"To provide, protect and preserve high quality groundwater through innovative, cost-effective and environmentally sensitive basin management practices for the benefit of residents and businesses of the Central and West Coast Basins"

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Regional Groundwater Monitoring Report • Water Year 2002-2003

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Water Replenishment District
of Southern California

REGIONAL GROUNDWATER MONITORING REPORT
CENTRAL AND WEST COAST BASINS
LOS ANGELES COUNTY, CALIFORNIA
WATER YEAR 2002-2003

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EXECUTIVE SUMMARY

"To provide, protect and preserve high quality groundwater through innovative, cost-effective and environmentally sensitive basin management practices for the benefit of residents and businesses of the Central and West Coast Basins."
-WRD Mission Statement

Since 1959, the Water Replenishment District of Southern California (WRD) has operated under the California Water Code to protect and preserve the quantity and quality of the groundwater supplies in the Central and West Coast groundwater basins (CWCB). Nearly 40 percent of the water used by the 4 million people overlying the WRD's 420-square mile service area comes from the underlying groundwater reservoir. As the regional agency responsible for managing and safeguarding this precious resource, WRD's focus is on maximizing the groundwater basins' capacity, preserving them for future use, and ensuring the basins' high water quality.

The extensive collection, analysis, and reporting of critical groundwater data is a major responsibility for the WRD to ensure proper basin management and to properly plan for the future. Our staff of highly skilled hydrogeologists, engineers, planners, and Geographic Information System (GIS) specialists work continually to sample, track, model, forecast, and plan for replenishment and water quality activities. These efforts result in the publication of the District's two main annual reports: the Engineering Survey and Report (issued since 1960) and a Groundwater Monitoring Report (since 1973).

This Regional Groundwater Monitoring Report for Water Year 2002-2003 is the most comprehensive report to date. The WRD's network of specialized monitoring wells continues to grow, DHS Title 22 drinking water analyses for potable wells in the CWCB are comprehensively incorporated, data sharing with the local groundwater pumpers and agencies improves, and greater amounts of data are collected, analyzed, and presented to better define the conditions in the CWCB. This report presents the latest information on groundwater replenishment activities, groundwater production, groundwater levels, and

an extensive section on groundwater quality, including an analysis and presentation of data for the latest chemicals of concern, including arsenic, hexavalent chromium, colored water, and total dissolved solids.

In Water Year 2002-2003 groundwater in storage decreased slightly, water levels decreased in some areas and increased in others. Groundwater production decreased 8,095 acre feet from the previous water year. The overall quantity and quality of groundwater and replenishment waters in the CWCB remain excellent and they are suitable for use now and in the near future. Localized areas of marginal to poor water quality do exist, however, and are being monitored closely by the WRD for potential action. When necessary, treatment plants are constructed by WRD or the pumpers to filter and treat groundwater before it is served to the public. WRD has constructed ten treatment facilities to date and is in the planning stages for five additional facilities to remove volatile organic contamination and arsenic from the CWCB groundwater.

The WRD is pursuing conjunctive use projects to store excess water in the ground during wet years for future use by the region in times of drought. WRD is working proactively with site owners and regulatory agencies to identify and prioritize contamination threats to CWCB groundwater, and monitor site clean-up activities. These projects are consistent with the WRD's efforts to effectively manage current and future groundwater supply and water quality needs of the CWCB.

The WRD remains committed to its statutory charge to manage the public resource of the basins' storage capacity for the common good. To that end, innovative projects and programs will be implemented to ensure a continued reliable source of high quality groundwater, reduce the reliance on costly imported water, and optimize the region's water resources for the District's groundwater users.

To achieve these objectives, the WRD will continue to reach out and work closely with the 43 WRD cities, private sector groundwater purveyors, and the southern Los Angeles County area officials. The WRD is optimistic that by working together we can

implement these new initiatives to optimize the management of the basins for the benefit of all.

More information can be obtained on the District web site at http:\\www.wrd.org, or by telephoning the District at (562) 921-5521. WRD welcomes any comments or suggestions to this Regional Groundwater Monitoring Report.

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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) in southern Los Angeles County (**Figure 1.1**). Our mission is to protect and preserve high-quality groundwater in the basins through innovative, cost-effective, and environmentally sensitive management practices for the benefit of residents and businesses of the Central and West Coast Basins. 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, the 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 heavily 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. The study was documented in the recently published USGS Water Resources Investigations Report 03-4065, *Geohydrology, Geochemistry and Ground-Water Simulation-Optimization of the Central and West Coast Basins, Los Angeles County, California* (Reichard et al. 2003). 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 recently completed and existing WRD nested monitoring wells. Construction details for the WRD wells are presented in **Table 1.1.**

An *Annual Report on the Results of Water Quality Monitoring* (*Annual Report*) was published by the 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 groundwater 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**, respectively. These cross-sections illustrate a simplified aquifer system in 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, which typically includes 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 ArcGIS® software for data analysis and preparation of spatially related information (maps and graphics tied to data). WRD utilizes global positioning system (GPS) technology 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 of the basins.

In early 2003, WRD completed the development of its Internet-based GIS, which was made available to the public. WRD's Internet-based GIS can be accessed at http://gis.wrd.org. The web site provides the public with access to much of the water level and water quality data contained in this report. The well information can be accessed through either an interactive map or a text search and the resulting data can be displayed in both tabular and graphical formats.

1.4 SCOPE OF REPORT

The purpose of this report is to update information on groundwater conditions in the CWCB for WY 2002-2003, and to discuss the status of the Regional Groundwater Monitoring Program. Section 1 has provided an overview of WRD and the WRD Regional Groundwater Monitoring Program. Section 2 discusses the types, quantities, and 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 2002-2003. Section 4 presents water quality data for the WRD nested monitoring wells and basinwide 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. Although it occurs to an extent within the CWCB, 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 past years, In-Lieu water to make up the difference. Artificial replenishment occurs at the Rio Hondo and San Gabriel Spreading Grounds, and at the Alamitos Gap, Dominguez Gap, and West Coast Basin Seawater Barriers. This section describes the sources, quantities, and quality of water used for artificial replenishment in the CWCB during WY 2002-2003.

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 Water Project 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 sources, as the source quality is high and the water is treated naturally as it percolates through the vadose zone soils. For the seawater 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 water is available seasonally from MWD if they have excess reserves, whereas a premium price is paid for non-interruptible injection water to maintain deliveries throughout the year and during 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 microfiltration and reverse osmosis treatment is used for injection into the West Coast Basin Barrier Project, and will soon be used at the Dominguez Gap and Alamitos Barrier Projects.

- Make-Up Water: "Make-Up Water" is occasionally delivered to the Montebello Forebay spreading grounds from the Main San Gabriel 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 2002-2003, 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) are also considered to be local water as they 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, Main San Gabriel, Orange County) and the Pacific Ocean. The amounts of inflow and outflow depend on the hydrogeologic properties of the aquifers and the groundwater gradients at the basin boundaries.

2.2 QUANTITIES OF REPLENISHMENT WATER

Current and historical quantities of water conserved (replenished) in the Montebello Forebay spreading grounds are presented in **Table 2.1**. Current and 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 Report* (ESR).

At the Montebello Forebay spreading grounds (**Table 2.1**), the following is noted for the

quantities of replenishment water for WY 2002-2003:

- 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 123,363 acre-feet (AF). This is less than the historical running average of 126,855 AF (WY 1963-64 through 2002-03).

- The quantity of local water conserved during WY 2002-2003 was 58,357 AF, more than the historical running average of 49,334 AF, and more than the previous 5-year average of 38,800 AF (WY 1998-99 through 2002-03).

- The quantity of imported water conserved during WY 2002-2003 was 22,366 AF. This is less than the long-term running average of 45,665 AF, and the previous 5-year average of 22,129 AF.

- The quantity of recycled water conserved during WY 2002-2003 was 42,640 AF. This is more than the long-term running average of 31,856 AF but less than the previous 5-year average of 44,659 AF.

- In addition to the water sources shown on **Table 2.1**, the Montebello Forebay received an estimated 7,100 AF of recharge due to infiltration of precipitation falling on the forebay floor, and an estimated 27,500 AF of groundwater underflow from San Gabriel Valley. The total replenishment was therefore 157,963 AF, of which 27% was recycled water. The three-year average recycled water used was 49,172 AF, and the three-year averaged percent recycled water component was 33%.

At the seawater intrusion barriers (**Table 2.2**), the following trends are noted for the quantities of artificial replenishment water for WY 2002-2003:

- At the West Coast Basin Barrier, 16,611 AF were injected, which included 10,419 AF of imported water and 6,192 AF of recycled water (37%). The current limit for recycled water injection is 50% of the total supply. The long-term injection average from WY 1963-64 through 2002/03 was 20,617 AF. The 5-year average (1998-99 through 2002-03) was 18,633 AF.

- At the Dominguez Gap Barrier, 8,056 AF were injected. The long-term average from WY 1970/71 through 2002/03 was 5,935 AF, and the 5-year average (1998-99 through 2002-03) was 5,586 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 2002-2003 a total of 4,484 AF were injected into the barrier system, 3,287 by WRD and 1,197 by OCWD. The amount of injection decreased this year due to a damaged water main requiring several months to repair. The long-term average from WY 1964-65 through 2002-03 was 5,093 AF, and the 5-year average (1998-99 through 2002-03) was 5,549 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.

2.3 QUALITY OF REPLENISHMENT WATER

This section discusses water quality data for key parameters in WRD replenishment water and local surface water. Although numerous other constituents are monitored, the constituents reported here are the ones found to be most prevalent and at elevated levels or of current regulatory interest in wells in the CWCB. The data are classified according to their sources. The key water quality parameters of this discussion are: total dissolved solids (TDS), hardness, sulfate, chloride, nitrogen, iron, manganese, trichloroethylene (TCE), tetrachloroethylene (PCE), total organic carbon (TOC), and perchlorate.

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. Various criteria are used in discussing water quality. An Action Level (AL) is an advisory level established by the California Department of Health Services (DHS) based on preliminary review of health effects studies. A Public Health Goal (PHG) is an advisory level that is developed by the Office of Environmental Health Hazard Assessment (OEHHA) after a thorough review of health effects and risk assessment studies. A Primary Maximum Contaminant Level (MCL) is an enforceable drinking water standard that DHS establishes after health effects, risk assessments, detection capability, treatability and economic feasibility are considered. A Secondary MCL is established for constituents that impact aesthetics of the water, such as taste, odor, and color, and do not impact health. It should also be noted that constituents with ALs often are considered unregulated contaminants for which additional monitoring may be required to determine the extent of exposure before PHG's and MCLs are established.

- Total Dissolved Solids (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 MCL for TDS ranges from 500 milligrams per liter (mg/L), which is the recommended level, to 1,500 mg/L, which is the upper limit allowed for short-term use.
- Hardness: For most municipal uses, hardness (a measure of calcium and magnesium ions that combine with carbonates to form a precipitate or solid substance in water) is an important mineral characteristic of water. Some degree of hardness is considered to be beneficial to human health; studies suggest that it helps to lower cholesterol levels. Excessive hardness is undesirable because it results in increased consumption of cleaning products, scale on pipes, and other undesirable effects. There is no MCL for hardness, but generally waters are considered soft when it is less than 75 mg/L and very hard when greater than 300 mg/L.
- Sulfate: Sulfate is generally not a water quality concern in the CWCB. In excess amounts, it can act as a laxative. DHS has established a Secondary MCL for sulfate

at 250 mg/L and up to 600 mg/L for short-term use. Sulfate is, however a very useful water quality constituent in the CWCB for use in tracking flow and observing travel times of artificial recharge water. Colorado River water, local stormwater, and recycled water used for recharge in CWCB have characteristically high sulfate concentrations, while native groundwater and State Water Project water have relatively low sulfate concentrations.

- Chloride: Chloride is the characteristic constituent used to identify seawater intrusion. While recharge sources contain moderate concentrations of chloride, these concentrations are well below the 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.
- Nitrogen species: DHS standards limit 2 forms of nitrogen, nitrite and nitrate, in drinking water. Nitrate cannot exceed concentrations of 45 mg/L (measured as nitrate), corresponding to 10 mg/L as Nitrogen. Nitrite is limited to 1 mg/L as Nitrogen. The combined total of nitrite and nitrate reported as Nitrogen cannot exceed 10 mg/L. These constituents are of concern because they can cause acute health effects in infants. When consumed in excess of these limits, they can reduce the uptake of oxygen; causing shortness of breath, lethargy, and a bluish color. Exposure to these constituents in excess of the limits can be fatal.
- Iron: Typically, iron occurs naturally in groundwater. It is also leached from iron or steel pipes as rust. Small concentrations of iron in water can affect the water's suitability for domestic or industrial purposes. DHS limits the amount of iron in drinking water to 0.3 mg/L because iron in water stains plumbing fixtures and clothing, incrusts well screens, and clogs pipes. Some industrial processes cannot tolerate more than 0.1 mg/L iron.
- Manganese: Manganese, also naturally occurring, 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 solvent used in metal degreasing, textile processing, and

dry cleaning. Because of its potential health effects, it has been classified as a probable human carcinogen. The MCL for TCE is 5 µg /L.

- PCE: Tetrachloroethylene (also known as perchloroethylene, perc, perclene, and perchlor) is a solvent used heavily in the dry cleaning industry, as well as in metal degreasing and textile processing. Like TCE, PCE is a probable carcinogen. The MCL for PCE in drinking water is 5 µg/L.
- Total Organic Carbon: Total organic carbon (TOC) is the broadest measure of all organic molecules in water. TOC can be naturally occurring, wastewater-derived, or a combination of both (National Research Counsel, 1998). While there is no MCL established for TOC, regulators are generally concerned with wastewater derived TOC as a measurable component of recycled water.
- Perchlorate: This is used in a variety of defense and industrial applications, including being a primary ingredient in solid propellant for rockets, missiles, road flares, and fireworks, a component of air bag inflators, additives in lubricating oils, in tanning and finishing leather, and the production of paints and enamels. When ingested, it can inhibit the proper uptake of iodide by the thyroid gland, which causes a decrease in the production of hormones for normal growth and development and normal metabolism. The DHS action level was revised on March 11, 2004 to 6 µg/L.

Quality of Imported Water

As stated previously, treated imported water is used at the seawater intrusion barriers. This water meets all drinking water standards and is suitable for direct injection. Average water quality data for treated imported water are presented in **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 593 mg/L. The average TDS concentration of State Project Water has also shown a modest decreasing trend, from 320 mg/L to 242 mg/L.

The average hardness of Colorado River water has decreased over the last five water

years, from 322 mg/L to 288 mg/L. The average hardness of untreated State Project Water has also shown a decreasing trend, from 173 mg/L to 99 mg/L.

The average nitrogen concentration of Colorado River water has decreased from the previous water year, dropping from 0.23 mg/L to below detection limits. The average nitrogen concentration of State Project Water has increased over the previous water year, from 0.54 mg/L to 0.70 mg/L. Recently and historically, both Colorado River and State Project Water nitrogen concentrations have been far below the MCL.

The average iron concentrations of untreated Colorado River Water have remained below detection limits. Iron in State Project Water was 0.124 mg/L. Manganese in State Project water averaged 22 µg/L. Both Colorado River and State Project Water iron and manganese concentrations have historically been below the MCL.

The average chloride and sulfate concentrations of Colorado River Water and State Project Water have not changed significantly over the past several years. Both Colorado River and State Project Water chloride and sulfate concentrations have historically been below their respective MCLs.

According to the MWD, TCE and PCE have not been detected in Colorado River Water or State Project Water over the last five water years.

Quality of Recycled Water

Recycled water is introduced into the CWCB through percolation and injection. Recycled water from the Whittier Narrows Water Reclamation Plant (WRP), San Jose Creek East WRP, San Jose Creek West WRP, and Pomona WRP is diverted into spreading basins where it percolates into the subsurface. The water quality from these WRPs is carefully controlled and monitored, as required by permits, and typically shows little variation over time. **Table 2.3** presents average water quality data from these WRPs. All constituents listed have either decreased slightly or remained stable over the past five water years. Furthermore, neither TCE nor PCE have been detected above their

MCLs in recycled water from these four WRPs over the last four water years.

Recycled water from the West Basin Municipal Water District (WBMWD) WRP undergoes advanced treatment using microfiltration and reverse osmosis, and is then injected at the West Coast Basin barrier. This water is treated to meet or exceed drinking water standards and is suitable for direct injection. The blend of recycled water and imported water is injected to prevent the intrusion of salt water and to also replenish the groundwater basins. The DHS limits injection of recycled water to 50 percent of the total injected amount. However, the WBMWD, working with the DHS and WRD, are seeking to increase the recycled water percentage to 100 percent recycled water in the future. Average water quality data for this water are presented on **Table 2.3**.

Quality of Stormwater

As discussed in Section 2.1, stormwater infiltrates to some degree throughout the District, but especially in the Montebello Forebay, where it is intentionally percolated along with imported and recycled water at local spreading grounds. Periodic stormwater quality analyses have been performed by LACDPW throughout the history of operations at the Montebello Forebay spreading grounds. Average stormwater quality data 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 have periodically exceeded MCLs.

SECTION 3
GROUNDWATER PRODUCTION AND WATER LEVELS

Groundwater production (pumping) is the major source of groundwater outflow from the CWCB. Groundwater currently provides about 40% of the total water used in the basins. It is critical to maintain adequate supplies of groundwater in storage to meet this demand and to protect against times of drought when imported water may not be available. Measurements of water levels in the basins are performed 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 increased. 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 in the CWCB to reduce the 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 rights were set at 271,650 AFY, although the Judgment set a lower Allowed Pumping Allocation (APA) of 217,367 AFY. 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. WRD was created in 1959 to manage this deficiency through artificial replenishment. A

replenishment assessment is placed on production to collect the funds necessary to purchase the supplemental replenishment water.

During WY 2002-2003, groundwater production in the CWCB was 241,871 AF, of which 190,082 AF occurred in the Central Basin and 51,789 AF occurred in the West Coast Basin. This represents a 3.2% decrease from the previous year. The five-year averaged production amount is 249,632 AF (WY 1998-99 through 2002-03). **Table 3.1** presents historical groundwater production quantities for the CWCB. **Figure 3.1** illustrates the levels of production throughout the CWCB during the 2002-2003 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 large producers, quarterly reports for small 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 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.

WRD's In-Lieu Replenishment Program, which replaces groundwater pumping with the use of imported water, was suspended in 2003-04 to evaluate its effectiveness. The District is considering whether to resume the program in 2004-05.

During emergency or drought conditions, WRD can also allow an additional 27,000 AF of extractions (17,000 AF for Central Basin and 10,000 AF for West Coast Basin) for a

four-month period. This provision has yet to be exercised but offers the potential use of an additional 7.8% of groundwater for Central Basin and 15% of groundwater for West Coast Basin pumpers.

3.2 GROUNDWATER LEVELS AND CHANGE IN STORAGE

Groundwater levels in the CWCB are tracked by the WRD through the collection of water level measurements in production wells and monitoring wells. Automatic datalogging equipment is 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 local 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 dataloggers. Staff also obtains records from other agencies such as the pumpers, the DWR, and the LACDPW, who regularly collect water level data from wells. These data are input into WRD's GIS for storage and analysis. Contour maps and hydrographs are prepared to illustrate the current and historical groundwater levels in the basins. The change in groundwater storage is 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 at a given period of time, typically 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 water levels and groundwater storage from one year to the next.

WRD has prepared contour maps representing the "Deep Aquifer System", which includes 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 2003, respectively. Based on these maps, groundwater levels are highest in the northeastern corner of the Montebello Forebay, where Main San

Gabriel Basin groundwater flows into the Central Basin and artificial recharge is performed. Groundwater levels are lowest in several areas, including Long Beach near the city's airport and in the West Coast Basin along the Newport-Inglewood uplift in the City of Gardena. Groundwater flow in the basins moves from recharge or high elevation areas to discharge or low elevation areas. In the Central Basin, groundwater generally moves in a southwesterly direction away from the Montebello Forebay recharge area, and then splits to either a southerly direction toward Long Beach or a westerly direction toward Huntington Park and Los Angeles. In the West Coast Basin, groundwater generally moves in an easterly direction away from the West Coast Basin Barrier Project. The Newport-Inglewood uplift and the Charnock Fault both act as partial barriers to groundwater flow.

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, and less from October through April. **Figure 3.4** illustrates the monthly pumping amount for WY 2002-2003. As shown in the figure, pumping in the West Coast Basin is less and does not fluctuate seasonally as much as in the Central Basin. Between October 2002 and April 2003, production in the Central Basin averaged 13,679 AF/month and in the West Coast Basin 4,084 AF/month. However, between May 2003 and September 2003, Central Basin pumping averaged 18,866 AF/month and in the West Coast Basin 4,639 AF/month. 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 2003 generally caused by this seasonal pumping. The biggest impact is in the Long Beach area along the Newport-Inglewood Uplift, where Fall water levels are 40 feet to 50 feet lower than Spring water levels.

The change in water levels over the course of the year are shown on **Figure 3.6**, which is a water level change map between Fall 2002 and Fall 2003 for the Silverado Aquifer (main production aquifer). As shown in the figure, water level changes in the Central Basin ranged from a 5-10 foot drop to a 40-50 foot rise. Over most of the Central Basin

water levels increased slightly or did not change significantly. The 40-50 foot rise was observed in the Long Beach area and is attributed primarily to decreased groundwater pumping in that area. The 5-10 foot drop was observed in the Montebello Forebay and is attributed to reduced spreading of imported water. In the West Coast Basin water levels decreased slightly or did not change significantly. The relative stability in the West Coast Basin is attributed to a well-managed artificial replenishment program via the West Coast Basin Barrier Project and the Dominguez Gap Barrier Project, and that inflows generally equaled outflows in the upper San Pedro Formation aquifers.

3.2.2 Hydrographs

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

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 long-term key well hydrographs illustrate the general history of groundwater conditions in the CWCB: 1) Water levels declined steadily in the 1940s and 1950s due to groundwater overdraft, causing seawater intrusion and significant removal of groundwater from storage; 2) The 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) Reduction in pumping and artificial replenishment caused groundwater levels to rise in the CWCB (although not to their historic highs), allowing a return of groundwater to storage; and 4) Through the early to late 1990s, water levels remained relatively stable, but over the past 5 years have declined in the Central Basin. Seasonal variations due to MWD's seasonal storage program have produced water level fluctuations exceeding 100 feet in the confined aquifers between Spring and

Fall, such as is illustrated in the Long Beach area **(Figure 3.9)**. In the West Coast Basin, water levels in these two key wells have increased somewhat over the past 3 years **(Figure 3.10)**.

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 constructed by the USGS. **Figure 1.3** shows the locations of WRD's nested monitoring wells. **Table 3.2** presents the manual groundwater elevation measurements collected from nested monitoring wells during Water Year 2002-2003. **Figures 3.11 through 3.14** are annual hydrographs of selected WRD nested monitoring wells showing data for WY 2002-2003. 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) that separate the aquifers, the amount and depth of pumping, and the proximity to recharge sources. 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 six 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 2002-2003, water levels in Zone 4, representing the Silverado Aquifer, varied about 23 feet throughout the year, from an elevation high of 80 feet (mean sea level, msl) in March 2003 to an elevation low of about 54 feet (msl) in September 2003. All six zones generally follow the same trend throughout the year, with lows in the fall and highs in the spring, consistent with natural and artificial recharge patterns. With the exceptions 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, the 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 southeast of the intersection of Slauson Avenue and Alameda Street. It has 5 individual wells (zones) screened in the Gaspur, Exposition, Gage, Jefferson, and Silverado Aquifers, from depths of 134 feet bgs to 910 feet bgs. Only 4 zones are shown on the Figure because the shallowest well (screened from 114 feet to 134 feet in the Gaspur Aquifer) is dry, and therefore no water elevations can be shown on the graph. In WY 2002-2003, water levels in Zone 1, representing the Silverado Aquifer, varied about 8 feet throughout the year, from an elevation high of 28 feet below sea level in Spring 2003 to an elevation low of about 36 feet below sea level at the beginning of the water year in October 2002. Water levels of the deepest 3 zones generally followed the same trend throughout the year, with lows in the late summer and fall and highs in the winter and spring, consistent with natural recharge pattern. Water levels in Zone 4, the Exposition Aquifer, had only relatively minor fluctuations throughout the year, and occur at elevations from 30 to 55 feet higher than the deeper zones, suggesting little interconnectivity with 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 south of 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 2002-2003, water levels in Zone 3, representing the Silverado Aquifer, varied about 41 feet throughout the year, from an elevation high of about 29 feet below sea level in January 2003 to an elevation low of about 70 feet below sea level in June 2003. The large variation is due to the seasonal pumping patterns and confined aquifer conditions previously discussed. Water levels of the six zones generally followed the same trend throughout the year, with lows in the late summer and fall and highs in Spring. An abrupt decrease in water levels began in late April to early May as seasonal pumping commenced. A similar rebounding effect is expected in October when pumping is reduced. Elevation head is lowest in Zone 3, the Silverado Aquifer,

suggesting that this aquifer is the most heavily pumped in the area. Because Zone 3 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 1.5 miles northwest of the intersection of the 405 Freeway and Alameda Street. 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 2002-2003, water levels in Zone 2, representing the Silverado Aquifer, varied about 6 feet throughout the year, from an elevation high of 58 feet below sea level in March 2003 to an elevation low of about 64 feet below sea level in January 2003. Water levels in Zones 1 and 2 track very similar throughout the year, as do Zones 3 and 4. A 35 to 40-foot difference in groundwater elevations between the upper two zones and lower two zones suggests that a significant aquitard exists between them.

3.2.3 Change In Storage

Groundwater enters the CWCB 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. Conversely, when groundwater leaving the basins exceeds the amount 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 aquifers' storage coefficients. Water level changes were obtained from WRD's nested monitoring wells, which have isolated screens in each of the four major aquifer systems in the CWCB (Gaspur, Gage/Gardena, Lynwood/Silverado, and Sunnyside/Lower San Pedro). The water level changes were brought into the GIS and converted into gridded surfaces so that they could be multiplied by the storage coefficient values determined by the USGS in

their calibrated computer (MODFLOW) model of the basins (Reichard, 2003). Storage changes are relatively small in the lower confined aquifers because they are fully saturated and storage coefficients are generally small (averaging about 0.0005). The most significant storage change occurs in the forebay areas, which have unconfined conditions with specific yield values from about 0.075 to 0.15. Based on the calculation, approximately 10,350 AF of water was lost from storage in the CWCB during the WY 2002-2003.

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 for Water Year 2002-2003 and purveyor's production wells for Water Years 2000-2003. Groundwater samples from nested wells were submitted to a DHS certified laboratory for analytical testing for general water quality constituents, known or suspected contaminants, and special interest constituents. Water quality data for production wells were provided by the DHS based on results submitted over the past three years by purveyors for their Title 22 compliance. **Figures 4.1 through 4.32** 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 over the time frame. **Table 1.1** presents well construction information and aquifer designations 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 in the Central Basin during WY 2002-2003. **Table 4.3** lists the water quality analytical results for the wells in the West Coast Basin during WY 2002-2003.

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

Major minerals data obtained from laboratory analyses were used to characterize groundwater from discrete vertical zones of each WRD well (**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 recent recharge water containing 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 2002-2003. 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 flow path 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. 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. It represents the overall mineral content of the water and usually is the first indicator used in assessing the quality of the water. The State DHS has established a recommended secondary standard of 500 mg/L and an upper limit of 1,000 mg/L for short-term use. Exceeding the upper limit is not considered a health hazard, but high TDS levels can impart a salty taste.

WRD nested monitoring well data for WY 2002-2003 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 170 mg/L in Lakewood #1 zone 1, to 2,750 mg/L in Whittier #1 zone 1. In the Central Basin, Silverado Aquifer zones in 18 out of 21 WRD nested monitoring wells had very low TDS concentrations, below 500 mg/L. The Silverado aquifer zones in 20 out of the 21 Central Basin wells tested contained less than the DHS upper limit for TDS of 1,000 mg/L. Generally, TDS concentrations above 1000 mg/L were limited to localized very deep or very shallow zones of Whittier #1, Inglewood #2, Long Beach #1, Long Beach #2, and Montebello #1.

In contrast, West Coast Basin nested monitoring well data show generally higher TDS concentrations. TDS in WRD nested monitoring wells in the West Coast Basin ranged from 200 mg/L in Carson #1 zone 1, to 11,700 mg/L in PM-4 Mariner zone 2. Only the most inland nested monitoring wells, Carson #1, Carson #2, Gardena #1, and Gardena #2 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 Barrier have significantly high TDS values, each with elevated TDS in multiple zones, including Silverado aquifer zones. Many 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 DHS water quality data for TDS in production wells across the CWCB during WYs 2000-2003. In the Central Basin, TDS generally ranged between 250 and 750 mg/L over most of the basin. In a localized area along the San Gabriel River in the general vicinity of and downgradient of the Rio Hondo and San Gabriel River spreading grounds, many wells had TDS concentrations between 500 and 750 mg/L. A few wells in this area contained TDS in excess of 750 mg/L TDS. Data from many of the production wells in the southernmost portion of the Central Basin indicated TDS less than 250 mg/L.

Data from West Coast Basin wells indicate that most wells in production had TDS concentrations below 750 mg/L. Several production wells located close to the coast in the Hawthorne/Torrance areas had TDS concentrations above 750 mg/L.

4.3 IRON

Iron and manganese in general are not harmful for ingestion. They are essential nutrients. However, secondary standards of 0.3 mg/L for iron and 50 µg/L for manganese were established for aesthetic purposes. If completely oxidized, they are relatively insoluble in groundwater as Fe^{+3} and Mn^{+4}. However, under anaerobic conditions, these constituents exist in the reduced forms of Fe^{+2} and Mn^{+2} which are more soluble in water. Upon exposure to air the reduced ions can slowly oxidize and form undesirable precipitates that discolor the water, and plumbing fixtures and clothes. Iron can cause encrustation in pipes and boilers and also impart a metallic taste to the water.

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 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 (numerous wells) to 0.67 mg/L (Willowbrook #1 zone 4). Five wells in the Central Basin had detectable iron concentrations in the Silverado zones. These include Inglewood #2, Huntington Park #1, Cerritos #2, Pico #1, and Whittier #1. Iron was not detected in excess of the MCL in any of the Silverado zones. Iron was detected in zones above and/or below the Silverado Aquifer in 11 of the 21 Central Basin nested wells sampled.

In the West Coast Basin elevated iron occurs locally. Iron concentrations ranged from less than the detection limit (numerous wells) to 8.2 mg/L (Gardena #1, zone 4). Three wells in the West Coast Basin had iron concentrations in the Silverado exceeding the MCL. Inglewood #1, Westchester #1, and Gardena #1 are in the northern portion of the basin which generally contains slightly higher iron concentrations than wells in the

central and southern portions of the basin. Wells in the central and southern portions of the basin tend to contain iron concentrations below the MCL, and within the Silverado zones are often below detectable limits.

Figure 4.4 presents DHS water quality data for iron in production wells across the CWCB during WYs 2000-2003. The data show elevated iron concentrations in many production wells throughout the CWCB and many purveyors must treat groundwater to remove the iron. There does not appear to be a distinct pattern to the occurrence of elevated iron. Production wells exhibiting high iron concentrations appear in and around many with non-detectable iron.

Data from DHS for the West Coast Basin indicate roughly one-third of production wells in the northwestern portion of the Basin have iron concentrations exceeding the secondary MCL. As in the Central Basin, there does not appear to be a distinct pattern to the occurrence of iron in the basins.

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 under specific geochemical conditions, the natural iron in the sediments can 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. Like iron, manganese is a naturally occurring element in aquifer materials and groundwater. In the Central Basin (**Figure 4.5**), manganese ranges from below the detection limit (numerous wells) to 780 µg/L (Pico #2 zone 6). In the southern portion of the basin, elevated manganese typically occurs in shallower aquifers 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 (numerous wells) up to 1,200 µg/L (PM-4 Mariner zone 2). In the southern portion of the West Coast Basin, like iron, elevated manganese concentrations were limited to aquifer zones above the Silverado. In the western and northern portions of the West Coast Basin, manganese concentrations typically exceed the MCL in most zones with only a few of the deepest aquifer zones containing manganese below the MCL.

Figure 4.6 presents DHS water quality data for manganese in production wells across the CWCB during WYs 2000-2003. The data show a large number of wells having elevated manganese concentrations with approximately one-third exceeding the MCL. The production wells with elevated manganese tend to be widespread, but there does appear to be an area in the vicinity and extending about five miles downgradient of the Montebello Forebay spreading grounds where manganese is consistently below the MCL. In the West Coast Basin, production wells with high concentrations of manganese tend to be somewhat clustered in the western portion of the basin.

4.5 NITRATE

Nitrate concentrations in groundwater are a concern because their presence indicates that a degree of contamination has occurred due to the degradation of organic matter. Native groundwater typically does not contain nitrate. It is usually introduced into groundwater

from agricultural practices such as fertilizing crops and leaching of animal wastes, and is also formed when recycled water is percolated through the soil during recharge. Typically, organic nitrogen and ammonia are the initial byproducts of the decomposition of human or animal wastes. Upon oxidation the organic nitrogen and ammonia are converted first to nitrite and then nitrate ions in the subsurface. A portion of the nitrite and nitrate are converted to nitrogen gas and hence are returned to the atmosphere. Nitrate itself is not harmful; however, it can be converted back to nitrite. If infants injest nitrite, methemoglobinemia, a condition in which hemoglobin in the blood cannot transport oxygen throughout the body may result. Methemoglobinemia results in a lack of oxygen, causing lethargy, shortness of breath, and a bluish skin color. Under extreme cases, this condition can be fatal. To safeguard public health, the DHS has a standard of 10 mg/L as nitrogen for nitrate, 1 mg/L as nitrogen for nitrite, and 10 mg/L as nitrogen for the total of nitrite and nitrate.

Figure 4.7 presents nitrate (as nitrogen) water quality data for nested monitoring wells in the CWCB during WY 2002-2003. In the Central Basin, nitrate (as nitrogen) concentrations ranged from below the detection limit (numerous wells) to 12 mg/L (Los Angeles #1 zone 5). Nested monitoring wells in the vicinity of the Montebello Forebay spreading grounds indicate concentrations of nitrate slightly above detection limits but below the MCL. Rio Hondo #1 and Pico #2 show detectable concentrations of nitrate from the shallowest zones down to Zones 3 and 1 respectively. South Gate #1, Downey #1, and Cerritos #2 show detectable concentrations in one or more of the middle zones, which are directly down the flow path from the spreading grounds, however Silverado and 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 may be 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, Montebello #1, Pico #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 that began in the 1950s.

In the West Coast Basin nested monitoring wells, nitrate concentrations ranged from below the detection limit (numerous wells) to 21 mg/L (Chandler #3 zone 2). Concentrations exceeding the nitrate MCL included the shallowest zone of Chandler #3, Inglewood #1 and Gardena #1. Detections below the MCL in the shallowest zone at Hawthorne #1 were observed along with 4 of the 5 zones monitored at Lomita #1. Nitrate also exceeded the MCL in the Silverado zone (zone 2) of the PM-4 Mariner location in one of two samples collected this water year, but may be anomalous as there is no historical data indicating nitrate in this zone. As in the Central Basin, shallow zone occurrences of nitrate with deeper zones below detection levels are likely attributable to local surface recharge from former agricultural activities prior to the extensive land development that began in the 1950s.

Figure 4.8 presents DHS water quality data for nitrate in production wells across the CWCB during WYs 2000-2003. The nitrate MCL was not exceeded in any of the wells in the CWCB during the 2000-2003 period. Detectable concentrations below the MCL were generally located in the vicinity and downgradient of the San Gabriel River and Rio Hondo spreading grounds of the Montebello Forebay, and in several scattered locations in the northwestern portion of the Central Basin. Production wells in the southern portion of the Central Basin and all of the West Coast Basin show non-detectable nitrate concentrations.

4.6 HARDNESS

Figure 4.9 presents water quality data for total hardness in WRD nested monitoring wells in the CWCB during WY 2002-2003. In the Central Basin total hardness ranged from 7.11 (Long Beach 1 zone 2) to 1,030 mg/L (Whittier #1 zone 1), while in the West Coast Basin, hardness ranged from 15.5 mg/L (Wilmington #2 zone 1) to 5,220 mg/L (PM-4 Mariner zone 2). In general, the deeper aquifers characterized as having older native groundwater in the southern portion of the Central Basin and locally in the West Coast Basin show low total hardness. Most other zones in both basins have moderate to high hardness.

Figure 4.10 presents DHS water quality data for total hardness in production wells in the CWCB during WYs 2000-2003. Groundwater in the West Coast Basin has moderate hardness. Production wells in the southern and western portions of the Central Basin show groundwater with low to moderate hardness. In the northern portion of the Central Basin, production wells show groundwater with generally moderate to high hardness.

4.7 SULFATE

Figure 4.11 presents water quality data for sulfate in WRD nested monitoring wells in the CWCB during WY 2002-2003. In the Central Basin sulfate ranged from below the detection limit (numerous wells) to 1,400 mg/L (Whittier #1 zone 1), while in the West Coast Basin sulfate ranged from below the detection limit (numerous wells) to 670 mg/L (PM-4 Mariner zone 2). In general the data indicate that the lowest sulfate concentrations are found in most of the deeper zones of the West Coast Basin and southern portion of the Central Basin. Again, these are areas characterized in previous sections as having characteristics representative of 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 imported Colorado River water. Results show that only two nested monitoring wells within the Silverado Aquifer are impacted by sulfate greater than the MCL. These wells include Whittier #1, in an area of generally poor water quality, and PM-4 Mariner, which is impacted by sea water intrusion in the West Coast Basin.

Figure 4.12 presents DHS water quality data for sulfate in production wells in the CWCB during WYs 2000-2003. The production well data indicate patterns of sulfate concentrations similar to those observed in the deeper zones of WRD nested monitoring wells. Sulfate concentrations are generally low in the central and eastern areas of the West Coast Basin and southern portion of the Central Basin, and somewhat higher along the western margin of the West Coast Basin and in the northern portion of the Central Basin.

4.8 CHLORIDE

Figure 4.13 presents water quality data for chloride in WRD nested monitoring wells in the CWCB during WY 2002-2003. In the Central Basin, chloride concentrations ranged from 5.1 mg/L (Downey #1 zone 1) to 680 mg/L (Montebello #1 zone 1). The Silverado aquifer zones of the Central Basin nested monitoring wells contain low to very low chloride concentrations, all below the MCL of 250 mg/L. In the West Coast Basin, chloride ranged from 13 (Gardena #2 zone 1) to 5800 mg/L (PM-4 Mariner zone 2). Chloride concentrations exceeded the MCL in the Silverado aquifer zones in six of the fifteen West Coast Basin nested wells, primarily due to seawater intrusion (Inglewood #1, Long Beach #3, Wilmington #1, Wilmington #2, and PM-4 Mariner) or from sources yet to be identified.

Figure 4.14 presents DHS water quality data for chloride in production wells in the CWCB during WYs 2000-2003. Chloride was not detected above its MCL in any of the Central Basin production wells. 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 ranged from 50 to 100 mg/L. In the West Coast Basin, available DHS data indicate that isolated production wells on the west side of the Basin had chloride concentrations above the MCL.

4.9 TRICHLOROETHYLENE (TCE)

TCE is a commonly used solvent for metal cleaning, dry cleaning of fabrics, and textile processing. It is classified as a probable human carcinogen. Its presence in groundwater likely originated from improper disposal practices. The MCL for TCE is 5 μg/L. If present in water, it can be removed easily either by packed tower aeration or granular activated carbon treatment.

TCE was detected in five WRD nested monitoring well locations in the Central Basin and in three nested well locations in the West Coast Basin (**Figure 4.15**). In the Central Basin, TCE concentrations, ranged from below the detection limit (numerous wells) to 21

µg/L (Los Angeles #1 zone 5) Only one nested well location in the Silverado Aquifer, South Gate #1, contained a detectable TCE concentration but that concentration was below the MCL. Four other locations (Los Angeles #1 zone 4, 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 detections in Los Angeles #1 zones 4 and 5, and Huntington Park #1 Zone 3 were above the MCL.

In the West Coast Basin, TCE concentrations ranged from below the detection limit (numerous wells) to 48 µg/L (Inglewood #1 zone 5). In the shallowest zone and deepest zone of Inglewood #1, and the shallowest zone of Hawthorne #1, TCE concentrations above the MCL were detected. In the shallowest zone at PM-3 Madrid, TCE was detected below the MCL. TCE was not detected in the Silverado zones in any of the nested monitoring wells in the West Coast Basin.

Figure 4.16 presents DHS water quality data for TCE in production wells across the CWCB during WYs 2000-2003. Over 300 wells were tested for TCE. The data show that over the past three years TCE has been detected in 63 production wells in the Central Basin. Eleven detections were above the MCL. All of the wells with concentrations above the MCL were in the vicinity of the Montebello and Los Angeles Forebay areas. In the West Coast Basin TCE was detected in one production well above the MCL.

4.10 TETRACHLOROETHYLENE (PCE)

Tetrachloroethylene, also known as perchloroethylene or perc, is a solvent used in dry cleaning, textile processing, and metal degreasing. It is also used in the manufacture of fluorocarbons and as a septic tank cleaner. Through improper disposal practices, it has contaminated many groundwater basins. It is a probable human carcinogen. The MCL for PCE is 5 µg/L. Like TCE, PCE is easily removed using packed tower aeration or granular activated carbon treatment.

During WY 2002-2003, PCE (**Figure 4.17**) was detected at seven nested well locations in the Central Basin and one well in the West Coast Basin. In the Central Basin, PCE

ranged from below the detection limit (numerous wells) to 11 µg/L (Pico #2 zone 3), all from nested wells nearing the vicinity of the Montebello and Los Angeles forebays. At well South Gate #1, PCE was detected above the MCL in the Silverado Aquifer. At Downey #1 and Cerritos #2, PCE was detected below the MCL in the Silverado Aquifer. South Gate #1 shows PCE detected below the MCL in the zone above and below the Silverado Aquifer. At Huntington Park #1, PCE was detected below the MCL in zones 3 and 4, above the Silverado Aquifer. At Los Angeles #1, PCE was detected below the MCL in the two shallowest zones, both above the Silverado aquifer. At Pico #2, PCE was detected in 3 zones below the Silverado aquifer; above the MCL in zone 3 and below the MCL in zones 1 and 2.

In the West Coast Basin, PCE concentrations were below the detection limit in all nested monitoring wells except Inglewood #1. The shallowest zone at Inglewood #1 had 5.0 µg/L of PCE. The deepest zone, below the Silverado aquifer, at Inglewood #1 also contained PCE below the MCL.

Figure 4.18 presents DHS water quality data for PCE in production wells across the CWCB during WYs 2000-2003. In the Central Basin, PCE was detected in 66 production wells. Eleven of the 66 wells exceeded the MCL for PCE. Production wells with PCE are primarily located within the vicinity of the Los Angeles and Montebello Forebays and extend out into the western portion of the Central Basin. PCE was not detected in any production wells tested in the West Coast Basin during WYs 2000-2003.

4.11 SPECIAL INTEREST CONSTITUENTS

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, total organic carbon (TOC), apparent color, and perchlorate. 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 each of these constituents.

4.11.1 Arsenic

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, which they have done. The DHS is required to establish a standard equal to or more stringent than the EPA standard. In establishing the new statewide standard, the DHS will consider not only possible adverse health effects from exposure to this constituent but also, as required by statute, technical, and economic feasibility. Studies have shown that treatment to remove arsenic to acceptable levels is technically feasible. However, the arsenic then becomes a potential hazardous waste. It is uncertain if arsenic residuals can be properly disposed of at acceptable costs.

EPA announced on October 31, 2001 that the arsenic standard will remain at 10 μg/L, as was originally announced on January 21, 2001. Three expert panel reviews were conducted on the health effects of arsenic, costs for compliance, and benefits associated with varying degrees of treatment, and were considered before EPA's announcement. The current State standard is 50 μg/L. Because costs for small systems will be significant, EPA has indicated that they will provide assistance in funding and training, as well as research, to find new treatment technologies that will reduce costs of compliance. The date for compliance for all water systems is January 2006.

Health and Safety code Section 116361 requires the State Department of Health Services to adopt a new arsenic MCL by June 30, 2004 and required the Office of Environmental Health Hazard Assessment (OEHHA) to establish a new Public Health Goal (PHG) by December 31, 2002. Also, new language concerning the health effects of ingesting water with arsenic is required in Consumer Confidence Reports as of July 1, 2003. OEHHA announced on March 7, 2003 that they are proposing a draft PHG of 0.004 μg/L and received public comments until May 2, 2003. DHS convened three stakeholder meetings in February and March 2003 to receive public comments on how to best approach the

process of setting a standard for arsenic. OEHHA released a revised draft PHG of 0.004 µg/L in November 2003 and are expected to finalize the PHG in 2004. As part of the regulatory process, DHS is required to establish an MCL at a level as close as is technically and economically feasible to the PHG.

Arsenic is an element that occurs naturally in the earth's crust. Accordingly, there are natural sources of exposure. Natural sources of arsenic include weathering and erosion of rocks, deposition 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. Over ninety percent of arsenic is used as wood preservative in the form of chromate copper arsenate to prevent dry rot, fungi, molds, termites, and other pests. People may also be exposed from industrial applications, such as semiconductor manufacturing, petroleum refining, animal feed additives and herbicides. Arsenic is carcinogenic and also causes other health effects such as high blood pressure and diabetes.

Figure 4.19 presents arsenic water quality data for WRD nested monitoring wells during WY 2002-2003. In the Central Basin arsenic concentrations ranged from non-detectable (numerous wells) to 57 µg/L in the shallowest zone at Compton #1 zone 5. Arsenic concentrations greater than the pending MCL in the Central Basin were found at four wells, Compton #1, Pico #2, Lakewood #1, Cerritos #1, and Cerritos #2. Arsenic concentrations exceeding the pending MCL in the Silverado aquifer zones were found only at Cerritos #1, located along the eastern District boundary. Overall the distribution of arsenic appears to be similar to the distribution of iron and manganese in the Central Basin with generally lower concentrations near the Forebays and higher concentrations down the flow paths away from the Montebello Forebay spreading basins.

In the West Coast Basin only zone 2 at PM4 Mariner had arsenic concentrations above the pending MCL in the Silverado Aquifer. Only the deepest zone in Gardena #1, below the Silverado Aquifer, had a concentration (20 µg/L) of arsenic above the pending MCL of 10 µg/L.

Figure 4.20 presents DHS water quality data for arsenic in production wells across the CWCB during WYs 2000-2003. Six production wells in the central and southeastern portion of the Central Basin contained arsenic concentrations above the pending MCL. Many other production wells at various locations in the Central Basin contained arsenic at concentrations between 5 and 10 µg/L. Arsenic was not detected in any of the West Coast Basin production wells from WYs 2000 through 2003

4.11.2 Chromium

Chromium is a metal used in the manufacture of stainless steel, metal plating operations, and other applications. Chromium has the potential to contaminate groundwater from spills and leaking tanks. It comes in two basic forms: chromium 3 (trivalent) and chromium 6 (hexavalent) ions. Chromium 3 is a basic nutrient that is quite commonly ingested by adults in doses of 50 to 200 µg/day. Chromium 6 is an oxidized form of chromium 3 that is a known carcinogen when inhaled. This is based on occupational exposures in chromium plating and other related industries. It is unclear if ingestion of chromium 6 is harmful. The reduction of chromium 6 to chromium 3 that occurs from gastric juices during digestion would be expected to play a role in limiting the carcinogenicity of ingested chromium 6.

Currently the MCL for total (all forms of) chromium is 50 µg/L. In February 1999, OEHHA established a Public Health Goal for total chromium at 2.5 µg/L, based on a health protective level for chromium 6 at 0.2 µg/L and the assumption that 7 percent of total chromium in drinking water is chromium 6. In November 2001, OEHHA announced that it rescinded this PHG. At their request earlier this year, a scientific panel convened by the University of California, known as the Chromate Toxicity Review Committee, reviewed the study that OEHHA originally used as a basis for their PHG and concluded in September 2001 that the data were flawed and should not be used for health risk assessment. At the request of both DHS and OEHHA, the National Toxicity Program of the National Institute of Environmental Health Sciences will perform a long-term health effects study on rodents to evaluate the potential carcinogenicity of ingested

chromium 6. It is expected to be completed in 2005. DHS has added chromium 6 to its list of Unregulated Chemicals Requiring Monitoring (UCRM) in production wells.

