REGIONAL GROUNDWATER MONITORING REPORT
CENTRAL AND WEST COAST BASINS
LOS ANGELES COUNTY, CALIFORNIA
WATER YEAR 1999-2000

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EXECUTIVE SUMMARY

Based on the results of Water Year (WY) 1999-2000 groundwater monitoring in the Water Replenishment District (WRD), the overall quality of groundwater and the replenishment waters used to recharge the Central and West Coast Basins (CWCB) remains excellent. Groundwater level monitoring data indicate that water levels in the CWCB remained approximately constant during the 1999-2000 WY, declining on average about one foot from the previous year in the Silverado Aquifer. Groundwater levels remain sufficient to meet current and near-term production demands. The following sections summarize the results of the WRD 1999-2000 Regional Groundwater Monitoring Program.

GROUNDWATER REPLENISHMENT

During WY 1999-2000, total artificial replenishment totaled 130,443 acre-feet (AF), including 45,037 AF of imported water and 43,142 AF of recycled water at the spreading grounds, 21,210 AF of imported water and 7,460 AF of recycled water at the seawater barrier wells, and 22,278 AF of In-Lieu replenishment water.

The water quality associated with key constituents in untreated imported water used at the Montebello Forebay spreading grounds remains good. Average total dissolved solids (TDS), hardness, iron and manganese concentrations in both Colorado River and/or State Project Water remain below their respective maximum contaminant levels (MCLs).

The water quality associated with key constituents in recycled water used at the Montebello Forebay spreading grounds also remains excellent and is carefully monitored and controlled to show little variation over time.

GROUNDWATER PRODUCTION AND WATER LEVELS

Groundwater production in the CWCB was 251,525 AF for WY 1999-2000. This amount is less than the adjudicated amount of 281,835 AF, partly due to the success of

WRD's In-Lieu Replenishment Program, which provides incentives to pumpers for not producing groundwater in areas that are difficult to recharge by other means.

The WRD nested monitoring wells show clear, significant differences in groundwater elevations between the various aquifers screened. The head differences in the WRD nested monitoring wells reflect both hydrogeologic and pumping influences on the CWCB. Vertical head differences between 1 and 90 feet occur between zones above and within the producing zones. The greatest head differences tend to occur in the pumping holes of the CWCB Pressure Areas, while the smallest differences occur in the Montebello Forebay recharge area, and in the Torrance area which has thick, merged aquifers.

Basinwide hydrographs and groundwater elevations measured in nested monitoring wells and key production wells indicate water in the CWCB did not decrease significantly from the end of WY 1998-1999 to the end of the 1999-2000 WY. On average, water levels in the Silverado Aquifer, which is the main producing zone, dropped about one foot over the period amounting to a loss from storage in that aquifer of about 300 AF.

GROUNDWATER QUALITY

During WY 1999-2000, WRD sampled 26 of its 27 nested monitoring wells. A total of 198 groundwater samples were analyzed for over 100 chemical constituents. These data, along with production well water quality data provided by the California Department of Health Services (DHS), demonstrate that groundwater quality differs both vertically and horizontally (areally) in aquifers across the CWCB. These differences can be summarized by reviewing the results of key constituents.

TDS concentrations for WRD wells located in the Central Basin are low, while TDS concentrations for WRD wells located in the West Coast Basin are elevated in portions of the basin, primarily the Torrance and Dominguez Gap areas. The elevated TDS concentrations may be caused by seawater intrusion and/or connate or oil field brines. During WY 1999-2000, TDS concentrations in the Central Basin ranged from

160 milligrams per liter (mg/L) to 2,020 mg/L, and in the West Coast Basin 200 mg/L to 9,200 mg/L. The District is conducting further studies with the United States Geological Survey (USGS) to identify the sources of high TDS.

Iron concentrations in many production wells and nested monitoring wells in the CWCB exceed the MCL. During this reporting period, concentrations in the Central Basin ranged from not detected (ND) to 0.55 mg/L, and in the West Coast Basin, ND to 1.2 mg/L.

Similar to the iron concentrations, manganese concentrations in the WRD wells exceed the MCL in a large number of nested monitoring wells and production wells across the CWCB. During this reporting period, concentrations in the Central Basin ranged from ND to 1,000 micrograms per liter (µg/L), and in the West Coast Basin from ND to 1,300 µg/L.

Nitrate concentrations in the Central Basin ranged from ND to 5.98 mg/L, and in the West Coast Basin from ND to 17.8 mg/L in WRD nested monitoring wells. Concentrations approaching or exceeding the 10 mg/L MCL tend to be limited to the uppermost zone at a particular nested well. No concentrations above the MCL were observed in the Silverado Aquifer. DHS data indicated no CWCB production wells tested above the MCL for nitrate during WY 1999-2000.

The chemicals Trichlorethylene (TCE) and Tetrachloroethylene (PCE) continue to be persistent water quality concerns in the Central Basin. These chemicals have also been identified in the West Coast Basin.

TCE was not detected in the Silverado Aquifer in the WRD wells sampled, with the exception of Huntington Park #1. During this reporting period, concentrations in the Central Basin ranged from ND to 25 µg/L, and in the West Coast Basin from ND to 39 µg/L. DHS data indicate that TCE was detected in 34 production wells in the Central

Basin. Six out of the 34 detections were above the MCL of 5 µg/L. TCE was detected in one production well in the West Coast Basin and was below the MCL.

PCE was detected in four WRD nested monitoring wells in the Central Basin and two wells in the West Coast Basin. Only one detection in a Central Basin nested monitoring well, at South Gate #1, was in the Silverado Aquifer and did not exceed the MCL. During this reporting period, concentrations in the Central Basin ranged from ND to 12 µg/L, and in the West Coast Basin from ND to17 µg/L. DHS data indicate that PCE was detected in 43 production wells in the Central Basin during WY 1999-2000. Seven out of the 43 detection's exceed the MCL. PCE was not detected in any West Coast Basin Production Wells.

WRD has addressed the problem of TCE and PCE in the Central Basin effectively through the Wellhead Treatment Program. This program keeps production wells impacted by the solvents in service by removing the contaminants from the groundwater.

WRD also sampled for constituents that are of recent interest to the pumpers and regulators because of proposed changes to MCLs, or other emerging issues in water quality. Special interest constituents include arsenic, hexavalent chromium, methyl tertiary butyl ether MTBE, perchlorate, and radon.

In January 2001, the Environmental Protection Agency (EPA) adopted a new standard for arsenic in groundwater. The new standard is 10 µg/L (formerly 50 µg/L) and it appears that areas of Central Basin will be impacted by this new standard. Enforcement of the pending MCL is scheduled to begin in 3 years. WRD nested monitoring wells indicated arsenic concentrations in the southeast portion of the Central Basin exceed the pending MCL. During WY 1999-2000, five production wells, all in the southeast portion of the Central Basin, had arsenic concentrations which exceed the pending MCL of 10 µg/L, and five additional production wells, at various locations around the Central Basin, had arsenic concentrations between 5 and 10 µg/L. WRD is currently working with Southern

California Water Company on a demonstration project to address this emerging water quality issue.

Hexavalent chromium has been detected at low levels in several WRD nested monitoring wells in and near the Montebello and Los Angeles forebay areas. Some of the detections are in the deep aquifers including the Silverado and Sunnyside aquifers. DHS did not report any data for hexavalent chromium from production wells during WY 1999-2000. DHS has ordered purveyors to test for hexavalent chromium. WRD will report these data in future reports.

MTBE has not been detected in any of WRDs nested monitoring wells and was not reported by DHS to have been detected in any production wells in the CWCB.

Perchlorate was detected at levels below the State Action Level (SAL) in several WRD nested monitoring wells and production wells. The presence of perchlorate appears to be isolated to localized areas.

Radon concentrations for WRD nested monitoring wells in the CWCB ranged from 54 to 1,700 picocurries/liter (pCi/L). If California adopts the Multimedia Mitigation (MMM) approach to regulating radon, the concentrations reported will likely fall below the proposed regulatory limit of 4000 pCi/L. However, if the MMM is not adopted and implemented locally, groundwater exceeding 300 pCi/L would require treatment to meet a lower proposed 300 pCi/L standard.

FUTURE ACTIVITIES

WRD will continue to update and augment its Regional Groundwater Monitoring Program to best serve the needs of the District, the pumpers and the public. Activities planned under this program for the WY 1999-2000 are listed below.

WRD will install eight additional nested monitoring wells in key areas throughout the CWCB in upcoming years to continue refining the regional understanding of groundwater occurrence, movement, and quality. Water levels will be recorded using automatic dataloggers to monitor groundwater elevation differences throughout the year.

WRD will continue to sample groundwater from nested monitoring wells twice per year, and analyze the samples for general water quality constituents. In addition we will continue to focus on constituents of interest to WRD and the pumpers such as hexavalent chromium, N-Nitroso dimethylamine (NDMA), arsenic and radon. WRD will continue to use the data generated by the Regional Groundwater Monitoring Program to address current and upcoming challenges related to water quality and groundwater replenishment in the Central and West Coast Basins.

Total injection quantities at all three seawater intrusion barriers is expected to increase over the next several years as additional barrier wells are constructed to further combat seawater intrusion. WRD will work with the pumpers over the next year to find solutions to reduce the injection water demands. Basin management alternatives will be explored.

Based on the success of the In-Lieu Replenishment Program at reducing pumping in the CWCB, WRD intends to continue this program as a management tool for replenishment. Workshops are currently being held by WRD with the pumpers to explore ways to expand this program.

Because recycled water is a relatively low-cost, replenishment water source, WRD will continue to maximize recycled water use at the Montebello Forebay spreading grounds without exceeding regulatory limits. WRD will also continue to maximize recycled water use at the West Coast Basin barrier, and intends to use recycled water at the Dominguez Gap and Alamitos barriers in the near future. WRD will continue to monitor the quality of all replenishment water sources to ensure the CWCB are being recharged with high-quality water.

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SECTION 1
INTRODUCTION

The Water Replenishment District of Southern California (WRD or the District) manages groundwater replenishment and water quality activities of the Central and West Coast Basins (CWCB) (**Figure 1.1**). Our mission is to maintain a sufficient supply of high quality groundwater in the basins through progressive, cost effective, and environmentally sensitive management. This mission is being accomplished by meeting WRD goals relating to water quality, water supply, basin management, stakeholder communications, and efficient operations of the organization.

A major aspect to meeting these goals is to have a thorough and current understanding of groundwater conditions in the CWCB, and to predict and prepare for future conditions. This is achieved through groundwater monitoring, modeling, and planning, which provide the necessary information to determine the "health" of the basins. This information in turn provides WRD, the pumpers in the District, other interested stakeholders, and the public with the knowledge necessary for responsible water resources planning and management.

1.1 BACKGROUND OF THE REGIONAL GROUNDWATER MONITORING PROGRAM

Since its formation in 1959, WRD has been actively involved in groundwater replenishment, water quality monitoring, contaminant prevention, data management, and data publication. Historical overpumping of the CWCB caused overdraft, seawater intrusion and other groundwater management problems related to supply and quality. Adjudication of the basins in the early 1960s set a limit on allowable production to control the overpumping. Along with adjudication, WRD was formed to address issues of groundwater recharge and groundwater quality. The Regional Groundwater Monitoring Program is an important District program to track water levels and water quality in the CWCB to ensure the usability of this groundwater reservoir.

Prior to 1995, WRD relied upon groundwater monitoring data collected, interpreted, and presented by other entities such as the Los Angeles County Department of Public Works (LACDPW), the California Department of Water Resources (DWR), and the private sector for understanding current basin conditions. This included WRD's former basinwide monitoring program, and the ongoing but separate Montebello Forebay recycled water monitoring for regulatory compliance. However, these data have been collected primarily from production wells, which are typically screened across multiple aquifers to maximize water inflow. This results in a mixing of the waters from the perforated aquifers inside of the well casing, causing an averaging of the water qualities and water levels.

In order to obtain more accurate data for specific aquifers from which to infer localized water quality and level conditions, depth-specific (nested) monitoring wells that tap discrete aquifer zones are necessary. **Figure 1.2** illustrates the capabilities of nested monitoring wells to assess individual aquifers compared to typical production wells. Data are generally provided for a water year (WY), which occurs from October 1 to the following September 30. During WY 1994-1995, WRD and the United States Geological Survey (USGS) began a cooperative study to improve the understanding of the geohydrology and geochemistry of the CWCB. This study was the nucleus of the Regional Groundwater Monitoring Program. In addition to compiling existing available data, this study recognized that sampling of production wells did not adequately characterize the layered multiple aquifer systems of the CWCB. The study focuses on new data collection through drilling and construction of nested groundwater monitoring wells and conducting depth-specific water quality sampling. **Figure 1.3** shows the locations of completed WRD nested monitoring wells and planned future well locations. Construction information for the completed wells is presented in **Table 1.1.**

An *Annual Report on the Results of Water Quality Monitoring* (*Annual Report*) was published by WRD from Water Years 1972-1973 through 1994-1995, and was based on a basinwide monitoring program outlined in the *Report on Program of Water Quality*

Monitoring (Bookman-Edmonston Engineering, Inc., January 1973). The latter report recommended a substantial expansion of the then-existing program, particularly the development of a detailed and intensive program of monitoring the quality of groundwaters in the Montebello Forebay. The Regional Groundwater Monitoring Program is designed to serve as an expanded, more representative basinwide monitoring program for the CWCB. This Regional Groundwater Monitoring Report is published in lieu of the previous *Annual Reports*.

1.2 CONCEPTUAL HYDROGEOLOGIC MODEL

The Regional Groundwater Monitoring Program changes the focus of groundwater monitoring efforts in the CWCB from production zones with averaged groundwater level and groundwater quality information, to a layered multiple aquifer system with individual zones of groundwater quality and groundwater levels. WRD views each aquifer as a significant component of the groundwater system and understands the importance of the interrelationships between water-bearing zones. The most accepted hydrogeologic description of the basin and the names of water-bearing aquifers were provided in California Department of Water Resources, *Bulletin No. 104: Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Appendix A – Ground Water Geology* (DWR, 1961). WRD generally follows the naming conventions of this report, redefining certain aspects when new data become available.

The locations of idealized geologic cross-sections AA' and BB' through the CWCB are shown on **Figure 1.3**. Cross-sections AA' and BB' are presented on **Figures 1.4 and 1.5**. These cross-sections illustrate a simplified aquifer system of the CWCB. The main potable production aquifers are shown, including the deeper Lynwood, Silverado, and Sunnyside aquifers of the lower Pleistocene San Pedro Formation. Other main shallower aquifers, which locally produce potable water, include the Gage and Gardena aquifers of the Upper Pleistocene Lakewood Formation. Also shown on the geologic sections are the aquitards separating the aquifers. Throughout this report the aquifers shown on the geologic sections are referred to as discrete groundwater zones. Many references are made to the Silverado aquifer producing zone, typically including the Lynwood Aquifer.

1.3 GIS DEVELOPMENT AND IMPLEMENTATION

WRD is using a sophisticated geographic information system (GIS) as a tool for CWCB groundwater management. Much of the GIS was compiled during the WRD/USGS cooperative study. The GIS links spatially related information (e.g., well locations, geologic features, cultural features, contaminated sites) to data on well production, water quality, water levels, and replenishment amounts. WRD uses the industry standard ArcInfo® and ArcView® GIS software for data analysis and preparation of spatially related information (maps and graphics tied to data). WRD utilizes a global positioning system (GPS) to survey the locations of basinwide production wells and nested monitoring wells for use in the GIS database.

WRD is constantly updating the GIS with new data and newly acquired archives of data acquired by Staff or provided by pumpers and other agencies. The GIS is a primary tool for WRD and other water-related agencies to more accurately track current and past use of groundwater, track groundwater quality, and project future water demands, thus allowing improved management use of the basins.

1.4 SCOPE OF REPORT

The purpose of this report is to update information on groundwater conditions in the CWCB for WY 1999-2000, and to discuss the status of the Regional Groundwater Monitoring Program. Section 1 provides an overview of WRD and the WRD Regional Groundwater Monitoring Program. Section 2 discusses the types, quantities, and water quality of different source waters used by WRD for replenishment at the Montebello Forebay spreading grounds and the seawater intrusion barriers. Section 3 summarizes groundwater production in the CWCB, and evaluates water level, storage change, and groundwater elevation data for WY 1999-2000. Section 4 presents water quality data for the WRD nested monitoring wells and basin-wide production wells. Section 5 summarizes the findings of this report. Section 6 describes future regional groundwater monitoring activities. Section 7 lists the references used in this report.

SECTION 2
GROUNDWATER REPLENISHMENT

Natural groundwater replenishment occurs through the percolation of precipitation and applied waters (such as irrigation), conservation of stormwater in spreading grounds, and underflow from adjacent basins. However, there is insufficient natural replenishment in the CWCB to sustain the groundwater pumping that takes place. Therefore, WRD provides for artificial groundwater replenishment through the purchase of imported, recycled, and In-Lieu water to make up the difference. Artificial replenishment occurs at the spreading grounds, the seawater intrusion barrier injection wells, and through the District's In-Lieu Replenishment Program. This section describes the sources, quantities, and quality of water used for replenishment in the CWCB during WY 1999-2000.

2.1 SOURCES OF REPLENISHMENT WATER

Replenishment water comes from imported, recycled, and local sources. The types used by WRD are described below:

- Imported water: This source comes from the Colorado River or the State Project Water via Metropolitan Water District (MWD) pipelines and aqueducts. WRD purchases this water both for surface recharge at the Montebello Forebay spreading grounds and for injection at the seawater intrusion barriers. For the spreading grounds, the water is replenished without further treatment from the rivers as the quality is very good and gets natural treatment as it percolates through the vadose zone soils. For the barrier wells, the water is treated to meet all drinking water standards before injection since it will not be moving through vadose zone soils. Spreading ground water is available seasonally from MWD if they have excess reserves, whereas a premium price is paid for injection water to maintain deliveries throughout the year and throughout droughts.
- Recycled water: This resource's relatively low unit cost and good quality coupled with its year-round availability makes it highly desirable as a replenishment source. However, its use is limited by regulatory agencies. Tertiary-treated recycled water is

used for replenishment at the spreading grounds. Tertiary-treated recycled water followed by additional reverse osmosis treatment is used for injection into the West Coast Basin Barrier Project seawater intrusion barriers.

- Make-Up Water: "Make-Up Water" is occasionally delivered to the Montebello Forebay spreading grounds from the San Gabriel Valley Basin. This water, termed the "Lower Area Annual Entitlement", was established in accordance with the judgment in Case No. 722647 of Los Angeles County, City of Long Beach, et al vs. San Gabriel Valley Water Co., et al (Long Beach Judgment). During WY 1999-2000, Make-Up Water was not delivered to the Lower Area.
- Local water: Local water consists of channel flow from local sources (e.g., storm-flow, rising water, incidental surface flows) conserved in the Montebello Forebay spreading grounds by the LACDPW. Precipitation falling on the basin floor and water applied to the ground (such as for irrigation) also percolate into the subsurface and contribute to recharge.
- Subsurface water: Groundwater flows into and out of the CWCB from adjacent groundwater basins (Santa Monica, Hollywood, San Gabriel, Orange County) and the Pacific Ocean. The amounts depend on the hydrogeologic properties of the aquifers and the groundwater gradients at the basin boundaries.

2.2 QUANTITIES OF REPLENISHMENT WATER

Historical quantities of water conserved (replenished) in the Montebello Forebay spreading grounds are presented in **Table 2.1**. Historical seawater barrier well injection amounts are shown on **Table 2.2**. The calculations required to determine the total quantity of artificial replenishment water necessary for the CWCB prior to each water year are outlined in the District's annual *Engineering Survey and Reports* (ESRs).

At the Montebello Forebay spreading grounds (**Table 2.1**), the following is noted for the quantities of replenishment water for WY 1999-2000:

- Total water conserved in the Rio Hondo (consisting of the Rio Hondo Spreading Grounds and percolation behind the Whittier Narrows Dam) and the San Gabriel

System (consisting of the unlined San Gabriel River south of the Whittier Narrows Dam and the San Gabriel River Spreading Grounds) was 108,915 acre-feet (AF). This is less than the long term running average of 133,721 AF (WY 1963/64 through 1998/99).

- The quantity of local water conserved during WY 1999-2000 was 20,736 AF, less than the long-term running average of 54,318 AF, and less than the previous 5-year average of 68,606 AF (WY 1994/95 through 1998/99).

- The quantity of imported water conserved during WY 1999-2000 was 45,037 AF. This is less than the long-term running average of 47,893 AF, but greater than the previous 5-year average of 13,592 AF. Very little imported water was purchased the previous two years due to construction activities in the spreading grounds (1998) and above average local water (El Nino, 1997), resulting in a low 5 year average.

- The quantity of recycled water conserved during WY 1999-2000 was 43,142 AF. This is more than the long-term running average of 31,510 AF, but less than the previous 5-year average of 45,520 AF. WRD attempts to maximize recycled water use within regulatory permit limits, which are 50 percent or 60,000 AF maximum in any one year, and 35 percent or 150,000 AF total over three consecutive years. In addition to the water sources shown on **Table 2.1**, the Montebello Forebay received an estimated 5,600 AF of recharge due to infiltration of precipitation falling on the forebay floor, and 27,343 AF of groundwater underflow from San Gabriel Valley. The total replenishment was therefore 141,858 AF, of which 30.4% was recycled water. The three-year average recycled water use was 44,740 AF, and the three-year average percent recycled water component is 32.6%.

At the seawater intrusion barriers (**Table 2.2**), the following trends are noted for the quantities of artificial replenishment water for WY 1999-2000:

- At the West Coast Basin Barrier, 18,632 AF was injected, which included 11,172

AF of imported water and 7,460 AF of recycled water (40%). The current limit for recycled water injection is 50% of the total supply. The long-term injection average from WY 1963/64 through 1998/99 is 25,822 AF. The 5-year average (1994/95 through 1998/99) is 16,700 AF.

- At the Dominguez Gap Barrier, 6,010 AF was injected. The long-term average from WY 1971/72 through 1998/99 is 6,079 AF, and the 5-year average (1994/95 through 1998/99) is 4,847 AF. To date, only imported water has been injected at the Dominguez Gap barrier; however, WRD and the City of Los Angeles plan to augment this source with recycled water in the near future.

- At the Alamitos Barrier, both WRD and Orange County Water District (OCWD) provide injection water; WRD for wells on the Los Angeles County side, and OWCD for wells on the Orange County side. During WY 1999-2000 a total of 5,737 AF were injected into the barrier system, 4,028 by WRD and 1,709 by OCWD. The long-term average from WY 1965/66 through 1998/99 is 5,106 AF, and the 5-year average (1994/95 through 1998/99) is 5,206 AF. To date, only imported water has been injected at the Alamitos Barrier; however, WRD plans to augment this source with recycled water in the near future.

Injection amounts at the barrier systems are expected to increase over the next several years to further combat seawater intrusion.

2.3 QUALITY OF REPLENISHMENT WATER

This section discusses water quality data for key parameters in WRD replenishment water and local surface water during WY 1999-2000. Although numerous other constituents are monitored, these are the ones found to be most prevalent and at elevated levels in wells in the CWCB. The data are classified according to their source. The key water quality parameters of this discussion are: Total dissolved solids (TDS), hardness, sulfate, chloride, nitrogen, iron, manganese, trichloroethylene (TCE), and tetrachloroethylene (PCE). Monitoring the concentrations of these constituents is necessary for an understanding of the general chemical nature of the recharge source, and its suitability for replenishing the groundwater basins. A brief description of each parameter follows.

- TDS: TDS is a measure of the total mineralization of water and is indicative of general water quality. In general, the higher the TDS the less desirable a given water supply is for beneficial uses. The California Department of Health Services (DHS) maximum contaminant level (MCL) in drinking water for TDS ranges from 500 milligrams per liter (mg/L), which is the recommended level, to 1,000 mg/L, which is the upper limit allowed.
- Hardness: For most municipal type uses, hardness (a measure of calcium and magnesium) is an important mineral characteristic in water. Excessive hardness is undesirable because it results in increased consumption of cleaning products, scale formation, and other undesirable effects. There is no MCL for hardness, but generally waters are considered soft less than 50 mg/L and very hard greater than 200 mg/L.
- Nitrogen: DHS standards limit nitrate concentrations to 45 mg/L (measured as nitrate), corresponding to 10 mg/L nitrogen. In recycled water most of the nitrogenous material exists in the form of ammonia (with a small portion existing in the form of organic nitrogen). Theoretically, it would be possible for all of the nitrogenous materials in water to be oxidized to the nitrate form. Therefore, the total nitrogen in water recharging the groundwater supply should not exceed 10 mg/L (as nitrogen). This is conservative in that it neglects any nitrogen that may be adsorbed, converted into nitrogen gas, or otherwise removed from the water.
- Sulfate: Sulfate is generally not a water quality concern in the CWCB. DHS has established a State MCL (secondary) for sulfate at 250 mg/L. This MCL is generally exceeded only when the TDS MCL has also been exceeded. Sulfate is, however a very useful water quality constituent in the CWCB for use in tracking flow and observing travel times of artificial recharge. Colorado River water, local stormwater, and recycled water used for recharge in CWCB have characteristically high sulfate concentrations, while native groundwater has relatively low sulfate concentrations.
- Chloride: Chloride is the characteristic constituents used to identify seawater intrusion. While recharge sources contain moderate concentrations of chloride, these

concentrations are well below the State secondary MCL for chloride of 250 mg/L. When the ratio of chloride to other anions such as sulfate and bicarbonate becomes high, there is a strong indication of seawater intrusion or possible industrial brine impact to groundwater.

- Iron: The iron content of water is important because small concentrations of iron in water can affect the water's suitability for domestic or industrial purposes. The DHS limits the amount of iron in drinking water to 0.3 mg/L because iron in water stains plumbing fixtures, incrusts well screens, and clogs pipes. Some industrial processes cannot tolerate more than 0.1 mg/L iron.
- Manganese: Manganese is objectionable in water in the same general way as iron. Stains caused by manganese are more unsightly and harder to remove than those caused by iron. The DHS MCL for manganese is 50 micrograms per liter (µg/L).
- TCE: Trichloroethylene is a manmade solvent used primarily to remove grease from metal parts. Because of its potential health effects (central nervous system depression, carcinogen), the MCL for TCE is 5 µg/L.
- PCE: Tetrachloroethylene (also known as perchloroethylene, perc, perclene, and perchlor) is a manmade solvent used heavily in the dry cleaning industry. Like TCE, PCE can depress the central nervous system and is a possible carcinogen. The MCL for PCE in drinking water is also 5 µg/L.

Quality of Imported Water

As stated previously, treated imported water is used at the seawater intrusion barriers. This water is treated to meet all drinking water standards, so its water quality is excellent and suitable for direct injection. Average water quality data for treated imported water during WY 1999-2000 are presented on **Table 2.3**.

Untreated imported water ("raw water") is used for recharge at the Montebello Forebay spreading grounds. The average TDS concentration of Colorado River water has decreased over the past five water years, from 682 mg/L to 564 mg/L. The average TDS concentration of State Project Water has also shown a modest decreasing trend, from 320 mg/L to 288 mg/L.

The average hardness of Colorado River water has decreased over the last five water years, from 322 mg/L to 284 mg/L. The average hardness of State Project Water has also shown a decreasing trend, from 173 mg/L to 136 mg/L.

The average nitrogen concentration of Colorado River water has decreased compared to the previous water year, from 0.90 mg/L to 0.23 mg/L. The average nitrogen concentration of State Project Water has also decreased compared to the previous water year, from 0.96 mg/L to 0.20 mg/L. Historically, both Colorado River and State Project Water nitrogen concentrations have been far below the MCL.

The average iron and manganese concentrations of Colorado River and State Project Water have decreased over the past water year to non-detectable levels. Both Colorado River and State Project Water iron and manganese concentrations have historically been below the MCL.

According to the Metropolitan Water District, TCE nor PCE have been detected in Colorado River Water or State Project Water over the last five water years.

Quality of Recycled Water

As outlined previously, recycled water from the West Basin Municipal Water District (West Basin MWD) wastewater reclamation plant (WRP) undergoes advanced treatment using reverse osmosis, then is used at the West Coast Basin barrier. This water is processed to meet or exceed drinking water standards, so it is of excellent quality and suitable for direct injection. The DHS limits injection however, to 50 percent of the total injected amount. Average water quality data for this water are presented on **Table 2.3**.

Recycled water from the Whittier Narrows WRP, San Jose Creek East WRP, San Jose Creek West WRP, and Pomona WRP are used at the Montebello Forebay spreading grounds. The water quality from these WRPs is carefully controlled and typically shows little variation over time. **Table 2.3** presents average water quality data from these

WRPs. All constituents shown have either decreased slightly or remain stable over the past five water years. Furthermore, neither TCE nor PCE have been detected above MCLs in recycled water from these four WRPs over the last four water years.

Quality of Stormwater

As discussed in Section 3, stormwater infiltrates to some degree throughout the District, but especially in the Montebello Forebay, where it is conserved along with imported and recycled water in the spreading grounds. Occasional stormwater quality analyses have been performed by LACDPW throughout the history of the Montebello Forebay spreading grounds. Average stormwater quality data for Water Year 1999-2000 are presented on **Table 2.3**. The average TDS, hardness, sulfate, chloride, nitrate, TCE, and PCE concentrations of stormwater in the Montebello Forebay are relatively low. Average iron and manganese concentrations of stormwater exceeded MCLs during the past water year.

SECTION 3
GROUNDWATER PRODUCTION AND WATER LEVELS

Groundwater production or pumping is the major source of outflow of groundwater from the CWCB. Groundwater currently provides about 34% of the total water used in the basins, whereas imported water provides 62% and recycled water 4%. It is critical to maintain adequate supplies of groundwater in storage to meet this demand and to protect against time of drought when imported water may not be available. Measurements of water levels in the basins are made to check the current supply and are used to determine when artificial replenishment is needed. The remainder of this Section describes WRD's management of groundwater production and water levels in the CWCB.

3.1 GROUNDWATER PRODUCTION IN THE CENTRAL AND WEST COAST BASINS

Prior to the 1960s, groundwater production in the CWCB went relatively unchecked and continued to increase as the population grew. West Coast Basin pumping reached a maximum of 94,100 AF in 1952/53, and Central Basin pumping reached a maximum of 259,400 AF in 1955/56. Pumping exceeded natural recharge resulting in overdraft, declining water levels, loss of groundwater from storage, and seawater intrusion.

In the early 1960s, the State courts limited the amount of pumping that could occur in the CWCB to reduce this overdraft. The West Coast Basin adjudication was finalized in 1961 and capped production at 64,468.25 acre-feet/year (AFY). The Central Basin adjudication was finalized in 1965 and capped production at 271,650 AFY, but set a reduced Allowed Pumping Allocation (APA) of 80% of the adjudication, or 217,367 AFY, that remains in effect today. The total amount that can be pumped from both basins is currently 281,835 AFY.

The adjudicated amounts were set higher than the natural replenishment of the CWCB with WRD being created to make up this deficiency through artificial replenishment. A replenishment assessment is placed on pumping to collect the funds necessary to purchase the supplemental water.

During WY 1999-2000, groundwater production in the CWCB was 251,525 AF, of which 197,946 AF occurred in the Central Basin and 53,579 occurred in the West Coast Basin. This represents a 2% decrease from the previous year, but is still higher than the five-year average of 244,592 AF (WY 1995/96 through 1999/00). **Table 3.1** presents historical groundwater production quantities for the CWCB. **Figure 3.1** illustrates the levels of production throughout the CWCB during the 1999-2000 Water Year.

Under the terms of the Water Replenishment Districts Act, each groundwater producer in the CWCB must submit a report to the District summarizing their production activities (monthly reports for larger producers, quarterly reports for smaller producers). The information in these reports is the basis from which each producer pays the replenishment assessment. WRD then forwards these production data to the DWR, the court-appointed Watermaster, in connection with the adjudication of the CWCB.

With few exceptions, meters installed and maintained by the individual producers measure the groundwater production throughout the basins. Through periodic testing, both WRD and Watermaster verify the accuracy of individual meters and order corrective measures when necessary. The production of the few wells that are not metered is estimated on the basis of electrical energy consumed by individual pump motors, duty of water, or other reasonable means.

Participation in WRD's In-Lieu Replenishment Program, which replaces groundwater pumping with the use of surplus imported water, has become a major factor affecting annual groundwater production. As participation in the program increases, total production decreases accordingly. In Fiscal Year 1999-2000, In-Lieu participation was 22,278 AF, with 18,799 AF in the Central Basin and 3,479 AF in the West Coast Basin.

During the past five years, in-lieu replenishment has averaged 33,370 AFY. In-lieu replenishment peaked during 1993/94, with total groundwater extractions of less than 172,000 AF, and in-lieu replenishment of about 110,000 AF. However, recent trends show In-Lieu participation decreasing, with a FY 2000-2001 participation estimate of 25,000 AF.

During emergency or drought conditions, WRD can also allow an additional 27,000 AF (17,000 AF for Central Basin and 10,000 AF for West Coast Basin) of extractions for a four-month period. This provision has yet to be exercised but offers the potential use of an additional 7.8 percent groundwater for Central Basin and 15 percent groundwater for West Coast Basin pumpers.

3.2 GROUNDWATER LEVELS AND CHANGE IN STORAGE

Groundwater levels in the CWCB are tracked through the collection of water level measurements in production wells and monitoring wells. Automatic data-logging equipment has been installed in selected monitoring wells to collect water levels up to four times per day to capture the daily and seasonal changes in water levels due to near by and regional pumping. WRD staff visit these and other monitoring wells at least four times per year to collect manual readings and to download the data loggers. Staff also obtain records from other agencies such as the pumpers, the DWR, and the LACDPW, who regularly collect water level data from production wells. These data are input into WRD's database management system for storage and analysis. Contour maps and hydrographs are prepared to illustrate the current and historical groundwater levels in the basins. The change in storage can be determined based on water level changes over the year.

3.2.1 Contour Maps

Groundwater elevation contour maps show the elevation of the water surface (potentiometric surface) in the aquifer system for a given period of time, such as spring or fall. These maps are used to determine groundwater flow directions and hydraulic gradients, identify areas of recharge and discharge, identify potential pathways for seawater intrusion, and can be used to calculate the changes in storage from one year to the next.

WRD has prepared several contour maps representing the "Deep Aquifer System", which consists of the San Pedro Formation aquifers (Lynwood/400-Foot Gravel, Silverado, and Sunnyside/Lower San Pedro). **Figures 3.2 and 3.3** are groundwater elevation contour maps for Spring and Fall 2000, respectfully. Based on these maps, groundwater levels are highest in the northeastern corner of the Montebello Forebay, where San Gabriel Valley groundwater flows into the Central Basin. Groundwater levels are at their lowest in several areas, including Long Beach near the airport and in the West Coast Basin along the Newport-Inglewood uplift.

In addition to the relatively high summer water demands, MWD's seasonal storage program provides some pumpers with an incentive to pump more groundwater from May through September than from October through April. **Figure 3.4** illustrates the monthly pumping amount for WY 1999-2000. As shown in the figure, pumping in the West Coast Basin remains relatively constant at about 4,500 AF/month throughout the year. However, in the Central Basin, pumping is generally 20,000 AF/month or higher May through September, and generally 15,000 AF/month or less the rest of the year. The result of this unsteady seasonal pumping causes groundwater levels to vary dramatically from spring to fall, especially in the confined Central Basin aquifers. **Figure 3.5** is a map showing the difference in water levels between Spring and Fall 2000 generally caused by the seasonal pumping. The biggest impact is in the Long Beach area along the Newport-Inglewood Uplift, where fall water levels are over 90 feet lower than spring water levels.

However, between Fall 1999 and Fall 2000, water levels did not change significantly. **Figure 3.6** shows that water level changes based on differences between the Fall 2000 contour map (**Figure 3.3**) and the Fall 1999 contour map presented in last years report. The greatest water level decline was observed in the Bellflower and Lakewood areas, where a decline of over 30 feet was observed. The greatest water level rise was observed in the Huntington Park/Los Angeles area. However, in general, the average water level change calculated from the GIS system was a decrease of only about 1-foot from the previous year.

3.2.2 Hydrographs

Hydrographs show the changes in water levels in a well over time. WRD uses hydrographs to evaluate basin storage, when to purchase replenishment water, drought preparedness, and how the basins respond to both seasonal and long-term recharge and discharge events.

Both long-term and annual hydrographs are used. **Figures 3.7 through 3.10** are long-term hydrographs of key wells used in the District's annual Engineering Survey and Report that show water levels dating back to the 1930s and 1940s in the Montebello Forebay, Los Angeles Forebay, Central Basin Pressure Area, and West Coast Basin, respectively. **Figure 3.2** shows the locations of these key wells. The hydrographs illustrate the general history of groundwater conditions in the CWCB: 1) Water levels were steadily declining in the 1940s and 50s due to groundwater overdraft, causing seawater intrusion and significant removal of groundwater from storage; 2) This severe overdraft condition led to the adjudication of the CWCB in the early 1960s, and the formation of WRD to purchase and deliver artificial replenishment water at the spreading grounds, seawater barrier wells, and through in-lieu replenishment; 3) The reduction in pumping and the artificial replenishment caused groundwater levels to rise in both the CWCB (although not to their historic highs) and returned groundwater to storage; and 4) Over the past 5 to 10 years, water levels have remained relatively level or have slightly decreased, although substantial seasonal variations can occur such as in the Long Beach area **(Figure 3.9)**.

Annual hydrographs are also used to obtain a more detailed picture of aquifer-specific water level changes over the water year. The data for these annual hydrographs are collected from WRD's nested monitoring wells that were installed by the USGS. **Figure 1.3** shows the locations of WRD's nested monitoring wells. **Table 3.2** presents the groundwater elevation measurements collected from nested monitoring wells during Water Year 1999-2000. These data demonstrate the elevation differences between individual aquifers at each nested well location. The differences in elevation are caused primarily by the thickness and hydraulic conductivity of aquitards (if any) which separate the aquifers, the amount and aquifer location of pumping, and the proximity to recharge sources. The information from selected monitoring wells is presented below:

Figure 3.11 – Rio Hondo#1: This nested well is located in the Montebello Forebay in the City of Pico Rivera at the southeast corner of the Rio Hondo spreading grounds. It has 6 individual wells (zones) screened in the Gardena, Lynwood, Silverado, and Sunnyside (three different zones) aquifers from depths of 160 feet below ground surface (bgs) to 1,130 feet bgs. In WY 1999-2000, water levels in Zone 4, representing the Silverado Aquifer, varied about 24 feet throughout the year, from a low elevation of 60 feet (mean sea level, msl) in November 1999 to a high of about 84 feet (msl) in April 2000. All 6 zones generally follow the same trend throughout the year, with lows in the fall and highs in the spring. With the exception of Zones 2 and 3 (both in the Sunnyside aquifer) which have nearly identical elevation heads throughout the year, there are several feet of vertical head differences between aquifers. Elevation heads are lowest in Zone 4 (Silverado Aquifer), suggesting that this aquifer is the most heavily pumped in the area. Because it has the lowest head, it should be expected to receive recharge waters from aquifers above and below.

Figure 3.12 - Huntington Park #1: This nested well is located in the Los Angeles Forebay in the City of Huntington Park near the southeast of the corner of the Slauson and Alameda. It has 5 individual wells screened in the Gaspur, Exposition, Gage, Jefferson, and Silverado aquifers from depths of 134 feet bgs to 910 feet bgs. In WY 1999-2000, water levels in Zone 1, representing the Silverado Aquifer, varied about 10 feet throughout the year, from a low elevation of –35 feet (msl) in August and September 1999 to a high of about –25 feet (msl) in April 2000. Zone 5, representing the Gaspur Aquifer, was dry throughout the year, indicating that the depth to groundwater exceeded 134 feet in that zone. Water levels of the deepest 3 zones generally followed the same

trend throughout the year, with lows in late summer and fall and highs in the spring. Water levels in Zone 4 (Exposition Aquifer) had only relatively minor fluctuations throughout the year, and occur at elevations from 15 feet to 25 feet higher than the deeper zones, suggesting little connection to the lower aquifers.

Figure 3.13 - Long Beach #1: This nested well is located in the Central Basin Pressure Area in the City of Long Beach about a half mile from the intersection of the 605 Freeway and Willow Street. It has 6 individual wells (zones) screened in the Artesia, Gage, Lynwood, Silverado, and Sunnyside (2 zones) aquifers, with depths ranging from 175 feet bgs to 1,450 feet bgs. In WY 1999-2000, water levels in Zone 3, representing the Silverado Aquifer, varied about 70 feet throughout the year, from a minimum elevation of –90 feet (msl) in September 2000 to a high of about –20 feet (msl) in April 2000. This large variation is due to the seasonal pumping patterns and confined aquifer conditions discussed previously. Water levels of the 6 zones generally followed the same trend throughout the year, with lows in the fall and highs in the spring. An abrupt lowering of water levels began in late April to early May as the seasonal pumping season began. A similar rebounding effect is expected in October, when pumping is reduced. Elevation heads are lowest in Zone 3 (Silverado Aquifer), suggesting that this aquifer is the most heavily pumped in the area. Because it has the lowest head, it should be expected to receive recharge waters from aquifers above and below the Silverado.

Figure 3.14 - Carson #1: This nested well is located in the West Coast Basin in the City of Carson about a mile northwest from the intersection of the 405 freeway and Alameda. It has 4 individual wells (zones) screened in the Gage, Lynwood, Silverado, and Sunnyside aquifers from depths of 270 feet bgs to 1,110 feet bgs. In WY 1999-2000, water levels in Zone 2, representing the Silverado Aquifer, varied about 14 feet throughout the year, from a low elevation of –79 feet (msl) in December 1999 to a high of about –65 feet (msl) in August 2000. Water levels in Zones 1 and 2 track very similar throughout the year, as do Zones 3 and 4. However, there is a 40 to 50 foot difference in groundwater elevations between Zones 1/2 and Zones 3/4 that suggest a strong aquitard between the zones.

3.2.3 Change In Storage

Groundwater enters and leaves the CWCB. It enters through natural and artificial replenishment, and leaves primarily through pumping. If the amount entering the basin equals the amount leaving, then water levels remain relatively unchanged and the basin is at steady state. When the amount of groundwater entering exceeds the amount leaving, water levels rise and there is an increase in the amount of groundwater in storage. When groundwater leaving the basins exceeds that entering, water levels drop and the amount in storage is reduced.

The change in groundwater storage over the course of a water year can be determined by calculating water level changes and multiplying those values by the aquifer's storage coefficients. As discussed in Section 3.2.1, groundwater levels between Fall 1999 and Fall 2000 did not change significantly. Although water levels rose and fell up to 30 feet in localized areas, the average change over the entire CWCB was a drop of only about one foot.

To determine the change in storage from Fall 1999 to Fall 2000, WRD used its GIS to multiply the change in water levels (**Figure 3.6**) by the storage coefficient values determined by the USGS in creating their regional computer model. The storage coefficient values for model layer 3 were used, which represent the confined Silverado and Lynwood aquifers. Because these aquifers are fully saturated and confined, storage coefficients are generally small (averaging about 0.0005). Based on the calculation, the relatively small volume, approximately 300 AF, of water was lost from storage from the Silverado/Lynwood aquifers during WY 1999 to 2000. This indicates that groundwater inflows nearly equaled outflows.

SECTION 4
GROUNDWATER QUALITY

This section discusses the vertical and horizontal distribution of several key water quality parameters based on data from WRD's monitoring wells and purveyor's production wells in the CWCB for Water Year 1999-2000. WRD collected biannual groundwater samples from completed WRD nested monitoring wells in Fall 1999 and Spring 2000. Groundwater samples are submitted to a DHS certified laboratory for analytical testing for general water quality parameters, known or suspected contaminants, and special interest constituents. Water quality data for production wells were provided by the DHS based on results submitted by purveyors for their Title 22 compliance. **Figures 4.1 through 4.27** are maps which present water quality data for key parameters and special interest constituents in the WRD nested monitoring wells and production wells in the CWCB. The figures present the maximum values for data where more than one result is available for the water year. **Table 1.1** presents well construction information for WRD wells. **Table 4.1** categorizes groundwater at the WRD wells into major mineral water quality groups. **Table 4.2** lists the water quality analytical results for the wells during WY 1999-2000.

4.1 MAJOR MINERAL CHARACTERISTICS OF GROUNDWATER IN THE CENTRAL AND WEST COAST BASINS

Major minerals data from general mineral analyses were used to characterize groundwater from discrete vertical zones of each WRD well with respect to source of recharge water (**Table 4.1**). Research by the USGS has provided three distinct groupings of groundwater compositions. Group A groundwater is typically calcium bicarbonate or calcium bicarbonate/sulfate dominant. Group B groundwater has a typically calcium-sodium bicarbonate or sodium bicarbonate character. Group C has a sodium chloride character. A few of the WRD wells yield groundwater samples which do not fall into one of the three major groups and are grouped separately.

Groundwater from Group A likely represents recently recharged water with a significant percentage of imported water. Groundwater from Group B represents older native groundwater replenished by natural local recharge. Groundwater from Group C represents groundwater impacted by seawater intrusion or connate saline brines. **Table 4.1** lists the groundwater group for each WRD nested monitoring well sampled during WY 1999-2000. Comparison of groundwater groups with well locations indicates that, in general, Group A groundwater is found at and immediately down-gradient from the Montebello Forebay spreading grounds in all but the deepest zones. Group B groundwater is found farther down the flowpath of the Central Basin and inland of the salt water wedge and injected water in the West Coast Basin. Group C water is generally found near the coastlines. Several wells, grouped as "Other" on **Table 4.1**, exhibit a chemical character range different from Group A, B, and C ranges and represent unique waters not characteristic of the dominant flow systems in the basins. The USGS is currently conducting trace element isotope analyses of water from these wells to identify their hydrogeologic source(s).

The major mineral compositions of water from the WRD nested monitoring wells sampled this water year have not changed substantially from previous years where older data are available. It is expected that continued analysis will show gradual changes in major mineral compositions over time, as older native water is extracted from the basins and replaced by younger artificially replenished water.

4.2 TOTAL DISSOLVED SOLIDS (TDS)

As described in Section 2.3, TDS is a measure of the total mineralization of water. WRD well data for WY 1999-2000 indicate relatively low TDS concentrations for groundwater in the deeper producing aquifers of the Central Basin (**Figure 4.1**).

TDS concentrations in the Central Basin ranged from 160 to 2,020 mg/L. In the Central Basin, the Silverado Aquifer zones in 13 out of 16 WRD nested monitoring wells had very low TDS concentrations below 500 mg/L. The Silverado Aquifer zone at Pico #2 was between 500 and 750 mg/L, and at Santa Fe Springs #1 and Whittier #1 between 750 and 1000 mg/L. The Silverado aquifer zones of all 16 Central Basin wells tested were less than the DHS upper limit for TDS of 1,000 mg/L. Generally, TDS concentrations above 1000 mg/L were limited to the deepest two zones of Whittier #1 and Santa Fe Springs #1, the Zone 6 (shallowest) at Long Beach #2 and Zone 5 at Long Beach #1.

In contrast, West Coast Basin nested monitoring well data show generally higher TDS concentrations. TDS in the West Coast Basin ranged from 200 to 9,200 mg/L in WRD nested monitoring wells. Only the most inland nested monitoring wells, Carson #1 and Gardena #1 indicate TDS values below 500 mg/L consistently for all zones below the shallowest. Wilmington #1 and Wilmington #2, located near the Dominguez Gap Seawater Intrusion Barriers have significantly high TDS values, each with TDS in 3 zones, including Silverado aquifer zones, above 1000 mg/L. The PM-4 Mariner well, inland from the West Coast Basin Barrier Project and located within the saline plume indicates TDS in the Silverado aquifer zone above 1000 mg/L due to seawater intrusion. All zones of the Inglewood #1 and Lomita #1 nested monitoring wells exceed 750 mg/L with one or more zones greater than 1,000 mg/L.

Figure 4.2 presents WY 1999-2000 DHS water quality data for TDS in production wells across the CWCB. In the Central basin, TDS is generally below 500 mg/L except a grouping of TDS data between 500 and 750 mg/L located along the San Gabriel River around and partially down the flow path from the San Gabriel River Spreading Grounds.

Limited data from West Coast Basin production wells indicate that for wells where data is available, TDS concentrations are below 500 mg/L. Two production wells near the coast have elevated TDS concentrations above 1,000 mg/L.

