution: 826

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ____ No: ✓

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 10-17-96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94016863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-URCO

Expiration Dates of Buffer Solutions pH 4.01: 2-27-98 pH 7.00: 2-27-98 pH 10.01: 3-18-98

INSTRUMENTATION CHECK-OUT

Time: 0800 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 17.9 pH: 5.62 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0900 Slope: N/A Temperature: 17.9

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1325 Slope: N/A Temperature: 22.4

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: Slope: Temperature:

Response to Low Buffer: Response to High Buffer:

Comments:

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: S.P.L.

Calibration by: T. Choi Date: 10-18-96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API - LRCO

Expiration Dates of Buffer Solutions pH 4.01: 2-28-98 pH 7.00: 2-27-98 pH 10.01: 3-18-96

INSTRUMENTATION CHECK-OUT

Time: 0800 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 13.5 pH: 5.62 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0830 Slope: N/A Temperature: 13.5

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1640 Slope: N/A Temperature: 24.6

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: Slope: Temperature:

Response to Low Buffer: Response to High Buffer:

Comments:

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 10-21-96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: APL-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: 2/27/98 pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0830 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 12.5 pH: 5.62 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0845 Slope: N/A Temperature: 12.5

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1500 Slope: N/A Temperature: 25.2

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Stanley Date: 10/22/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C 16963

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: APE - Lirco

Expiration Dates of Buffer Solutions pH 4.01: 2/27/98 pH 7.00: 2/27/98 pH 10.01: 3/19/98

INSTRUMENTATION CHECK-OUT

Time: 0815 Battery Condition: Good

Instrument Readings with Shorting Plug in, mV: — Temperature: 12.1 pH: 7.74 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: Good

FIELD CALIBRATION

Time: 0820 Slope: N/A Temperature: 10.2

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1300 Slope: N/A Temperature: 25.0

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Blaney Date: 10/23/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16813

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 351

Serial Number: N/A

Buffer Solution Manufacturer: API - LIRCO

Expiration Dates of Buffer Solutions pH 4.01: 2/27/98 pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0715 Battery Condition: Good

Instrument Readings with Shorting Plug in, mV: — Temperature: 10.9 pH: 7.05 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: Good

FIELD CALIBRATION

Time: 0740 Slope: N/A Temperature: 8.9

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1500 Slope: N/A Temperature: ~~11.7~~ 22.7

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: Slope: Temperature:

Response to Low Buffer: Response to High Buffer:

Comments:

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/24/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 5530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API - LIRCO

Expiration Dates of Buffer Solutions pH 4.01: _____ pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0720 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 10.8 pH: 8.93 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0810 Slope: N/A Temperature: 9.3

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1435 Slope: N/A Temperature: 21.1

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/25/96

Instrument Manufacturer: YSI Model: 3580

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: ATP1-LI12CO

Expiration Dates of Buffer Solutions pH 4.01: _____ pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0730 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 10.8 pH: 8.93 ISO: —

Reference Chamber Solution Changed ?: —

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0815 Slope: N/A Temperature: 15.5

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1535 Slope: N/A Temperature: 22.5

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/28/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: 2/27/98 pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0730 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 11.3 pH: 8.16 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0750 Slope: N/A Temperature: 8.8

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1445 Slope: N/A Temperature: 22.5

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/29/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94E16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: APT - LIGO

Expiration Dates of Buffer Solutions pH 4.01: ——— pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0730 Battery Condition: Good

Instrument Readings with Shorting Plug in, mV: — Temperature: 11.1 pH: 8.25 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: Good

FIELD CALIBRATION

Time: 0815 Slope: N/A Temperature: 9.5

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1445 Slope: N/A Temperature: 18.8

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: ——— Slope: ——— Temperature: ———

Response to Low Buffer: ——— Response to High Buffer: ———

Comments: ———

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANEY Date: 10/30/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API - LIRCO

Expiration Dates of Buffer Solutions pH 4.01: ——— pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0830 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 11.7 pH: 8.25 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0830 Slope: N/A Temperature: 11.7

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1450 Slope: N/A Temperature: 17.2

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Blaney Date: 10/31/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3536

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API - LIRCO

Expiration Dates of Buffer Solutions pH 4.01: — pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0715 Battery Condition: Good

Instrument Readings with Shorting Plug in, mV: — Temperature: 10.4 pH: 7.0 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: Good

FIELD CALIBRATION

Time: 0910 Slope: N/A Temperature: 10.4

Response to Low Buffer: 7.0 Response to High Buffer: 10.0

Time: 1350 Slope: N/A Temperature: 13.8

Response to Low Buffer: 7.0 Response to High Buffer: 10.0

Time: Slope: Temperature:

Response to Low Buffer: Response to High Buffer:

Comments:

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JDL

Calibration by: T. BLANEY Date: 11/1/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: _____ pH 7.00: 2/27/98 pH 10.01: 3/19/98

INSTRUMENTATION CHECK-OUT

Time: 0820 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 8.1 pH: 4.57 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0830 Slope: N/A Temperature: 8.1

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1127 Slope: N/A Temperature: 15.3

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 11/4/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: —— pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0800 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: —— Temperature: 18.6 pH: 4.57 ISO: ——

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 1000 Slope: N/A Temperature: 18.8

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1400 Slope: N/A Temperature: 21.3

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Choi Date: 11/5/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: — pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0820 Battery Condition: Good

Instrument Readings with Shorting Plug in, mV: — Temperature: 12.2 pH: 4.57 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: Good