Health and Safety Code Section 116365.5 required DHS to adopt a chromium 6 MCL by January 1, 2004. However, OEHHA has not yet issued a new draft chromium 6 PHG.

Figure 4.21 presents total chromium water quality data for WRD nested monitoring wells. In the Central Basin, only the upper two zones in the Los Angeles #1 nested well exceed the MCL of 50 µg/L for total chromium. Trace levels of total chromium were detected in one or more zones of numerous other Central Basin nested wells. Total chromium was not detected above the MCL in the West Coast Basin. As in the Central Basin, trace levels of total chromium were detected in one or more zones of numerous other nested wells in the West Coast Basin.

Figure 4.22 presents DHS water quality data for total chromium in production wells across the CWCB during WYs 2000-2003. Only two production wells in the South Gate area of the Central Basin exceeded the MCL for total chromium. Twelve other production wells in the Central Basin contained total chromium below the MCL. In the majority of production wells sampled in the Central Basin, total chromium was not detected. Total chromium was not detected in any of the production wells in the central portion of the West Coast Basin.

Figure 4.23 presents hexavalent chromium water quality data for WRD nested monitoring wells. In the CWCB, most WRD nested monitoring wells have been sampled twice for hexavalent chromium since early 1998. Most zones of nested monitoring wells in the CWCB contained chromium 6 below the Preliminary Health Goal of 0.2 µg/L. However, in the northern portion of the Central Basin, hexavalent chromium was detected at concentrations ranging from 0.2 to 30 µg/L. All of the detected concentrations were below the current MCL for total chromium. In the Los Angeles #1, Huntington Park #1, Commerce #1, Downey #1, Pico #1, and Whittier #1 wells hexavalent chromium was detected in zones above the Silverado Aquifer. In Los

Angeles #1, South Gate #1, Downey #1, Rio Hondo #1, Pico #2, Cerritos #2, and Long Beach #1 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 zones of Inglewood #1, Gardena #1, and Chandler #3.

As new wells are added to the WRD nested monitoring well network, samples will be collected for hexavalent chromium analysis to update the special study results. WRD will report these updates in subsequent regional groundwater monitoring reports.

Figure 4.24 presents WYs 2000-2003 DHS water quality data for hexavalent chromium in production wells across the CWCB during 2000-2003. Hexavalent chromium results have been reported in 134 production wells in the Central Basin and West Coast Basins. Detections of hexavalent chromium were observed in the northern portion of the Central Basin. Most of the detected concentrations were below the MCL for total chromium; only one production well in the Central Basin had a concentration above the MCL. In the southern and southeastern portion of the Central Basin, all of the production wells contained hexavalent chromium at concentrations below the detection limit. Hexavalent chromium was not detected in any of the West Coast Basin production wells.

4.11.3 Methyl Tert-Butyl Ether (MTBE)

Methyl tert(iary) butyl ether (MTBE) is a synthetic chemical added to gasoline to improve air quality as required by the Federal Clean Air Act. Limited quantities have been used in gasoline in California since the 1970s. In 1992, oil companies began using it extensively in California to meet reformulated gas requirements of the State Air Resources Board. Its use enables gasoline to burn more completely. However, MTBE has been detected in groundwater and surface water throughout California from sources including leaking underground storage tanks, pipelines, and spills; and from emissions of boat engines into lakes and reservoirs. Animal tests have shown MTBE to be carcinogenic. Effective May 17, 2000, a primary MCL of 13 µg/L was established by DHS. A secondary standard of 5 µg/L was established in response to taste and odor concerns. An executive order by Governor Davis banned the use of MTBE effective

December 31, 2002, which should significantly reduce, if not virtually eliminate new discharges. In March 2002, the Governor delayed the ban one year to December 31, 2003 over concerns that a ban would result in gasoline shortages and increased prices. The most likely substitute for MTBE is ethanol. The production and distribution of ethanol, however, is problematic. There may not be an adequate supply source, and it cannot be delivered through pipelines. The State requested a waiver from the USEPA for oxygenates, and was denied. The State has filed suit requesting EPA to reconsider. On January 29, 2004, Governor Schwarzenegger submitted to USEPA another request for a waiver from oxygenate requirements.

Figure 4.25 presents MTBE water quality data for WRD nested monitoring wells during WY 2002-2003. MTBE was detected in only the uppermost zone of one of the WRD nested monitoring wells, Gardena #1 in the West Coast Basin. A second sample collected from the same zone indicated MTBE was below detection limit. It is not certain whether the first detection was an anomaly or if MTBE is present at very low concentrations near the detection limit. MTBE will be watched closely at this location in the upcoming water year.

Figure 4.26 presents DHS water quality data for MTBE in production wells across the CWCB during WYs 2000-2003. In the Central Basin, MTBE was detected in three production wells in the Montebello Forebay area. All three wells are in close proximity to each other and have not exceeded the MCL. MTBE was not detected in any West Coast Basin production wells during the reporting period.

4.11.4 Total Organic Carbon

Total organic carbon (TOC) is the broadest measure of all organic molecules in water. TOC can be naturally occurring, wastewater-derived, or a combination of both (NRC, 1998). While there is no MCL established for TOC, regulators are generally concerned with wastewater derived TOC as a measurable component of recycled water. Typically, wastewater that has been subjected to effective secondary treatment contains 5 to 15 mg/L of TOC. Advanced treatment can effectively lower the TOC concentration to

less than 1 mg/L. Likewise, percolating water through the soil has also been proven to be an effective method in reducing TOC in reclaimed water. It is likely that much of the TOC measured in groundwater samples in both nested monitoring wells and production wells in the CWCB is naturally occurring in the aquifer systems and was derived from organic material and decaying vegetation either deposited with the aquifer sediments as the basins were filling or originally contained in imported water.

Figure 4.27 presents TOC water quality data for WRD nested monitoring wells during WY 2002-3003. In the Central Basin, TOC was detected in multiple zones of 17 of the 21 nested monitoring wells. Only Los Angeles #1 and Huntington Park #1 contained no detectable TOC in any zone. Where TOC is present, concentrations are typically below 1 mg/L and less frequently between 1 and 5 mg/L. The lower concentrations occur in the shallow and middle zones of the nested wells; higher concentrations of TOC are generally found in the deeper zones. Only four wells in the Central Basin have zones with TOC greater than 5 mg/L; including the four deepest zones at Long Beach #6, the deepest zone at Long Beach #2, the deepest two zones at Inglewood #2, and the deepest zone sampled at Montebello #1. The deeper wells with TOC greater than 5 mg/L are likely to contain naturally occurring organic carbon, and not wastewater related organic carbon. In the West Coast Basin, TOC greater than 1 mg/L is present in one or more zones at all 14 nested monitoring wells tested, and at concentrations greater than 5 mg/L in one or more zones at six of the 14 West Coast Basin production wells tested.

Figure 4.28 presents limited DHS water quality data for TOC in production wells across the CWCB during WYs 2000-2003. During the three-year period only 46 wells were tested for TOC. Only five of the 46 wells tested below the detection limit for TOC. Most of the wells contained TOC at concentrations ranging from 1 to 5 mg/L and most were located near the Montebello Forebay spreading basins or in the southern Central Basin (City of Long Beach).

4.11.5 Apparent Color

Apparent color in groundwater (colored groundwater) is not toxic or harmful; an MCL of 15 apparent color units (ACUs) has been established as an aesthetic standard. Colored groundwater results from colloidal organic particles suspended in the water that display colors ranging from pale yellow to a dark tea brown. There is an observed relationship between apparent color and TOC, especially in the higher concentration range. Colored groundwater can be effectively treated and served, however it is relatively expensive to treat.

Figure 4.29 presents apparent color water quality data for WRD nested monitoring wells in the CWCB during WY 2002-2003. Apparent color is present above the MCL in the deepest zones of sixteen nested monitoring wells. One other well has apparent color above the MCL in intermediate zones. Apparent color does not exceed the MCL in the uppermost zone in any nested monitoring wells tested. This relationship between apparent color and depth, along with the relationship between color and TOC, is probably due to an increase in the content of natural organic matter in the deeper sediments of the basins.

Figure 4.30 presents DHS water quality data for apparent color in production wells across the CWCB during WYs 2000-2003. These data indicate that colored groundwater is not a widespread problem in the basins. Most production wells tested below the MCL. Locally in the Long Beach, Inglewood, La Mirada and Los Angeles areas, several wells did test above the MCL for apparent color; water purveyors in those areas have treatment systems operating to remove color from the groundwater.

4.11.6 Perchlorate

Perchlorate is the primary ingredient in rockets, missiles, road flares, and fireworks. It also has widespread use in air bag inflators, electronics, electroplating, lubricating oils, and the production of paints and enamels. Studies showed that perchlorate can impact the proper functioning of the thyroid gland by inhibiting the uptake of iodide, and can

cause a decrease in the production of hormones necessary for normal growth, development, and metabolism.

DHS established an action level of 18 µg/L in 1997, but revised it to 4 µg/L on January 18, 2002 based on the results more current studies. OEHHA proposed a draft PHG of 2 to 6 µg/L in December 2002. On March 12, 2004, OEHHA issued a final PHG of 6 ug/L. DHS also revised the action level to 6 µg/L. Health and Safety Code Section 116275 required DHS to adopt a MCL for perchlorate by January 1, 2004. DHS's MCL will be based on the final PHG with consideration given to technical and economic feasibility. A factor in the potential revision of the final PHG is an ongoing review by the National Academy of Sciences on adverse health effects of perchlorate, which is scheduled for completion in late 2004. OEHHA has indicated that they will consider revising the PHG if there are conflicts.

Figure 4.31 presents perchlorate water quality data for WRD nested monitoring wells in the CWCB during 1998-2003. The longer time period was used because perchlorate is only tested the first two sampling events at a new nested monitoring well and not tested twice per year as most other constituents in this report. Perchlorate was not detected above the State AL in any of the WRD nested monitoring wells. Perchlorate is present below the State AL in six of the 35 nested monitoring wells. In the Central Basin perchlorate was in or below the Silverado Aquifer at Downey #1, South Gate #1 and Los Angeles #1. Perchlorate was also detected in the shallowest zone of Los Angeles #1. In the West Coast Basin, perchlorate was detected below the SAL at three wells; the shallowest zone of Lomita #1, Chandler #3, and Gardena #1. Several of the WRD nested monitoring wells have not been tested for perchlorate; these wells will be sampled during the next monitoring period and the results updated in next year's report.

Figure 4.32 presents DHS water quality data for perchlorate in production wells across the CWCB during WYs 2000-2003. These data indicate perchlorate is not a widespread problem in the basins. Most production wells tested below the detection limit of 4 ug/L. Locally, one production well in Norwalk and two production wells in the Los Angeles

Forebay had perchlorate at concentrations below the SAL.

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 2002-2003. 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, and recycled water with advanced treatment from West Basin MWD.
- At the Montebello Forebay, 22,366 AF of imported water was conserved for replenishment during WY 2002-2003. A total of 42,640 AF of recycled water was conserved for spreading in the Montebello Forebay. A total of 22,959 AF of imported water was injected to the seawater barriers. A total of 6,192 AF of recycled water was purchased for injection into the West Coast Basin Barrier Project. Total artificial replenishment was 89,088 AF for WY 2002-2003.
- Groundwater production in the CWCB was 241,871 AF for Water Year 2002-2003. This amount is less than the adjudicated amount of 281,835 AF.
- Groundwater levels (heads) were monitored continuously in the CWCB during the water year. 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 60 feet occur between zones above and within the producing zones. The greatest head differences tend to occur in the Long Beach area of the Central Basin and Gardena and Carson areas of the West Coast Basin, 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 a slight decline in water levels in the CWCB during WY 2002-2003. On average, water levels dropped in the unconfined Montebello Forebay area from 1 to 10 feet during WY 2002-2003. Elsewhere in the confined portions of the deeper aquifers of the basin water levels generally increased during WY 2002-2003. The change in groundwater storage for the CWCB was calculated at a loss in storage of approximately 10,350 AF from the CWCB.
- 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 water quality parameters. Samples collected during WY 2002-2003 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 2002-2003, 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 170 mg/L to 2,750 mg/L, and in the West Coast Basin 200 mg/L to 11,700 mg/L. The District is conducting further studies with the USGS to identify potential sources of high TDS.
- Iron concentrations continue to be problematic in portions of the CWCB. During the

current reporting period, concentrations in the Central Basin ranged from non-detectable to 0.67 mg/L, and in the West Coast Basin from non-detectable to 8.2 mg/L. The secondary MCL for iron is 0.3 mg/L. Sources of the localized high iron concentrations have not yet been 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 the current reporting period, concentrations in the Central Basin ranged from non-detectable to 780 µg/L, and in the West Coast Basin from non-detectable to 1,200 µg/L. Similar to iron, sources of the localized high manganese concentrations have not yet been identified.
- Nitrate (as nitrogen) concentrations in WRD nested monitoring wells in the Central Basin ranged from non-detectable to 12 mg/L, and in the West Coast Basin from non-detectable to 21 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 are likely due to localized infiltration and leaching. Concentrations above the MCL were observed in the Silverado Aquifer. DHS data indicates that none of the CWCB production wells tested for nitrate above the MCL during WYs 2000-2003.
- TCE was not detected in the Silverado Aquifer in the WRD wells sampled, with the exception of South Gate #1. During the current reporting period, concentrations in nested monitoring wells in the Central Basin ranged from non-detectable to 21 µg/L, and in the West Coast Basin from non-detectable to 48 µg/L. DHS data indicate that TCE was detected in 63 production wells in the Central Basin during WYs 2000-2003, 11 out of the 63 detections exceed the MCL for TCE. In the West Coast Basin, TCE was detected above the MCL in one production well.
- PCE was detected in seven WRD nested monitoring wells in the Central Basin and one well in the West Coast Basin. PCE was detected in the Silverado Aquifer in three of the WRD wells sampled. During the current reporting period, concentrations in the Central Basin ranged from non-detectable to 11 µg/L, and in the West Coast Basin from non-detectable to 5.0 µg/L. DHS data indicate that PCE was detected in 66 production wells in the Central Basin during WYs 2000-2003. Eleven out of the 66 detections exceeded the MCL for PCE. PCE was not detected in any of the West

Coast Basin production wells.

- EPA has adopted a new arsenic standard for drinking water, decreasing the former MCL of 50 µg/L to 10 µg/L. Enforcement of the pending MCL is scheduled to begin in 2006. WRD nested monitoring wells indicate that arsenic concentrations in the southeast portion of the Central Basin exceed the pending MCL. Eleven production wells, all in the southern portion of the Central Basin, have arsenic concentrations exceeding the pending MCL of 10 µg/L. Arsenic was not detected above the MCL in any of the West Coast Basin production wells.
- Chromium, including hexavalent chromium, was detected above the MCL in groundwater samples from one WRD nested monitoring well and three production wells in the vicinity of the Montebello and Los Angeles Forebay areas. Additional monitoring wells and production wells contained detectable chromium concentrations below the MCL. Some of the detections are in the deep aquifers including the Silverado and Sunnyside. DHS data for hexavalent chromium in groundwater from production wells are reasonably consistent with data for nested monitoring wells. WRD is currently conducting an investigation to identify potential sources of hexavalent chromium in the South Gate/Cudahy/Bell Gardens area of the Central Basin.
- MTBE was detected in one WRD nested monitoring well and in three Central Basin production wells, all below the MCL.
- Total organic carbon and apparent color are being monitored and studied in relation to potential groundwater production from deeper portions of the CWCB than have typically been utilized in the past.
- Perchlorate was detected in four WRD nested monitoring wells and three production wells in the Central Basin, all concentrations below the State AL. Perchlorate was not detected in West Coast Basin wells.
- As shown by the data presented herein, 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. Localized areas of marginal to poor water quality are either currently receiving or may require treatment prior to being used as a potable source.

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 2003-2004 are listed below.

- WRD will continue to maximize recycled water use at the Montebello Forebay spreading grounds without exceeding regulatory limits, because recycled water is a high quality and relatively low-cost replenishment water source. Over the past three years, WRD has fully utilized this resource within 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 WY 2003-2004. Extensive monitoring of these recycled water injection projects will be performed to comply with applicable permits.
- WRD will continue to monitor the quality of replenishment water sources to ensure the CWCB are being recharged with high-quality water.
- Total injection quantities at the Dominguez Gap Barrier is expected to increase over the next several years as additional barrier wells are constructed to further combat seawater intrusion. Injection quantities at the West Coast Basin Barrier and the Alamitos Barrier are expected to remain at current levels. 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 including Aquifer Storage and Recovery (ASR) projects, pipeline construction, and other conjunctive use projects and programs will be explored to help find solutions.
- WRD continues 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, WRD will

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

- WRD Staff will be working on refining the hydrogeologic conceptual model of the CWCB using data from the RGWMP and other data to serve as an improved framework for understanding the dynamics of the groundwater system and use as a planning tool.
- WRD will continue to use the data generated by the Regional Groundwater Monitoring Program along with WRD's advanced GIS capabilities 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
Carson #2	1	101787	1250	1230	1250	Lower San Pedro
	2	101788	870	850	870	Silverado
	3	101789	620	600	620	Silverado
	4	101790	470	450	470	Lynwood
	5	101791	250	230	250	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
Cerritos #2	1	101781	1470	1350	1370	Sunnyside
	2	101782	935	915	935	Silverado
	3	101783	760	740	760	Silverado
	4	101784	510	490	510	Lynwood
	5	101785	370	350	370	Gage
	6	101786	170	150	170	Gaspur
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
Compton #1	1	101809	1410	1370	1390	Sunnyside
	2	101810	1170	1150	1170	Silverado
	3	101811	820	800	820	Lynwood
	4	101812	480	460	480	Gage
	5	101813	325	305	325	Exposition
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
Gardena #2	1	101804	1335	1275	1335	Lower San Pedro
	2	101805	790	770	790	Silverado
	3	101806	630	610	630	Silverado
	4	101807	360	340	360	Lynwood
	5	101808	255	235	255	Gardena
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

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
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
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
Long Beach #4	1	101759	1380	1200	1220	Pico Formation
	2	101760	820	800	820	Lower San Pedro
Long Beach #6	1	101792	1530	1490	1510	Lower San Pedro
	2	101793	950	930	950	Sunnyside
	3	101794	760	740	760	Sunnyside
	4	101795	500	480	500	Silverado
	5	101796	400	380	400	Lynwood
	6	101797	240	220	240	Gage

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
Long Beach #8	1	101819	1495	1435	1455	Lower San Pedro
	2	101820	1040	1020	1040	Silverado
	3	101821	800	780	800	Silverado
	4	101822	655	635	655	Silverado
	5	101823	435	415	435	Lynwood
	6	101824	185	165	185	Gage
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
Montebello #1	1	101770	980	900	960	Pico Formation
	2	101771	710	690	710	Sunnyside
	3	101772	520	500	520	Silverado
	4	101773	390	370	390	Lynwood
	5	101774	230	210	230	Gage
	6	101775	110	90	110	Exposition
Norwalk #1	1	101814	1420	1400	1420	Sunnyside
	2	101815	1010	990	1010	Silverado
	3	101816	740	720	740	Lynwood
	4	101817	450	430	450	Jefferson
	5	101818	240	220	240	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
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			

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
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
Westchester #1	1	101776	860	740	760	Pico Formation
	2	101777	580	560	580	Lower San Pedro
	3	101778	475	455	475	Silverado
	4	10179	330	310	330	Lynwood
	5	101780	235	215	235	Gage
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 (includes Spreading 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
2000/01									23,451	43,778	42,290	109,519
2001/02				72,874				47,597	41,268	60,596	18,607	120,471
2002/03				85,757				39,606	22,366	42,640	58,357	123,363

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 nc 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 were 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 SEAWATER 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
1999/00	11,172	7,460	18,632	6,010	4,028	1,709	5,737	30,379
2000/01	13,988	6,838	20,826	3,923	3,710	1,923	5,633	30,382
2001/02	12,724	7,276	20,000	5,459	3,961	2,232	6,193	31,652
2002/03	10,419	6,192	16,611	8,056	3,287	1,197	4,484	29,151

(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 2002-2003

Constituent	Units	Treated Colorado River/State Project Water[a] 2003[d]	Untreated Colorado River Water[b] 2003[d]	Untreated State Project Water[b] 2003[d]	West Basin MWD WRP[c] 2003[e]	Whittier Narrows WRP[b] 2002-2003[f]	San Jose Creek East WRP[b] 2002-2003[f]	San Jose Creek West WRP[b] 2002-2003[f]	Pomona WRP[b] 2002-2003[f]	Stormwater[g] 2002-2003
Total Dissolved Solids (TDS)	mg/L	387/301	593	242	48	523	632	527	538	253
Hardness	mg/L	164/120	288	99	26	178	198	190	204	125
Sulfate	mg/L	111/48	232	33	9.1	91	124	78	61	50
Chloride	mg/L	79/82	81	64	6	98	159	105	135	36
Nitrogen (Nitrate as N)	mg/L	0.5/0.6	ND	0.70	ND	5.37	3.45	3.92	2.15	0.95
Iron	mg/L	ND/ND	ND	0.124	ND	<0.05	0.08	<0.06	<0.05	0.43
Manganese	ug/L	ND/ND	ND	0.022	ND	<7	30	10	<7	NA
Trichloroethylene (TCE)	ug/L	ND/ND	ND	ND	ND	<0.5	<0.5	<0.5	<0.5	NA
Tetrachloroethylene (PCE)	ug/L	ND/ND	ND	ND	ND	<0.5	<0.5	<0.6	<0.5	NA
Total Organic Carbon (TOC)	mg/L	2.1/2.1	3.4	3.7	0.2	6.63	7.95	8	9.6	7.54
Perchlorate	ug/L	ND/ND	ND	ND	NA	NA	NA	NA	NA	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 2003

e = Average concentration data from West Basin Municipal Water District (West Basin MWD), for calendar year 2003

f = Average concentration data from County Sanitation Districts of Los Angeles County (CSDLAC), for WY 2002-2003

g = Average concentration data from LACDPW, for samples collected from San Gabriel River WY 2002-2003

Sources of data:

2003 Water Quality Report to MWD Member Agencies

Montebello Forebay Groundwater Recharge annual report (CSDLAC, December 2003)

West Basin Water Recycling Facility Annual Report (West Basin MWD, 2003)

Los Angeles County Stormwater Monitoring Report, WY 2002-2003 (LACDPW Web Site)

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
2000/01	195,255	53,842	249,047
2001/02	199,900	50,066	249,966
2002/03	190,082	51,789	241,871

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	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	Sunnyside	Silverado	Lynwood	Gage		
11/4/2002	-61.47	-58.28	-24.71	-22.68		
12/31/2002	-64.12	-65.22	-25.02	-23.02		
3/31/2003	-62.27	-61.62	-24.42	-22.28		
6/23/2003	-63.6	-60.18	-24.18	-22.11		
9/29/2003	-60.31	-61.25	-24.05	-22		
Carson #2					Reference Point Elevation: 39.81	
Depth of Well	1230-1250	850-870	600-620	450-470	230-250	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Lynwood	Gage	
12/26/2002	-48.82	-48.82	-46.64	-41.42	-37.69	
3/31/2003	-47.85	-47.85	-45.21	-40.09	-36.55	
6/17/2003	-48.19	-48.19	-45.63	-40.92	-35.62	
7/10/2003	-48.49	-48.49	-45.85	-40.8	-37.28	
9/30/2003	-48.07	-48.07	-45	-40.09	-36.74	
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
10/31/2002	-44.12	-42.26	-47.51	8.11	14.24	14.36
11/5/2002	-39.86	-38.89	-44.43	8.64	14.31	14.44
12/27/2002	-16.66	-16.95	-18.67	15.24	19.3	19.3
4/3/2003	-25.62	-28.31	-31.43	14.22	18.95	19.09
6/25/2003	-38.15	-41.63	-42.12	11.03	16.29	16.45
9/11/2003	-40.78	-48.29	-42.15	10.2	15.3	15.42
9/30/2003	-40.93	-46.49	-41.24	10.89	16.06	16.11
Cerritos #2					Reference Point Elevation: 75.27	
Depth of Well	1350-1370	915-935	740-760	490-510	350-370	150-170
Aquifer Name	Sunnyside	Silverado	Silverado	Lynwood	Gage	Gaspur
12/12/2002	-7.17	-6.42	-11.68	3.28	32.18	25.4
12/30/2002	-2.71	0.09	-5.85	7.36	26.76	33.02
3/27/2003	1.34	-8.26	-15.51	0.96	25.71	32.9
6/26/2003	-8.81	-20.19	-21.21	-2.61	24	31.77
9/22/2003	-14.88	-25.96	-27.66	-6.11	22.62	31.04
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
1/2/2003	81.24	60.25	56.95	27.68	35.89	59.62
3/27/2003	60.09	63.34	60.27	32.81	37.03	60.14
7/3/2003	59.62	61.94	58.26	27.96	33.98	59.66
9/19/2003	59.64	56.63	52.4	21.35	28.49	58.69

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Compton #1					Reference Point Elevation: 67.07	
Depth of Well	1370-1390	1150-1170	800-820	460-480	325-345	
Aquifer Name	Sunnyside	Silverado	Lynwood	Gage	Exposition	
1/2/2003	-32.86	-32.72	-12.88	4.61	9.63	
3/30/2003	-24.05	-23.99	-10.5	0.79	1.71	
6/29/2003	-43.2	-42.94	-14.79	-3.01	-0.18	
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
3/27/2003	19.42	20.19	21.49	20.43	42.02	45.11
6/9/2003	15.18	15.65	17.21	19.13	41.76	44.22
6/27/2003	12.55	13.63	16.77	16.72	41.39	44.76
7/14/2003	10.12	11.49	14.05	15.63	41.31	44.82
7/17/2003	9.78	11	13.85	14.99	41.25	44.8
7/22/2003	8.91	10.35	13.54	14.38	40.96	44.78
9/29/2003	3.86	6.08	8.71	8.93	39.71	44.26
Gardena #1					Reference Point Elevation: 79.9	
Depth of Well	970-990	445-465	345-365	120-140		
Aquifer Name	Sunnyside	Silverado	Lynwood	Gage		
12/30/2002	-60.37	-126.06	-83.67	-16.73		
3/27/2003	-60.54	-120.56	-83.53	-16.06		
6/30/2003	-60.99	-128.93	-86.08	-16.36		
8/21/2003	-61.44	-129.23	-86.49	-15.99		
9/30/2003	-61.56	-129.01	-92.18	-16.94		
Gardena #2					Reference Point Elevation: 26.74	
Depth of Well	1275-1335	770-790	610-630	340-360	235-255	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Lynwood	Gardena	
1/2/2003	-49.86	-67.27	-67.5	-29.38	-14.45	
3/27/2003	-49.62	-65.61	-65.8	-29.14	-14.14	
6/30/2003	-49.83	-66.71	-66.86	-30.34	-24.33	
9/30/2003	-50.25	-65.55	-65.67	-30.46	-15.4	
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	Lower San Pedro	Silverado	Lynwood	Gage
12/30/2002	-109.48	-16.08	-15.05	-14.89	-11.03	-2.52
3/30/2003	-109.4	-17.18	-16.07	-15.87	-11.64	-2.35
4/15/2003	-111.07	-17.25	-16.07	-15.87	-11.66	-2.26
6/30/2003	-110.96	-18.64	-17.56	-17.32	-12.56	-2.26
9/23/2003	-110.08	-19.06	-17.84	-17.6	-12.88	-2.67

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
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		
12/31/2002	-29.44	-32.38	-26.38	16.82		
3/31/2003	-27.7	-30.9	-27.29	17.03		
7/2/2003	-27.82	-32.32	-23.72	15.92		
7/8/2003	-28.97			15.84		
9/30/2003	-30.57	-32.13	-26.9	15.39		
Inglewood #1						Reference Point Elevation: 110.56
Depth of Well	1380-1400		430-450	280-300	150-170	
Aquifer Name	Pico		Silverado	Lynwood	Gage	
12/30/2002	-35.29		-52.03	-5.21	0.4	
3/30/2003	-35.01		-52.45	-5.1	0.49	
6/27/2003	-34.91		-53.56	-4.85	0.81	
9/29/2003	-35.12		-54.09	-5.11	0.9	
Inglewood #2						Reference Point Elevation: 217.33
Depth of Well	800-840	450-470	330-350	225-245		
Aquifer Name	Pico	Pico	Silverado	Lynwood		
12/30/2002	-23.26	-19.59	-9.7	-4.25		
3/30/2003	-23.16	-19.95	-9.57	-4.09		
6/27/2003	-22.55	-18.89	-9.15	-3.94		
9/29/2003	-22.35	-18.44	-8.91	-3.81		
Lakewood #1						Reference Point Elevation: 37.91
Depth of Well	989-1009	640-660	450-470	280-300	140-160	70-90
Aquifer Name	Sunnyside	Silverado	Lynwood	Hollydale	Artesia	Semi-Perched
12/30/2002	-62.48	-51.54	-48.1	-17.19	-5.88	12.93
3/25/2003	-57.53	-48.1	-46	-21.31	-9.2	12.98
6/25/2003	-85.51	-64.83	-62.99	-25.47	-11.26	12.64
9/16/2003	-96.87	-71.75	-69.95	-29.26	-15.12	11.58
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	
10/31/2002	-29.07	-31.48	-35.2	-46.09	-30.41	
11/14/2002	-24	-27.12	-29.72	-38.76	-26.06	
12/30/2002	-6.62	-9.32	-12.89	-21.2	-11.86	
3/26/2003	-4.81	-7.15	-14.64	-28.06	-14.67	
6/25/2003	-23.89	-24.83	-27.97	-41.87	-24	
9/11/2003	-27.15	-29.15	-29.36	-37.05	-22.95	
9/30/2003	-27.91	-29.55	-29.81	-41.17	-23.99	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	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
11/7/2002	-36.07	-29.3	-26.24	-27.99	-27.47	-28.77
12/26/2002	-35.99	-28.07	-26.48	-27.44	-22.69	-26.17
3/30/2003	-36.01	-26.63	-25.35	-26.77	-22.58	-25.25
6/25/2003	-35.48	-25.94	-24.81	-26.49	-22.4	-24.86
9/10/2003	-36.89	-27.2	-28.51	-27.53	-23.48	-28.98
9/30/2003	-38.34	-29.37	-26.7	-27.19	-22.52	-26.5
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
11/1/2002	-38.01	-39.97	-60.49	-42.02	-36.22	-20.36
12/30/2002	-20.3	-21.56	-33.58	-20.47	-16.31	-4.49
1/16/2003	-17.72	-19.17	-33.01	-18.24	-14.62	-3.99
4/2/2003	-7.34	-8.57	-30.02	-28.49	-27.73	-12.1
6/27/2003	-25.55	-28.52	-61.69	-41.05	-38.34	-15.69
9/15/2003	-32.21	-29.63	-55.22	-43.46	-42.38	-15.65
Long Beach #2						Reference Point Elevation: 42.15
Depth of Well	970-990	720-740	450-470	280-300	160-180	95-115
Aquifer Name	Pico	Sunnyside	Silverado	Lynwood	Gage	Gaspur
11/25/2002	-47.41	-43.83	-42.62	-13.85	-3.84	-2.08
12/30/2002	-44.73	-39.26	-39.53	-12.01	-3.22	-1.78
3/30/2003	-34.07	-34.75	-37	-10.88	-2.36	-0.85
6/29/2003	-67.92	-40.52	-36.95	-11.91	-2.44	-0.61
9/15/2003	-59.59	-39.76	-45.69	-12.8	-2.89	-1.03
9/29/2003	-68.22	-43.08	-40.13	-13.09	-3.02	-1.1
Long Beach #3						Reference Point Elevation: 24.60
Depth of Well	1350-1390	997-1017	670-690	530-550	410-430	
Aquifer Name	Lower San Pedro	Silverado	Silverado	Silverado	Lynwood	
10/31/2002	-45.28	-59.62	-59.6	-59.68	-12.3	
1/2/2003	-44.97	-63.38	-63.37	-63.48	-12.09	
3/31/2003	-44.76	-61.98	-61.97	-62.1	-11.64	
6/30/2003	-45.2	-61.55	-61.53	-61.61	-10.57	
9/3/2003	-45.43	-62.38	-62.11	-61.36	-10.76	
9/29/2003	-45.4	-59.51	-59.54	-59.63	-9.92	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Long Beach #6						Reference Point Elevation: 32.53
Depth of Well	1490-1510	930-950	740-760	480-500	380-400	220-240
Aquifer Name	Lower San Pedro	Sunnyside	Sunnyside	Silverado	Lynwood	Gage
11/27/2002	-40.36	-41.84	-41.78	-47.37	-47.37	-32.4
12/30/2002	-30.81	-32.98	-33.18	-44.04	-43.95	-28.66
1/2/2003	-29.96	-32.12	-32.32	-41.22	-41.2	-28.06
4/2/2003	-15.36	-18.45	-18.63	-29.23	-29.18	-27.7
6/29/2003	-31.56	-55.42	-56.39	-84.75	-84.91	-35.59
7/11/2003	-33.27	-57.27	-58.88	-97.98	-97.93	-35.06
7/17/2003	-33.95	-57.64	-59.2	-97.96	-97.91	-34.82
9/17/2003	-37.42	-51.96	-52.44	-73.42	-73.21	-36.3
9/28/2003	-36.98			-82.5		
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	
4/4/2003	-14.63	-20.23	-22.52	-27.43	-20.72	
6/19/2003	-12.65	-16.66	-24.16	-20.06	-20.71	
9/30/2003	-16.95	-21.98	-23.77	-28.03	-21.04	
Montebello #1						Reference Point Elevation: 192.60
Depth of Well	960-980	690-710	500-520	370-390	210-230	90-110
Aquifer Name	Pico	Sunnyside	Silverado	Lynwood	Gage	Exposition
1/2/2003	101.62	101.96	100.58	96.56	91.32	92.57
3/27/2003	106.48	106.76	105.57	101.29	97.5	100.46
6/30/2003	104.16	99.92	98.95	95.13	98.54	
9/30/2003	94.19	87.29	86.36	83.32	90.05	Dry
Norwalk #1						Reference Point Elevation: 95.44
Depth of Well	1400-1420	990-1010	720-740	430-450	220-240	
Aquifer Name	Sunnyside	Silverado	Lynwood	Jefferson	Gage	
4/4/2003	44.29	11.95	24.8	23.19	11.97	
6/26/2003	43.8	0.73	16.3	21.16	6.45	
8/19/2003	39.03	-6.42	11.41		3.99	
9/29/2003	36.27	-8.05	10.5	7.11	3.86	
Pico #1						Reference Point Elevation: 181.06
Depth of Well	860-900	460-480	380-400	170-190		
Aquifer Name	Pico	Silverado	Silverado	Jefferson		
12/31/2002	140.62	131.71	130.28	137.88		
3/28/2003	146.76	135.99	134.56	141.69		
6/20/2003	146.38	133.84	131.56	135.74		
6/27/2003	145.45	137.65	137.25	135.58		
7/22/2003	142.61	128.29	128.85	128.84		
9/30/2003	134.85	114.29	111	115.7		

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Pico #2						Reference Point Elevation: 149.6
Depth of Well	1180-1200	830-850	560-580	320-340	235-255	100-120
Aquifer Name	Sunnyside	Sunnyside	Sunnyside	Silverado	Lynwood	Gaspur
12/31/2002	88.47	92.94	97.61	104.66	106.72	115.55
3/28/2003	91.94	96.13	102.67	113.55	114.28	118.84
6/20/2003	82.29	83.38	90.94	105.58	106.31	110.11
6/27/2003		77.61		97.24		106.49
7/22/2003	70.54	69.4	77.44	94.12	92.85	99.56
9/30/2003	68.29	67.92	74.86	91.5	92.47	96.97
PM-1 Columbia						Reference Point Elevation: 78.42
Depth of Well	555-595	460-500				
Aquifer Name	Lower San Pedro	Silverado				
11/7/2002	-12.63	-11.69				
12/26/2002	-11.89	-11.21				
6/25/2003	-11.79	-10.72				
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		
11/5/2002	-17.68	-14	-13.86	-13.79		
12/26/2002	-17.05	-13.33	-13.26	-13.21		
4/1/2003	-16.36	-12.62	-12.56	-12.53		
6/25/2003	-16.75	-13.01	-12.91	-14.85		
9/8/2003	-17.16	-13.4	-13.26	-13.24		
9/30/2003	-17.1	-13.48	-13.37	-13.34		
PM-4 Mariner						Reference Point Elevation: 97.7
Depth of Well	670-710	500-540	340-380	200-240		
Aquifer Name	Lower San Pedro	Silverado	Lynwood	Gage		
11/3/2002	-11.28	-6.24	-3.71	-3.62		
12/31/2002	-9.82	-6.4	-3.83	-3.75		
4/1/2003	-9.67	-6.34	-3.9	-3.81		
6/25/2003	-10.56	-7.03	-5.14	-4.45		
9/28/2003	-11.29	-7.75	-5.32	-5.26		

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
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
12/13/2002	74.11	77.82		70.29	77.73	83.23
1/2/2003	78.08	81.66	80.99	73.55	82.47	85.88
2/28/2003	82.05	84.53	83.82	78.09	87.39	90.2
3/27/2003	82.6	84.04	83.32	79.37	89.92	92.74
5/12/2003	83.98	84.59	83.84	78.23	88.42	91.38
6/20/2003	78.2	77.04	76.27	69.33	81.43	85.03
6/29/2003	76.46	72.66	72.45	66.28	79.53	83.38
8/4/2003	71.15	68.52	67.79	60.48	73.55	77.39
8/28/2003	67.69	63.84	63.15	56.39	69.4	73.51
9/24/2003	65.45	61.28	60.62	54.24	65.93	69.94
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		
12/31/2002	92.88	82.52	59.14	45.87		
3/26/2003		86	65.03	52.93		
6/26/2003		87.1	66.14	53.76		
9/29/2003	90.75	82.85	60.38	46.54		
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	
3/28/2003	2.14	2.84	6.28	1.58	35.78	
5/21/2003	0.9	-0.4	2.1	0.89	35.7	
7/3/2003	-3.8	-3.52	-0.23	-3.91	35.34	
9/29/2003	-10.13	-8.07	-3.58	-8.33	34.28	
Westchester #1						Reference Point Elevation: 124.27
Depth of Well	740-760	560-580	455-475	310-330	215-235	
Aquifer Name	Pico	Lower San Pedro	Silverado	Lynwood	Gage	
11/27/2002	-3.83	6.17	6.53	6.79	6.9	
12/30/2002	-3.56	6.3	6.61	6.79	6.95	
1/15/2003	-3.53	6.23	6.66	6.9	7.07	
3/30/2003	-3.21	6.2	6.54	6.81	7.01	
6/27/2003	-3.24	6.48	6.86	7.11	7.27	

TABLE 3.2
GROUNDWATER ELEVATIONS, WATER YEAR 2002-2003

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Whittier #1					Reference Point Elevation: 217.17	
Depth of Well	1180-1200	920-940	600-620	450-470	200-220	
Aquifer Name	Pico	Sunnyside	Silverado	Jefferson	Gage	
11/1/2002	116.1	116.08	109.64	107.92	197.14	
12/31/2002	116.06	116.17	110.29	108.12	197.52	
3/27/2003	116.87	118.49	101.14	109.71	198.67	
6/26/2003	117.3	117.33	111.87	110.6	198.63	
9/26/2003	117.58	117.44	111.3	109.75	198.03	
Willowbrook #1					Reference Point Elevation: 96.21	
Depth of Well	885-905	500-520	360-380	200-220		
Aquifer Name	Pico	Silverado	Lynwood	Gage		
11/13/2002	-33.69	-30.62	-23.41	-23.18		
12/30/2002	-33.38	-30.52	-23.68	-23.62		
3/31/2003	-28.29	-29.38	-24.02	-23.78		
6/30/2003	-29.99	-29.02	-24.01	-23.57		
7/15/2003	-31.13	-29.52	-24.42	-24.01		
9/9/2003	-36.6	-30.19	-26.01	-25.58		
9/9/2003	-37.05	-30.1	-25.91	-25.75		
9/29/2003	-42.81	-31.79	-26.61	-26.14		
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	
10/28/2002	-57.68	-57.89	-58	-26.65	-23.35	
1/2/2003	-62.14	-62.38	-62.5	-26.74	-23.04	
3/30/2003	-60.9	-61.13	-61.23	-25.93	-22.34	
6/24/2003	-60.05	-60.15	-60.19	-25.48	-21.04	
9/29/2003	-58.86	-59.04	-59.14	-25.19	-21.64	
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	
10/16/2002	-43.55	-38.4	-33.25	-32.26	-10.33	
10/30/2002	-43.32	-38.07	-33.33	-32.26	-10.28	
1/2/2003	-46.19	-40.6	-34.7	-33.58	-10.1	
4/1/2003	-44.69	-39.01	-33.14	-31.96	-9.88	
6/30/2003	-45.31	-39.71	-34.72	-32.49	-9.85	
9/2/2003	-45.76	-39.92	-34.14	-32.38	-9.77	
9/29/2003	-44.42	-39.29	-33.38	-32.25	-9.71	