4.3 IRON

Dissolved iron in groundwater has historically been a water quality problem in portions of the CWCB. An abundant source of iron is present in the minerals making up the aquifers of the basins. The presence of dissolved iron, that is, iron dissolving from the minerals into the groundwater is controlled by a variety of geochemical factors discussed at the end of this section. In the Central Basin iron in nested monitoring wells (**Figure 4.3**) ranged from less than the detection limit to 0.55 mg/L, and indicated only a few local zones where iron exceeds the MCL. Only three wells in the Central Basin had detectable iron concentrations in the Silverado zones. These include Huntington Park #1, Pico #1, and Whittier #1. Only the Silverado zone in Pico #1 exceeded the MCL. Iron was detected in zones above and/or below the Silverado Aquifer in six of the sixteen Central Basin nested wells sampled.

In the West Coast Basin elevated iron concentrations in nested monitoring wells appears more widespread than in the Central Basin. Iron concentrations ranged from less than the detection limit to 1.2 mg/L. There does not appear to be a distinct pattern to the occurrence of elevated iron. Elevated iron concentrations are observed locally within, above, and below the Silverado zones at some wells but not at others.

Figure 4.4 presents WY 1999-2000 DHS water quality data for iron in production wells across the CWCB. The data show elevated iron concentrations in many production wells throughout the CWCB. Iron concentrations exceeded the MCL in 16 out of 96 production wells tested in the Central Basin. Fewer iron data were available from DHS for the West Coast Basin. For those production wells where data were available, iron concentrations were above the MCL in 4 out of 16 production wells tested.

Although a definitive source cannot be identified for the various elevated iron concentrations described above, some general geochemical relationships for dissolved iron in groundwater may apply to the iron distribution patterns. First, dissolved iron tends to form under reducing groundwater conditions. Groundwater having a pH value between 6 and 8 (as is the case for all the WRD wells) can be sufficiently reducing to retain as much as 50 mg/L of dissolved ferrous iron at equilibrium, when bicarbonate activity does not exceed 61 mg/L (Hem, 1992). Second, iron is a common component of many igneous rocks and is found in trace amounts in virtually all sediments and sedimentary rocks—therefore, abundant natural sources of dissolved iron are present throughout the CWCB and in particular geochemical conditions the natural iron will dissolve into the groundwater. Third, water may dissolve any subsurface iron casing, piping, etc. (the main materials of older production wells and pumps, and distribution systems)-thus, production wells themselves may contribute iron to water supplies.

4.4 MANGANESE

Manganese concentrations in the WRD nested monitoring wells exhibit widespread vertical and horizontal variations across the CWCB (**Figure 4.5**). Like iron, manganese is a naturally occurring element in groundwater and aquifer materials. In the Central Basin, manganese ranged from below the detection limit to 1,000 µg/L. In the southern portion of the basin, manganese typically occurs above the Silverado producing zones. In the northern portion of the Central basin, manganese is present in shallow zones, the Silverado Aquifer, and the deeper zones.

In the West Coast Basin, manganese concentrations in nested monitoring wells ranged from below the detection limit up to 1,300 µg/L, tending to be even higher than the Central Basin.

Figure 4.6 presents WY 1999-2000 DHS water quality data for manganese in production wells across the CWCB. The data show a greater number of wells having elevated manganese concentrations compared to those exhibiting elevated iron concentrations. Manganese exceeds the MCL in approximately one-third of the production wells in the Central Basin. In the West Coast Basin, manganese exceeds the MCL in about half of fourteen production wells tested.

4.5 NITRATE

Nitrate concentrations in groundwater are a concern due to a relatively low MCL of 10 mg/L and the widespread introduction of nitrate into groundwater systems by human activities. These activities include nitrate associated with historic agricultural practices such as fertilizing crops and leaching of animal wastes, as well as presence of nitrate in recycled water used for recharge.

Figure 4.7 presents WY 1999-2000 nitrate (as nitrogen) water quality data for nested monitoring wells in the CWCB. In the Central Basin, nitrate (as nitrogen) concentrations ranged from below the detection limit to 5.98 mg/L. Nested monitoring wells in the vicinity of the Montebello Forebay spreading grounds indicate concentrations of nitrate slightly above detection but below the MCL. Rio Hondo #1 and Pico #2 show detectable concentrations of nitrate from the shallowest down to Zones 3 and 1 respectively. These two wells are near the down-gradient end of the Rio Hondo and San Gabriel spreading grounds. South Gate #1 and Downey #1 show detectable concentrations in the middle zones, which are directly down the flow path from the spreading grounds, however deeper zones of nested wells more distant from the spreading grounds have no detectable concentrations of nitrate. The detectable but relatively low concentrations of nitrate at and near the spreading grounds are likely due to the local water and/or recycled water component of recharge at the spreading grounds. Nitrate is also observed in shallow zones at Huntington Park #1, Commerce #1, and Whittier #1. These shallow occurrences of nitrate, away from the spreading grounds, are likely attributed to local surface recharge from former agricultural activities prior to the extensive land development beginning in the 1950s.

In the West Coast Basin nested monitoring wells, nitrate concentrations ranged from below the detection limit to 17.8 mg/L. Concentrations exceeding the nitrate MCL were limited to the shallowest zones of Gardena #1 and Lomita #1, and detections below the MCL in the shallowest zone at Inglewood #1 and Hawthorne #1 nested monitoring wells. These shallow occurrences and other shallow zone occurrences of nitrate where deeper zones are below detection levels are also likely attributable to local surface recharge from former agricultural activities prior to the extensive land development beginning in the 1950s.

Figure 4.8 presents WY 1999-2000 DHS water quality data for nitrate in production wells across the CWCB. The data show only one production well, located in the Los Angeles Forebay exceeded the nitrate MCL in the CWCB during the past WY. Detectable concentrations below the MCL were generally concentrated around and down the groundwater flow path of the San Gabriel River and Rio Hondo Spreading Grounds of the Montebello Forebay and several scattered detections in the northwestern portion of the Central Basin. Three production wells in the West Coast Basin also show detectable nitrate below the MCL.

4.6 HARDNESS

Figure 4.9 presents WY 1999-2000 water quality data for total hardness in WRD nested monitoring wells in the CWCB. As described in Section 2, there is no MCL established for total hardness; rather, hardness is undesirable due to scaling and other undesirable qualities. In the Central Basin total hardness ranged from 8.06 to 1,160 mg/L, while in the West Coast Basin, hardness ranged from 17.4 to 5,180 mg/L. In general, the deeper aquifers in the southern portion of the Central Basin and locally in the West Coast Basin show low total hardness, zones characterized as having older native groundwater. Most other zones in both basins have moderate to high hardness.

Figure 4.10 presents WY 1999-2000 DHS water quality data for total hardness in production wells in the CWCB. Production wells in the West Coast Basin have moderate hardness. Production wells in the southern and western portions of the Central Basin have moderate to high hardness, with the proportion of production wells with high hardness increasing somewhat in the northeast portion of the basin.

4.7 SULFATE

Figure 4.11 presents WY 1999-2000 water quality data for sulfate in WRD nested monitoring wells in the CWCB. In the Central Basin sulfate ranged from below the detection limit to 1,410 mg/L, while in the West Coast Basin sulfate ranged from below the detection limit to 663 mg/L. The data indicate generally lowest sulfate concentrations in most of the deeper zones of the West Coast Basin and southwest portion of the Central Basin. Again, areas characterized as having older native groundwater. The uppermost one or two zones in many of these wells typically show elevated sulfate concentrations, likely due to local surface recharge. In the northeast portion of the Central Basin higher sulfate concentrations are observed in most zones primarily due to the relatively high sulfate in Colorado River water imported for artificial recharge. Only two nested monitoring wells indicated the Silverado Aquifer is impacted by sulfate greater than the MCL. These include the Whittier #1 well, in an area of generally poor water quality, and PM-4 Mariner, which is impacted by the saline plume in the West Coast Basin.

Figure 4.12 presents WY 1999-2000 DHS water quality data for sulfate in production wells in the CWCB. The production well data indicate patterns of sulfate concentrations similar to the deeper zones of WRD nested monitoring wells. Sulfate is generally low in the West Coast Basin and southern portion of the Central Basin, and somewhat higher in the northeastern portion of the Central Basin.

4.8 CHLORIDE

Figure 4.13 presents WY 1999-2000 water quality data for chloride in WRD nested monitoring wells in the CWCB. In the Central Basin, chloride concentrations ranged from 5 to 735 mg/L. The Silverado aquifer zones of the Central Basin nested monitoring wells have low to very low chloride concentrations, all below the MCL of 250 mg/L. In the West Coast Basin, chloride ranged from 16.4 to 5,560 mg/L. Chloride concentrations exceed the MCL in the Silverado aquifer zones in six of the nine West Coast Basin wells, primarily due to seawater intrusion (Wilmington #1 and #2, and PM-4 Mariner), or yet to be identified sources (Chandler 3, Lomita #1, and Inglewood #1).

Figure 4.14 presents WY 1999-2000 DHS water quality data for chloride in production wells in the CWCB. No Central Basin production wells had chloride levels above the MCL. In the southern portion of the Central Basin, chloride concentrations in production wells were generally below 50 mg/L, while in the northeastern portion of the Central Basin, concentrations in most wells were slightly higher, between 50 and 100 mg/L. In the West Coast Basin, available DHS data indicate two production wells, within the area of the saline plume, tested high for chloride at 2,000 to 4,000 mg/L.

4.9 TRICHLOROETHYLENE (TCE)

TCE was detected in four WRD nested monitoring wells in the Central Basin and four in the West Coast Basin (**Figure 4.15**). In the Central Basin, TCE concentrations ranged from below the detection limit to 25 µg/L. Only one well in the Silverado Aquifer, South Gate #1, had TCE detected and it was below the MCL. Three other wells, Huntington Park #1 zones 3 and 4, Commerce #1 Zone 5, and Downey #1 zones 5 and 6, had detections of TCE in zones above the Silverado Aquifer. The detection in Huntington Park #1 Zone 3 was above the MCL.

In the West Coast Basin, TCE concentrations ranged from below the detection limit to 39 µg/L. In the shallowest zones of Inglewood #1 and Hawthorne #1, high TCE concentrations above the MCL were detected. In the shallowest zones at Gardena #1 and PM-3 Madrid, TCE was detected below the MCL. TCE was not detected in the deeper Silverado zones of any nested monitoring wells in the West Coast Basin.

Figure 4.16 presents WY 1999-2000 DHS water quality data for TCE in production wells across the CWCB. The data show 33 production wells with TCE detected. Six of those detection's were above the MCL. All of those testing above the MCL were in or near the Montebello and Los Angeles Forebay areas. In the West Coast Basin TCE was detected below the MCL in one production well sampled during WY 1999-2000.

4.10 TETRACHLOROETHYLENE (PCE)

The PCE distribution pattern is slightly different than the TCE pattern in WRD nested wells. Overall, PCE (**Figure 4.17**) was detected in four nested wells in the Central Basin and two wells in the West Coast Basin. In the Central Basin, PCE ranged from below the detection limit to 12 µg/L. A notable difference with respect to PCE with TCE absent in the Central Basin is well Pico #2, showing PCE detected at 2-4 times the MCL, below the Silverado Aquifer, in the Sunnyside Aquifer. Elsewhere, South Gate #1 shows PCE detected at 1-2 times the MCL in and below the Silverado Aquifer. At Huntington Park #1, PCE was detected below the MCL in zone 3, above the Silverado Aquifer.

In the West Coast Basin PCE concentrations ranged from below the detection limit to 17 μg/L. The Inglewood #1 well shows PCE exceeding the MCL in the shallowest Gage aquifer zone. Gardena #1 had PCE detected below the MCL in the shallowest zone, also the Gage Aquifer.

Figure 4.18 presents WY 1999-2000 DHS water quality data for PCE in production wells across the CWCB. In the Central Basin, PCE was detected in 43 production wells. Seven of the 43 wells exceeded the MCL for PCE. Production wells with PCE are primarily located in or near the Los Angeles and Montebello Forebays and extend out into the middle of the Central Basin. PCE was not detected in any production wells tested in the West Coast Basin during WY 1999-2000.

4.11 SPECIAL INTEREST CONSTITUENTS

At the recommendation of the WRD Pumpers' Task Force, several additional water quality constituents have been studied by WRD to address emerging water quality issues related to hazardous waste contamination, recycled water use in the CWCB, and proposed revisions to water quality regulations. Current special interest constituents include arsenic, hexavalent chromium, MTBE, perchlorate, and radon. The studies have included focused sampling of WRD nested monitoring wells and evaluation of DHS Title 22 Program data for the special interest constituents. The following subsections present the data collected for these constituents.

Arsenic

Arsenic is an element that occurs naturally in the earth's crust. Accordingly, there are natural sources of exposure. These include weathering of rocks and erosion depositing arsenic in water bodies and uptake of the metal by animals and plants. Consumption of food and water are the major sources of arsenic exposure for the majority of U.S. citizens. People may also be exposed from industrial sources, as arsenic is used in semiconductor manufacturing, petroleum refining, wood preservatives, animal feed additives and herbicides. The National Research Council (NRC) of the National Academy of Sciences released its *Report on Arsenic in Drinking Water* in March 1999 and recommended lowering the current drinking water standard of 50 µg/L, which has been in effect since 1943. This recommendation is based on NRC assessments of the risks of skin, lung, and bladder cancer from drinking water containing inorganic arsenic. The report quantified the risks from bladder cancer and describes potential risks of cardiovascular effects.

The Safe Drinking Water Act, as amended in 1996, requires the United States Environmental Protection Agency (EPA) to revise the existing drinking water standard for arsenic. EPA adopted a new arsenic standard in January, 2001. The new standard will be 10 µg/L. Currently, there are objections and challenges to the new standard which is scheduled to be enforced in 3 years. In this report, new standard will be referred to as the pending MCL.

Figure 4.19 presents WY 1999-2000 arsenic water quality data for WRD nested monitoring wells. Arsenic concentrations greater than the pending MCL in the Central Basin were found in the southeastern portion of the Central Basin and at the Pico #2 well. Arsenic concentrations exceeding the pending MCL in the Silverado aquifer zones were found at La Mirada #1 and Cerritos #1 along the eastern District boundary. Arsenic levels exceeding the pending MCL in zones above and below the Silverado were found at Pico #2 and Lakewood #1 respectively. Overall the distribution of arsenic appears similar to the distribution of iron and manganese in the Central Basin with generally lower concentrations near the Forebays and higher concentrations in the distal portions of the basin.

In the West Coast Basin no zones in the Silverado Aquifer had arsenic concentrations above the pending MCL. Only the deepest zone in Gardena #1, below the Silverado Aquifer, had a concentration of arsenic above the pending MCL of 10 µg/L.

Figure 4.20 presents WY 1999-2000 DHS water quality data for arsenic in production wells across the CWCB. Production wells in the southeastern portion of the Central Basin indicate five production wells with arsenic concentrations above the pending MCL. Five other production wells at various locations in the Central Basin have arsenic between 5 and 10 μg/L. Most production wells in the Central Basin have arsenic concentrations below 5 μg/L. Arsenic was not detected in any West Coast Basin production wells during the 1999-2000 WY.

Hexavalent Chromium

Chromium is a metal used in the manufacture of stainless steel, metal plating operations, and other applications. It has the potential to contaminate groundwater from spills and leaking tanks and historic wastewater discharges. It comes in two basic forms: chromium III (trivalent) and chromium VI (hexavalent). Chromium is also a naturally occurring component of many rocks and minerals and low levels of chromium III and chromium VI are expected to be found in groundwater. Currently there is an MCL for total (all forms of) chromium set at 50 μg/L.

Figure 4.21 presents hexavalent chromium water quality data for WRD nested monitoring wells. In the Central Basin most WRD nested monitoring wells were sampled twice for hexavalent chromium since early 1998. Most zones of nested monitoring wells of the CWCB tested below the Preliminary Health Goal (PHG) of 0.2μg/L. However, in one area, the northern portion of the Central Basin, hexavalent chromium was detected from 0.2 to 30 μg/L, all below the current MCL for total chromium. In the Huntington Park #1, Commerce #1, Downey #1, Pico #1, and Whittier #1 wells; hexavalent chromium was detected in zones above the Silverado Aquifer. In South Gate #1, Downey #1, Rio Hondo #2, and Pico #2, hexavalent chromium was detected in zones within and/or below the Silverado Aquifer. In the West Coast Basin, hexavalent chromium was detected below the MCL, in the shallowest zone of Inglewood #1 and Gardena #1.

As new wells are added to the WRD nested monitoring well network, samples will be collected for hexavalent chromium analysis to update these special study results. WRD will report these updates in subsequent regional groundwater monitoring reports. Hexavalent chromium has not typically been sampled for in production wells across the CWCB, and DHS did not report any results during WY 1999-2000. DHS has ordered

California water purveyors to begin hexavalent chromium testing in active drinking water production wells, this data will also be reported in future regional groundwater monitoring reports.

Methyl Tert-Butyl Ether (MTBE)

Methyl tertiary butyl ether (MTBE) is a synthetic chemical added to gasoline to improve air quality as part of the federal Clean Air Act. Limited quantities have been used in gasoline in California since the 1970s. In 1992, refineries began using it extensively in California to meet reformulated gas requirements of the State Air Resources Board. MTBE has been detected in groundwater and surface water sources throughout California. Animal tests have shown it to be carcinogenic. Effective May 17, 2000, a primary MCL of 13 µg/L was established by DHS. Previously, a secondary standard of 5 µg/L was established in response to objectionable taste and odor characteristics. An executive order by Governor Davis bans the use of MTBE by 2003, which should significantly reduce, if not virtually eliminate new discharges.

Figure 4.22 presents WY 1999-2000 MTBE water quality data for WRD nested monitoring wells. MTBE was not detected in any of the WRD nested monitoring wells sampled. **Figure 4.23** presents WY 1999-2000 DHS water quality data for MTBE in production wells across the CWCB. MTBE was not detected in any of the production wells reported.

Perchlorate

Perchlorate (as ammonium perchlorate) is an inorganic chemical used in the production of solid rocket fuel, fireworks, explosive devices, and munitions. It dissolves easily in water, does not biodegrade readily, and adsorbs poorly to the soil. Water supply wells have been contaminated by perchlorate in areas in which such production, or rocket testing, occurred. Perchlorate primarily affects the human thyroid gland's ability to utilize iodine to produce thyroid hormones, which are required for normal body metabolism, as well as growth and development. DHS has established an action level for perchlorate at 18 µg/L. Below 18 µg/L, perchlorate is not thought to pose a health risk to humans. If a public utility detects perchlorate above 18 µg/L, DHS will recommend that the utility remove the contaminated source from service.

Figure 4.24 presents 1998 through 2000 perchlorate water quality data for WRD nested monitoring wells. In the Central Basin, perchlorate was detected at low levels in four nested monitoring wells including Commerce #1 Zone 6, Downey #1 Zones 2 and 3, South Gate #1 Zone 3, and Huntington Park #1 Zones 3 and 4. These perchlorate concentrations occur in relatively deep aquifers (Silverado in Downey #1 and below the Silverado in South Gate #1) in the Central Basin Pressure Area. At Huntington Park #1, detections of perchlorate were found somewhat shallower in the Gage and Exposition Aquifers. The source of the perchlorate in the aquifers is unknown at this time. None of the detected concentrations were above the State Action Level (SAL) in any of the WRD wells sampled.

In the West Coast Basin, perchlorate was detected at low levels in the shallowest zone of Gardena #1, Lomita #1, and Chandler #3. The source of the perchlorate in the aquifers is unknown at this time. None of the detected concentrations were above the SAL in any of the WRD wells sampled.

Figure 4.25 presents WY 1999-2000 DHS water quality data for perchlorate in production wells across the CWCB. Perchlorate was detected below the SAL in four Central Basin production wells. In the West Coast Basin, no perchlorate was detected in production wells.

Radon

Radon occurs naturally as a radioactive gas that may be found in drinking water and indoor air. Some people who are exposed to radon may have an increased cancer risk during their lifetime. Currently, there is no drinking water standard for radon. As required by the Safe Drinking Water Act, the EPA released a proposed regulation in November 1999 to reduce radon in drinking water. The proposed regulation has a multimedia mitigation option to reduce radon in indoor air.

The proposed standards would apply to community water systems that use ground water or mixed ground and surface water (e.g., systems serving homes, apartments, and trailer parks). The proposal will provide states flexibility in how to limit exposure to radon by allowing them to focus their efforts on the greatest radon risks, those in indoor air, while also reducing the risks from radon in drinking water. The proposed regulation provides two options to states and water systems to reduce exposure to radon.

- First Option: States can choose to develop enhanced state programs to address the health risks from radon in indoor air, known as Multimedia Mitigation (MMM) programs, while individual water systems reduce radon levels in drinking water to 4,000 picoCuries/liter (pCi/L) or lower. EPA is encouraging states to adopt this option because it is the most cost-effective way to achieve the greatest radon risk reduction.
- Second Option: If a state chooses not to develop an MMM program, individual water systems in that state would be required to either reduce radon in their system's drinking water to 300 pCi/L or develop individual local MMM programs and reduce levels in drinking water to 4000 pCi/L. Water systems already at or below 300 pCi/L standard would not be required to treat their water for radon.

The final rule is pending.

Figure 4.26 presents 1998 through 2000 radon water quality data for WRD nested monitoring wells in the CWCB. In the Central Basin, radon was detected above 300 pCi/L in one or more zones in six of the sixteen WRD nested monitoring wells sampled. Radon concentrations exceeded the proposed MCL in the Silverado Aquifer at Huntington Park #1, Rio Hondo #1 , and Pico #1.

In the West Coast Basin, radon was detected in four of ten nested monitoring wells tested. In the Silverado Aquifer, only Inglewood #1 Zone 3 had a radon concentration above the proposed MCL. As new wells are added to the WRD nested monitoring well network, samples will be collected for radon analysis to update these results. WRD will report these updates in subsequent Annual Regional Groundwater Monitoring Reports.

Figure 4.27 presents WY 1999-2000 DHS water quality data for radon in production wells across the CWCB. In the Central Basin 136 production wells were tested for Radon and 20 wells had radon concentrations greater than the proposed MCL. Central Basin production wells with concentrations of radon above 300 pCi/L tended to be clustered in four separate areas. Clusters are seen in the Los Angeles Forebay, Montebello Forebay, and two separate areas in the southern portion of the Central Basin. In the West Coast basin, only two out of 17 production wells exceeded 300 pCi/L. WRD will continue to study the occurrence and distribution of radon in the basins in an effort to understand the behavior of this emerging water quality constituent of interest.

SECTION 5
SUMMARY OF FINDINGS

This Annual Groundwater Monitoring Report was prepared by WRD to report on the groundwater conditions in the CWCB during the WY 1999-2000. A summary of findings is presented below.

- Artificial replenishment activities combined with natural replenishment and controlled pumping have ensured a sustainable, reliable supply of groundwater in the CWCB. Artificial replenishment water sources used by WRD include imported water from the Metropolitan Water District of Southern California, recycled water from the County Sanitation Districts of Los Angeles County, recycled water with advanced treatment from West Basin MWD, and In-Lieu replenishment water.
- At the Montebello Forebay, 45,037 AF of imported water was purchased for replenishment during WY 1999-2000. In spite of a below-normal precipitation year, water levels in the Montebello Forebay did not decrease significantly in the CWCB. A total of 43,142 AF of recycled water was purchased for spreading in the Montebello Forebay. A total of 22,919 AF of imported water was purchased for injection to the seawater barriers. A total of 7,460 AF of recycled water was purchased for injection into the West Coast Basin Barrier Project. In-Lieu replenishment water totaled 22,278 AF for Fiscal Year 1999-2000. Total artificial replenishment was 140,836 AF for WY 1999-2000
- Groundwater production in the CWCB was 251,525 AF for Water Year 1999-2000. This amount is less than the adjudicated amount of 281,835 AF, partly due to the success of WRD's In-Lieu Replenishment Program, which provides incentives to pumpers for not pumping in areas that are difficult to recharge by other means.
- The WRD nested monitoring wells show clear, significant differences in groundwater elevations between the various aquifers screened. The head differences in the WRD nested monitoring wells reflect both hydrogeologic and pumping conditions in the CWCB. Vertical head differences between 1 and 90 feet occur between zones above

and within the producing zones. The greatest head differences tend to occur in the pumping holes of the Central and West Coast Basin Pressure Areas, while the smallest differences occur in the Montebello Forebay recharge area, and the Torrance area which has thick, merged aquifers.

- Basinwide hydrographs and groundwater elevations measured in nested monitoring wells and key production wells indicate an insignificant decline in water levels in the CWCB during WY 1999-2000. On average, water levels dropped about one foot during WY 1999-2000. The change in groundwater storage for the CWCB was calculated at a loss in storage of approximately 300 AF from the Silverado Aquifer.
- The water quality associated with key constituents in untreated imported water used at the Montebello Forebay spreading grounds remains good. Average TDS, hardness, iron and manganese concentrations in both Colorado River and State Project Water remain below their respective MCLs. Meanwhile, TCE and PCE have not been detected in either water source.
- The water quality associated with key constituents in recycled water used at the Montebello Forebay spreading grounds also remains excellent and is carefully monitored and controlled to show little variation over time.
- Stormwater samples are occasionally collected and analyzed for a few water quality parameters. Samples collected between 1998 and 2000 show that average stormwater TDS concentrations and hardness are lower than most other sources of replenishment water.
- Based on the data obtained from the WRD nested monitoring wells during WY 1999-2000, the water quality associated with key constituents in groundwater differs both vertically between aquifers and horizontally (areally) across the CWCB.
- TDS concentrations for WRD wells located in the Central Basin are relatively low, while TDS concentrations for WRD wells located in the West Coast Basin are elevated in portions of the basin, primarily the Torrance and Dominguez Gap areas. The elevated TDS concentrations may be caused by seawater intrusion or connate brines, or possibly oil field brines. During this reporting period, concentrations in the Central Basin ranged from 160 mg/L to 2,020 mg/L, and in the West Coast Basin 200 mg/L to 9,200 mg/L. The District is conducting further studies with the USGS to

identify the sources of high TDS.

- Iron concentrations continue to be problem in portions of the CWCB. During this reporting period, concentrations in the Central Basin ranged from ND to 0.55 mg/L, and in the West Coast Basin ND to 1.2 mg/L The MCL for iron is 0.3 mg/L. Sources of the localized high iron concentrations have yet to be identified.
- Similar to the iron concentrations, manganese concentrations exceed the MCL (50 µg/L) in a large number of nested monitoring wells and production wells across the CWCB. During this reporting period, concentrations in the Central Basin ranged from ND to 1,000 µg/L, and in the West Coast Basin ND to 1,300 µg/L. Similar to iron, sources of the localized high manganese concentrations have yet to be identified.
- Nitrate (as nitrogen) concentrations in WRD nested monitoring wells in the Central Basin ranged from ND to 5.98 mg/L, and in the West Coast Basin ND to 17.8 mg/L. Concentrations approaching or exceeding the 10 mg/L MCL tend to be limited to the uppermost zone at a particular nested well, and likely due to localized infiltration and leaching rather than artificial recharge activities. No concentrations above the MCL were observed in the Silverado Aquifer. DHS data indicated no CWCB production wells tested for nitrate above the MCL during WY 1999-2000.
- TCE was not detected in the Silverado Aquifer in the WRD wells sampled, with the exception of Huntington Park #1. During this reporting period, concentrations in the Central Basin ranged from ND to 25 µg/L, and in the West Coast Basin from ND to 39 µg/L. DHS data indicate that TCE was detected in 33 production wells in the Central Basin during WY 1999-2000. Six out of the 33 detection's exceed the MCL for TCE. In the West Coast Basin, TCE was detected below the MCL in one production well.
- PCE was detected in four WRD nested monitoring wells in the Central Basin and one well in the West Coast Basin. PCE was not detected in the Silverado Aquifer in the WRD wells sampled, with the exception of South Gate #1. During this reporting period, concentrations in the Central Basin ranged from ND to 12 µg/L, and in the West Coast Basin from ND to 17 µg/L. DHS data indicate that PCE was detected in 43 production wells in the Central Basin during WY 1999-2000. Seven out of the 43 detection's exceed the MCL for PCE. PCE was not detected in any West Coast Basin

production wells.

- EPA has adopted a new arsenic standard for drinking water, decreasing the former MCL of 50 µg/L to a pending MCL of 10 µg/L. Enforcement of the pending MCL is scheduled to begin in 3 years. WRD nested monitoring wells indicated Arsenic concentrations in the southeast portion of the Central Basin exceed the pending MCL. During WY 1999-2000, five production wells, all in the southeast portion of the Central Basin, had arsenic concentrations exceeding the pending MCL of 10 µg/L, and five additional production wells, at various locations around the Central Basin, had arsenic concentrations between 5 and 10 µg/L.
- Hexavalent chromium has been detected below the MCL in WRD nested monitoring wells in and near the Montebello and Los Angeles Forebay areas. Some of the detections are in the deep aquifers including the Silverado and Sunnyside aquifers. DHS did not report any data for hexavalent chromium production wells during WY 1999-2000. DHS has ordered purveyors to test for hexavalent chromium. WRD will report these data in future reports.
- MTBE has not been detected in any of WRDs nested monitoring wells and was not reported by DHS to have been detected in any production wells in the CWCB.
- Perchlorate was detected at levels below the State Action Level locally in several WRD nested monitoring wells and production wells. The presence of low levels of perchlorate appear to be isolated to localized areas.
- Radon concentrations for WRD nested monitoring wells in the CWCB ranged from 54 to 1,700 pCi/L. If California and/or local municipalities adopt a (Multimedia Mitigation (MMM) approach to regulating radon, the concentrations reported will likely fall below the proposed regulatory limit of 4000 pCi/L. However, if the MMM is not adopted and implemented locally, groundwater exceeding pCi/L would require treatment to meet a proposed 300 pCi/L standard.
- As represented by these data, groundwater in the CWCB is of generally good quality and is suitable for continued use by the pumpers in the District, the stakeholders, and the public.

SECTION 6
FUTURE ACTIVITIES

WRD will continue to update and augment its Regional Groundwater Monitoring Program to best serve the needs of the District, the pumpers and the public. Some of the activities planned under this program for the WY 2000/2001 are listed below.

- Based on the success of the In-Lieu Replenishment Program at reducing pumping in the CWCB, WRD intends to continue and look to increase this program as a management tool for replenishment.
- Because recycled water is a relatively low-cost, replenishment water source, WRD will continue to maximize recycled water use at the Montebello Forebay spreading grounds without exceeding regulatory limits.
- WRD will continue to maximize recycled water use at the West Coast Basin barrier, and intends to use recycled water at the Dominguez Gap and Alamitos barriers in the near future.
- WRD will continue to monitor the quality of all replenishment water sources to ensure the CWCB are being recharged with high-quality water.
- Total injection quantities at all three seawater intrusion barriers are expected to increase over the next several years as additional barrier wells are constructed to further combat seawater intrusion. WRD will work with the pumpers over the next year to find solutions to reduce the injection water demands and/or high costs. Basin management alternatives will be explored to help find these solutions.
- WRD will install eight additional nested monitoring wells in key areas throughout the CWCB in upcoming years to continue refining the regional understanding of groundwater occurrence, movement, and quality. Water levels will be recorded using automatic dataloggers to monitor groundwater elevation differences throughout the year.
- WRD will continue to sample groundwater from nested monitoring wells, and analyze the samples for general water quality constituents. In addition, we will

continue to focus on constituents of interest to WRD and the pumpers such as TCE, PCE, arsenic, hexavalent chromium, MTBE, perchlorate, and radon.

- WRD will continue to use the data generated by this Regional Groundwater Monitoring Program to address current and upcoming issues related to water quality and groundwater replenishment in the Central and West Coast Basins.

SECTION 7
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TABLES

TABLE 1.1
CONSTRUCTION INFORMATION FOR WRD NESTED MONITORING WELLS

Well Name	Zone	WRD ID Number	Depth of Well (feet)	Top of Perforation (feet)	Bottom of Perforation (feet)	Aquifer Designation
Carson #1	1	100030	1010	990	1010	Sunnyside
	2	100031	760	740	760	Silverado
	3	100032	480	460	480	Lynwood
	4	100033	270	250	270	Gage
Cerritos #1	1	100870	1215	1155	1175	Sunnyside
	2	100871	1020	1000	1020	Sunnyside
	3	100872	630	610	630	Silverado
	4	100873	290	270	290	Hollydale
	5	100874	200	180	200	Gage
	6	100875	135	125	135	Artesia
Chandler #3b	1	100082	363	341	363	Gage/Lynwood/Silverado
Chandler #3a	2	100083	192	165	192	Gage/Lynwood/Silverado
Commerce #1	1	100881	1390	1330	1390	Pico Formation
	2	100882	960	940	960	Sunnyside
	3	100883	780	760	780	Sunnyside
	4	100884	590	570	590	Silverado
	5	100885	345	325	345	Hollydale
	6	100886	225	205	225	Exposition/Gage
Downey #1	1	100010	1190	1170	1190	Sunnyside
	2	100011	960	940	960	Silverado
	3	100012	600	580	600	Silverado
	4	100013	390	370	390	Hollydale/Jefferson
	5	100014	270	250	270	Exposition
	6	100015	110	90	110	Gaspur
Gardena #1	1	100020	990	970	990	Sunnyside
	2	100021	465	445	465	Silverado
	3	100022	365	345	365	Lynwood
	4	100023	140	120	140	Gage
Hawthorne #1	1	100887	990	910	950	Pico Formation
	2	100888	730	710	730	Lower San Pedro/Sunnyside
	3	100889	540	520	540	Lower San Pedro/Sunnyside
	4	100890	420	400	420	Silverado
	5	100891	260	240	260	Lynwood
	6	100892	130	110	130	Gage
Huntington Park #1	1	100005	910	890	910	Silverado
	2	100006	710	690	710	Jefferson
	3	100007	440	420	440	Gage
	4	100008	295	275	295	Exposition
	5	100009	134	114	134	Gaspur
Inglewood #1	1	100091	1400	1380	1400	Pico Formation
	2	100092	Abandoned Well			
	3	100093	450	430	450	Silverado
	4	100094	300	280	300	Lynwood
	5	100095	170	150	170	Gage
Inglewood #2	1	100824	860	800	840	Pico Formation
	2	100825	470	450	470	Pico Formation
	3	100826	350	330	350	Silverado
	4	100827	245	225	245	Lynwood

TABLE 1.1
CONSTRUCTION INFORMATION FOR WRD NESTED MONITORING WELLS

Well Name	Zone	WRD ID Number	Depth of Well (feet)	Top of Perforation (feet)	Bottom of Perforation (feet)	Aquifer Designation
Lakewood #1	1	100024	1009	989	1009	Sunnyside
	2	100025	660	640	660	Silverado
	3	100026	470	450	470	Lynwood
	4	100027	300	280	300	Hollydale
	5	100028	160	140	160	Artesia
	6	100029	90	70	90	semi-perched
La Mirada #1	1	100876	1150	1130	1150	Sunnyside
	2	100877	985	965	985	Silverado
	3	100878	710	690	710	Lynwood
	4	100879	490	470	490	Jefferson
	5	100880	245	225	245	Gage
Lomita #1	1	100818	1340	1240	1260	Lower San Pedro
	2	100819	720	700	720	Silverado
	3	100820	570	550	570	Silverado
	4	100821	420	400	420	Silverado
	5	100822	240	220	240	Gage
	6	100823	120	100	120	Gage
Long Beach #1	1	100920	1470	1430	1450	Sunnyside
	2	100921	1250	1230	1250	Sunnyside
	3	100922	990	970	990	Silverado
	4	100923	619	599	619	Lynwood
	5	100924	420	400	420	Gage
	6	100925	175	155	175	Artesia
Long Beach #2	1	101740	1090	970	990	Pico Formation
	2	101741	740	720	740	Sunnyside
	3	101742	470	450	470	Silverado
	4	101743	300	280	300	Lynwood
	5	101744	180	160	180	Gage
	6	101745	115	95	115	Gaspur
Long Beach #3	1	101751	1390	1350	1390	Lower San Pedro
	2	101752	1017	997	1017	Silverado
	3	101753	690	670	690	Silverado
	4	101754	550	530	550	Silverado
	5	101755	430	410	430	Lynwood
Los Angeles #1	1	100926	1370	1350	1370	Pico Formation
	2	100927	1100	1080	1100	Sunnyside
	3	100928	940	920	940	Silverado
	4	100929	660	640	660	Lynwood
	5	100930	370	350	370	Gage
Pico #1	1	100001	900	860	900	Pico Formation
	2	100002	480	460	480	Silverado
	3	100003	400	380	400	Silverado
	4	100004	190	170	190	Jefferson
Pico #2	1	100085	1200	1180	1200	Sunnyside
	2	100086	850	830	850	Sunnyside
	3	100087	580	560	580	Sunnyside
	4	100088	340	320	340	Silverado
	5	100089	255	235	255	Lynwood
	6	100090	120	100	120	Gaspur

TABLE 1.1
CONSTRUCTION INFORMATION FOR WRD NESTED MONITORING WELLS

Well Name	Zone	WRD ID Number	Depth of Well (feet)	Top of Perforation (feet)	Bottom of Perforation (feet)	Aquifer Designation
PM-1 Columbia	1	100042	600	555	595	Lower San Pedro
	2	100043	505	460	500	Silverado
	3	100044	285	240	280	Lynwood
	4	100045	205	160	200	Gage
PM-3 Madrid	1	100034	685	640	680	Lower San Pedro
	2	100035	525	480	520	Silverado
	3	100036	285	240	280	Lynwood
	4	100037	190	145	185	Gage
PM-4 Mariner	1	100038	715	670	710	Lower San Pedro
	2	100039	545	500	540	Silverado
	3	100040	385	340	380	Lynwood
	4	100041	245	200	240	Gage
Rio Hondo #1	1	100064	1150	1110	1130	Sunnyside
	2	100065	930	910	930	Sunnyside
	3	100066	730	710	730	Sunnyside
	4	100067	450	430	450	Silverado
	5	100068	300	280	300	Lynwood
	6	100069	160	140	160	Gardena
Santa Fe Springs #1	1	100096	1410	1290	1310	Pico Formation
	2	100097	845	825	845	Sunnyside
	3	100098	560	540	560	Sunnyside
	4	100099	285	265	285	Silverado
	5	100100	Abandoned Well			
South Gate #1	1	100893	1460	1440	1460	Sunnyside
	2	100894	1340	1320	1340	Sunnyside
	3	100895	930	910	930	Sunnyside
	4	100896	585	565	585	Lynwood/Silverado
	5	100897	250	220	240	Exposition
Whittier #1	1	101735	1298	1180	1200	Pico Formation
	2	101736	940	920	940	Sunnyside
	3	101737	620	600	620	Silverado
	4	101738	470	450	470	Jefferson
	5	101739	220	200	220	Gage
Willowbrook #1	1	100016	905	885	905	Pico Formation
	2	100017	520	500	520	Silverado
	3	100018	380	360	380	Lynwood
	4	100019	220	200	220	Gage
Wilmington #1	1	100070	1040	915	935	Lower San Pedro
	2	100071	800	780	800	Silverado
	3	100072	570	550	570	Silverado
	4	100073	245	225	245	Lynwood
	5	100074	140	120	140	Gage
Wilmington #2	1	100075	1030	950	970	Lower San Pedro
	2	100076	775	755	775	Silverado
	3	100077	560	540	560	Silverado
	4	100078	410	390	410	Lynwood
	5	100079	140	120	140	Gage

TABLE 2.1
SUMMARY OF SPREADING OPERATIONS AT MONTEBELLO FOREBAY

(Acre-feet)

Water Year	Rio Hondo (includesSpreading Grounds & Whittier Narrows Reservoir)				San Gabriel (includes unlined river and Spreading Grounds)				Total Recharge			
	Imported	Recycled	Local	Total	Imported	Recycled	Local	Total	Imported	Recycled	Local	Total
1963/64	44,366	4,758	6,013	55,137	40,150	4,145	3,979	48,274	84,516	8,903	9,992	103,411
1964/65	64,344	2,501	8,616	75,461	69,995	4,867	4,481	79,343	134,339	7,368	13,097	154,804
1965/66	62,067	9,984	31,317	103,368	32,125	3,129	14,433	49,687	94,192	13,113	45,750	153,055
1966/67	46,322	14,117	37,428	97,867	20,813	2,106	22,392	45,311	67,135	16,223	59,820	143,178
1967/68	65,925	16,299	27,885	110,109	12,402	1,975	11,875	26,252	78,327	18,274	39,760	136,361
1968/69	13,018	6,105	69,055	88,178	4,895	7,772	50,106	62,773	17,913	13,877	119,161	150,951
1969/70	25,474	13,475	24,669	63,618	35,164	3,683	28,247	67,094	60,638	17,158	52,916	130,712
1970/71	41,913	11,112	24,384	77,409	21,211	8,367	21,735	51,313	63,124	19,479	46,119	128,722
1971/72	15,413	12,584	10,962	38,959	14,077	4,959	6,218	25,254	29,490	17,543	17,180	64,213
1972/73	47,712	12,238	33,061	93,011	32,823	9,767	12,016	54,606	80,535	22,005	45,077	147,617
1973/74	40,593	9,574	18,421	68,588	34,271	10,516	8,544	53,331	74,864	20,090	26,965	121,919
1974/75	29,173	11,359	16,542	57,075	32,974	8,084	10,360	51,418	62,147	19,443	26,902	108,493
1975/76	14,783	8,371	10,503	33,657	19,611	10,297	7,763	37,671	34,394	18,668	18,266	71,328
1976/77	11,349	3,195	7,753	22,297	2,548	15,707	5,165	23,420	13,897	18,902	12,918	45,717
1977/78	19,112	7,424	53,086	79,622	11,249	9,938	74,967	96,154	30,361	17,362	128,053	175,776
1978/79	27,486	6,233	36,659	70,377	15,143	14,367	17,250	46,760	42,629	20,600	53,909	117,137
1979/80	11,229	8,082	54,416	73,726	6,602	14,549	39,753	60,904	17,831	22,631	94,169	134,630
1980/81	43,040	9,177	38,363	90,581	13,823	16,283	8,860	38,966	56,863	25,460	47,223	129,547
1981/82	19,299	9,667	37,730	66,696	11,239	19,143	8,283	38,665	30,538	28,810	46,013	105,361
1982/83	3,203	7,512	89,153	99,868	5,975	9,419	36,893	52,287	9,178	16,931	126,046	152,155
1983/84	18,815	9,647	38,395	66,857	912	17,371	18,667	36,950	19,727	27,018	57,062	103,807
1984/85	33,364	7,848	23,614	64,826	3,879	12,930	10,620	27,429	37,243	20,778	34,234	92,255
1985/86	8,128	9,234	51,913	69,275	10,927	16,806	13,045	40,778	19,055	26,040	64,958	110,053
1986/87	-	12,234			64,575	87,921			64,575	100,155	16,700	181,431
1987/88	16,105	12,560	22,508	51,173	6,529	24,678	22,125	53,332	22,634	37,238	44,633	104,505
1988/89	-	26,568			63,216	25,981			63,216	52,548	24,200	139,964
1989/90	7,079	25,629			72,196	24,560			79,275	50,188	26,400	155,864
1990/91	33,320	20,927			34,215	33,045			67,536	53,972	18,300	139,808
1991/92	28,695	19,156			58,381	28,679			87,077	47,835	71,000	205,911
1992/93	4,306	18,526			26,596	32,041			30,902	50,567	107,700	189,169
1993/94	7,599	26,654			25,893	27,361			33,492	54,015	36,800	124,307
1994/95	3,827	16,397			25,227	22,861			29,054	39,258	92,100	160,411
1995/96	12,304	24,154	41,514	77,972	3,899	26,502	13,709	44,110	16,203	50,656	55,223	122,082
1996/97	12,652	17,899	33,658	64,209	4,732	28,085	17,715	50,532	17,384	45,984	51,373	114,741
1997/98	889	14,984	52,958	68,831	-	19,594	32,580	52,174	889	34,578	85,538	121,005
1998/99	-	23,102	14,840	37,942	-	18,099	11,990	30,089	-	41,201	26,830	68,031
1999/00	43,441	16,093	5,700	65,234	1,596	27,049	15,036	43,681	45,037	43,142	20,736	108,915

Notes:

1) These amounts may differ from those shown in WRD's Annual Engineering Survey and Report. The ESR reflects only water that WRD purchased for replenishment. However, some of this water may percolate or evaporate in San Gabriel Valley before it reaches the spreading grounds. Other entities such as LACDPW or the Main San Gabriel Basin Watermaster may also purchase replenishment water that is spread and accounted for in the above table. Reclaimed water is also provided by the Pomona treatment plant and is not paid for by WRD. This table reflects water which was actually conserved in the spreading grounds as reported by LACDPW. The Rio Hondo System includes the Rio Hondo spreading grounds and water conserved behind the Whittier Narrows Reservoir.

2) Data from shaded areas was not available from LACDPW detailing the relative amounts of water spread in the Rio Hondo and San Gabriel River Spreading Grounds, only total central basin recharge volumes could be reported (Source: Annual Reports on Results of Water Quality Monitoring). Corresponding local water rechage volumes were calculated by subtracting corresponding imported and reclaimed water from the total volume.

TABLE 2.2
HISTORICAL QUANTITIES OF ARTIFICIAL REPLENISHMENT WATER AT SESAWATER INTRUSION BARRIERS

(Acre-feet)

WATER YEAR	WEST COAST BASIN BARRIER			DOMINGUEZ GAP BARRIER	ALAMITOS BARRIER (a)			TOTAL
	Imported	Recycled	Total		WRD	OCWD	Total	
1952/53	1,140		1,140					1,140
1953/54	3,290		3,290					3,290
1954/55	2,740		2,740					2,740
1955/56	2,840		2,840					2,840
1956/57	3,590		3,590					3,590
1957/58	4,330		4,330					4,330
1958/59	3,700		3,700					3,700
1959/60	3,800		3,800					3,800
1960/61	4,480		4,480					4,480
1961/62	4,510		4,510					4,510
1962/63	4,200		4,200					4,200
1963/64	10,450		10,450					10,450
1964/65	33,020		33,020		2,760	200	2,960	35,980
1965/66	44,390		44,390		3,370	350	3,720	48,110
1966/67	43,060		43,060		3,390	490	3,880	46,940
1967/68	39,580		39,580		4,210	740	4,950	44,530
1968/69	36,420		36,420		4,310	950	5,260	41,680
1969/70	29,460		29,460		3,760	720	4,480	33,940
1970/71	29,870		29,870	2,200	3,310	820	4,130	36,200
1971/72	26,490		26,490	9,550	4,060	930	4,990	41,030
1972/73	28,150		28,150	8,470	4,300	880	5,180	41,800
1973/74	27,540		27,540	7,830	6,140	1,150	7,290	42,660
1974/75	26,430		26,430	5,160	4,440	720	5,160	36,750
1975/76	35,220		35,220	4,940	4,090	570	4,660	44,820
1976/77	34,260		34,260	9,280	4,890	880	5,770	49,310
1977/78	29,640		29,640	5,740	4,020	830	4,850	40,230
1978/79	23,720		23,720	5,660	4,220	900	5,120	34,500
1979/80	28,630		28,630	4,470	3,560	580	4,140	37,240
1980/81	26,350		26,350	3,550	3,940	530	4,470	34,370
1981/82	24,640		24,640	4,720	4,540	390	4,930	34,290
1982/83	33,950		33,950	6,020	3,270	1,940	5,210	45,180
1983/84	28,000		28,000	7,640	2,440	1,400	3,840	39,480
1984/85	25,210		25,210	7,470	3,400	1,450	4,850	37,530
1985/86	20,260		20,260	6,160	3,410	1,860	5,270	31,690
1986/87	26,030		26,030	6,230	4,170	2,750	6,920	39,180
1987/88	24,270		24,270	7,050	3,990	2,170	6,160	37,480
1988/89	22,740		22,740	5,220	3,900	1,680	5,580	33,540
1989/90	20,279		20,279	5,736	4,110	2,000	6,110	32,125
1990/91	16,039		16,039	7,756	4,096	1,818	5,914	29,709
1991/92	22,180		22,180	6,894	4,172	1,553	5,725	34,799
1992/93	21,516		21,516	4,910	3,350	1,567	4,917	31,343
1993/94	15,482		15,482	5,524	2,794	1,309	4,103	25,109
1994/95	14,237	1,480	15,717	4,989	2,883	889	3,772	24,478
1995/96	12,426	4,170	16,596	5,107	3,760	2,010	5,770	27,473
1996/97	11,372	6,241	17,613	5,886	3,854	1,751	5,605	29,103
1997/98	8,173	8,306	16,479	3,771	3,677	1,503	5,180	25,430
1998/99	10,125	6,973	17,098	4,483	4,012	1,689	5,701	27,282
1999/2000	11,172	7,460	18,632	6,010	4,028	1,709	5,737	30,379

(a) Alamitos Barrier Water is purchased by WRD on the Los Angeles County side of the barriers, and by Orange County Water District on the Orange County side.