FIELD CALIBRATION

Time: 0820 Slope: N/A Temperature: 12.2

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1415 Slope: N/A Temperature: 18.8

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: TCHOI Date: 11/6/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: — pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0720 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 8.3 pH: 4.98 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0815 Slope: N/A Temperature: 8.8

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1410 Slope: N/A Temperature: 21.7

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: Slope: Temperature:

Response to Low Buffer: Response to High Buffer:

Comments:

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 11/7/96

Instrument Manufacturer: YSI Model: 3506

Serial Number: 94CK6863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: ~~95A~~ N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: ——— pH 7.00: 2/27/98 pH 10.01: 3/13/98

INSTRUMENTATION CHECK-OUT

Time: 0815 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: ——— Temperature: 8.5 pH: 9.00 ISO: ———

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0815 Slope: N/A Temperature: 8.5

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1355 Slope: N/A Temperature: 22.7

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL
Calibration by: T. CHOI Date: 11/8/96
Instrument Manufacturer: YSI Model: 3500
Serial Number: 94C16863
pH Probe Manufacturer: YSI Model: 3630
Serial Number: N/A
ATC Probe Manufacturer: YSI Model: 3510
Serial Number: N/A
Buffer Solution Manufacturer: API-LIRCO
Expiration Dates of Buffer Solutions pH 4.01: ——— pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0750 Battery Condition: GOOD
Instrument Readings with Shorting Plug in, mV: —— Temperature: 10.5 pH: 9.00 ISO: ——
Reference Chamber Solution Changed ?: ✓
pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0750 Slope: N/A Temperature: 10.5
Response to Low Buffer: 7.00 Response to High Buffer: 10.00
Time: 1345 Slope: N/A Temperature: 31.8
Response to Low Buffer: 7.00 Response to High Buffer: 10.00
Time: ——— Slope: ——— Temperature: ———
Response to Low Buffer: ——— Response to High Buffer: ———

Comments: ———

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: J. BRENNER Date: 4/11/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3500

Serial Number: N/A

Buffer Solution Manufacturer: API-URCO

Expiration Dates of Buffer Solutions pH 4.01: — pH 7.00: 2/27/96 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0720 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 15.7 pH: 9.02 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0725 Slope: N/A Temperature: 12.4

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1425 Slope: N/A Temperature: 31.1

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Choi Date: 11/12/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C6863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3910

Serial Number: N/A

Buffer Solution Manufacturer: API-Ligon

Expiration Dates of Buffer Solutions pH 4.01: — pH 7.00: 2/27/96 pH 10.01: 3/18/97

INSTRUMENTATION CHECK-OUT

Time: 0820 Battery Condition: Good

Instrument Readings with Shorting Plug in, mV: — Temperature: 15.3 pH: 9.02 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: Good

FIELD CALIBRATION

Time: 0820 Slope: N/A Temperature: 15.3

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1210 Slope: N/A Temperature: 23.2

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 11/13/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16863

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIBCO

Expiration Dates of Buffer Solutions pH 4.01: —— pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0905 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: —— Temperature: 17.1 pH: 9.02 ISO: ——

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0905 Slope: N/A Temperature: 17.1

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: 1610 Slope: N/A Temperature: 25.9

Response to Low Buffer: 7.00 Response to High Buffer: 10.00

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: TCHOI Date: 11/14/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C16803

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: — pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0800 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 10.6 pH: 9.90 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0800 Slope: N/A Temperature: 10.6

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1300 Slope: NA Temperature: 26.7

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 11-13-98

Instrument Manufacturer: YSI Model: 35C

Serial Number: 94C1636

pH Probe Manufacturer: YSI Model: 3536

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3516

Serial Number: N/A

Buffer Solution Manufacturer: API-LIBRA

Expiration Dates of Buffer Solutions pH 4.01: — pH 7.00: 2/27/98 pH 10.01: 3/13/98

INSTRUMENTATION CHECK-OUT

Time: 0845 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: — Temperature: 11.1 pH: 7.02 ISO: —

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0845 Slope: N/A Temperature: 11.1

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1290 Slope: N/A Temperature: 15.5

Response to Low Buffer: 7.03 Response to High Buffer: 10.00

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%

pH/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 11/19/96

Instrument Manufacturer: YSI Model: 3500

Serial Number: 94C1686E3

pH Probe Manufacturer: YSI Model: 3530

Serial Number: N/A

ATC Probe Manufacturer: YSI Model: 3510

Serial Number: N/A

Buffer Solution Manufacturer: API-LIRCO

Expiration Dates of Buffer Solutions pH 4.01: —— pH 7.00: 2/27/98 pH 10.01: 3/18/98

INSTRUMENTATION CHECK-OUT

Time: 0910 Battery Condition: GOOD

Instrument Readings with Shorting Plug in, mV: —— Temperature: 10.3 pH: 9.00 ISO: ——

Reference Chamber Solution Changed ?: ✓

pH Probe Condition: GOOD

FIELD CALIBRATION

Time: 0910 Slope: N/A Temperature: 10.3

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: 1225 Slope: N/A Temperature: 21.7

Response to Low Buffer: 7.00 Response to High Buffer: 10.0

Time: _____ Slope: _____ Temperature: _____

Response to Low Buffer: _____ Response to High Buffer: _____

Comments: _____

Calibrate to Accuracy of ± 0.05 pH Units
Slope Must Be Between 80 - 110%