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 Los Angeles #1 Zones 1, 2, 3, 4, 5 Montebello #1 Zones 3, 4, 5 Cerritos #2 Zones 1, 2, 3, 4, 5, 6 Compton #1 Zones 2,3,4,5 Norwalk #1 Zones 1,2,3	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 Long Beach #6 Zones 1,2 ,3 ,4 ,5 ,6 Montebello #1 Zone 2 Carson #2 Zones 1, 2, 3, 4, 5 Westchester #1 Zones 1, 2, 3, 4, 5 Compton #1 Zone 1	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-3 Madrid Zone 2 Wilmington #2 Zone 3 Long Beach #3 Zones 1, 2, 3	PM-4 Mariner Zones 2,3,4 Wilmington #1 Zones 1, 2, 3, 4, 5 Wilmington #2 Zones 4, 5 Long Beach #3 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
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Cerr-itos #1 Zone 1 11/20/02	Cerr-itos #1 Zone 1 09/11/03	Cerr-itos #1 Zone 2 11/20/02	Cerr-itos #1 Zone 2 09/11/03	Cerr-itos #1 Zone 3 11/20/02	Cerr-itos #1 Zone 3 09/11/03	Cerr-itos #1 Zone 4 11/20/02	Cerr-itos #1 Zone 4 09/11/03	Cerr-itos #1 Zone 5 11/20/02	Cerr-itos #1 Zone 5 09/11/03	Cerr-itos #1 Zone 6 11/20/02	Cerr-itos #1 Zone 6 09/11/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	280	270	270	260	340	320	280	260	270	260	270	270
Cation Sum	meq/l			4.94	4.8	4.61	4.48	5.52	5.5	4.81	4.85	4.7	4.65	4.74	4.73
Anion Sum	meq/l			4.74	4.67	4.43	4.32	5.29	5.3	4.69	4.65	4.53	4.54	4.61	4.56
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	27	27	30	31	45	48	**70**	**74**	**120**	**120**	**140**	**140**
Turbidity	NTU			0.3	0.15	0.25	0.1	0.05	0.1	0.15	0.2	0.3	0.25	0.2	0.2
Alkalinity	mg/l			163	162	157	155	173	174	180	180	181	183	191	190
Boron	mg/l			0.064	0.094	ND	0.079	0.068	0.099	0.066	0.1	0.066	0.095	0.071	0.088
Bicarbonate as HCO3,calculated	mg/l			198	197	191	188	210	212	219	219	220	222	232	231
Calcium, Total, ICAP	mg/l			35	34	35	34	44	44	44	44	39	39	47	46
Carbonate as CO3, Calculated	mg/l			2.57	2.55	1.97	2.44	1.72	1.73	1.42	2.26	2.27	2.88	1.51	2.38
Hardness (Total, as CaCO3)	mg/l			107	105	110	108	134	135	151	155	136	139	156	156
Chloride	mg/l	500	s	15	14	14	13	19	19	11	11	10	9.8	9.8	9.4
Fluoride	mg/l	2	p	0.25	0.26	0.35	0.36	0.46	0.34	0.57	0.54	0.46	0.47	0.31	0.31
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.03
Langelier Index - 25 degree	None			0.7	0.68	0.58	0.66	0.62	0.62	0.54	0.74	0.69	0.79	0.59	0.78
Magnesium, Total, ICAP	mg/l			4.7	4.8	5.5	5.7	5.9	6.2	10	11	9.5	10	9.3	9.9
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.5	2.2	2.4	2.1	2.2	2	2	1.9	2.2	1.9	2.2	2
Sodium, Total, ICAP	mg/l			63	61	54	52	64	63	40	39	44	42	36	36
Sulfate	mg/l	500		50	49	42	40	61	61	36	34	29	28	24	23
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			ND	ND	ND	0.5	ND	ND	ND	0.6	ND	ND	ND	0.9
Carbon Dioxide	mg/l			1.98	1.97	2.41	1.88	3.34	3.37	4.38	2.76	2.78	2.23	4.64	2.92
General Physical															
Apparent Color	ACU	15	s	5	5	5	5	5	5	5	5	5	5	5	5
Lab pH	Units			8.3	8.3	8.2	8.3	8.1	8.1	8	8.2	8.2	8.3	8	8.2
Odor	TON	3	s	1	**4**	1	**4**	1	**4**	1	**4**	2	**8**	2	**4**
pH of CaCO3 saturation(25C)	Units	1600	s	7.604	7.619	7.62	7.639	7.479	7.475	7.461	7.461	7.512	7.508	7.407	7.419
pH of CaCO3 saturation(60C)	Units	5	s	**7.2**	**7.2**	**7.2**	**7.2**	**7**	**7**	**7**	**7**	**7.1**	**7.1**	**7**	**7**
Specific Conductance	umho/cm			464	461	432	426	519	521	451	446	437	432	438	439
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	13	18	11	13	22	24	6.1	6.6	15	12	42	45
Barium, Total, ICAP/MS	ug/l	1000	p	46	48	100	100	120	130	58	60	80	79	100	99
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	1.1	ND	1.2	ND	1.2	ND	1.3	ND	1.3	ND	1.6
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Cerr-itos #2 Zone 1 12/12/02	Cerr-itos #2 Zone 1 09/22/03	Cerr-itos #2 Zone 2 12/12/02	Cerr-itos #2 Zone 2 09/22/03	Cerr-itos #2 Zone 3 12/12/02	Cerr-itos #2 Zone 3 09/22/03	Cerr-itos #2 Zone 4 09/22/03	Cerr-itos #2 Zone 4 12/12/02	Cerr-itos #2 Zone 5 12/12/02	Cerr-itos #2 Zone 5 09/22/03	Cerr-itos #2 Zone 6 12/12/02	Cerr-itos #2 Zone 6 09/22/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	210	200	490	500	230	230	240	250	250	240	780	810
Cation Sum	meq/l			3.82	3.66	8.11	8	3.65	3.74	4.21	4.41	4.37	4.25	13.3	13.8
Anion Sum	meq/l			3.63	3.58	8.03	8.05	3.7	3.7	4.18	4.18	4.14	4.13	13.3	13.6
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	0.16	ND	ND	ND	ND	0.1	**0.35**	0.27
Manganese, Total, ICAP/MS	ug/l	50	s	30	28	ND	ND	**64**	**64**	**90**	**94**	**110**	**110**	**510**	**440**
Turbidity	NTU			0.05	0.2	0.25	0.4	6.4	59	2.4	0.9	0.2	0.25	1.4	1.3
Alkalinity	mg/l			153	152	172	173	160	160	183	183	183	182	338	337
Boron	mg/l			0.052	0.063	0.097	0.11	0.054	0.069	0.083	0.067	0.072	0.082	0.092	0.11
Bicarbonate as HCO3,calculated	mg/l			186	185	209	211	195	194	223	223	223	221	412	411
Calcium, Total, ICAP	mg/l			44	42	100	96	39	43	50	52	52	52	160	170
Carbonate as CO3, Calculated	mg/l			1.52	1.51	0.857	0.865	1.6	2	1.82	1.45	1.45	1.81	1.07	1.06
Hardness (Total, as CaCO3)	mg/l			133	127	324	314	120	132	159	164	160	161	535	569
Chloride	mg/l	500	s	5.7	5.5	66	66	5.4	5.2	5.8	6	6	5.8	85	95
Fluoride	mg/l	2	p	0.26	0.27	0.35	0.35	0.29	0.29	0.41	0.39	0.31	0.33	0.35	0.36
Hydroxide as OH, Calculated	mg/l			0.02	0.02	0.01	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.007	0.007
Langelier Index - 25 degree	None			0.57	0.54	0.67	0.66	0.54	0.68	0.7	0.62	0.62	0.71	0.97	1
Magnesium, Total, ICAP	mg/l			5.6	5.4	18	18	5.5	5.9	8.3	8.4	7.3	7.5	33	35
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	2.9	2.9	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3	2.7	4.1	4.1	2.8	2.5	2.6	2.8	3.1	2.8	4.8	4.4
Sodium, Total, ICAP	mg/l			25	24	35	37	27	24	22	24	25	22	56	54
Sulfate	mg/l	500		19	18	120	120	16	16	16	16	14	15	200	200
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	2.9	2.9	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			ND	ND	ND	ND	0.8	ND	ND	0.5	ND	ND	1.2	1.3
Carbon Dioxide	mg/l			2.95	2.94	6.62	6.69	3.1	2.45	3.54	4.46	4.46	3.51	20.7	20.6
General Physical															
Apparent Color	ACU	15	s	3	5	3	5	5	5	5	3	5	5	10	5
Lab pH	Units			8.1	8.1	7.8	7.8	8.1	8.2	8.1	8	8	8.1	7.6	7.6
Odor	TON	3	s	**3**	**4**	1	2	2	**8**	**8**	**3**	**4**	**8**	1	**4**
pH of CaCO3 saturation(25C)	Units	1600	s	7.532	7.555	7.125	7.138	7.564	7.524	7.398	7.381	7.381	7.385	6.626	6.601
pH of CaCO3 saturation(60C)	Units	5	s	**7.1**	**7.1**	**6.7**	**6.7**	**7.1**	**7.1**	**7**	**6.9**	**6.9**	**6.9**	**6.2**	**6.2**
Specific Conductance	umho/cm			355	347	806	789	360	351	394	404	391	391	1200	1230
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	140	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	3.3	2.8	2.6	ND	3.6	4.3	8.8	13	18	19	8.9	5.4
Barium, Total, ICAP/MS	ug/l	1000	p	94	81	190	140	91	84	130	130	130	130	170	110
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	1.6	1.7	3.4	ND	ND	ND	ND	ND	1.2	1
Hexavalent Chromium (Cr VI)	mg/l			ND		1.3		ND			ND	ND		ND	
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	5.9
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	8.7	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	0.7	0.5	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND		ND	ND	ND	ND	ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Com-merce #1 Zone 2 04/17/03	Com-merce #1 Zone 2 09/19/03	Com-merce #1 Zone 3 04/17/03	Com-merce #1 Zone 3 09/19/03	Com-merce #1 Zone 4 04/17/03	Com-merce #1 Zone 4 09/19/03	Com-merce #1 Zone 5 04/17/03	Com-merce #1 Zone 5 09/19/03	Com-merce #1 Zone 6 04/17/03	Com-merce #1 Zone 6 09/19/03
General Minerals													
Total Dissolved Solid (TDS)	mg/l	1000	s	660	680	475	490	490	490	490	490	385	380
Cation Sum	meq/l			11.9	11.8	8.23	8.24	8.43	8.35	8.3	8.14	6.42	6.38
Anion Sum	meq/l			12.3	12.3	8.32	8.36	8.57	8.53	8.07	8.17	6.37	6.28
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	0.1	0.11	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	26	22	**78**	**69**	**84**	**76**	ND	ND	ND	ND
Turbidity	NTU			5.3	3.5	0.4	0.35	0.15	0.25	2.1	2.7	1.6	0.7
Alkalinity	mg/l			306	304	217	213	207	204	193	191	174	172
Boron	mg/l			0.5	0.52	0.24	0.24	0.26	0.25	0.16	0.16	0.14	0.14
Bicarbonate as HCO3,calculated	mg/l			373	370	264	259	252	248	235	233	212	210
Calcium, Total, ICAP	mg/l			59	58	58	58	47	47	75	75	57	57
Carbonate as CO3, Calculated	mg/l			1.93	1.91	1.36	1.68	1.3	1.28	0.765	0.759	0.69	0.684
Hardness (Total, as CaCO3)	mg/l			262	256	231	227	200	196	294	286	220	216
Chloride	mg/l	500	s	220	220	94	99	120	120	72	74	57	56
Fluoride	mg/l	2	p	0.34	0.35	0.36	0.36	0.42	0.44	0.39	0.4	0.46	0.48
Hydroxide as OH, Calculated	mg/l			0.01	0.01	0.01	0.02	0.01	0.01	0.009	0.009	0.009	0.009
Langelier Index - 25 degree	None			0.8	0.79	0.64	0.73	0.53	0.52	0.5	0.5	0.34	0.33
Magnesium, Total, ICAP	mg/l			28	27	21	20	20	19	26	24	19	18
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	4	4	6	5.9
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			6.1	6	3.3	3.4	3.4	3.4	2.5	2.5	1.9	1.9
Sodium, Total, ICAP	mg/l			150	150	81	83	100	100	54	54	45	46
Sulfate	mg/l	500		ND	ND	63	62	49	50	90	94	40	39
Surfactants	mg/l			ND	0.065	ND	ND	ND	0.054	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	4	4	6	5.9
Total Organic Carbon	mg/l			4	3.9	0.8	1.2	0.7	1.1	0.5	0.6	ND	0.6
Carbon Dioxide	mg/l			9.39	9.32	6.65	5.18	6.34	6.24	9.38	9.3	8.46	8.38
General Physical													
Apparent Color	ACU	15	s	**15**	**15**	5	5	5	5	5	3	5	3
Lab pH	Units			7.9	7.9	7.9	8	7.9	7.9	7.7	7.7	7.7	7.7
Odor	TON	3	s	**8**	**8**	**4**	**8**	**4**	**4**	**4**	**3**	**3**	**3**
pH of CaCO3 saturation(25C)	Units	1600	s	7.102	7.113	7.26	7.268	7.372	7.378	7.199	7.203	7.363	7.367
pH of CaCO3 saturation(60C)	Units	5	s	**6.7**	**6.7**	**6.8**	**6.8**	**6.9**	**6.9**	**6.8**	**6.8**	**6.9**	**6.9**
Specific Conductance	umho/cm			1250	1230	838	839	880	860	820	812	652	645
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.2	1.5	ND	ND	1.1	ND	1.3	1.3	ND	1
Barium, Total, ICAP/MS	ug/l	1000	p	85	71	68	74	230	220	80	81	53	57
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	5.4	5.1	10	10
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	1	1.1	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	2.7	2.2	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Compton #1 Zone 1 09/30/03	Compton #1 Zone 2 09/30/03	Compton #1 Zone 3 09/30/03	Compton #1 Zone 4 09/30/03	Compton #1 Zone 5 09/30/03
General Minerals								
Total Dissolved Solid (TDS)	mg/l	1000	s	230	300	330	350	360
Cation Sum	meq/l			3.69	4.79	5.39	5.74	5.94
Anion Sum	meq/l			3.72	4.99	5.12	5.57	5.61
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	0.16	0.11
Manganese, Total, ICAP/MS	ug/l	50	s	13	35	**67**	**110**	**89**
Turbidity	NTU			0.4	0.15	5.8	5.2	2.6
Alkalinity	mg/l			162	146	168	172	187
Boron	mg/l			0.15	0.11	0.12	0.1	0.14
Bicarbonate as HCO3,calculated	mg/l			196	177	204	209	228
Calcium, Total, ICAP	mg/l			18	40	48	59	52
Carbonate as CO3, Calculated	mg/l			5.07	2.89	2.1	1.71	1.48
Hardness (Total, as CaCO3)	mg/l			51.9	115	157	175	171
Chloride	mg/l	500	s	14	24	22	21	19
Fluoride	mg/l	2	p	0.33	0.33	0.29	0.28	0.35
Hydroxide as OH, Calculated	mg/l			0.07	0.04	0.03	0.02	0.02
Langelier Index - 25 degree	None			0.7	0.81	0.75	0.75	0.63
Magnesium, Total, ICAP	mg/l			1.7	3.7	9	6.6	10
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			1.8	1.9	3.1	2.8	3.3
Sodium, Total, ICAP	mg/l			60	56	50	50	56
Sulfate	mg/l	500		3.2	66	54	73	63
Surfactants	mg/l			ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			3.6	0.7	1.1	ND	0.6
Carbon Dioxide	mg/l			0.985	1.41	2.57	3.32	4.56
General Physical								
Apparent Color	ACU	15	s	**30**	10	10	5	5
Lab pH	Units			8.6	8.4	8.2	8.1	8
Odor	TON	3	s	2	**3**	**3**	**4**	**3**
pH of CaCO3 saturation(25C)	Units	1600	s	7.897	7.595	7.454	7.354	7.371
pH of CaCO3 saturation(60C)	Units	5	s	**7.5**	**7.2**	**7**	**6.9**	**6.9**
Specific Conductance	umho/cm			356	470	506	542	551
Metals								
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	1.4	51	57
Barium, Total, ICAP/MS	ug/l	1000	p	8.3	16	74	130	72
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Downey #1 Zone 1 06/09/03	Downey #1 Zone 1 09/29/03	Downey #1 Zone 2 06/09/03	Downey #1 Zone 2 09/29/03	Downey #1 Zone 3 06/09/03	Downey #1 Zone 3 09/29/03	Downey #1 Zone 4 06/12/03	Downey #1 Zone 4 09/29/03	Downey #1 Zone 5 06/12/03	Downey #1 Zone 5 09/29/03	Downey #1 Zone 6 06/12/03	Downey #1 Zone 6 09/29/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	230	230	400	410	490	510	550	560	420	420	860	870
Cation Sum	meq/l			3.69	3.69	6.04	6.34	7.76	7.91	9.24	8.99	7.36	6.97	14.1	13.7
Anion Sum	meq/l			3.6	3.59	6.19	6.31	7.92	8.26	8.81	9.13	7.05	7.15	13.9	14.1
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	2	ND	**120**	**110**	**69**	**78**
Turbidity	NTU			0.15	0.1	0.65	0.8	1.2	0.1	0.6	ND	4.3	0.9	1	0.55
Alkalinity	mg/l			155	155	165	165	168	167	196	196	215	213	296	296
Boron	mg/l			0.13	0.063	0.08	0.062	0.086	0.083	0.23	0.2	0.12	0.087	0.27	0.24
Bicarbonate as HCO3,calculated	mg/l			188	188	201	201	205	203	239	239	262	259	361	361
Calcium, Total, ICAP	mg/l			41	41	76	80	98	100	100	96	93	87	160	150
Carbonate as CO3, Calculated	mg/l			1.94	1.94	1.31	1.64	1.06	1.32	0.491	0.98	0.853	1.68	0.468	1.18
Hardness (Total, as CaCO3)	mg/l			127	126	243	253	323	328	332	322	306	287	527	506
Chloride	mg/l	500	s	5.2	5.1	33	34	65	69	71	81	37	39	96	96
Fluoride	mg/l	2	p	0.31	0.31	0.27	0.28	0.32	0.34	0.39	0.39	0.35	0.36	0.28	0.29
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.02	0.02	0.01	0.02	0.005	0.01	0.009	0.02	0.003	0.009
Langelier Index - 25 degree	None			0.64	0.64	0.74	0.86	0.76	0.86	0.43	0.72	0.64	0.91	0.62	0.99
Magnesium, Total, ICAP	mg/l			5.9	5.8	13	13	19	19	20	20	18	17	31	32
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	1.9	2.2	3	3.4	2.2	2.7	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.7	2.9	3.3	3.6	3.2	3.3	4.5	4.4	3.8	3.6	5.7	5.5
Sodium, Total, ICAP	mg/l			25	25	25	27	28	29	57	56	26	26	78	78
Sulfate	mg/l	500		16	16	87	90	120	130	130	130	81	85	250	260
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	1.9	2.2	3	3.4	2.2	2.7	ND	ND	ND	ND
Total Organic Carbon	mg/l			ND	ND	ND	ND	ND	0.7	0.6	0.8	ND	ND	0.7	0.8
Carbon Dioxide	mg/l			2.37	2.37	4.02	3.19	5.16	4.06	15.1	7.58	10.5	5.18	36.2	14.4
General Physical															
Apparent Color	ACU	15	s	3	5	3	5	5	5	3	5	3	5	3	3
Lab pH	Units			8.2	8.2	8	8.1	7.9	8	7.5	7.8	7.7	8	7.3	7.7
Odor	TON	3	s	**4**	1	**3**	1	**3**	1	2	1	1	1	**3**	1
pH of CaCO3 saturation(25C)	Units	1600	s	7.558	7.558	7.261	7.239	7.142	7.138	7.067	7.084	7.058	7.092	6.683	6.711
pH of CaCO3 saturation(60C)	Units	5	s	**7.1**	**7.1**	**6.8**	**6.8**	**6.7**	**6.7**	**6.6**	**6.6**	**6.6**	**6.6**	**6.2**	**6.3**
Specific Conductance	umho/cm			347	353	611	617	785	788	870	887	664	667	1260	1310
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	3.6	3.4	3.4	3	3.7	3.5	1.9	2.3	4.4	5.3	ND	3
Barium, Total, ICAP/MS	ug/l	1000	p	95	100	170	140	140	120	100	99	260	250	65	83
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	3.6	3.5	2.4	2.5	1.7	1.8	ND	1	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	3.2	ND	2.9	ND	5.1	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	0.9	0.9	3.4	3.2
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	0.6	0.8	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	10
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Huntington Park #1 Zone 1 05/21/03	Huntington Park #1 Zone 2 05/21/03	Huntington Park #1 Zone 3 05/21/03	Huntington Park #1 Zone 4 05/21/03
General Minerals							
Total Dissolved Solid (TDS)	mg/l	1000	s	350	360	630	700
Cation Sum	meq/l			5.69	5.73	10.3	11
Anion Sum	meq/l			6	6.02	10.7	11.7
Iron, Total, ICAP	mg/l	0.3	s	0.22	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**51**	5	ND	ND
Turbidity	NTU			1	0.25	0.15	0.3
Alkalinity	mg/l			181	182	251	277
Boron	mg/l			0.12	0.12	0.17	0.16
Bicarbonate as HCO3,calculated	mg/l			221	222	306	338
Calcium, Total, ICAP	mg/l			57	57	110	120
Carbonate as CO3, Calculated	mg/l			0.72	0.91	0.997	0.874
Hardness (Total, as CaCO3)	mg/l			200	200	394	427
Chloride	mg/l	500	s	22	22	60	65
Fluoride	mg/l	2	p	0.48	0.42	0.34	0.35
Hydroxide as OH, Calculated	mg/l			0.009	0.01	0.009	0.007
Langelier Index - 25 degree	None			0.36	0.46	0.78	0.76
Magnesium, Total, ICAP	mg/l			14	14	29	31
Mercury	ug/l	2	p	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	0.15	5.8	4.8
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3.1	3.1	4.3	4.4
Sodium, Total, ICAP	mg/l			37	38	53	54
Sulfate	mg/l	500		83	83	170	190
Surfactants	mg/l			ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	0.15	5.8	4.8
Total Organic Carbon	mg/l			ND	ND	ND	ND
Carbon Dioxide	mg/l			8.82	7.04	12.2	17
General Physical							
Apparent Color	ACU	15	s	5	3	3	3
Lab pH	Units			7.7	7.8	7.7	7.6
Odor	TON	3	s	1	1	1	1
pH of CaCO3 saturation(25C)	Units	1600	s	7.345	7.343	6.918	6.837
pH of CaCO3 saturation(60C)	Units	5	s	**6.9**	**6.9**	**6.5**	**6.4**
Specific Conductance	umho/cm			574	580	991	1070
Metals							
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	1.3	1.1
Barium, Total, ICAP/MS	ug/l	1000	p	60	74	130	110
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	8	2.3
Hexavalent Chromium (Cr VI)	mg/l						
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND
Volatile Organic Compounds							
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	16	1.3
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	3.4	0.6
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	3.1	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	9.3	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Inglewood #2 Zone 1 08/06/03	Inglewood #2 Zone 2 08/06/03	Inglewood #2 Zone 3 08/06/03
General Minerals						
Total Dissolved Solid (TDS)	mg/l	1000	s	**1690**	**1520**	300
Cation Sum	meq/l			25.7	23.9	5.12
Anion Sum	meq/l			3.94	3.16	5.07
Iron, Total, ICAP	mg/l	0.3	s	**0.54**	**0.53**	0.1
Manganese, Total, ICAP/MS	ug/l	50	s	33	47	45
Turbidity	NTU			3.2	51	2.1
Alkalinity	mg/l			149	125	226
Boron	mg/l			3.4	3	0.19
Bicarbonate as HCO3,calculated	mg/l			181	152	275
Calcium, Total, ICAP	mg/l			15	11	30
Carbonate as CO3, Calculated	mg/l			1.18	0.988	2.25
Hardness (Total, as CaCO3)	mg/l			103	65.3	124
Chloride	mg/l	500	s	33	23	19
Fluoride	mg/l	2	p	0.54	0.3	0.24
Hydroxide as OH, Calculated	mg/l			0.02	0.02	0.02
Langelier Index - 25 degree	None			-0.01	-0.2	0.57
Magnesium, Total, ICAP	mg/l			16	9.2	12
Mercury	ug/l	2	p	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND
Potassium, Total, ICAP	mg/l			22	17	6.1
Sodium, Total, ICAP	mg/l			530	510	57
Sulfate	mg/l	500		ND	ND	ND
Surfactants	mg/l			ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND
Total Organic Carbon	mg/l			23	18	1.6
Carbon Dioxide	mg/l			3.62	3.04	4.37
General Physical						
Apparent Color	ACU	15	s	**300**	**200**	**15**
Lab pH	Units			8	8	8.1
Odor	TON	3	s	**40**	**17**	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	8.011	8.222	7.529
pH of CaCO3 saturation(60C)	Units	5	s	**7.6**	**7.8**	**7.1**
Specific Conductance	umho/cm			2460	2260	476
Metals						
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	28	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.7	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	50	27	14
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	2.1	1.5	1.2
Hexavalent Chromium (Cr VI)	mg/l					
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND
Volatile Organic Compounds						
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND
Toluene	ug/l	150		ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND
MTBE	ug/l			ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	La Mirada #1 Zone 1 11/14/02	La Mirada #1 Zone 1 09/11/03	La Mirada #1 Zone 2 11/14/02	La Mirada #1 Zone 2 09/11/03	La Mirada #1 Zone 3 11/14/02	La Mirada #1 Zone 3 09/11/03	La Mirada #1 Zone 4 11/14/02	La Mirada #1 Zone 4 09/11/03	La Mirada #1 Zone 5 11/14/02	La Mirada #1 Zone 5 09/11/03
General Minerals													
Total Dissolved Solid (TDS)	mg/l	1000	s	350	390	260	280	320	320	450	450	520	570
Cation Sum	meq/l			5.92	5.93	4.37	4.24	5.38	5.51	7.83	7.64	8.99	9.64
Anion Sum	meq/l			5.93	5.87	4.31	4.12	5.4	5.37	7.47	7.61	8.5	9.31
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	11	12	6.9	7	16	19	**77**	19	18	33
Turbidity	NTU			0.25	0.25	0.15	0.2	0.1	0.1	0.3	3.6	0.35	0.1
Alkalinity	mg/l			158	157	141	138	185	186	199	196	204	191
Boron	mg/l			0.14	0.16	0.099	0.11	0.14	0.15	0.12	0.14	0.14	0.16
Bicarbonate as HCO3,calculated	mg/l			192	190	171	167	225	226	242	238	248	232
Calcium, Total, ICAP	mg/l			16	16	9.9	9.7	21	21	57	53	64	71
Carbonate as CO3, Calculated	mg/l			2.49	3.1	2.79	3.43	1.84	2.93	1.25	1.95	2.03	1.9
Hardness (Total, as CaCO3)	mg/l			53.9	54.8	31.7	31.6	78.7	81.3	225	206	263	280
Chloride	mg/l	500	s	26	26	15	14	16	15	46	55	72	110
Fluoride	mg/l	2	p	0.75	0.8	0.55	0.57	0.72	0.75	0.48	0.44	0.52	0.37
Hydroxide as OH, Calculated	mg/l			0.03	0.04	0.04	0.05	0.02	0.03	0.01	0.02	0.02	0.02
Langelier Index - 25 degree	None			0.34	0.44	0.18	0.26	0.33	0.53	0.6	0.76	0.86	0.87
Magnesium, Total, ICAP	mg/l			3.4	3.6	1.7	1.8	6.4	7	20	18	25	25
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	1.2	0.51	1	5.4
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.1	2.1	1.7	1.6	2.5	2.4	3	2.9	3	3.1
Sodium, Total, ICAP	mg/l			110	110	85	82	86	88	75	79	84	91
Sulfate	mg/l	500		96	94	50	45	58	57	100	100	110	95
Surfactants	mg/l			ND	ND	ND	ND	ND	0.063	ND	ND	ND	0.063
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	1.2	0.51	1	5.4
Total Organic Carbon	mg/l			ND	ND	ND	ND	0.6	ND	ND	ND	ND	ND
Carbon Dioxide	mg/l			1.92	1.51	1.36	1.06	3.57	2.27	6.09	3.78	3.94	3.69
General Physical													
Apparent Color	ACU	15	s	5	5	3	5	10	5	3	5	3	3
Lab pH	Units			8.3	8.4	8.4	8.5	8.1	8.3	7.9	8.1	8.1	8.1
Odor	TON	3	s	1	1	1	1	1	1	1	2	1	**3**
pH of CaCO3 saturation(25C)	Units	1600	s	7.958	7.962	8.216	8.236	7.771	7.769	7.305	7.344	7.244	7.228
pH of CaCO3 saturation(60C)	Units	5	s	**7.5**	**7.5**	**7.8**	**7.8**	**7.3**	**7.3**	**6.9**	**6.9**	**6.8**	**6.8**
Specific Conductance	umho/cm			595	597	431	418	520	529	750	731	852	940
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	6.8	7.2	6.6	7.9	8.2	8.4	4.8	2.1	6.2	1.3
Barium, Total, ICAP/MS	ug/l	1000	p	53	53	22	24	35	40	53	47	63	67
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	1	ND	ND	ND	1.2	ND	ND	1.4	2.8
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	6.2	8.1
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.57
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND			ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1	Lake-wood #1
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4	Zone 5	Zone 5	Zone 6	Zone 6
				03/18/03	09/16/03	03/18/03	09/16/03	03/18/03	09/16/03	03/18/03	09/16/03	03/18/03	09/16/03	03/18/03	09/16/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	170	170	190	200	225	230	280	310	210	230	450	420
Cation Sum	meq/l			2.91	2.74	3.35	3.23	3.95	3.72	5.01	5.27	4.22	4.17	8.34	7.3
Anion Sum	meq/l			2.81	2.82	3.27	3.28	3.77	3.73	4.88	5.24	4.04	4.08	8.04	7.29
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	0.1	0.11	ND	ND	0.12	0.11
Manganese, Total, ICAP/MS	ug/l	50	s	3.3	3.1	19	17	28	25	**150**	**160**	**55**	**52**	**320**	**290**
Turbidity	NTU			0.2	0.2	0.5	0.3	2.9	3	0.3	0.3	0.3	0.25	1.1	0.8
Alkalinity	mg/l			96	95	138	138	159	157	168	166	173	174	216	207
Boron	mg/l			ND	0.06	ND	0.05	ND	0.071	ND	0.077	0.1	0.092	0.1	0.087
Bicarbonate as HCO3,calculated	mg/l			114	114	167	167	193	191	204	201	210	211	263	251
Calcium, Total, ICAP	mg/l			10	9.9	33	32	42	39	57	59	46	47	110	96
Carbonate as CO3, Calculated	mg/l			5.88	4.67	2.17	2.73	1.99	2.48	1.33	2.61	2.16	2.74	1.36	2.59
Hardness (Total, as CaCO3)	mg/l			26.4	26.1	98.8	96	127	118	172	179	151	153	320	280
Chloride	mg/l	500	s	19	20	6.4	6.3	8.4	8.5	41	55	10	9.9	96	76
Fluoride	mg/l	2	p	0.44	0.44	0.23	0.23	0.29	0.29	0.24	0.27	0.21	0.48	0.16	0.21
Hydroxide as OH, Calculated	mg/l			0.1	0.1	0.03	0.04	0.03	0.03	0.02	0.03	0.03	0.03	0.01	0.03
Langelier Index - 25 degree	None			0.51	0.41	0.6	0.68	0.66	0.73	0.62	0.93	0.74	0.85	0.92	1.1
Magnesium, Total, ICAP	mg/l			0.36	0.34	4	3.9	5.3	5	7.3	7.7	8.7	8.6	11	9.7
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			1.3	ND	2.5	2	2.7	2.3	3.1	3	2.8	2.5	4.2	3.6
Sodium, Total, ICAP	mg/l			54	51	30	29	31	30	34	37	26	24	42	37
Sulfate	mg/l	500		16	16	15	16	16	16	17	17	14	14	48	48
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	0.097	0.125	ND	ND	0.079	0.061
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			0.9	1.1	ND	ND	ND	0.6	0.8	1	ND	ND	0.8	0.7
Carbon Dioxide	mg/l			0.287	0.361	1.67	1.33	2.44	1.91	4.08	2.01	2.65	2.12	6.62	3.17
General Physical															
Apparent Color	ACU	15	s	**15**	**15**	5	5	3	5	5	5	3	5	5	5
Lab pH	Units			8.9	8.8	8.3	8.4	8.2	8.3	8	8.3	8.2	8.3	7.9	8.2
Odor	TON	3	s	**3**	2	2	1	1	1	2	2	**4**	**3**	**3**	**3**
pH of CaCO3 saturation(25C)	Units	1600	s	8.388	8.392	7.704	7.717	7.536	7.573	7.379	7.371	7.46	7.449	6.984	7.063
pH of CaCO3 saturation(60C)	Units	5	s	**8**	**8**	**7.3**	**7.3**	**7.1**	**7.1**	**6.9**	**6.9**	**7**	**7**	**6.5**	**6.6**
Specific Conductance	umho/cm			287	282	314	307	357	348	483	515	384	387	790	709
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	7	13	1.8	1.7	1.3	1.4	4.9	13	ND	4.9	10	28
Barium, Total, ICAP/MS	ug/l	1000	p	17	17	22	21	30	30	140	150	110	110	320	290
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	1.1	ND	1.1	ND	1.4	ND	1.9
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Long Beach #1 Zone 1 11/18/02	Long Beach #1 Zone 1 09/15/03	Long Beach #1 Zone 2 11/18/02	Long Beach #1 Zone 2 09/15/03	Long Beach #1 Zone 3 11/18/02	Long Beach #1 Zone 3 09/15/03	Long Beach #1 Zone 4 11/18/02	Long Beach #1 Zone 4 09/15/03	Long Beach #1 Zone 5 11/18/02	Long Beach #1 Zone 5 09/15/03	Long Beach #1 Zone 6 11/18/02	Long Beach #1 Zone 6 09/15/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	230	230	230	230	200	210	250	260	**1520**	**1310**	840	860
Cation Sum	meq/l			3.56	3.65	3.66	3.66	3.07	3.07	3.82	3.75	24.5	20.7	15	13.7
Anion Sum	meq/l			3.63	3.63	3.57	3.55	3.04	3.01	3.66	3.67	27.1	21.7	15.2	14
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	0.12
Manganese, Total, ICAP/MS	ug/l	50	s	2.8	2.7	ND	ND	4.7	4.8	17	22	**200**	**170**	**330**	**330**
Turbidity	NTU			0.2	0.2	0.3	0.6	1	2.4	6.6	20	0.9	4.3	0.75	1
Alkalinity	mg/l			160	160	157	156	121	120	140	137	145	147	214	211
Boron	mg/l			0.17	0.21	0.18	0.21	0.082	0.094	0.092	0.083	0.085	0.096	0.09	0.094
Bicarbonate as HCO3,calculated	mg/l			189	189	185	184	144	143	169	166	177	179	261	257
Calcium, Total, ICAP	mg/l			2.2	2.2	2.6	2.6	5.2	5.2	12	15	190	140	180	160
Carbonate as CO3, Calculated	mg/l			15.5	15.5	15.1	15.1	9.36	7.38	3.47	3.41	0.726	1.46	1.35	2.1
Hardness (Total, as CaCO3)	mg/l			ND	ND	7.11	7.11	14.2	14.3	34.9	44.5	585	440	565	511
Chloride	mg/l	500	s	14	14	14	14	12	11	12	11	**590**	430	180	160
Fluoride	mg/l	2	p	0.62	0.62	0.62	0.61	0.62	0.63	0.39	0.36	0.14	0.16	0.26	0.27
Hydroxide as OH, Calculated	mg/l			0.2	0.2	0.2	0.2	0.2	0.1	0.05	0.05	0.01	0.02	0.01	0.02
Langelier Index - 25 degree	None			0.27	0.27	0.34	0.33	0.43	0.33	0.36	0.45	0.88	1.1	1.1	1.3
Magnesium, Total, ICAP	mg/l			0.21	0.23	0.15	0.15	0.3	0.33	1.2	1.7	27	22	28	27
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND
Potassium, Total, ICAP	mg/l			ND	ND	ND	ND	ND	ND	1.3	1.4	5.3	4.6	3.7	3.6
Sodium, Total, ICAP	mg/l			79	81	81	81	64	64	71	65	290	270	82	79
Sulfate	mg/l	500		ND	ND	ND	ND	12	13	24	29	360	320	280	250
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND
Total Organic Carbon	mg/l			4.7	4.4	5.1	4.9	2.1	2.3	1.3	0.9	1.4	1.5	1.3	1.7
Carbon Dioxide	mg/l			0.3	0.3	0.294	0.292	0.288	0.36	1.07	1.05	5.61	2.84	6.57	4.08
General Physical															
Apparent Color	ACU	15	s	**70**	**80**	**80**	**100**	**35**	**35**	**15**	5	5	3	10	5
Lab pH	Units			9.1	9.1	9.1	9.1	9	8.9	8.5	8.5	7.8	8.1	7.9	8.1
Odor	TON	3	s	2	**4**	1	**4**	**3**	**8**	2	**3**	**3**	2	2	2
pH of CaCO3 saturation(25C)	Units	1600	s	8.826	8.826	8.763	8.765	8.571	8.574	8.138	8.049	6.918	7.046	6.773	6.831
pH of CaCO3 saturation(60C)	Units	5	s	**8.4**	**8.4**	**8.3**	**8.3**	**8.1**	**8.1**	**7.7**	**7.6**	**6.5**	**6.6**	**6.3**	**6.4**
Specific Conductance	umho/cm			338	348	337	340	293	299	351	362	2400	2090	1330	1280
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	33	36	ND	27	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	1.6	1.3	ND	3.3	7.2	9.1
Barium, Total, ICAP/MS	ug/l	1000	p	2.3	2	2.5	ND	ND	ND	5	6.5	130	110	300	280
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	1.4	1.5	ND	1.2	ND	1	ND	ND	ND	1	ND	1.4
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	6	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	10	ND	6.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750			ND		ND		ND		ND		ND		ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Long Beach #2 Zone 1 11/25/02	Long Beach #2 Zone 1 09/15/03	Long Beach #2 Zone 2 10/15/02	Long Beach #2 Zone 2 07/16/03	Long Beach #2 Zone 3 11/25/02	Long Beach #2 Zone 3 09/15/03	Long Beach #2 Zone 4 11/25/02	Long Beach #2 Zone 4 09/15/03	Long Beach #2 Zone 5 11/25/02	Long Beach #2 Zone 5 09/15/03	Long Beach #2 Zone 6 11/25/02	Long Beach #2 Zone 6 09/15/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	420	420	280	300	250	260	280	300	**1000**	**1030**	**1210**	**1230**
Cation Sum	meq/l			6.14	7.06	4.99	4.52	4.38	4.02	4.9	4.72	17	16.1	19.6	19.5
Anion Sum	meq/l			6.87	6.9	4.62	4.55	3.92	3.93	4.67	4.6	16.5	16.2	19.8	19.3
Iron, Total, ICAP	mg/l	0.3	s	0.14	ND	ND	ND	ND	ND	ND	ND	0.14	0.15	0.17	0.16
Manganese, Total, ICAP/MS	ug/l	50	s	17	17	23	21	11	11	34	35	**160**	**180**	**340**	**340**
Turbidity	NTU			1.3	11	1.6	0.45	0.4	0.4	1.7	1.4	2.1	1.9	2.4	4.1
Alkalinity	mg/l			314	315	202	200	140	140	147	145	308	309	311	309
Boron	mg/l			0.46	0.56	0.19	0.22	0.13	0.14	0.085	0.1	0.25	0.28	0.33	0.36
Bicarbonate as HCO3,calculated	mg/l			381	381	245	243	169	169	179	176	375	376	379	376
Calcium, Total, ICAP	mg/l			6.3	6.9	14	14	14	14	38	37	190	180	210	210
Carbonate as CO3, Calculated	mg/l			6.22	7.83	2.52	3.15	3.47	3.47	1.84	2.28	0.97	2.44	0.981	3.08
Hardness (Total, as CaCO3)	mg/l			21.5	23.8	42.4	42.8	40.7	40.7	113	111	581	561	664	664
Chloride	mg/l	500	s	20	20	20	19	22	22	29	28	130	120	170	170
Fluoride	mg/l	2	p	0.57	0.6	0.35	0.36	0.47	0.49	0.28	0.31	0.13	0.15	0.26	0.29
Hydroxide as OH, Calculated	mg/l			0.04	0.05	0.03	0.03	0.05	0.05	0.03	0.03	0.007	0.02	0.007	0.02
Langelier Index - 25 degree	None			0.34	0.47	0.29	0.39	0.43	0.43	0.59	0.67	1	1.4	1.1	1.6
Magnesium, Total, ICAP	mg/l			1.4	1.6	1.8	1.9	1.4	1.4	4.3	4.5	26	27	34	34
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.2	2.5	2.3	2.1	1.5	1.4	3.2	2.7	5.7	5	6.8	6.4
Sodium, Total, ICAP	mg/l			130	150	94	83	72	73	59	56	120	110	140	140
Sulfate	mg/l	500		ND	ND	ND	ND	23	23	43	43	320	320	420	400
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	0.063	0.068	0.073	0.077	0.109
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			21	13.5	0.88	3.6	1.3	1.6	1.1	1.4	1.4	1.8	1.5	1.9
Carbon Dioxide	mg/l			3.03	2.41	3.09	2.44	1.07	1.07	2.26	1.76	18.8	7.52	19	5.97
General Physical															
Apparent Color	ACU	15	s	**450**	**350**	**40**	**40**	**25**	**20**	10	5	10	5	5	5
Lab pH	Units			8.4	8.5	8.2	8.3	8.5	8.5	8.2	8.3	7.6	8	7.6	8.1
Odor	TON	3	s	2	**8**	**4**	**8**	1	2	**3**	2	2	2	2	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	8.065	8.025	7.91	7.913	8.071	8.071	7.612	7.631	6.592	6.615	6.544	6.548
pH of CaCO3 saturation(60C)	Units	5	s	**7.6**	**7.6**	**7.5**	**7.5**	**7.6**	**7.6**	**7.2**	**7.2**	**6.1**	**6.2**	**6.1**	**6.1**
Specific Conductance	umho/cm			652	637	430	446	401	392	471	460	1470	1450	1770	1710
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.7	ND	1.8	ND	ND	ND	2.5	2.4	7.8	8	7.9	8
Barium, Total, ICAP/MS	ug/l	1000	p	7.6	6.6	8.7	9.7	5.7	6.2	19	21	91	92	93	93
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	3.8	1.9	ND	ND	ND	ND	ND	ND	3	2.1	4	2.3
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	3.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	7.8	ND	9.5	5.2
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Long Beach #6 Zone 1 11/27/02	Long Beach #6 Zone 1 09/17/03	Long Beach #6 Zone 2 11/27/02	Long Beach #6 Zone 2 09/17/03	Long Beach #6 Zone 3 11/27/02	Long Beach #6 Zone 3 09/17/03	Long Beach #6 Zone 4 11/27/02	Long Beach #6 Zone 4 09/17/03	Long Beach #6 Zone 5 11/27/02	Long Beach #6 Zone 5 09/17/03	Long Beach #6 Zone 6 11/27/02	Long Beach #6 Zone 6 09/17/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	670	700	460	680	220	240	300	270	200	200	290	270
Cation Sum	meq/l			10.1	11	6.86	11	3.25	3.59	4.41	4.11	3.39	3.2	4.9	4.36
Anion Sum	meq/l			11.6	11.6	7.66	11.4	3.71	3.66	4.72	4.04	3.23	3.18	4.44	4.17
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	0.12	ND	ND	ND	ND	ND	ND	0.11	0.13
Manganese, Total, ICAP/MS	ug/l	50	s	13	12	27	38	7.1	6.7	31	34	13	13	**69**	**90**
Turbidity	NTU			6.8	20	1.4	1.8	2.5	2.6	3.6	1.8	0.5	0.2	7.2	2.4
Alkalinity	mg/l			555	552	356	542	163	160	207	175	128	124	154	142
Boron	mg/l			0.98	1.2	0.58	1.1	0.2	0.25	0.23	0.25	0.079	0.065	ND	0.057
Bicarbonate as HCO3,calculated	mg/l			673	668	431	656	195	190	252	211	154	149	188	173
Calcium, Total, ICAP	mg/l			7.2	7.8	5	8.6	3.7	4.3	5.4	5.7	13	13	26	28
Carbonate as CO3, Calculated	mg/l			11	13.7	8.86	13.5	10.1	12.3	2.06	5.46	3.98	4.85	0.771	1.12
Hardness (Total, as CaCO3)	mg/l			23.7	26.1	15.3	28.1	10.6	12.2	16.6	17.1	37	37	78.5	86.4
Chloride	mg/l	500	s	18	18	18	18	15	15	17	16	14	15	36	35
Fluoride	mg/l	2	p	0.65	0.69	0.63	0.66	0.6	0.61	0.57	0.61	0.45	0.47	0.21	0.2
Hydroxide as OH, Calculated	mg/l			0.04	0.05	0.05	0.05	0.1	0.2	0.02	0.07	0.07	0.09	0.01	0.02
Langelier Index - 25 degree	None			0.64	0.77	0.36	0.81	0.31	0.47	-0.2	0.23	0.46	0.54	0.044	0.24
Magnesium, Total, ICAP	mg/l			1.4	1.6	0.93	1.6	0.32	0.35	0.75	0.7	1.1	1.1	3.3	4
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			1.6	1.8	1.5	2	ND	ND	1.4	1	1.4	1.1	2.7	2.5
Sodium, Total, ICAP	mg/l			220	240	170	240	70	77	93	86	60	56	75	59
Sulfate	mg/l	500		ND	ND	ND	ND	ND	ND	3.4	2.7	12	12	16	16
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			28	26	18	26	8	7.1	11	9	1.2	1.9	1.3	1
Carbon Dioxide	mg/l			5.36	4.22	2.73	4.15	0.491	0.38	4	1.06	0.774	0.595	5.96	3.46
General Physical															
Apparent Color	ACU	15	s	**300**	**300**	**200**	**350**	**125**	**100**	**150**	**120**	**20**	**20**	10	5
Lab pH	Units			8.4	8.5	8.5	8.5	8.9	9	8.1	8.6	8.6	8.7	7.8	8
Odor	TON	3	s	**3**	**17**	**4**	**17**	2	**8**	**3**	**8**	**3**	**8**	**4**	**17**
pH of CaCO3 saturation(25C)	Units	1600	s	7.76	7.728	8.138	7.694	8.587	8.533	8.311	8.365	8.144	8.158	7.756	7.76
pH of CaCO3 saturation(60C)	Units	5	s	**7.3**	**7.3**	**7.7**	**7.2**	**8.1**	**8.1**	**7.9**	**7.9**	**7.7**	**7.7**	**7.3**	**7.3**
Specific Conductance	umho/cm			1040	1040	704	1030	358	353	473	400	318	313	454	432
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	32	35	ND	49	32	31	39	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	4	2.2	1.8	ND	1.8	ND	4.1	ND	1.1	ND	7.4	7.7
Barium, Total, ICAP/MS	ug/l	1000	p	9.5	8.5	8.2	13	4.4	3.9	4.9	6.9	6.4	6.5	8.5	10
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	3.9	ND	4.1	ND	3.7	ND	3.8	1.1	2	1	ND	1
Hexavalent Chromium (Cr VI)	mg/l			ND		ND		ND		ND		ND		ND	
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	2.4	ND	3	2.8	ND	ND	8.5	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	6.6	ND	ND	ND	5.9	ND	ND	12	6.1	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Los Angeles #1 Zone 1 06/19/03	Los Angeles #1 Zone 2 06/19/03	Los Angeles #1 Zone 3 06/19/03	Los Angeles #1 Zone 4 06/19/03	Los Angeles #1 Zone 5 06/19/03
General Minerals								
Total Dissolved Solid (TDS)	mg/l	1000	s	350	370	360	580	630
Cation Sum	meq/l			5.7	6.23	6.24	9.5	10.5
Anion Sum	meq/l			5.64	6.01	6.07	9.37	10.1
Iron, Total, ICAP	mg/l	0.3	s	ND	0.21	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	43	**57**	33	ND	ND
Turbidity	NTU			0.1	0.6	0.15	1.1	0.2
Alkalinity	mg/l			179	183	185	213	221
Boron	mg/l			0.17	0.16	0.17	0.2	0.21
Bicarbonate as HCO3,calculated	mg/l			217	223	225	259	269
Calcium, Total, ICAP	mg/l			54	57	60	98	110
Carbonate as CO3, Calculated	mg/l			2.24	0.914	1.16	1.06	1.1
Hardness (Total, as CaCO3)	mg/l			184	204	216	352	394
Chloride	mg/l	500	s	21	22	22	64	76
Fluoride	mg/l	2	p	0.27	0.4	0.35	0.4	0.39
Hydroxide as OH, Calculated	mg/l			0.03	0.01	0.01	0.01	0.01
Langelier Index - 25 degree	None			0.82	0.46	0.58	0.76	0.83
Magnesium, Total, ICAP	mg/l			12	15	16	26	29
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	8	12
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	0.38	ND
Potassium, Total, ICAP	mg/l			4	3.8	3.6	4.3	4.4
Sodium, Total, ICAP	mg/l			44	47	42	54	57
Sulfate	mg/l	500		70	82	83	130	130
Surfactants	mg/l			ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	8.38	**12**
Total Organic Carbon	mg/l			ND	ND	ND	ND	ND
Carbon Dioxide	mg/l			2.74	7.07	5.67	8.21	8.53
General Physical								
Apparent Color	ACU	15	s	3	5	3	5	10
Lab pH	Units			8.2	7.8	7.9	7.8	7.8
Odor	TON	3	s	2	2	2	**4**	2
pH of CaCO3 saturation(25C)	Units	1600	s	7.376	7.341	7.315	7.04	6.974
pH of CaCO3 saturation(60C)	Units	5	s	**6.9**	**6.9**	**6.9**	**6.6**	**6.5**
Specific Conductance	umho/cm			554	592	596	917	1010
Metals								
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	1.2	1.3	1
Barium, Total, ICAP/MS	ug/l	1000	p	30	49	56	130	150
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	130	370
Hexavalent Chromium (Cr VI)	mg/l							
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	16	21
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	1.2	1.4
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	0.6
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Montebello #1 Zone 1 05/27/03	Montebello #1 Zone 2 05/27/03	Montebello #1 Zone 3 05/27/03	Montebello #1 Zone 4 05/27/03	Montebello #1 Zone 5 05/27/03
General Minerals								
Total Dissolved Solid (TDS)	mg/l	1000	s	**2180**	890	620	560	490
Cation Sum	meq/l			34	14.8	9.97	9.24	8.22
Anion Sum	meq/l			37.4	15.4	9.82	9.02	8.03
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	ND	41	**150**	**94**	ND
Turbidity	NTU			2.5	0.65	6.2	0.3	0.15
Alkalinity	mg/l			908	586	215	194	169
Boron	mg/l			6.1	2.1	0.38	0.16	0.21
Bicarbonate as HCO3,calculated	mg/l			1100	713	262	236	206
Calcium, Total, ICAP	mg/l			13	16	86	110	80
Carbonate as CO3, Calculated	mg/l			11.3	5.83	0.853	1.22	0.533
Hardness (Total, as CaCO3)	mg/l			57.1	64.2	276	349	266
Chloride	mg/l	500	s	**680**	130	92	71	65
Fluoride	mg/l	2	p	0.46	0.32	0.21	0.18	0.4
Hydroxide as OH, Calculated	mg/l			0.03	0.02	0.009	0.01	0.007
Langelier Index - 25 degree	None			0.91	0.71	0.61	0.87	0.37
Magnesium, Total, ICAP	mg/l			6	5.9	15	18	16
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	4.1
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			8	ND	3.3	3.3	3
Sodium, Total, ICAP	mg/l			750	310	100	50	65
Sulfate	mg/l	500		ND	ND	140	150	120
Surfactants	mg/l			ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	4.1
Total Organic Carbon	mg/l			40	2.7	2.2	1.1	0.5
Carbon Dioxide	mg/l			13.9	11.3	10.5	5.94	10.3
General Physical								
Apparent Color	ACU	15	s	**350**	**250**	**20**	10	3
Lab pH	Units			8.2	8.1	7.7	7.9	7.6
Odor	TON	3	s	**17**	**8**	**17**	**8**	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	7.29	7.388	7.092	7.031	7.228
pH of CaCO3 saturation(60C)	Units	5	s	**6.8**	**6.9**	**6.6**	**6.6**	**6.8**
Specific Conductance	umho/cm			3580	1430	977	868	779
Metals								
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	1.5	ND	1.3	2.1
Barium, Total, ICAP/MS	ug/l	1000	p	36	24	42	80	59
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	2.5	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	3.6	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	12	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Norwalk #1	Norwalk #1	Norwalk #1
				Zone 1	Zone 2	Zone 3
				08/19/03	08/19/03	09/03/03
General Minerals						
Total Dissolved Solid (TDS)	mg/l	1000	s	500	310	260
Cation Sum	meq/l			8.68	4.76	4.14
Anion Sum	meq/l			8.26	5.2	4.1
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	3.6	6.3	17
Turbidity	NTU			0.85	1.2	29
Alkalinity	mg/l			307	180	123
Boron	mg/l			0.37	0.21	ND
Bicarbonate as HCO3,calculated	mg/l			373	214	149
Calcium, Total, ICAP	mg/l			13	7.5	22
Carbonate as CO3, Calculated	mg/l			3.84	6.97	2.43
Hardness (Total, as CaCO3)	mg/l			61.2	23.2	65.2
Chloride	mg/l	500	s	70	57	48
Fluoride	mg/l	2	p	0.43	0.58	0.29
Hydroxide as OH, Calculated	mg/l			0.03	0.09	0.04
Langelier Index - 25 degree	None			0.44	0.46	0.47
Magnesium, Total, ICAP	mg/l			7	1.1	2.5
Mercury	ug/l	2	p	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.5	1.4	2
Sodium, Total, ICAP	mg/l			170	98	64
Sulfate	mg/l	500		6	ND	13
Surfactants	mg/l			ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND
Total Organic Carbon	mg/l			2.4	2.7	ND
Carbon Dioxide	mg/l			4.71	0.854	1.19
General Physical						
Apparent Color	ACU	15	s	**25**	**35**	5
Lab pH	Units			8.2	8.7	8.4
Odor	TON	3	s	**200**	**40**	**17**
pH of CaCO3 saturation(25C)	Units	1600	s	7.759	8.24	7.929
pH of CaCO3 saturation(60C)	Units	5	s	**7.3**	**7.8**	**7.5**
Specific Conductance	umho/cm			809	523	414
Metals						
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	23
Barium, Total, ICAP/MS	ug/l	1000	p	16	5.9	73
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	2.2	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND
Volatile Organic Compounds						
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND
Toluene	ug/l	150		ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND
MTBE	ug/l			ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Pico #1	Pico #1	Pico #1	Pico #1	Pico #1	Pico #1
				Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
				06/03/03	09/30/03	06/03/03	09/30/03	06/03/03	09/30/03
General Minerals									
Total Dissolved Solid (TDS)	mg/l	1000	s	320	360	630	600	620	610
Cation Sum	meq/l			5.4	5.98	9.95	9.76	9.77	9.68
Anion Sum	meq/l			5.38	5	11.3	9.73	10.3	9.89
Iron, Total, ICAP	mg/l	0.3	s	0.26	0.29	**0.39**	**0.4**	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	32	34	22	21	3.2	2.2
Turbidity	NTU			1.6	2	3.9	3.3	0.15	0.1
Alkalinity	mg/l			167	136	176	186	198	191
Boron	mg/l			0.07	0.073	0.26	0.2	0.21	0.21
Bicarbonate as HCO3,calculated	mg/l			203	166	215	227	241	233
Calcium, Total, ICAP	mg/l			66	75	94	100	100	100
Carbonate as CO3, Calculated	mg/l			0.661	0.681	0.221	0.466	0.393	0.603
Hardness (Total, as CaCO3)	mg/l			218	245	321	340	336	332
Chloride	mg/l	500	s	20	24	120	87	88	94
Fluoride	mg/l	2	p	0.3	0.3	0.22	0.26	0.27	0.29
Hydroxide as OH, Calculated	mg/l			0.009	0.01	0.003	0.005	0.004	0.007
Langelier Index - 25 degree	None			0.38	0.45	0.061	0.41	0.34	0.52
Magnesium, Total, ICAP	mg/l			13	14	21	22	21	20
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	1.2	1
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3	3.1	5.1	4.8	5	4.9
Sodium, Total, ICAP	mg/l			22	23	78	65	67	67
Sulfate	mg/l	500		70	76	210	170	180	160
Surfactants	mg/l			ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	1.2	1
Total Organic Carbon	mg/l			ND	ND	0.8	ND	0.6	0.9
Carbon Dioxide	mg/l			8.1	5.26	27.1	14.4	19.2	11.7
General Physical									
Apparent Color	ACU	15	s	5	10	10	10	3	5
Lab pH	Units			7.7	7.8	7.2	7.5	7.4	7.6
Odor	TON	3	s	1	1	2	2	2	1
pH of CaCO3 saturation(25C)	Units	1600	s	7.318	7.35	7.139	7.089	7.063	7.078
pH of CaCO3 saturation(60C)	Units	5	s	**6.9**	**6.9**	**6.7**	**6.6**	**6.6**	**6.6**
Specific Conductance	umho/cm			528	552	1020	956	993	963
Metals									
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	3.7	3.2
Barium, Total, ICAP/MS	ug/l	1000	p	80	93	61	55	69	63
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l								
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	5	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds									
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Pico #2 Zone 1 05/14/03	Pico #2 Zone 1 09/24/03	Pico #2 Zone 2 05/14/03	Pico #2 Zone 2 09/24/03	Pico #2 Zone 3 05/14/03	Pico #2 Zone 3 09/24/03	Pico #2 Zone 4 05/14/03	Pico #2 Zone 4 09/24/03	Pico #2 Zone 5 05/14/03	Pico #2 Zone 5 09/24/03	Pico #2 Zone 6 05/14/03	Pico #2 Zone 6 09/24/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	500	510	570	580	520	540	510	530	510	550	450	410
Cation Sum	meq/l			8.16	8.23	9.55	9.42	8.48	8.49	8.45	8.3	8.47	8.52	7.57	6.67
Anion Sum	meq/l			7.99	8	9.56	9.26	8.61	8.55	8.28	8.24	8.14	8.38	7.56	6.72
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	18	4.6	ND	ND	ND	ND	8.7	13	28	34	**740**	**780**
Turbidity	NTU			0.6	1	0.25	4.2	0.5	0.45	0.35	0.5	0.1	0.8	0.1	1.4
Alkalinity	mg/l			192	197	229	226	198	197	157	142	141	141	159	141
Boron	mg/l			0.12	0.087	0.11	0.12	0.13	0.12	0.25	0.23	0.24	0.24	0.25	0.25
Bicarbonate as HCO3,calculated	mg/l			234	240	279	275	241	240	191	173	172	172	194	172
Calcium, Total, ICAP	mg/l			89	95	120	120	100	100	71	69	68	68	48	44
Carbonate as CO3, Calculated	mg/l			0.605	0.782	0.909	1.13	0.785	0.782	0.494	0.356	0.445	0.281	0.502	0.353
Hardness (Total, as CaCO3)	mg/l			309	328	402	398	336	336	247	242	244	248	182	168
Chloride	mg/l	500	s	51	48	65	64	60	59	86	96	93	100	92	81.4
Fluoride	mg/l	2	p	0.29	0.29	0.26	0.26	0.32	0.32	0.36	0.27	0.33	0.33	0.42	0.41
Hydroxide as OH, Calculated	mg/l			0.007	0.009	0.009	0.01	0.009	0.009	0.007	0.005	0.007	0.004	0.007	0.005
Langelier Index - 25 degree	None			0.47	0.61	0.78	0.87	0.64	0.63	0.29	0.13	0.22	0.023	0.12	-0.059
Magnesium, Total, ICAP	mg/l			21	22	25	24	21	21	17	17	18	19	15	14
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	2.7	2.7	3	3	3.2	3.1	2.7	2.5	2.5	3.1	1.6	1.3
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.21	ND
Potassium, Total, ICAP	mg/l			5.9	5.9	3.9	3.9	4	4.1	4.2	4.2	4.5	4.8	6.1	5.5
Sodium, Total, ICAP	mg/l			42	35	32	31	38	38	78	77	80	79	87	73
Sulfate	mg/l	500		120	120	140	130	130	130	120	120	120	120	79	71.6
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.086	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		2.7	2.7	3	3	3.2	3.1	2.7	2.5	2.5	3.1	1.81	1.3
Total Organic Carbon	mg/l			0.7	ND	ND	0.7	ND	ND	0.8	1.3	1.2	1.1	1.8	1.7
Carbon Dioxide	mg/l			11.8	9.58	11.1	8.72	9.62	9.58	9.6	10.9	8.64	13.7	9.75	10.9
General Physical															
Apparent Color	ACU	15	s	5	5	3	3	3	5	3	5	5	5	5	10
Lab pH	Units			7.6	7.7	7.7	7.8	7.7	7.7	7.6	7.5	7.6	7.4	7.6	7.5
Odor	TON	3	s	1	1	1	1	1	1	1	1	1	2	2	2
pH of CaCO3 saturation(25C)	Units	1600	s	7.126	7.087	6.92	6.926	7.063	7.065	7.313	7.368	7.377	7.377	7.476	7.566
pH of CaCO3 saturation(60C)	Units	5	s	**6.7**	**6.6**	**6.5**	**6.5**	**6.6**	**6.6**	**6.9**	**6.9**	**6.9**	**6.9**	**7**	**7.1**
Specific Conductance	umho/cm			776	777	885	885	822	819	827	846	825	858	766	686
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	3.8	4.3	3.1	1.5	2.2	ND	2.4	2.6	1.4	1.2	25	21
Barium, Total, ICAP/MS	ug/l	1000	p	140	120	140	120	160	130	69	59	95	86	130	110
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	1.5	1.8	ND	1.3	1.5	1.8	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	3.5	ND	ND	ND	ND	ND	ND	ND	ND	2.4	8.3	6.6
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	6	5.7
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	0.5	ND	2.5	2.6	10	11	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Rio Hondo #1 Zone 1 12/13/02	Rio Hondo #1 Zone 1 09/24/03	Rio Hondo #1 Zone 2 12/13/02	Rio Hondo #1 Zone 2 09/24/03	Rio Hondo #1 Zone 3 12/13/02	Rio Hondo #1 Zone 3 09/24/03	Rio Hondo #1 Zone 4 12/13/02	Rio Hondo #1 Zone 4 09/24/03	Rio Hondo #1 Zone 5 12/13/02	Rio Hondo #1 Zone 5 09/24/03	Rio Hondo #1 Zone 6 12/13/02	Rio Hondo #1 Zone 6 09/24/03
General Minerals															
Total Dissolved Solid (TDS)	mg/l	1000	s	270	270	480	480	440	450	480	460	410	390	420	420
Cation Sum	meq/l			4.56	4.51	7.75	7.74	7.26	7.23	7.65	7.58	6.67	6.41	6.82	7.22
Anion Sum	meq/l			4.44	4.38	7.84	7.5	7.23	6.9	7.48	7.34	6.74	6.07	7.04	6.8
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	36	32	**53**	**51**	2.2	2.2	ND	ND	9	ND	ND	ND
Turbidity	NTU			0.3	0.5	0.35	0.35	0.2	0.15	0.5	0.15	0.4	1.7	0.7	1.2
Alkalinity	mg/l			146	145	168	167	156	157	148	147	131	119	107	120
Boron	mg/l			0.055	0.063	ND	ND	0.14	0.15	0.18	0.2	0.15	0.16	0.16	0.16
Bicarbonate as HCO3,calculated	mg/l			178	176	205	203	190	191	180	179	160	145	130	146
Calcium, Total, ICAP	mg/l			42	40	100	100	82	78	72	70	64	58	60	62
Carbonate as CO3, Calculated	mg/l			1.46	1.44	0.841	0.832	0.779	0.622	0.586	0.463	0.414	0.298	0.169	0.189
Hardness (Total, as CaCO3)	mg/l			139	135	324	324	262	257	233	232	213	198	216	225
Chloride	mg/l	500	s	18	18	55	51	58	53	71	67	65	60	87	79
Fluoride	mg/l	2	p	0.24	0.24	0.2	0.2	0.3	0.3	0.4	0.39	0.31	0.32	0.27	0.27
Hydroxide as OH, Calculated	mg/l			0.02	0.02	0.01	0.01	0.01	0.009	0.009	0.007	0.007	0.005	0.003	0.003
Langelier Index - 25 degree	None			0.53	0.5	0.67	0.66	0.55	0.43	0.37	0.25	0.16	-0.009	-0.19	-0.09
Magnesium, Total, ICAP	mg/l			8.3	8.5	18	18	14	15	13	14	13	13	16	17
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	2.4	2.3	2.9	2.8	2.6	2.6	3.13	2.8
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			3	2.8	3.8	3.5	3.7	3.6	4.2	3.9	3.9	3.7	4.4	4.4
Sodium, Total, ICAP	mg/l			39	40	27	27	44	46	66	65	53	54	55	60
Sulfate	mg/l	500		48	46	140	130	110	100	110	110	100	86	106	94
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	2.4	2.3	2.9	2.8	2.6	2.6	3.13	2.8
Total Organic Carbon	mg/l			ND	ND	0.6	ND	ND	0.7	0.7	0.9	0.7	0.6	0.5	0.7
Carbon Dioxide	mg/l			2.83	2.8	6.5	6.43	6.02	7.62	7.18	8.99	8.04	9.17	13	14.6
General Physical															
Apparent Color	ACU	15	s	5	5	5	3	3	3	3	3	5	3	5	5
Lab pH	Units			8.1	8.1	7.8	7.8	7.8	7.7	7.7	7.6	7.6	7.5	7.3	7.3
Odor	TON	3	s	1	1	1	1	1	1	2	1	1	1	1	1
pH of CaCO3 saturation(25C)	Units	1600	s	7.571	7.597	7.133	7.138	7.252	7.272	7.332	7.347	7.435	7.52	7.553	7.488
pH of CaCO3 saturation(60C)	Units	5	s	**7.1**	**7.2**	**6.7**	**6.7**	**6.8**	**6.8**	**6.9**	**6.9**	**7**	**7.1**	**7.1**	**7**
Specific Conductance	umho/cm			388	428	675	728	623	689	678	728	676	630	692	703
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	1.3	1.1	2.7	2.5	3.2	2.9	ND	2	1.4	1.4
Barium, Total, ICAP/MS	ug/l	1000	p	18	21	56	66	120	120	62	63	56	63	81	76
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	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
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	South Gate #1 Zone 1 05/22/03	South Gate #1 Zone 1 09/30/03	South Gate #1 Zone 2 05/22/03	South Gate #1 Zone 2 09/30/03	South Gate #1 Zone 3 05/22/03	South Gate #1 Zone 3 09/30/03	South Gate #1 Zone 4 05/22/03	South Gate #1 Zone 4 09/30/03	South Gate #1 Zone 5 05/22/03	South Gate #1 Zone 5 09/30/03
General Minerals													
Total Dissolved Solid (TDS)	mg/l	1000	s	310	310	410	420	420	420	470	470	510	520
Cation Sum	meq/l			5.02	5.2	6.52	6.76	6.61	7.03	7.21	7.73	7.84	8.58
Anion Sum	meq/l			5.13	4.55	6.61	6.11	6.77	6.47	7.62	6.98	8.45	8.16
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**71**	**69**	ND	ND	ND	ND	2.9	3.2	**120**	**100**
Turbidity	NTU			0.15	0.3	0.3	0.45	0.2	0.35	0.1	0.1	0.4	0.2
Alkalinity	mg/l			168	139	146	123	163	151	178	146	197	170
Boron	mg/l			0.096	0.12	0.12	0.14	0.11	0.12	0.17	0.17	0.13	0.14
Bicarbonate as HCO3,calculated	mg/l			204	169	178	150	199	184	217	178	240	207
Calcium, Total, ICAP	mg/l			48	50	70	73	73	78	78	84	80	88
Carbonate as CO3, Calculated	mg/l			1.67	1.74	0.73	0.774	0.816	1.2	0.707	0.73	0.621	1.07
Hardness (Total, as CaCO3)	mg/l			152	159	232	240	244	261	256	276	286	314
Chloride	mg/l	500	s	21	21	50	49	44	42	51	51	89	95
Fluoride	mg/l	2	p	0.29	0.29	0.3	0.3	0.36	0.37	0.35	0.36	0.41	0.42
Hydroxide as OH, Calculated	mg/l			0.02	0.03	0.01	0.01	0.01	0.02	0.009	0.01	0.007	0.01
Langelier Index - 25 degree	None			0.65	0.68	0.45	0.49	0.52	0.71	0.48	0.53	0.44	0.72
Magnesium, Total, ICAP	mg/l			7.9	8.3	14	14	15	16	15	16	21	23
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	2.5	2.42	2.4	2.3	1.5	1.46	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.4	2.5	3.2	3.3	2.7	3	3	3.2	2.5	2.8
Sodium, Total, ICAP	mg/l			44	45	41	43	38	40	46	49	47	51
Sulfate	mg/l	500		56	56	100	100	100	100	120	120	95	99
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	2.5	2.42	2.4	2.3	1.5	1.46	ND	ND
Total Organic Carbon	mg/l			ND	0.6	ND	ND	ND	ND	ND	ND	0.6	ND
Carbon Dioxide	mg/l			3.24	2.13	5.64	3.78	6.31	3.68	8.66	5.64	12.1	5.21
General Physical													
Apparent Color	ACU	15	s	5	5	3	3	3	5	3	3	5	3
Lab pH	Units			8.1	8.2	7.8	7.9	7.8	8	7.7	7.8	7.6	7.9
Odor	TON	3	s	1	2	2	1	1	1	2	2	1	2
pH of CaCO3 saturation(25C)	Units	1600	s	7.454	7.518	7.349	7.406	7.283	7.288	7.216	7.27	7.162	7.185
pH of CaCO3 saturation(60C)	Units	5	s	**7**	**7.1**	**6.9**	**7**	**6.8**	**6.8**	**6.8**	**6.8**	**6.7**	**6.7**
Specific Conductance	umho/cm			505	513	667	677	680	687	747	759	838	855
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.9	2.4	2.4	3	2.7	3.5	1.7	2.4	2.2	3.1
Barium, Total, ICAP/MS	ug/l	1000	p	120	95	99	73	150	120	74	62	210	160
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	1.2	1.3	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	8.4	ND	ND	ND	ND	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	1.3	1.5	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	0.8	0.9	9	9.1	ND	0.6
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Whittier #1	Whittier #1	Whittier #1	Whittier #1	Whittier #1	Whittier #1	Whittier #1	Whittier #1	Whittier #1	Whittier #1
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4	Zone 5	Zone 5
				04/23/03	09/26/03	04/23/03	09/26/03	04/23/03	09/26/03	04/23/03	09/26/03	04/23/03	09/26/03
General Minerals													
Total Dissolved Solid (TDS)	mg/l	1000	s	**2730**	**2750**	**2540**	**2610**	**1680**	**1710**	700	700	685	700
Cation Sum	meq/l			40.5	40.5	37.9	39.2	25.9	25.9	11.4	11.8	11.2	11.4
Anion Sum	meq/l			42.5	40.3	39.4	39.6	27	26	11.7	11.4	11.3	11
Iron, Total, ICAP	mg/l	0.3	s	**0.55**	**0.53**	**0.46**	**0.43**	0.24	0.22	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**120**	**100**	**145**	**110**	**135**	**170**	21	23	18	17
Turbidity	NTU			3.4	2.5	2.5	2.1	1.4	3.2	0.15	0.15	1.7	2.3
Alkalinity	mg/l			270	266	292	288	299	296	267	263	241	238
Boron	mg/l			0.9	0.91	0.95	0.99	0.64	0.65	0.21	0.2	0.17	0.16
Bicarbonate as HCO3,calculated	mg/l			329	324	356	351	364	361	325	320	294	290
Calcium, Total, ICAP	mg/l			200	190	190	190	150	150	80	79	80	81
Carbonate as CO3, Calculated	mg/l			0.537	1.33	0.581	1.44	0.942	1.48	0.668	1.31	1.21	0.75
Hardness (Total, as CaCO3)	mg/l			1030	1010	968	1010	720	720	348	346	364	367
Chloride	mg/l	500	s	280	280	230	240	190	180	76	74	84	82
Fluoride	mg/l	2	p	0.27	0.28	0.27	0.29	0.5	0.51	0.18	0.18	0.31	0.3
Hydroxide as OH, Calculated	mg/l			0.004	0.01	0.004	0.01	0.007	0.01	0.005	0.01	0.01	0.007
Langelier Index - 25 degree	None			0.77	1.1	0.79	1.2	0.89	1.1	0.47	0.76	0.73	0.53
Magnesium, Total, ICAP	mg/l			130	130	120	130	84	84	36	36	40	40
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	4	3.9	4.9	4.8
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			11	11	10	10	6.8	6.8	4.1	4.1	3.5	3.5
Sodium, Total, ICAP	mg/l			450	460	420	430	260	260	100	110	88	91
Sulfate	mg/l	500		**1400**	**1300**	**1300**	**1300**	**750**	**720**	190	180	180	170
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	4	3.9	4.9	4.8
Total Organic Carbon	mg/l			2.7	2	3.1	2.4	1.3	1.4	ND	ND	ND	ND
Carbon Dioxide	mg/l			26.2	10.3	28.3	11.1	18.3	11.4	20.6	10.1	9.32	14.6
General Physical													
Apparent Color	ACU	15	s	**15**	**15**	**15**	**15**	10	10	3	3	3	5
Lab pH	Units			7.4	7.8	7.4	7.8	7.6	7.8	7.5	7.8	7.8	7.6
Odor	TON	3	s	1	1	**4**	1	1	1	1	1	1	1
pH of CaCO3 saturation(25C)	Units	1600	s	6.627	6.656	6.615	6.621	6.708	6.711	7.03	7.042	7.074	7.074
pH of CaCO3 saturation(60C)	Units	5	s	**6.2**	**6.2**	**6.2**	**6.2**	**6.3**	**6.3**	**6.6**	**6.6**	**6.6**	**6.6**
Specific Conductance	umho/cm			3540	3420	3330	3240	2320	2220	1100	1070	1060	1040
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.7	1.3	1.9	1.2	1.3	1.8	2	1.3	1.5	1.4
Barium, Total, ICAP/MS	ug/l	1000	p	21	21	23	21	24	24	33	33	29	27
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	ND	ND	3.4	3.8
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	5.7	ND	5.5	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	13	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.2
CENTRAL BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Willow-brook #1 Zone 1 11/13/02	Willow-brook #1 Zone 1 09/09/03	Willow-brook #1 Zone 2 11/13/02	Willow-brook #1 Zone 2 09/09/03	Willow-brook #1 Zone 3 11/13/02	Willow-brook #1 Zone 3 09/09/03	Willow-brook #1 Zone 4 11/13/02	Willow-brook #1 Zone 4 09/09/03
General Minerals											
Total Dissolved Solid (TDS)	mg/l	1000	s	320	360	330	340	320	350	330	350
Cation Sum	meq/l			5.75	6.07	5.65	5.42	5.81	5.7	5.86	5.21
Anion Sum	meq/l			5.6	5.96	5.38	5.38	5.62	5.53	5.66	5.6
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	**0.67**
Manganese, Total, ICAP/MS	ug/l	50	s	**55**	44	48	**54**	32	34	**85**	**96**
Turbidity	NTU			0.2	0.3	0.2	0.2	0.25	0.25	8.3	12
Alkalinity	mg/l			179	234	166	167	179	178	180	179
Boron	mg/l			0.13	0.2	0.12	0.12	0.12	0.13	0.12	0.12
Bicarbonate as HCO3,calculated	mg/l			217	285	202	203	218	217	219	218
Calcium, Total, ICAP	mg/l			53	42	57	54	58	56	59	52
Carbonate as CO3, Calculated	mg/l			2.24	2.33	2.08	2.09	1.13	1.41	1.42	1.42
Hardness (Total, as CaCO3)	mg/l			173	143	183	176	194	193	188	170
Chloride	mg/l	500	s	20	16	20	20	20	19	22	22
Fluoride	mg/l	2	p	0.29	0.26	0.27	0.29	0.39	0.41	0.35	0.37
Hydroxide as OH, Calculated	mg/l			0.03	0.02	0.03	0.03	0.01	0.02	0.02	0.02
Langelier Index - 25 degree	None			0.82	0.73	0.82	0.79	0.56	0.64	0.67	0.61
Magnesium, Total, ICAP	mg/l			10	9.3	9.9	10	12	13	10	9.7
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			4.1	4.7	2.9	2.8	3.7	3.4	3.4	2.9
Sodium, Total, ICAP	mg/l			50	71	44	42	42	40	46	40
Sulfate	mg/l	500		69	39	71	70	70	68	68	66
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l	10		ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			0.5	2.2	ND	ND	ND	ND	ND	ND
Carbon Dioxide	mg/l			2.74	4.53	2.55	2.56	5.49	4.34	4.38	4.36
General Physical											
Apparent Color	ACU	15	s	5	**15**	3	5	3	5	5	5
Lab pH	Units			8.2	8.1	8.2	8.2	7.9	8	8	8
Odor	TON	3	s	**4**	**3**	1	2	**3**	2	**3**	**3**
pH of CaCO3 saturation(25C)	Units	1600	s	7.384	7.367	7.384	7.405	7.343	7.36	7.334	7.391
pH of CaCO3 saturation(60C)	Units	5	s	**6.9**	**6.9**	**6.9**	**7**	**6.9**	**6.9**	**6.9**	**6.9**
Specific Conductance	umho/cm			541	563	520	511	536	528	542	534
Metals											
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	530
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	8.3	9.3	ND	ND	3.8	3.8	6.3	4
Barium, Total, ICAP/MS	ug/l	1000	p	67	54	49	50	71	72	120	130
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	2	ND	1	ND	1.1	ND	2
Hexavalent Chromium (Cr VI)	mg/l										
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds											
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750		ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5		ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150		ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Carson #1	Carson #1	Carson #1	Carson #1	Carson #1	Carson #1	Carson #1	Carson #1
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
				11/04/02	06/23/03	11/04/02	06/23/03	11/04/02	06/23/03	11/04/02	06/23/03
Total Dissolved Solid (TDS)	mg/l	1000	s	200	200	230	220	310	320	430	420
Cation Sum	meq/l			3.61	3.44	4.21	4.04	5.49	5.26	7.59	6.99
Anion Sum	meq/l			3.54	3.49	4.08	4.03	5.2	5.23	7.16	6.95
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	28	29	21	22	34	34	**90**	**98**
Turbidity	NTU			3	1.2	0.5	0.2	0.1	0.25	1.1	10
Alkalinity	mg/l			148	147	174	173	168	167	209	202
Boron	mg/l			0.088	0.11	0.099	0.13	0.1	0.13	0.11	0.15
Bicarbonate as HCO3,calculated	mg/l			180	178	211	210	204	203	254	246
Calcium, Total, ICAP	mg/l			21	20	33	32	46	44	66	60
Carbonate as CO3, Calculated	mg/l			2.33	2.91	2.74	2.72	2.1	2.63	2.62	2.01
Hardness (Total, as CaCO3)	mg/l			70.5	68.4	112	110	168	163	235	216
Chloride	mg/l	500	s	20	19	21	20	21	22	45	44
Fluoride	mg/l	2	p	0.23	0.24	0.19	0.19	0.27	0.28	0.38	0.38
Hydroxide as OH, Calculated	mg/l			0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.02
Langelier Index - 25 degree	None			0.43	0.51	0.7	0.68	0.73	0.81	0.98	0.82
Magnesium, Total, ICAP	mg/l			4.4	4.5	7.2	7.3	13	13	17	16
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			2.7	2.7	2.2	2.3	2.8	3	4.3	4.2
Sodium, Total, ICAP	mg/l			49	46	44	41	47	44	64	59
Sulfate	mg/l	500	s	ND	ND	ND	ND	59	60	81	79
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			0.9	0.8	0.6	ND	ND	ND	0.6	ND
Carbon Dioxide	mg/l			1.8	1.42	2.12	2.1	2.57	2.03	3.21	3.91
General Physical											
Apparent Color	ACU	15	s	10	10	5	10	3	5	3	10
Lab pH	Units			8.3	8.4	8.3	8.3	8.2	8.3	8.2	8.1
Odor	TON	3	s	2	**4**	2	**8**	1	**3**	1	**3**
pH of CaCO3 saturation(25C)	Units	1600	s	7.868	7.894	7.602	7.618	7.473	7.494	7.221	7.276
pH of CaCO3 saturation(60C)	Units	5	s	**7.4**	**7.4**	**7.2**	**7.2**	**7**	**7.1**	**6.8**	**6.8**
Specific Conductance	umho/cn			341	332	384	379	511	500	706	662
Metals											
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1	ND	ND	ND	ND	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	17	17	36	37	66	71	220	240
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l										
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds											
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Carson #2	Carson #2	Carson #2	Carson #2	Carson #2
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				06/17/03	06/17/03	06/17/03	06/17/03	06/17/03
Total Dissolved Solid (TDS)	mg/l	1000	s	240	260	260	280	270
Cation Sum	meq/l			3.34	4.51	4.45	4.8	4.76
Anion Sum	meq/l			3.86	4.51	4.45	4.84	4.59
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	3.2	20	29	31	**52**
Turbidity	NTU			2.1	0.5	0.15	1.8	16
Alkalinity	mg/l			167	191	185	212	184
Boron	mg/l			0.14	0.15	0.14	0.13	0.13
Bicarbonate as HCO3,calculated	mg/l			199	231	224	258	224
Calcium, Total, ICAP	mg/l			1.9	12	22	36	36
Carbonate as CO3, Calculated	mg/l			10.3	5.98	3.66	2.66	1.83
Hardness (Total, as CaCO3)	mg/l			ND	48.5	86.6	127	127
Chloride	mg/l	500	s	18	21	21	21	20
Fluoride	mg/l	2	p	0.3	0.22	0.28	0.23	0.28
Hydroxide as OH, Calculated	mg/l			0.1	0.07	0.04	0.03	0.02
Langelier Index - 25 degree	None			0.033	0.6	0.65	0.72	0.56
Magnesium, Total, ICAP	mg/l			0.4	4.5	7.7	9	9
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			1.6	4.1	4.3	3.5	3.6
Sodium, Total, ICAP	mg/l			73	79	60	50	49
Sulfate	mg/l	500	s	ND	4.2	6.8	ND	16
Surfactants	mg/l			ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			2	1	0.9	1	0.7
Carbon Dioxide	mg/l			0.501	1.16	1.78	3.26	3.56
General Physical								
Apparent Color	ACU	15	s	**25**	**15**	10	5	5
Lab pH	Units			8.9	8.6	8.4	8.2	8.1
Odor	TON	3	s	**17**	**17**	**17**	**17**	**17**
pH of CaCO3 saturation(25C)	Units	1600	s	8.867	8.002	7.752	7.477	7.538
pH of CaCO3 saturation(60C)	Units	5	s	**8.4**	**7.6**	**7.3**	**7**	**7.1**
Specific Conductance	umho/cm			378	435	426	461	455
Metals								
Aluminum, Total, ICAP/MS	ug/l	1000	s	28	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	1.7
Barium, Total, ICAP/MS	ug/l	1000	p	ND	5.9	9.4	15	11
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	9.1	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	1.1
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	1.5
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Chandler #3a	Chandler #3b	Chandler #3b
				Zone 2	Zone 1	Zone 1
				08/07/03	10/17/02	08/07/03
Total Dissolved Solid (TDS)	mg/l	1000	s	**1080**	590	590
Cation Sum	meq/l			16.8	10.4	10.1
Anion Sum	meq/l			16.4	10.3	10.4
Iron, Total, ICAP	mg/l	0.3	s	ND	0.24	0.21
Manganese, Total, ICAP/MS	ug/l	50	s	**54**	**78**	**87**
Turbidity	NTU			294	0.9	
Alkalinity	mg/l			380	322	325
Boron	mg/l			0.35	0.18	0.18
Bicarbonate as HCO3,calculated	mg/l			463	391	396
Calcium, Total, ICAP	mg/l			150	69	69
Carbonate as CO3, Calculated	mg/l			1.2	4.03	1.29
Hardness (Total, as CaCO3)	mg/l			531	254	263
Chloride	mg/l	500	s	200	130	130
Fluoride	mg/l	2	p	0.22	0.24	0.25
Hydroxide as OH, Calculated	mg/l			0.007	0.03	0.009
Langelier Index - 25 degree	None			1	1.2	0.69
Magnesium, Total, ICAP	mg/l			38	20	22
Mercury	ug/l	2	p	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	21	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND
Potassium, Total, ICAP	mg/l			4.6	3	2.9
Sodium, Total, ICAP	mg/l			140	120	110
Sulfate	mg/l	500	s	78	9.1	9.8
Surfactants	mg/l			ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			21	ND	ND
Total Organic Carbon	mg/l			1	0.6	1.6
Carbon Dioxide	mg/l			23.3	4.93	15.8
General Physical						
Apparent Color	ACU	15	s	5	10	
Lab pH	Units			7.6	8.2	7.7
Odor	TON	3	s	**4**	1	
pH of CaCO3 saturation(25C)	Units	1600	s	6.603	7.014	7.008
pH of CaCO3 saturation(60C)	Units	5	s	**6.2**	**6.6**	**6.6**
Specific Conductance	umho/cm			1680	943	997
Metals						
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	5.1	3.7	4.6
Barium, Total, ICAP/MS	ug/l	1000	p	110	78	65
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	1.4	ND	1.7
Hexavalent Chromium (Cr VI)	mg/l					
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	110	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND
Volatile Organic Compounds						
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND		ND
MTBE	ug/l			ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Gardena #1	Gardena #1	Gardena #1	Gardena #1	Gardena #1	Gardena #1	Gardena #1	Gardena #1
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
				11/12/02	08/21/03	11/12/02	08/21/03	11/12/02	08/21/03	11/12/02	08/21/03
Total Dissolved Solid (TDS)	mg/l	1000	s	350	360	340	350	330	360	960	**1660**
Cation Sum	meq/l			5.67	14.7	5.66	16.5	5.39	16.3	14.2	20.6
Anion Sum	meq/l			6.19	6.13	5.51	5.47	5.44	5.55	15.3	22.9
Iron, Total, ICAP	mg/l	0.3	s	ND	**7.2**	**0.36**	**6.6**	0.12	**8.2**	**0.53**	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**75**	40	**78**	**82**	28	32	13	ND
Turbidity	NTU			36	3.9	5.2	17	2.5	13	7.7	3.8
Alkalinity	mg/l			285	282	176	181	171	179	128	182
Boron	mg/l			0.34	0.25	0.12	0.23	0.11	0.26	0.16	0.091
Bicarbonate as HCO3,calculated	mg/l			346	342	214	220	208	218	156	222
Calcium, Total, ICAP	mg/l			14	150	55	160	54	170	150	220
Carbonate as CO3, Calculated	mg/l			3.56	4.43	2.2	1.43	1.7	1.78	0.805	0.362
Hardness (Total, as CaCO3)	mg/l			68.2	564	187	617	176	634	539	812
Chloride	mg/l	500	s	17	17	22	23	23	22	400	**620**
Fluoride	mg/l	2	p	0.17	0.19	0.36	0.39	0.31	0.35	0.17	0.17
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.004
Langelier Index - 25 degree	None			0.44	1.6	0.83	1.1	0.71	1.2	0.82	0.64
Magnesium, Total, ICAP	mg/l			7.3	46	12	53	10	51	40	64
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	0.16	ND	ND	9.4	11
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			11	13	3.6	14	3.2	14	4.2	5
Sodium, Total, ICAP	mg/l			94	71	42	88	41	75	75	96
Sulfate	mg/l	500	s	ND	ND	65	56	65	64	38	48
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	0.16	ND	ND	9.4	11
Total Organic Carbon	mg/l			3.1	3.1	ND	ND	ND	0.6	1.3	ND
Carbon Dioxide	mg/l			4.37	3.43	2.7	4.4	3.3	3.46	3.93	17.7
General Physical											
Apparent Color	ACU	15	s	**20**	**25**	5	10	5	10	10	5
Lab pH	Units			8.2	8.3	8.2	8	8.1	8.1	7.9	7.4
Odor	TON	3	s	**4**	**17**	**4**	**3**	**4**	**3**	**4**	**4**
pH of CaCO3 saturation(25C)	Units	1600	s	7.76	6.735	7.374	6.898	7.395	6.876	7.076	6.756
pH of CaCO3 saturation(60C)	Units	5	s	**7.3**	**6.3**	**6.9**	**6.5**	**7**	**6.4**	**6.6**	**6.3**
Specific Conductance	umho/cn			588	562	536	510	529	520	1570	2280
Metals											
Aluminum, Total, ICAP/MS	ug/l	1000	s	1300	ND	210	ND	73	ND	400	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	19	23	3.1	ND	1.5	ND	ND	3.1
Barium, Total, ICAP/MS	ug/l	1000	p	27	16	59	53	25	26	170	260
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	6.1	2.1	4	1.2	3.6	1.2	8.3	8
Hexavalent Chromium (Cr VI)	mg/l										
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	4.3	ND	ND	ND	2.2	ND	4	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	6.9	ND	0.63	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	6.4	ND	8.1	8.8
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	17	ND	20	ND	22	ND	20	ND
Volatile Organic Compounds											
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	0.7	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	**5.8**	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Gardena #2	Gardena #2	Gardena #2	Gardena #2	Gardena #2
				Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
				05/29/03	05/29/03	05/29/03	05/29/03	05/29/03
Total Dissolved Solid (TDS)	mg/l	1000	s	350	330	330	230	330
Cation Sum	meq/l			5.67	5.18	5.1	3.94	5.19
Anion Sum	meq/l			6.18	5.44	5.28	4.15	5.47
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	43	**57**	**81**	43	**73**
Turbidity	NTU			4.6	2.1	1.9	0.25	7
Alkalinity	mg/l			290	185	181	177	198
Boron	mg/l			0.34	0.18	0.12	0.1	0.14
Bicarbonate as HCO3,calculated	mg/l			352	225	220	215	241
Calcium, Total, ICAP	mg/l			15	34	44	30	44
Carbonate as CO3, Calculated	mg/l			5.75	2.32	1.43	2.21	2.48
Hardness (Total, as CaCO3)	mg/l			61.7	130	159	111	151
Chloride	mg/l	500	s	13	22	22	21	36
Fluoride	mg/l	2	p	0.24	0.27	0.36	0.28	0.3
Hydroxide as OH, Calculated	mg/l			0.04	0.03	0.02	0.03	0.03
Langelier Index - 25 degree	None			0.68	0.64	0.54	0.56	0.78
Magnesium, Total, ICAP	mg/l			5.9	11	12	8.7	10
Mercury	ug/l	2	p	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			5.1	5.3	3.5	3	3.1
Sodium, Total, ICAP	mg/l			99	56	42	38	48
Sulfate	mg/l	500	s	ND	53	49	ND	23
Surfactants	mg/l			ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			3.7	0.7	0.5	0.6	ND
Carbon Dioxide	mg/l			2.8	2.84	4.4	2.71	3.04
General Physical								
Apparent Color	ACU	15	s	**25**	5	3	5	5
Lab pH	Units			8.4	8.2	8	8.2	8.2
Odor	TON	3	s	**8**	**4**	**8**	**4**	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	7.722	7.561	7.459	7.635	7.42
pH of CaCO3 saturation(60C)	Units	5	s	**7.3**	**7.1**	**7**	**7.2**	**7**
Specific Conductance	umho/cm			580	533	517	399	537
Metals								
Aluminum, Total, ICAP/MS	ug/l	1000	s	26	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	1
Barium, Total, ICAP/MS	ug/l	1000	p	23	16	17	61	78
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l			ND	ND	ND	ND	ND
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND
Volatile Organic Compounds								
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND
MTBE	ug/l			ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1	Haw-thorne #1
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4	Zone 5	Zone 5	Zone 6	Zone 6
				04/15/03	09/23/03	04/15/03	09/23/03	04/15/03	09/23/03	04/15/03	09/23/03	04/15/03	09/23/03	04/15/03	09/23/03
Total Dissolved Solid (TDS)	mg/l	1000	s	885	900	780	810	570	590	460	460	850	990	**2060**	**2070**
Cation Sum	meq/l			14	14.9	12.7	13.6	10.7	10.5	8.54	8.02	14.1	14.6	34.4	33.5
Anion Sum	meq/l			16	15.7	14	14	10.7	10.6	8.27	7.68	14.5	15.3	35.5	34.1
Iron, Total, ICAP	mg/l	0.3	s	0.15	0.15	0.13	0.12	0.2	0.23	0.1	ND	ND	ND	0.17	0.1
Manganese, Total, ICAP/MS	ug/l	50	s	14	14	**57**	**52**	**79**	**78**	**57**	**53**	**170**	**190**	**810**	**720**
Turbidity	NTU			5.3	0.6	4.6	0.7	1.9	0.4	1	0.35	0.9	0.4	4.1	4
Alkalinity	mg/l			731	719	637	628	471	469	342	332	220	221	322	313
Boron	mg/l			1.3	1.5	0.94	1	0.53	0.52	0.39	0.38	0.16	0.16	0.33	0.33
Bicarbonate as HCO3,calculated	mg/l			890	875	774	763	573	570	416	404	268	269	393	382
Calcium, Total, ICAP	mg/l			14	15	15	15	36	35	39	39	120	120	300	290
Carbonate as CO3, Calculated	mg/l			5.78	5.69	7.97	7.86	3.72	4.66	2.7	3.31	1.1	0.876	0.808	0.785
Hardness (Total, as CaCO3)	mg/l			88.4	91	75.3	75.8	193	182	175	172	476	481	1120	1080
Chloride	mg/l	500	s	47	47	45	47	44	43	50	50	320	340	**610**	**540**
Fluoride	mg/l	2	p	0.1	0.11	0.23	0.25	0.2	0.22	0.34	0.36	0.25	0.25	0.23	0.25
Hydroxide as OH, Calculated	mg/l			0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.009	0.005	0.005
Langelier Index - 25 degree	None			0.65	0.67	0.82	0.81	0.87	0.96	0.76	0.84	0.86	0.76	1.1	1.1
Magnesium, Total, ICAP	mg/l			13	13	9.2	9.3	25	23	19	86	43	44	91	18
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9	1.9
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			19	20	13	13	14	15	9.4	8.1	7.6	7.8	7.6	9.3
Sodium, Total, ICAP	mg/l			270	290	250	270	150	150	110	270	100	110	270	100
Sulfate	mg/l	500	s	ND	ND	ND	2.6	ND	ND	ND	ND	53	63	**560**	**580**
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	0.073	0.054	0.209	0.192
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9	1.9
Total Organic Carbon	mg/l			22	16.5	20	16.1	5	4.8	2.7	3.2	1.1	1	4.7	4
Carbon Dioxide	mg/l			17.8	17.5	9.77	9.63	11.5	9.06	8.32	6.42	8.5	10.7	24.9	24.2
General Physical															
Apparent Color	ACU	15	s	**250**	**175**	**250**	**175**	**40**	**35**	**30**	**30**	5	10	5	10
Lab pH	Units			8	8	8.2	8.2	8	8.1	8	8.1	7.8	7.7	7.5	7.5
Odor	TON	3	s	**4**	**4**	**4**	**4**	**4**	**4**	**8**	**8**	**8**	**17**	**17**	**17**
pH of CaCO3 saturation(25C)	Units	1600	s	7.349	7.327	7.38	7.386	7.131	7.145	7.235	7.259	6.938	6.936	6.373	6.401
pH of CaCO3 saturation(60C)	Units	5	s	**6.9**	**6.9**	**6.9**	**6.9**	**6.7**	**6.7**	**6.8**	**6.8**	**6.5**	**6.5**	**5.9**	**6**
Specific Conductance	umho/cm			1350	1440	1190	1280	922	985	733	777	1390	1580	3050	3070
Metals															
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1.6	ND	ND	ND	1.1	1.1	ND	ND	1.2	1.2	3.1	2.8
Barium, Total, ICAP/MS	ug/l	1000	p	32	35	28	28	36	33	32	32	140	120	59	63
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	4.1	1.2	3.8	1.6	ND	1.4	ND	ND	ND	ND	1.6	ND
Hexavalent Chromium (Cr VI)	mg/l														
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	10	ND	6.8	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			0.88	ND	0.69	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	5.3	ND	17	13
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	22	5.3	21	5.2	ND	ND	ND	ND	ND	ND	7.5	ND
Volatile Organic Compounds															
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	18
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	1
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.4	8.6
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.5	8.2
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	1.8
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Inglewood #1	Inglewood #1	Inglewood #1	Inglewood #1	Inglewood #1	Inglewood #1	Inglewood #1	Inglewood #1
				Zone 1	Zone 1	Zone 3	Zone 3	Zone 4	Zone 4	Zone 5	Zone 5
				09/30/02	08/04/03	11/17/02	09/09/03	11/17/02	09/09/03	11/17/02	09/09/03
Total Dissolved Solid (TDS)	mg/l	1000	s	**2460**	**1700**	940	950	690	730	**1130**	**1090**
Cation Sum	meq/l			40.6	25.7	15.9	15.6	12.1	12.1	19.5	17.7
Anion Sum	meq/l			46.4	29.8	16.3	16.3	12.2	12.5	20.3	17.6
Iron, Total, ICAP	mg/l	0.3	s	ND	0.22	**0.32**	**0.31**	**0.3**	**0.3**	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**56**	44	**240**	**260**	**160**	**190**	ND	ND
Turbidity	NTU			0.7	2.8	1.8	1.2	1.3	1.1	0.4	0.6
Alkalinity	mg/l			842	555	310	310	227	225	306	278
Boron	mg/l			4.5	2.1	0.39	0.41	0.19	0.2	0.28	0.27
Bicarbonate as HCO3,calculated	mg/l			1020	676	378	378	277	274	373	339
Calcium, Total, ICAP	mg/l			170	160	100	100	89	90	180	160
Carbonate as CO3, Calculated	mg/l			6.63	1.75	0.978	0.978	0.902	0.892	0.305	0.349
Hardness (Total, as CaCO3)	mg/l			655	621	414	423	383	394	684	618
Chloride	mg/l	500	s	**980**	**580**	270	270	210	220	380	320
Fluoride	mg/l	2	p	0.28	0.27	0.5	0.51	0.4	0.41	0.2	0.24
Hydroxide as OH, Calculated	mg/l			0.02	0.007	0.007	0.007	0.009	0.009	0.002	0.003
Langelier Index - 25 degree	None			1.8	1.2	0.73	0.73	0.65	0.65	0.48	0.49
Magnesium, Total, ICAP	mg/l			56	54	40	42	39	41	57	53
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	1.5	ND	ND	ND	ND	ND	10	7.2
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	0.56	ND	0.57	ND	1.1	ND
Potassium, Total, ICAP	mg/l			19	9.4	6.7	6.7	9.4	9	6.7	6.2
Sodium, Total, ICAP	mg/l			620	300	170	160	96	93	130	120
Sulfate	mg/l	500	s	87	110	120	120	83	85	130	120
Surfactants	mg/l			0.097	0.067	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			1.5	ND	0.56	ND	0.57	ND	11.1	7.2
Total Organic Carbon	mg/l			43	9.3	1.2	1	0.7	0.7	1.7	0.8
Carbon Dioxide	mg/l			20.4	34	19	19	11.1	10.9	59.3	42.8
General Physical											
Apparent Color	ACU	15	s	**120**	**60**	10	10	10	10	5	3
Lab pH	Units			8	7.6	7.6	7.6	7.7	7.7	7.1	7.2
Odor	TON	3	s	**8**	**8**	**3**	**4**	**3**	2	2	2
pH of CaCO3 saturation(25C)	Units	1600	s	6.206	6.411	6.868	6.868	7.053	7.053	6.618	6.711
pH of CaCO3 saturation(60C)	Units	5	s	**5.8**	**6**	**6.4**	**6.4**	**6.6**	**6.6**	**6.2**	**6.3**
Specific Conductance	umho/cn			4160	2850	1510	1530	1060	1210	1830	1680
Metals											
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	4.5	ND	ND	1.2	1.7	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	240	210	37	35	93	99	210	180
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	5.1	ND	ND	2.2	ND	1.4	ND	2.6
Hexavalent Chromium (Cr VI)	mg/l										
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	3	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	6.5	ND	ND	ND	ND	7.3	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	29	ND	8.5	ND	11	ND	8.5	ND
Volatile Organic Compounds											
Trichloroethylene (TCE)	ug/l	5	p	31	26	ND	ND	ND	ND	48	35
Tetrachloroethylene (PCE)	ug/l	5	p	3.4	2.5	ND	ND	ND	ND	5	3
1,1-Dichloroethylene	ug/l	6	p	2.8	2.1	ND	ND	ND	ND	5.3	3.5
cis-1,2-Dichloroethylene	ug/l	6	p	1.5	0.8	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Lomita #1	Lomita #1	Lomita #1	Lomita #1	Lomita #1	Lomita #1	Lomita #1	Lomita #1	Lomita #1	Lomita #1
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4	Zone 5	Zone 5
				11/07/02	09/10/03	11/07/02	09/10/03	11/07/02	09/10/03	11/07/02	09/10/03	11/07/02	09/10/03
Total Dissolved Solid (TDS)	mg/l	1000	s	**1520**	**1360**	**1120**	970	800	820	660	670	**1310**	**1240**
Cation Sum	meq/l			22.1	21.2	15.2	15.3	13.3	14	11.5	11.8	19	19.2
Anion Sum	meq/l			23.2	21.3	16.5	16.3	14.6	14.1	12	11.8	19.6	19.9
Iron, Total, ICAP	mg/l	0.3	s	ND	**0.34**	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**260**	**280**	**130**	**150**	**110**	**120**	**110**	**110**	**210**	**240**
Turbidity	NTU			0.35	1.8	3.8	14	2.4	3.7	1.1	1.6	0.6	0.45
Alkalinity	mg/l			253	262	248	257	283	293	239	247	243	264
Boron	mg/l			0.8	0.74	0.42	0.45	0.42	0.44	0.4	0.39	0.6	0.6
Bicarbonate as HCO3,calculated	mg/l			308	319	302	313	344	356	291	300	296	321
Calcium, Total, ICAP	mg/l			140	130	110	100	84	86	70	68	130	130
Carbonate as CO3, Calculated	mg/l			2	2.07	2.47	2.56	3.54	3.67	2.38	3.09	1.92	2.09
Hardness (Total, as CaCO3)	mg/l			502	477	369	381	304	318	257	252	477	485
Chloride	mg/l	500	s	**630**	**570**	380	370	300	280	240	230	**500**	**500**
Fluoride	mg/l	2	p	0.09	0.1	0.12	0.13	0.13	0.15	0.18	0.2	0.09	0.1
Hydroxide as OH, Calculated	mg/l			0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.03	0.02	0.02
Langelier Index - 25 degree	None			1.2	1.2	1.1	1.2	1.2	1.2	0.96	1.1	1.1	1.2
Magnesium, Total, ICAP	mg/l			37	37	30	32	23	25	20	20	37	39
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	0.54	ND
Nitrite, Nitrogen by IC	mg/l	1	p	1.5	ND	0.81	ND	0.61	ND	0.76	ND	1.1	ND
Potassium, Total, ICAP	mg/l			14	14	11	12	9.5	10	8.8	8.7	13	13
Sodium, Total, ICAP	mg/l			270	260	160	170	160	170	140	150	210	210
Sulfate	mg/l	500	s	19	ND	39	32	22	17	19	15	28	23
Surfactants	mg/l			ND	0.072	ND	ND	ND	0.056	ND	0.052	ND	0.06
Total Nitrate, Nitrite-N, CALC	mg/l			1.5	ND	0.81	ND	0.61	ND	0.76	ND	1.64	ND
Total Organic Carbon	mg/l			1.5	1.6	1.6	1.6	3.1	3	2.8	2.3	1.5	1.6
Carbon Dioxide	mg/l			6.16	6.38	4.8	4.97	4.34	4.49	4.62	3.79	5.92	6.42
General Physical													
Apparent Color	ACU	15	s	5	10	10	10	**20**	**20**	**20**	**20**	3	10
Lab pH	Units			8	8	8.1	8.1	8.2	8.2	8.1	8.2	8	8
Odor	TON	3	s	**8**	**4**	**8**	**4**	**4**	**4**	**8**	**8**	**4**	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	6.81	6.827	6.965	6.949	6.984	6.959	7.136	7.135	6.86	6.825
pH of CaCO3 saturation(60C)	Units	5	s	**6.4**	**6.4**	**6.5**	**6.5**	**6.5**	**6.5**	**6.7**	**6.7**	**6.4**	**6.4**
Specific Conductance	umho/cm			2350	2250	1610	1610	1440	1420	1190	1180	2000	2040
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	73	ND	39	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	3.8	ND	ND	ND	ND	ND	1.2	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	86	86	59	67	50	55	40	41	78	86
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	2.3	2.4	1.9	2.5	2.4	ND	2.3	ND	2.2
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	5.1	ND	ND	ND	ND	ND	ND	ND	5	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	8.2	ND	13	ND	17	ND	7.8	ND	7.5	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Long Beach #3 Zone 1 10/31/02	Long Beach #3 Zone 1 09/04/03	Long Beach #3 Zone 2 10/31/02	Long Beach #3 Zone 2 09/04/03	Long Beach #3 Zone 3 10/31/02	Long Beach #3 Zone 3 09/04/03	Long Beach #3 Zone 4 10/31/02	Long Beach #3 Zone 4 09/04/03	Long Beach #3 Zone 5 10/31/02	Long Beach #3 Zone 5 09/04/03
Total Dissolved Solid (TDS)	mg/l	1000	s	460	470	240	250	220	260	**1130**	**1240**	**1470**	**1630**
Cation Sum	meq/l			8.32	7.38	3.9	3.91	3.9	4.32	20	20.5	25.2	26.1
Anion Sum	meq/l			8.06	8.11	5.87	3.81	3.85	4.18	20	20.9	25.6	26.7
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	0.18	0.19
Manganese, Total, ICAP/MS	ug/l	50	s	17	18	13	15	12	17	**210**	**240**	**310**	**370**
Turbidity	NTU			0.6	3.4	0.5	1.4	0.3	0.3	1.8	0.8	1.2	1
Alkalinity	mg/l			378	380	241	139	155	163	141	140	140	136
Boron	mg/l			0.38	0.35	0.13	0.11	0.13	0.14	0.12	0.12	0.11	0.12
Bicarbonate as HCO3,calculated	mg/l			458	462	292	168	188	198	172	171	170	166
Calcium, Total, ICAP	mg/l			11	10	17	17	19	22	220	220	290	300
Carbonate as CO3, Calculated	mg/l			7.48	4.76	4.77	3.45	2.44	2.04	0.705	0.701	1.1	0.681
Hardness (Total, as CaCO3)	mg/l			41.9	38.6	54.8	55.6	61.4	71.8	780	796	1010	1050
Chloride	mg/l	500	s	17	17	19	19	26	32	**560**	**590**	**760**	**800**
Fluoride	mg/l	2	p	0.48	0.5	0.32	0.34	0.31	0.31	0.17	0.16	0.16	0.16
Hydroxide as OH, Calculated	mg/l			0.04	0.03	0.04	0.05	0.03	0.03	0.01	0.01	0.02	0.01
Langelier Index - 25 degree	None			0.66	0.42	0.65	0.51	0.41	0.39	0.93	0.93	1.2	1.1
Magnesium, Total, ICAP	mg/l			3.5	3.3	3	3.2	3.4	4.1	56	60	69	74
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	1.1	ND	1.5	ND
Potassium, Total, ICAP	mg/l			3.6	3.4	2.4	2.1	2.5	2.3	9.7	10	9.4	9.2
Sodium, Total, ICAP	mg/l			170	150	63	63	60	65	95	100	110	110
Sulfate	mg/l	500	s	ND	ND	24	23	ND	ND	65	68	66	68
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND	1.1	ND	1.5	ND
Total Organic Carbon	mg/l			9.3	9.2	1.5	2.1	2.3	2.9	0.8	1.1	0.9	0.9
Carbon Dioxide	mg/l			3.65	5.83	2.32	1.06	1.88	2.5	5.45	5.42	3.4	5.26
General Physical													
Apparent Color	ACU	15	s	**70**	**80**	**15**	**15**	**20**	**25**	3	3	3	5
Lab pH	Units			8.4	8.2	8.4	8.5	8.3	8.2	7.8	7.8	8	7.8
Odor	TON	3	s	**8**	**3**	**3**	**4**	**3**	**3**	**4**	**3**	**8**	**4**
pH of CaCO3 saturation(25C)	Units	1600	s	7.743	7.78	7.749	7.989	7.892	7.806	6.867	6.87	6.752	6.748
pH of CaCO3 saturation(60C)	Units	5	s	**7.3**	**7.3**	**7.3**	**7.5**	**7.4**	**7.4**	**6.4**	**6.4**	**6.3**	**6.3**
Specific Conductance	umho/cm			752	721	380	368	380	402	2060	2110	2610	2650
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	1	ND	ND	ND	ND	ND	ND	1.7	ND	1.8
Barium, Total, ICAP/MS	ug/l	1000	p	8.8	10	14	17	10	13	75	86	130	160
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	1.7	ND	ND	ND	ND	1.2	ND	ND	ND	1
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	2.6	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	7.6	5.6	10	8.5
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	5.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	PM-1 Columbia Zone 1 11/07/02	PM-1 Columbia Zone 2 11/07/02
Total Dissolved Solid (TDS)	mg/l	1000	s	300	**1980**
Cation Sum	meq/l			5.69	31.9
Anion Sum	meq/l			5.59	32.2
Iron, Total, ICAP	mg/l	0.3	s	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	**58**	49
Turbidity	NTU			0.55	16
Alkalinity	mg/l			245	164
Boron	mg/l			0.14	0.22
Bicarbonate as HCO3,calculated	mg/l			298	200
Calcium, Total, ICAP	mg/l			26	320
Carbonate as CO3, Calculated	mg/l			2.44	1.3
Hardness (Total, as CaCO3)	mg/l			127	1070
Chloride	mg/l	500	s	24	**950**
Fluoride	mg/l	2	p	0.3	0.15
Hydroxide as OH, Calculated	mg/l			0.02	0.02
Langelier Index - 25 degree	None			0.54	1.3
Magnesium, Total, ICAP	mg/l			15	99
Mercury	ug/l	2	p	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	1.9
Potassium, Total, ICAP	mg/l			9.3	14
Sodium, Total, ICAP	mg/l			67	170
Sulfate	mg/l	500	s	ND	100
Surfactants	mg/l			ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	1.9
Total Organic Carbon	mg/l			1.5	1
Carbon Dioxide	mg/l			4.73	4
General Physical					
Apparent Color	ACU	15	s	10	3
Lab pH	Units			8.1	8
Odor	TON	3	s	**4**	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	7.556	6.697
pH of CaCO3 saturation(60C)	Units	5	s	**7.1**	**6.3**
Specific Conductance	umho/cm			527	3170
Metals					
Aluminum, Total, ICAP/MS	ug/l	1000	s	44	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	28	86
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND
Hexavalent Chromium (Cr VI)	mg/l				
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	2.4
Lead, Total, ICAP/MS	ug/l			ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	7.3	7.4
Volatile Organic Compounds					
Trichloroethylene (TCE)	ug/l	5	p	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND
Isopropylbenzene	ug/l			ND	ND
n-Propylbenzene	ug/l			ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND
Toluene	ug/l	150	p	ND	ND
Dichlorodifluoromethane	ug/l				
MTBE	ug/l			ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid	PM-3 Madrid
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
				11/05/02	09/08/03	11/05/02	09/08/03	11/05/02	09/08/03	11/05/02	09/08/03
Total Dissolved Solid (TDS)	mg/l	1000	s	390	420	280	300	740	670	830	830
Cation Sum	meq/l			7.39	6.97	5.19	5.18	12.1	11	13.9	13.7
Anion Sum	meq/l			7.06	7.04	5.03	4.98	12.3	10.8	14	14.3
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	0.14	0.14	0.12	0.11	**0.36**	**0.4**
Manganese, Total, ICAP/MS	ug/l	50	s	43	40	48	46	**70**	**60**	**280**	**300**
Turbidity	NTU			3.9	2.3	0.1	0.3	3	3	3.3	2.9
Alkalinity	mg/l			320	320	200	200	219	200	199	198
Boron	mg/l			0.34	0.36	0.11	0.12	0.11	0.12	0.26	0.26
Bicarbonate as HCO3,calculated	mg/l			388	388	243	243	266	244	242	241
Calcium, Total, ICAP	mg/l			12	12	38	39	110	98	110	110
Carbonate as CO3, Calculated	mg/l			5.03	6.33	2.5	1.58	1.73	1	1.57	0.785
Hardness (Total, as CaCO3)	mg/l			70.2	71.1	144	147	406	364	402	415
Chloride	mg/l	500	s	23	22	36	34	250	240	330	340
Fluoride	mg/l	2	p	0.29	0.29	0.35	0.36	0.31	0.34	0.26	0.26
Hydroxide as OH, Calculated	mg/l			0.03	0.04	0.03	0.02	0.02	0.01	0.02	0.009
Langelier Index - 25 degree	None			0.52	0.62	0.72	0.53	1	0.73	0.98	0.68
Magnesium, Total, ICAP	mg/l			9.8	10	12	12	32	29	31	34
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	0.68	ND	0.73	ND
Potassium, Total, ICAP	mg/l			13	13	3.2	2.8	5.5	4.9	6.5	6.4
Sodium, Total, ICAP	mg/l			130	120	51	50	87	82	130	120
Sulfate	mg/l	500	s	ND	ND	ND	ND	41	ND	34	36
Surfactants	mg/l			ND	ND	ND	ND	ND	0.061	ND	0.092
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	0.68	ND	0.73	ND
Total Organic Carbon	mg/l			3.9	3.6	0.6	ND	1	1	1.1	1.2
Carbon Dioxide	mg/l			3.89	3.09	3.07	4.86	5.32	7.73	4.84	9.62
General Physical											
Apparent Color	ACU	15	s	**35**	**30**	5	5	5	5	10	10
Lab pH	Units			8.3	8.4	8.2	8	8	7.8	8	7.7
Odor	TON	3	s	**4**	**4**	2	**3**	1	**4**	**4**	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	7.777	7.777	7.48	7.468	6.979	7.066	7.02	7.022
pH of CaCO3 saturation(60C)	Units	5	s	**7.3**	**7.3**	**7**	**7**	**6.5**	**6.6**	**6.6**	**6.6**
Specific Conductance	umho/cn			661	645	485	474	1230	1090	1430	1400
Metals											
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	ND	8.8
Barium, Total, ICAP/MS	ug/l	1000	p	26	26	21	21	76	66	77	82
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	2.8	ND	1.8	ND	1.8	ND	1.9
Hexavalent Chromium (Cr VI)	mg/l										
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	11	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds											
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	1	1.1
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	25	17	6.8	2.1
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	1.8	1.4	1	1.1
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	5.8	2.4	0.5	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner	PM-4 Mariner
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4
				11/03/02	09/28/03	11/03/02	09/28/03	11/03/02	09/28/03	11/03/02	09/28/03
Total Dissolved Solid (TDS)	mg/l	1000	s	330	360	**10300**	**11700**	830	760	670	700
Cation Sum	meq/l			6.23	5.96	175	175	13.1	11.9	11.2	11.1
Anion Sum	meq/l			5.95	5.94	181	171	12.8	11.4	11.3	11
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	0.22	ND	ND	0.17	0.15
Manganese, Total, ICAP/MS	ug/l	50	s	40	45	**1200**	**1000**	**85**	**75**	**87**	**83**
Turbidity	NTU			0.3	0.15	1.3	1.3	0.85	0.65	0.6	0.3
Alkalinity	mg/l			257	258	159	155	163	169	194	194
Boron	mg/l			0.16	0.17	ND	0.19	0.32	0.35	0.24	0.25
Bicarbonate as HCO3,calculated	mg/l			312	313	194	189	198	205	236	236
Calcium, Total, ICAP	mg/l			28	27	1400	1400	100	84	82	79
Carbonate as CO3, Calculated	mg/l			4.05	4.06	0.632	0.388	1.29	2.11	1.53	2.43
Hardness (Total, as CaCO3)	mg/l			119	117	5220	5180	365	304	291	284
Chloride	mg/l	500	s	28	27	**5800**	**5500**	140	120	130	120
Fluoride	mg/l	2	p	0.32	0.34	0.11	0.12	0.24	0.27	0.25	0.28
Hydroxide as OH, Calculated	mg/l			0.03	0.03	0.009	0.005	0.02	0.03	0.02	0.03
Langelier Index - 25 degree	None			0.8	0.78	1.7	1.5	0.85	0.99	0.84	1
Magnesium, Total, ICAP	mg/l			12	12	420	410	28	23	21	21
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	12	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			7.5	7.2	44	50	7	6.8	6.6	6.5
Sodium, Total, ICAP	mg/l			84	79	1600	1600	130	130	120	120
Sulfate	mg/l	500	s	ND	ND	**670**	**630**	270	220	180	180
Surfactants	mg/l			ND	ND	ND	0.108	ND	0.058	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	12	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			1.8	1.1	1.4	0.6	1.5	1.4	1.3	0.7
Carbon Dioxide	mg/l			3.13	3.14	7.74	12	3.96	2.59	4.72	2.98
General Physical											
Apparent Color	ACU	15	s	**15**	10	5	10	5	10	5	10
Lab pH	Units			8.3	8.3	7.7	7.5	8	8.2	8	8.2
Odor	TON	3	s	**4**	1	**4**	1	**17**	1	**17**	1
pH of CaCO3 saturation(25C)	Units	1600	s	7.504	7.518	6.011	6.022	7.148	7.209	7.158	7.174
pH of CaCO3 saturation(60C)	Units	5	s	**7.1**	**7.1**	**5.6**	**5.6**	**6.7**	**6.8**	**6.7**	**6.7**
Specific Conductance	umho/cn			563	579	16080	16760	1270	1190	1100	1120
Metals											
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	12	ND	ND	ND	1.1
Barium, Total, ICAP/MS	ug/l	1000	p	23	26	260	260	110	94	53	57
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l										
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	58	42	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	2.8	3.3	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds											
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	West-chester #1	West-chester #1	West-chester #1	West-chester #1	West-chester #1	West-chester #1	West-chester #1	West-chester #1	West-chester #1	West-chester #1
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4	Zone 5	Zone 5
				12/03/02	09/18/03	12/03/02	09/18/03	12/03/02	09/18/03	12/03/02	09/18/03	12/03/02	09/18/03
Total Dissolved Solid (TDS)	mg/l	1000	s	**1070**	**1290**	730	730	610	620	590	600	570	570
Cation Sum	meq/l			16.9	21.5	12.5	12.4	10.9	10.9	10.9	10.4	10.1	9.94
Anion Sum	meq/l			19	21.9	13	13	10.9	10.8	10.4	10.5	10.3	9.92
Iron, Total, ICAP	mg/l	0.3	s	0.22	0.27	0.12	0.13	**0.33**	0.27	0.14	0.14	0.27	0.28
Manganese, Total, ICAP/MS	ug/l	50	s	**110**	**76**	**75**	**70**	**200**	**230**	**110**	**150**	**210**	**260**
Turbidity	NTU			0.4	1.9	5.4	3.3	0.65	0.4	0.5	0.3	1.2	0.55
Alkalinity	mg/l			747	911	552	550	396	413	356	358	334	323
Boron	mg/l			1.4	2.1	0.8	0.85	0.3	0.35	0.24	0.25	0.21	0.23
Bicarbonate as HCO3,calculated	mg/l			910	1110	672	669	482	503	434	436	407	394
Calcium, Total, ICAP	mg/l			39	29	31	30	53	51	77	70	68	66
Carbonate as CO3, Calculated	mg/l			4.7	7.21	4.37	4.35	1.98	2.6	1.78	2.25	1.33	1.28
Hardness (Total, as CaCO3)	mg/l			175	142	147	145	227	226	316	294	281	276
Chloride	mg/l	500	s	120	130	69	69	66	63	63	64	69	66
Fluoride	mg/l	2	p	0.24	0.25	0.23	0.25	0.26	0.27	0.23	0.25	0.29	0.32
Hydroxide as OH, Calculated	mg/l			0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.009	0.009
Langelier Index - 25 degree	None			1	1.1	0.87	0.86	0.76	0.86	0.88	0.94	0.7	0.67
Magnesium, Total, ICAP	mg/l			19	17	17	17	23	24	30	29	27	27
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium, Total, ICAP	mg/l			13	17	15	14	11	11	9.9	9.3	8	7.7
Sodium, Total, ICAP	mg/l			300	420	210	210	140	140	100	98	99	97
Sulfate	mg/l	500	s	30	ND	ND	ND	54	36	72	73	81	76
Surfactants	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon	mg/l			32	39	9	8.9	2.9	3.3	1.8	2.1	1.4	1.8
Carbon Dioxide	mg/l			22.9	22.2	13.4	13.4	15.3	12.7	13.8	11	16.2	15.7
General Physical													
Apparent Color	ACU	15	s	**350**	**500**	**70**	**70**	**20**	**20**	**15**	10	10	10
Lab pH	Units			7.9	8	8	8	7.8	7.9	7.8	7.9	7.7	7.7
Odor	TON	3	s	**4**	**8**	**4**	**8**	**8**	**17**	**4**	**3**	**4**	**8**
pH of CaCO3 saturation(25C)	Units	1600	s	6.895	6.937	7.126	7.142	7.038	7.036	6.921	6.96	7.003	7.03
pH of CaCO3 saturation(60C)	Units	5	s	**6.4**	**6.5**	**6.7**	**6.7**	**6.6**	**6.6**	**6.5**	**6.5**	**6.6**	**6.6**
Specific Conductance	umho/cm			1670	1980	1200	1180	1020	1010	968	975	940	937
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	1.6	1.5	ND	ND	1.4	ND	ND	ND	1.8
Barium, Total, ICAP/MS	ug/l	1000	p	60	53	99	100	55	57	77	76	56	59
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	4.2	2.5	2.1	ND	ND	3.3	3.1	3.3	ND	2.9
Hexavalent Chromium (Cr VI)	mg/l			0.1		ND		ND		ND		ND	
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	5.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003