TABLE 2.3
WATER QUALITY OF REPLENISHMENT WATER, WATER YEAR 1999-2000

Constituent	Units	Treated Colorado River/State Project Water[a] 2000[d]	Untreated Colorado River Water[b] 1999-2000[e]	Untreated State Project Water[b] 1999-2000[e]	West Basin MWD WRP[c] 1999[f]	Whittier Narrows WRP[b] 1999-2000[g]	San Jose Creek East WRP[b] 1999-2000[g]	San Jose Creek West WRP[b] 1999-2000[g]	Pomona WRP[b] 1999-2000[g]	Stormwater[h] 1998-2000[h]
Total Dissolved Solids (TDS)	mg/L	727	564	288	113	542	581	550	539	365
Hardness	mg/L	209	284	136	44	196	220	217	213	183
Sulfate	mg/L	150	224	62	3	97	106	82.2	67	86
Chloride	mg/L	67	69	59	27	96	129	105	128	59
Nitrogen (Nitrate as N)	mg/L	0.35	0.23	0.20	1.0	6.53	2.44	3.66	2.08	2
Iron	mg/L	<0.05	<0.05	<0.05	<0.1	<0.05	0.1	<0.10	<0.06	0.451
Manganese	ug/L	<5	<5	<5	<30	10	40	8	<10	141
Trichloroethylene (TCE)	ug/L	ND	<0.2	<0.2	<0.3	<0.3	<0.4	<0.3	<0.3	NA
Tetrachloroethylene (PCE)	ug/L	ND	<0.2	<0.2	<0.3	<0.3	<0.9	<0.4	<0.4	NA

Notes:

a = Used at the seawater intrusion barriers

b = Used at the Montebello Forebay spreading grounds

c = Used at the West Coast Basin Barrier

d = Average concentration data from Metropolitan Water District of Southern California (MWD), for calendar year

e = Average concentration data from MWD, for fiscal year July-June

f = Average concentration data from West Basin Municipal Water District (West Basin MWD), for calendar year

g = Average concentration data from County Sanitation Districts of Los Angeles County (CSDLAC), for water year October-September

h = Average concentration data from LACDPW, for samples collected from San Gabriel River late 1998-2000

Sources of data:
MWD draft data for 1999-2000
Montebello Forebay Groundwater Recharge annual report (CSDLAC, 2000)
West Basin Water Recycling Facility Annual Report (West Basin MWD, 1999)

TABLE 3.1
HISTORICAL AMOUNTS OF GROUNDWATER PRODUCTION
(Acre-feet)

WATER YEAR	CENTRAL BASIN	WEST COAST BASIN	TOTAL
1960-61	292,500	61,900	354,400
1961-62	275,800	59,100	334,900
1962-63	225,400	59,100	284,500
1963-64	219,100	61,300	280,400
1964-65	211,600	59,800	271,400
1965-66	222,800	60,800	283,600
1966-67	206,700	62,300	269,000
1967-68	220,100	61,600	281,700
1968-69	213,800	61,600	275,400
1969-70	222,200	62,600	284,800
1970-71	211,600	60,900	272,500
1971-72	216,100	64,800	280,900
1972-73	205,600	60,300	265,900
1973-74	211,300	55,000	266,300
1974-75	213,100	56,700	269,800
1975-76	215,300	59,400	274,700
1976-77	211,500	59,800	271,300
1977-78	196,600	58,300	254,900
1978-79	207,000	58,000	265,000
1979-80	209,500	57,100	266,600
1980-81	211,915	57,711	269,626
1981-82	202,587	61,874	264,461
1982-83	194,548	57,542	252,090
1983-84	196,660	51,930	248,590
1984-85	193,085	52,746	245,831
1985-86	195,889	52,762	248,650
1986-87	196,587	48,026	244,613
1987-88	194,561	43,833	238,394
1988-89	200,105	44,162	244,267
1989-90	197,811	47,904	245,715
1990-91	186,977	53,075	240,052
1991-92	196,382	55,964	252,346
1992-93	150,386	40,058	190,444
1993-94	156,930	41,768	198,697
1994-95	181,164	41,396	222,560
1995-96	182,067	52,759	234,826
1996-97	187,452	52,581	240,033
1997-98	188,988	51,841	240,829
1998-99	204,418	51,331	255,749
1999-00	197,946	53,579	251,525

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 1999-2000
WRD NESTED MONITORING WELLS

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Carson #1						Reference Point Elevation: 24.16
Depth of Well	990-1010	740-760	460-480	250-270		
Aquifer Name Name	Sunnyside	Silverado	Lynwood	Gage		
10/4/99	-75.88	-74.23	-27.33	-24.64		
1/6/00	-79.63	-76.94	-27.5	-24.85		
4/3/00	-76.35	-73.73	-26.9	-24.38		
4/25/00	-76.21	-73.31	-26.74	-24.31		
5/17/00	-74.76	-72.07	-26.51	-24.05		
7/5/00	-75.17	-72.27	-26.34	-23.85		
8/7/00	-66.42	-64.47	-25.71	-23.46		
9/27/00	-73.16	-70.75	-26.03	-23.61		
Cerritos #1						Reference Point Elevation: 40.72
Depth of Well	1155-1175	1000-1020	610-630	270-290	180-200	125-135
Aquifer Name	Sunnyside	Sunnyside	Silverado	Hollydale	Gage	Artesia
10/4/99	-53.23	-54.57	-53.98	8.83	15.24	15.24
10/25/99	-48.41	-46.19	-49.73	9.15	15.4	15.4
1/6/00	-31.23	-29.01	-32.2	13.79	18.75	18.74
2/11/00	-28.02	-28.32	-27.95	14.89	19.73	19.71
4/3/00	-26.82	-25.5	-31.21	15.83	20.73	20.72
7/20/00	-48.27	-50.46	-52.61	9.06	14.94	14.91
9/27/00	-51.53	-52.54	-54.64	8.08	14.4	14.41
Chandler #3						Reference Point Elevation: 153.2
Depth of Well	341-363	165-192				
Aquifer Name	Gage/Lynwood/ Silverado	Gage/Lynwood/ Silverado				
10/4/99						
10/7/99	-27.53	-27.25				
2/9/00	-27.69	-27.47				
4/4/00	-27.16	-27.03				
8/2/00	-26.73	-26.63				
9/27/00	-26.73	-26.61				
Commerce #1						Reference Point Elevation: 170.09
Depth of Well	1330-1390	940-960	760-780	570-590	325-345	205-225
Aquifer Name	Pico	Sunnyside	Sunnyside	Silverado	Hollydale	Exposition/Gage
10/4/99	63.72	61.16	57.44	29.75	37.03	59.55
11/2/99	63.14	61.36	58.65	35.38	43.51	60.67
1/6/00	62.09	64.94	62.28	40.32	48.4	61.74
3/7/00	62.55	69.68	67.34	46.25	53.62	62.82
4/4/00	63.58	70.09	67.62	47.33	55.05	63.27
7/22/00	56.31	65.1	61.72	32.01	32.28	61.06
9/27/00	57.67	61.92	57.98	28.02	29.48	60.22

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 1999-2000
WRD NESTED MONITORING WELLS

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Downey #1						Reference Point Elevation: 97.21
Depth of Well	1170-1190	940-960	580-600	370-390	250-270	90-110
Aquifer Name	Sunnyside	Silverado	Silverado	Hollydale/Jefferson	Exposition	Gaspur
10/4/99	7.34	10.5	17.41	15.78	47.14	50.98
11/1/99	8.41	11.81	18.12	19.13	47.53	51.08
1/6/00	15.74	17.59	19.54	20.86	47.08	50.54
3/31/00	25.52	25.74	23.54	21.95	47.07	50.25
4/3/00	25.49	25.58	22.43	21.2	46.86	50.1
7/31/00	11.87	13.95	16.03	15.2	44.84	49.21
8/24/00	8.67	11.49	13.67	13.55	44.36	48.81
9/27/00	7.1	10.6	15.83	15.54	44.22	48.31
Gardena #1						Reference Point Elevation: 79.90
Depth of Well	970-990	445-465	345-365	120-140		
Aquifer Name	Sunnyside	Silverado	Lynwood	Gage		
10/4/99	-52.52	-97.25	-68.1	-16.65		
10/12/99	-52.54	-100.86	-68.6	-16.57		
1/6/00	-53.6	-98.1	-73.07	-16.62		
4/4/00	-53.13	-97.95	-73.6	-16.38		
8/2/00	-53.23	-96.11	-71.42	-16.6		
9/29/00	-52.95	-96.03	-64.42	-16.66		
Hawthorne #1						Reference Point Elevation: 86.35
Depth of Well	910-950	710-730	520-540	400-420	240-260	110-130
Aquifer Name	Pico	Lower San Pedro/ Sunnyside	Lower San Pedro/ Sunnyside	Silverado	Lynwood	Gage
10/5/99	-81.22	-23.31	-22.15	-21.92	-16.04	-3.26
10/21/99	-81.85	-20.91	-21.86	-20.72	-15.23	-2.94
1/7/00	-77.45	-20.42	-19.13	-18.88	-14.04	-2.85
3/23/00	-83.61	-18.91	-17.81	-17.61	-13.24	-2.58
4/5/00	-81.32	-21.75	-20.36	-20.08	-14.55	-2.43
8/2/00	-84.68	-24.58	-23.02	-22.75	-16.69	-3.26
9/28/00	-82.27	-23.76	-22.27	-22.04	-16.51	-3.27
Huntington Park #1						Reference Point Elevation: 177.08
Depth of Well	890-910	690-710	420-440	275-295		
Aquifer Name	Silverado	Jefferson	Gage	Exposition		
10/4/99	-33.45	-36.87	-23.16	16.41		
11/10/99	-30.45	-32.99	-18.72	16.45		
1/6/00	-27.62	-28.38	-16.52	17.24		
4/5/00	-25.3	-29.22	-15.86	16.66		
5/4/00	-29.74	-34.4	-18.73	16.52		
8/7/00	-31.55	-36.32	-22.48	16.06		
9/29/00	-33.58	-35.56	-22.48	15.91		

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 1999-2000
WRD NESTED MONITORING WELLS

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Inglewood #1						Reference Point Elevation: 110.56
Depth of Well	1380-1400		430-450	280-300	150-170	
Aquifer Name	Pico		Silverado	Lynwood	Gage	
10/15/99	-35.83		-39.53	-6.46	-0.39	
1/7/00	-35.55		-39.68	-6.19	-0.69	
9/28/00	-35.44		-40.49	-5.88	-0.19	
4/5/00	-35.32		-40.52	-5.79	-0.24	
7/24/00	-35.28		-40.26	-5.88	-0.14	
10/5/99	-35.25		-40.44	-6.6	-0.7	
3/23/00	-35.22		-40.84	-5.95	-0.52	
Inglewood #2						Reference Point Elevation: 217.33
Depth of Well	800-840	450-470	330-350	225-245		
Aquifer Name	Pico	Pico	Silverado	Lynwood		
10/5/99	-23.28	-22.59	-11.61	-5.54		
11/16/99	-23.5	-22.49	-11.5	-5.61		
1/6/00	-23.79	-22.53	-11.59	-5.68		
3/23/00	-23.48	-21.77	-11.45	-5.58		
4/5/00	-23.42	-21.7	-11.28	-5.45		
7/24/00	-22.67	-21.29	-11.06	-5.22		
9/28/00	-22.78	-21.35	-11.08	-5.61		
La Mirada #1						Reference Point Elevation: 75.85
Depth of Well	1130-1150	965-985	690-710	470-490	225-245	
Aquifer Name	Sunnyside	Silverado	Lynwood	Jefferson	Gage	
10/4/99	-36.1	-35.37	-46.53	-64.41	-35.57	
10/27/99	-32.67	-32.31	-44.63	-60.54	-34.59	
1/5/00	-11.39	-14.01	-30.52	-51.53	-25.37	
2/11/00	-6.68	-10.7	-28.56	-40.19	-22.14	
4/3/00	-19.53	-45.33	-22.73	-3.13	0.37	
5/23/00	-10.83	-10.58	-28.9	-50.92	-24.56	
8/1/00	-31.73	-30.75	-43.81	-62.7	-34.24	
9/27/00	-36.4	-36.64	-47.26	-56.09	-35.8	
Lakewood #1			Reference Point Elevations: 37.91 (Zones 1, 2, 3, 4) and 37.93 (Zones 5 and 6)			
Depth of Well	989-1009	640-660	450-470	280-300	140-160	70-90
Aquifer Name	Sunnyside	Silverado	Lynwood	Hollydale	Artesia	Semi-Perched
10/4/99	-87.72	-67.03	-65.61	-29.91	-14.02	11.34
10/26/99	-74.02	-58.81	-57.81	-27.16	-11.59	12.2
1/6/00	-51.73	-44.51	-43.14	-19.54	-6.82	13.2
4/3/00	-44.4	-39.74	-39.03	-18.58	-6.35	14.23
8/10/00	-116.06	-83.04	-81.19	-30.41	-15.72	12.24
8/21/00	-115.79	-83.12	-81.23	-31.88	-16.56	12.06
9/27/00	-112.42	-81.11	-78.32	-28.63	-15.12	11.65

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 1999-2000
WRD NESTED MONITORING WELLS

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Lomita #1						Reference Point Elevation: 76.91
Depth of Well	1240-1260	700-720	550-570	400-420	220-240	100-120
Aquifer Name	Lower San Pedro	Silverado	Silverado	Silverado	Gage	Gage
10/4/99	-44.25	-32.61	-30.45	-31.14	-25.42	-28.52
12/10/99	-42.32	-32.24	-29.87	-31.3	-25.31	-28.02
1/7/00	-42.39	-31.85	-29.56	-31.23	-25.36	-28.02
2/17/00	-42.99	-31.28	-28.99	-30.89	-25.36	-27.85
4/4/00	-41.67	-30.4	-28.15	-30.37	-25.05	-27.25
6/21/00	-41.02	-30.85	-28.78	-30.02	-25.02	-27.76
8/2/00	-39.5	-29.62	-27.9	-29.5	-24.86	-27.26
9/27/00	-38.6	-29.32	-27.77	-29.73	-24.85	-27.16
Long Beach #1						Reference Point Elevation: 28.69
Depth of Well	1430-1450	1230-1250	970-990	599-619	400-420	155-175
Aquifer Name	Sunnyside	Sunnyside	Silverado	Lynwood	Gage	Artesia
10/4/99	-42.95	-45.85	-83.04	-49.92	-45.23	-22.81
1/6/00	-13.44	-14.61	-30.7	-23.1	-21.18	-10.03
3/21/00	-1.76	-2.74	-19.65	-19.18	-18.53	-8.26
4/3/00	-0.84	-1.91	-19.33	-19.02	-18.16	-10.11
8/1/00	-39.59	-43.21	-86.4	-49	-45.37	-24.9
9/27/00	-49.69	-53.4	-89.04	-50.56	-46.43	-25.71
Long Beach #2						Estimated Reference Point Elevation (From USGS topographic Quad): 42
Depth of Well	970-990	720-740	450-470	280-300	160-180	95-115
Aquifer Name	Pico	Sunnyside	Silverado	Lynwood	Gage	Gaspur
3/29/00	-16	-31	-72	-9	0	1
4/4/00	-16	-33	-72	-9	-1	1
7/5/00	-85	-50	-75	-12	-1	0
8/1/00	-93	-53	-75	-13	-12	0
9/27/00	-99	-55	-68	-14	-3	0
Long Beach #3						Estimated Reference Point Elevation (From USGS topographic Quad): 24
Depth of Well	1350-1390	997-1017	670-690	530-550	410-430	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Silverado	Lynwood	
8/31/00	-49	-66	-66	-64	-12	
9/27/00	-49	-72	-71	-72	-12	
Los Angeles #1						Reference Point Elevation: 173.34
Depth of Well	1350-1370	1080-1100	920-940	640-660	350-370	
Aquifer Name	Pico	Sunnyside	Silverado	Lynwood	Gage	
10/4/99	-81.15	-59.11	-58.6	-32.73	-28.49	
1/6/00	-70.09	47.45	62.24	93.63	91.45	
4/4/00	-7.78	-19.67	-21.43	-16.45	11.61	
7/31/00	-9.06	-21.72	-22.36	-16.75	-31.46	
9/29/00	-11.23	-22.02	-24.18	-29.05	-20.96	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 1999-2000
WRD NESTED MONITORING WELLS

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Pico #1						Reference Point Elevation: 181.06
Depth of Well	860-900	460-480	380-400	170-190		
Aquifer Name	Pico	Silverado	Silverado	Jefferson		
10/4/99	140.23	129.14	128.3	125.2		
11/3/99	138.96	126.92	126.03	122.86		
1/5/00	139.47	132.09	131.42	129.44		
4/5/00	148.9	145.52	145.16	144.08		
5/24/00	149.79	145.55	145.25	144.39		
6/22/00	149.39	144.2	143.9	142.74		
8/4/00	146.84	138.63	138.13	136.04		
9/29/00	141.56	131.79	131.27	129.01		
Pico #2						Reference Point Elevation: 149.60
Depth of Well	1180-1200	830-850	560-580	320-340	235-255	100-120
Aquifer Name	Sunnyside	Sunnyside	Sunnyside	Silverado	Lynwood	Gaspur
10/4/99	73.31	75.4	83.84	97.65	96.76	103.88
11/4/99	72.18	75.55	82.39	94.83	93.9	100.51
1/6/00	79.97	83.03	87.5	97.84	98.3	100.99
4/5/00	93.55	97.19	104.62	113.15	112.24	113.09
5/24/00	90.96	96.45	103.16	117.22	117.99	123.22
8/4/00	79.78	84.61	93.68	112.4	113.27	118.78
9/27/00	74.5	80.17	88	106.38	107.01	111.33
PM-1 Columbia						Reference Point Elevation: 78.48
Depth of Well	555-595	460-500				
Aquifer Name	Lower San Pedro	Silverado				
10/4/99	-13.27	-11.65				
1/7/00	-13.64	-12.59				
4/4/00	-13.6	-12.49				
8/2/00	-13.96	-12.91				
9/27/00	-14.11	-13.05				
PM-3 Madrid						Reference Point Elevation: 70.68
Depth of Well	640-680	480-520	240-280	145-185		
Aquifer Name	Lower San Pedro	Silverado	Lynwood	Gage		
10/4/99	-19.45	-14.88	-14.71	-14.66		
1/7/00	-19.44	-15.16	-14.99	-14.93		
4/4/00	-19.23	-15.1	-14.94	-14.91		
8/2/00	-19.41	-27.3	-15.25	-15.2		
9/27/00	-19.48	-15.49	-15.36	-15.29		

GROUNDWATER ELEVATIONS, WATER YEAR 1999-2000
WRD NESTED MONITORING WELLS

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
PM-4 Mariner					Reference Point Elevation: 97.70	
Depth of Well	670-710	500-540	340-380	200-240		
Aquifer Name	Lower San Pedro	Silverado	Lynwood	Gage		
10/4/99	-12.1	-6.13	-3.75	-3.69		
1/7/00	-12.06	-4.06	-5.4	-3.98		
4/4/00	-12.13	-6.53	-4.26	-4.19		
8/2/00	-12.78	-7	-4.64	-4.55		
9/27/00	-12.78	-6.77	-4.42	-4.34		
Rio Hondo #1					Reference Point Elevation: 144.36	
Depth of Well	1110-1130	910-930	710-730	430-450	280-300	140-160
Aquifer Name	Sunnyside	Sunnyside	Sunnyside	Silverado	Lynwood	Gardena
10/4/99	73.89	68.48	67.31	62.86	75.17	78.85
10/13/99	72.22	69.16	66.7	59.46	74.3	78.13
10/29/99	72.46	67.87	67.03	61.57	73.63	77.17
1/5/00	75.02	74.77	73.78	68.7	75.96	78.34
4/5/00	88.17	88.48	87.46	81.44	93.93	96.49
5/24/00	85.69	85.88	85.13	80.64	92.18	95.35
8/4/00	77.88	73.93	73		83.04	86.96
9/29/00	72.42	68.2	67.24	64.12	76.9	80.84
Santa Fe Springs #1					Reference Point Elevation: 168.83	
Depth of Well	1290-1310	825-845	540-560	265-285		
Aquifer Name	Pico	Sunnyside	Sunnyside	Silverado		
10/4/99	68	81.89	58.58	63.69		
4/3/00		86.05	65.99	56.09		
8/4/00		84.79	62.47	52.49		
9/1/00	88.49	84.14	60.89	51.49		
9/27/00	100.41	82.42	59.01	46.76		
South Gate #1					Reference Point Elevation: 90.96	
Depth of Well	1440-1460	1320-1340	910-930	565-585	220-240	
Aquifer Name	Sunnyside	Sunnyside	Sunnyside	Lynwood/Silverado	Exposition	
10/4/99	-7.39	-7.22	-4.64	-3.2	39.52	
10/29/99	-5.41	-5.46	-3.22	2.58	39.54	
1/6/00	0.98	1.11	4.59	1.39	39.47	
2/25/00	5.12	7.11	11.81	6.51	39.67	
3/29/00	8.45	8.92	11.73	5.16	39.94	
4/4/00	8.47	8.48	11.01	2.62	39.91	
7/31/00	-3.8	-3.39	1.79	-3.78	38.34	
9/27/00	-6.7	-6.12	-0.06	-6.24	37.31	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 1999-2000
WRD NESTED MONITORING WELLS

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Whittier #1						Estimated Reference Point Elevation (From USGS topographic Quad): 210
Depth of Well	1180-1200	920-940	600-620	450-470	200-220	
Aquifer Name	Pico	Sunnyside	Silverado	Jefferson	Gage	
1/5/00	105	105		98	191	
4/3/00	106	106	101	100	192	
8/14/00	107	107	101	100	191	
9/27/00	107	107	101	99	191	
Whittier Narrows #1						Reference Point Elevation: 215.14
Depth of Well				749-769		
Aquifer Name				Silverado		
5/24/00				196.74		
11/17/00				192.08		
Willowbrook #1						Reference Point Elevation: 96.21
Depth of Well	885-905	500-520	360-380	200-220		
Aquifer Name	Pico	Silverado	Lynwood	Gage		
10/4/99	-38.27	-29.83	-23.38	-22.88		
11/9/99	-34.47	-28.66	-21.48	-21.23		
12/17/99	-30.26	-27.64	-20.48	-20.23		
1/6/00	-30.03	-27.55	-20.73	-20.46		
4/4/00	-23.55	-25.96	-20.31	-20.06		
8/2/00	-35.29	-28.95	-23.35	-23		
9/28/00	-34.88	-29.95	-24.49	-24.2		
Wilmington #1						Reference Point Elevation: 37.96
Depth of Well	915-935	780-800	550-570	225-245	120-140	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Lynwood	Gage	
10/4/99	-72.41	-72.55	-72.77	-32.26	-28.08	
1/7/00	-74.36	-74.51	-74.67	-32.92	-28.79	
4/4/00	-71.23	-71.32	-71.54	-31.01	-27.17	
9/27/00	-68.87	-69.06	-69.3	-29.64	-25.72	
Wilmington #2						Reference Point Elevation: 29.78
Depth of Well	950-970	755-775	540-560	390-410	120-140	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Lynwood	Gage	
10/4/99	-53.49	-46.97	-41.13	-40	-11.69	
10/6/99	-53.43	-46.89	-41.23	-40.21	-11.57	
1/7/00	-54.28	-47.48	-41.92	-40.84	-12.42	
4/4/00	-51.87	-45.35	-39.56	-38.53	-12.2	
8/2/00	-47.27	-42.28	-37.12	-36.18	-11.2	
9/27/00	-50.34	-43.99	-38.34	-37.28	-11.51	

TABLE 4.1
MAJOR MINERAL WATER QUALITY GROUPS

GROUP A Generally Calcium Bicarbonate or Calcium Bicarbonate/Sulfate Dominant	GROUP B Generally Calcium-Sodium-Bicarbonate or Sodium-Bicarbonate Dominant	GROUP C Generally Sodium-Chloride Dominant	OTHER Generally Different Than Groups A, B, and C
CENTRAL BASIN			
Cerritos #1 Zones 1, 2, 3, 4, 5, 6 Commerce #1 Zones 2,3,4,5,6 Downey #1 Zones 2, 3, 4, 5, 6 Huntington Park #1 Zones 1, 2, 3, 4 Lakewood #1 Zone 6 Long Beach #1 Zones 5,6 Long Beach #2 Zones 4,5,6 Rio Hondo #1 Zones 1, 2, 3, 4, 5, 6, Pico #1 Zones 2, 3, 4 Pico #2 Zones 1, 2, 3, 4, 5, 6 South Gate #1 Zones 1, 2, 3, 4, 5 Whittier #1 Zones 1,2,3,4,5 Willowbrook #1 Zones 2, 3, 4	Downey #1 Zone 1 Inglewood #2 Zones 1,3 Lakewood #1 Zones 1,2, 3, 4, 5 La Mirada #1 Zones 1, 2, 3, 4 Willowbrook #1 Zone 1 Long Beach #1 Zones 1,2,3,4 Long Beach #2 Zones 1,2,3 Santa Fe Springs #1 Zone 3	Inglewood #2 Zone 2	La Mirada #1 Zone 5 Pico #1 Zone 1 Santa Fe Springs #1 Zones 1,2,4
WEST COAST BASIN			
Carson #1 Zones 3, 4 Gardena #1 Zones 2, 3, 4 Hawthorne #1 Zones 5,6 Inglewood #1 Zones 3, 4, 5 PM-3 Madrid Zones 3,4	Carson #1 Zones 1, 2 Hawthorne #1 Zones 1,2,3,4 PM-Madrid Zone 2 Wilmington #2 Zone 3	PM-4 Mariner Zones 2,3,4 Wilmington #1 Zones 1, 2, 3, 4, 5 Wilmington #2 Zones 4,5	Gardena #1 Zone 1 Inglewood #1 Zone 1 Lomita #1 Zones 1, 2, 3, 4, 5, 6 PM-3 Madrid Zone 1 PM-4 Mariner Zone 1 Wilmington #2 Zone 1,2

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Carson #1 Zone 1 4/24/00	Carson #1 Zone 2 4/24/00	Carson #1 Zone 3 5/3/00	Carson #1 Zone 4 5/3/00	Cerritos #1 Zone 1 10/25/99	Cerritos #1 Zone 1 5/23/00	Cerritos #1 Zone 2 10/25/99	Cerritos #1 Zone 2 5/23/00	Cerritos #1 Zone 3 10/25/99	Cerritos #1 Zone 3 5/23/00	Cerritos #1 Zone 4 10/27/99	Cerritos #1 Zone 4 5/23/00	Cerritos #1 Zone 5 10/27/99
General Mineral:																	
Total Dissolved Solid (TDS)	500			mg/l	200	220	290	500	260	280	250	260	300	300	280	270	260
Cation Sum				meq/l	3.6	4.12	5.59	9.49	4.77	4.79	4.43	4.41	5.22	5.28	4.77	4.78	4.58
Anion Sum				meq/l	3.49	3.93	5.35	9.3	4.74	4.71	4.32	4.31	5.1	5.16	4.69	4.67	4.44
Iron, Total, ICAP	0.3			mg/l	ND	ND	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	24	20	34	135	27	32	34	35	47	48	ND	78	105
Turbidity	5			NTU	ND	0.1	0.05	1.2	0.1	ND	ND	0.4	ND	ND	0.1	0.1	0.4
Alkalinity				mg/l	147	168	170	212	165	163	155	154	167	168	177	177	176
Boron	1			mg/l	0.08	0.091	0.1	0.1		0.077		0.053		0.07		0.072	
Bicarbonate as HCO3,calculated				mg/l	178	204	207	258	200	198	188	187	203	204	215	215	214
Calcium, Total, ICAP				mg/l	21	32	48	92	33.8	36.3	35.5	36	41.3	43	43.8	45	37.1
Carbonate as CO3, Calculated				mg/l	2.31	2.65	2.13	1.68	2.59	1.62	1.94	1.53	1.66	2.65	1.11	2.21	1.1
Hardness (Total, as CaCO3)				mg/l	69.7	107	173	316	105	110	113	113	124	131	153	153	131
Chloride	250			mg/l	19.2	20	22.1	101	14.2	14.3	12.2	12.3	18.4	18.8	12	11.8	10.2
Fluoride	2			mg/l	0.24	0.2	0.28	0.39	0.28	0.25	0.35	0.36	0.34	0.37	0.53	0.56	0.49
Hydroxide as OH, Calculated				mg/l	0.03	0.03	0.03	0.02	0.034	0.02	0.027	0.02	0.021	0.03	0.014	0.03	0.014
Langelier Index - 25 degree				None	0.43	0.67	0.75	0.93	0.7	0.51	0.6	0.48	0.6	0.8	0.4	0.74	0.4
Magnesium, Total, ICAP				mg/l	4.2	6.6	13	21	5	4.8	6	5.7	5.1	5.7	10.6	10	9.4
Nitrate-N by IC	10			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	2.8	2.4	3	4.5	2.5	2.4	2.2	2.3	2	2.1	2	2	2.1
Sodium, Total, ICAP				mg/l	49	44	47	70	59.8	58	48.4	48	61.7	60	38	38	43.6
Sulfate	250			mg/l	ND	ND	63.1	105	49.2	49.5	41	41.7	58.7	60	37.4	36.8	29.3
Surfactants	0.5			mg/l	0.186	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon				mg/l	0.6	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Dioxide				mg/l	1.78	2.04	2.61	5.16	2	3.15	2.37	2.97	3.22	2.04	5.41	2.71	5.39
General Physical:																	
Apparent Color	15			ACU	10	5	ND	5	ND	3	ND	3	ND	3	ND	ND	5
Lab pH				Units	8.3	8.3	8.2	8	8.3	8.1	8.2	8.1	8.1	8.3	7.9	8.2	7.9
Odor	3			TON	3	3	1	1	1	2	2	2	2	1	1	1	2
pH of CaCO3 saturation(25C)				Units	7.872	7.63	7.448	7.07	7.615	7.588	7.621	7.617	7.522	7.502	7.471	7.459	7.545
pH of CaCO3 saturation(60C)				Units	7.4	7.2	7	6.6	7.2	7.1	7.2	7.2	7.1	7.1	7	7	7.1
Specific Conductance	900			umho/cm	315	355	475	830	450	455	420	420	490	495	450	440	430
Radon				pCi/l	73	111	81	100	340	310	205	220	140	130	190	130	93
Metals:																	
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	ND	ND	ND	1	17	17	12	12	23	22	5.6	6.2	13
Barium, Total, ICAP/MS	1000			ug/l	16	38	66	220	49	53	96	98	95	120	55	59	61
Chromium, Total, ICAP/MS	50			ug/l	8.3	11	8.7	10	14	10	13	8	15	8.1	8.6	8.5	13
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics:																	
Trichloroethylene (TCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l					ND		ND		ND		ND		ND

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Cerritos #1 Zone 5 5/23/00	Cerritos #1 Zone 6 10/27/99	Cerritos #1 Zone 6 5/23/00	Chandler #3 Zone 2 11/15/99	Chandler #3 Zone 1 11/15/99	Chandler #3 Zone 1 8/28/00	Commerce #1 Zone 2 11/2/99	Commerce #1 Zone 2 5/30/00	Commerce #1 Zone 3 11/2/99	Commerce #1 Zone 3 5/30/00	Commerce #1 Zone 4 11/2/99
General Mineral:															
Total Dissolved Solid (TDS)	500			mg/l	250	250	250	950	630	680	630	650	460	440	480
Cation Sum				meq/l	4.64	4.59	4.74	16.3	11.4	11.3	10.8	11.1	7.6	7.89	8.44
Anion Sum				meq/l	4.49	4.44	4.52	16	11.9	12.1	10.9	11.6	7.83	7.91	8.41
Iron, Total, ICAP	0.3			mg/l	ND	ND	ND	1.2	0.29	0.3	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	115	120	135	105	115	120	37	39	56	79	89
Turbidity	5			NTU	0.35	0.1	0.2	27	1.3	1.6	7.7	6	8.6	0.65	5.2
Alkalinity				mg/l	178	183	187	299	298	298	294	306	210	218	202
Boron	1			mg/l	0.074		0.065			0.17		0.46		0.22	
Bicarbonate as HCO3,calculated				mg/l	216	223	227	365	363	363	358	373	256	265	246
Calcium, Total, ICAP				mg/l	39	44.8	47	111	77.3	81	50.9	57	49.8	62	45.9
Carbonate as CO3, Calculated				mg/l	2.8	1.15	3.71	0.473	0.939	1.87	1.85	1.53	1.32	1.72	1.01
Hardness (Total, as CaCO3)				mg/l	136	150	156	370	288	301	223	241	195	233	191
Chloride	250			mg/l	10.2	9.55	9.46	256	191	195	176	190	77.3	74.7	120
Fluoride	2			mg/l	0.48	0.32	0.32	0.24	0.27	0.25	0.4	0.41	0.38	0.41	0.44
Hydroxide as OH, Calculated				mg/l	0.03	0.014	0.04	0.003	0.007	0.01	0.0135	0.01	0.0135	0.02	0.0107
Langelier Index - 25 degree				None	0.78	0.5	0.98	0.46	0.6	0.92	0.72	0.68	0.56	0.77	0.41
Magnesium, Total, ICAP				mg/l	9.3	9.4	9.3	22.5	23	24	23.3	24	17.3	19	18.6
Nitrate-N by IC	10			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	2.1	2.1	2.2	6.1	3.3	3.2	5.9	5.9	3.7	3.6	3.5
Sodium, Total, ICAP				mg/l	43	35	36	200	128	120	143	140	82.7	72	104
Sulfate	250			mg/l	29.6	23.8	23.7	133	26.5	30.1	ND	2.52	68.6	68	46.1
Surfactants	0.5			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon				mg/l	0.6	0.5	0.5	1.4	1	1.1	2.6	2.9	0.6	0.9	0.8
Carbon Dioxide				mg/l	2.17	5.61	1.81	36.6	18.2	9.14	9.01	11.8	6.45	5.3	7.8
General Physical:															
Apparent Color	15			ACU	3	3	3	20	10	10	15	20	5	ND	5
Lab pH				Units	8.3	7.9	8.4	7.3	7.6	7.9	7.9	7.8	7.9	8	7.8
Odor	3			TON	2	1	2	2	3	2	1	3	2	3	2
pH of CaCO3 saturation(25C)				Units	7.519	7.445	7.417	6.837	6.997	6.977	7.184	7.117	7.34	7.229	7.392
pH of CaCO3 saturation(60C)				Units	7.1	7	7	6.4	6.6	6.5	6.7	6.7	6.9	6.8	6.9
Specific Conductance	900			umho/cm	430	430	430	1580	1080	1150	1110	1070	765	720	830
Radon				pCi/l	62	147	160	84	185	150	200	245	120	195	200
Metals:															
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	54	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	11	39	42	ND	4.1	3.8	ND	1.6	2.6	ND	3.3
Barium, Total, ICAP/MS	1000			ug/l	70	84	94	39	75	71	74	78	54	58	175
Chromium, Total, ICAP/MS	50			ug/l	10	14	9.8	36	25	13	ND	15	15	9.5	13
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	5.2	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND			ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	ND	370	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	14	ND	ND	10	ND	ND	ND	ND
Volatile Organics:															
Trichloroethylene (TCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l		ND		6.1	ND		ND		ND		ND

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Commerce #1 Zone 4 5/30/00	Commerce #1 Zone 5 11/2/99	Commerce #1 Zone 5 5/30/00	Commerce #1 Zone 6 11/2/99	Commerce #1 Zone 6 5/30/00	Downey #1 Zone 1 11/1/99	Downey #1 Zone 1 6/6/00	Downey #1 Zone 2 11/1/99	Downey #1 Zone 2 6/6/00	Downey #1 Zone 3 11/1/99	Downey #1 Zone 3 6/6/00
General Mineral:															
Total Dissolved Solid (TDS)	500			mg/l	500	520	720	370	350	210	160	330	270	440	360
Cation Sum				meq/l	8.55	9.72	12.9	6.24	6.59	3.61	3.74	5.7	6.06	7.91	8.32
Anion Sum				meq/l	8.71	9.82	13.1	6.25	6.32	3.52	3.54	5.58	5.8	7.89	8.18
Iron, Total, ICAP	0.3			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	100	ND	22	8.2	3.5	2.9	2.8	ND	ND	ND	ND
Turbidity	5			NTU	0.3	1.3	0.3	4.7	2.6	0.15	0.5	1.2	2.75	ND	0.15
Alkalinity				mg/l	207	194	210	165	172	151	151	163	167	161	167
Boron	1			mg/l	0.25		0.26		0.15		ND		ND		0.068
Bicarbonate as HCO3,calculated				mg/l	252	236	256	201	209	184	184	198	203	196	203
Calcium, Total, ICAP				mg/l	51	88.1	99	52.1	62	39.8	43	71.1	78	101	110
Carbonate as CO3, Calculated				mg/l	1.3	0.769	0.834	0.655	0.857	1.2	0.95	1.02	0.832	0.804	0.661
Hardness (Total, as CaCO3)				mg/l	205	323	358	200	229	123	131	224	244	330	353
Chloride	250			mg/l	126	118	213	59.8	57	5.14	5.33	25.1	26.9	63.6	66.5
Fluoride	2			mg/l	0.48	0.37	0.37	0.47	0.54	0.33	0.32	0.3	0.3	0.35	0.34
Hydroxide as OH, Calculated				mg/l	0.01	0.00852	0.009	0.00852	0.01	0.017	0.01	0.0135	0.01	0.0107	0.009
Langelier Index - 25 degree				None	0.56	0.57	0.66	0.28	0.47	0.42	0.35	0.6	0.55	0.65	0.6
Magnesium, Total, ICAP				mg/l	19	25	27	16.9	18	5.7	5.8	11.3	12	18.9	19
Nitrate-N by IC	10			mg/l	ND	4.22	4.31	5.82	5.98	ND	ND	1.66	1.65	2.72	2.74
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	3.5	2.6	3.4	2	2	2.8	2.7	3.3	3.4	3.1	3.1
Sodium, Total, ICAP				mg/l	100	73.4	130	50.5	45	24.9	24	25.9	25	28.1	27
Sulfate	250			mg/l	47.5	110	123	39.5	39	16.2	16.8	70.9	75.3	128	132
Surfactants	0.5			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	4.22	4.31	5.82	5.98	ND	ND	1.66	1.65	2.72	2.74
Total Organic Carbon				mg/l	1	0.6	1	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Dioxide				mg/l	6.34	9.42	10.2	8.02	6.62	3.68	4.63	4.99	6.43	6.21	8.1
General Physical:															
Apparent Color	15			ACU	5	ND	ND	ND	3	ND	3	ND	ND	ND	ND
Lab pH				Units	7.9	7.7	7.7	7.7	7.8	8	7.9	7.9	7.8	7.8	7.7
Odor	3			TON	3	2	3	1	2	1	ND	1	ND	1	ND
pH of CaCO3 saturation(25C)				Units	7.336	7.127	7.041	7.425	7.332	7.58	7.547	7.296	7.245	7.148	7.096
pH of CaCO3 saturation(60C)				Units	6.9	6.7	6.6	7	6.9	7.1	7.1	6.9	6.8	6.7	6.7
Specific Conductance	900			umho/cm	830	945	1240	615	595	345	265	545	550	775	595
Radon				pCi/l	205	180	205	200	275	290	580	100	160	110	200
Metals:															
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	ND	2.5	ND	2.5	1.8	3.2	3.3	3.3	3.1	3.5	3.5
Barium, Total, ICAP/MS	1000			ug/l	215	91	105	49	55	89	97	145	150	150	150
Chromium, Total, ICAP/MS	50			ug/l	9.9	22	12	22	16	16	10	17	9.2	17	9.6
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	2.7	ND	6.7	ND	3.2	ND	1.9	ND	1.2
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics:															
Trichloroethylene (TCE)	5			ug/l	ND	0.8	0.8	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	1.4	1.3	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l		ND		4.3		ND		ND		4.9	

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Downey #1 Zone 4 11/4/99	Downey #1 Zone 4 6/6/00	Downey #1 Zone 5 11/4/99	Downey #1 Zone 5 6/6/00	Downey #1 Zone 6 11/4/99	Downey #1 Zone 6 6/6/00	Gardena #1 Zone 1 10/12/99	Gardena #1 Zone 1 5/22/00	Gardena #1 Zone 2 10/12/99	Gardena #1 Zone 2 5/22/00	Gardena #1 Zone 3 10/20/99	Gardena #1 Zone 3 5/22/00
General Mineral:																
Total Dissolved Solid (TDS)	500			mg/l	500	370	470	480	710	720	350	350	320	320	310	310
Cation Sum				meq/l	8.52	9.14	8.58	9.17	13.1	14	5.73	5.96	5.6	5.72	5.38	5.62
Anion Sum				meq/l	8.91	9.09	8.65	8.73	13.8	13.7	6.03	6.26	5.34	5.55	5.35	5.32
Iron, Total, ICAP	0.3			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	6.7	2.1	155	185	76	82	69	53	82	94	28	27
Turbidity	5			NTU	ND	0.85	1.5	0.09	0.7	1.2	5.2	3.6	5.4	0.3	8.2	1
Alkalinity				mg/l	193	195	237	236	284	282	278	289	173	177	167	163
Boron	1			mg/l		0.19		0.084		0.21		0.34		0.12		0.12
Bicarbonate as HCO3,calculated				mg/l	235	238	289	288	346	344	338	351	211	216	203	198
Calcium, Total, ICAP				mg/l	90.7	100	109	120	145	160	14.1	14	54	57	52.3	56
Carbonate as CO3, Calculated				mg/l	0.608	0.616	0.748	0.745	0.565	0.562	2.2	2.87	1.09	0.704	1.66	1.29
Hardness (Total, as CaCO3)				mg/l	302	332	358	390	482	527	64	65	185	192	175	185
Chloride	250			mg/l	73.7	75.8	55.2	56.6	96.4	97	16.4	16.5	21.4	23.2	22.2	22.7
Fluoride	2			mg/l	0.41	0.41	0.33	0.34	0.3	0.3	0.21	0.22	0.4	0.43	0.35	0.37
Hydroxide as OH, Calculated				mg/l	0.00677	0.007	0.00677	0.007	0.00427	0.004	0.017	0.02	0.014	0.009	0.021	0.02
Langelier Index - 25 degree				None	0.48	0.53	0.65	0.69	0.66	0.7	0.2	0.35	0.5	0.34	0.7	0.6
Magnesium, Total, ICAP				mg/l	18.4	20	20.9	22	29.3	31	7.1	7.3	12.3	12	10.7	11
Nitrate-N by IC	10			mg/l	2.49	2.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	4	4.2	3.8	3.9	5.2	5.4	10.7	12	3.5	3.8	3	3.6
Sodium, Total, ICAP				mg/l	54.4	55	30.1	29	75.1	76	95.8	100	41.4	41	41.6	42
Sulfate	250			mg/l	133	137	112	115	257	257	ND	ND	60.4	64	65.7	67.3
Surfactants	0.5			mg/l	ND	0.073	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	2.49	2.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon				mg/l	ND	0.6	ND	ND	ND	0.7	2.5	2.8	ND	ND	ND	ND
Carbon Dioxide				mg/l	11.8	12	14.5	14.5	27.5	27.4	6.76	5.58	5.31	8.62	3.22	3.96
General Physical:																
Apparent Color	15			ACU	ND	ND	ND	ND	ND	ND	25	20	3	ND	10	ND
Lab pH				Units	7.6	7.6	7.6	7.6	7.4	7.4	8	8.1	7.9	7.7	8.1	8
Odor	3			TON	1	ND	1	ND	1	ND	3	4	3	2	1	1
pH of CaCO3 saturation(25C)				Units	7.116	7.068	6.947	6.906	6.745	6.704	7.767	7.754	7.388	7.355	7.419	7.4
pH of CaCO3 saturation(60C)				Units	6.7	6.6	6.5	6.5	6.3	6.3	7.3	7.3	6.9	6.9	7	7
Specific Conductance	900			umho/cm	850	635	800	785	1200	1210	570	575	520	525	530	505
Radon				pCi/l	280	270	70	100	260	260	80	85	98	110	160	140
Metals:																
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	2.6	2.4	5.9	5.5	3.4	3.2	26	26	ND	ND	ND	ND
Barium, Total, ICAP/MS	1000			ug/l	89	96	300	310	59	62	20	17	47	52	23	24
Chromium, Total, ICAP/MS	50			ug/l	16	11	21	13	26	17	22	15	14	8.7	15	5.1
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8
Hexavalent Chromium (Cr VI)				ug/l	ND	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	6.6	ND	7.1	ND	10	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.3
Volatile Organics:																
Trichloroethylene (TCE)	5			ug/l	ND	ND	0.7	0.8	3.2	4.5	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	5.7	5.4	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l	ND		ND		ND		ND		ND		ND	

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Gardena #1 Zone 4 10/20/99	Gardena #1 Zone 4 5/22/00	Hawthorne #1 Zone 1 10/21/99	Hawthorne #1 Zone 1 5/17/00	Hawthorne #1 Zone 2 10/21/99	Hawthorne #1 Zone 2 5/17/00	Hawthorne #1 Zone 3 10/21/99	Hawthorne #1 Zone 3 5/17/00	Hawthorne #1 Zone 4 10/21/99	Hawthorne #1 Zone 4 5/17/00
General Mineral:														
Total Dissolved Solid (TDS)	500			mg/l	1370	1500	860	790	710	690	560	500	480	430
Cation Sum				meq/l	21.6	26.3	15.4	14.9	13.4	13.4	9.94	10.2	8.24	
Anion Sum				meq/l	23.5	26.1	15.2	15.5	13.1	13.3	9.76	9.93	8.13	
Iron, Total, ICAP	0.3			mg/l	ND	ND	0.2	0.19	0.13	0.13	0.12	0.22	0.1	0.11
Manganese, Total, ICAP/MS	50			ug/l	ND	ND	19	18	60	62	82	110	82	85
Turbidity	5			NTU	4	18	2.1	0.05	0.5	0.1	0.25	0.1	0.2	0.15
Alkalinity				mg/l	213	233	693	709	593	606	421	429	332	336
Boron	1			mg/l		0.16		1.4		0.99		0.44		0.37
Bicarbonate as HCO3,calculated				mg/l	260	284	844	863	721	736	512	522	404	409
Calcium, Total, ICAP				mg/l	228	290	15.3	15	13	13	31.6	33	39.3	38
Carbonate as CO3, Calculated				mg/l	0.337	0.232	4.36	5.61	7.43	7.58	3.33	4.27	2.09	2.66
Hardness (Total, as CaCO3)				mg/l	852	1070	91.2	86.8	68.2	65.8	165	165	174	169
Chloride	250			mg/l	601	666	46	46.8	42.4	42	46.9	47.3	52.2	47.5
Fluoride	2			mg/l	0.19	0.17	0.12	0.11	0.27	0.25	0.24	0.23	0.37	0.35
Hydroxide as OH, Calculated				mg/l	0.003	0.002	0.014	0.02	0.027	0.03	0.017	0.02	0.014	0.02
Langelier Index - 25 degree				None	0.6	0.57	0.57	0.67	0.73	0.74	0.8	0.89	0.7	
Magnesium, Total, ICAP				mg/l	68.8	83	12.9	12	8.7	8.1	20.9	20	18.5	18
Nitrate-N by IC	10			mg/l	16.2	17.8	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	5.4	6.3	20.3	20	13.1	13	13	14	9.2	9.8
Sodium, Total, ICAP				mg/l	101	110	300	290	270	270	145	150	104	100
Sulfate	250			mg/l	54.3	66.8	ND	ND	2.31	ND	ND	ND	ND	ND
Surfactants	0.5			mg/l	ND	0.052	ND	ND	ND	ND	0.32	ND	ND	0.055
Total Nitrate, Nitrite-N, CALC	45			mg/l	16.2	17.8	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon				mg/l	ND	0.9	10.9	14.6	10.9	13.5	3.5	3.6	2.3	0.9
Carbon Dioxide				mg/l	26.1	45.1	21.3	17.3	9.1	9.29	10.2	8.29	10.2	8.18
General Physical:														
Apparent Color	15			ACU	3	ND	200	250	250	200	25	35	15	25
Lab pH				Units	7.3	7.1	7.9	8	8.2	8.2	8	8.1	7.9	
Odor	3			TON	1	1	1	2	1	2	1	1	1	1
pH of CaCO3 saturation(25C)				Units	6.672	6.529	7.334	7.333	7.473	7.464	7.236	7.209	7.244	
pH of CaCO3 saturation(60C)				Units	6.2	6.1	6.9	6.9	7	7	6.8	6.8	6.8	
Specific Conductance	900			umho/cm	2290	2480	1420	1330	1220	1140	925	845	785	715
Radon				pCi/l	320	270	64	138	ND	78	55	105	79	116
Metals:														
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	1.6	ND	ND	1.6	ND	ND
Barium, Total, ICAP/MS	1000			ug/l	240	320	32	33	ND	24	31	32	31	32
Chromium, Total, ICAP/MS	50			ug/l	31	27	2.1	3.9	2.4	4.4	28	26	28	22
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	6.9	6.8	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	13	10	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	22	ND	6.7	ND	15	8.7	ND	ND	ND	ND
Volatile Organics:														
Trichloroethylene (TCE)	5			ug/l	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l	6.8		ND		ND		ND		ND	