Water Quality Constituent	Units	MCL	MCL Type	Wilmington #1 Zone 1 10/28/02	Wilmington #1 Zone 1 06/24/03	Wilmington #1 Zone 2 10/28/02	Wilmington #1 Zone 2 06/24/03	Wilmington #1 Zone 3 10/28/02	Wilmington #1 Zone 3 06/24/03	Wilmington #1 Zone 4 10/28/02	Wilmington #1 Zone 4 06/24/03	Wilmington #1 Zone 5 10/28/02	Wilmington #1 Zone 5 06/24/03
Total Dissolved Solid (TDS)	mg/l	1000	s	540	650	**1110**	**1240**	**1570**	**1600**	**1930**	**1870**	800	900
Cation Sum	meq/l			9.6	9.52	18.8	18.6	26.4	23.5	32.8	28.5	13.4	13.8
Anion Sum	meq/l			9.96	9.72	20.4	19.9	28.1	25.3	35.3	31.3	14.1	14
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND
Manganese, Total, ICAP/MS	ug/l	50	s	23	24	19	22	6.8	7.5	32	25	**52**	40
Turbidity	NTU			0.8	0.35	0.25	0.2	0.3	0.95	0.3	0.6	18	17
Alkalinity	mg/l			131	133	138	141	154	153	152	148	176	185
Boron	mg/l			0.11	0.12	0.2	0.21	0.24	0.25	0.2	0.24	0.19	0.21
Bicarbonate as HCO3,calculated	mg/l			159	162	168	172	187	187	185	180	214	225
Calcium, Total, ICAP	mg/l			61	58	160	160	170	150	200	150	98	100
Carbonate as CO3, Calculated	mg/l			1.3	1.33	1.09	0.705	1.53	0.384	1.2	0.738	1.39	1.16
Hardness (Total, as CaCO3)	mg/l			230	227	539	552	589	535	775	584	380	398
Chloride	mg/l	500	s	260	250	**570**	**550**	**870**	**780**	**960**	**820**	270	260
Fluoride	mg/l	2	p	0.15	0.14	0.08	0.07	0.08	0.07	0.08	0.08	0.13	0.11
Hydroxide as OH, Calculated	mg/l			0.02	0.02	0.02	0.01	0.02	0.005	0.02	0.01	0.02	0.01
Langelier Index - 25 degree	None			0.64	0.63	0.98	0.79	1.2	0.5	1.1	0.79	0.88	0.81
Magnesium, Total, ICAP	mg/l			19	20	34	37	40	39	67	51	33	36
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	0.75	ND	ND	ND	2.35	ND	2.6	ND	ND	ND
Potassium, Total, ICAP	mg/l			7.8	7.6	6.9	6.9	9	8.4	11	10	6.7	7
Sodium, Total, ICAP	mg/l			110	110	180	170	330	290	390	380	130	130
Sulfate	mg/l	500	s	ND	ND	73	77	24.1	11	250	250	140	140
Surfactants	mg/l			0.21	0.173	0.319	0.272	0.337	0.316	0.206	0.185	0.751	1.23
Total Nitrate, Nitrite-N, CALC	mg/l			0.75	ND	ND	ND	2.35	ND	2.6	ND	ND	ND
Total Organic Carbon	mg/l			3.1	3.8	4.6	4.8	6.3	6.8	3.8	3.5	8.6	9.3
Carbon Dioxide	mg/l			2.53	2.57	3.36	5.45	2.97	11.8	3.7	5.71	4.28	5.67
General Physical													
Apparent Color	ACU	15	s	10	5	10	5	**15**	10	5	5	5	5
Lab pH	Units			8.1	8.1	8	7.8	8.1	7.5	8	7.8	8	7.9
Odor	TON	3	s	**40**	**100**	**40**	**67**	**200**	**200**	**17**	**40**	**100**	**200**
pH of CaCO3 saturation(25C)	Units	1600	s	7.458	7.472	7.016	7.005	6.943	6.997	6.877	7.014	7.123	7.093
pH of CaCO3 saturation(60C)	Units	5	s	**7**	**7**	**6.6**	**6.6**	**6.5**	**6.6**	**6.4**	**6.6**	**6.7**	**6.6**
Specific Conductance	umho/cm			1050	1060	2090	2030	2890	2620	3430	3050	1390	1430
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	ND	ND	1.7	1.5
Barium, Total, ICAP/MS	ug/l	1000	p	11	11	12	12	24	26	83	71	81	78
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	5.5	ND	7.4	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	0.7	0.5
n-Propylbenzene	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

TABLE 4.3
WEST BASIN WATER QUALITY RESULTS
REGIONAL GROUNDWATER MONITORING - WATER YEAR 2002/2003
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Water Quality Constituent	Units	MCL	MCL Type	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2	Wilming-ton #2
				Zone 1	Zone 1	Zone 2	Zone 2	Zone 3	Zone 3	Zone 4	Zone 4	Zone 5	Zone 5
				10/30/02	09/02/03	10/16/02	08/05/03	10/30/02	09/02/03	10/30/02	09/02/03	10/30/02	09/02/03
Total Dissolved Solid (TDS)	mg/l	1000	s	510	520	**1430**	**1420**	450	440	**1680**	**1960**	**7920**	**7980**
Cation Sum	meq/l			8.72	7.81	23.9	20.3	7.63	6.78	29.7	29	130	123
Anion Sum	meq/l			8.58	8.64	26.1	24.3	8.14	7.66	30	31.6	142	121
Iron, Total, ICAP	mg/l	0.3	s	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese, Total, ICAP/MS	ug/l	50	s	5.5	5.5	18	14	15	12	33	27	**130**	**120**
Turbidity	NTU			1.5	3.3	1.6	0.25	0.45	1.6	1.4	1.1	1.5	7.4
Alkalinity	mg/l			373	377	473	467	223	213	273	284	196	191
Boron	mg/l			0.66	0.56	1.6	1.4	0.3	0.19	0.55	0.49	ND	0.64
Bicarbonate as HCO3,calculated	mg/l			450	453	575	568	271	259	332	346	239	233
Calcium, Total, ICAP	mg/l			3.2	2.9	35	28	29	28	130	110	530	450
Carbonate as CO3, Calculated	mg/l			12.8	18.6	5.92	4.65	2.79	3.36	3.42	1.42	0.98	0.603
Hardness (Total, as CaCO3)	mg/l			16.6	15.5	182	152	114	115	555	497	2350	1990
Chloride	mg/l	500	s	38	37	**590**	**530**	130	120	**870**	**920**	**4500**	**3800**
Fluoride	mg/l	2	p	0.98	0.98	0.34	0.37	0.25	0.23	0.29	0.28	0.2	0.18
Hydroxide as OH, Calculated	mg/l			0.07	0.1	0.03	0.02	0.03	0.03	0.03	0.01	0.01	0.007
Langelier Index - 25 degree	None			0.35	0.47	1.1	0.86	0.65	0.72	1.4	0.93	1.5	1.2
Magnesium, Total, ICAP	mg/l			2.1	2	23	20	10	11	56	54	250	210
Mercury	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-N by IC	mg/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrite, Nitrogen by IC	mg/l	1	p	ND	ND	1.5	ND	ND	ND	ND	ND	8.5	ND
Potassium, Total, ICAP	mg/l			5.1	4.4	12	11	5.5	4.9	14	13	28	30
Sodium, Total, ICAP	mg/l			190	170	460	390	120	100	420	430	1900	1900
Sulfate	mg/l	500	s	ND	ND	ND	ND	ND	ND	ND	ND	**530**	480
Surfactants	mg/l			ND	ND	ND	0.067	ND	ND	ND	0.061	ND	0.07
Total Nitrate, Nitrite-N, CALC	mg/l			ND	ND	1.5	ND	ND	ND	ND	ND	8.5	ND
Total Organic Carbon	mg/l			14	8.3	23	8	6	4.5	8.5	6.9	3.2	2.9
Carbon Dioxide	mg/l			2.06	1.44	7.26	9.02	3.42	2.6	4.19	11	7.58	11.7
General Physical													
Apparent Color	ACU	15	s	**350**	**300**	**90**	**120**	**30**	**25**	**40**	**35**	**15**	**15**
Lab pH	Units			8.64	8.8	8.2	8.1	8.2	8.3	8.2	7.8	7.8	7.6
Odor	TON	3	s	**4**	**8**	**17**	**8**	**4**	**3**	**100**	**200**	**8**	**4**
pH of CaCO3 saturation(25C)	Units	1600	s	8.287	8.327	7.141	7.243	7.55	7.585	6.81	6.865	6.342	6.424
pH of CaCO3 saturation(60C)	Units	5	s	**7.8**	**7.9**	**6.7**	**6.8**	**7.1**	**7.1**	**6.4**	**6.4**	**5.9**	**6**
Specific Conductance	umho/cm			796	808	2520	2540	803	780	3100	3380	12590	12050
Metals													
Aluminum, Total, ICAP/MS	ug/l	1000	s	ND	28	ND	ND	ND	ND	ND	ND	ND	ND
Antimony, Total, ICAP/MS	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic, Total, ICAP/MS	ug/l	50	p	ND	ND	6.2	3.4	ND	ND	ND	ND	ND	ND
Barium, Total, ICAP/MS	ug/l	1000	p	6.4	6	52	52	17	14	91	98	130	110
Beryllium, Total, ICAP/MS	ug/l	4	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total, ICAP/MS	ug/l	50	p	3.2	4.2	ND	1.4	1.8	1.5	1.7	5.5	ND	ND
Hexavalent Chromium (Cr VI)	mg/l												
Cadmium, Total, ICAP/MS	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper, Total, ICAP/MS	ug/l	1000	s	5.4	ND	ND	2.1	ND	ND	2	ND	ND	ND
Lead, Total, ICAP/MS	ug/l			1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel, Total, ICAP/MS	ug/l	100	p	16	ND	ND	ND	ND	ND	5.7	ND	ND	ND
Selenium, Total, ICAP/MS	ug/l	50	s	ND	ND	ND	ND	ND	ND	ND	15	ND	ND
Silver, Total, ICAP/MS	ug/l	100	p	ND	ND	17	ND	ND	ND	ND	ND	14	ND
Thallium, Total, ICAP/MS	ug/l	2	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc, Total, ICAP/MS	ug/l	5000	s	16	27	ND	ND	ND	ND	ND	17	58	ND
Volatile Organic Compounds													
Trichloroethylene (TCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (PCE)	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/l	6	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/l	10	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	ug/l	100	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/l	0.5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane-Freon11	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	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
m,p-Xylenes	ug/l	1750	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/l	5	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/l	150	p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/l				ND		ND		ND		ND		ND
MTBE	ug/l			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MCL: Maximum Contaminant Level, bold value indicates concentration exceeds MCL. (p): Primary MCL (s): Secondary MCL (ND): Not Detected

FIGURES

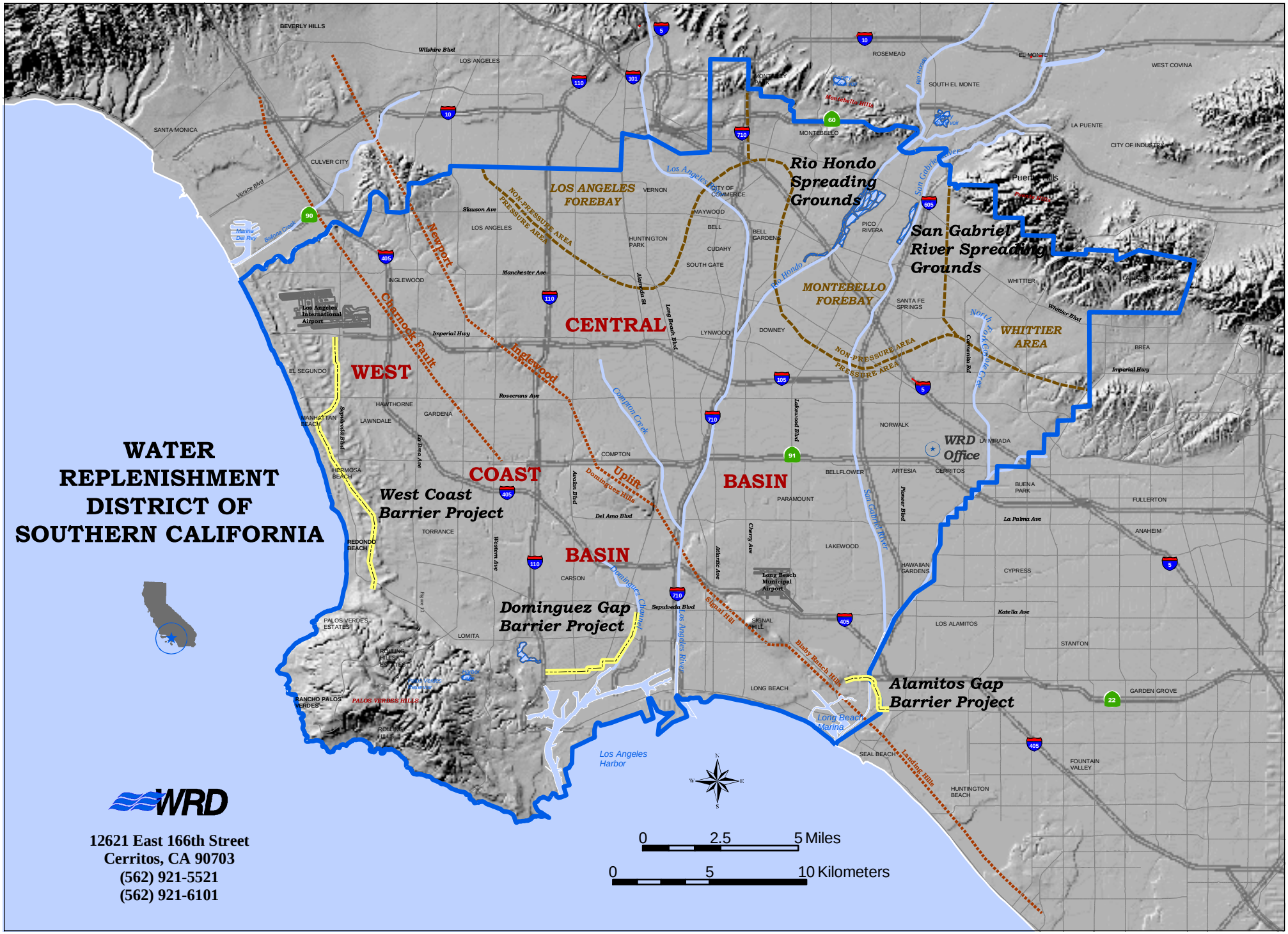
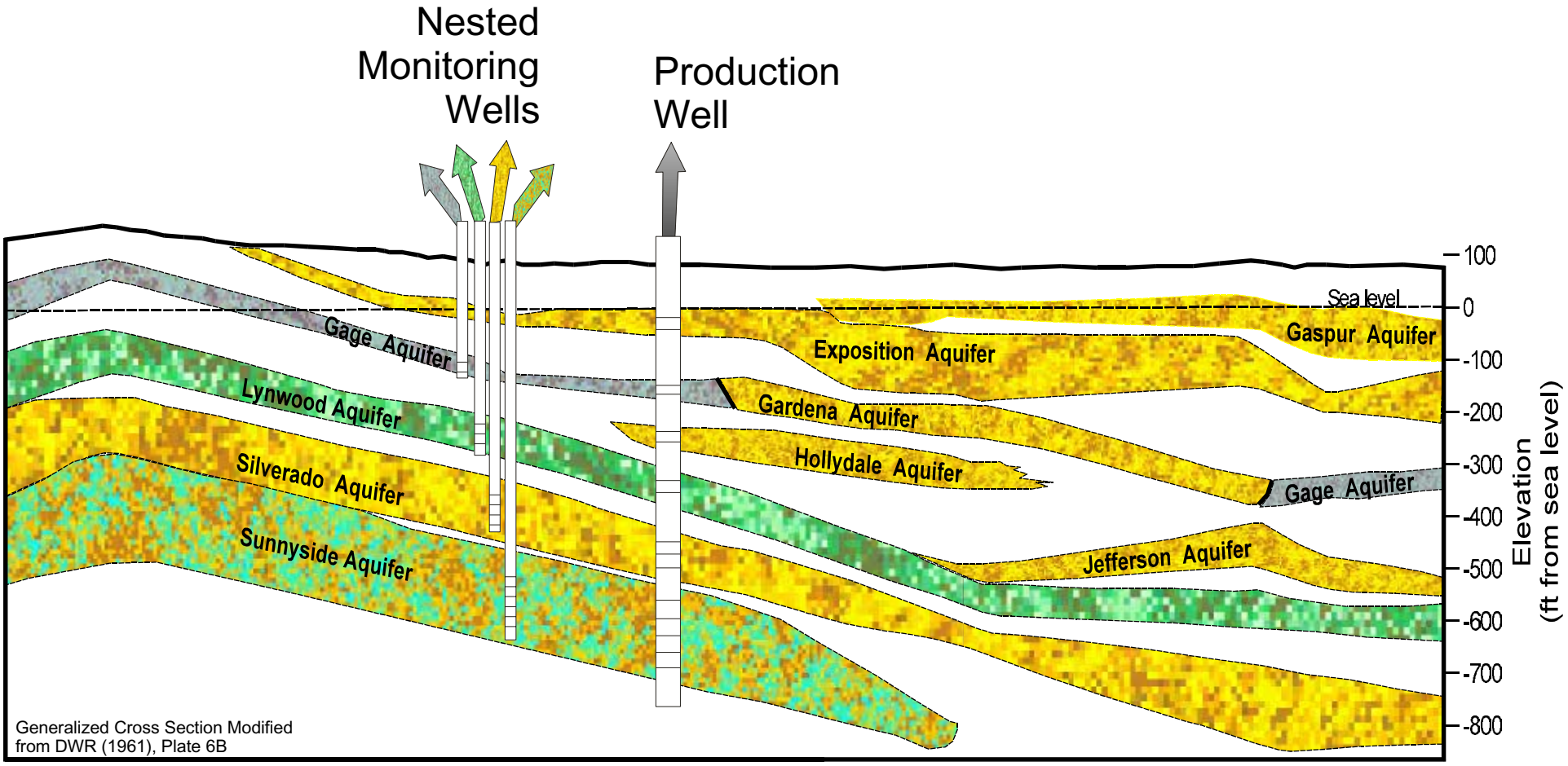

WATER REPLENISHMENT DISTRICT OF SOUTHERN CALIFORNIA
WRD
12621 East 166th Street
Cerritos, CA 90703
(562) 921-5521
(562) 921-6101
Rio Hondo Spreading Grounds
San Gabriel River Spreading Grounds
LOS ANGELES FOREBAY
MONTEBELLO FOREBAY
WHITTIER AREA
CENTRAL
WEST
COAST
BASIN
West Coast Barrier Project
Dominguez Gap Barrier Project
Alamitos Gap Barrier Project
WRD Office
Newport
Inglewood
Charnock Fault
Uplift
NON-PRESSURE AREA
PRESSURE AREA
Los Angeles International Airport
Long Beach Municipal Airport
Long Beach Marina
Los Angeles Harbor
Los Angeles River
San Gabriel River
Rio Hondo
Compton Creek
North Fork Coyote Creek
Signal Hill
Landing Hills
Bixby Ranch Hills
Montebello Hills
Puente Hills
Palos Verdes Hills
0 2.5 5 Miles
0 5 10 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

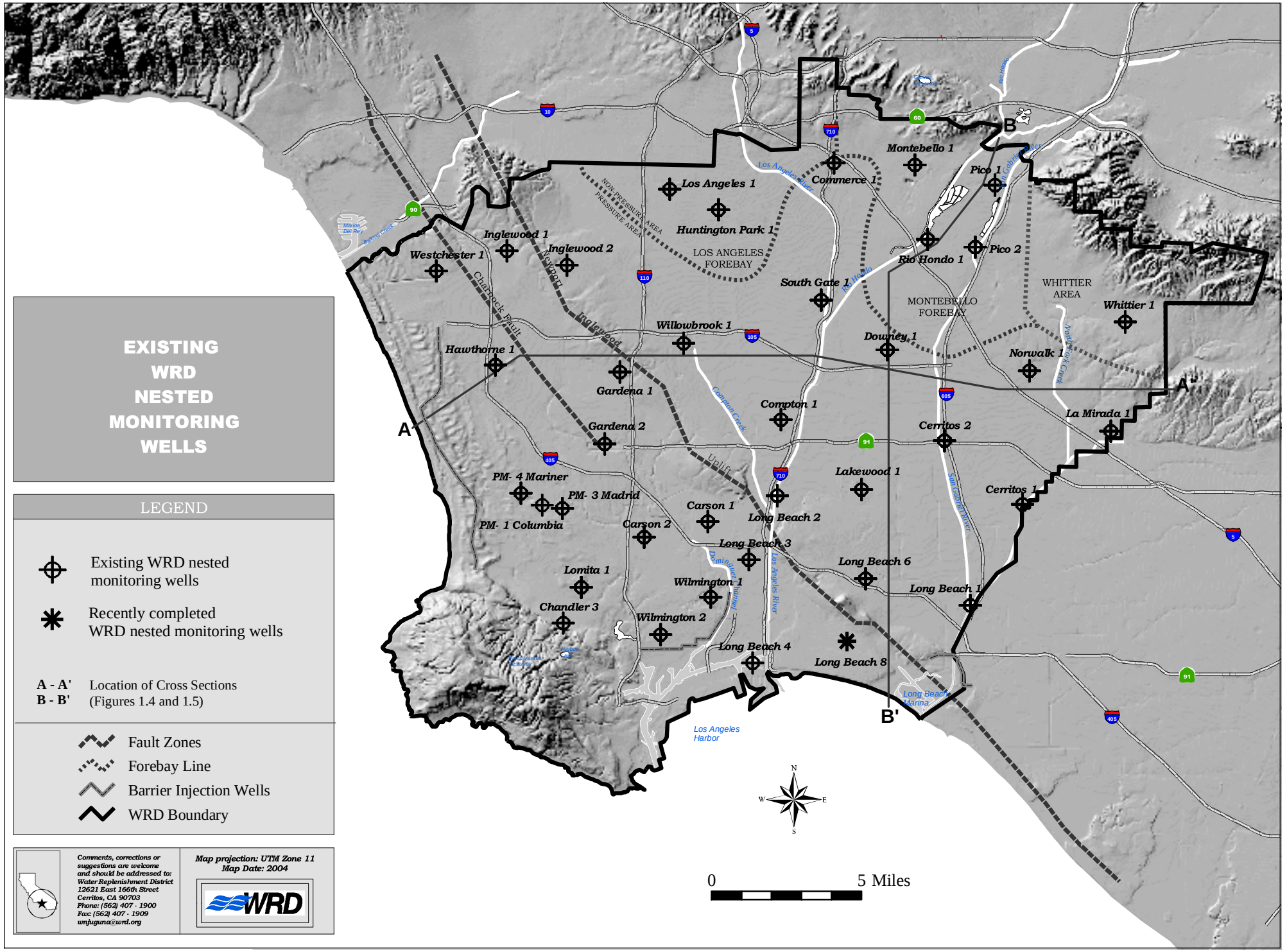
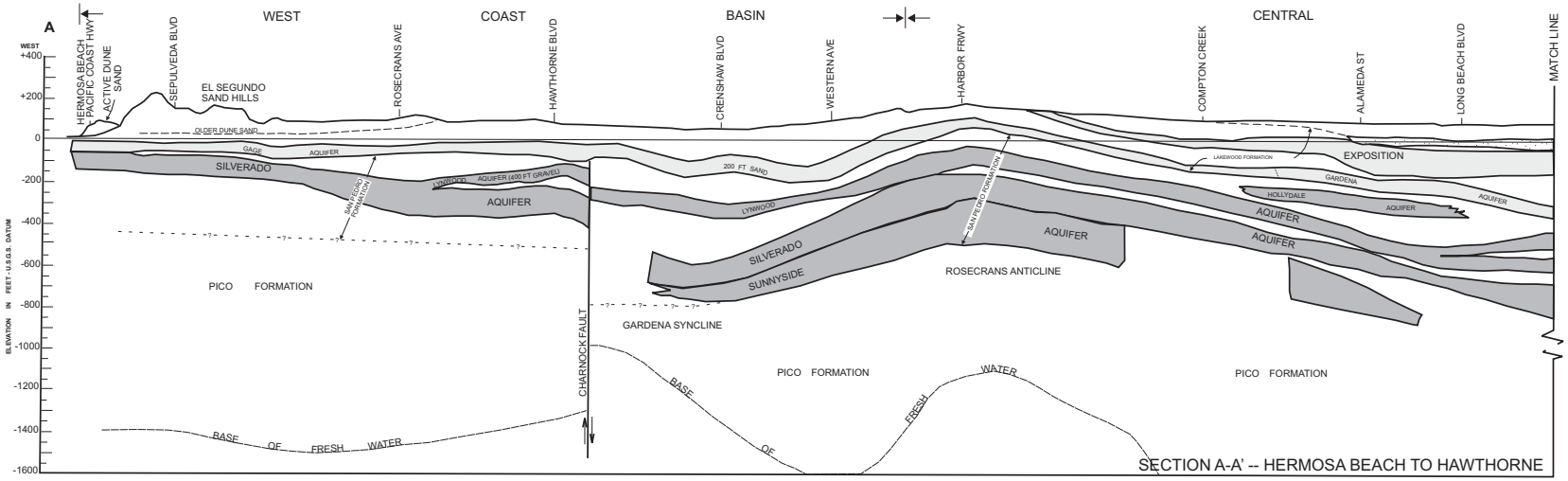
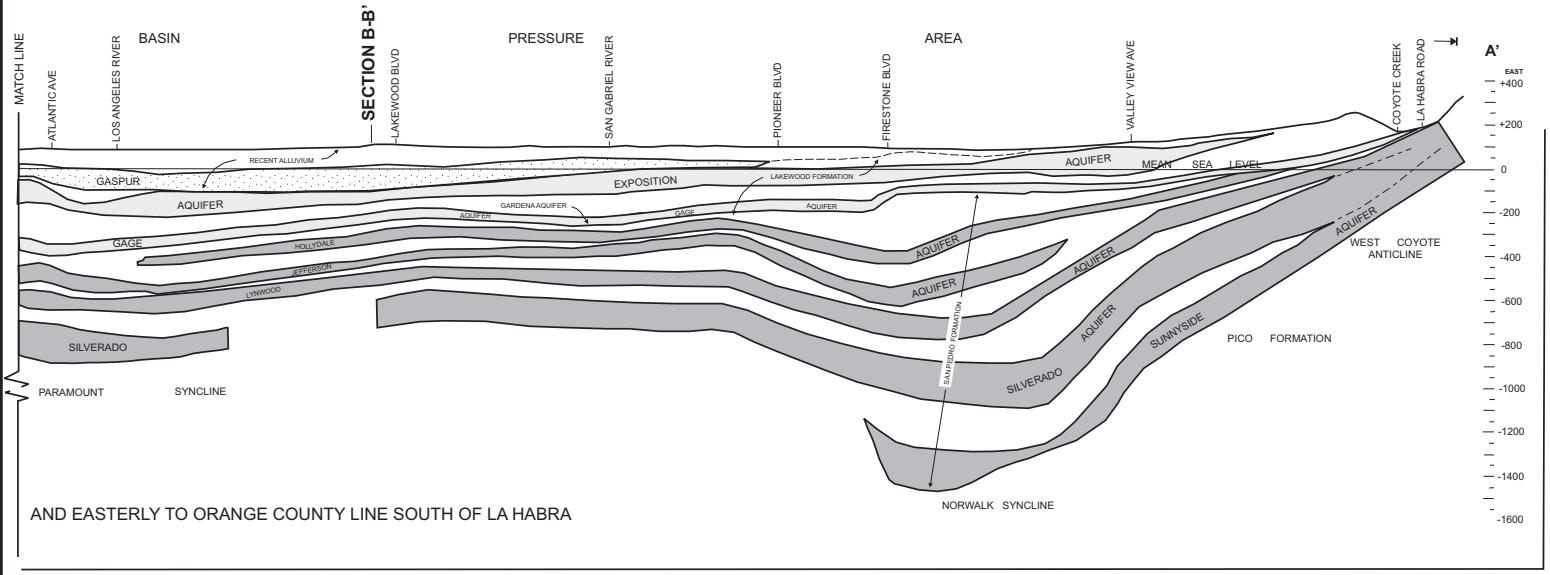

EXISTING
WRD
NESTED
MONITORING
WELLS
LEGEND
Existing WRD nested monitoring wells
Recently completed WRD nested monitoring wells
A - A' Location of Cross Sections
B - B' (Figures 1.4 and 1.5)
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date: 2004
WRD
0
5 Miles
N
W
E
S
Los Angeles 1
Huntington Park 1
Inglewood 1
Inglewood 2
Westchester 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
PM- 4 Mariner
PM- 3 Madrid
PM- 1 Columbia
Carson 1
Carson 2
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Long Beach 4
Long Beach 8
Long Beach 3
Long Beach 2
Long Beach 6
Long Beach 1
Lakewood 1
Compton 1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
South Gate 1
Downey 1
Norwalk 1
Whittier 1
Cerritos 1
Cerritos 2
La Mirada 1
LOS ANGELES FOREBAY
MONTEBELLO FOREBAY
WHITTIER AREA
NON-PRESSURE AREA
PRESSURE AREA
Los Angeles River
San Gabriel River
Rio Hondo
Coyote Creek
Compton Creek
Dominguez Channel
Los Angeles Harbor
Long Beach Marina
Alamitos Bay
Marina Del Rey
Ballona Creek
Newport-Inglewood Uplift
Charnock Fault
A
A'
B
B'