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Hawthorne #1 Zone 5 10/21/99	Hawthorne #1 Zone 5 5/17/00	Hawthorne #1 Zone 6 10/21/99	Hawthorne #1 Zone 6 5/17/00	Huntington Park #1 Zone 1 11/10/99	Huntington Park #1 Zone 1 5/1/00	Huntington Park #1 Zone 2 11/10/99	Huntington Park #1 Zone 2 5/2/00	Huntington Park #1 Zone 3 11/10/99	Huntington Park #1 Zone 3 5/2/00
General Mineral:														
Total Dissolved Solid (TDS)	500			mg/l	530	540	1880	1750	320	290	330	310	460	440
Cation Sum				meq/l	8.78	9.13	34.5	34.8	5.75	6.16	5.86	6.07	8.26	8.72
Anion Sum				meq/l	8.64	9.4	35.4	34.3	5.82	5.66	5.98	5.71	7.8	8.14
Iron, Total, ICAP	0.3			mg/l	ND	ND	0.2	0.18	0.21	0.26	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	87	93	740	800	50	48	3.1	2.9	ND	ND
Turbidity	5			NTU	1.9	0.7	19	2.5	1	1.9	0.35	0.4	ND	ND
Alkalinity				mg/l	201	210	299	275	178	173	176	176	213	208
Boron	1			mg/l		0.13		0.29		0.13		0.13		0.19
Bicarbonate as HCO3,calculated				mg/l	245	256	365	335	217	211	214	214	260	253
Calcium, Total, ICAP				mg/l	70.8	75	306	320	57.8	63	58.5	61	84.4	89
Carbonate as CO3, Calculated				mg/l	1.26	1.66	0.596	0.688	0.707	0.546	0.877	1.1	0.673	0.824
Hardness (Total, as CaCO3)				mg/l	281	294	1.14E+03	1.16E+03	201	219	204	210	297	313
Chloride	250			mg/l	154	171	607	562	20.2	19.7	25	20.7	40.1	43.3
Fluoride	2			mg/l	0.34	0.35	0.24	0.25	0.5	0.48	0.43	0.43	0.33	0.34
Hydroxide as OH, Calculated				mg/l	0.014	0.02	0.004	0.005	0.00852	0.007	0.0107	0.01	0.00677	0.009
Langelier Index - 25 degree				None	0.7	0.84	1	1.1	0.35	0.28	0.45	0.57	0.5	0.61
Magnesium, Total, ICAP				mg/l	25.3	26	91.9	89	13.9	15	14.2	14	21.1	22
Nitrate-N by IC	10			mg/l	ND	ND	1.62	ND	ND	ND	0.15	ND	ND	3.96
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	6	6	7.6	7.7	3.1	3.2	3.1	3.3	3.9	4.5
Sodium, Total, ICAP				mg/l	69.2	71	264	260	37.7	39	38.7	41	50.7	54
Sulfate	250			mg/l	12.4	17.1	585	620	79.8	77.7	82.8	76	115	118
Surfactants	0.5			mg/l	ND	0.063	0.486	0.632	ND	ND	ND	ND	0.055	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	ND	1.62	ND	ND	ND	0.15	ND	ND	3.96
Total Organic Carbon				mg/l	0.7	2.8	3.8	1.1	ND	ND	ND	ND	0.5	0.8
Carbon Dioxide				mg/l	6.17	5.12	29.1	21.2	8.66	10.6	6.78	5.39	13.1	10.1
General Physical:														
Apparent Color	15			ACU	5	3	5	5	ND	5	ND	ND	ND	3
Lab pH				Units	7.9	8	7.4	7.5	7.7	7.6	7.8	7.9	7.6	7.7
Odor	3			TON	3	2	4	8	1	1	1	1	1	1
pH of CaCO3 saturation(25C)				Units	7.206	7.162	6.397	6.415	7.347	7.321	7.347	7.329	7.104	7.092
pH of CaCO3 saturation(60C)				Units	6.8	6.7	6	6	6.9	6.9	6.9	6.9	6.7	6.6
Specific Conductance	900			umho/cm	905	870	3190	2890	535	460	545	510	740	710
Radon				pCi/l	56	58	160	320	400	365	180	152	230	225
Metals:														
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	ND	ND	4.1	4	1.2	1.2	1.3	1.2	1.9	1.6
Barium, Total, ICAP/MS	1000			ug/l	69	79	60	65	52	58	64	69	74	76
Chromium, Total, ICAP/MS	50			ug/l	17	13	22	19	17	5.5	15	9.9	39	42
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	2.1	2.1	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND	ND		ND		ND		30
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	24	20	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	20	15	ND	ND	ND	ND	ND	ND
Volatile Organics:														
Trichloroethylene (TCE)	5			ug/l	ND	ND	17.9	17	ND	ND	ND	ND	21	25
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	0.7	0.6
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	0.7	0.8	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	7.9	12
Chloroform (Trichloromethane)	100			ug/l	ND	ND	5.1	5.6	ND	ND	ND	ND	1.4	2.3
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	0.5	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	5.8	5.6	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	1.5	1.2	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l	ND		ND		ND		ND		ND	

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Huntington Park #1 Zone 4 11/10/99	Huntington Park #1 Zone 4 5/2/00	Inglewood #1 Zone 3 10/20/99	Inglewood #1 Zone 3 5/22/00	Inglewood #1 Zone 4 10/19/99	Inglewood #1 Zone 4 5/22/00	Inglewood #1 Zone 5 10/19/99	Inglewood #1 Zone 5 5/22/00	Inglewood #2 Zone 1 11/23/99	Inglewood #2 Zone 2 9/28/00
General Mineral:														
Total Dissolved Solid (TDS)	500			mg/l	580	540	880	880	670	640	1000	1000	1460	1590
Cation Sum				meq/l	11.1	11.8	14.8	15.8	11.1	11.3	16.8	17	27.7	25.8
Anion Sum				meq/l	10.6	11.1	15.1	15.8	11	11.2	17.1	17.3	30.2	23.2
Iron, Total, ICAP	0.3			mg/l	ND	0.11	0.27	0.32	0.29	0.29	ND	ND	0.55	0.53
Manganese, Total, ICAP/MS	50			ug/l	ND	ND	310	230	195	155	5.3	2.2	42	58
Turbidity	5			NTU	0.05	0.3	1.2	2.2	1.6	1.5	0.25	0.1	0.85	24
Alkalinity				mg/l	250	256	299	304	218	220	259	248	1450	269
Boron	1			mg/l		0.17		0.38		0.18		0.23		3.2
Bicarbonate as HCO3,calculated				mg/l	305	312	364	371	266	268	316	302	1.77E+03	327
Calcium, Total, ICAP				mg/l	122	130	94.3	100	79.9	84	158	160	17.7	12
Carbonate as CO3, Calculated				mg/l	0.993	1.28	0.748	0.606	0.688	0.551	0.325	0.196	9.14	2.13
Hardness (Total, as CaCO3)				mg/l	428	452	391	410	347	358	597	601	116	68.2
Chloride	250			mg/l	53.2	59.7	239	257	180	183	325	337	36.6	450
Fluoride	2			mg/l	0.37	0.35	0.53	0.56	0.43	0.46	0.24	0.22	0.58	0.34
Hydroxide as OH, Calculated				mg/l	0.00852	0.01	0.005	0.004	0.007	0.005	0.003	0.002	0.014	0.02
Langelier Index - 25 degree				None	0.83	0.96	0.6	0.52	0.5	0.41	0.5	0.24	0.95	0.15
Magnesium, Total, ICAP				mg/l	30	31	37.8	39	35.9	36	49.2	49	17.5	9.3
Nitrate-N by IC	10			mg/l	3.82	3.99	ND	ND	ND	ND	8.66	9.93	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	4.3	5.3	6.4	7.3	8.5	9.4	5.9	6.6	22.9	19
Sodium, Total, ICAP				mg/l	55.1	61	157	170	89.5	90	109	110	570	550
Sulfate	250			mg/l	181	191	115	117	75.1	78.8	103	102	4.86	246
Surfactants	0.5			mg/l	ND	ND	ND	ND	0.073	ND	ND	0.073	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	3.82	3.99	ND	ND	ND	ND	8.66	9.93	ND	ND
Total Organic Carbon				mg/l	ND	0.6	1	1.2	0.6	0.8	0.6	0.8	34.5	20
Carbon Dioxide				mg/l	12.2	9.89	23	29.5	13.4	16.9	39.9	60.4	44.6	6.54
General Physical:														
Apparent Color	15			ACU	ND	ND	5	5	5	5	ND	ND	300	200
Lab pH				Units	7.7	7.8	7.5	7.4	7.6	7.5	7.2	7	7.9	8
Odor	3			TON	1	1	1	2	1	1	2	1	8	17
pH of CaCO3 saturation(25C)				Units	6.874	6.837	6.909	6.876	7.118	7.093	6.747	6.761	6.949	7.851
pH of CaCO3 saturation(60C)				Units	6.4	6.4	6.5	6.4	6.7	6.6	6.3	6.3	6.5	7.4
Specific Conductance	900			umho/cm	980	910	1490	1460	1120	1090	1710	1640	2630	2410
Radon				pCi/l	345	285	430	380	1700	1700	320	255	105	110
Metals:														
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	37	145
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	1.7	1.3	ND	1.6	ND	1.1	ND	1.7	3.5	1.9
Barium, Total, ICAP/MS	1000			ug/l	125	110	30	34	83	83	175	180	43	22
Chromium, Total, ICAP/MS	50			ug/l	29	18	27	16	16	12	28	15	7.7	3.1
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l		2	ND	ND	ND	ND	0.37	0.26	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	0.94	ND
Nickel, Total, ICAP/MS	100			ug/l	5.6	ND	ND	ND	ND	ND	7.7	ND	6	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND		ND	ND	ND		ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	59	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	27	ND
Volatile Organics:														
Trichloroethylene (TCE)	5			ug/l	1.1	1.3	ND	ND	ND	ND	22	39	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	8.7	17	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	0.5	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	11	18	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	0.5	1.1	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l	ND		ND		ND		ND		ND	ND

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Inglewood #2 Zone 3 9/28/00	La Mirada #1 Zone 1 10/27/99	La Mirada #1 Zone 1 5/23/00	La Mirada #1 Zone 2 10/27/99	La Mirada #1 Zone 2 5/23/00	La Mirada #1 Zone 3 10/27/99	La Mirada #1 Zone 3 5/23/00	La Mirada #1 Zone 4 10/27/99	La Mirada #1 Zone 4 5/23/00	La Mirada #1 Zone 5 10/27/99	La Mirada #1 Zone 5 5/23/00	Lakewood #1 Zone 1 10/26/99
General Mineral:																
Total Dissolved Solid (TDS)	500			mg/l	290	370	340	260	260	330	330	400	360	500	460	180
Cation Sum				meq/l	4.96	5.79	5.91	4.56	4.15	5.46	5.52	7.05	6.78	8.29	8.2	2.82
Anion Sum				meq/l	4.87	5.8	5.79	4.24	4.11	5.34	5.44	6.57	6.58	8.15	8.14	2.72
Iron, Total, ICAP	0.3			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	55	11	13	ND	9.6	18	23	65	76	55	73	3.6
Turbidity	5			NTU	0.2	ND	0.15	ND	0.1	ND	0.1	1.6	0.7	0.15	0.9	0.05
Alkalinity				mg/l	215	155	154	137	133	183	181	193	195	199	195	93
Boron	1			mg/l	0.18		0.14		0.085		0.13		0.13		0.13	
Bicarbonate as HCO3,calculated				mg/l	262	188	187	166	161	223	220	235	238	242	238	111
Calcium, Total, ICAP				mg/l	29	15.1	16	10.6	9.8	21.7	23	43.1	45	59.3	60	9.9
Carbonate as CO3, Calculated				mg/l	1.35	3.07	2.42	3.41	2.09	1.82	1.43	0.964	0.976	0.992	0.775	4.55
Hardness (Total, as CaCO3)				mg/l	118	51.7	53.5	33	31	83.8	85.4	169	170	229	232	26
Chloride	250			mg/l	19.8	25.1	25.1	14.8	14.6	15.3	16.7	26.2	25.3	66.3	68.2	18.8
Fluoride	2			mg/l	0.26	0.79	0.79	0.58	0.6	0.74	0.74	0.58	0.59	0.46	0.47	0.47
Hydroxide as OH, Calculated				mg/l	0.01	0.043	0.03	0.054	0.03	0.021	0.02	0.011	0.01	0.011	0.009	0.107
Langelier Index - 25 degree				None	0.34	0.41	0.33	0.3	0.053	0.34	0.26	0.36	0.38	0.51	0.41	0.4
Magnesium, Total, ICAP				mg/l	11	3.4	3.3	1.6	1.6	7.2	6.8	14.9	14	19.8	20	0.35
Nitrate-N by IC	10			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.11	2.08	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	6.6	2.2	2.2	2	2	2.5	2.6	3	2.9	3	3	ND
Sodium, Total, ICAP				mg/l	56	108	110	88.5	80	85.5	86	82.5	76	83.2	80	52.9
Sulfate	250			mg/l	ND	93.5	94	50.7	48.1	58.2	62.7	93.2	92.8	102	103	14.8
Surfactants	0.5			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.11	2.08	ND
Total Organic Carbon				mg/l	1.1	ND	ND	ND	ND	ND	0.9	ND	ND	ND	ND	0.8
Carbon Dioxide				mg/l	6.6	1.5	1.87	1.05	1.61	3.54	4.4	7.45	7.54	7.67	9.5	0.352
General Physical:																
Apparent Color	15			ACU	10	3	3	ND	ND	5	5	ND	3	ND	ND	15
Lab pH				Units	7.9	8.4	8.3	8.5	8.3	8.1	8	7.8	7.8	7.8	7.7	8.8
Odor	3			TON	4	1	1	1	1	1	1	1	2	1	2	4
pH of CaCO3 saturation(25C)				Units	7.564	7.992	7.969	8.2	8.247	7.76	7.741	7.439	7.415	7.288	7.29	8.404
pH of CaCO3 saturation(60C)				Units	7.1	7.5	7.5	7.8	7.8	7.3	7.3	7	7	6.8	6.8	8
Specific Conductance	900			umho/cm	480	585	570	430	410	530	520	650	625	800	775	285
Radon				pCi/l	127	124	130	164	180	151	120	216	250	189	910	265
Metals:																
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	1.6	7.8	7.8	10	14	9.3	11	11	5.6	3.2	4.2	12
Barium, Total, ICAP/MS	1000			ug/l	13	48	51	22	18	32	34	30	38	39	50	16
Chromium, Total, ICAP/MS	50			ug/l	2.1	10	10	11	8.2	17	12	14	14	16	9.6	7.1
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	0.67	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics:																
Trichloroethylene (TCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l	ND	ND		ND		ND		ND		ND		ND

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Lakewood #1 Zone 1 5/25/00	Lakewood #1 Zone 2 10/26/99	Lakewood #1 Zone 2 5/25/00	Lakewood #1 Zone 3 10/26/99	Lakewood #1 Zone 3 5/25/00	Lakewood #1 Zone 4 10/26/99	Lakewood #1 Zone 4 5/25/00	Lakewood #1 Zone 5 10/26/99	Lakewood #1 Zone 5 5/25/00	Lakewood #1 Zone 6 10/26/99
General Mineral:														
Total Dissolved Solid (TDS)	500			mg/l	160	190	190	220	210	250	240	240	230	770
Cation Sum				meq/l	2.83	3.32	3.5	3.72	3.97	4.34	4.38	4.13	4.31	12.2
Anion Sum				meq/l	2.73	3.2	4.68	3.64	3.72	4.29	4.15	4.05	4.1	12.4
Iron, Total, ICAP	0.3			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	0.1	0.18
Manganese, Total, ICAP/MS	50			ug/l	3.2	18	19	25	27	115	115	53	53	530
Turbidity	5			NTU	ND	0.4	0.6	2.2	14	1.9	0.2	0.9	0.4	0.5
Alkalinity				mg/l	93	135	209	153	157	172	174	174	176	195
Boron	1			mg/l	0.05		ND		0.059		0.058		0.078	
Bicarbonate as HCO3,calculated				mg/l	111	164	253	186	190	209	211	212	214	238
Calcium, Total, ICAP				mg/l	10	31.1	33	38.3	42	47.4	48	46.4	49	167
Carbonate as CO3, Calculated				mg/l	4.55	2.13	4.13	2.41	3.1	1.08	2.17	1.38	2.2	0.389
Hardness (Total, as CaCO3)				mg/l	26.4	93	98	115	125	143	143	151	158	486
Chloride	250			mg/l	18.9	5.91	5.97	8.82	8.6	18.5	12.7	8.99	9.25	271
Fluoride	2			mg/l	0.44	0.27	0.24	0.3	0.29	0.77	0.23	0.49	0.47	0.15
Hydroxide as OH, Calculated				mg/l	0.1	0.034	0.04	0.034	0.04	0.014	0.03	0.017	0.03	0.004
Langelier Index - 25 degree				None	0.4	0.6	0.88	0.7	0.86	0.5	0.76	0.5	0.78	0.6
Magnesium, Total, ICAP				mg/l	0.35	3.8	3.8	4.8	5	5.9	5.7	8.6	8.6	16.7
Nitrate-N by IC	10			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	ND	2.1	2.3	2.4	2.5	2.6	2.8	2.5	2.7	5.2
Sodium, Total, ICAP				mg/l	53	32.1	34	31.1	32	32.5	33	23.8	25	52.9
Sulfate	250			mg/l	15	15.1	15.2	15.2	15.4	14	14.6	14	14.2	40.4
Surfactants	0.5			mg/l	ND	ND	ND	0.061	ND	0.132	ND	0.137	ND	0.329
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon				mg/l	0.9	ND	ND	ND	ND	ND	ND	ND	ND	1.6
Carbon Dioxide				mg/l	0.352	1.64	2.01	1.86	1.51	5.26	2.66	4.24	2.7	18.9
General Physical:														
Apparent Color	15			ACU	15	3	3	3	5	3	5	5	ND	5
Lab pH				Units	8.8	8.3	8.4	8.3	8.4	7.9	8.2	8	8.2	7.4
Odor	3			TON	4	1	1	1	2	4	2	2	2	3
pH of CaCO3 saturation(25C)				Units	8.4	7.737	7.523	7.592	7.543	7.449	7.439	7.452	7.424	6.846
pH of CaCO3 saturation(60C)				Units	8	7.3	7.1	7.1	7.1	7	7	7	7	6.4
Specific Conductance	900			umho/cm	280	310	310	350	350	415	400	390	390	1240
Radon				pCi/l	240	71	92	235	220	280	240	87	83	95
Metals:														
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	11	2.4	2.6	1.5	1.4	17	18	3.9	3.7	18
Barium, Total, ICAP/MS	1000			ug/l	15	22	22	29	28	100	100	110	105	530
Chromium, Total, ICAP/MS	50			ug/l	ND	9.9	6.2	13	6.5	14	4.6	16	4.1	19
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics:														
Trichloroethylene (TCE)	5			ug/l	ND	ND	ND	ND	ND		ND		ND	
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND		ND		ND	
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND		ND		ND	
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND		ND		ND	
Benzene	1			ug/l	ND	ND	ND	ND	ND		ND		ND	
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND		ND		ND	
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND		ND		ND	
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND		ND		ND	
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND		ND		ND	
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND		ND		ND	
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND		ND		ND	
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND		ND		ND	
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND		ND		ND	
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND		ND		ND	
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND		ND		ND	
Freon 12				ug/l	ND	ND	ND	ND	ND		ND		ND	
Perchlorate	18			ug/l		ND		ND		ND		ND		ND

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Lakewood #1 Zone 6 5/25/00	Lomita #1 Zone 1 5/4/00	Lomita #1 Zone 2 5/4/00	Lomita #1 Zone 3 5/4/00	Lomita #1 Zone 4 5/4/00	Lomita #1 Zone 5 5/4/00	Lomita #1 Zone 6 4/28/00	Long Beach #1 Zone 1 5/25/00	Long Beach #1 Zone 2 5/25/00	Long Beach #1 Zone 3 5/25/00	Long Beach #1 Zone 4 5/25/00	Long Beach #1 Zone 5 5/25/00	Long Beach #1 Zone 6 5/25/00
General Mineral:																	
Total Dissolved Solid (TDS)	500			mg/l	740	1370	870	770	680	1050	930	220	200	180	240	1750	700
Cation Sum				meq/l	12.5	21.1	15.3	13.5	12.1	17.6	16.5	3.91	3.6	3.22	4.26	29.7	13.1
Anion Sum				meq/l	12.5	24.1	16.1	14	11.3	18.4	16.2	3.65	3.5	3.05	3.82	29.9	13
Iron, Total, ICAP	0.3			mg/l	0.19	ND	ND	ND	ND	0.13	ND	0.11	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	510	230	150	115	105	205	58	3.7	2	8	25	410	330
Turbidity	5			NTU	2.5	0.55	26	2.5	1	0.7	22	1	0.2	6.6	15	2.1	1.4
Alkalinity				mg/l	197	231	238	284	256	223	225	160	153	122	148	153	209
Boron	1			mg/l	0.098	0.95	0.38	0.38	0.43	0.59	0.23	0.19	0.19	0.075	0.093	0.085	0.085
Bicarbonate as HCO3,calculated				mg/l	240	281	290	346	311	272	274	190	183	146	180	186	254
Calcium, Total, ICAP				mg/l	170	110	110	87	67	120	89	3.4	2.9	4.8	12	280	150
Carbonate as CO3, Calculated				mg/l	1.24	1.15	1.5	2.25	2.54	1.4	0.282	12.3	9.45	5.99	1.85	1.21	2.62
Hardness (Total, as CaCO3)				mg/l	490	386	402	316	245	431	354	11.4	8.06	13.3	34.9	868	473
Chloride	250			mg/l	268	665	361	264	200	469	197	15	14.6	11.4	12.6	735	138
Fluoride	2			mg/l	0.14	0.1	0.12	0.14	0.2	0.12	ND	0.6	0.6	0.54	0.34	0.17	0.27
Hydroxide as OH, Calculated				mg/l	0.01	0.01	0.01	0.02	0.02	0.01	0.003	0.2	0.1	0.1	0.03	0.02	0.03
Langelier Index - 25 degree				None	1.1	0.84	0.96	1	0.97	0.97	0.14	0.37	0.18	0.2	0.089	1.3	1.3
Magnesium, Total, ICAP				mg/l	16	27	31	24	19	32	32	0.72	0.2	0.33	1.2	41	24
Nitrate-N by IC	10			mg/l	ND	1.46	ND	ND	ND	ND	10.8	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	5.8	13	11	9.5	8.7	12	11	1.1	ND	ND	1.7	6.3	3.9
Sodium, Total, ICAP				mg/l	58	300	160	160	160	200	210	84	79	68	81	280	80
Sulfate	250			mg/l	46.4	30.6	55.5	40	27.6	31.7	259	ND	ND	12.6	23.6	292	234
Surfactants	0.5			mg/l	0.316	0.078	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	1.46	ND	ND	ND	ND	10.8	ND	ND	ND	ND	ND	ND
Total Organic Carbon				mg/l	1.8	1.8	1.5	2.8	2.4	1.6	1.7	4.9	4.6	2.3	1.8	1.2	1.2
Carbon Dioxide				mg/l	6.04	8.91	7.3	6.92	4.94	6.85	34.6	0.38	0.461	0.463	2.27	3.72	3.21
General Physical:																	
Apparent Color	15			ACU	3	3	5	20	20	10	ND	100	120	30	15	ND	ND
Lab pH				Units	7.9	7.8	7.9	8	8.1	7.9	7.2	9	8.9	8.8	8.2	8	8.2
Odor	3			TON	2	3	2	2	3	2	1	2	1	2	2	2	2
pH of CaCO3 saturation(25C)				Units	6.834	6.955	6.941	6.966	7.126	6.931	7.058	8.635	8.72	8.599	8.111	6.728	6.864
pH of CaCO3 saturation(60C)				Units	6.4	6.5	6.5	6.5	6.7	6.5	6.6	8.2	8.3	8.2	7.7	6.3	6.4
Specific Conductance	900			umho/cm	1230	2250	1410	1260	1120	1720	1530	350	345	305	385	2890	1170
Radon				pCi/l	87	79	160	110	99	160	ND	230	140	100	73	120	83
Metals:																	
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	26	ND	ND	ND	ND	55	31	50	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	15	ND	ND	ND	ND	ND	3.6	1.1	1.1	ND	3.8	7.9	11
Barium, Total, ICAP/MS	1000			ug/l	490	84	62	45	37	70	28	2.9	2.4	ND	3.5	250	285
Chromium, Total, ICAP/MS	50			ug/l	6.9	14	13	14	12	12	14	2.1	2.3	5.8	6.8	7.7	10
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	17	ND	ND	ND	ND
Volatile Organics:																	
Trichloroethylene (TCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l													

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Long Beach #2 Zone 1 4/12/00	Long Beach #2 Zone 2 9/14/00	Long Beach #2 Zone 3 4/13/00	Long Beach #2 Zone 4 4/13/00	Long Beach #2 Zone 5 4/13/00	Long Beach #2 Zone 6 4/13/00	Pico #1 Zone 2 11/3/99	Pico #1 Zone 2 5/31/00	Pico #1 Zone 3 11/3/99	Pico #1 Zone 3 5/31/00	Pico #1 Zone 4 11/3/99	Pico #1 Zone 4 5/31/00	Pico #2 Zone 1 11/4/99
General Mineral:																	
Total Dissolved Solid (TDS)	500			mg/l	400	360	250	290	780	1040	290	270	480	480	580	580	490
Cation Sum				meq/l	7.42	5.11	4.47	5.47	15.2	21.4	5.01	5	9.03	9.27	9.98	11.4	8.65
Anion Sum				meq/l	6.8	4.86	4.1	4.99	15.3	22.6	4.85	4.87	9.02	8.01	10.2	11	8.68
Iron, Total, ICAP	0.3			mg/l	0.12	ND	ND	ND	0.1	0.15	0.21	0.22	0.36	0.37	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	13	19	11	22	145	390	46	49	18	19	2	2.2	520
Turbidity	5			NTU	0.2	70	1.4	10	0.6	0.65	3.7	2	4.2	3.1	0.3	ND	0.1
Alkalinity				mg/l	307	207	137	146	288	311	159	164	192	198	204	217	178
Boron	1			mg/l	0.55	0.2	0.15	0.11	0.25	0.31		ND		0.088		0.18	
Bicarbonate as HCO3,calculated				mg/l	372	251	166	177	351	379	194	200	234	241	249	265	217
Calcium, Total, ICAP				mg/l	6.9	13	14	39	160	230	61.9	63	111	120	102	130	71.7
Carbonate as CO3, Calculated				mg/l	6.07	2.59	3.41	1.82	0.908	0.779	0.632	0.651	0.382	0.624	0.406	0.545	0.354
Hardness (Total, as CaCO3)				mg/l	23.4	39.4	40.7	115	490	714	202	203	365	382	336	419	268
Chloride	250			mg/l	22.5	20.9	25.8	33.7	113	189	15.8	14.9	59.8	46.2	76.5	85	75.8
Fluoride	2			mg/l	0.53	0.42	0.44	0.29	0.16	0.26	0.33	0.37	0.29	0.34	0.32	0.28	0.39
Hydroxide as OH, Calculated				mg/l	0.04	0.03	0.05	0.03	0.007	0.005	0.00852	0.009	0.00427	0.007	0.00427	0.005	0.00427
Langelier Index - 25 degree				None	0.36	0.27	0.42	0.59	0.9	1	0.33	0.36	0.37	0.62	0.36	0.59	0.15
Magnesium, Total, ICAP				mg/l	1.5	1.7	1.4	4.3	22	34	11.5	11	21.3	20	19.8	23	21.6
Nitrate-N by IC	10			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.47	2.44	1.76
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	ND	2.4	1.7	2.9	6.7	4.7	3	2.8	4	3.9	4.8	5	7.2
Sodium, Total, ICAP				mg/l	160	98	83	71	120	160	20.4	20	37.4	35	71.9	67	71.4
Sulfate	250			mg/l	ND	5.02	29.2	53	305	532	58	55.4	167	131	180	195	136
Surfactants	0.5			mg/l	ND	ND	ND	ND	0.066	0.078	0.396	ND	ND	ND	ND	ND	0.059
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.47	2.86	1.76
Total Organic Carbon				mg/l	14.4	5	1.5	1.1	1.2	1.4	ND	ND	ND	ND	ND	ND	1.1
Carbon Dioxide				mg/l	2.96	3.17	1.05	2.23	17.6	24	7.74	7.98	18.6	12.1	19.8	16.8	17.3
General Physical:																	
Apparent Color	15			ACU	300	60	20	10	3	3	3	3	ND	10	ND	ND	5
Lab pH				Units	8.4	8.2	8.5	8.2	7.6	7.5	7.7	7.7	7.4	7.6	7.4	7.5	7.4
Odor	3			TON	4	1	4	4	2	4	2	2	1	1	1	2	1
pH of CaCO3 saturation(25C)				Units	8.036	7.931	8.079	7.606	6.696	6.505	7.366	7.345	7.03	6.984	7.04	6.908	7.253
pH of CaCO3 saturation(60C)				Units	7.6	7.5	7.6	7.2	6.3	6.1	6.9	6.9	6.6	6.5	6.6	6.5	6.8
Specific Conductance	900			umho/cm	655	450	405	480	1290	1750	480	435	840	800	955	955	835
Radon				pCi/l	59	77	65	117	280	175	240	290	1100	1450	120	157	170
Metals:																	
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	73	43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	1.2	5.1	ND	2.8	9	2.8	1.1	1.1	ND	ND	3.7	3	13
Barium, Total, ICAP/MS	1000			ug/l	6.6	4.8	12	18	77	110	62	67	47	50	62	71	130
Chromium, Total, ICAP/MS	50			ug/l	2.5	3.6	ND	12	25	29	14	6.7	20	9.9	21	7.2	13
Copper, Total, ICAP/MS	1000	1300		ug/l	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.4
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	7	10	ND	ND	7.2	ND	6.8	ND	6.9
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics:																	
Trichloroethylene (TCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	0.5	0.5	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l							ND		ND		ND		ND

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	Pico #2 Zone 1 5/30/00	Pico #2 Zone 2 11/4/99	Pico #2 Zone 2 5/30/00	Pico #2 Zone 3 11/4/99	Pico #2 Zone 3 5/30/00	Pico #2 Zone 4 11/4/99	Pico #2 Zone 4 5/30/00	Pico #2 Zone 5 11/4/99	Pico #2 Zone 5 5/30/00	Pico #2 Zone 6 11/4/99	Pico #2 Zone 6 5/30/00	PM-3 Madrid Zone 1 5/3/00	PM-3 Madrid Zone 2 5/3/00
General Mineral:																	
Total Dissolved Solid (TDS)	500			mg/l	420	500	500	490	460	520	520	490	450	500	340	380	280
Cation Sum				meq/l	7.79	8.99	9.3	8.32	9.35	9.02	9.29	8.28	7.94	8.49	5.86	7.1	5.02
Anion Sum				meq/l	7.61	9.12	9.2	8.54	8.8	9.21	9.31	8.44	7.96	8.69	5.77	7.11	5
Iron, Total, ICAP	0.3			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.15
Manganese, Total, ICAP/MS	50			ug/l	54	ND	ND	ND	19	34	19	10	14	1000	640	50	58
Turbidity	5			NTU	0.8	ND	0.4	0.1	0.35	ND	0.2	ND	0.05	0.05	0.3	3.6	0.2
Alkalinity				mg/l	165	231	235	191	194	175	171	164	160	156	118	324	198
Boron	1			mg/l	0.13		0.11		0.12		0.27		0.23		0.18	0.31	0.093
Bicarbonate as HCO3,calculated				mg/l	201	282	286	233	236	213	208	200	195	190	144	393	241
Calcium, Total, ICAP				mg/l	76	115	120	102	120	80.4	86	72.5	65	69.2	40	14	38
Carbonate as CO3, Calculated				mg/l	0.52	0.73	1.17	0.603	1.22	0.438	0.538	0.411	0.504	0.246	0.296	5.1	1.97
Hardness (Total, as CaCO3)				mg/l	272	380	394	338	390	271	285	253	224	260	149	76.1	140
Chloride	250			mg/l	58.6	55.7	56.5	59.7	62.7	94.8	97.3	86	77.7	96.6	55	21.7	36.3
Fluoride	2			mg/l	0.38	0.28	0.31	0.34	0.37	0.43	0.47	0.33	0.34	0.4	0.52	0.3	0.37
Hydroxide as OH, Calculated				mg/l	0.007	0.00677	0.01	0.00677	0.01	0.00538	0.007	0.00538	0.007	0.00339	0.005	0.03	0.02
Langelier Index - 25 degree				None	0.34	0.67	0.89	0.53	0.91	0.29	0.41	0.22	0.26	-0.019	-0.09	0.6	0.62
Magnesium, Total, ICAP				mg/l	20	22.7	23	20.3	22	17.1	17	17.4	15	21.3	12	10	11
Nitrate-N by IC	10			mg/l	1.88	2.88	2.79	3.19	3.26	3.15	3.13	1.84	1.25	1.55	1.3	ND	ND
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	6.8	3.6	3.9	3.7	4	4.3	4.4	4.1	4.2	6.2	5.2	14	3.2
Sodium, Total, ICAP				mg/l	50	29.4	30	33.4	33	80.2	80	71.7	77	71.7	63	120	49
Sulfate	250			mg/l	120	130	129	134	139	134	139	124	118	130	83.6	ND	ND
Surfactants	0.5			mg/l	ND	ND	ND	0.09	ND	0.519	0.055	0.051	0.051	ND	0.103	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	1.88	2.88	2.79	3.19	3.26	3.15	3.13	1.84	1.25	1.55	1.3	ND	ND
Total Organic Carbon				mg/l	1.2	ND	0.7	ND	ND	0.7	0.9	0.9	1.2	1.4	1.5	3.2	0.5
Carbon Dioxide				mg/l	10.1	14.2	9.07	11.7	5.94	13.5	10.4	12.6	9.8	19	9.11	3.94	3.83
General Physical:																	
Apparent Color	15			ACU	3	ND	ND	ND	ND	ND	3	ND	ND	5	10	25	5
Lab pH				Units	7.6	7.6	7.8	7.6	7.9	7.5	7.6	7.5	7.6	7.3	7.5	8.3	8.1
Odor	3			TON	1	1	1	1	1	1	1	1	2	1	2	2	2
pH of CaCO3 saturation(25C)				Units	7.261	6.934	6.909	7.069	6.993	7.211	7.192	7.284	7.342	7.326	7.685	7.704	7.483
pH of CaCO3 saturation(60C)				Units	6.8	6.5	6.5	6.6	6.5	6.8	6.7	6.8	6.9	6.9	7.2	7.3	7
Specific Conductance	900			umho/cm	715	830	820	785	780	885	840	820	740	855	565	610	455
Radon				pCi/l	185	250	250	250	240	290	235	240	220	280	220	ND	160
Metals:																	
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	7.9	3.2	2.8	2.2	3.4	3.7	3.4	1.7	1.5	26	30	ND	ND
Barium, Total, ICAP/MS	1000			ug/l	117	135	145	165	70	66	70	83	80	150	89	31	22
Chromium, Total, ICAP/MS	50			ug/l	10	20	12	16	10	15	10	15	8	14	5.5	19	9.2
Copper, Total, ICAP/MS	1000	1300		ug/l	3.4	ND	ND	ND	ND	ND	ND	ND	2.7	3.9	2.7	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	1.3	ND	0.84	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	7.5	ND	6.4	ND	7.3	ND	7	ND	7.1	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics:																	
Trichloroethylene (TCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	3.6	3.4	12	11	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l		ND		ND		ND		ND		ND			

TABLE 4.2
WATER QUALITY RESULTS REGIONAL GROUNDWATER MONITORING
WATER YEAR 1999-2000

CONSTITUENT	PRIM. MCL	SEC. MCL	ACTION LEVEL	UNITS	PM-3 Madrid Zone 3 5/3/00	PM-3 Madrid Zone 4 5/3/00	PM-4 Mariner Zone 1 6/4/00	PM-4 Mariner Zone 2 6/4/00	PM-4 Mariner Zone 3 6/4/00	PM-4 Mariner Zone 4 6/4/00	Rio Hondo #1 Zone 1 10/13/99	Rio Hondo #1 Zone 1 5/31/00	Rio Hondo #1 Zone 2 10/13/99	Rio Hondo #1 Zone 2 5/31/00	Rio Hondo #1 Zone 3 10/13/99	Rio Hondo #1 Zone 3 5/31/00
General Mineral:																
Total Dissolved Solid (TDS)	500			mg/l	590	800	330	9200	820	680	260	260	410	420	430	400
Cation Sum				meq/l	10.8	13.4	6.05	166	14.5	11.9	4.44	4.51	7.31	7.62	7.31	7.26
Anion Sum				meq/l	11.2	14.2	6.03	174	14.5	12.1	4.31	4.54	7.17	7.64	6.94	7.18
Iron, Total, ICAP	0.3			mg/l	0.12	0.46	0.11	0.28	ND	0.22	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	50			ug/l	66	330	48	1300	115	115	22	31	88	75	7.8	5.6
Turbidity	5			NTU	16	2.7	0.17	1.8	3.31	0.68	2.4	2	0.15	0.2	0.1	0.2
Alkalinity				mg/l	195	204	261	163	159	187	142	149	162	169	148	155
Boron	1			mg/l	0.1	0.31	0.17	0.18	0.26	0.27		0.055		ND		0.14
Bicarbonate as HCO3,calculated				mg/l	238	249	317	199	193	228	173	181	197	206	180	189
Calcium, Total, ICAP				mg/l	99	110	29	1400	120	93	40	42	94.2	100	80.2	82
Carbonate as CO3, Calculated				mg/l	0.775	0.644	2.59	0.258	1.25	1.18	1.42	1.48	0.808	0.533	0.586	0.489
Hardness (Total, as CaCO3)				mg/l	362	398	122	5180	431	327	133	139	109	320	261	262
Chloride	250			mg/l	252	316	27.8	5560	164	139	17.7	18.7	62.3	51.5	53.9	55.3
Fluoride	2			mg/l	0.33	0.27	0.4	0.14	0.29	0.31	0.26	0.24	0.22	0.35	0.32	0.35
Hydroxide as OH, Calculated				mg/l	0.009	0.007	0.02	0.003	0.02	0.01	0.021	0.02	0.011	0.007	0.009	0.007
Langelier Index - 25 degree				None	0.63	0.59	0.62	1.3	0.92	0.78	0.5	0.54	0.6	0.47	0.4	0.34
Magnesium, Total, ICAP				mg/l	28	30	12	410	32	23	8.1	8.3	16.8	17	14.7	14
Nitrate-N by IC	10			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.39	2.42
Nitrite, Nitrogen by IC	1			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP				mg/l	5.1	6.7	7	43	7	6.6	2.9	2.9	3.6	3.6	3.8	3.7
Sodium, Total, ICAP				mg/l	79	120	79	1400	130	120	39.1	38	25.8	26	45.8	44
Sulfate	250			mg/l	7.39	58.5	ND	650	322	213	45.9	48.9	123	134	109	112
Surfactants	0.5			mg/l	ND	ND	ND	0.118	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	45			mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.39	ND
Total Organic Carbon				mg/l	1	1.3	1.4	1.3	1.4	1	ND	ND	ND	ND	ND	0.5
Carbon Dioxide				mg/l	9.5	12.5	5.04	19.9	3.86	5.74	2.75	2.88	6.24	10.3	7.18	9.49
General Physical:																
Apparent Color	15			ACU	3	5	10	3	3	5	ND	3	ND	3	ND	ND
Lab pH				Units	7.7	7.6	8.1	7.3	8	7.9	8.1	8.1	7.8	7.6	7.7	7.6
Odor	3			TON	2	4	ND	ND	8	ND	1	3	1	3	1	2
pH of CaCO3 saturation(25C)				Units	7.073	7.007	7.482	6	7.08	7.119	7.605	7.564	7.176	7.131	7.286	7.255
pH of CaCO3 saturation(60C)				Units	6.6	6.6	7	5.6	6.6	6.7	7.2	7.1	6.7	6.7	6.8	6.8
Specific Conductance	900			umho/cm	990	1320	565	15300	1340	1150	425	420	700	675	690	660
Radon				pCi/l	93	240	87	70	62	670	160	134	360	260	350	275
Metals:																
Aluminum, Total, ICAP/MS	1000	200		ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	6			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	50			ug/l	1.5	4.5	ND		ND	ND	ND	ND	ND	1	2.6	2.3
Barium, Total, ICAP/MS	1000			ug/l	64	80	27	340	125	58	16	16	52	56	110	115
Chromium, Total, ICAP/MS	50			ug/l	11	13	13	9.3	2.8	7.4	9.7	6.3	13	7.2	13	5.9
Copper, Total, ICAP/MS	1000	1300		ug/l	ND	ND	ND	5.7	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.38	0.3
Lead, Total, ICAP/MS	15			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	100			ug/l	ND	7.4	ND	49	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	50			ug/l	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	100			ug/l	ND	ND	ND	2.4	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	5000			ug/l	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics:																
Trichloroethylene (TCE)	5			ug/l	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5			ug/l	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6			ug/l	ND	65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	100			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	6			ug/l	1.4	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-Isopropyl Ether				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert-butyl ether (MTBE)	13	5	13	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	150			ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 12				ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perchlorate	18			ug/l							ND		ND		ND	

FIGURES

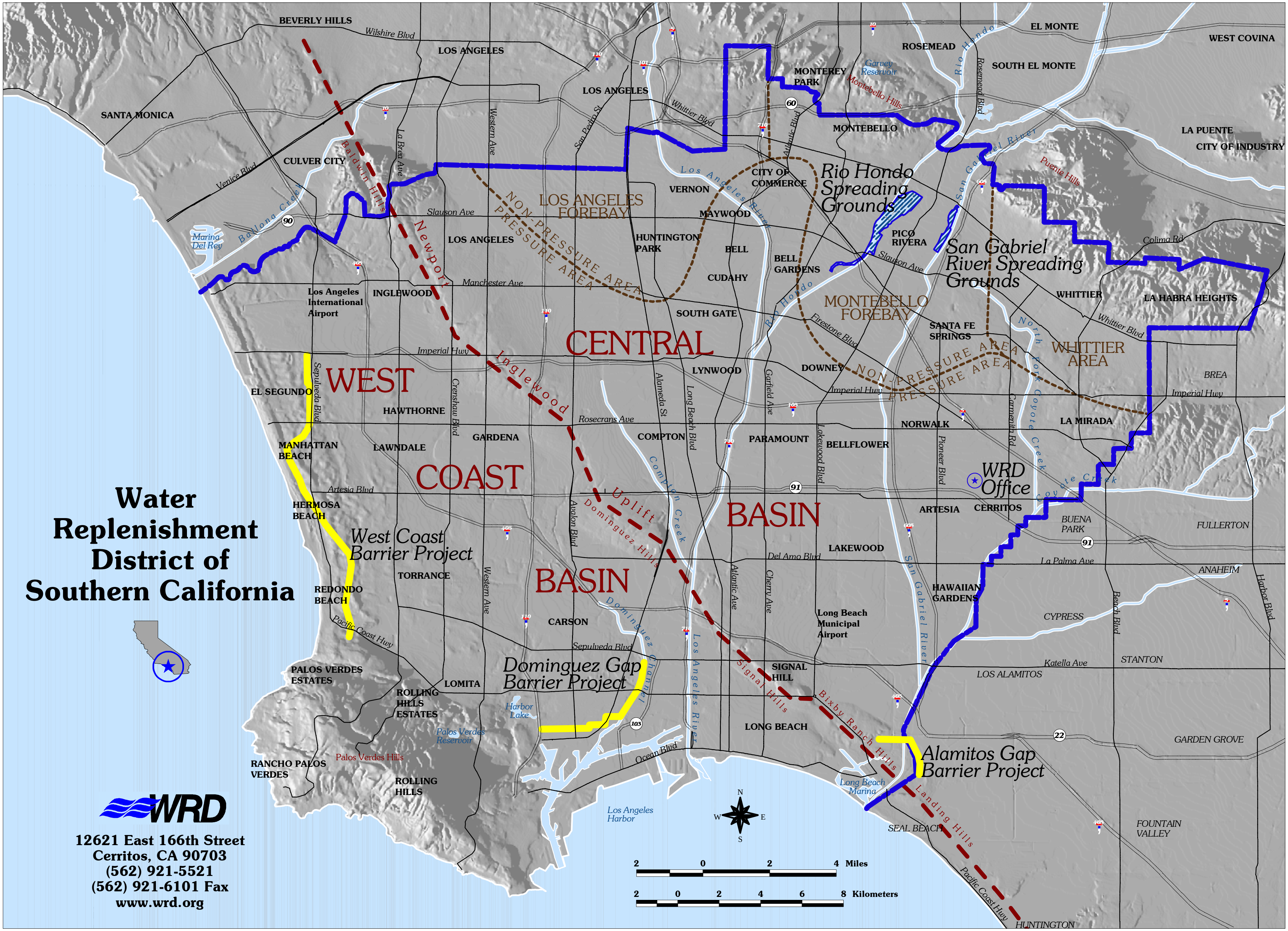
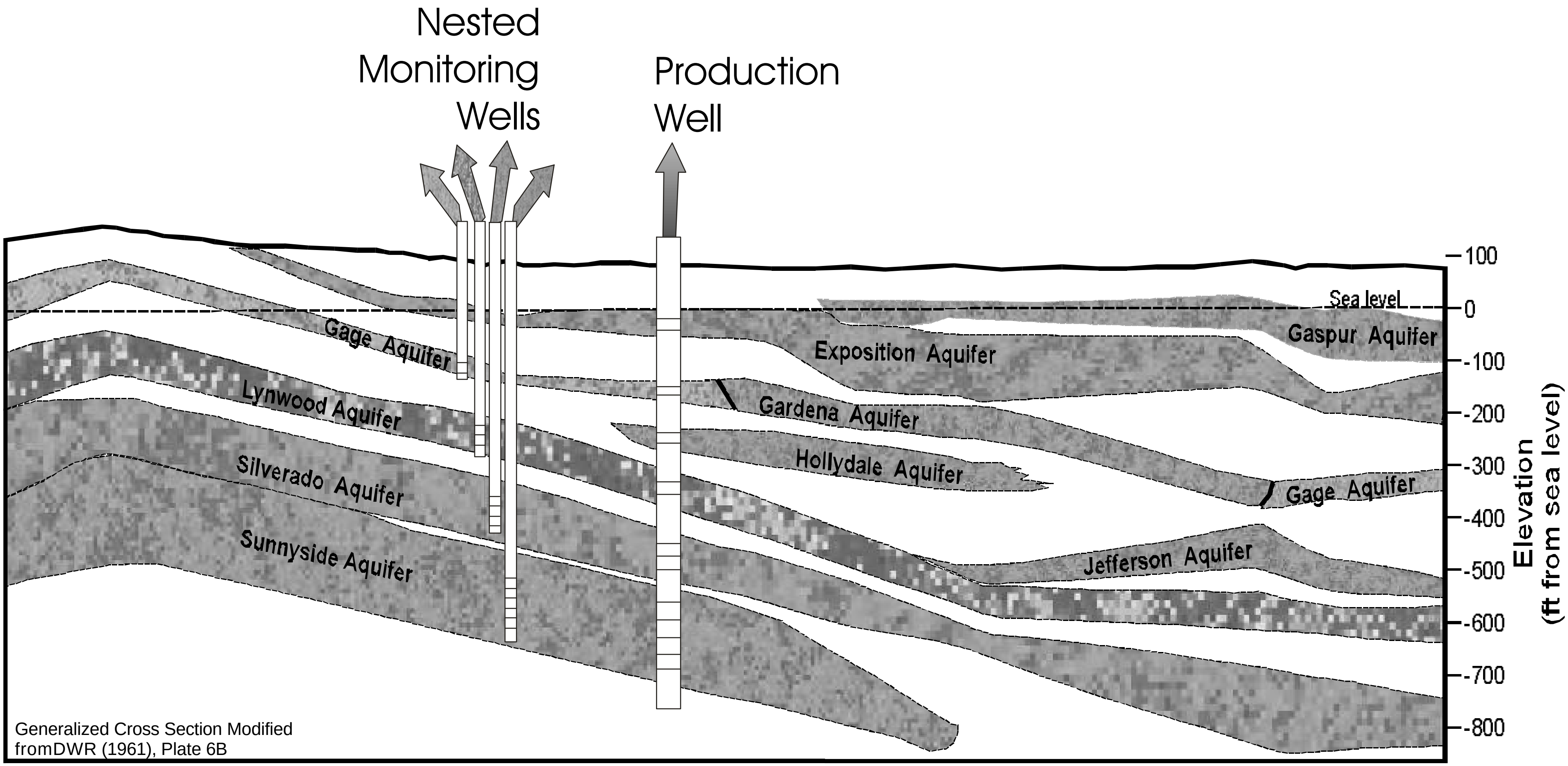

Water Replenishment District of Southern California
WRD
12621 East 166th Street
Cerritos, CA 90703
(562) 921-5521
(562) 921-6101 Fax
www.wrd.org
WEST
COAST
BASIN
CENTRAL
BASIN
LOS ANGELES FOREBAY
MONTEBELLO FOREBAY
WHITTIER AREA
NON-PRESSURE AREA
PRESSURE AREA
Rio Hondo Spreading Grounds
San Gabriel River Spreading Grounds
West Coast Barrier Project
Dominguez Gap Barrier Project
Alamitos Gap Barrier Project
WRD Office
Newport
Inglewood
Uplift
Baldwin Hills
Dominguez Hills
Signal Hills
Bixby Ranch Hills
Landing Hills
Palos Verdes Hills
Montebello Hills
Puente Hills
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
Marina Del Rey
EL MONTE
ROSEMEAD
SOUTH EL MONTE
WEST COVINA
MONTEREY PARK
MONTEBELLO
LA PUENTE
CITY OF INDUSTRY
VERNON
CITY OF COMMERCE
MAYWOOD
HUNTINGTON PARK
BELL
BELL GARDENS
CUDAHY
PICO RIVERA
WHITTIER
LA HABRA HEIGHTS
SOUTH GATE
Los Angeles International Airport
INGLEWOOD
SANTA FE SPRINGS
LYNWOOD
DOWNEY
EL SEGUNDO
HAWTHORNE
BREA
LA MIRADA
NORWALK
MANHATTAN BEACH
LAWNDALE
GARDENA
COMPTON
PARAMOUNT
BELLFLOWER
HERMOSA BEACH
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
LAKEWOOD
TORRANCE
REDONDO BEACH
HAWAIIAN GARDENS
ANAHEIM
CARSON
Long Beach Municipal Airport
CYPRESS
STANTON
LOS ALAMITOS
SIGNAL HILL
PALOS VERDES ESTATES
LOMITA
ROLLING HILLS ESTATES
Harbor Lake
Palos Verdes Reservoir
LONG BEACH
GARDEN GROVE
RANCHO PALOS VERDES
ROLLING HILLS
Long Beach Marina
Los Angeles Harbor
SEAL BEACH
FOUNTAIN VALLEY
HUNTINGTON
Garvey Reservoir
Wilshire Blvd
Whittier Blvd
Venice Blvd
Ballona Creek
Slauson Ave
Manchester Ave
Imperial Hwy
Rosecrans Ave
Artesia Blvd
Del Amo Blvd
Sepulveda Blvd
Pacific Coast Hwy
Ocean Blvd
Firestone Blvd
Colima Rd
La Palma Ave
Katella Ave
La Brea Ave
Western Ave
San Pedro St
Atlantic Blvd
Crenshaw Blvd
Alameda St
Long Beach Blvd
Garfield Ave
Lakewood Blvd
Pioneer Blvd
Carmenita Rd
Avalon Blvd
Atlantic Ave
Cherry Ave
Beach Blvd
Harbor Blvd
Rosemead Blvd
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
N
E
S
W
2 0 2 4 Miles
2 0 2 4 6 8 Kilometers

Figure 1.1

NESTED WELLS versus PRODUCTION WELLS FOR AQUIFER-SPECIFIC DATA



Production wells are typically perforated across multiple aquifers producing an average water quality. Nested monitoring wells are screened in a portion of a specific aquifer, providing water quality and water level information for the specific zone.