Figure 1.3



SECTION A-A' -- HERMOSA BEACH TO HAWTHORNE



AND EASTERLY TO ORANGE COUNTY LINE SOUTH OF LA HABRA

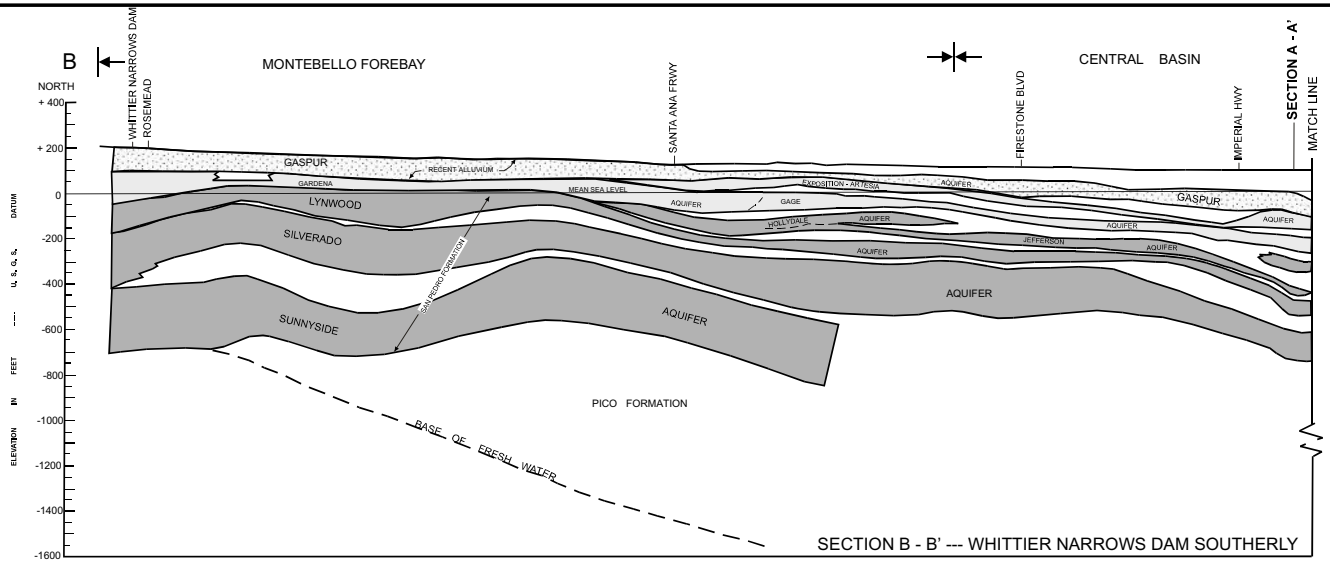
LEGEND

- AQUICLUDES AND DEEPER UNDIFFERENTIATED FORMATIONS
- AQUIFERS IN RECENT ALLUVIUM (INCLUDES THE GASPUR AND BALLONA AQUIFERS)
- AQUIFERS IN LAKEWOOD FORMATION (INCLUDES THE ARTESIA, EXPOSITION, GAGE, AND GARDENA AQUIFERS)
- AQUIFERS IN THE SAN PEDRO FORMATION (INCLUDES THE HOLLYDALE, JEFFERSON, LYNWOOD, SILVERADO AND SUNNYSIDE AQUIFERS)

IDEALIZED GEOLOGIC CROSS SECTION AA'

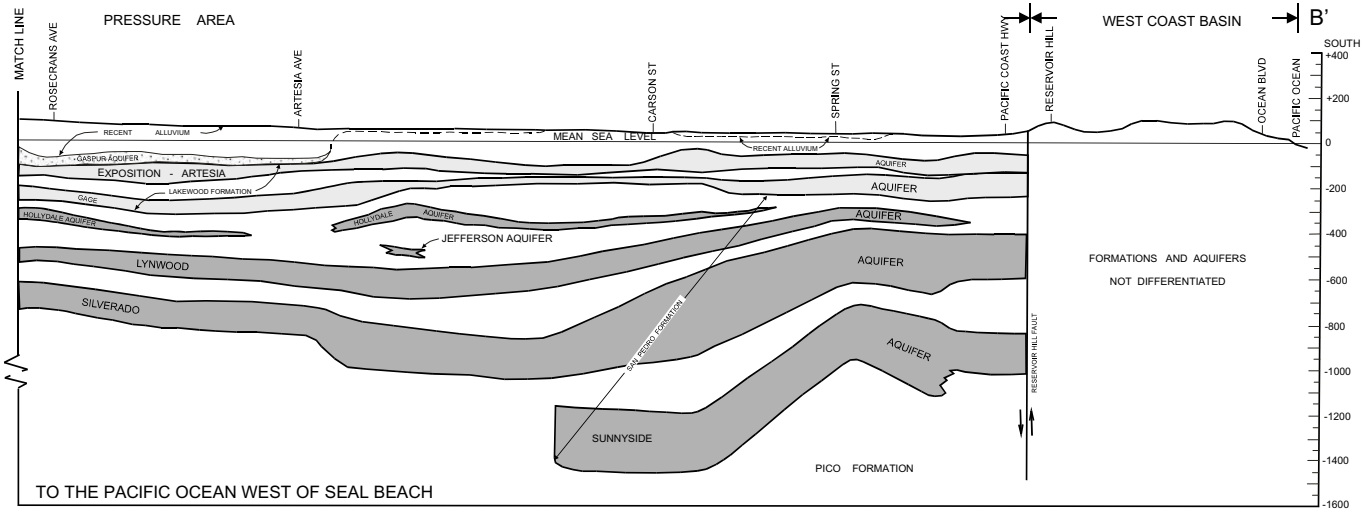
Adapted from
CDWR Bull. 104 App. B

FIGURE 1.4



LEGEND

- AQUICLUDES AND DEEPER UNDIFFERENTIATED FORMATIONS
- AQUIFERS IN RECENT ALLUVIUM (INCLUDES THE GASPUR AND BALLONA AQUIFERS)
- AQUIFERS IN LAKEWOOD FORMATION (INCLUDES THE ARTESIA, EXPOSITION, GAGE, AND GARDENA AQUIFERS)
- AQUIFERS IN THE SAN PEDRO FORMATIO (INCLUDES THE HOLLYDALE, JEFFERSON, LYNWOOD, SILVERADO AND SUNNYSIDE AQUIFERS)



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

FIGURE 1.5

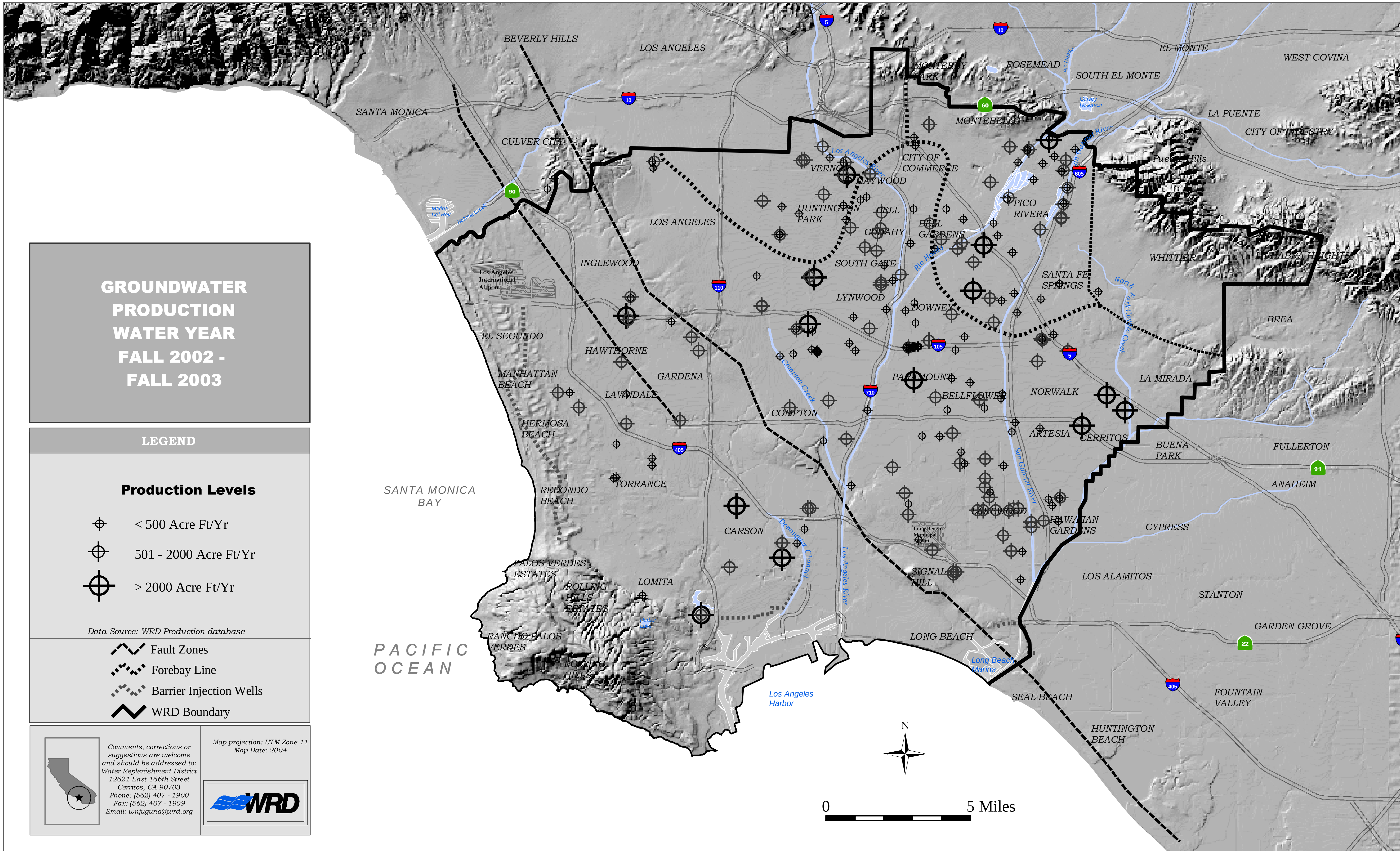

GROUNDWATER PRODUCTION WATER YEAR FALL 2002 - FALL 2003
LEGEND
Production Levels
< 500 Acre Ft/Yr
501 - 2000 Acre Ft/Yr
> 2000 Acre Ft/Yr
Data Source: WRD Production database
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to: Water Replenishment District 12621 East 166th Street Cerritos, CA 90703 Phone: (562) 407 - 1900 Fax: (562) 407 - 1909 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11 Map Date: 2004
WRD
0
5 Miles
N
SANTA MONICA BAY
PACIFIC OCEAN
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
ROSEMEAD
SOUTH EL MONTE
EL MONTE
WEST COVINA
LA PUENTE
CITY OF INDUSTRY
Puente Hills
MONTEBELLO
CITY OF COMMERCE
VERNON
HUNTINGTON PARK
BELL
CUDAHY
BELL GARDENS
PICO RIVERA
WHITTIER
LOS ANGELES
INGLEWOOD
SOUTH GATE
LYNWOOD
DOWNEY
SANTA FE SPRINGS
BREA
EL SEGUNDO
HAWTHORNE
GARDENA
LAWNDALE
MANHATTAN BEACH
HERMOSA BEACH
COMPTON
BELLFLOWER
NORWALK
LA MIRADA
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
ANAHEIM
REDONDO BEACH
TORRANCE
CARSON
HAWAIIAN GARDENS
CYPRESS
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
LOMITA
SIGNAL HILL
LOS ALAMITOS
STANTON
GARDEN GROVE
RANCHO PALOS VERDES
LONG BEACH
Long Beach Marina
Los Angeles Harbor
SEAL BEACH
FOUNTAIN VALLEY
HUNTINGTON BEACH
Los Angeles International Airport
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek

Figure 3.1

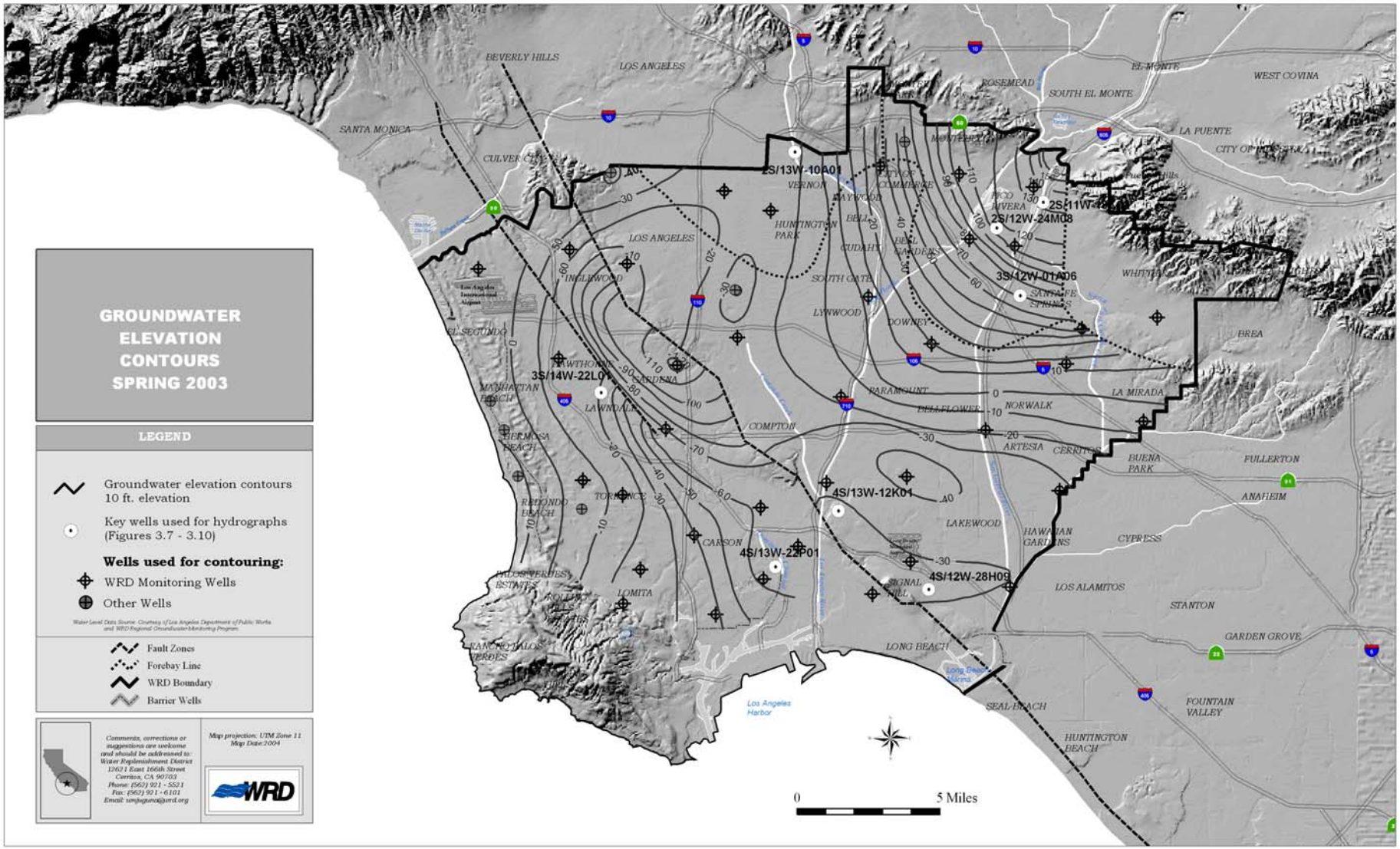

GROUNDWATER ELEVATION CONTOURS SPRING 2003
LEGEND
Groundwater elevation contours 10 ft. elevation
Key wells used for hydrographs (Figures 3.7 - 3.10)
Wells used for contouring:
WRD Monitoring Wells
Other Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.
Fault Zones
Forebay Line
WRD Boundary
Barrier Wells
Comments, corrections or suggestions are welcome and should be addressed to: Water Replenishment District 12621 East 166th Street Cerritos, CA 90703 Phone: (562) 921 - 5521 Fax: (562) 921 - 6101 Email: wrdpgruno@wrd.org
Map projection: UTM Zone 11 Map Date:2004
WRD
2S/13W-10A01
2S/11W-
2S/12W-24M03
3S/12W-01A06
3S/14W-22L01
4S/13W-12K01
4S/13W-22F01
4S/12W-28H09
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
VERNON
HUNTINGTON PARK
BELL
CUDAHY
SOUTH GATE
LYNWOOD
DOWNEY
WHITTIER
SANTA FE SPRINGS
EL SEGUNDO
MANHATTAN BEACH
HAWTHORNE
GARDENA
LAWNDALE
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
BREA
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
ANAHEIM
LAKEWOOD
HAWAIIAN GARDENS
CYPRESS
PALOS VERDES ESTATES
LOMITA
SIGNAL HILL
LOS ALAMITOS
STANTON
LONG BEACH
GARDEN GROVE
FOUNTAIN VALLEY
SEAL BEACH
HUNTINGTON BEACH
ROSEMEAD
SOUTH EL MONTE
EL MONTE
WEST COVINA
LA PUENTE
Los Angeles Harbor
Long Beach Marina
0
5 Miles

Figure 3.2

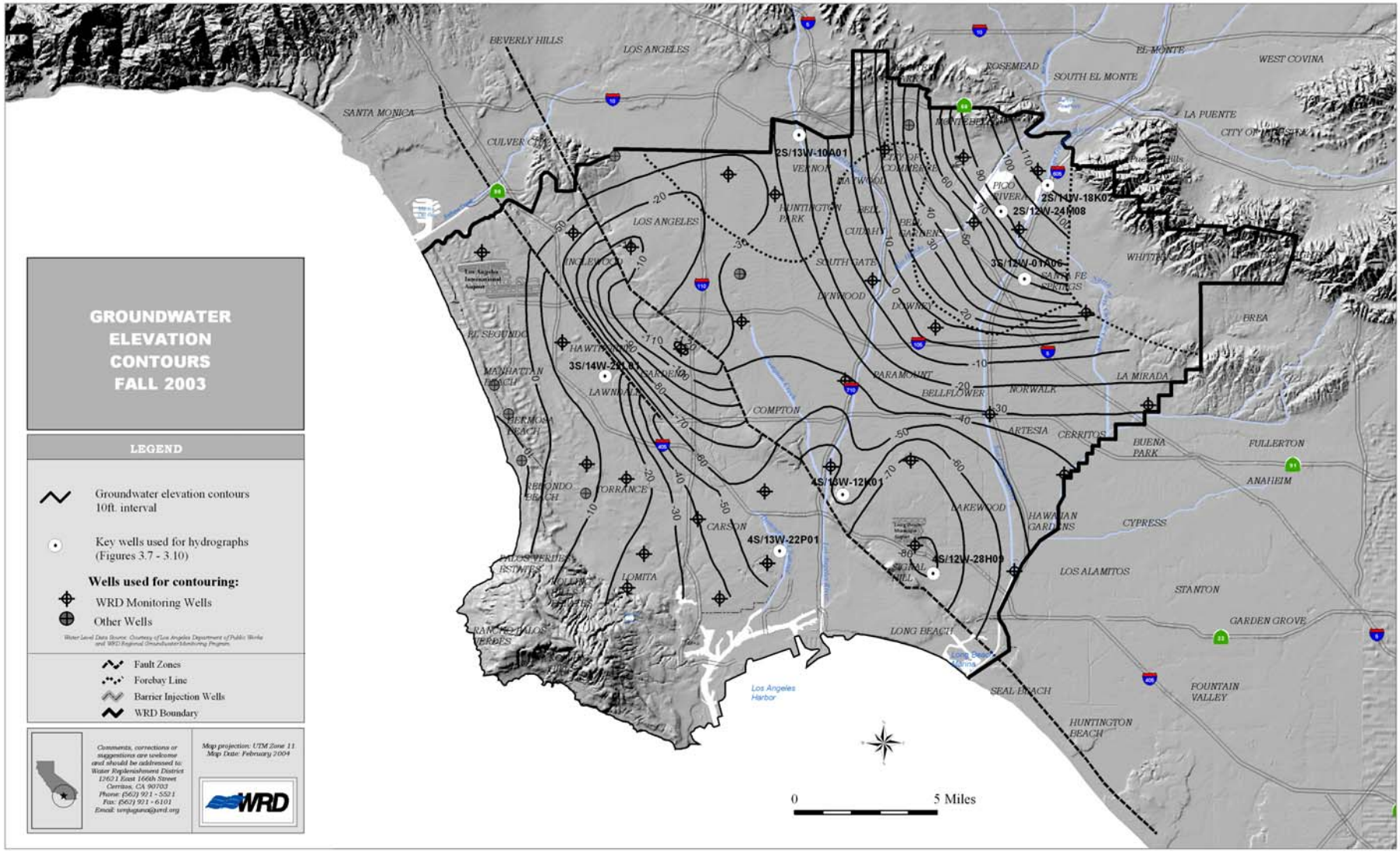

GROUNDWATER ELEVATION CONTOURS FALL 2003
LEGEND
Groundwater elevation contours 10ft. interval
Key wells used for hydrographs (Figures 3.7 - 3.10)
Wells used for contouring:
WRD Monitoring Wells
Other Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater 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 East 166th Street Cerritos, CA 90703 Phone: (562) 921 - 5521 Fax: (562) 921 - 6101 Email: wrdgagma@wrd.org
Map projection: UTM Zone 11 Map Date: February 2004
WRD
2S/13W-10A01
2S/12W-18K02
2S/12W-24M08
3S/12W-01A06
3S/14W-28L01
4S/13W-12K01
4S/13W-22P01
4S/12W-28H09
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
EL MONTE
WEST COVINA
ROSEMEAD
SOUTH EL MONTE
LA PUENTE
CITY OF INDUSTRY
VERNON
HUNTINGTON PARK
BELL
CUDAHY
SOUTH GATE
DOWNEY
WHITTIER
SANTA FE SPRINGS
PICO RIVERA
INGLEWOOD
EL SEGUNDO
MANHATTAN BEACH
HAWTHORNE
GARDENA
LAWNDALE
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
LA MIRADA
BREA
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
ARTESIA
CERRITOS
BUENA PARK
FULLERTON
ANAHEIM
LAKEWOOD
HAWAIIAN GARDENS
CYPRESS
LOS ALAMITOS
STANTON
GARDEN GROVE
PALOS VERDES ESTATES
LOMITA
RANCHO PALOS VERDES
LONG BEACH
Los Angeles Harbor
SEAL BEACH
FOUNTAIN VALLEY
HUNTINGTON BEACH
0
5 Miles

Figure 3.3

Monthly Groundwater Production
Water Year 2002-2003

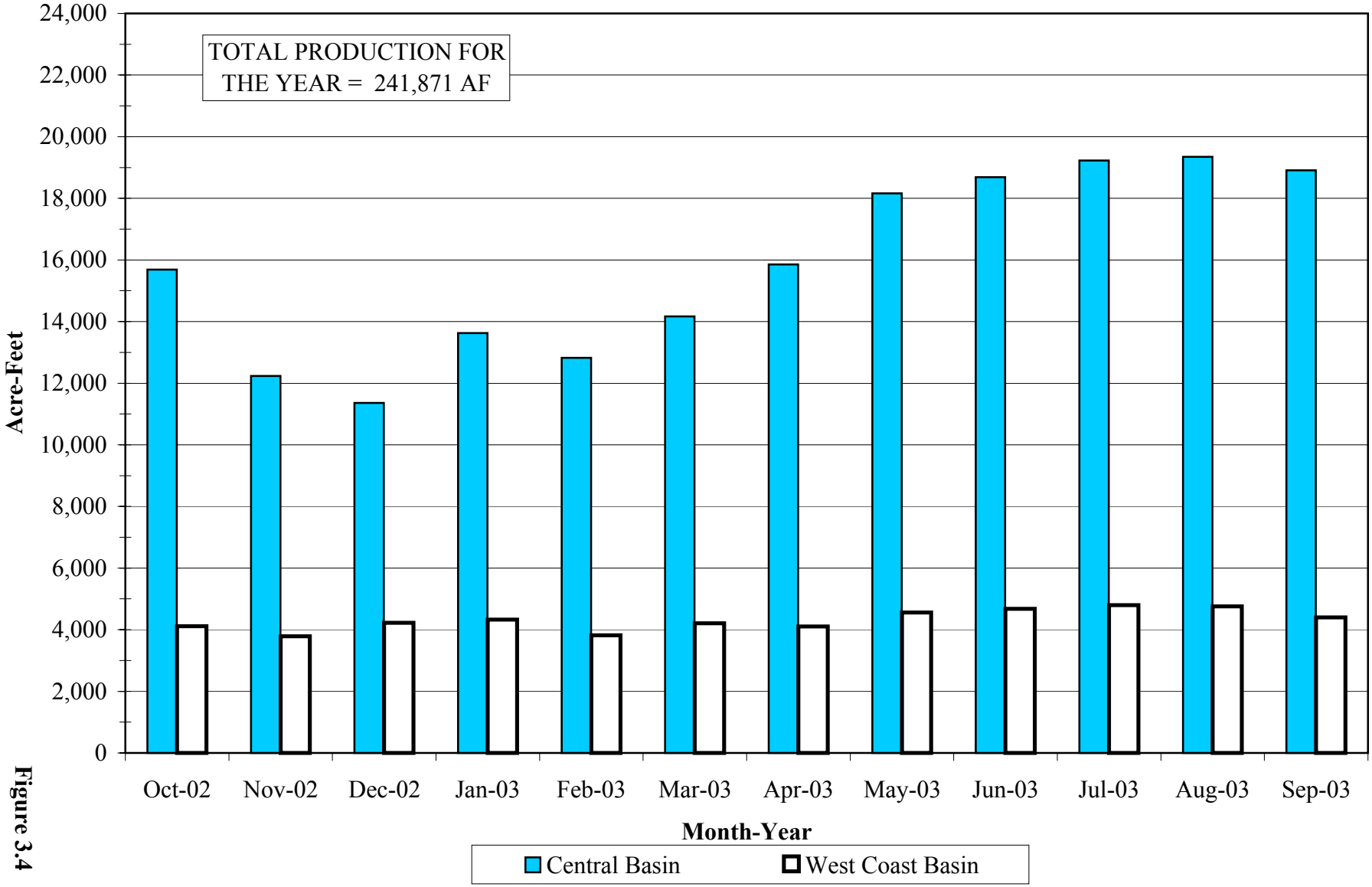


Figure 3.4

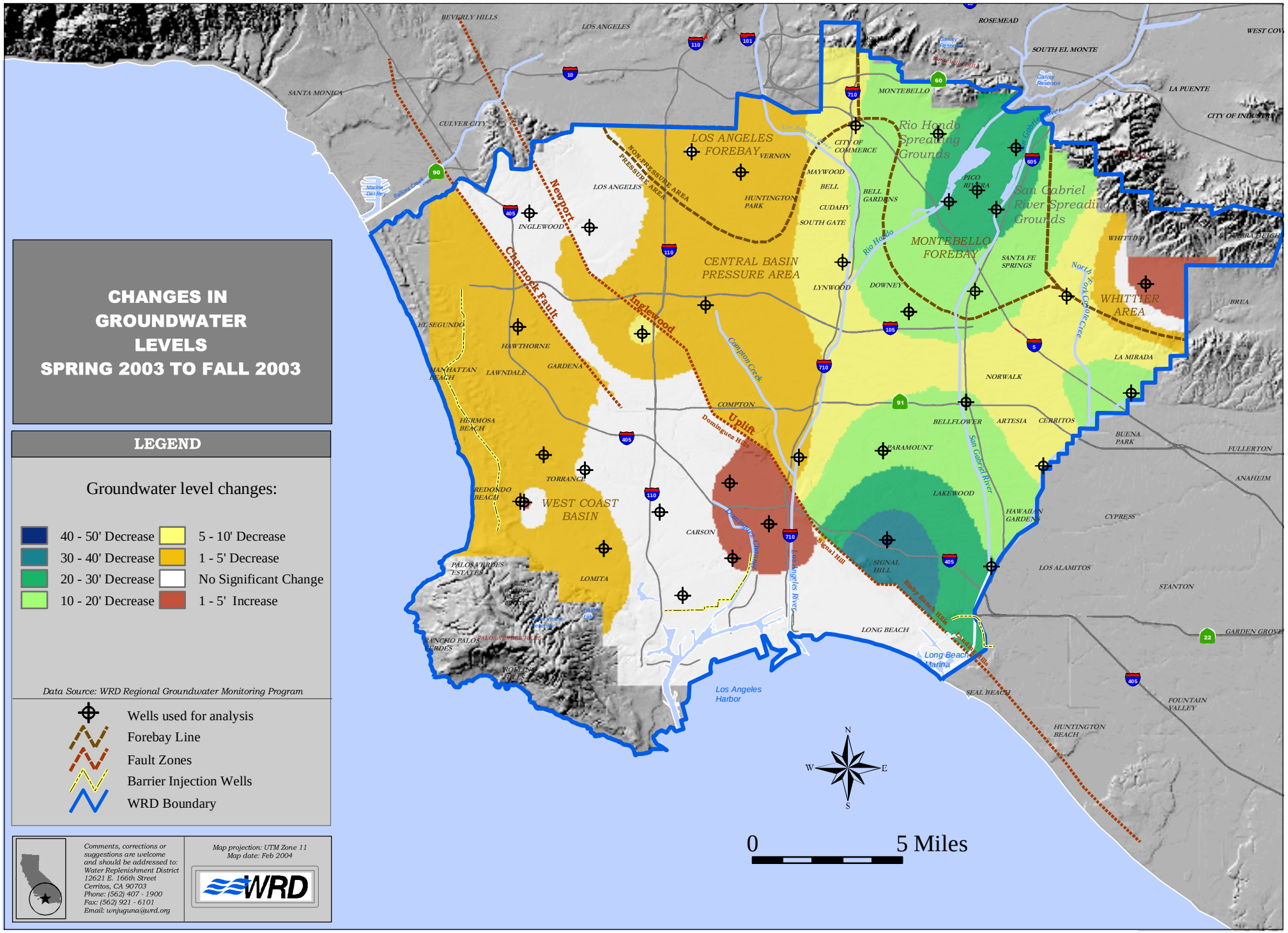

CHANGES IN GROUNDWATER LEVELS SPRING 2003 TO FALL 2003
LEGEND
Groundwater level changes:
40 - 50' Decrease
30 - 40' Decrease
20 - 30' Decrease
10 - 20' Decrease
5 - 10' Decrease
1 - 5' Decrease
No Significant Change
1 - 5' Increase
Data Source: WRD Regional Groundwater Monitoring Program
Wells used for analysis
Forebay Line
Fault Zones
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) 407 - 1900
Fax: (562) 921 - 6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2004
WRD
LOS ANGELES FOREBAY
CENTRAL BASIN PRESSURE AREA
WEST COAST BASIN
MONTEBELLO FOREBAY
Rio Hondo Spreading Grounds
San Gabriel River Spreading Grounds
WHITTIER AREA
NONPRESSURE AREA
PRESSURE AREA
Newport
Charnock Fault
Inglewood
Uplift
Dominguez Hills
Signal Hill
Baldy Beach Hills
Compton Creek
Rio Hondo
San Gabriel River
North Fork Coyote Cree
Los Angeles River
Los Angeles Harbor
Long Beach Marina
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
INGLEWOOD
HAWTHORNE
GARDENA
LAWNDALE
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
LOMITA
PALOS VERDES ESTATES
RANCHO PALOS VERDES
ROLLING HILLS ESTATES
ROLLING HILLS
PALOS VERDES HILLS
LONG BEACH
SEAL BEACH
HUNTINGTON BEACH
FOUNTAIN VALLEY
GARDEN GROVE
STANTON
LOS ALAMITOS
CYPRESS
ANAHEIM
FULLERTON
BUENA PARK
LA MIRADA
WHITTIER
BREA
LA PUENTE
CITY OF INDUSTRY
ROSEMEAD
SOUTH EL MONTE
MONTEBELLO
CITY OF COMMERCE
VERNON
MAYWOOD
BELL
BELL GARDENS
HUNTINGTON PARK
CUDAHY
SOUTH GATE
LYNWOOD
DOWNEY
SANTA FE SPRINGS
NORWALK
BELLFLOWER
ARTESIA
CERRITOS
PARAMOUNT
LAKEWOOD
HAWAIIAN GARDENS
SIGNAL HILL
N
S
E
W
0
5 Miles

Figure 3.5

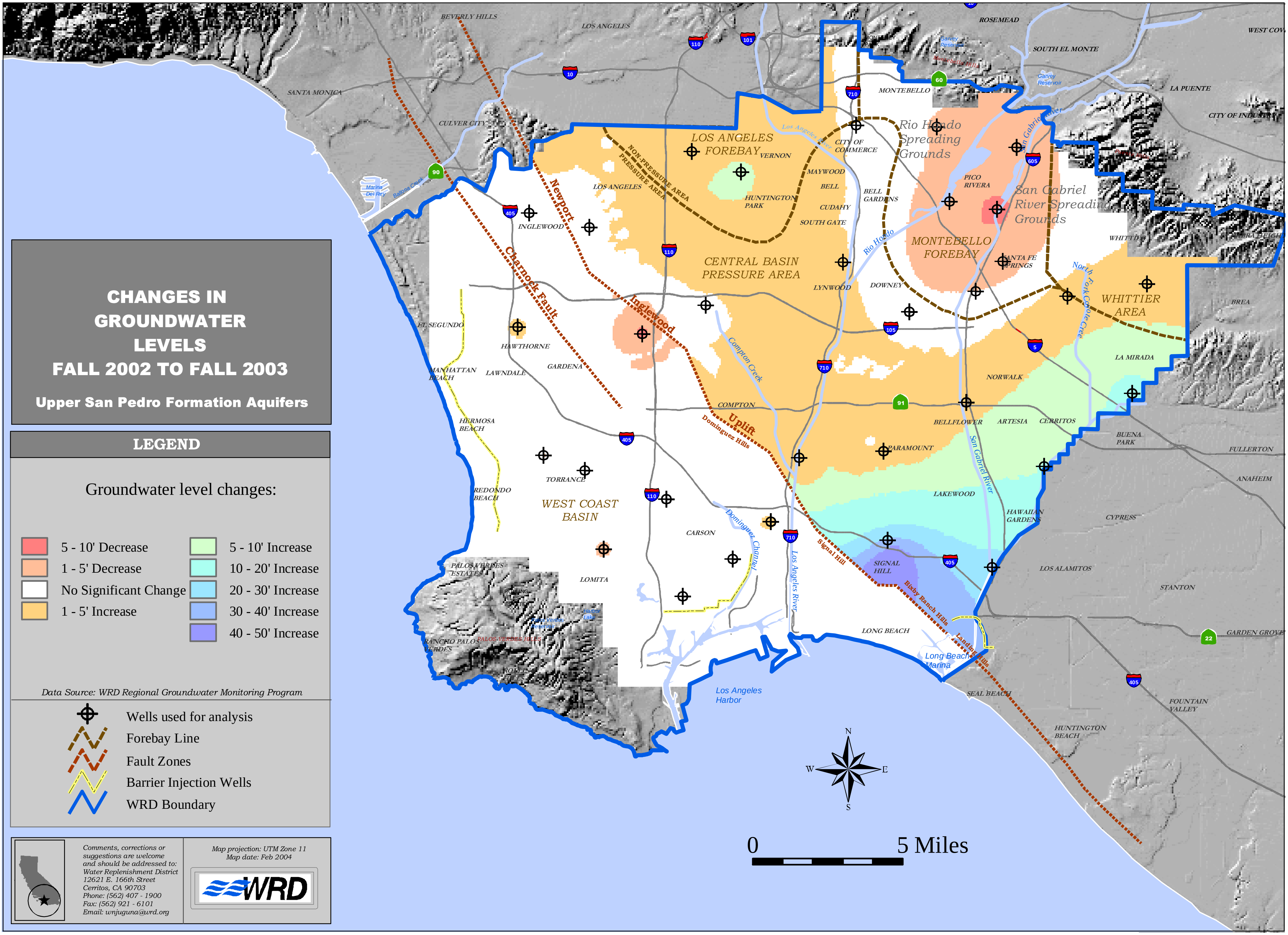
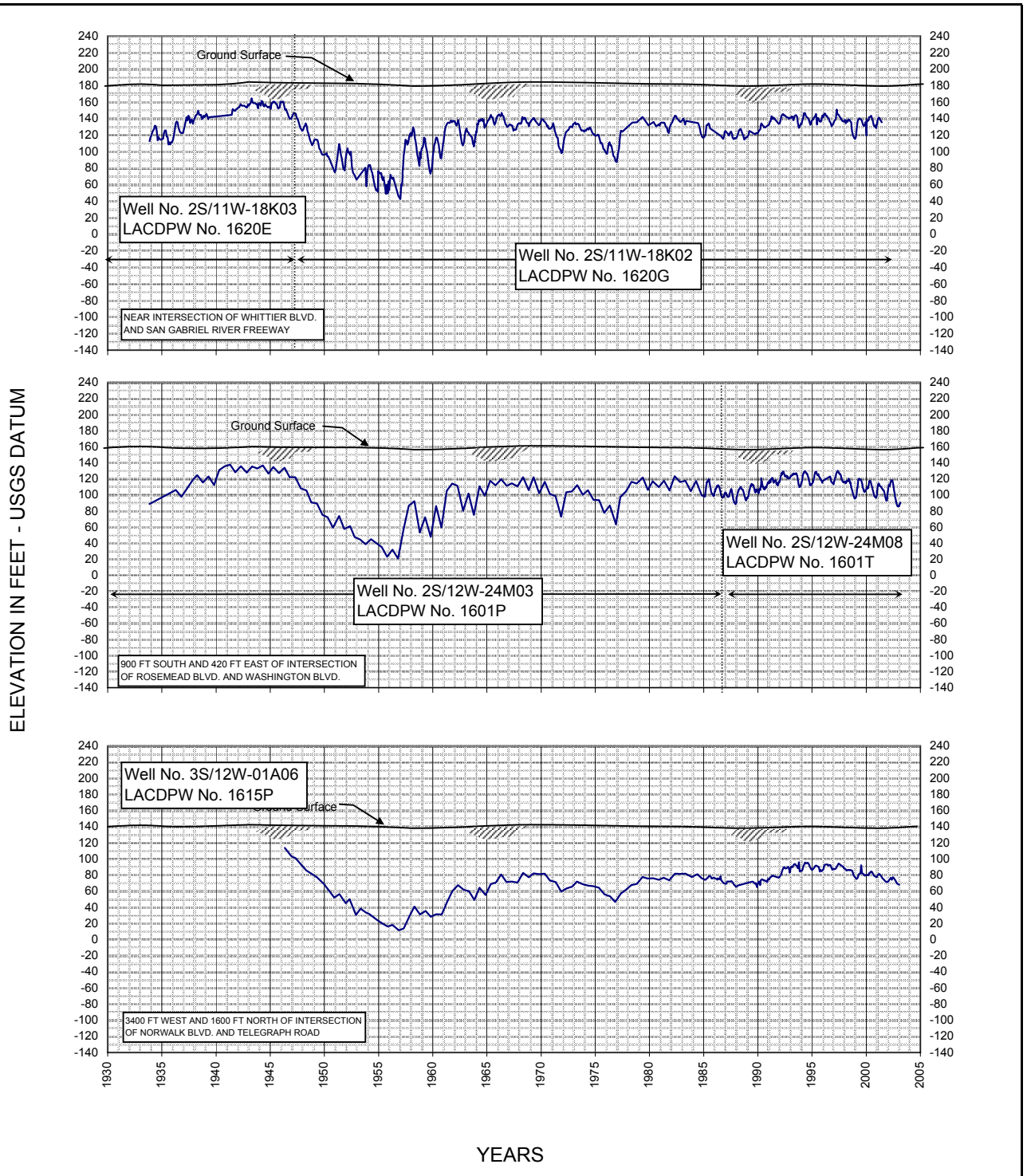
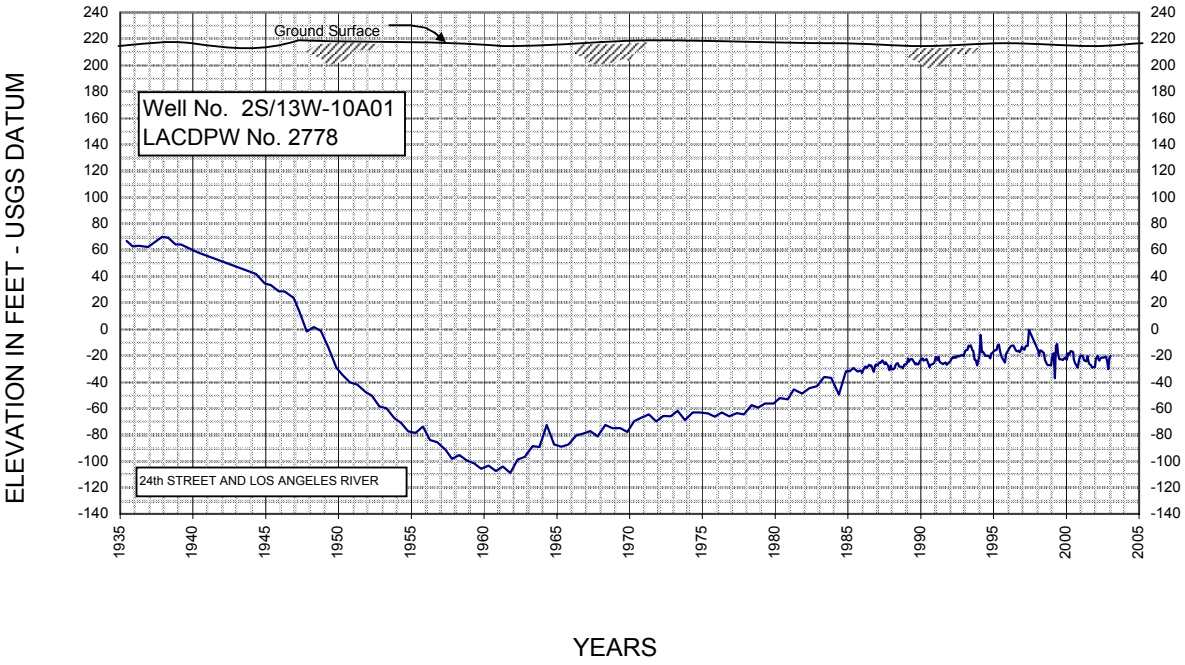

CHANGES IN GROUNDWATER LEVELS
FALL 2002 TO FALL 2003
Upper San Pedro Formation Aquifers
LEGEND
Groundwater level changes:
5 - 10' Decrease
1 - 5' Decrease
No Significant Change
1 - 5' Increase
5 - 10' Increase
10 - 20' Increase
20 - 30' Increase
30 - 40' Increase
40 - 50' Increase
Data Source: WRD Regional Groundwater Monitoring Program
Wells used for analysis
Forebay Line
Fault Zones
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) 407 - 1900
Fax: (562) 921 - 6101
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map date: Feb 2004
WRD
LOS ANGELES FOREBAY
NON-PRESSURE AREA
PRESSURE AREA
CENTRAL BASIN PRESSURE AREA
MONTEBELLO FOREBAY
Rio Hondo Spreading Grounds
San Gabriel River Spreading Grounds
WHITTIER AREA
WEST COAST BASIN
Newport
Charnock Fault
Inglewood
Uplift
Dominguez Hills
Signal Hill
Bixby Ranch Hills
Landing Hills
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
INGLEWOOD
EL SEGUNDO
HAWTHORNE
MANHATTAN BEACH
LAWNDALE
GARDENA
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
LOMITA
PALOS VERDES ESTATES
RANCHO PALOS VERDES
VERNON
MAYWOOD
BELL
HUNTINGTON PARK
CUDAHY
SOUTH GATE
BELL GARDENS
CITY OF COMMERCE
MONTEBELLO
PICO RIVERA
SANTA FE SPRINGS
DOWNEY
LYNWOOD
COMPTON
PARAMOUNT
BELLFLOWER
NORWALK
ARTESIA
CERRITOS
LAKEWOOD
HAWAIIAN GARDENS
SIGNAL HILL
LONG BEACH
LA MIRADA
WHITTIER
ROSEMEAD
SOUTH EL MONTE
LA PUENTE
CITY OF INDUSTRY
BREA
BUENA PARK
FULLERTON
ANAHEIM
CYPRESS
LOS ALAMITOS
STANTON
GARDEN GROVE
SEAL BEACH
HUNTINGTON BEACH
FOUNTAIN VALLEY
Los Angeles Harbor
Long Beach Marina
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
N
S
E
W
0
5 Miles