WRD

Figure 1.2

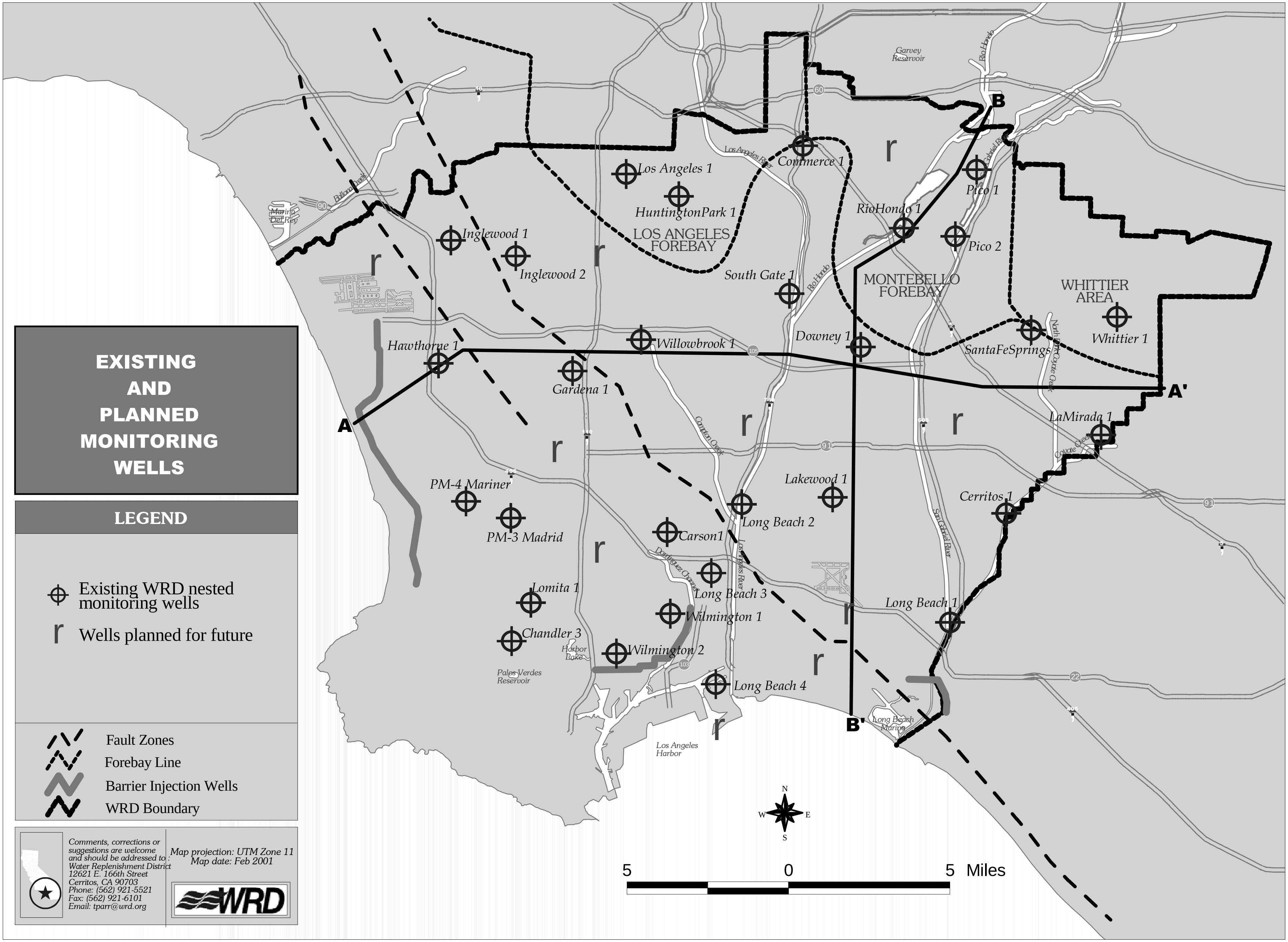
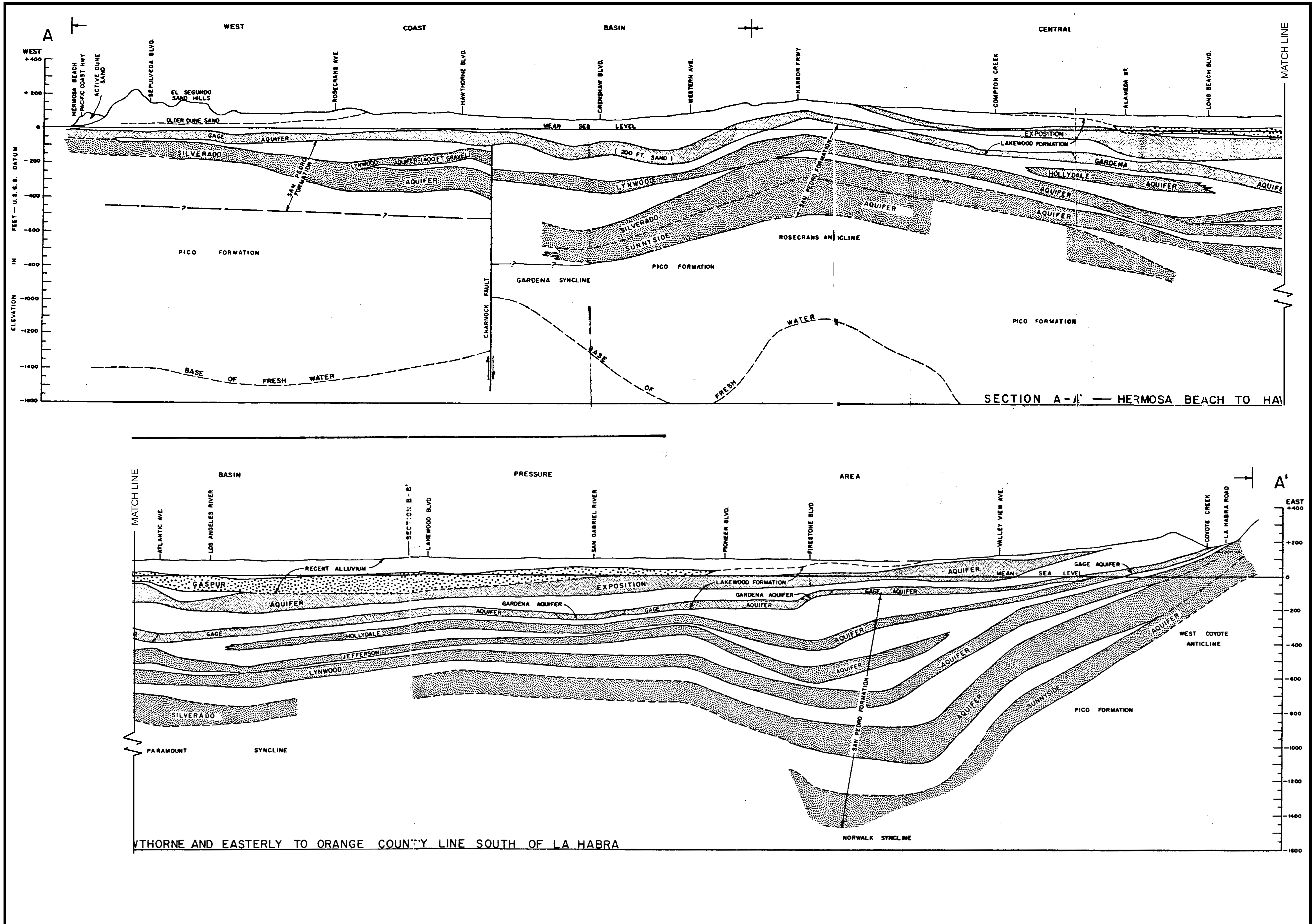

EXISTING AND PLANNED MONITORING WELLS
LEGEND
Existing WRD nested monitoring wells
r Wells planned for future
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to: Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
5 0 5 Miles
N
W
E
S
LOS ANGELES FOREBAY
MONTEBELLO FOREBAY
WHITTIER AREA
A
A'
B
B'
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Pico 2
RioHondo 1
South Gate 1
Inglewood 1
Inglewood 2
Hawthorne 1
Willowbrook 1
Gardena 1
Downey 1
SantaFeSprings
Whittier 1
LaMirada 1
Lakewood 1
Cerritos 1
Long Beach 2
PM-4 Mariner
PM-3 Madrid
Carson1
Long Beach 3
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
Long Beach 4
Marina Del Rey
Garvey Reservoir
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina

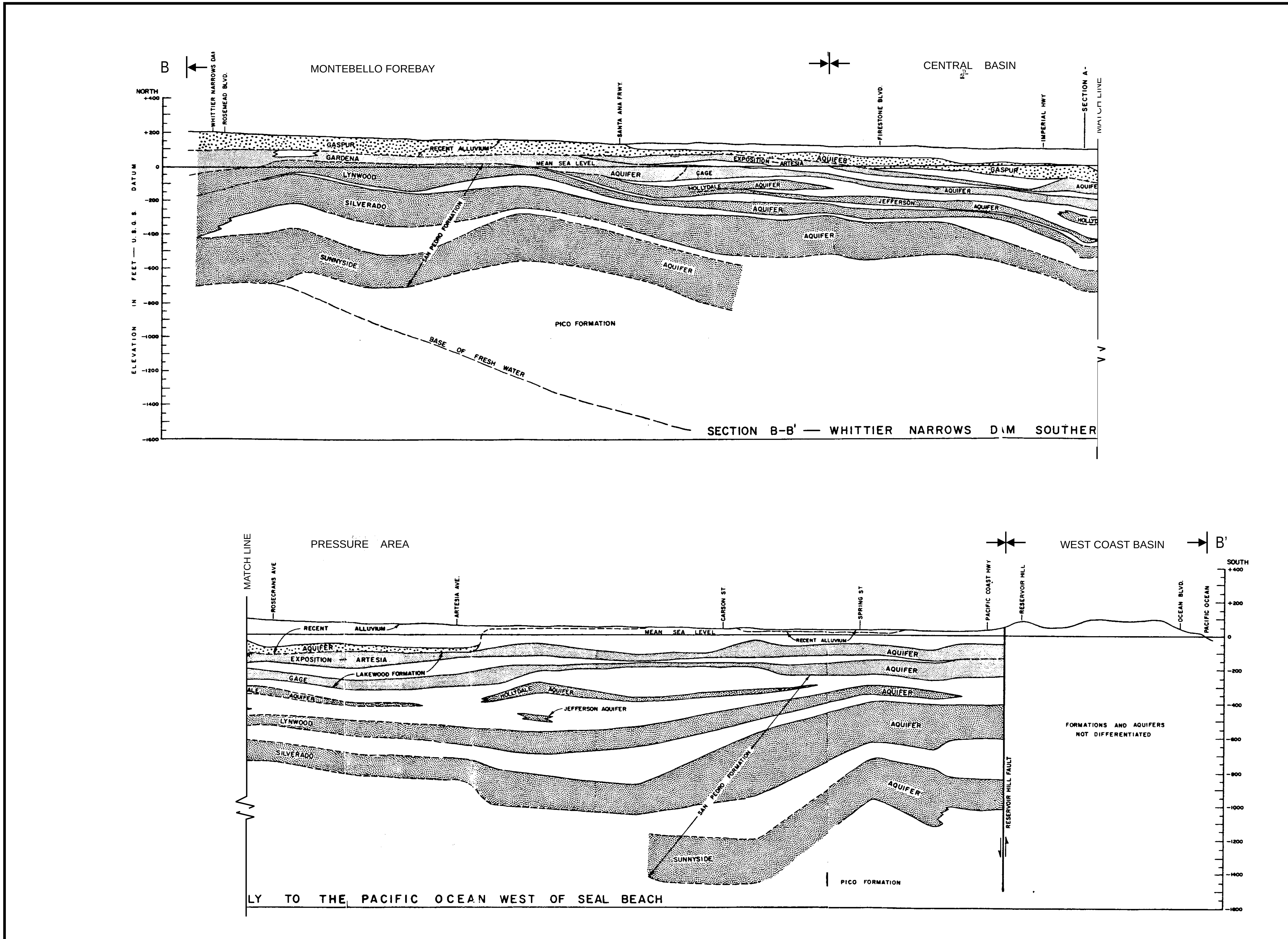
Figure 1.3



IDEALIZED GEOLOGIC CROSS SECTION AA'

Adapted from
CDWR Bull. 104 App. B

FIGURE 1.4



IDEALIZED GEOLOGIC CROSS SECTION BB'
Adapted from
CDWR Bull. 104 App. B

FIGURE 1.5

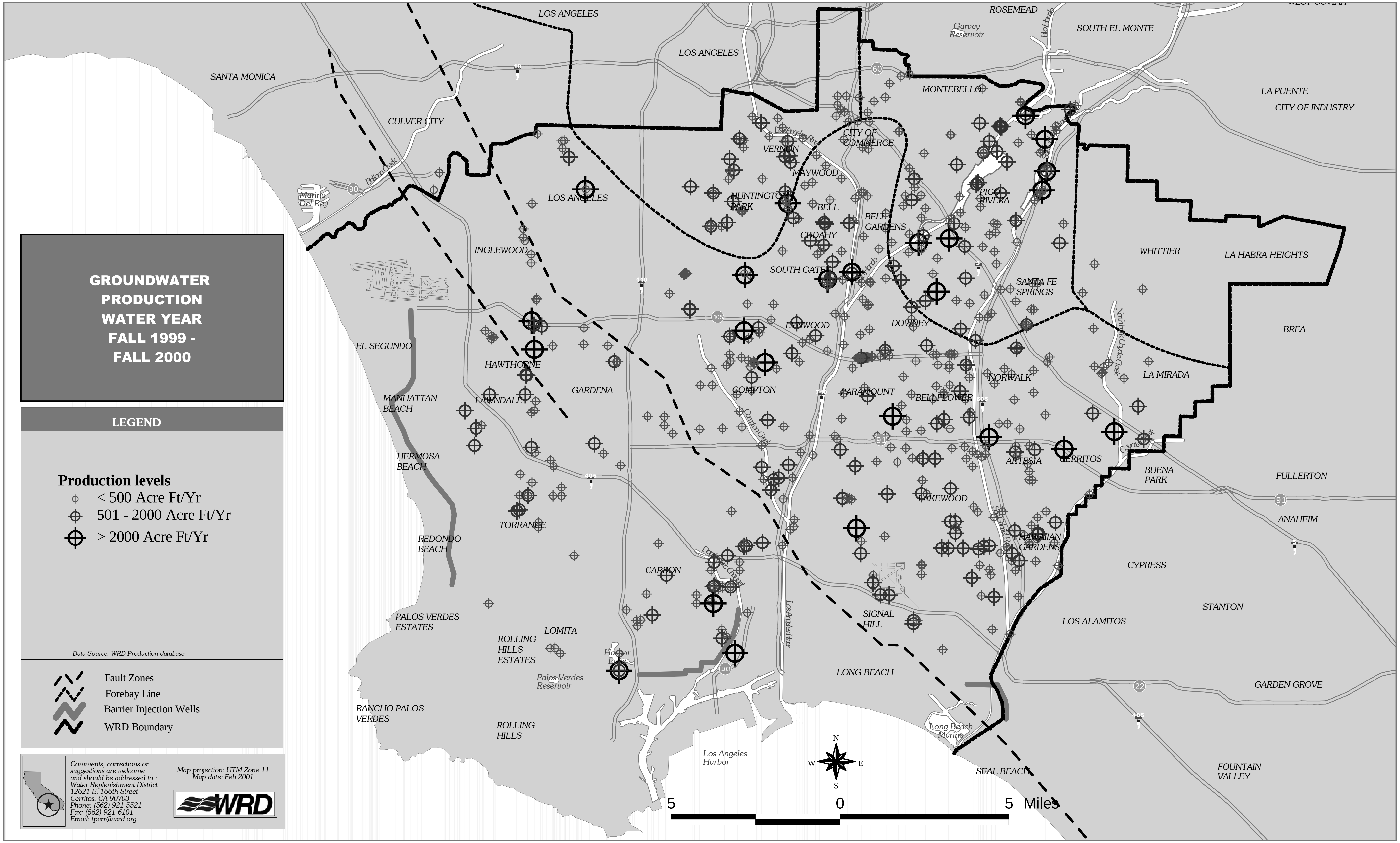
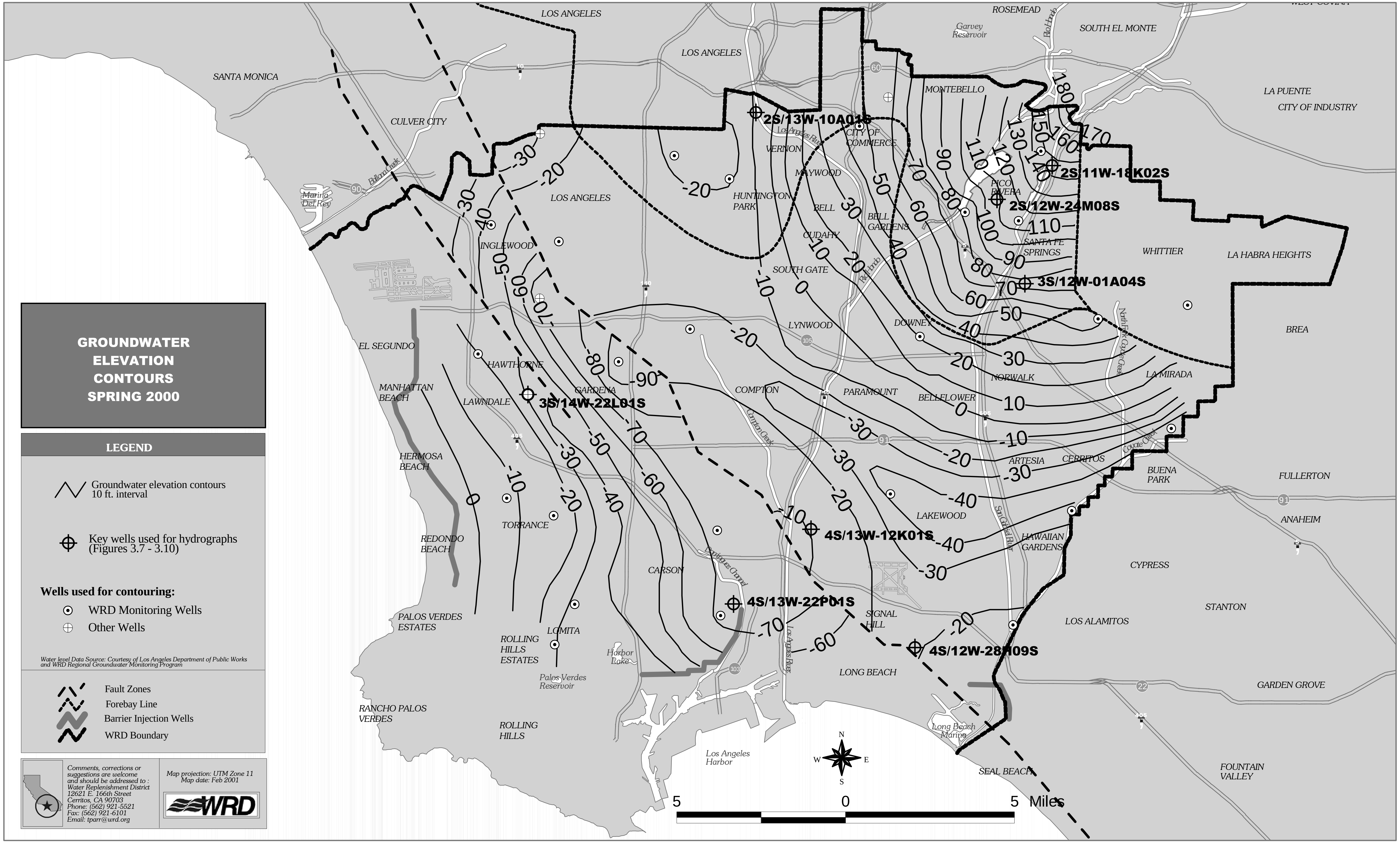

GROUNDWATER PRODUCTION WATER YEAR FALL 1999 - FALL 2000
LEGEND
Production levels
< 500 Acre Ft/Yr
501 - 2000 Acre Ft/Yr
> 2000 Acre Ft/Yr
Data Source: WRD Production database
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
5
0
5 Miles
N
S
E
W
LOS ANGELES
ROSEMEAD
SOUTH EL MONTE
SANTA MONICA
CULVER CITY
MONTEBELLO
LA PUENTE
CITY OF INDUSTRY
VERNON
CITY OF COMMERCE
MAYWOOD
HUNTINGTON PARK
BELL
PICO RIVERA
BELL GARDENS
CUDAHY
INGLEWOOD
SOUTH GATE
WHITTIER
LA HABRA HEIGHTS
SANTA FE SPRINGS
LYNWOOD
DOWNEY
BREA
EL SEGUNDO
HAWTHORNE
NORWALK
LA MIRADA
GARDENA
COMPTON
PARAMOUNT
BELLFLOWER
MANHATTAN BEACH
LAWNDALE
HERMOSA BEACH
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
LAKEWOOD
ANAHEIM
REDONDO BEACH
TORRANCE
HAWAIIAN GARDENS
CARSON
CYPRESS
STANTON
PALOS VERDES ESTATES
SIGNAL HILL
LOS ALAMITOS
LOMITA
ROLLING HILLS ESTATES
Harbor Park
LONG BEACH
Palos Verdes Reservoir
GARDEN GROVE
RANCHO PALOS VERDES
ROLLING HILLS
Long Beach Marina
Los Angeles Harbor
SEAL BEACH
FOUNTAIN VALLEY
Marina Del Rey
Garvey Reservoir

Figure 3.1



GROUNDWATER ELEVATION CONTOURS SPRING 2000
LEGEND
Groundwater elevation contours 10 ft. interval
Key wells used for hydrographs (Figures 3.7 - 3.10)
Wells used for contouring:
WRD Monitoring Wells
Other Wells
Water level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
2S/13W-10A01S
2S/11W-18K02S
2S/12W-24M08S
3S/12W-01A04S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-22P01S
4S/12W-28H09S
LOS ANGELES
SANTA MONICA
CULVER CITY
Marina Del Rey
INGLEWOOD
EL SEGUNDO
HAWTHORNE
MANHATTAN BEACH
LAWNDALE
GARDENA
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
LOMITA
Harbor Lake
Palos Verdes Reservoir
RANCHO PALOS VERDES
ROLLING HILLS
Los Angeles Harbor
ROSEMEAD
Garvey Reservoir
SOUTH EL MONTE
MONTEBELLO
CITY OF COMMERCE
VERNON
MAYWOOD
HUNTINGTON PARK
BELL
BELL GARDENS
CUDAHY
SOUTH GATE
PICO RIVERA
SANTA FE SPRINGS
LYNWOOD
DOWNEY
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
ARTESIA
CERRITOS
LAKEWOOD
HAWAIIAN GARDENS
SIGNAL HILL
LONG BEACH
Long Beach Marina
SEAL BEACH
LA PUENTE
CITY OF INDUSTRY
WHITTIER
LA HABRA HEIGHTS
BREA
LA MIRADA
BUENA PARK
FULLERTON
ANAHEIM
CYPRESS
STANTON
LOS ALAMITOS
GARDEN GROVE
FOUNTAIN VALLEY
N
S
E
W
5 0 5 Miles

Figure 3.2

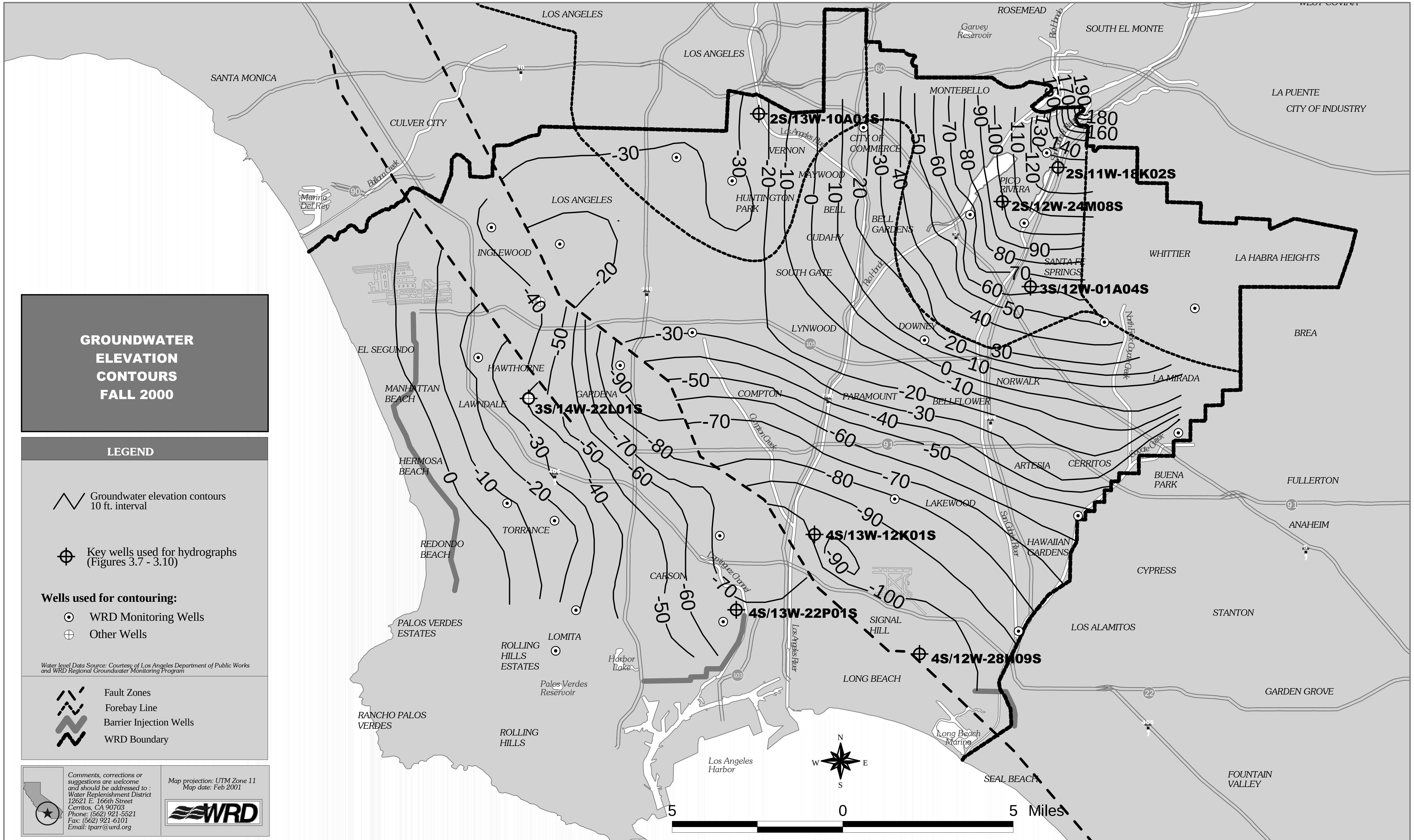

GROUNDWATER ELEVATION CONTOURS FALL 2000
LEGEND
Groundwater elevation contours 10 ft. interval
Key wells used for hydrographs (Figures 3.7 - 3.10)
Wells used for contouring:
WRD Monitoring Wells
Other Wells
Water level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11 Map date: Feb 2001
WRD
5 0 5 Miles
N S E W
2S/13W-10A01S
2S/11W-18K02S
2S/12W-24M08S
3S/12W-01A04S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-22P01S
4S/12W-28M09S
LOS ANGELES
SANTA MONICA
CULVER CITY
Marina Del Rey
INGLEWOOD
EL SEGUNDO
HAWTHORNE
MANHATTAN BEACH
LAWNDALE
GARDENA
HERMOSA BEACH
REDONDO BEACH
TORRANCE
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
LOMITA
RANCHO PALOS VERDES
ROLLING HILLS
Palos Verdes Reservoir
Harbor Lake
CARSON
Los Angeles Harbor
LONG BEACH
SIGNAL HILL
Long Beach Marina
SEAL BEACH
VERNON
HUNTINGTON PARK
MAYWOOD
BELL
CUDAHY
BELL GARDENS
CITY OF COMMERCE
SOUTH GATE
LYNWOOD
COMPTON
PARAMOUNT
DOWNEY
BELLFLOWER
NORWALK
ARTESIA
CERRITOS
LAKEWOOD
HAWAIIAN GARDENS
MONTEBELLO
PICO RIVERA
SANTA FE SPRINGS
WHITTIER
LA HABRA HEIGHTS
LA MIRADA
BREA
BUENA PARK
FULLERTON
ANAHEIM
CYPRESS
LOS ALAMITOS
STANTON
GARDEN GROVE
FOUNTAIN VALLEY
ROSEMEAD
Garvey Reservoir
SOUTH EL MONTE
LA PUENTE
CITY OF INDUSTRY
WEST COVINA

Figure 3.3

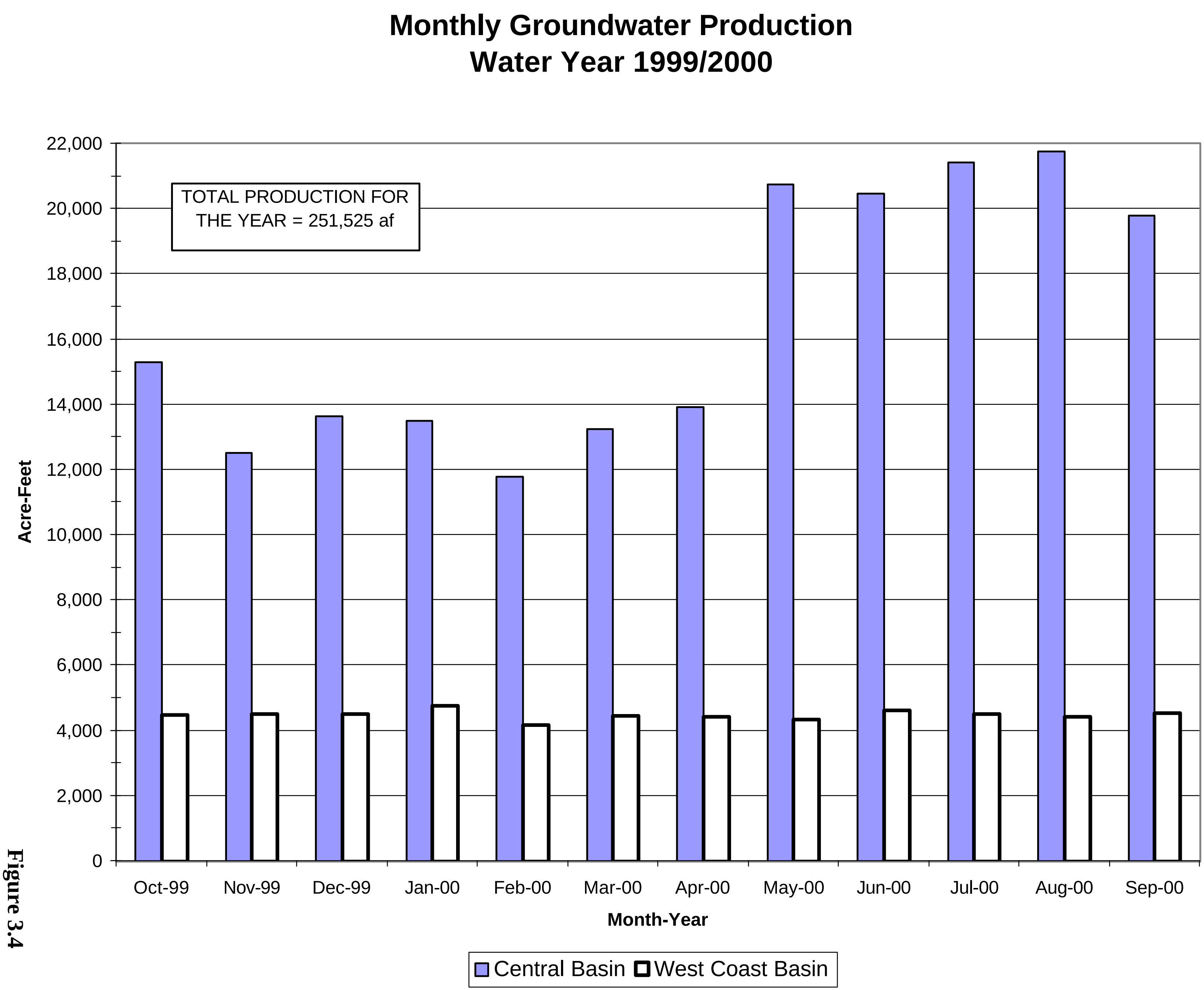

Monthly Groundwater Production
Water Year 1999/2000
TOTAL PRODUCTION FOR THE YEAR = 251,525 af
Acre-Feet
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Oct-99
Nov-99
Dec-99
Jan-00
Feb-00
Mar-00
Apr-00
May-00
Jun-00
Jul-00
Aug-00
Sep-00
Month-Year
Central Basin
West Coast Basin

Figure 3.4

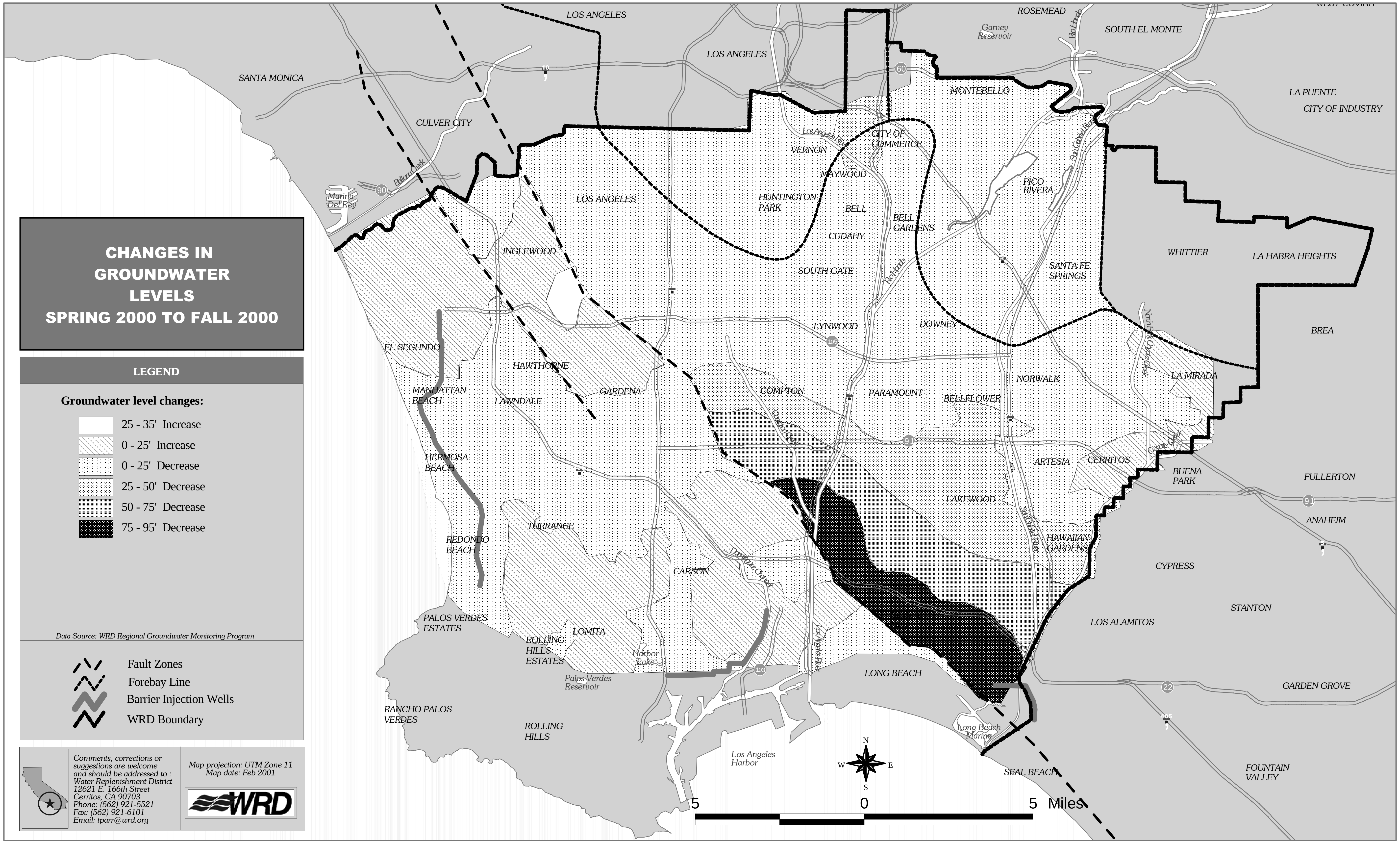

CHANGES IN GROUNDWATER LEVELS SPRING 2000 TO FALL 2000
LEGEND
Groundwater level changes:
25 - 35' Increase
0 - 25' Increase
0 - 25' Decrease
25 - 50' Decrease
50 - 75' Decrease
75 - 95' Decrease
Data Source: WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
N
S
E
W
5
0
5 Miles
LOS ANGELES
SANTA MONICA
CULVER CITY
Marina Del Rey
ROSEMEAD
Garvey Reservoir
SOUTH EL MONTE
WEST COVINA
LA PUENTE
CITY OF INDUSTRY
MONTEBELLO
CITY OF COMMERCE
VERNON
MAYWOOD
HUNTINGTON PARK
BELL
BELL GARDENS
CUDAHY
PICO RIVERA
SOUTH GATE
SANTA FE SPRINGS
WHITTIER
LA HABRA HEIGHTS
INGLEWOOD
EL SEGUNDO
HAWTHORNE
LYNWOOD
DOWNEY
BREA
MANHATTAN BEACH
LAWNDALE
GARDENA
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
HERMOSA BEACH
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
LAKEWOOD
REDONDO BEACH
TORRANCE
CARSON
HAWAIIAN GARDENS
ANAHEIM
CYPRESS
STANTON
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
LOMITA
Harbor Lake
LOS ALAMITOS
Palos Verdes Reservoir
LONG BEACH
GARDEN GROVE
RANCHO PALOS VERDES
ROLLING HILLS
Long Beach Marina
Los Angeles Harbor
SEAL BEACH
FOUNTAIN VALLEY

Figure 3.5

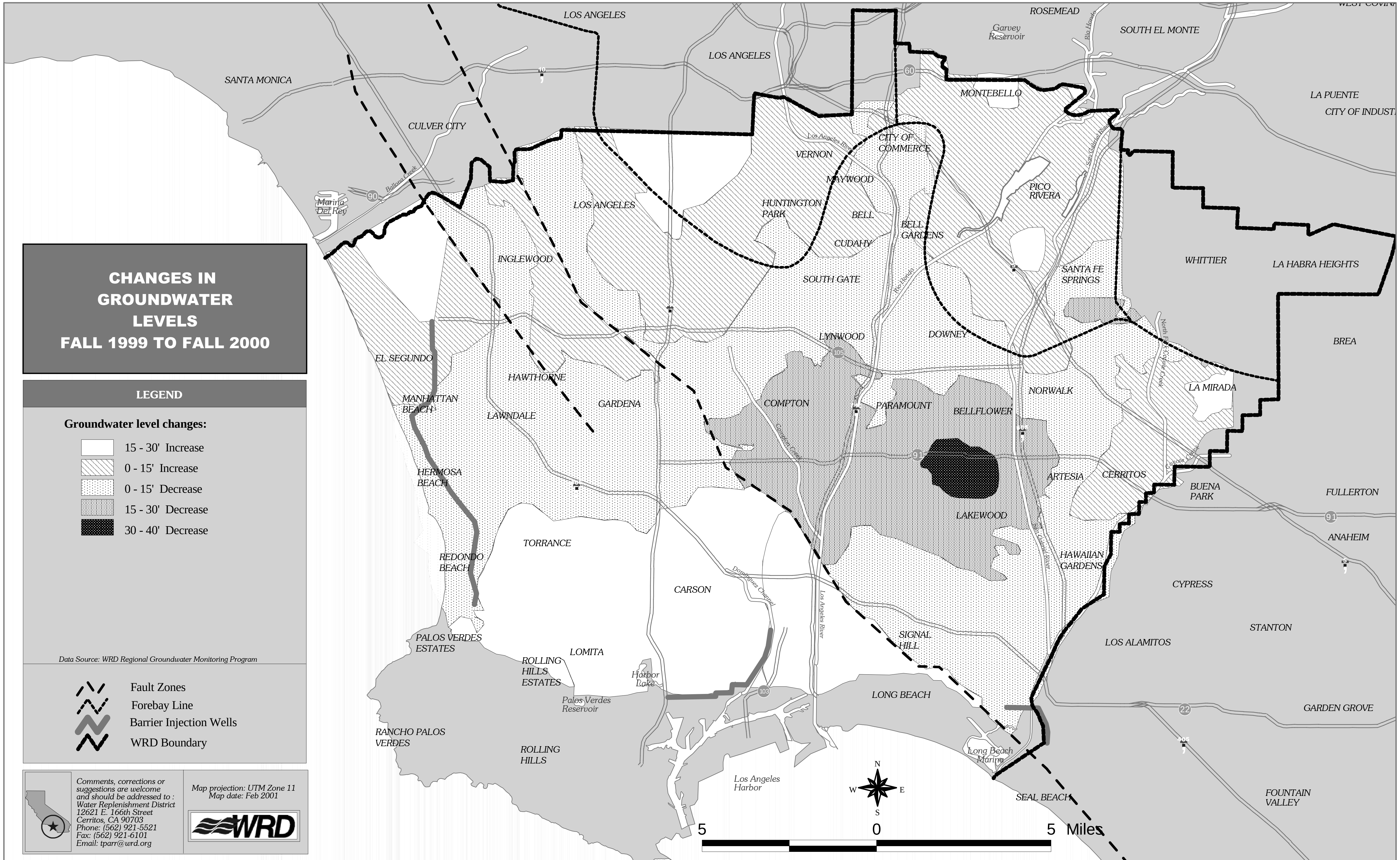
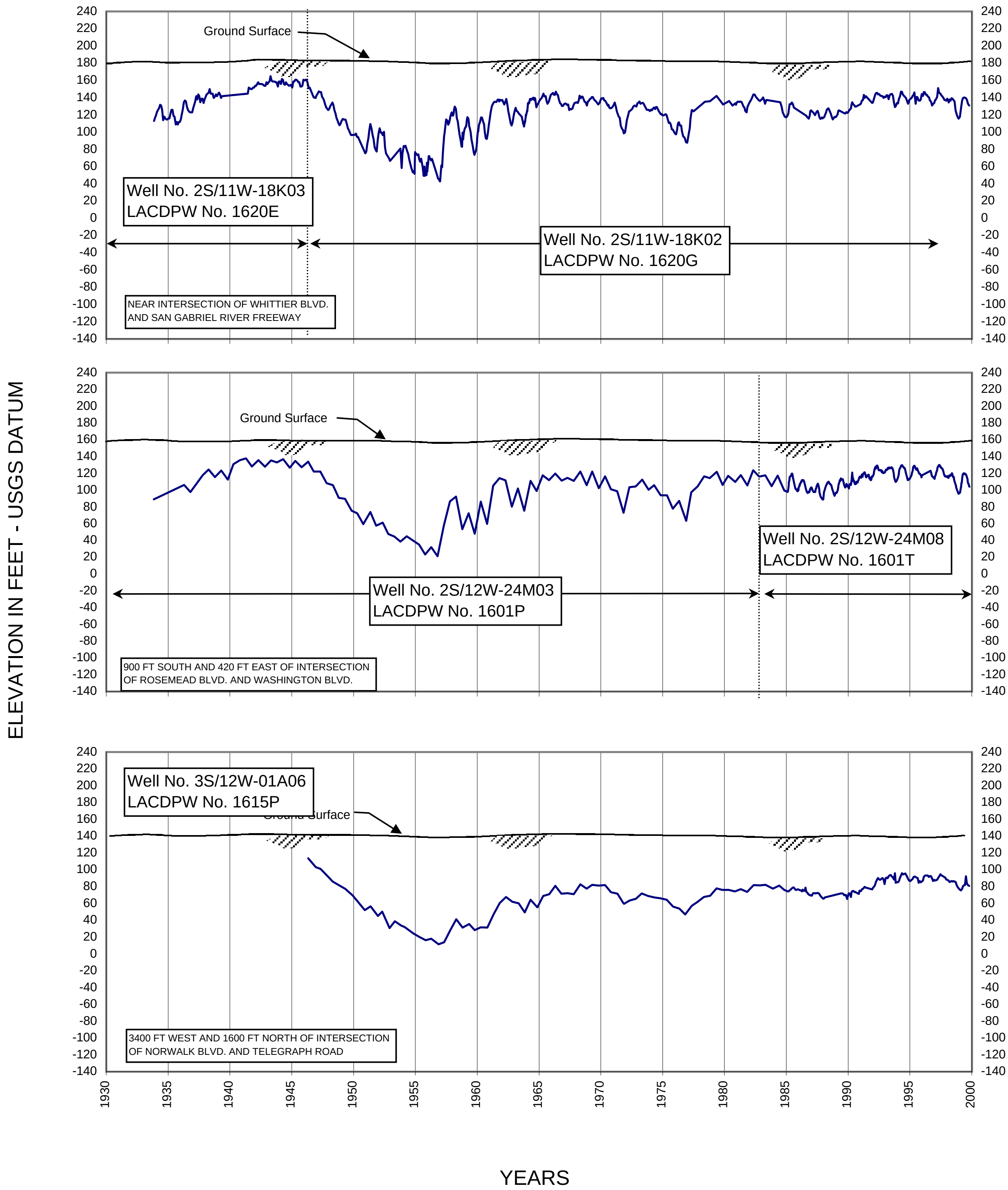