Figure 3.6



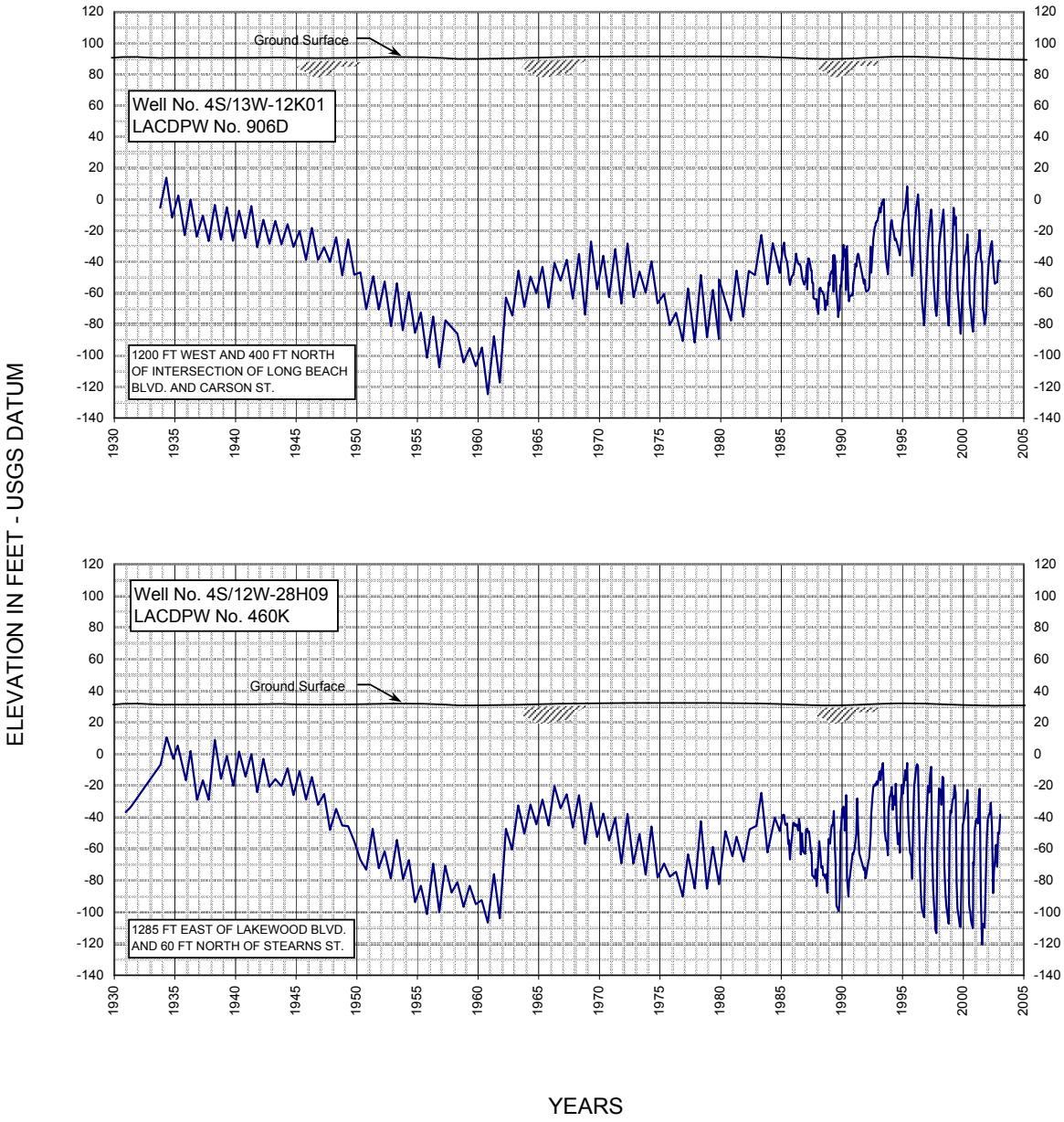
FLUCTUATIONS OF WATER LEVEL AT WELLS
MONTEBELLO FOREBAY

Figure 3.7



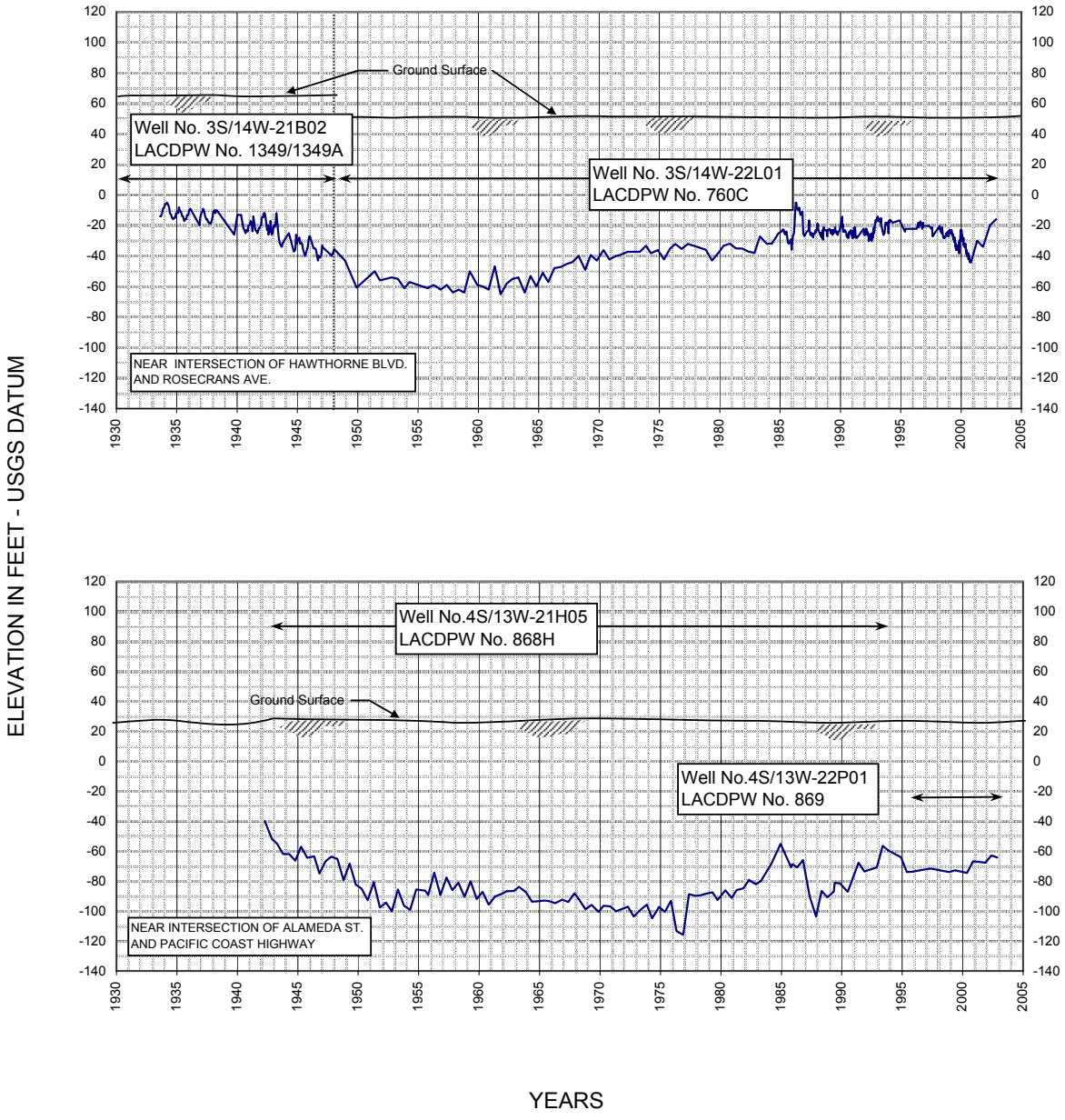
FLUCTUATIONS OF WATER LEVEL AT WELLS
LOS ANGELES FOREBAY

Figure 3.8



FLUCTUATIONS OF WATER LEVEL AT WELLS
CENTRAL BASIN PRESSURE AREA

Figure 3.9



FLUCTUATIONS OF WATER LEVEL AT WELLS

WEST BASIN

Figure 3.10

FLUCTUATIONS OF WATER LEVELS IN WRD NESTED MONITORING WELL RIO HONDO #1

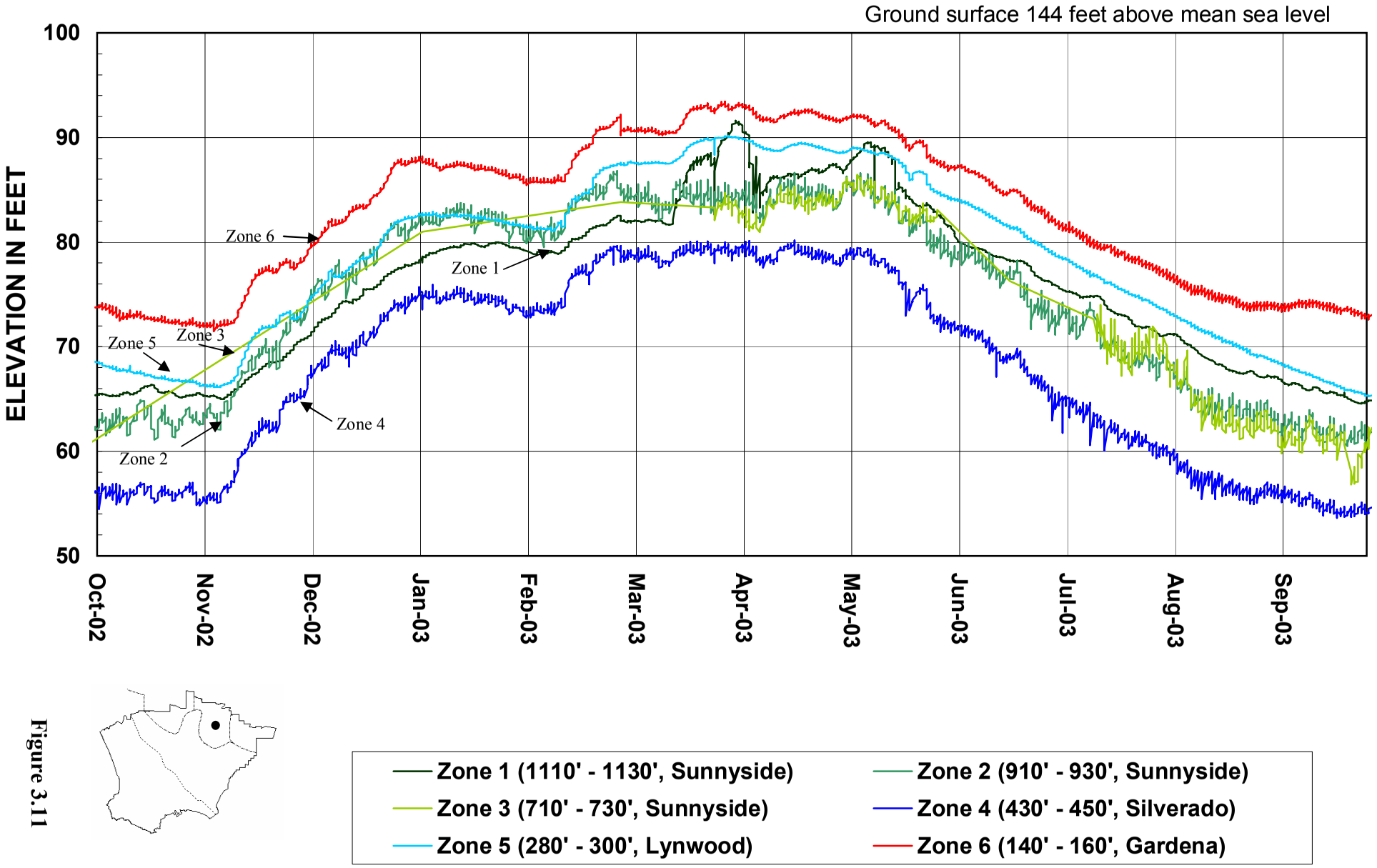


Figure 3.11

5/24/2004

FLUCTUATIONS OF WATER LEVELS IN WRD NESTED MONITORING WELL HUNTINGTON PARK #1

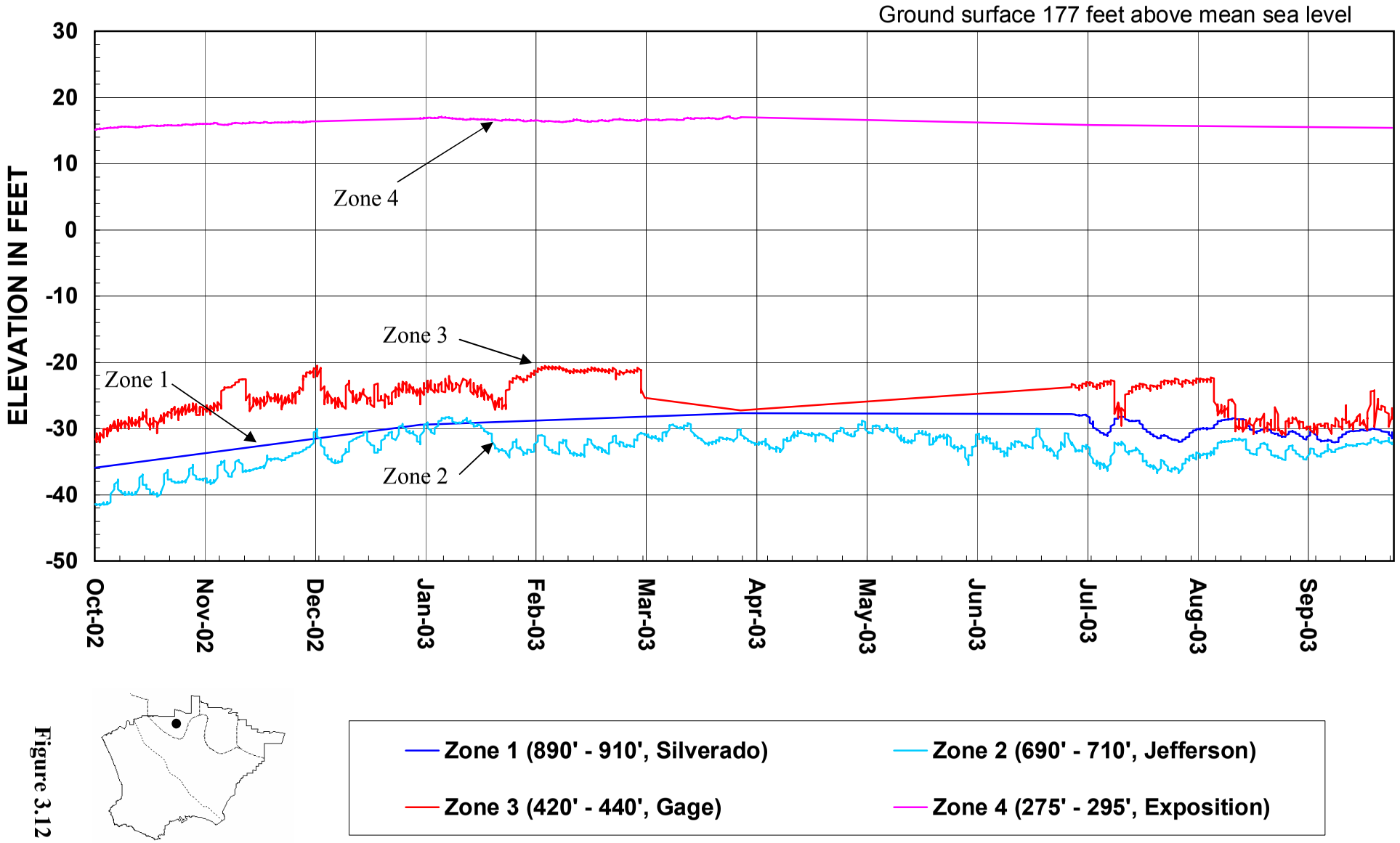


Figure 3.12

5/24/2004

FLUCTUATIONS OF WATER LEVELS IN WRD NESTED MONITORING WELL LONG BEACH #1

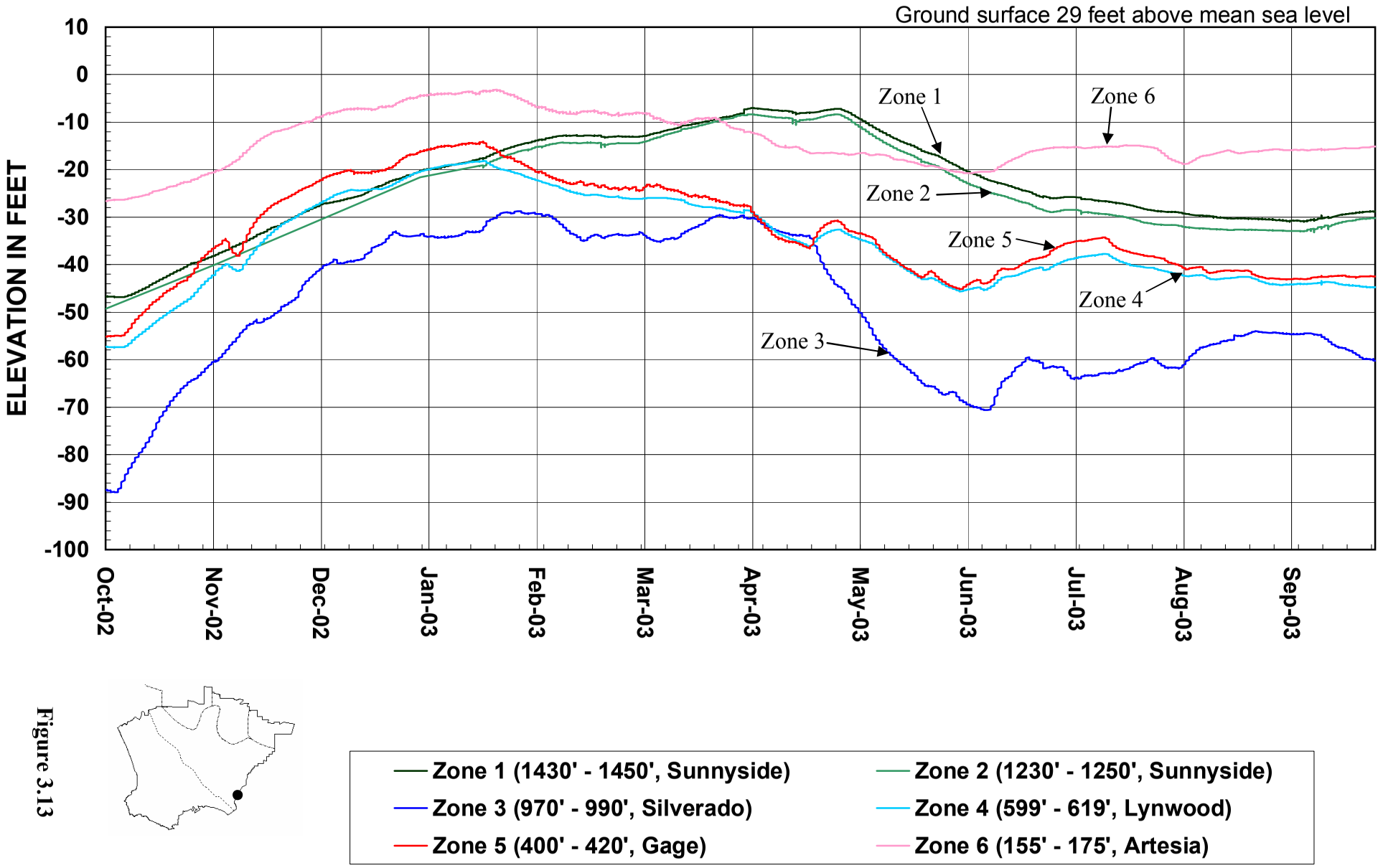


Figure 3.13

5/24/2004

FLUCTUATIONS OF WATER LEVELS IN WRD NESTED MONITORING WELL CARSON #1

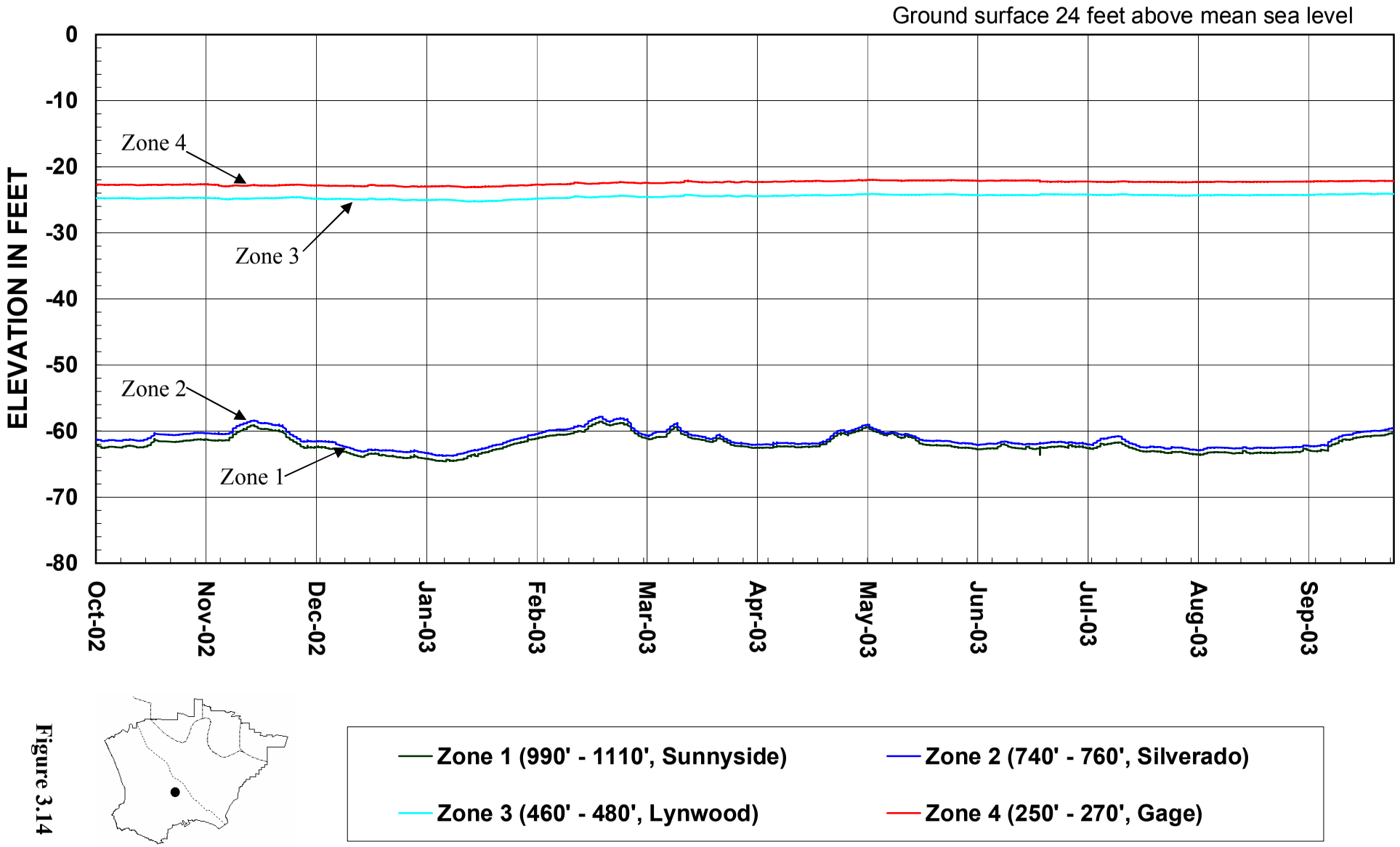


Figure 3.14

5/24/2004

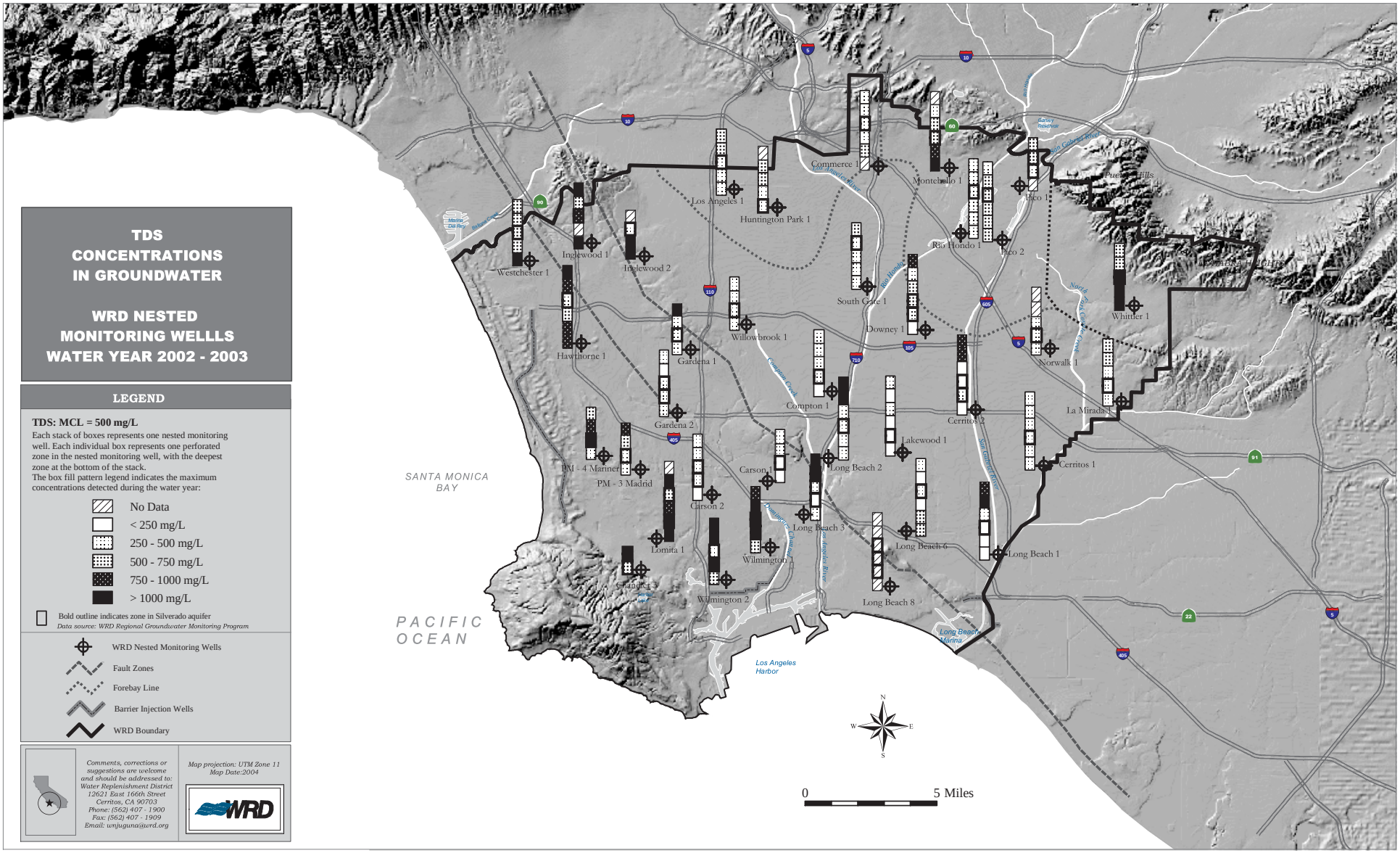

TDS
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLLS
WATER YEAR 2002 - 2003
LEGEND
TDS: MCL = 500 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
< 250 mg/L
250 - 500 mg/L
500 - 750 mg/L
750 - 1000 mg/L
> 1000 mg/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Montebello 1
Los Angeles 1
Huntington Park 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Willowbrook 1
Hawthorne 1
Gardena 1
Gardena 2
Norwalk 1
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Long Beach 2
Carson 2
Long Beach 3
Long Beach 6
Lomita 1
Wilmington 1
Long Beach 1
Torrance
Wilmington 2
Long Beach 8
0
5 Miles
N
S
W
E

Figure 4.1

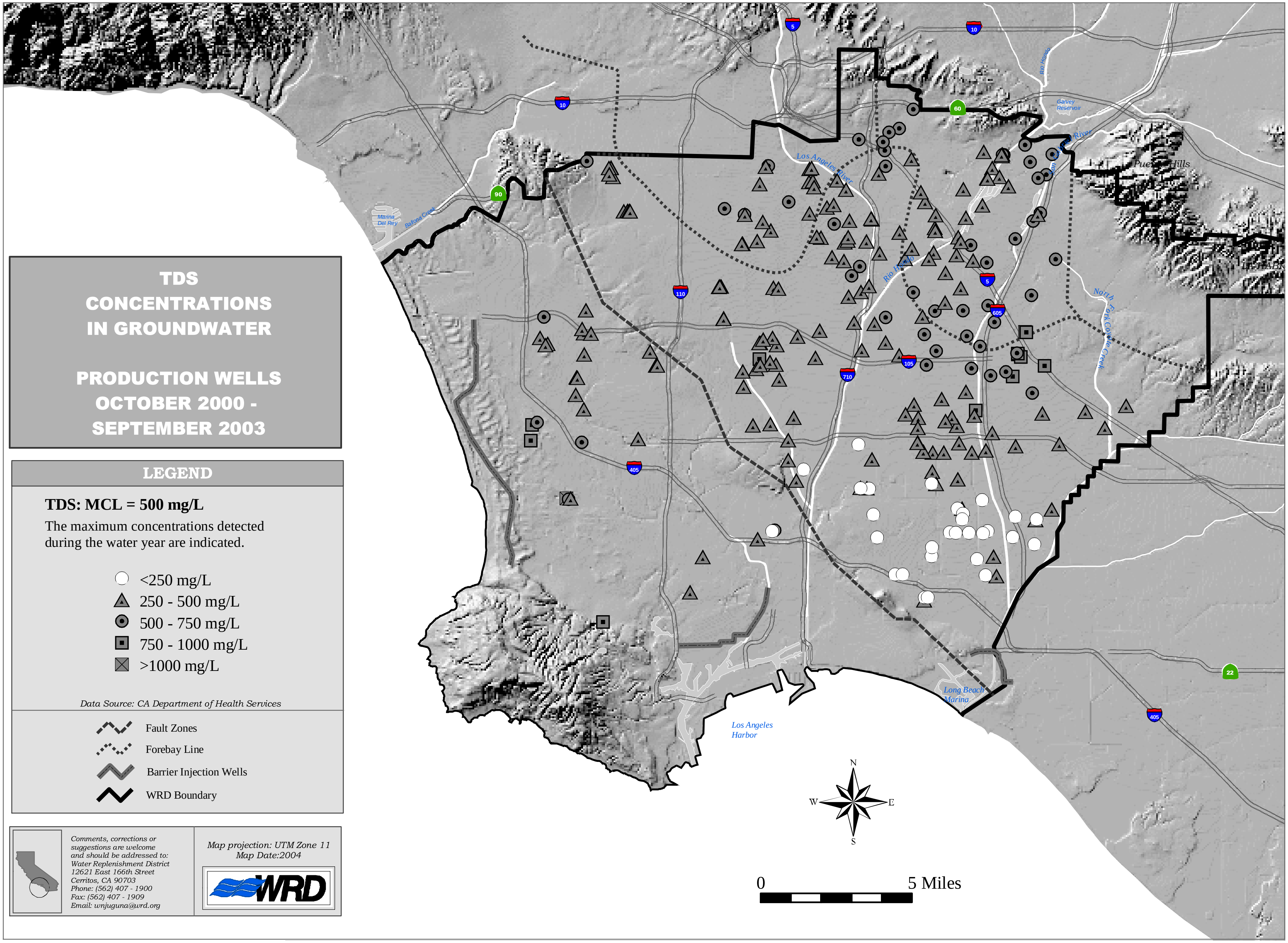

TDS
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 2000 -
SEPTEMBER 2003
LEGEND
TDS: MCL = 500 mg/L
The maximum concentrations detected
during the water year are indicated.
<250 mg/L
250 - 500 mg/L
500 - 750 mg/L
750 - 1000 mg/L
>1000 mg/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
0
5 Miles
N
S
E
W
Los Angeles River
Rio Hondo
Garvey Reservoir
Puente Hills
Marina Del Rey
Ballona Creek
North Fork Coyote Creek
Long Beach Marina
Los Angeles Harbor
5
10
60
90
110
710
105
605
405
22

Figure 4.2

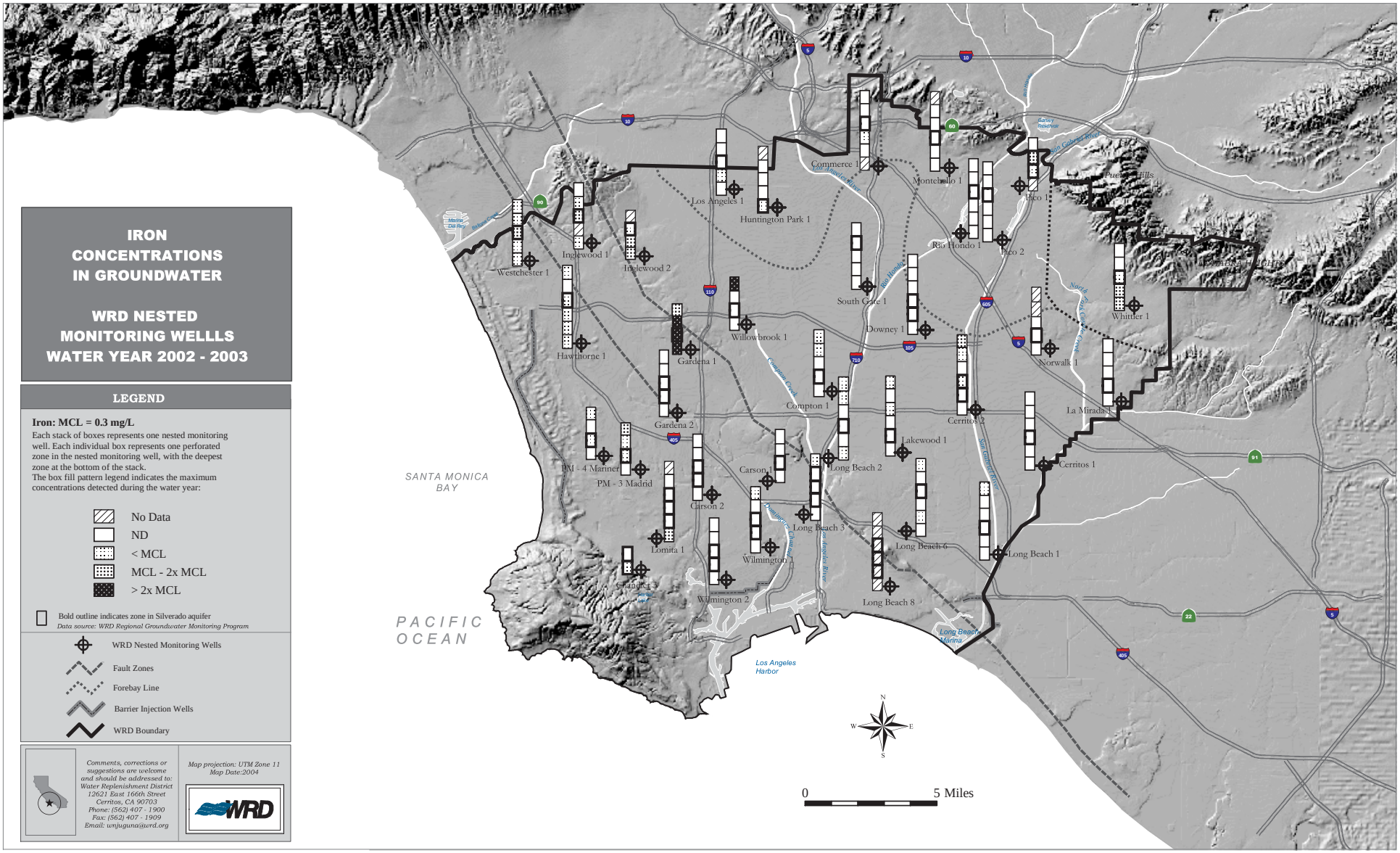

IRON
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLLS
WATER YEAR 2002 - 2003
LEGEND
Iron: MCL = 0.3 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< MCL
MCL - 2x MCL
> 2x MCL
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Los Angeles 1
Huntington Park 1
Inglewood 1
Inglewood 2
Westchester 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
Rio Hondo
San Gabriel River
Coyote Creek
Dominguez Channel
Los Angeles River
Puente Hills
0
5 Miles

Figure 4.3

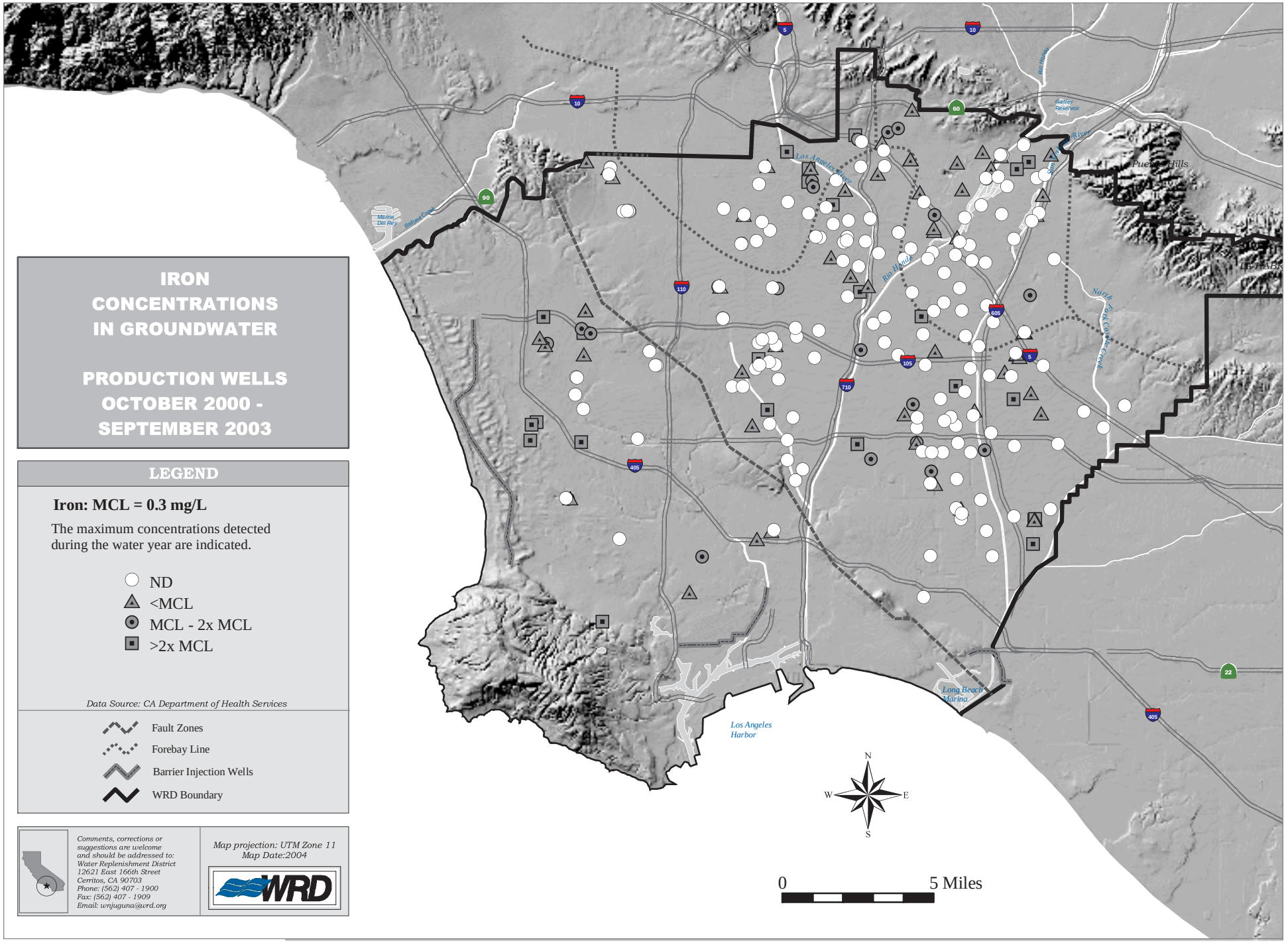

IRON
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 2000 -
SEPTEMBER 2003
LEGEND
Iron: MCL = 0.3 mg/L
The maximum concentrations detected during the water year are indicated.
ND
<MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
N
W
E
S
0
5 Miles
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Los Angeles Harbor
Long Beach Marina
Marina Del Rey
Ballona Creek
Puente Hills

Figure 4.4

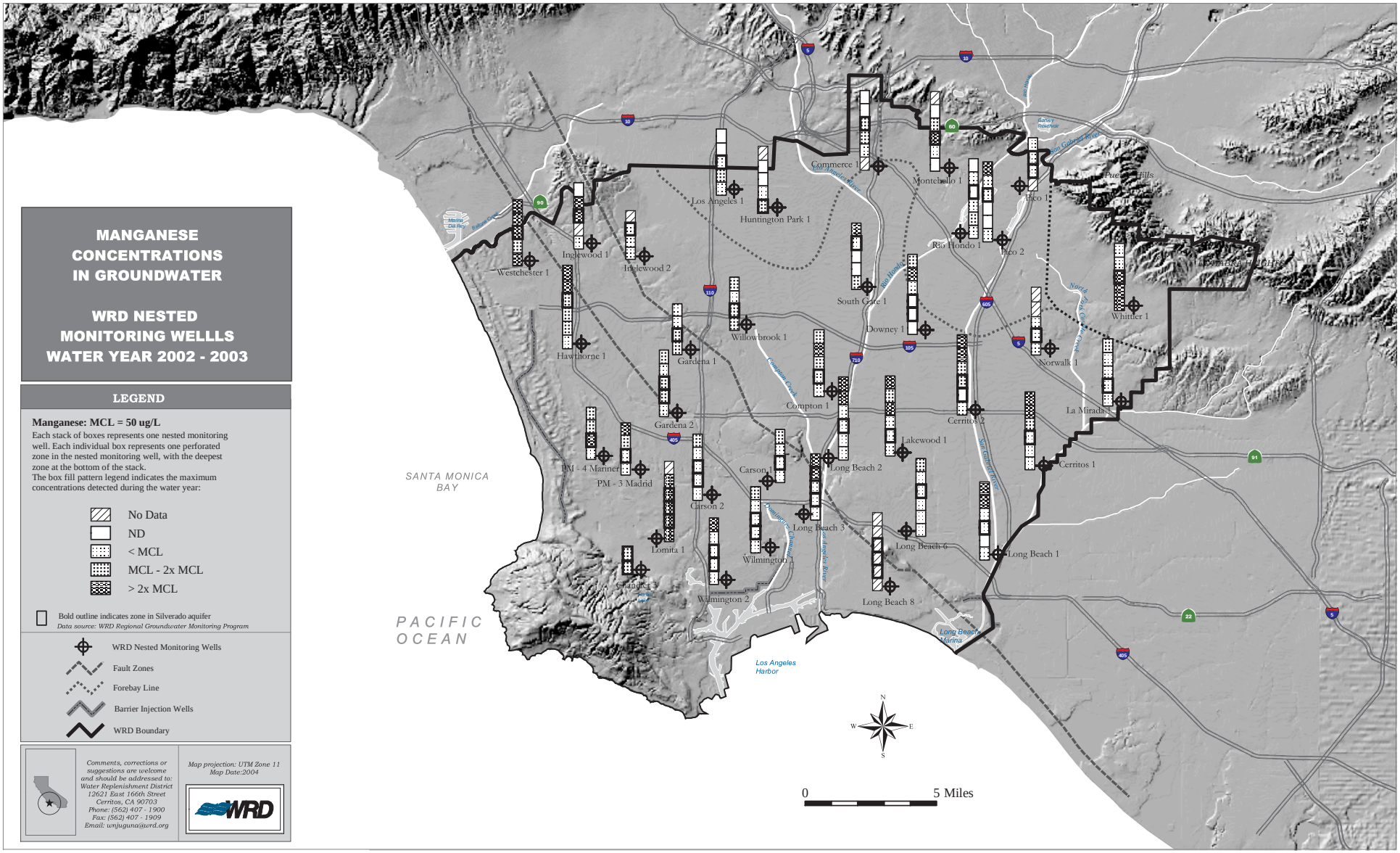

MANGANESE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
Manganese: MCL = 50 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< MCL
MCL - 2x MCL
> 2x MCL
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Los Angeles 1
Huntington Park 1
Inglewood 1
Inglewood 2
Westchester 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
Long Beach 2
Carson 1
Carson 2
PM - 4 Mariner
PM - 3 Madrid
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Gaspur 3
Wilmington 2
Long Beach 8
0
5 Miles

Figure 4.5

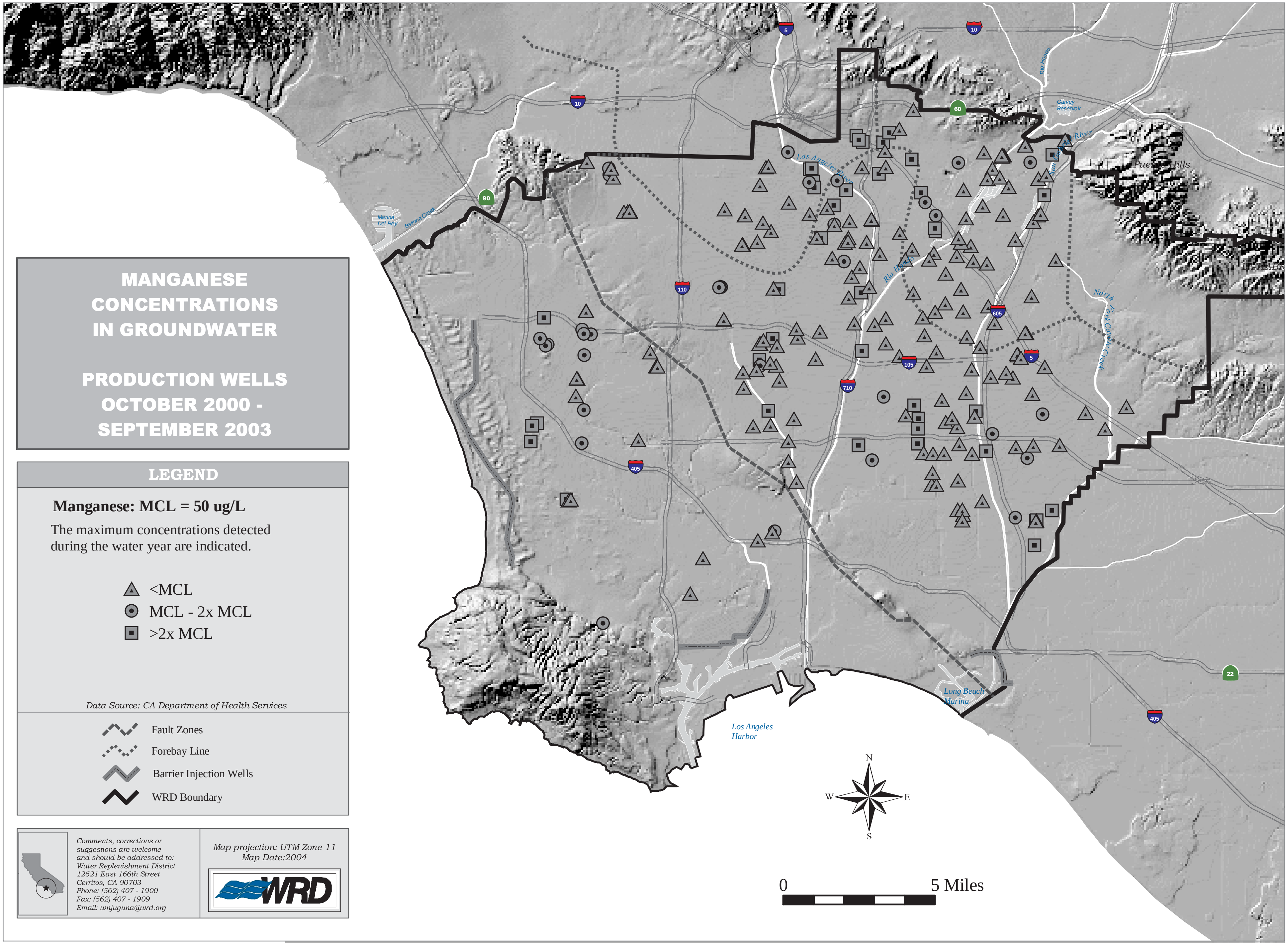

MANGANESE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003
LEGEND
Manganese: MCL = 50 ug/L
The maximum concentrations detected during the water year are indicated.
<MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Ballona Creek
Marina Del Rey
Garvey Reservoir
Puente Hills
Long Beach Marina
Los Angeles Harbor
5
10
60
90
110
105
605
710
405
22
N
W
E
S
0
5 Miles

Figure 4.6

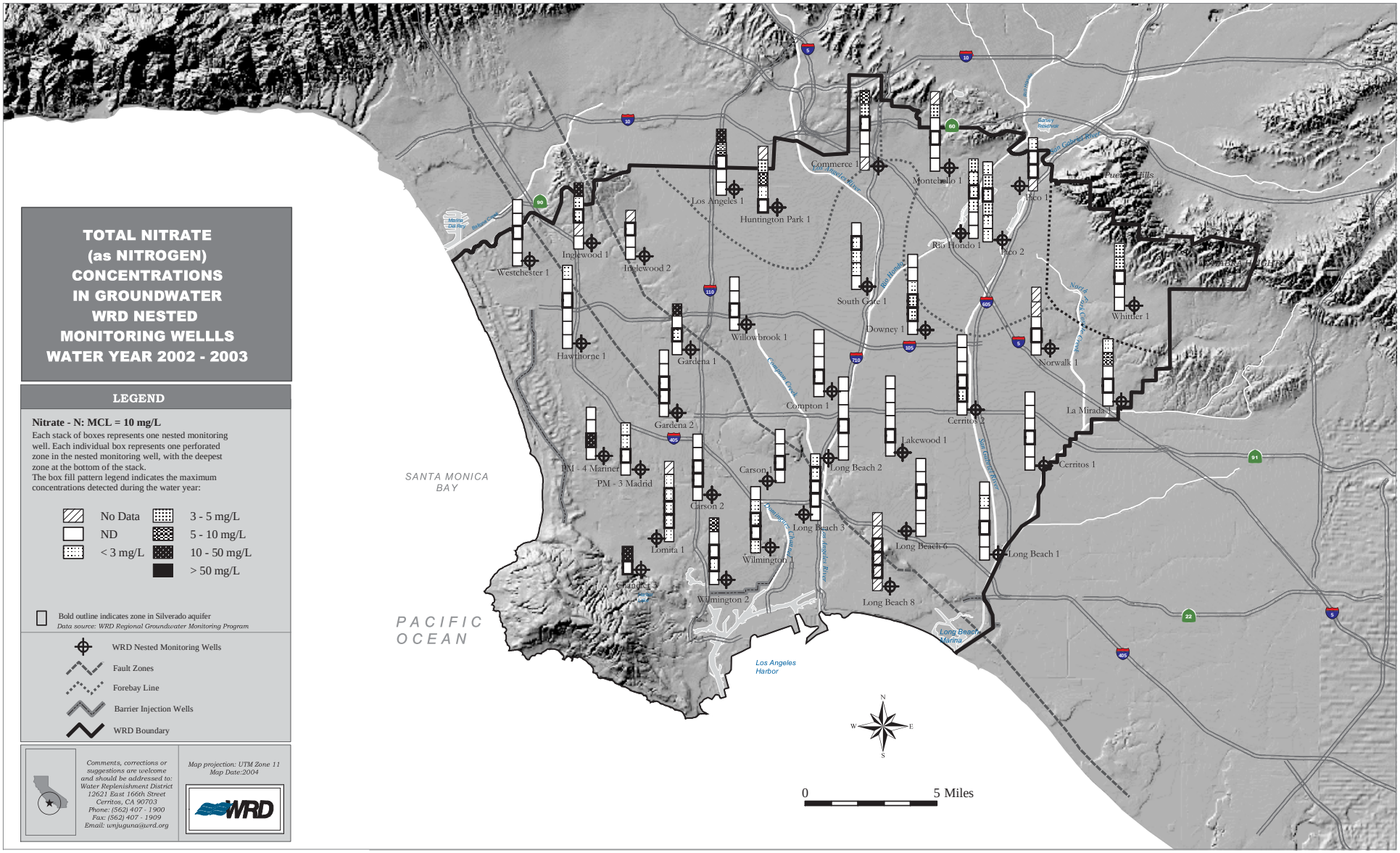

TOTAL NITRATE
(as NITROGEN)
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLLS
WATER YEAR 2002 - 2003
LEGEND
Nitrate - N: MCL = 10 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< 3 mg/L
3 - 5 mg/L
5 - 10 mg/L
10 - 50 mg/L
> 50 mg/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Los Angeles 1
Huntington Park 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Willowbrook 1
Hawthorne 1
Gardena 1
Gardena 2
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
Los Angeles Harbor
Long Beach Marina
0
5 Miles