CHANGES IN GROUNDWATER LEVELS
FALL 1999 TO FALL 2000
LEGEND
Groundwater level changes:
15 - 30' Increase
0 - 15' Increase
0 - 15' Decrease
15 - 30' Decrease
30 - 40' Decrease
Data Source: WRD Regional Groundwater Monitoring Program
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
5 0 5 Miles
N S E W
LOS ANGELES
ROSEMEAD
SOUTH EL MONTE
Garvey Reservoir
SANTA MONICA
CULVER CITY
MONTEBELLO
LA PUENTE
CITY OF INDUST
VERNON
CITY OF COMMERCE
MAYWOOD
HUNTINGTON PARK
BELL
BELL GARDENS
CUDAHY
PICO RIVERA
Marina Del Rey
INGLEWOOD
SOUTH GATE
SANTA FE SPRINGS
WHITTIER
LA HABRA HEIGHTS
EL SEGUNDO
HAWTHORNE
LYNWOOD
DOWNEY
BREA
MANHATTAN BEACH
LAWNDALE
GARDENA
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
HERMOSA BEACH
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
LAKEWOOD
TORRANCE
ANAHEIM
REDONDO BEACH
HAWAIIAN GARDENS
CARSON
CYPRESS
STANTON
PALOS VERDES ESTATES
LOMITA
SIGNAL HILL
LOS ALAMITOS
ROLLING HILLS ESTATES
Harbor Lake
Palos Verdes Reservoir
LONG BEACH
GARDEN GROVE
RANCHO PALOS VERDES
ROLLING HILLS
Long Beach Marina
Los Angeles Harbor
SEAL BEACH
FOUNTAIN VALLEY
Los Angeles River
Dominguez Channel
Ballona Creek
Rio Hondo
San Gabriel River

Figure 3.6

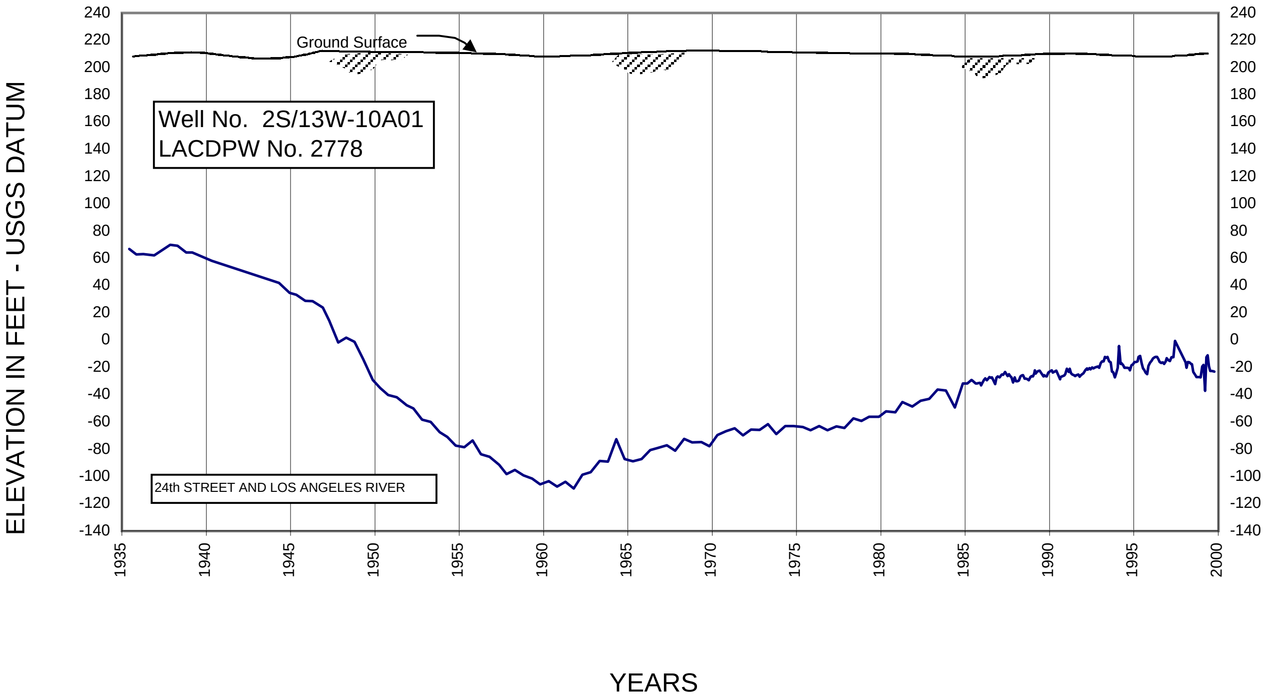


For Well Locations See Figure 3.2

FLUCTUATIONS OF WATER LEVEL AT WELLS

MONTEBELLO FOREBAY

Figure 3.7

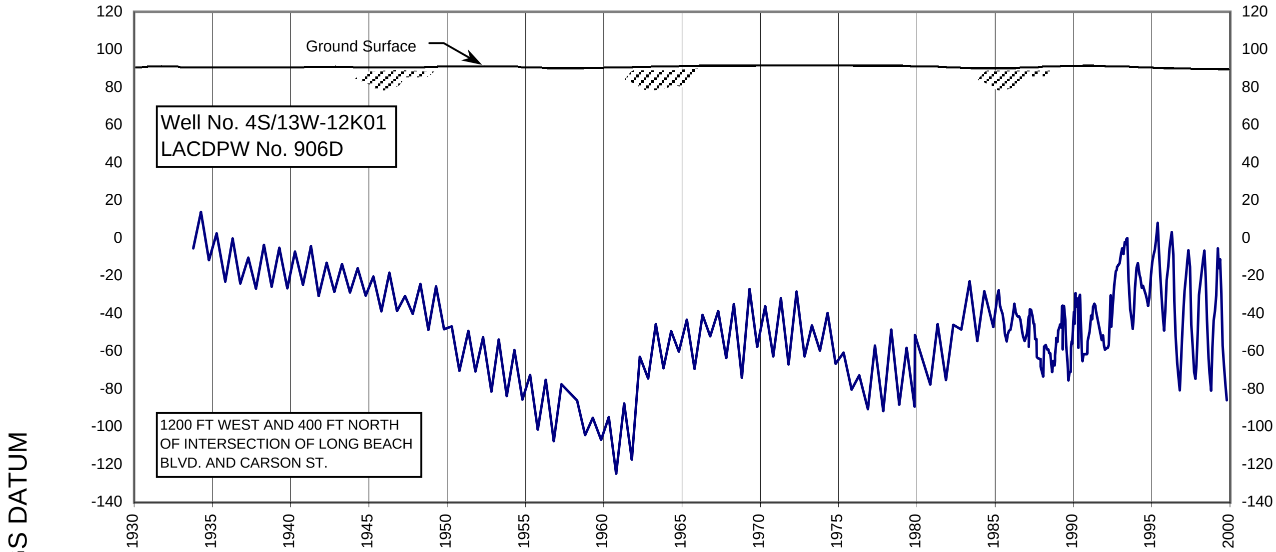


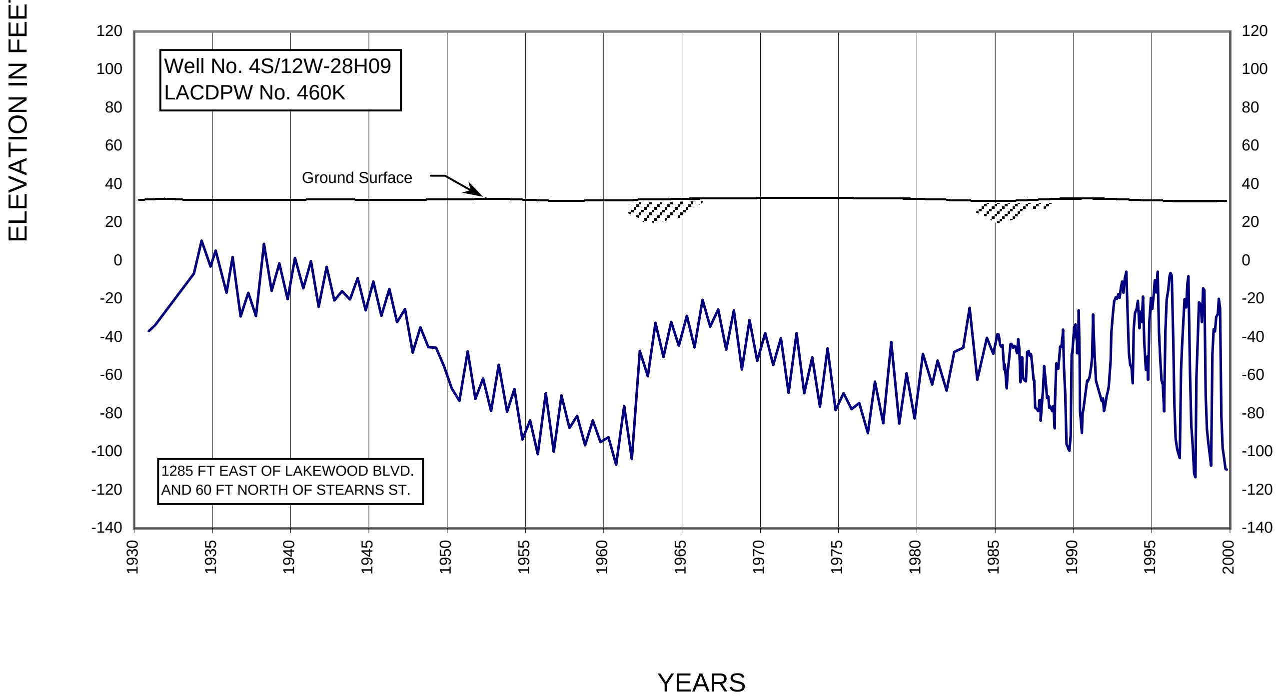
For Well Locations See Figure 3.2

FLUCTUATIONS OF WATER LEVEL AT WELLS

LOS ANGELES FOREBAY

Figure 3.8



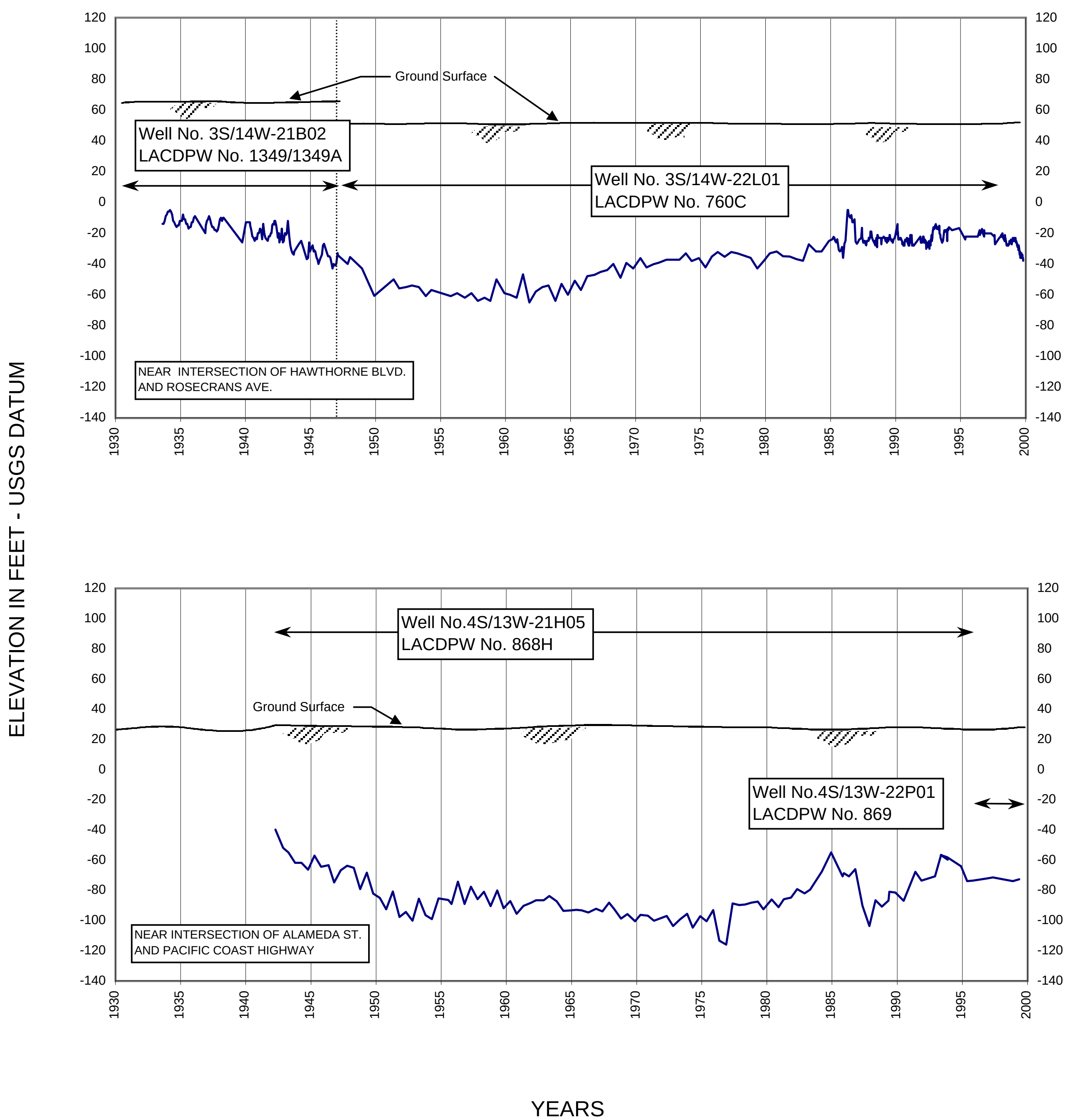


For Well Locations See Figure 3.2

FLUCTUATIONS OF WATER LEVEL AT WELLS

CENTRAL BASIN PRESSURE AREA

Figure 3.9



For Well Locations See Figure 3.2

FLUCTUATIONS OF WATER LEVEL AT WELLS

WEST BASIN

Figure 3.10

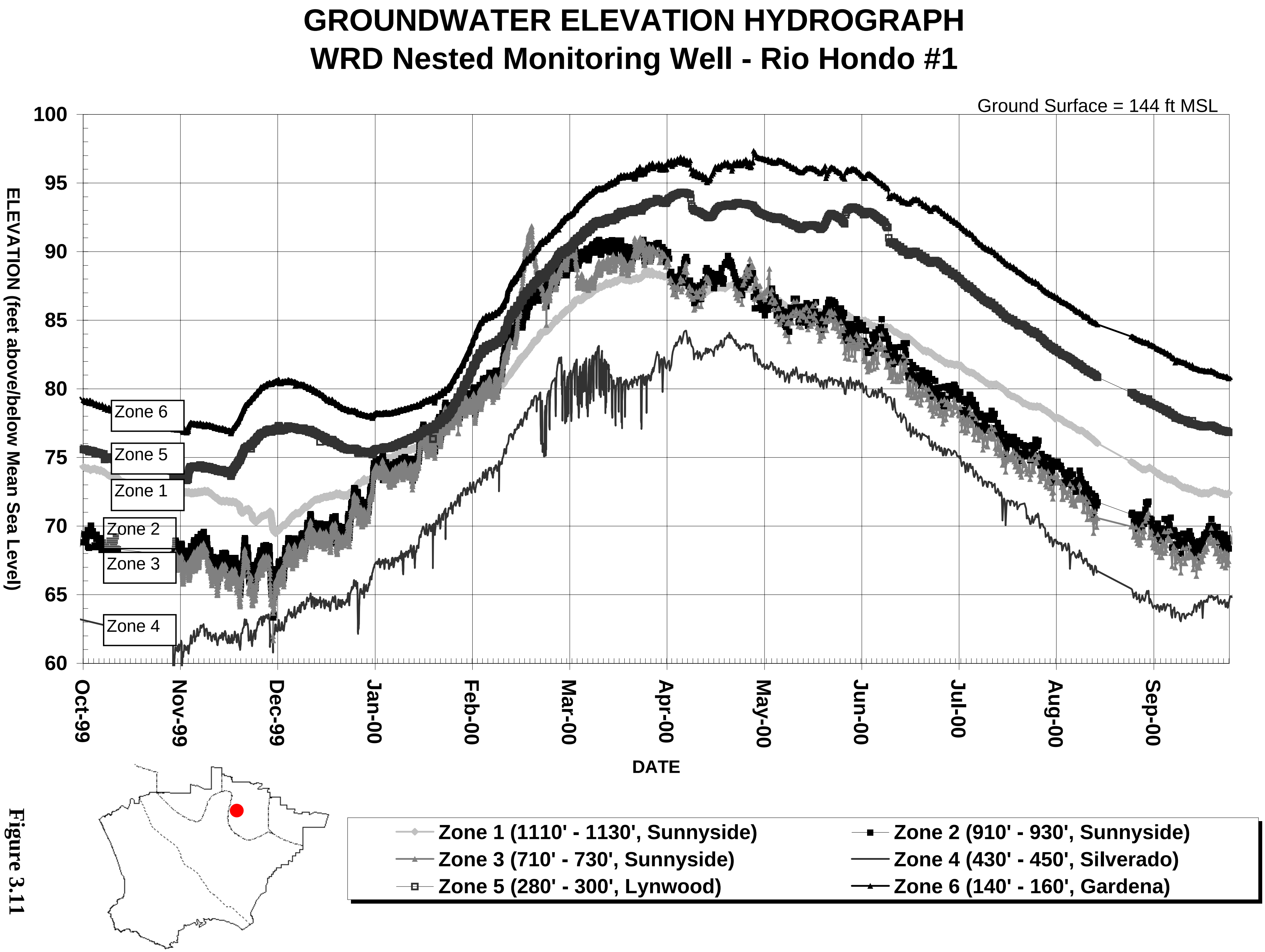

GROUNDWATER ELEVATION HYDROGRAPH
WRD Nested Monitoring Well - Rio Hondo #1
Ground Surface = 144 ft MSL
ELEVATION (feet above/below Mean Sea Level)
100
95
90
85
80
75
70
65
60
Zone 6
Zone 5
Zone 1
Zone 2
Zone 3
Zone 4
Oct-99
Nov-99
Dec-99
Jan-00
Feb-00
Mar-00
Apr-00
May-00
Jun-00
Jul-00
Aug-00
Sep-00
DATE
Zone 1 (1110' - 1130', Sunnyside)
Zone 2 (910' - 930', Sunnyside)
Zone 3 (710' - 730', Sunnyside)
Zone 4 (430' - 450', Silverado)
Zone 5 (280' - 300', Lynwood)
Zone 6 (140' - 160', Gardena)

Figure 3.11

GROUNDWATER ELEVATION HYDROGRAPH
WRD Nested Monitoring Well - Huntington Park #1

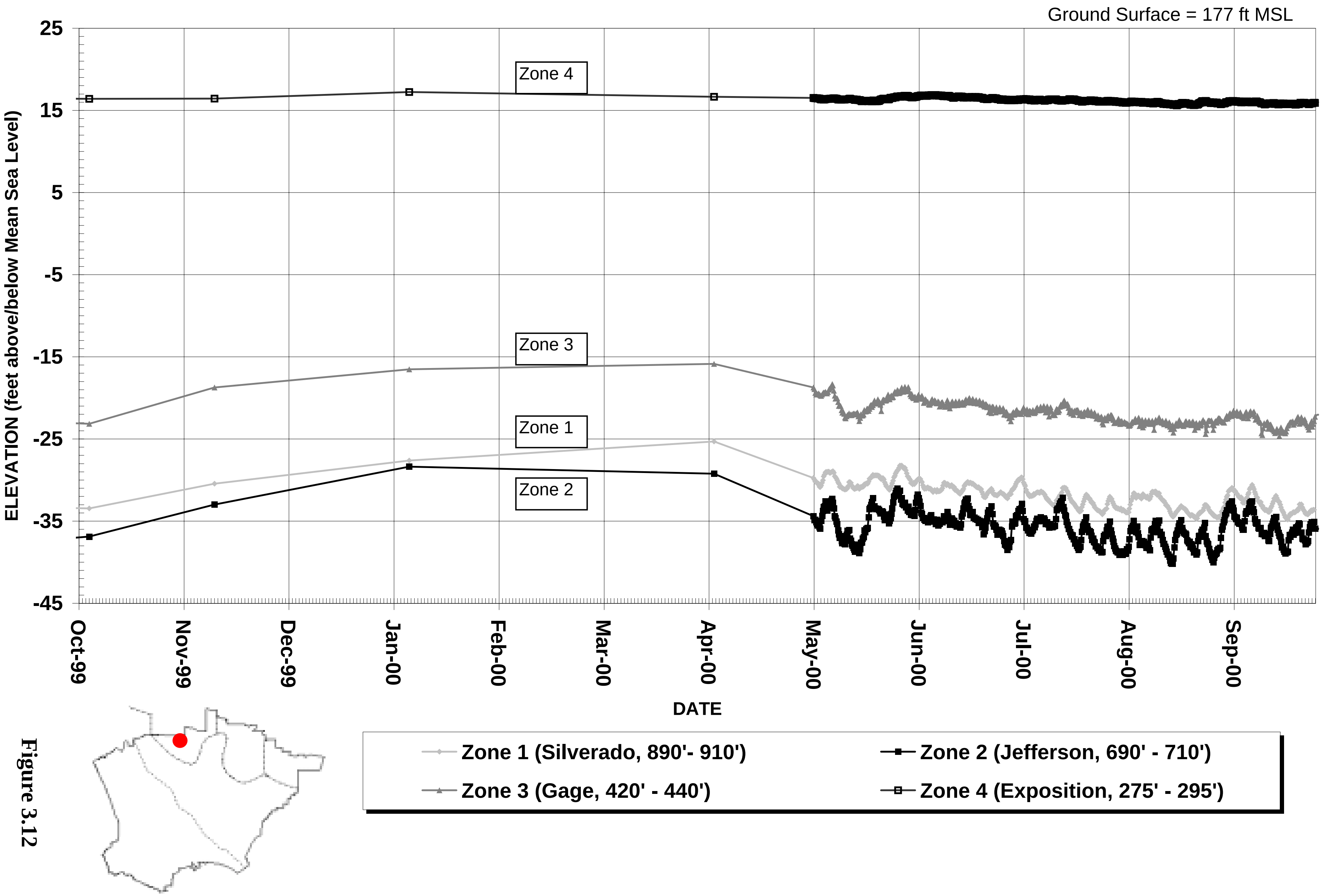


Figure 3.12

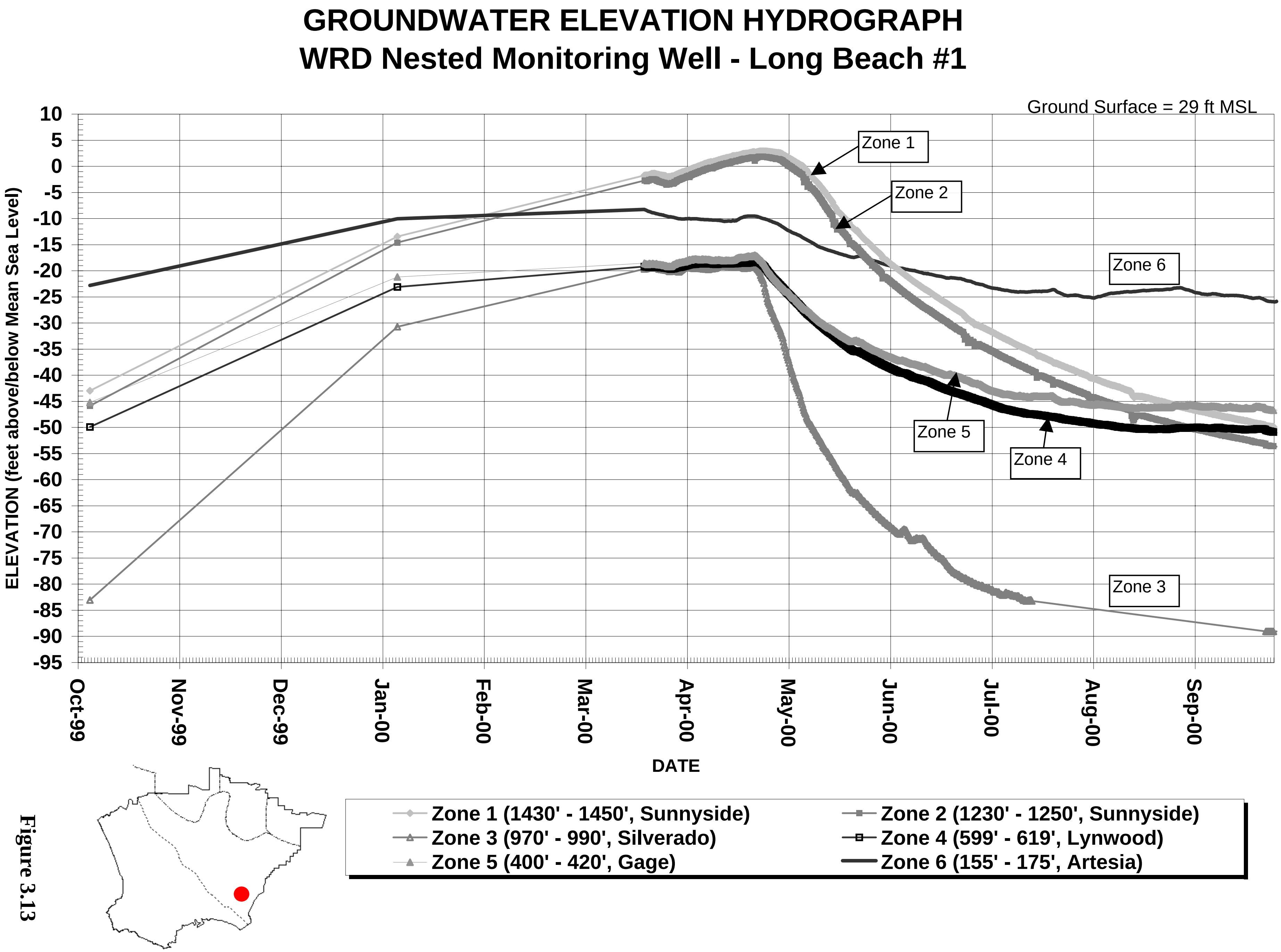

GROUNDWATER ELEVATION HYDROGRAPH
WRD Nested Monitoring Well - Long Beach #1
Ground Surface = 29 ft MSL
ELEVATION (feet above/below Mean Sea Level)
DATE
Zone 1
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6
Oct-99
Nov-99
Dec-99
Jan-00
Feb-00
Mar-00
Apr-00
May-00
Jun-00
Jul-00
Aug-00
Sep-00
Zone 1 (1430' - 1450', Sunnyside)
Zone 2 (1230' - 1250', Sunnyside)
Zone 3 (970' - 990', Silverado)
Zone 4 (599' - 619', Lynwood)
Zone 5 (400' - 420', Gage)
Zone 6 (155' - 175', Artesia)

Figure 3.13

GROUNDWATER ELEVATION HYDROGRAPH
WRD Nested Monitoring Well - Carson #1

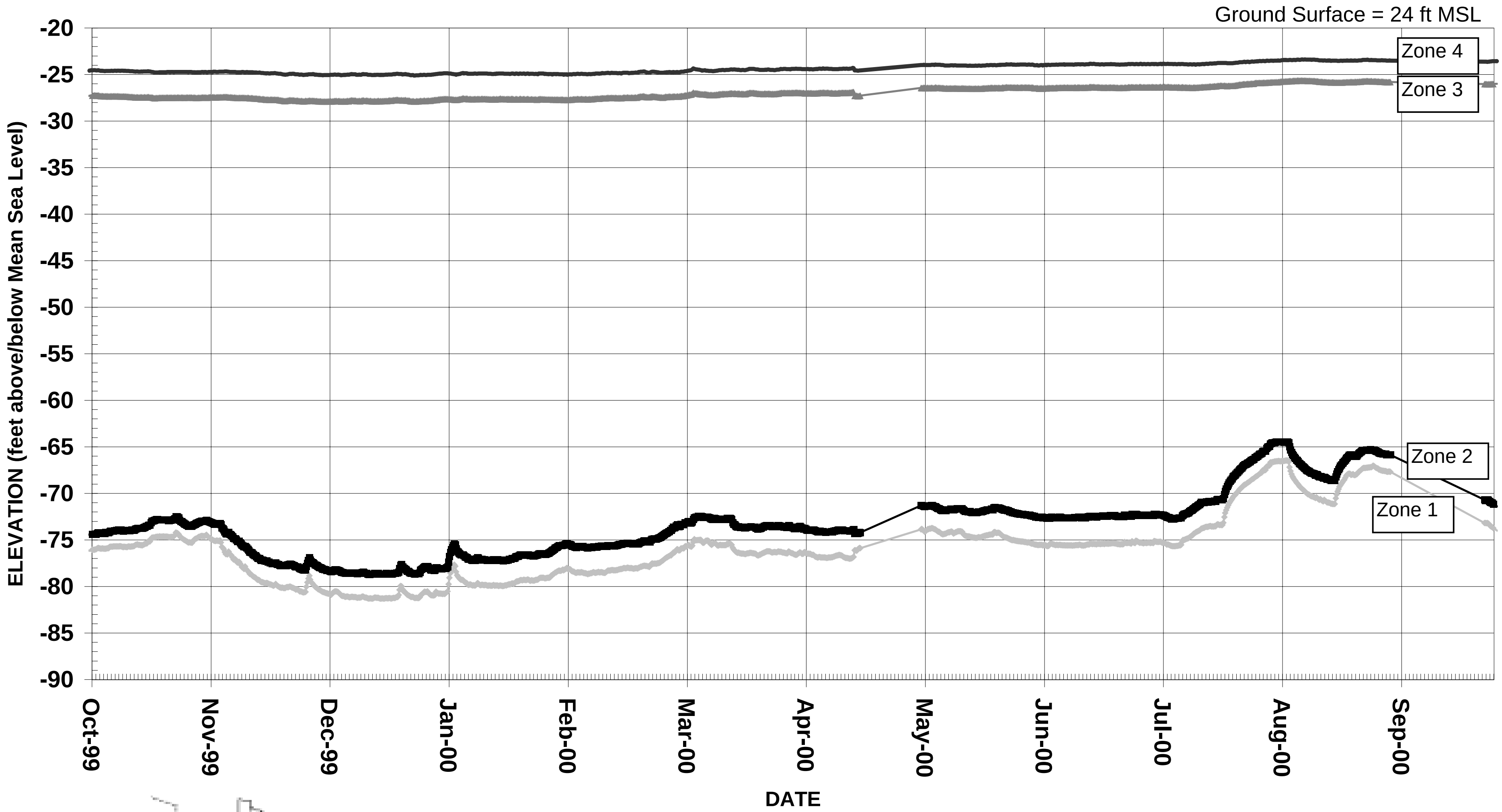


Figure 3.14

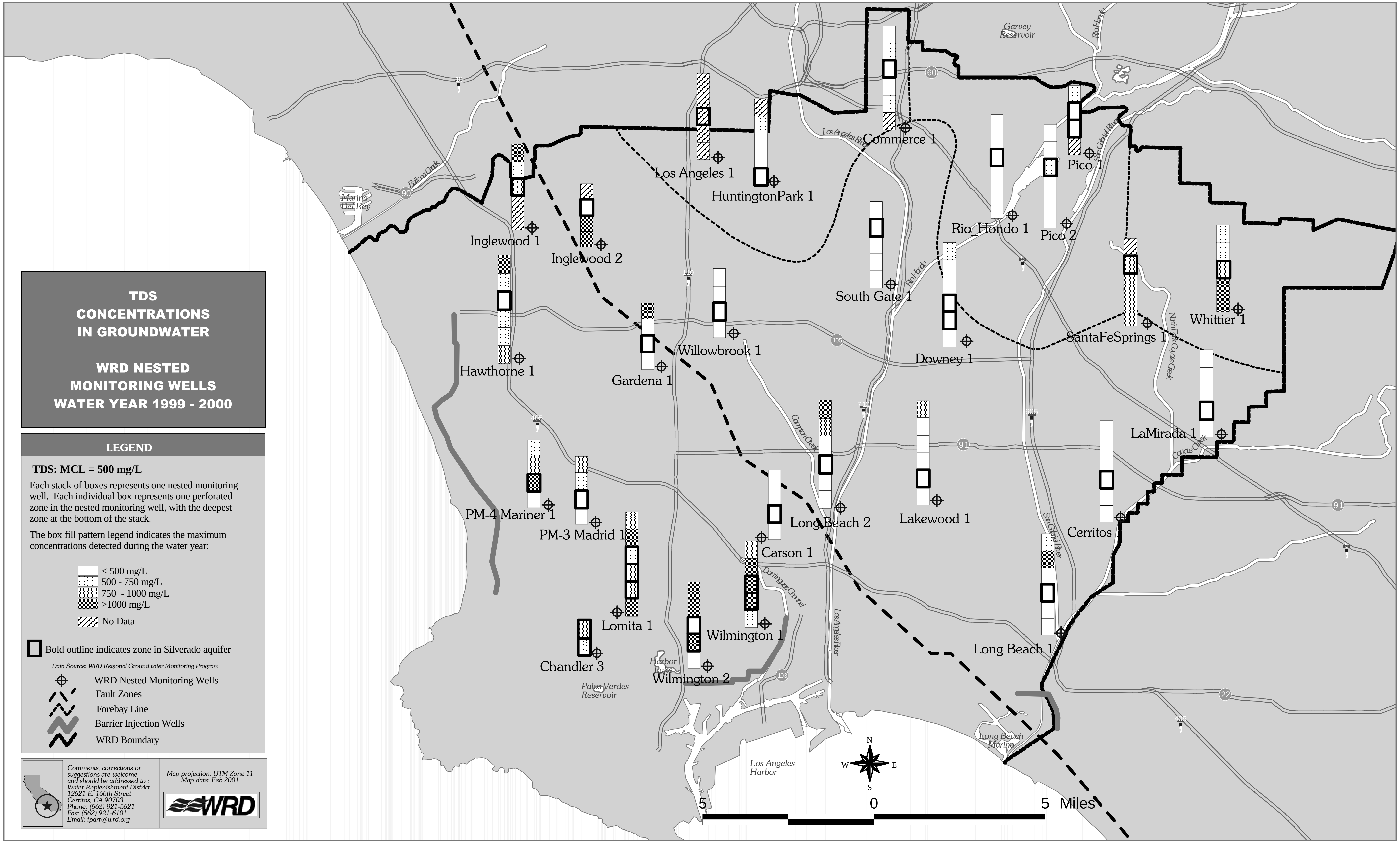
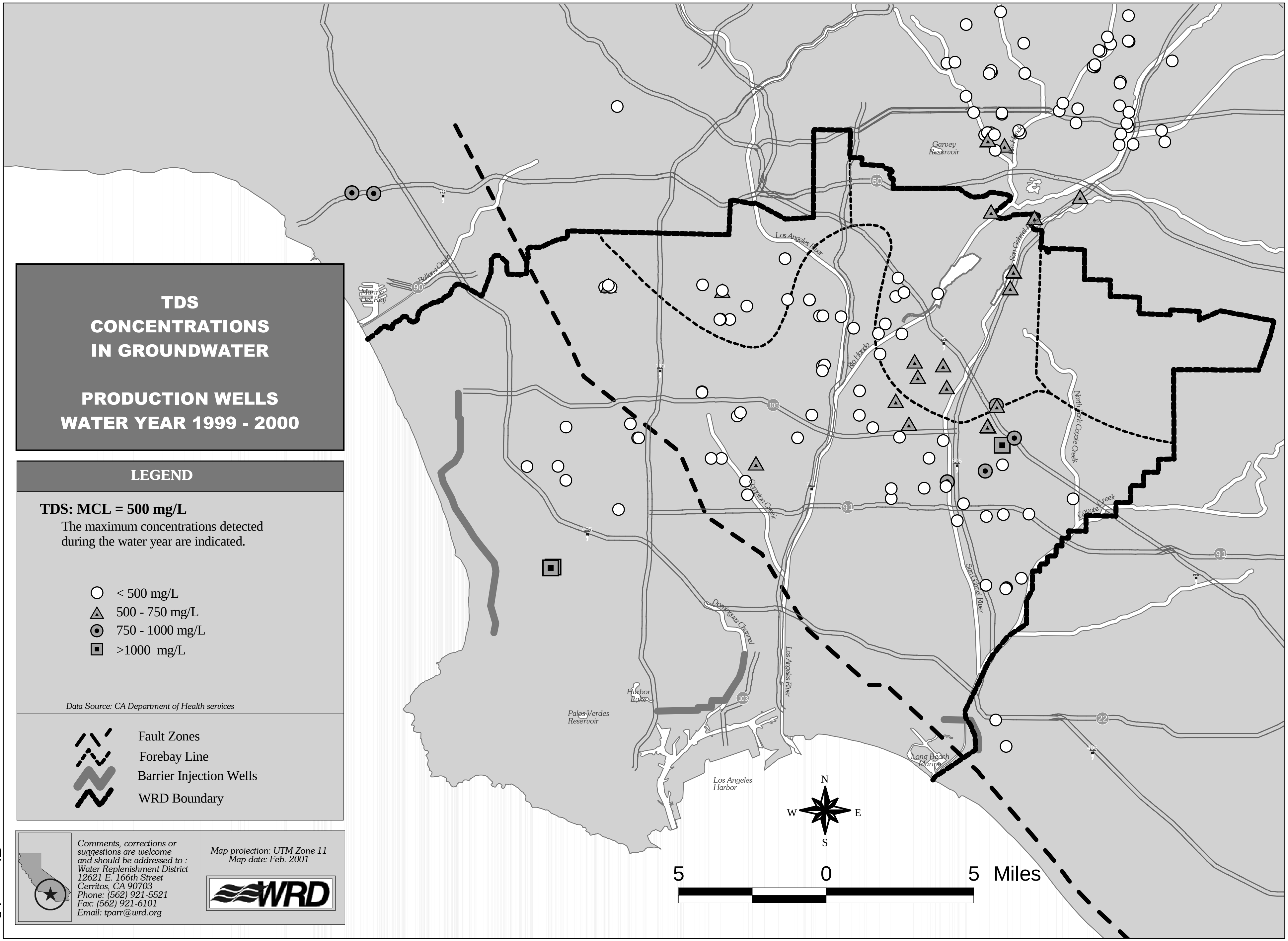

TDS
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
TDS: MCL = 500 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 500 mg/L
500 - 750 mg/L
750 - 1000 mg/L
>1000 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Rio_Hondo 1
Pico 2
South Gate 1
Whittier 1
SantaFeSprings 1
Downey 1
Willowbrook 1
Gardena 1
Hawthorne 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos
Carson 1
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.1



TDS
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
TDS: MCL = 500 mg/L
The maximum concentrations detected during the water year are indicated.
< 500 mg/L
500 - 750 mg/L
750 - 1000 mg/L
>1000 mg/L
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
Garvey Reservoir
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Ballona Creek
Marina Del Rey
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5 Miles

Figure 4.2

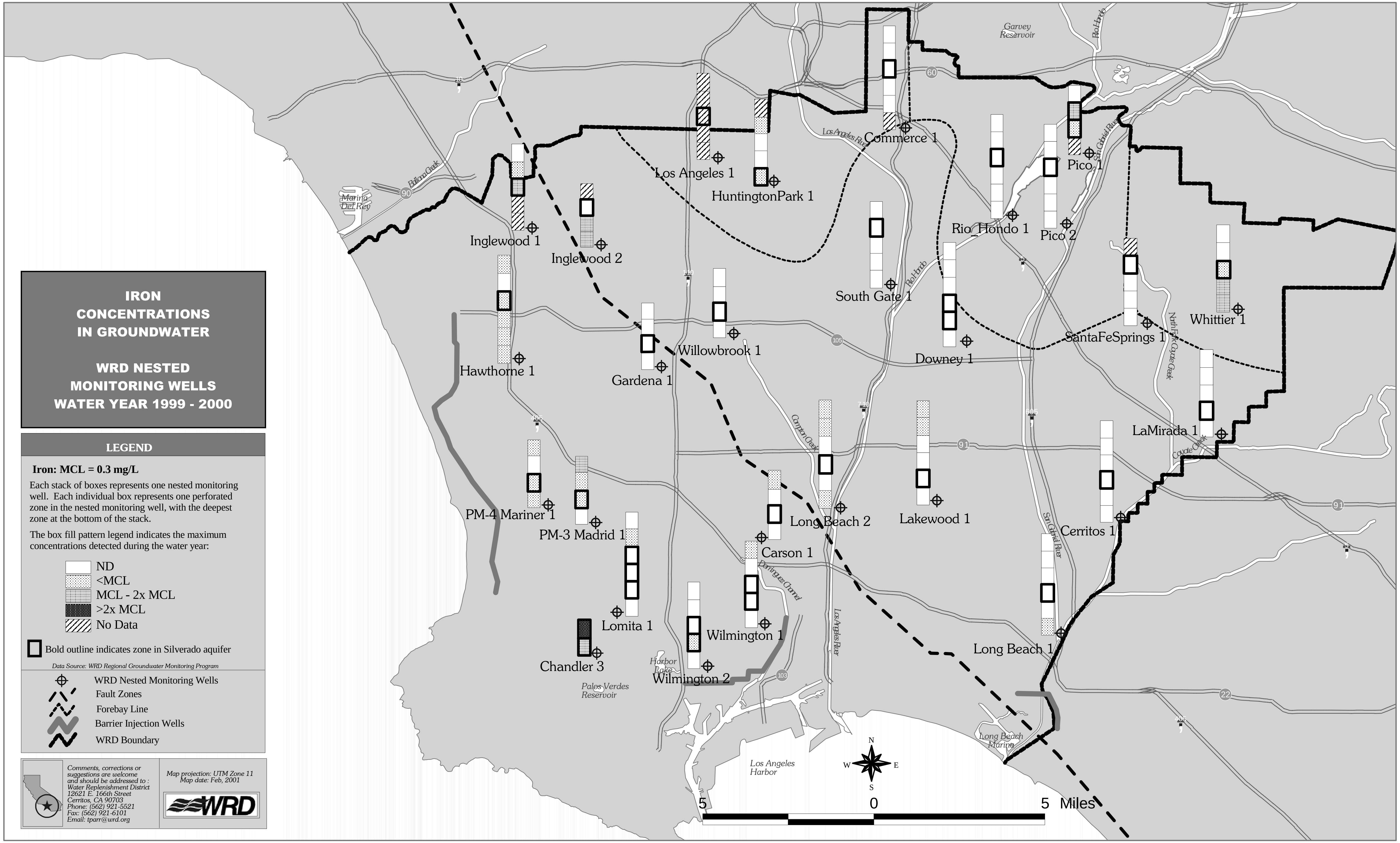
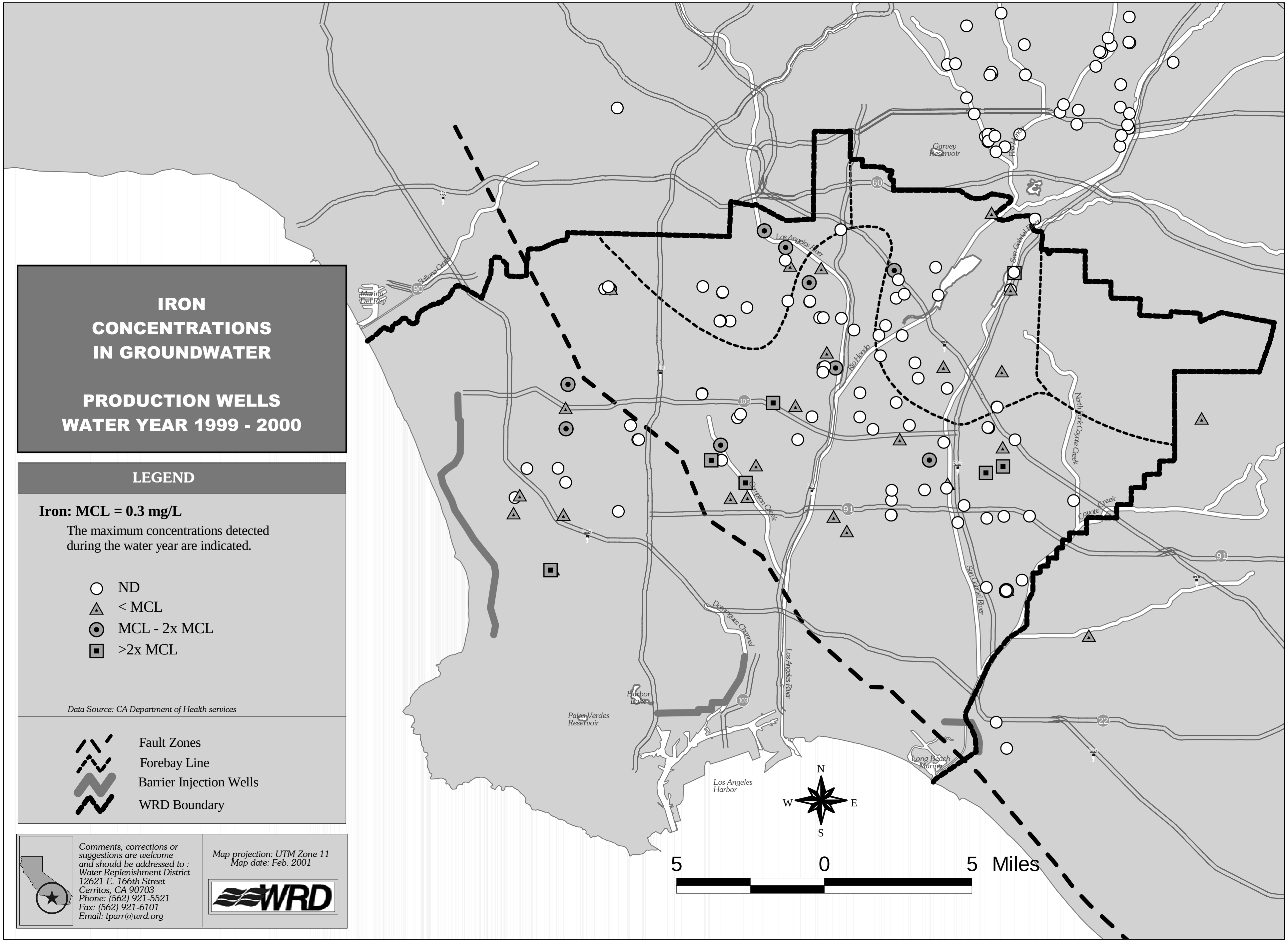
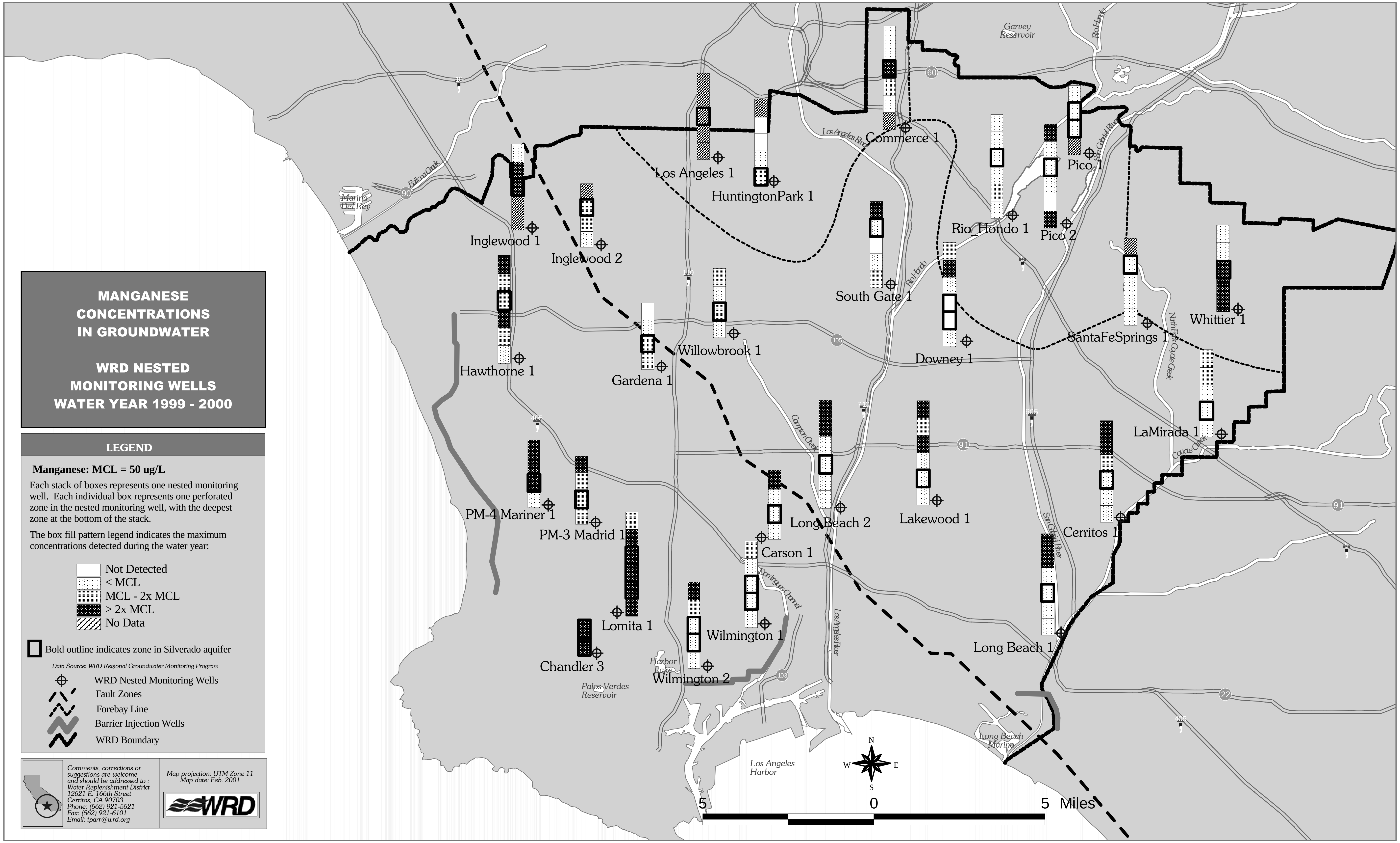

IRON CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
Iron: MCL = 0.3 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
<MCL
MCL - 2x MCL
>2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb, 2001
WRD
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Rio_Hondo 1
Pico 2
South Gate 1
Whittier 1
Hawthorne 1
Gardena 1
Willowbrook 1
Downey 1
SantaFeSprings 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
Marina Del Rey
Ballona Creek
Los Angeles River
Garvey Reservoir
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.3



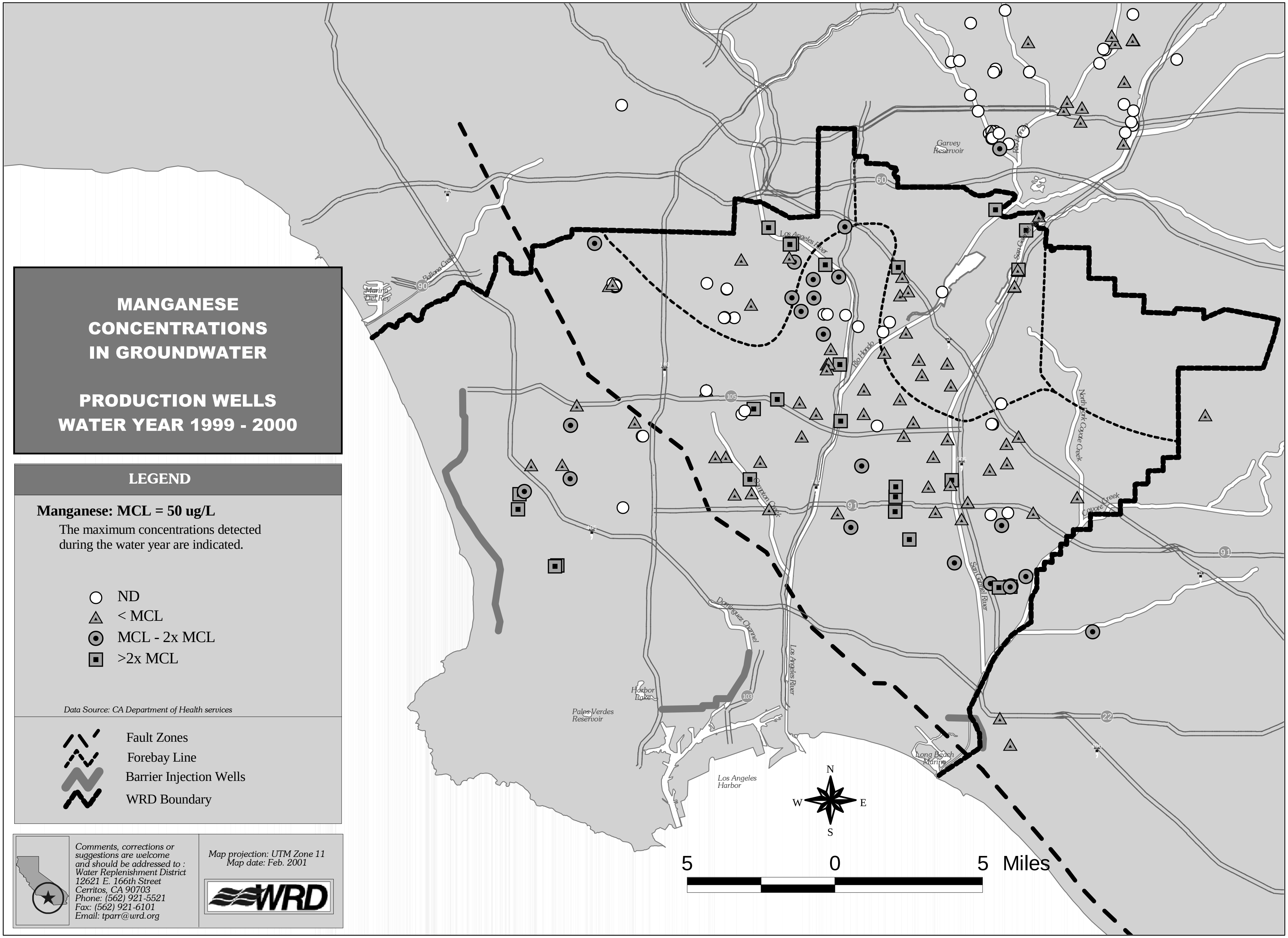
IRON
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
Iron: MCL = 0.3 mg/L
The maximum concentrations detected during the water year are indicated.
ND
< MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
5
0
5
Miles
N
W
E
S
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Garvey Reservoir
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
Palos Verdes Reservoir
Harbor Lake
Los Angeles Harbor
Long Beach Marina
90
60
105
91
103
22

Figure 4.4



MANGANESE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
Manganese: MCL = 50 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
Not Detected
< MCL
MCL - 2x MCL
> 2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
Commerce 1
Los Angeles 1
HuntingtonPark 1
Pico 1
Pico 2
Rio_Hondo 1
Inglewood 1
Inglewood 2
South Gate 1
Whittier 1
SantaFeSprings 1
Downey 1
Hawthorne 1
Willowbrook 1
Gardena 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
N
S
W
E
5
0
5 Miles

Figure 4.5



MANGANESE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
Manganese: MCL = 50 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5 Miles

Figure 4.6

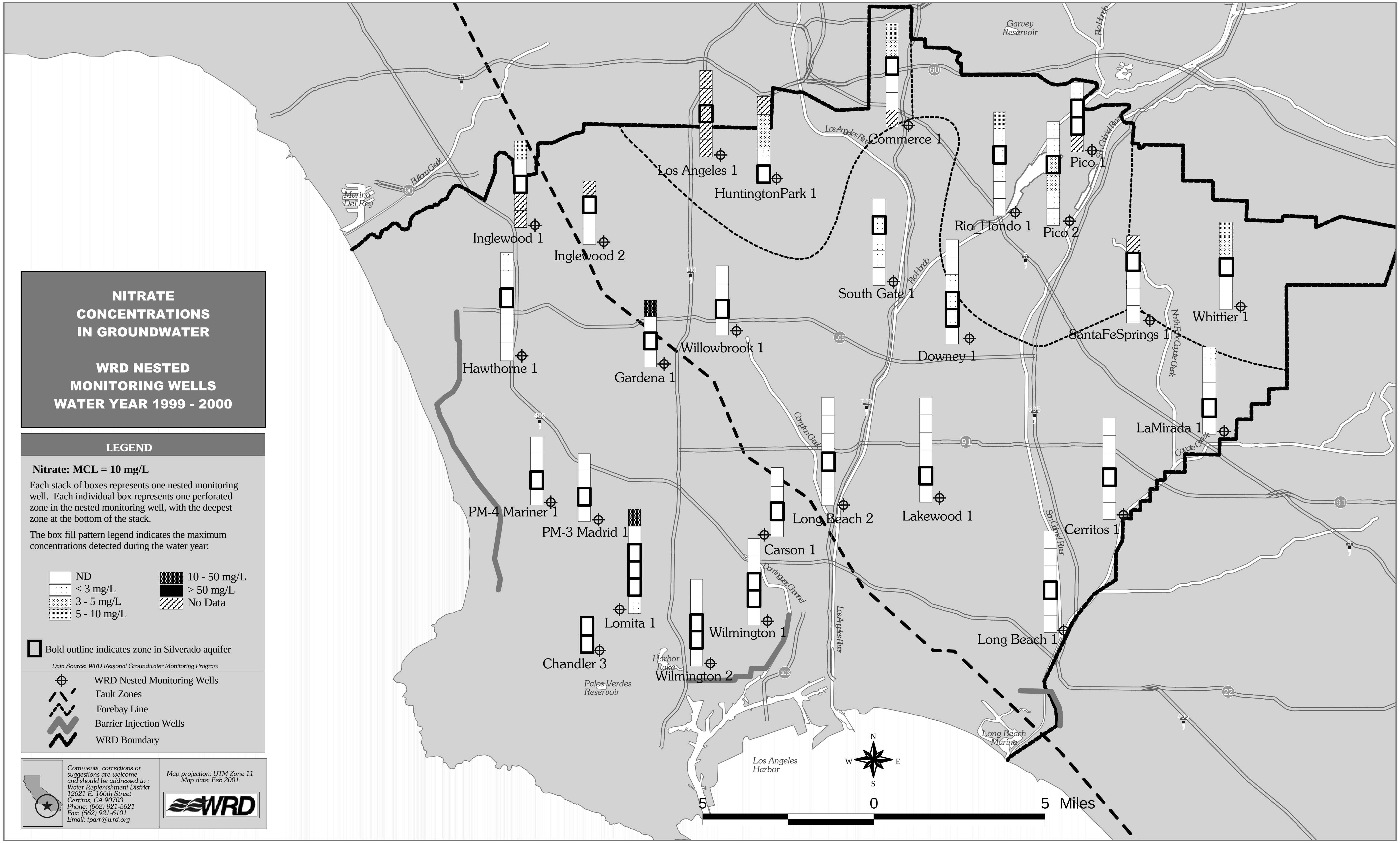
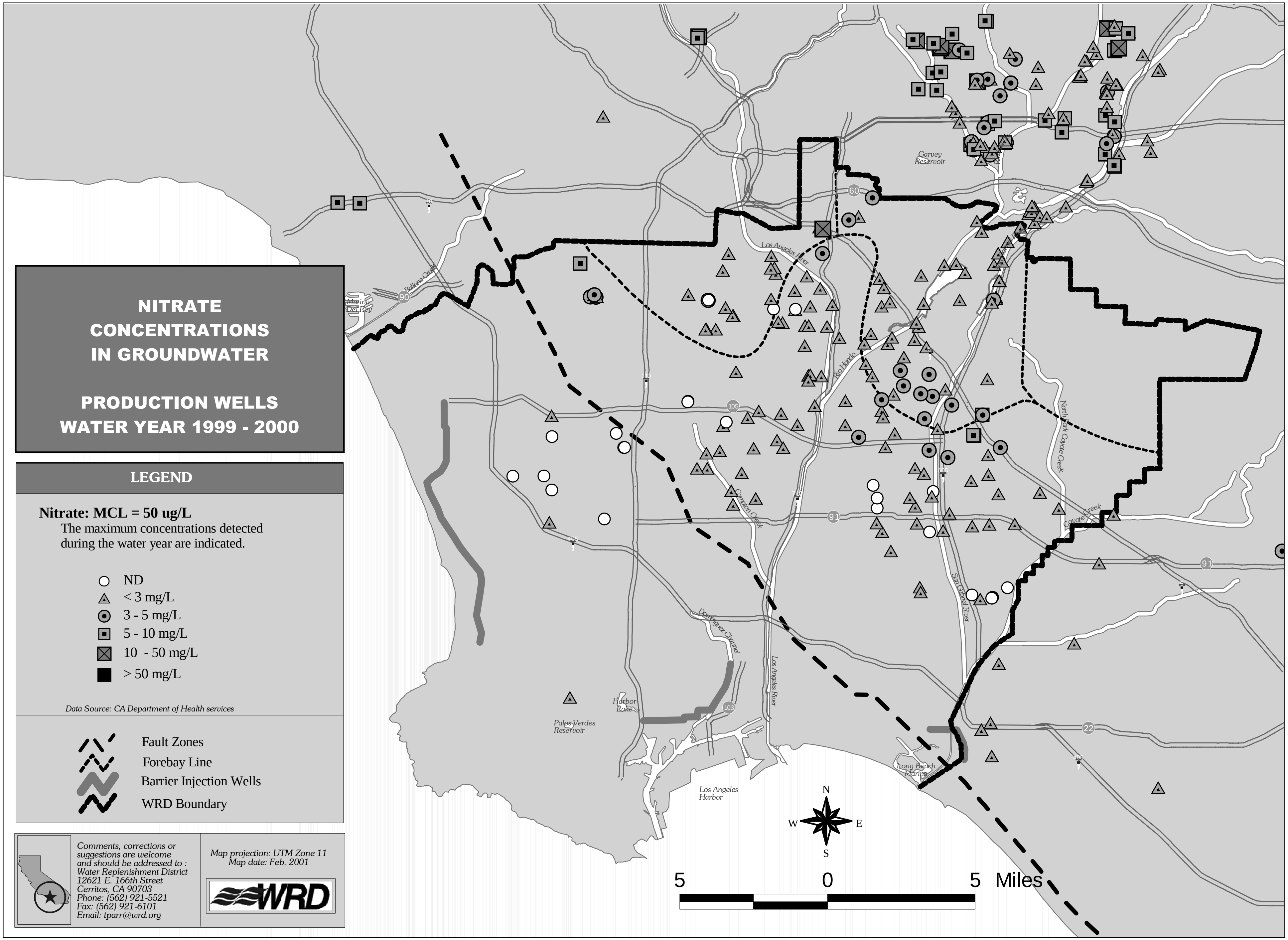

NITRATE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
Nitrate: MCL = 10 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< 3 mg/L
3 - 5 mg/L
5 - 10 mg/L
10 - 50 mg/L
> 50 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Rio_Hondo 1
Pico 1
Pico 2
South Gate 1
Whittier 1
SantaFeSprings 1
Downey 1
Willowbrook 1
Hawthorne 1
Gardena 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
Marina Del Rey
Ballona Creek
Garvey Reservoir
Rio Hondo
Los Angeles River
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.7



NITRATE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
Nitrate: MCL = 50 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< 3 mg/L
3 - 5 mg/L
5 - 10 mg/L
10 - 50 mg/L
> 50 mg/L
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
5
0
5 Miles
N
S
E
W
Garvey Reservoir
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Ballona Creek
Marina Del Rey
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22

Figure 4.8

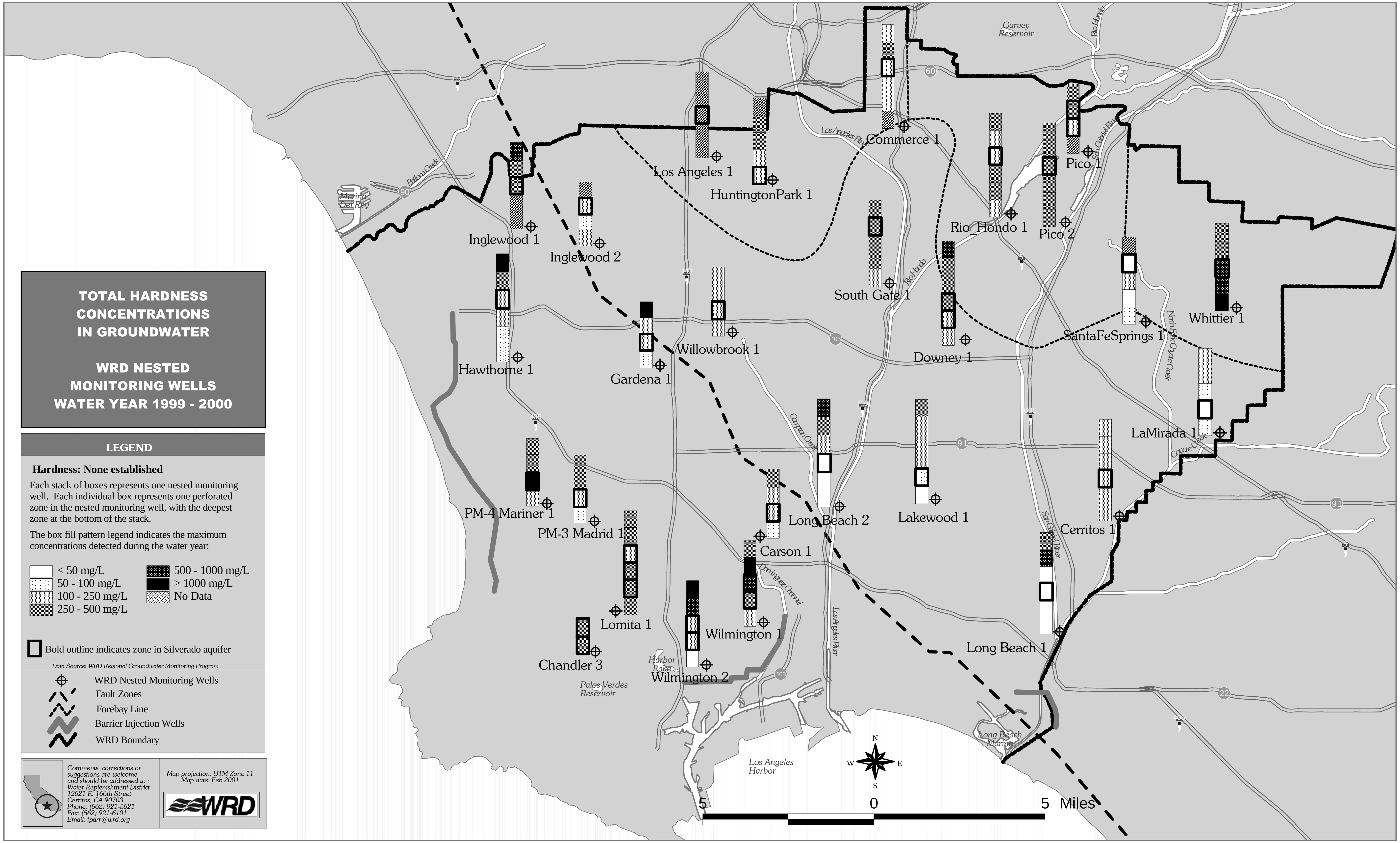

TOTAL HARDNESS CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
Hardness: None established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 50 mg/L
50 - 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
500 - 1000 mg/L
> 1000 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Pico 2
Rio_Hondo 1
South Gate 1
Downey 1
SantaFeSprings 1
Whittier 1
Hawthorne 1
Gardena 1
Willowbrook 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Wilmington 2
Chandler 3
Long Beach 1
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.9

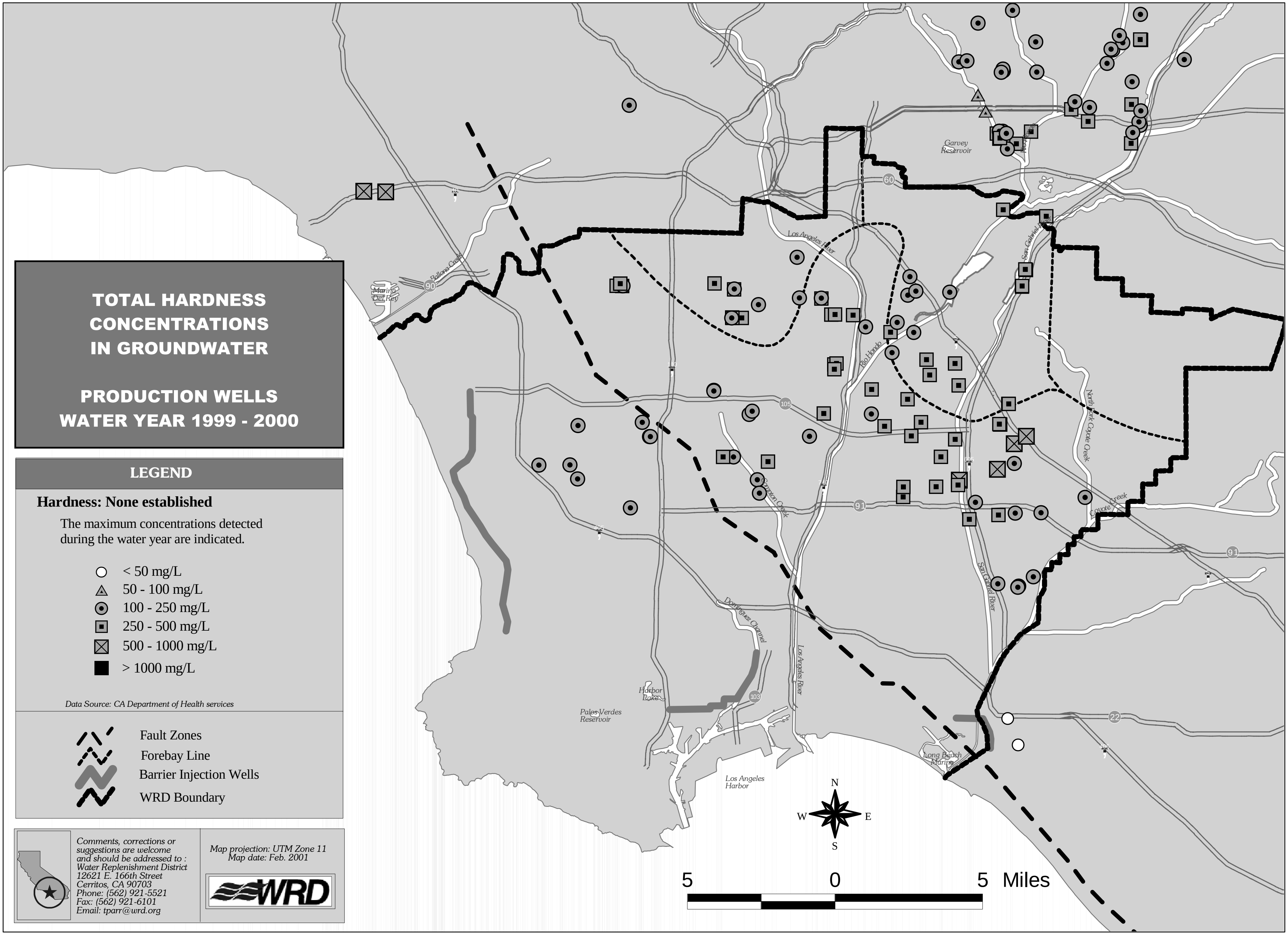

TOTAL HARDNESS CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
Hardness: None established
The maximum concentrations detected during the water year are indicated.
< 50 mg/L
50 - 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
500 - 1000 mg/L
> 1000 mg/L
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
5
0
5 Miles
N
W
E
S
Garvey Reservoir
Los Angeles River
Ballona Creek
Marina Del Rey
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Los Angeles River
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
22
103

Figure 4.10

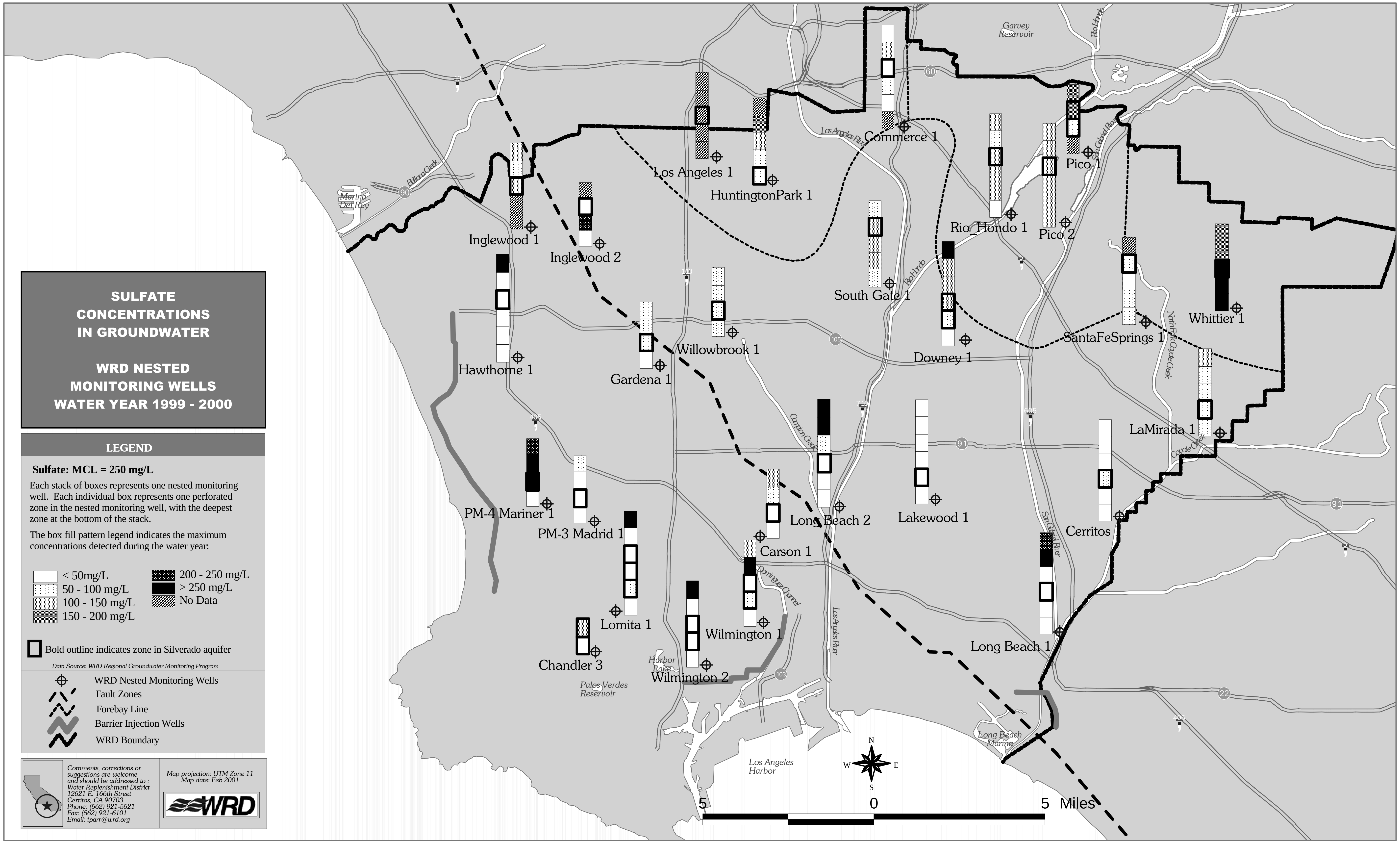

SULFATE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
Sulfate: MCL = 250 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 50mg/L
50 - 100 mg/L
100 - 150 mg/L
150 - 200 mg/L
200 - 250 mg/L
> 250 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Pico 2
Rio Hondo 1
South Gate 1
Downey 1
SantaFeSprings 1
Whittier 1
Hawthorne 1
Gardena 1
Willowbrook 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Carson 1
Long Beach 2
Lakewood 1
Cerritos 1
Long Beach 1
N
W
E
S
5
0
5 Miles

Figure 4.11

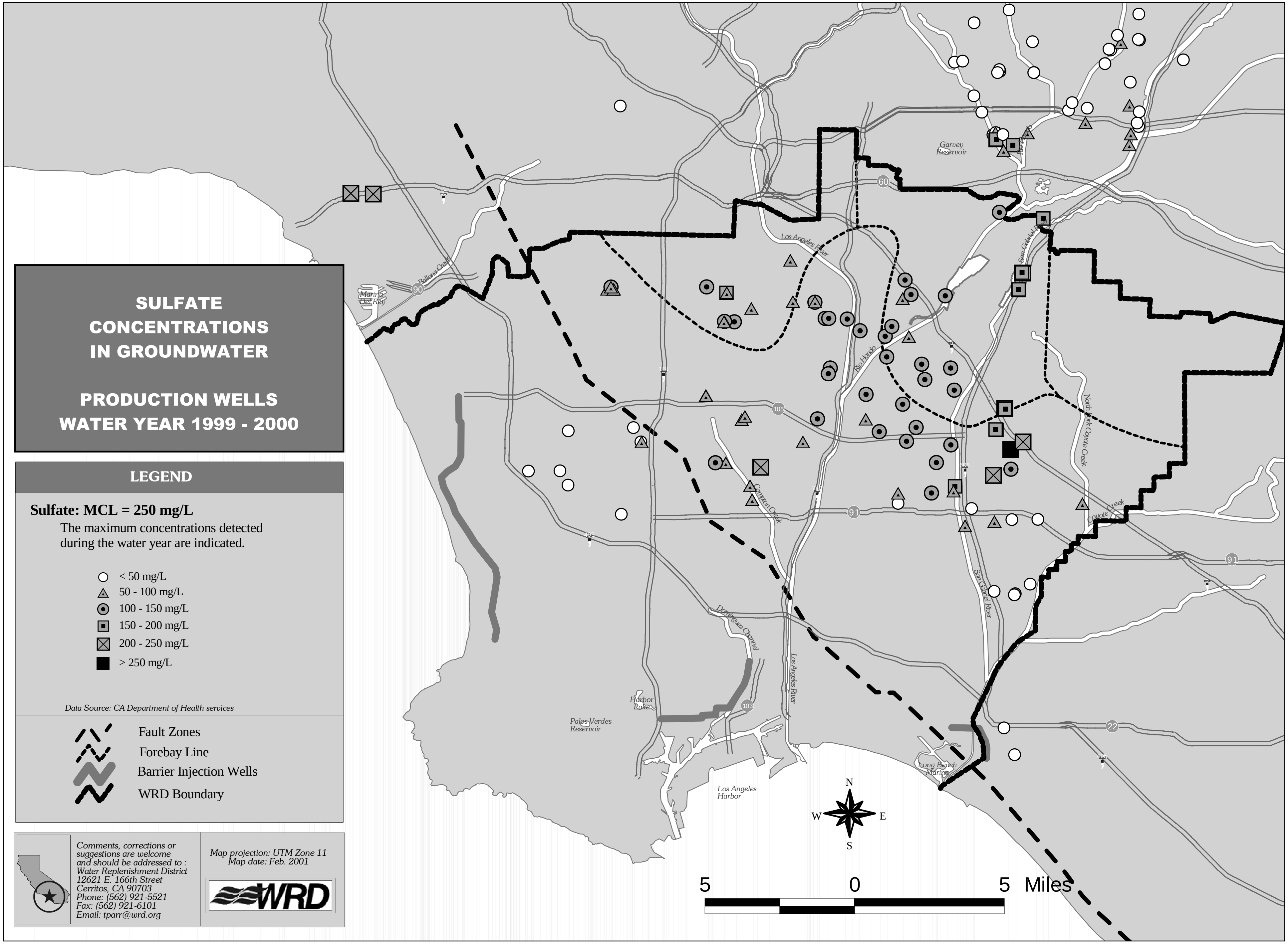

SULFATE
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
Sulfate: MCL = 250 mg/L
The maximum concentrations detected during the water year are indicated.
< 50 mg/L
50 - 100 mg/L
100 - 150 mg/L
150 - 200 mg/L
200 - 250 mg/L
> 250 mg/L
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
N
S
W
E
5
0
5
Miles
Garvey Reservoir
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Ballona Creek
Marina Del Rey
Compton Creek
Dominguez Channel
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22

Figure 4.12

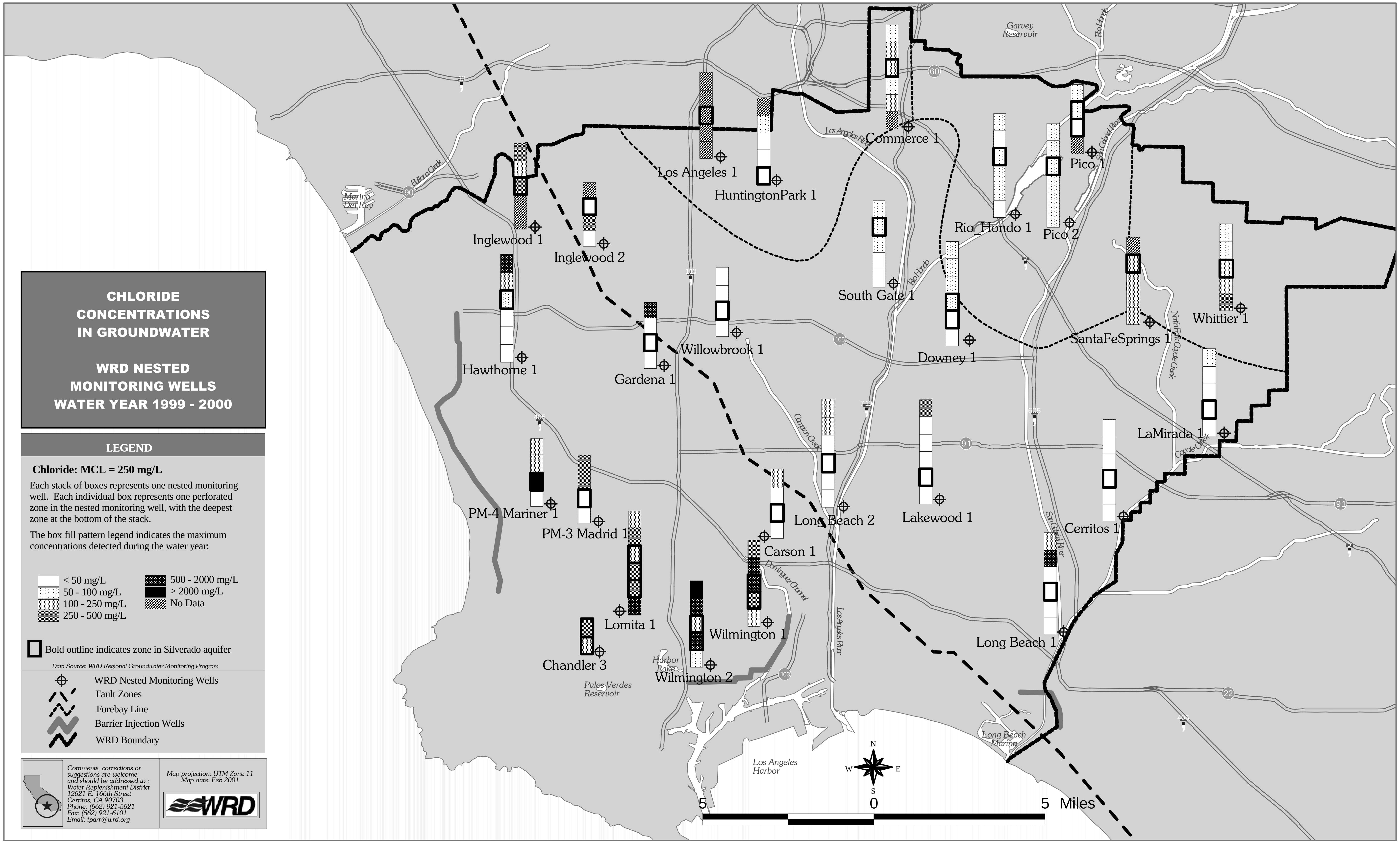
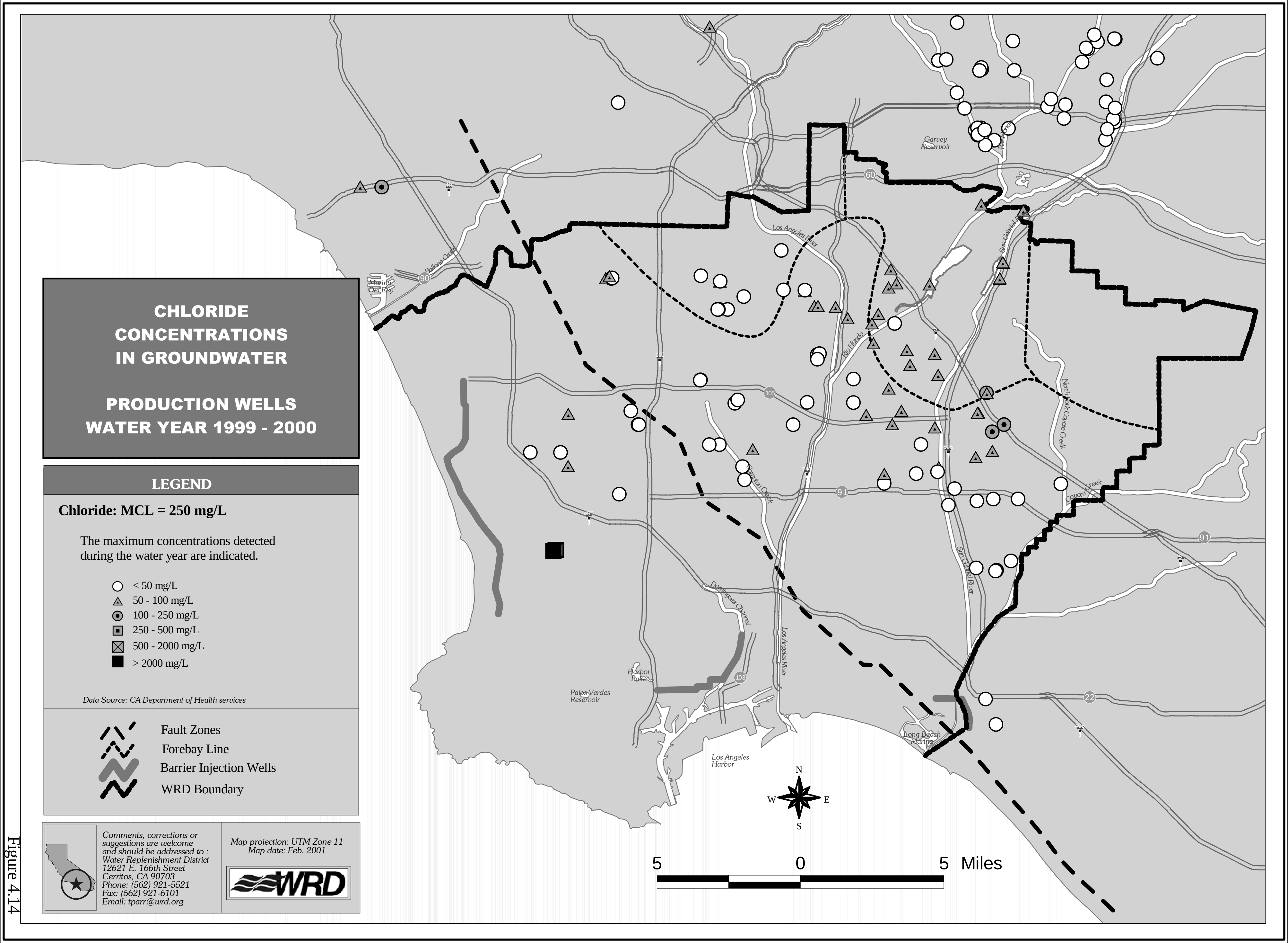
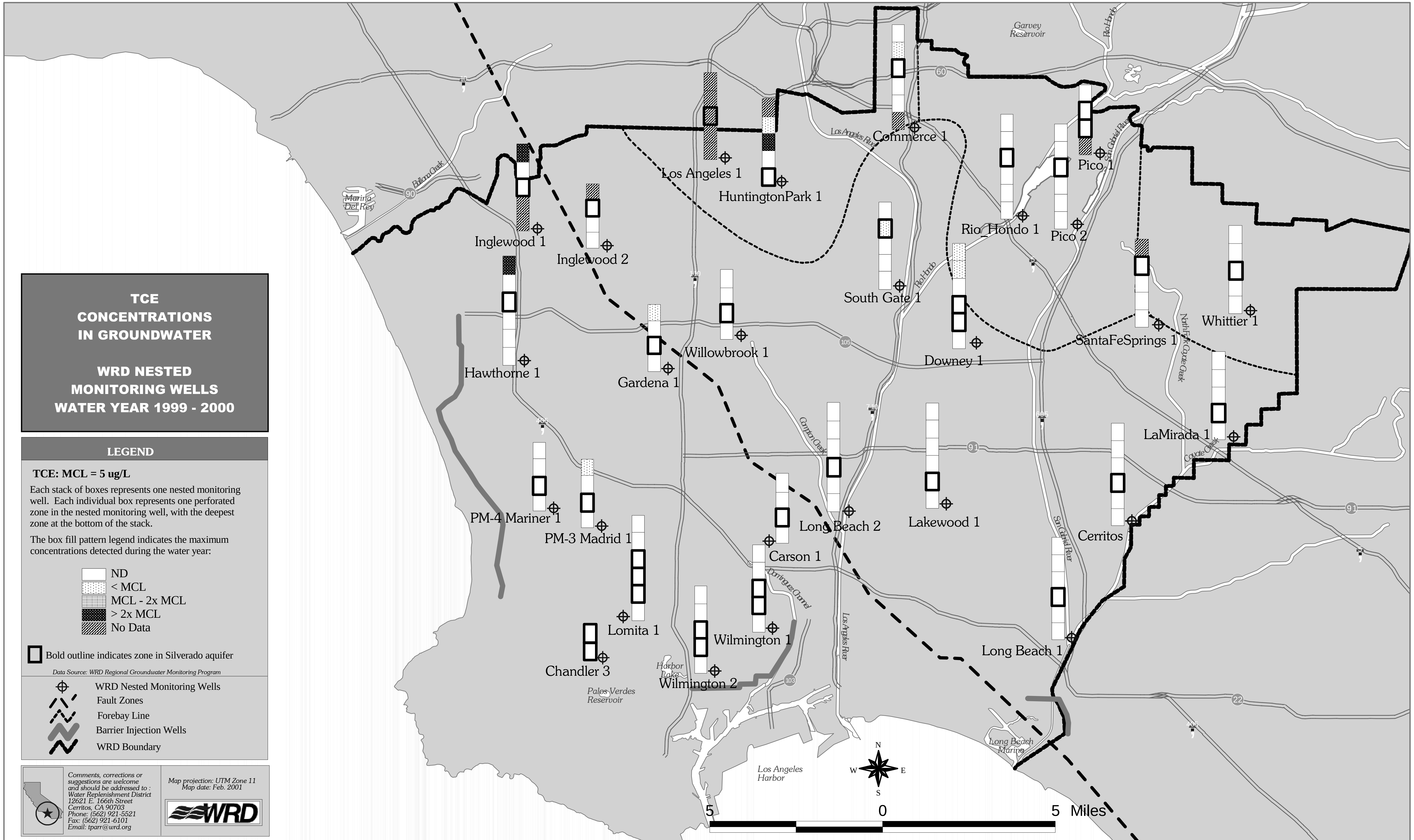

CHLORIDE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
Chloride: MCL = 250 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 50 mg/L
50 - 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
500 - 2000 mg/L
> 2000 mg/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Rio_Hondo 1
Pico 1
Pico 2
South Gate 1
Hawthorne 1
Gardena 1
Willowbrook 1
Downey 1
SantaFeSprings 1
Whittier 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Carson 1
Long Beach 2
Lakewood 1
Cerritos 1
Long Beach 1
Marina Del Rey
Ballona Creek
Garvey Reservoir
Rio Hondo
San Gabriel River
Los Angeles River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.13



CHLORIDE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
Chloride: MCL = 250 mg/L
The maximum concentrations detected during the water year are indicated.
< 50 mg/L
50 - 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
500 - 2000 mg/L
> 2000 mg/L
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
5
0
5 Miles
N
S
E
W
Garvey Reservoir
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Ballona Creek
Marina Del Rey
Compton Creek
Dominguez Channel
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22

Figure 4.14



TCE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
TCE: MCL = 5 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< MCL
MCL - 2x MCL
> 2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Rio_Hondo 1
Pico 1
Pico 2
South Gate 1
Downey 1
SantaFeSprings 1
Whittier 1
Hawthorne 1
Gardena 1
Willowbrook 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Carson 1
Long Beach 2
Lakewood 1
Cerritos
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Long Beach 1
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.15

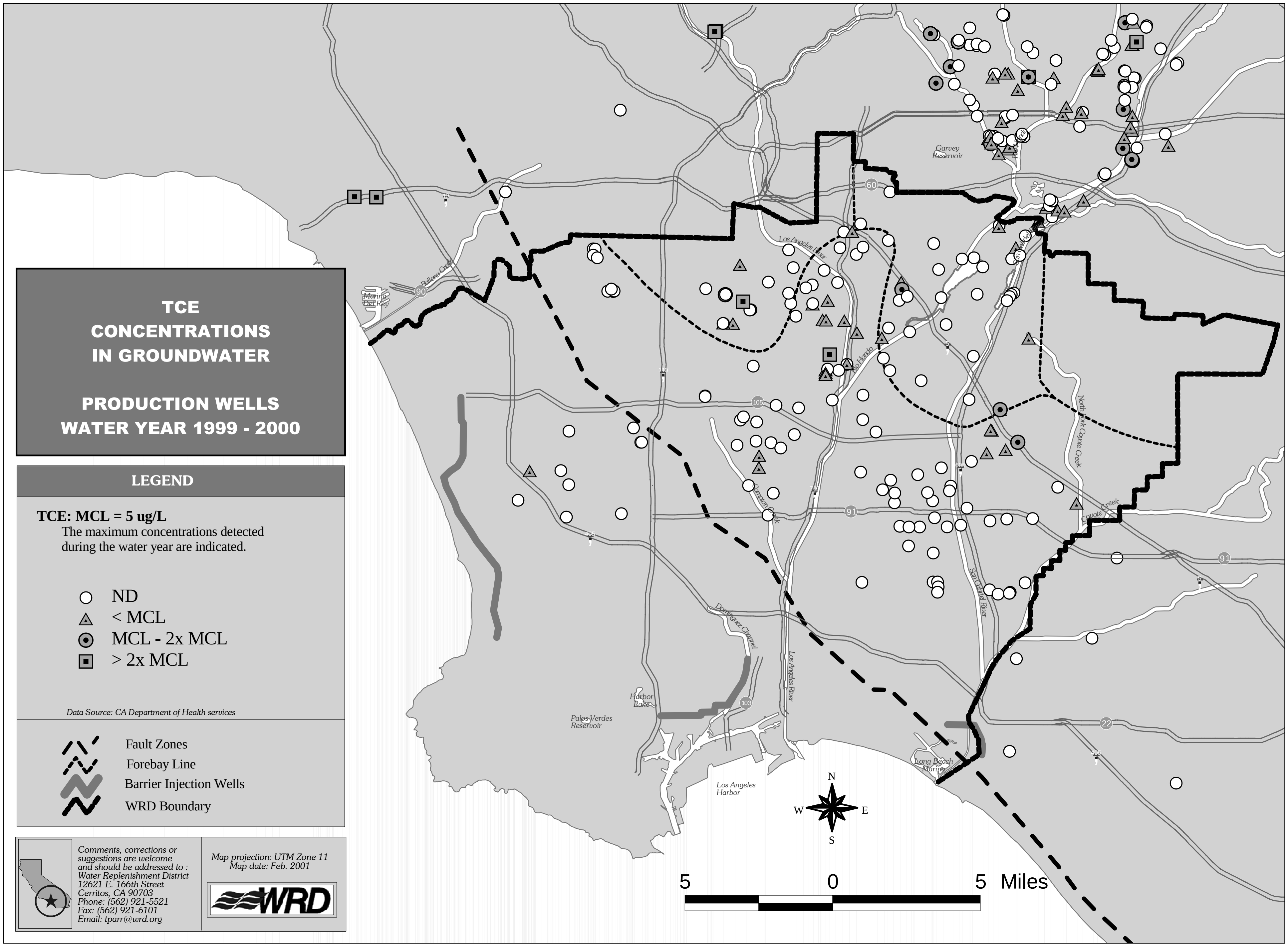

TCE
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
TCE: MCL = 5 ug/L
The maximum concentrations detected
during the water year are indicated.
ND
< MCL
MCL - 2x MCL
> 2x MCL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
5
0
5 Miles
N
S
W
E
Garvey Reservoir
Los Angeles River
Rio Hondo
San Gabriel River
Coyote Creek
North Fork Coyote Creek
Compton Creek
Dominguez Channel
Ballona Creek
Marina Del Rey
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22

Figure 4.16

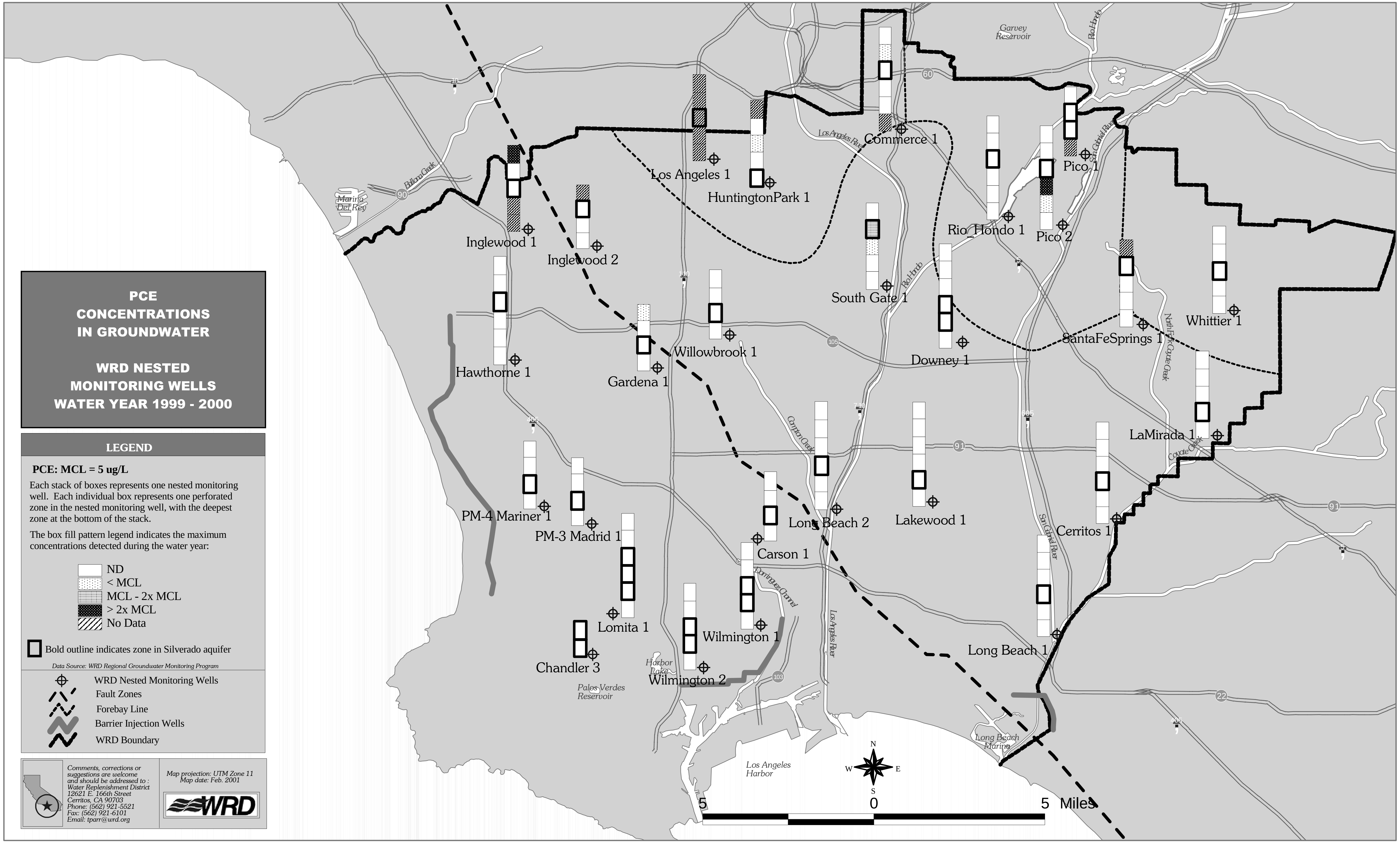

PCE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
PCE: MCL = 5 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< MCL
MCL - 2x MCL
> 2x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Rio_Hondo 1
Pico 2
Inglewood 1
Inglewood 2
South Gate 1
Whittier 1
SantaFeSprings 1
Hawthorne 1
Gardena 1
Willowbrook 1
Downey 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5 Miles

Figure 4.17

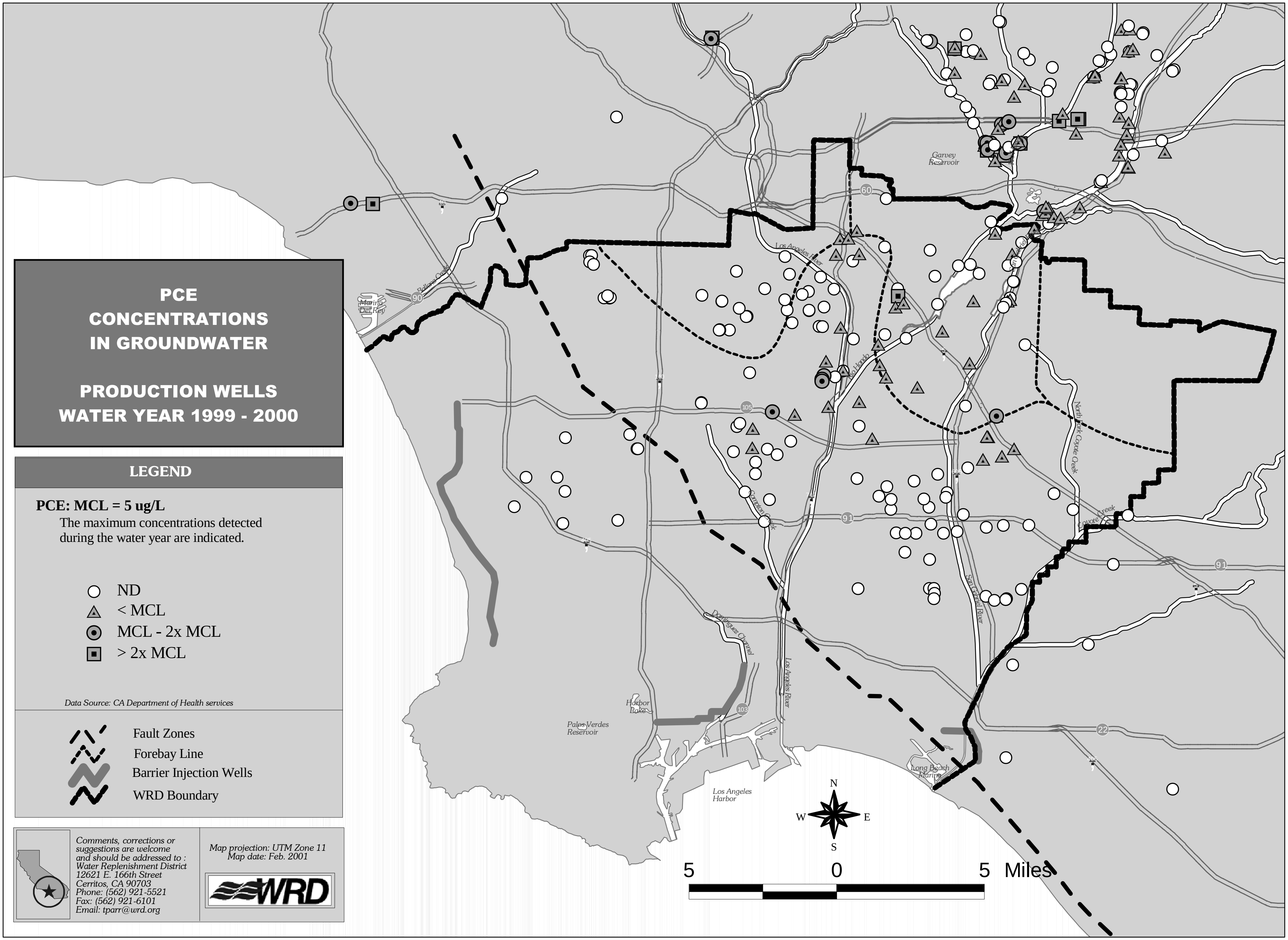

PCE
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
PCE: MCL = 5 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< MCL
MCL - 2x MCL
> 2x MCL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
Garvey Reservoir
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Ballona Creek
Marina Del Rey
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22
N
W
E
S
5
0
5 Miles

Figure 4.18

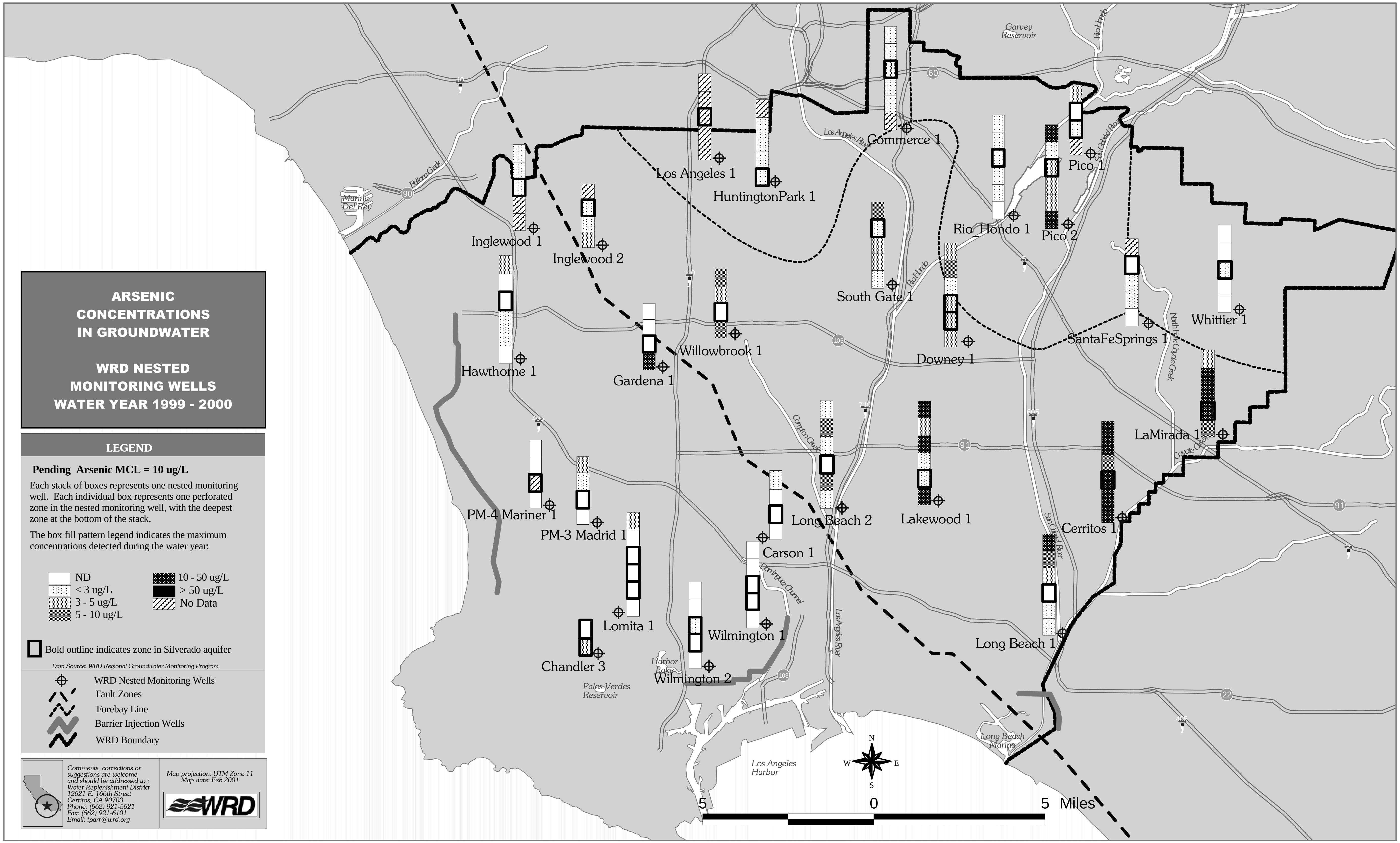

ARSENIC CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS WATER YEAR 1999 - 2000
LEGEND
Pending Arsenic MCL = 10 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< 3 ug/L
3 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L
> 50 ug/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
Los Angeles 1
HuntingtonPark 1
Commerce 1
Rio_Hondo 1
Pico 1
Pico 2
Inglewood 1
Inglewood 2
South Gate 1
Whittier 1
Hawthorne 1
Gardena 1
Willowbrook 1
Downey 1
SantaFeSprings 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Carson 1
Long Beach 2
Lakewood 1
Cerritos 1
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Long Beach 1
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.19

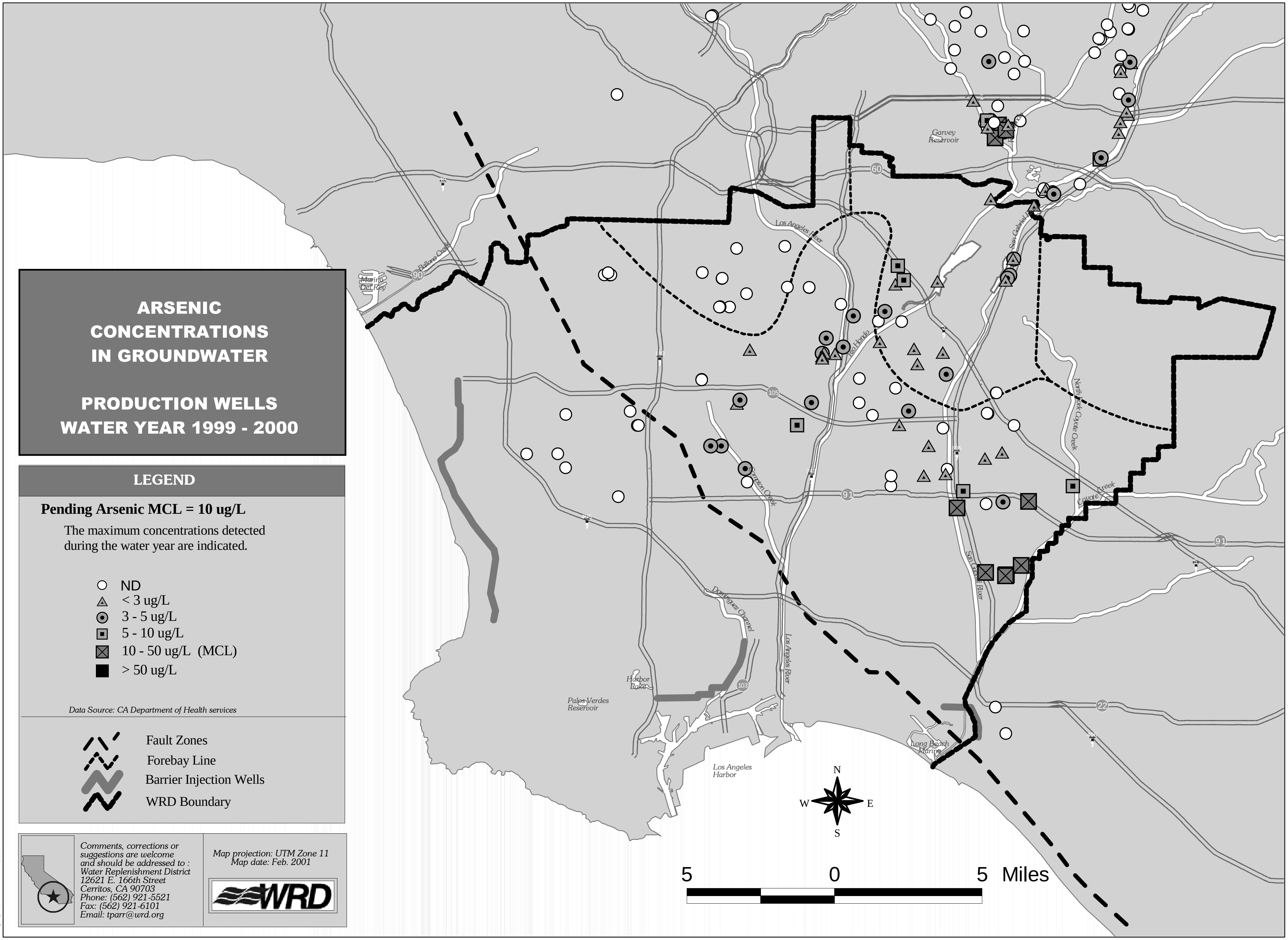
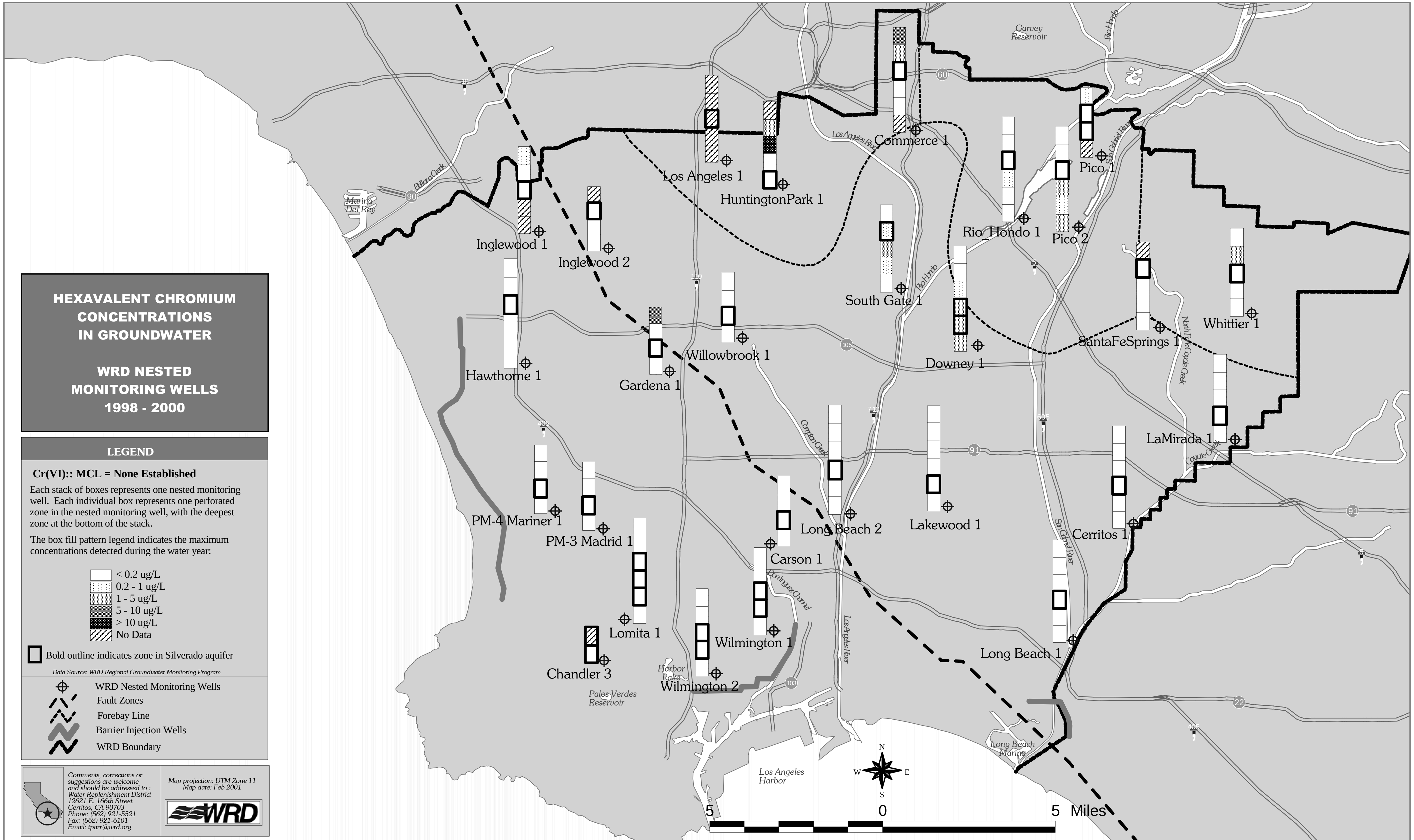
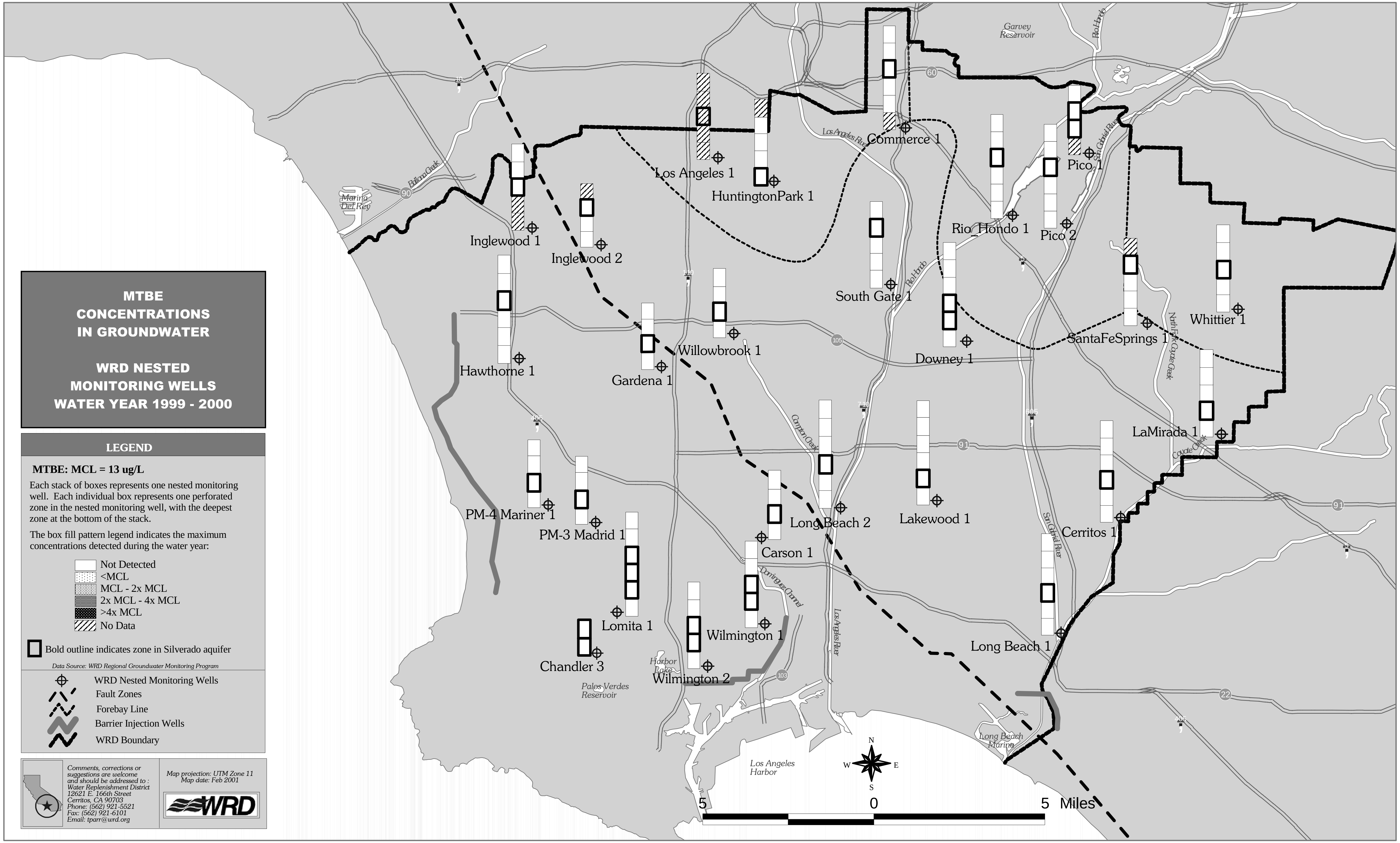

ARSENIC CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
Pending Arsenic MCL = 10 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< 3 ug/L
3 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L (MCL)
> 50 ug/L
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
Garvey Reservoir
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Compton Creek
Dominguez Channel
Ballona Creek
Marina Del Rey
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5 Miles

Figure 4.20



HEXAVALENT CHROMIUM
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
1998 - 2000
LEGEND
Cr(VI):: MCL = None Established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
< 0.2 ug/L
0.2 - 1 ug/L
1 - 5 ug/L
5 - 10 ug/L
> 10 ug/L
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
Inglewood 1
Inglewood 2
Los Angeles 1
HuntingtonPark 1
Commerce 1
Rio_Hondo 1
Pico 2
Pico 1
South Gate 1
Whittier 1
Hawthorne 1
Gardena 1
Willowbrook 1
Downey 1
SantaFeSprings 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
Marina Del Rey
Garvey Reservoir
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
Los Angeles River
San Gabriel River
Rio Hondo
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Ballona Creek
N
W
E
S
5
0
5 Miles

Figure 4.21



MTBE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLS
WATER YEAR 1999 - 2000
LEGEND
MTBE: MCL = 13 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
Not Detected
<MCL
MCL - 2x MCL
2x MCL - 4x MCL
>4x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Rio_Hondo 1
Pico 2
Inglewood 1
Inglewood 2
South Gate 1
Whittier 1
Hawthorne 1
Gardena 1
Willowbrook 1
Downey 1
SantaFeSprings 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Long Beach 1
Chandler 3
Wilmington 2
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Palos Verdes Reservoir
Harbor Lake
Los Angeles Harbor
Long Beach Marina
N
W
E
S
5
0
5 Miles

Figure 4.22

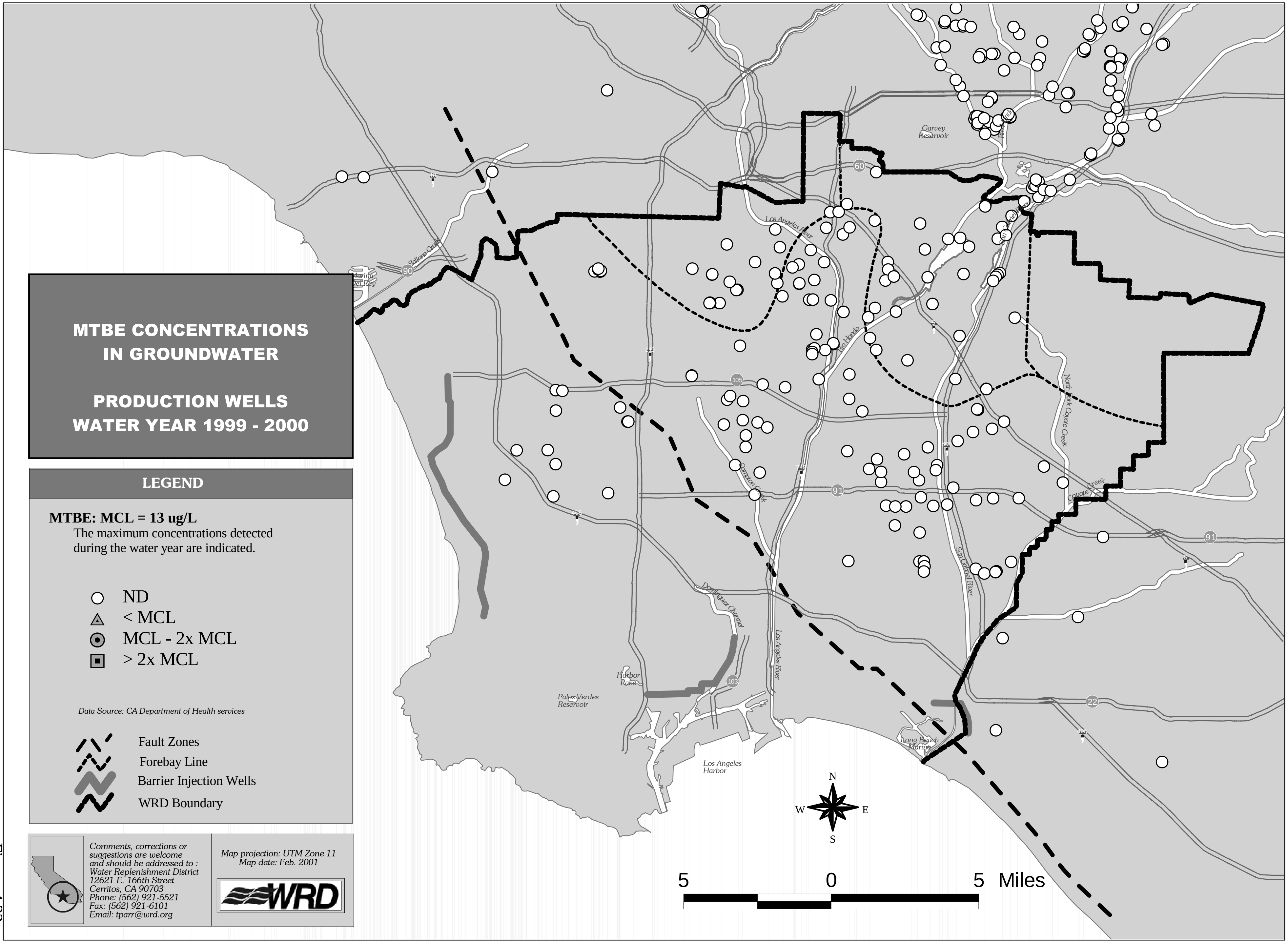

MTBE CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
WATER YEAR 1999 - 2000
LEGEND
MTBE: MCL = 13 ug/L
The maximum concentrations detected
during the water year are indicated.
ND
< MCL
MCL - 2x MCL
> 2x MCL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
5 0 5 Miles
N
W
E
S
Garvey Reservoir
Los Angeles River
Rio Hondo
Ballona Creek
Marina del Rey
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
San Gabriel River
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22

Figure 4.23

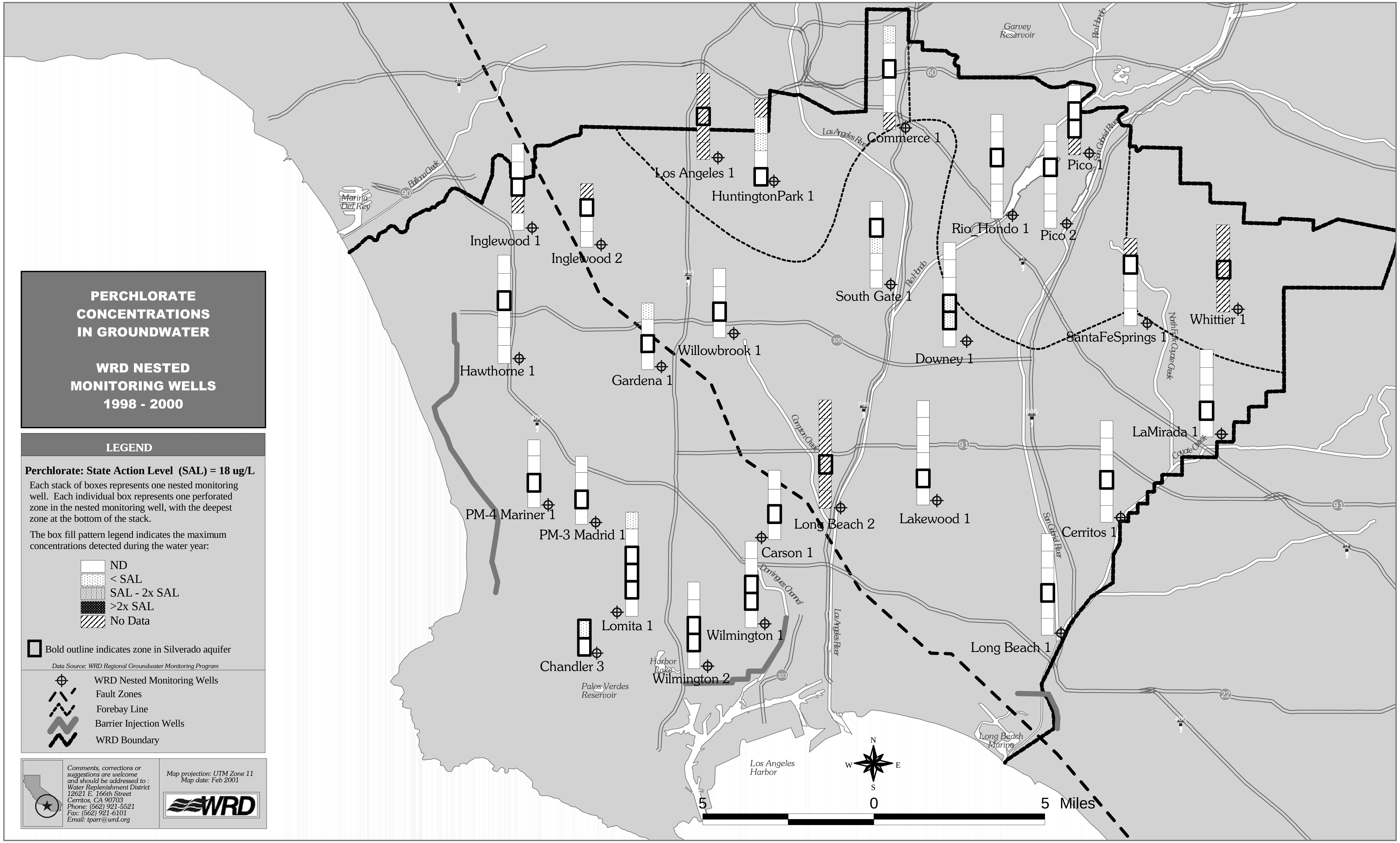

PERCHLORATE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
1998 - 2000
LEGEND
Perchlorate: State Action Level (SAL) = 18 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
< SAL
SAL - 2x SAL
>2x SAL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2001
WRD
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Rio_Hondo 1
Pico 2
Inglewood 1
Inglewood 2
South Gate 1
Whittier 1
SantaFeSprings 1
Hawthorne 1
Gardena 1
Willowbrook 1
Downey 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Long Beach 1
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.24

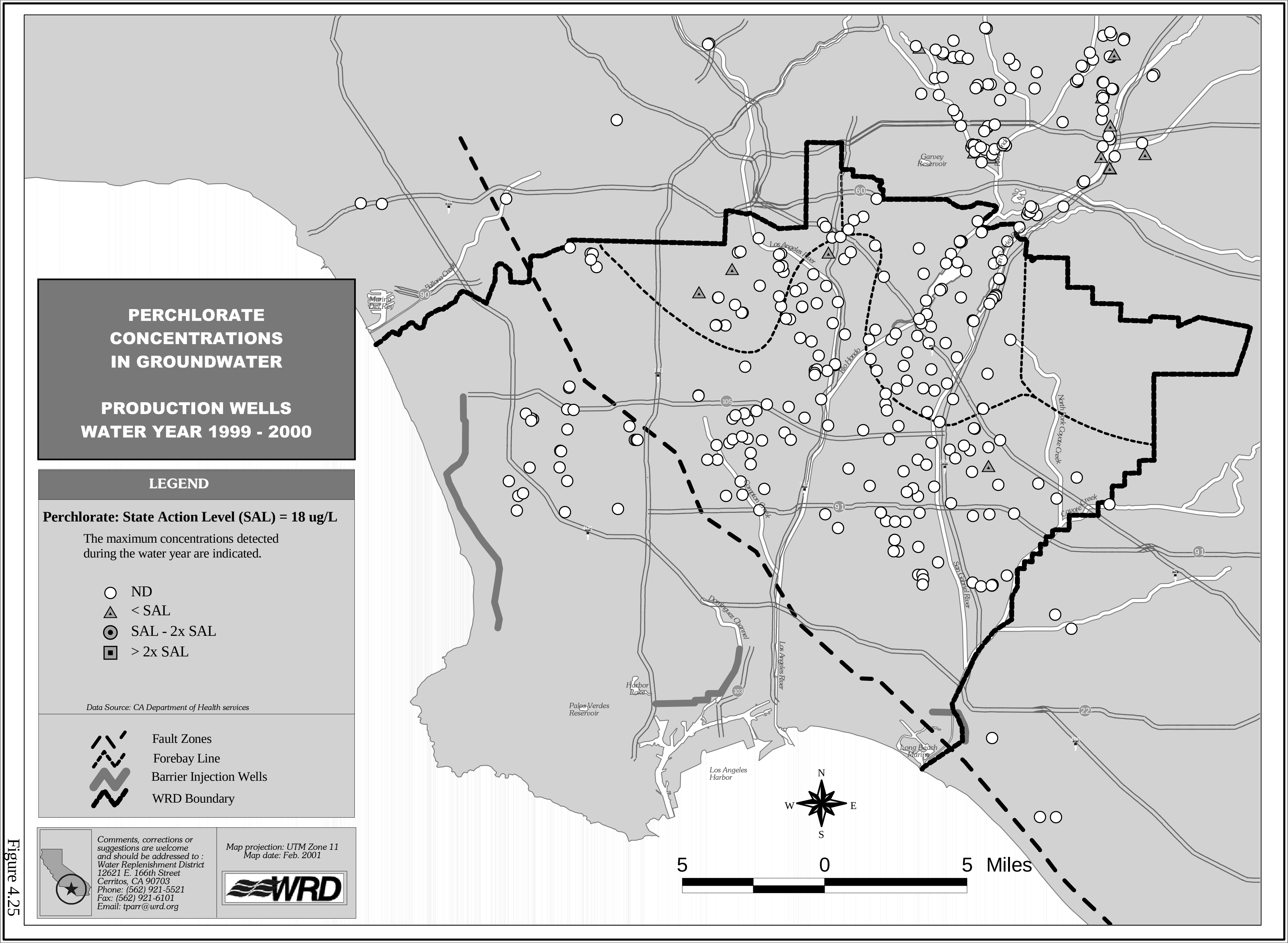

PERCHLORATE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS WATER YEAR 1999 - 2000
LEGEND
Perchlorate: State Action Level (SAL) = 18 ug/L
The maximum concentrations detected during the water year are indicated.
ND
< SAL
SAL - 2x SAL
> 2x SAL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to : Water Replenishment District 12621 E. 166th Street Cerritos, CA 90703 Phone: (562) 921-5521 Fax: (562) 921-6101 Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
5
0
5 Miles
N
W
E
S
Garvey Reservoir
Los Angeles River
Rio Hondo
Ballona Creek
Marina Del Rey
Compton Creek
Dominguez Channel
Los Angeles River
San Gabriel River
North Fork Coyote Creek
Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22

Figure 4.25

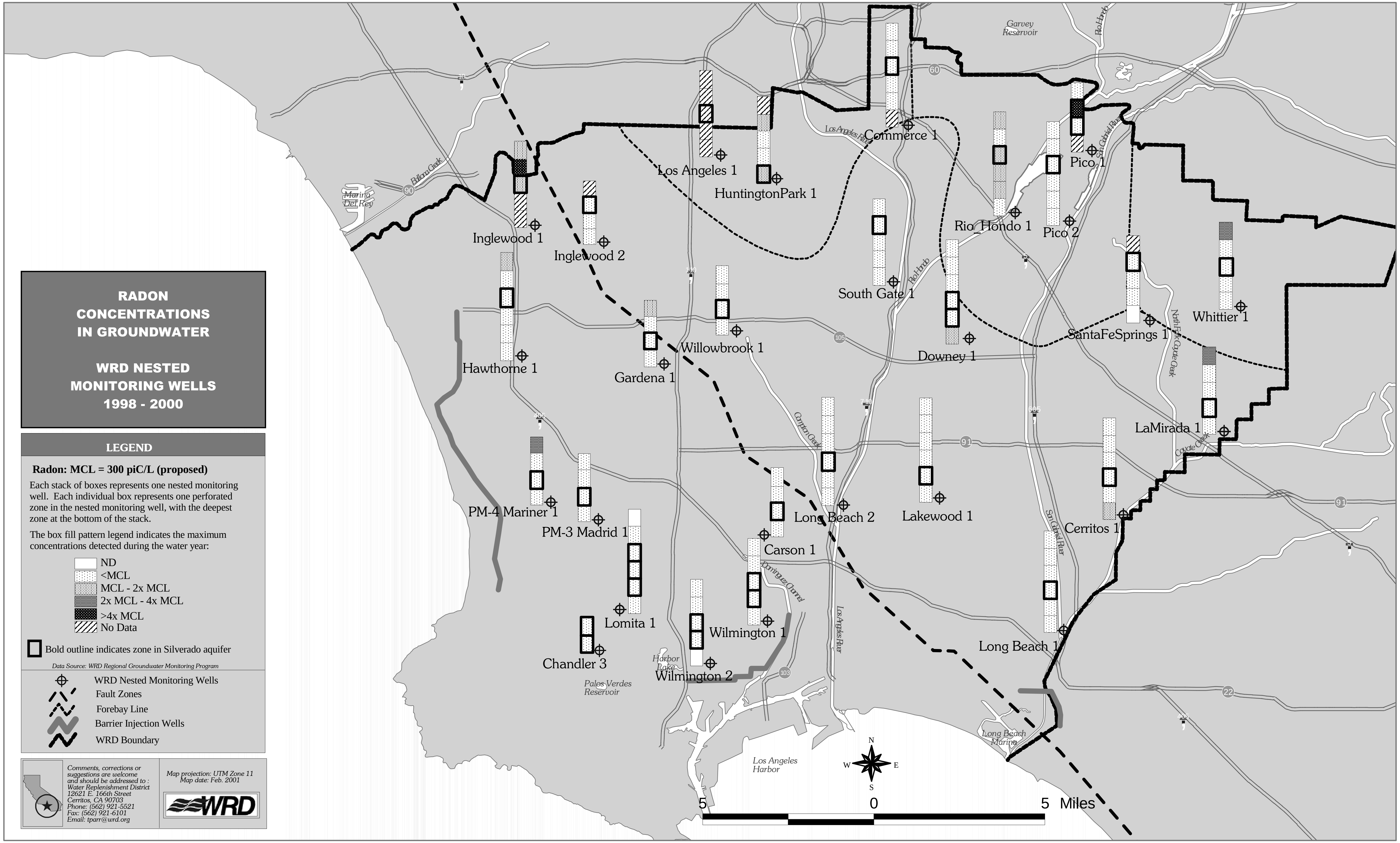

RADON
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLS
1998 - 2000
LEGEND
Radon: MCL = 300 piC/L (proposed)
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
ND
<MCL
MCL - 2x MCL
2x MCL - 4x MCL
>4x MCL
No Data
Bold outline indicates zone in Silverado aquifer
Data Source: WRD Regional Groundwater Monitoring Program
WRD Nested Monitoring Wells
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
Los Angeles 1
HuntingtonPark 1
Commerce 1
Pico 1
Pico 2
Rio_Hondo 1
Inglewood 1
Inglewood 2
South Gate 1
Whittier 1
SantaFeSprings 1
Downey 1
Hawthorne 1
Gardena 1
Willowbrook 1
LaMirada 1
PM-4 Mariner 1
PM-3 Madrid 1
Long Beach 2
Lakewood 1
Cerritos 1
Carson 1
Lomita 1
Wilmington 1
Chandler 3
Wilmington 2
Long Beach 1
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
Coyote Creek
North Fork Coyote Creek
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
N
S
E
W
5
0
5 Miles

Figure 4.26

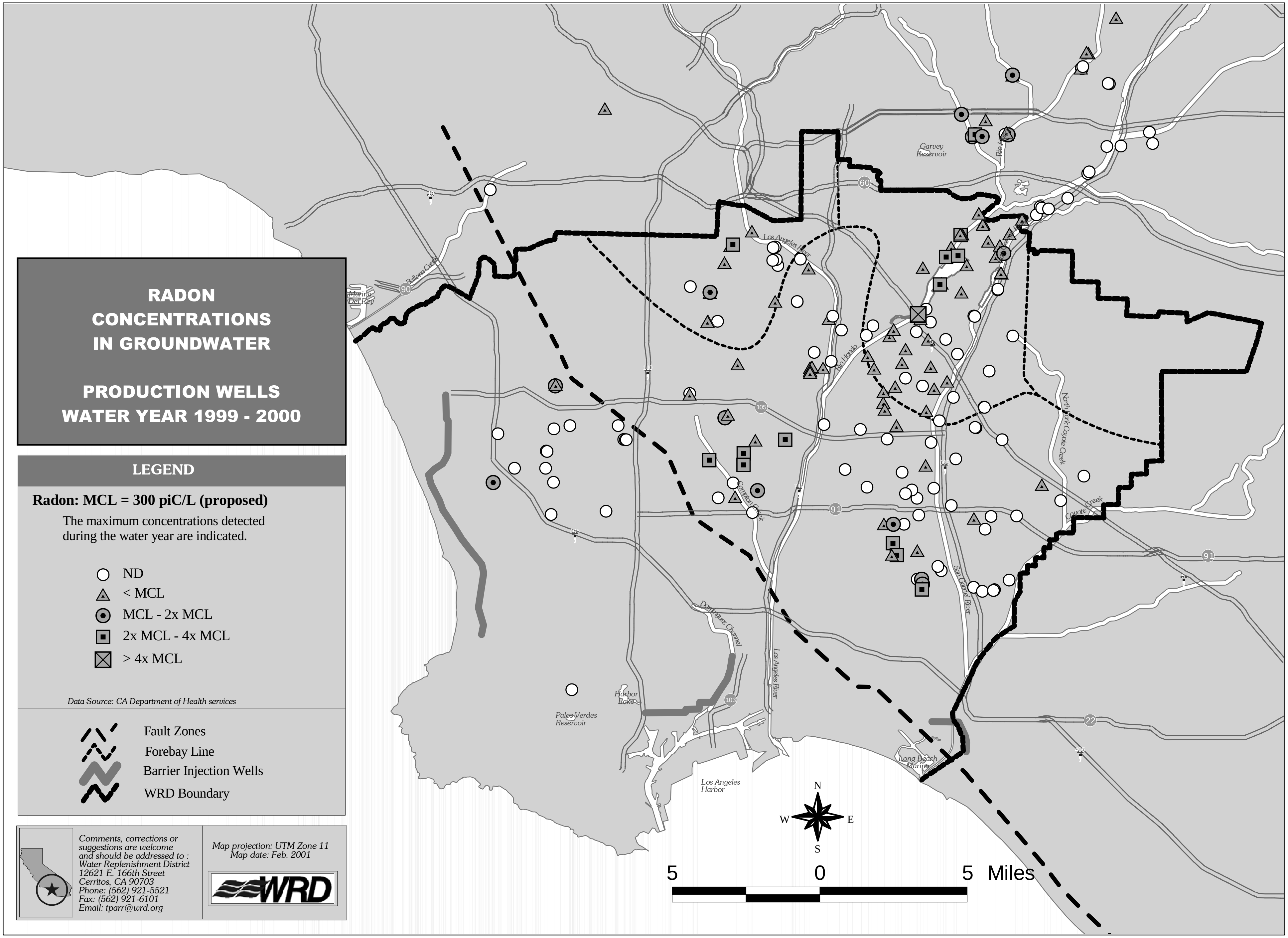

RADON CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS WATER YEAR 1999 - 2000
LEGEND
Radon: MCL = 300 piC/L (proposed)
The maximum concentrations detected during the water year are indicated.
ND
< MCL
MCL - 2x MCL
2x MCL - 4x MCL
> 4x MCL
Data Source: CA Department of Health services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to :
Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Phone: (562) 921-5521
Fax: (562) 921-6101
Email: tparr@wrd.org
Map projection: UTM Zone 11
Map date: Feb. 2001
WRD
N
W
E
S
5
0
5
Miles
Garvey Reservoir
Los Angeles River
Rio Hondo
Ballona Creek
Marina Del Rey
Compton Creek
Dominguez Channel
North Fork Coyote Creek
Coyote Creek
San Gabriel River
Harbor Lake
Palos Verdes Reservoir
Los Angeles Harbor
Long Beach Marina
60
90
105
91
103
22

Figure 4.27