Figure 4.7

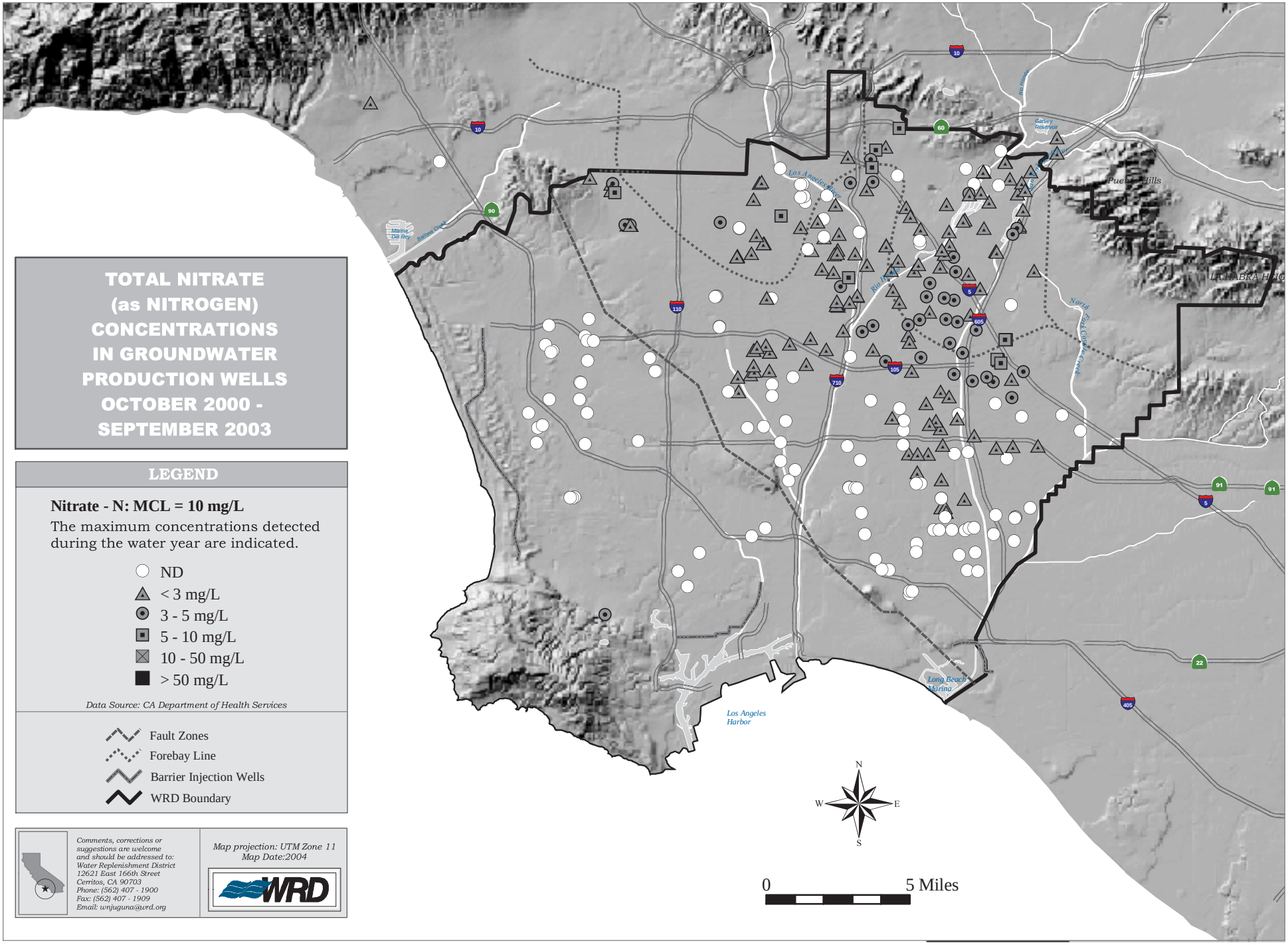

TOTAL NITRATE
(as NITROGEN)
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 2000 -
SEPTEMBER 2003
LEGEND
Nitrate - N: MCL = 10 mg/L
The maximum concentrations detected during the water year are indicated.
ND
< 3 mg/L
3 - 5 mg/L
5 - 10 mg/L
10 - 50 mg/L
> 50 mg/L
Data Source: CA Department of Health 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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
N
W
E
S
0
5 Miles
Los Angeles River
Rio Hondo
Marina Del Rey
Ballona Creek
Harvey Reservoir
Puente Hills
LA HABRA HTS
North East Coyote Creek
Los Angeles Harbor
Long Beach Marina

Figure 4.8

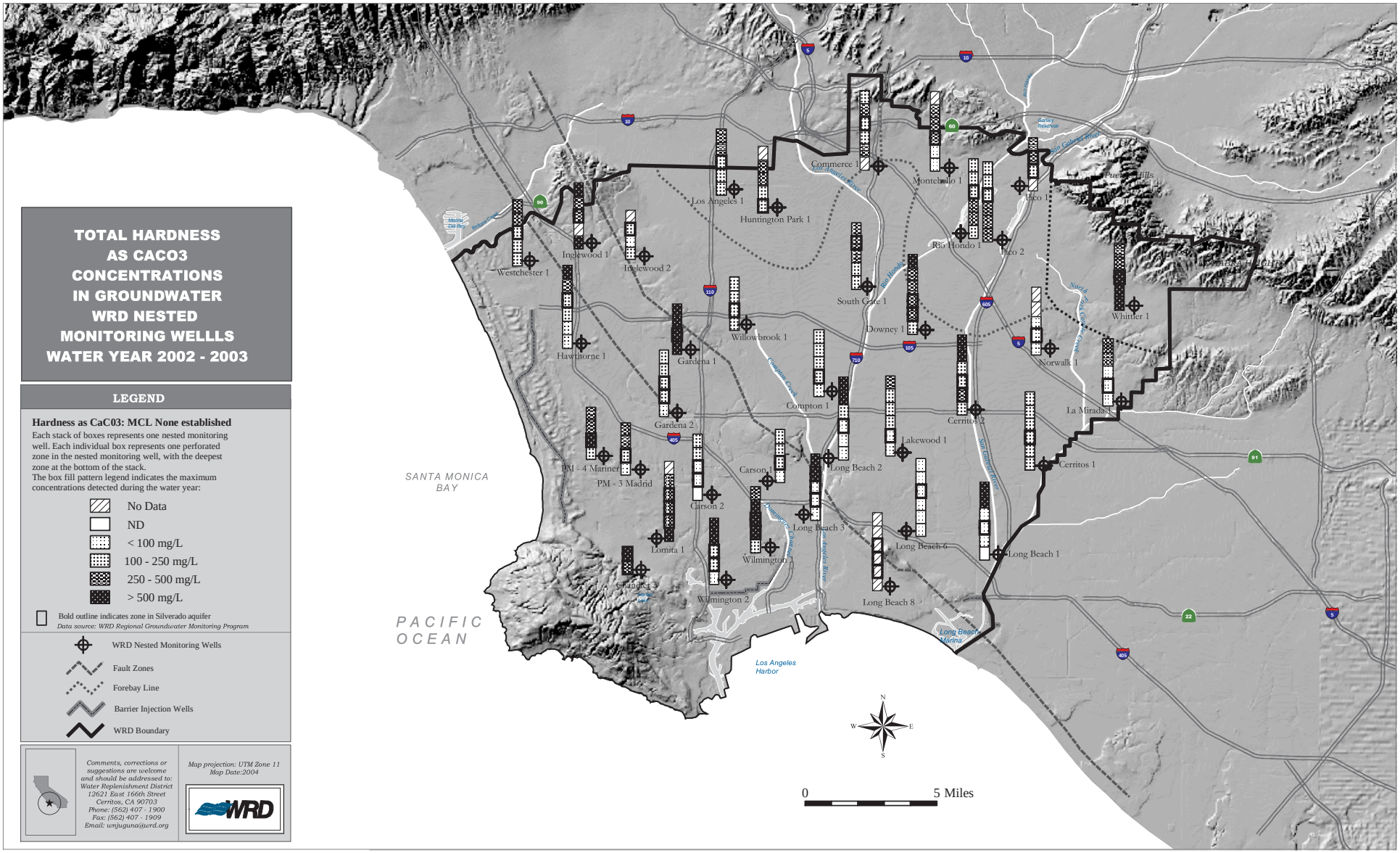
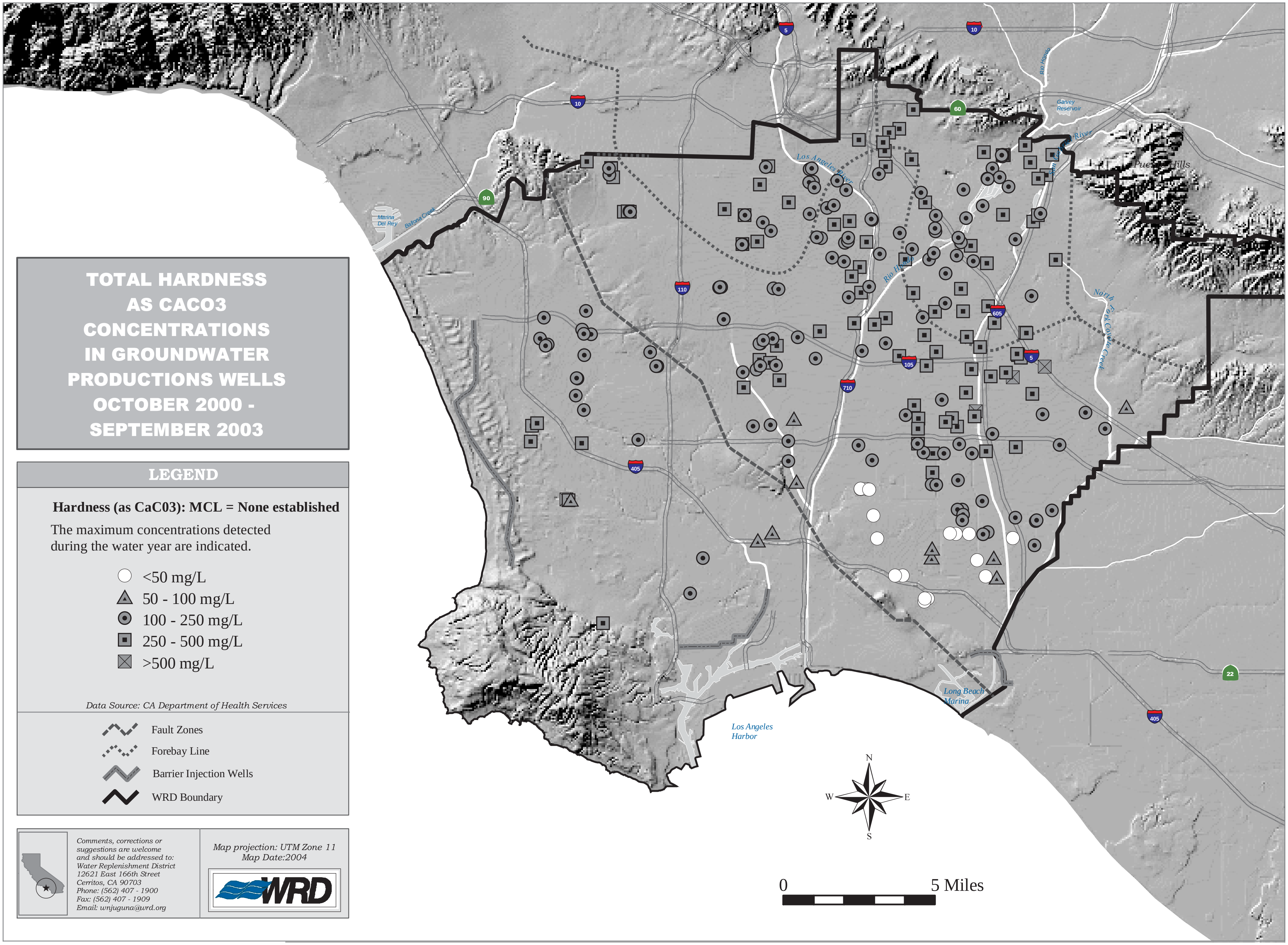

TOTAL HARDNESS AS CACO3 CONCENTRATIONS IN GROUNDWATER WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
Hardness as CaC03: MCL None established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< 100 mg/L
100 - 250 mg/L
250 - 500 mg/L
> 500 mg/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Commerce 1
Montebello 1
Los Angeles 1
Huntington Park 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Willowbrook 1
Hawthorne 1
Gardena 1
Norwalk 1
Compton 1
Gardena 2
Cerritos 2
La Mirada 1
Lakewood 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Long Beach 2
Cerritos 1
Carson 2
Long Beach 3
Long Beach 6
Lomita 1
Wilmington 1
Long Beach 1
Torrance 1
Wilmington 2
Long Beach 8
Long Beach Marina
Los Angeles Harbor
N
W
E
S
0
5 Miles

Figure 4.9



TOTAL HARDNESS AS CACO3 CONCENTRATIONS IN GROUNDWATER PRODUCTIONS WELLS OCTOBER 2000 - SEPTEMBER 2003

LEGEND

Hardness (as CaC03): MCL = 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 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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org

Map projection: UTM Zone 11
Map Date:2004

WRD

Figure 4.10

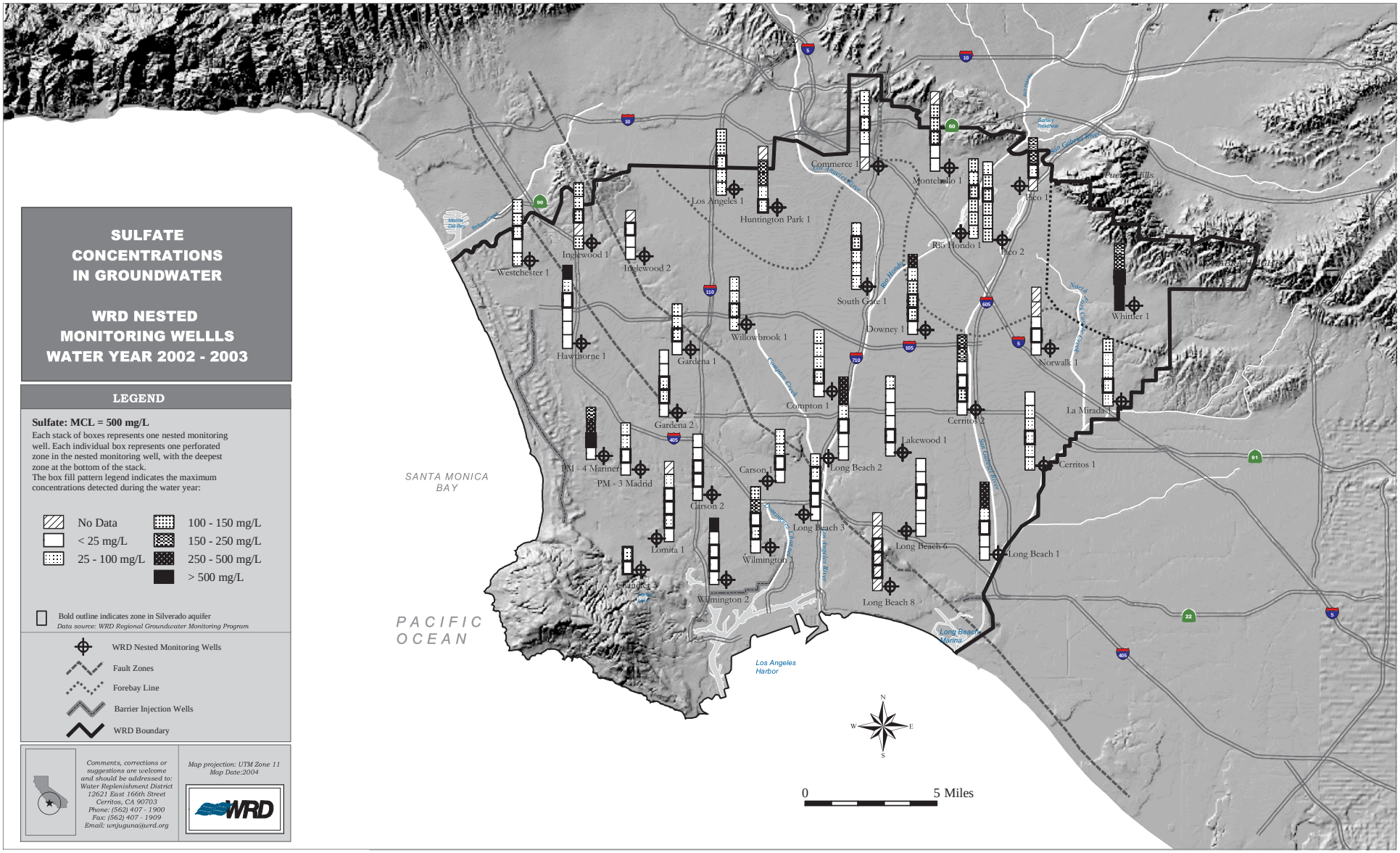
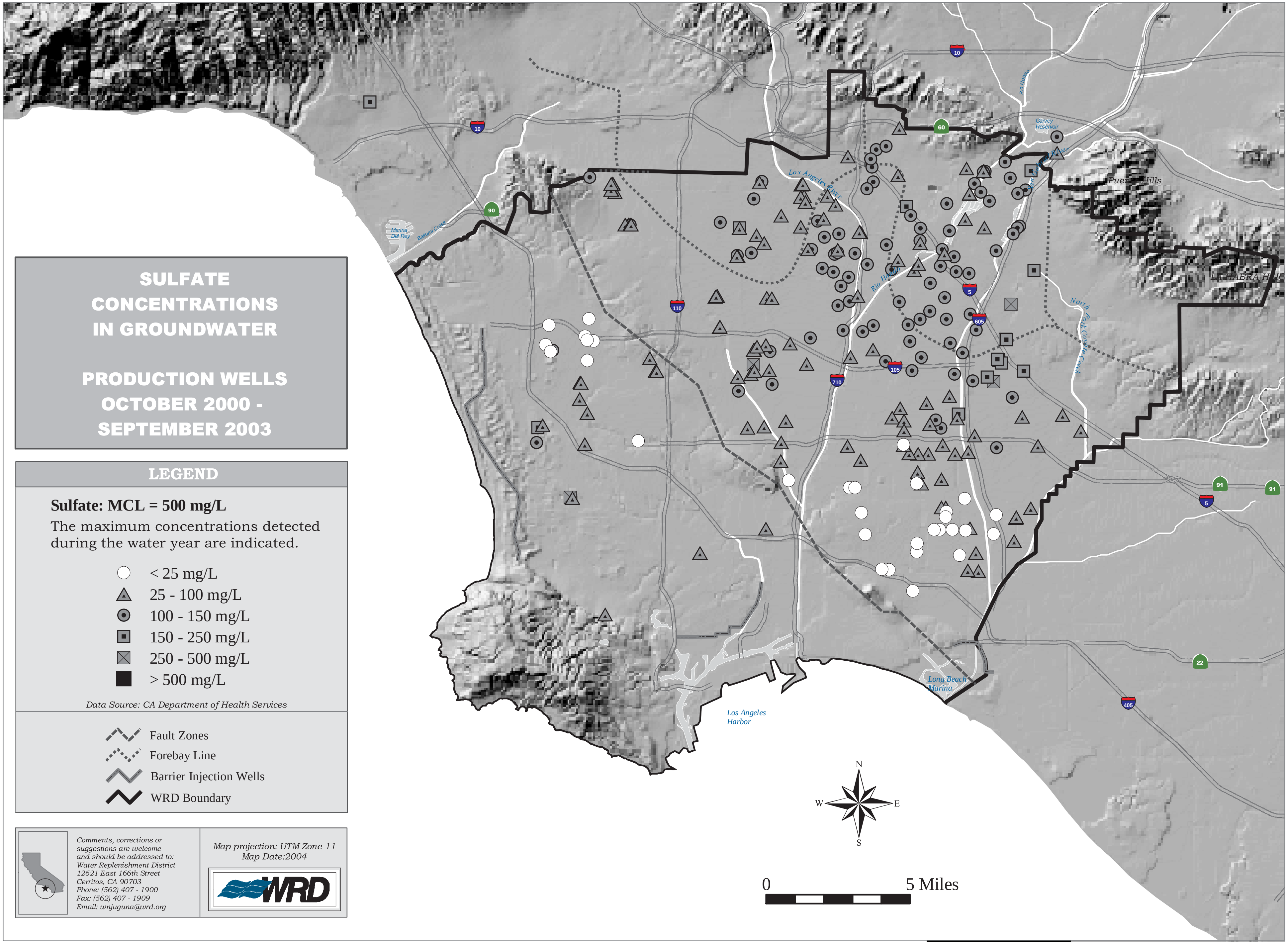

SULFATE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
Sulfate: MCL = 500 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
< 25 mg/L
25 - 100 mg/L
100 - 150 mg/L
150 - 250 mg/L
250 - 500 mg/L
> 500 mg/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Montebello 1
Los Angeles 1
Huntington Park 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Willowbrook 1
Hawthorne 1
Gardena 1
Gardena 2
Compton 1
Norwalk 1
La Mirada 1
Cerritos 2
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
0
5 Miles

Figure 4.11



SULFATE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003
LEGEND
Sulfate: MCL = 500 mg/L
The maximum concentrations detected during the water year are indicated.
< 25 mg/L
25 - 100 mg/L
100 - 150 mg/L
150 - 250 mg/L
250 - 500 mg/L
> 500 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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Los Angeles River
Rio Hondo
Los Angeles Harbor
Long Beach Marina
Garvey Reservoir
N
S
E
W
0
5 Miles

Figure 4.12

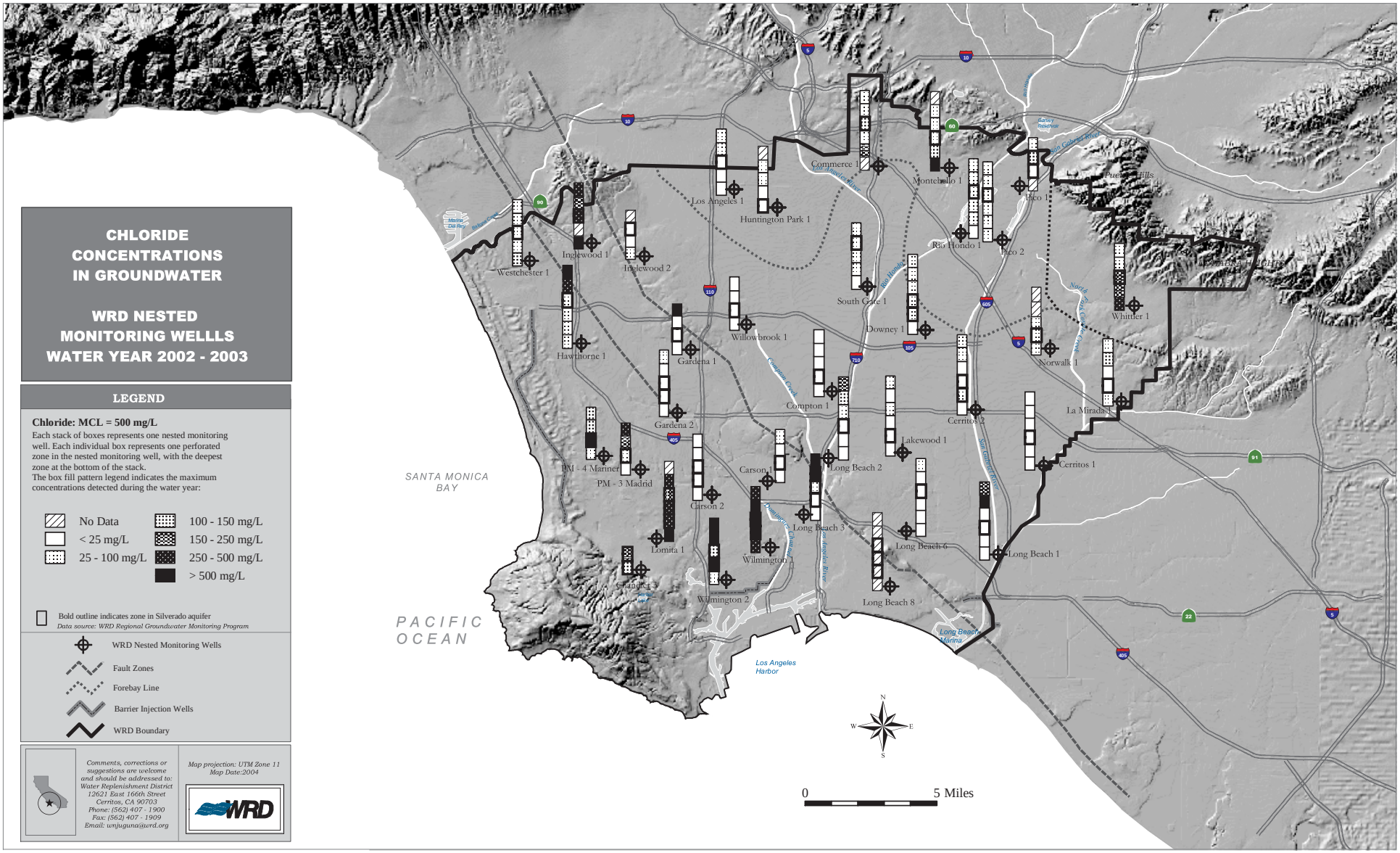
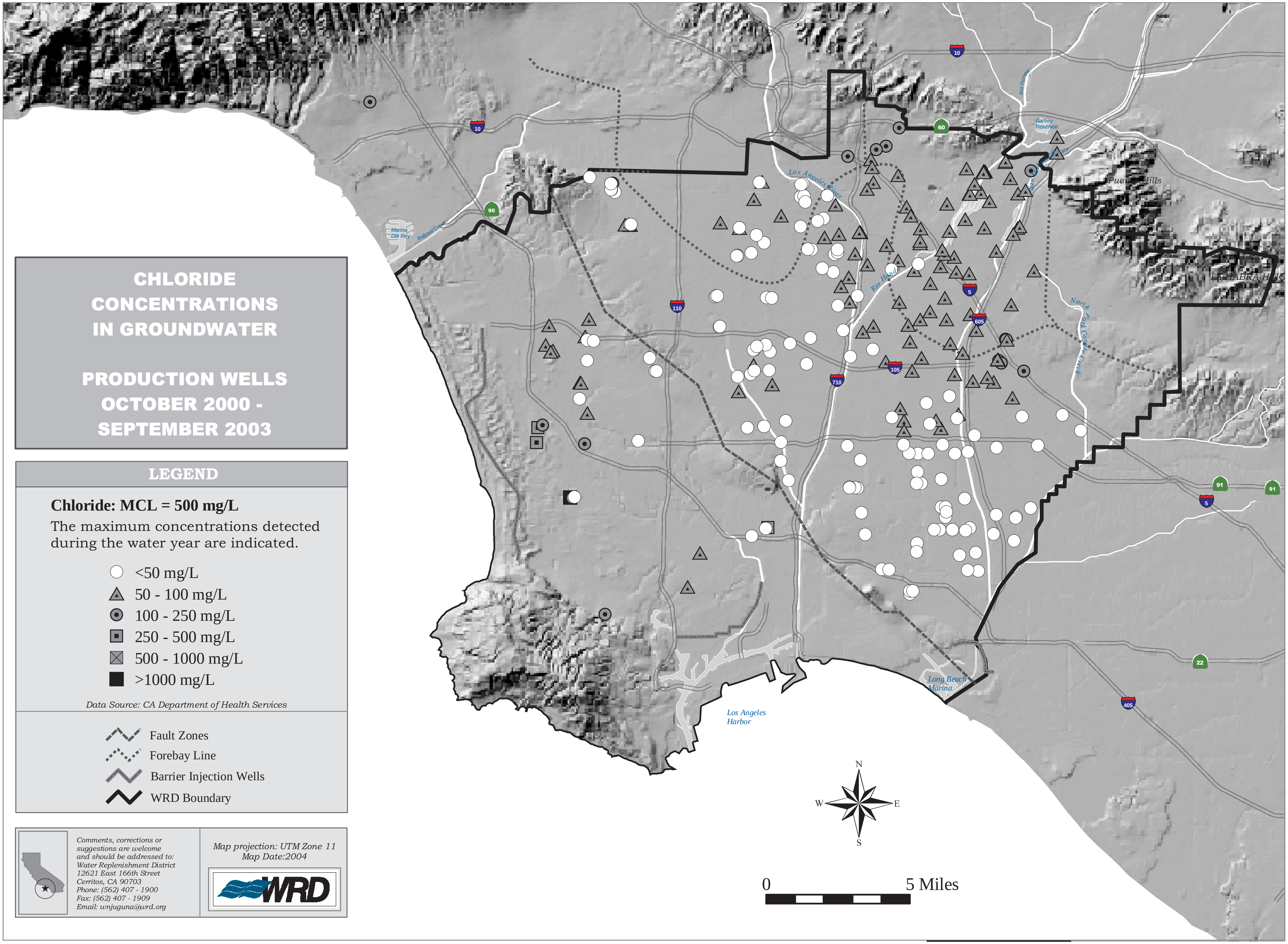

CHLORIDE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
Chloride: MCL = 500 mg/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
< 25 mg/L
25 - 100 mg/L
100 - 150 mg/L
150 - 250 mg/L
250 - 500 mg/L
> 500 mg/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Commerce 1
Montebello 1
Los Angeles 1
Huntington Park 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Whittier 1
Downey 1
Willowbrook 1
Hawthorne 1
Gardena 1
Norwalk 1
Compton 1
Cerritos 2
La Mirada 1
Gardena 2
Lakewood 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Long Beach 2
Cerritos 1
Carson 2
Long Beach 3
Long Beach 6
Lomita 1
Wilmington 1
Long Beach 1
Torrance 1
Wilmington 2
Long Beach 8
Los Angeles Harbor
Long Beach Marina
N
W
E
S
0
5 Miles

Figure 4.13



CHLORIDE CONCENTRATIONS IN GROUNDWATER

PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003

LEGEND

Chloride: MCL = 500 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 - 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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org

Map projection: UTM Zone 11
Map Date:2004

Figure 4.14

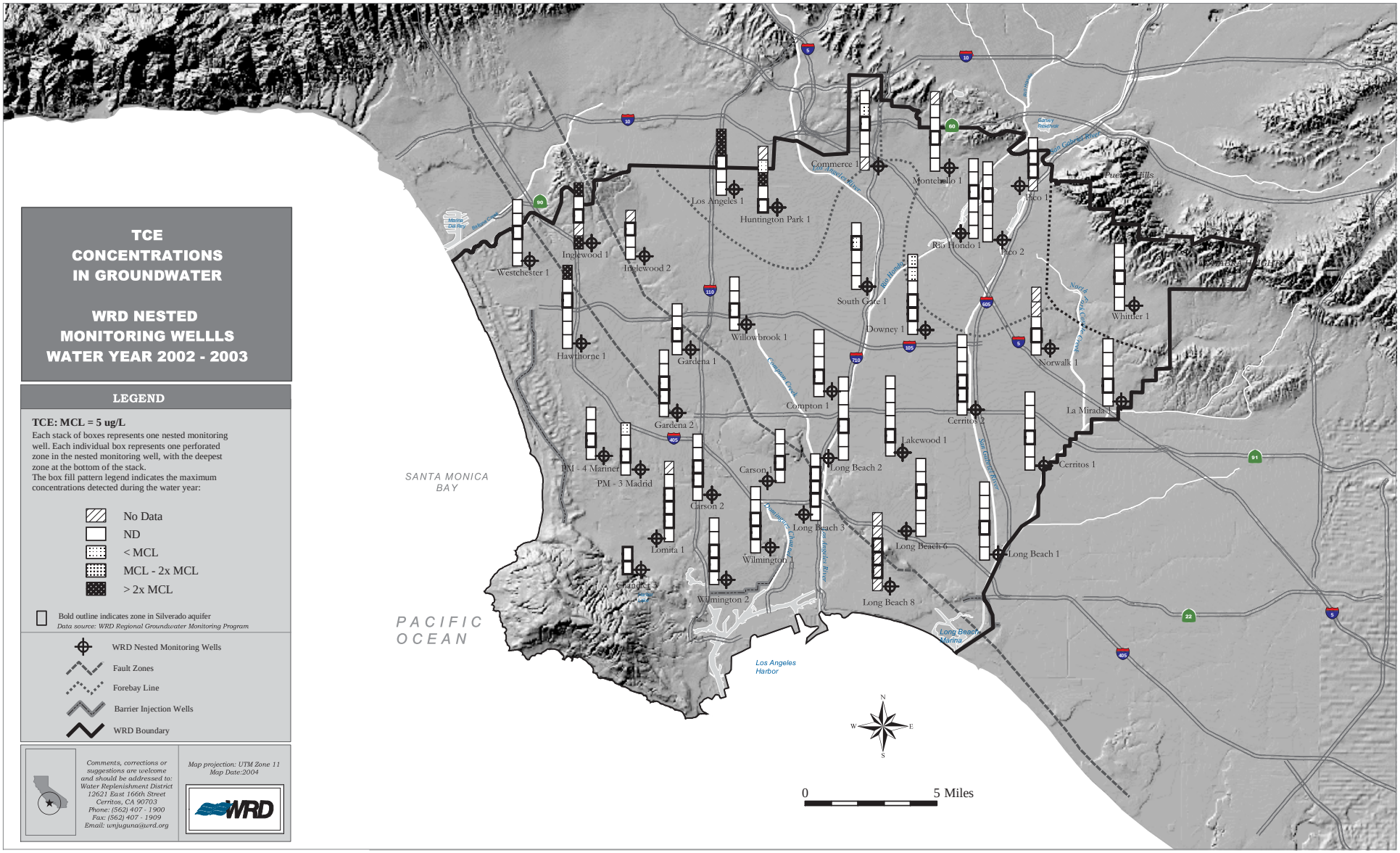

TCE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLLS
WATER YEAR 2002 - 2003
LEGEND
TCE: MCL = 5 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< MCL
MCL - 2x MCL
> 2x MCL
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Los Angeles 1
Huntington Park 1
Inglewood 1
Inglewood 2
Westchester 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
0
5 Miles
N
S
E
W

Figure 4.15

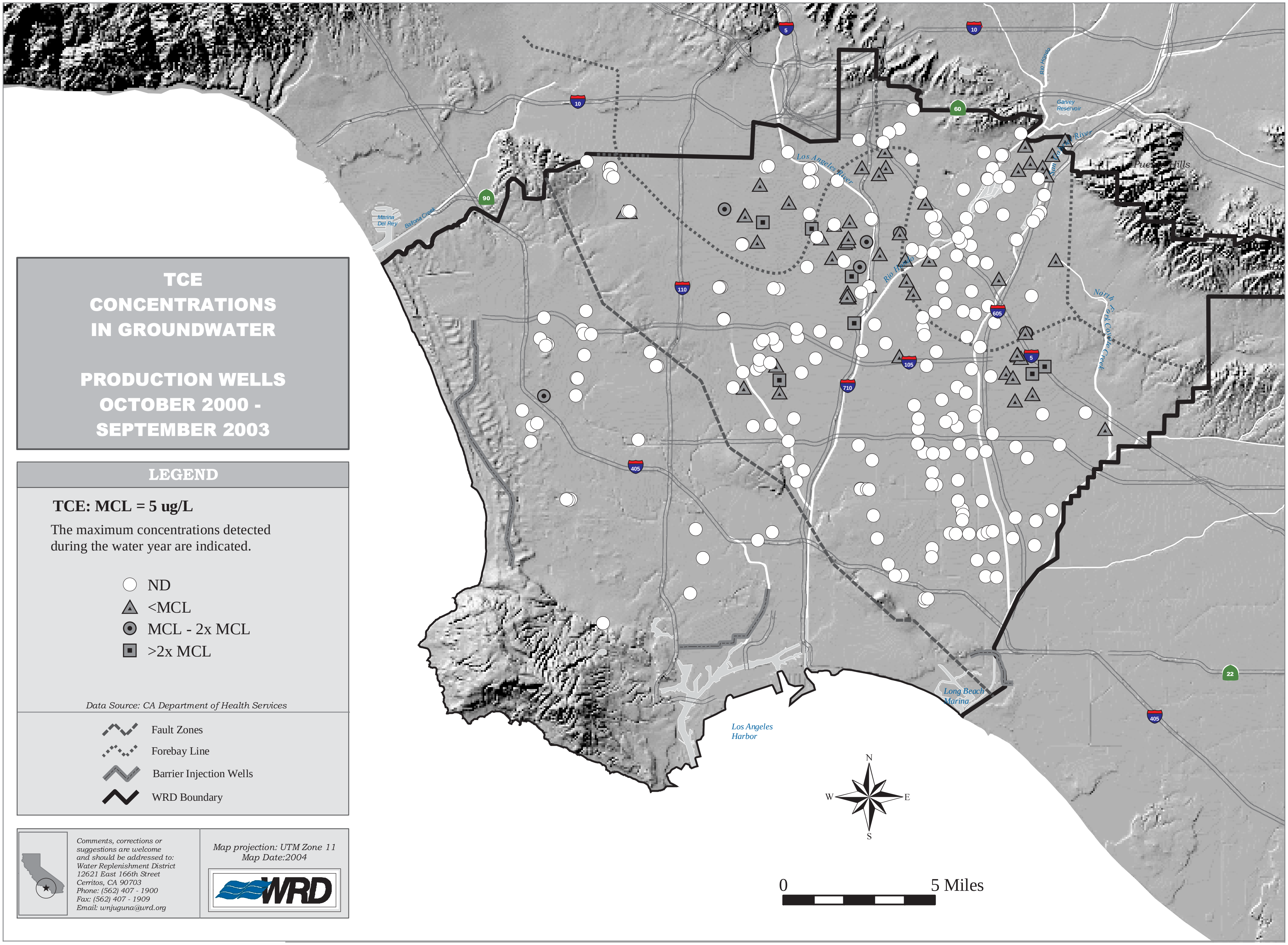

TCE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003
LEGEND
TCE: MCL = 5 ug/L
The maximum concentrations detected during the water year are indicated.
ND
<MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Los Angeles River
Rio Hondo
North Fork Coyote Creek
Ballona Creek
Marina Del Rey
Garvey Reservoir
Puente Hills
Los Angeles Harbor
Long Beach Marina
N
S
E
W
0
5 Miles

Figure 4.16

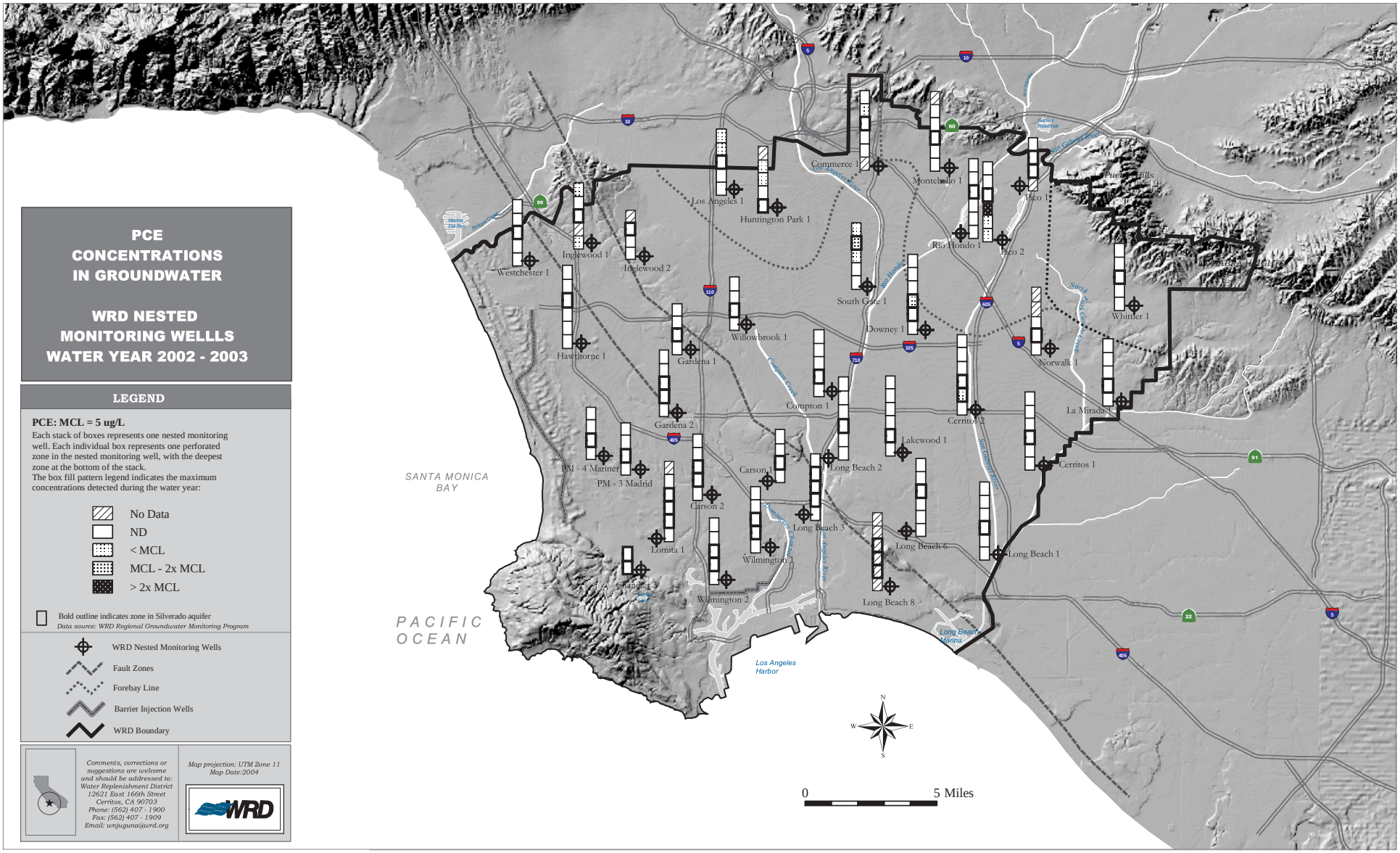

PCE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLLS
WATER YEAR 2002 - 2003
LEGEND
PCE: MCL = 5 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< MCL
MCL - 2x MCL
> 2x MCL
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Los Angeles 1
Huntington Park 1
Inglewood 1
Inglewood 2
Westchester 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
Rio Hondo
San Gabriel River
Coyote Creek
Dominguez Channel
Los Angeles River
Puente Hills
0
5 Miles
N
S
E
W

Figure 4.17

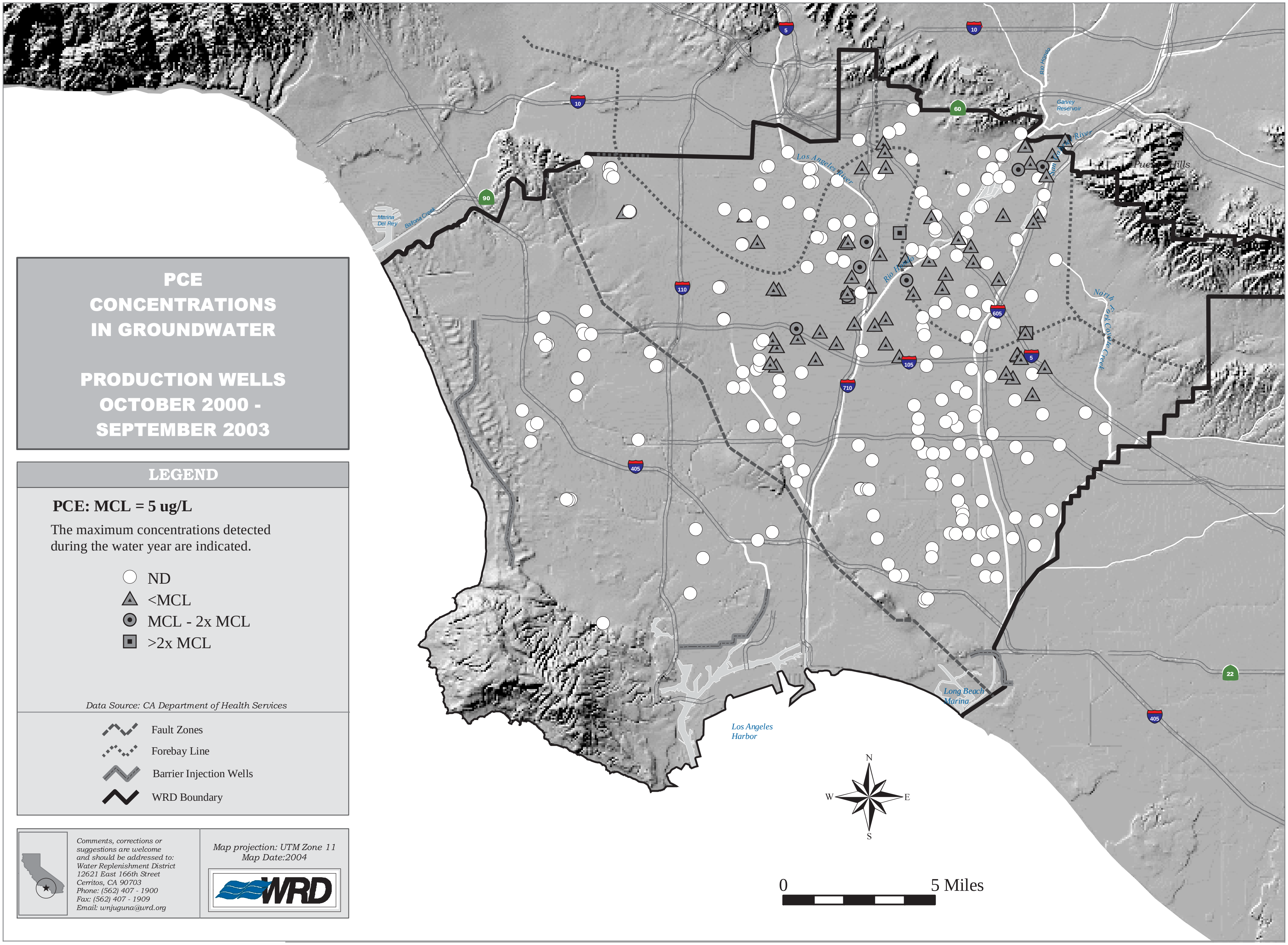

PCE CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003
LEGEND
PCE: MCL = 5 ug/L
The maximum concentrations detected during the water year are indicated.
ND
<MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
0
5 Miles
N
E
S
W
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Puente Hills
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles Harbor
Long Beach Marina
5
10
60
90
110
405
605
710
105
22

Figure 4.18

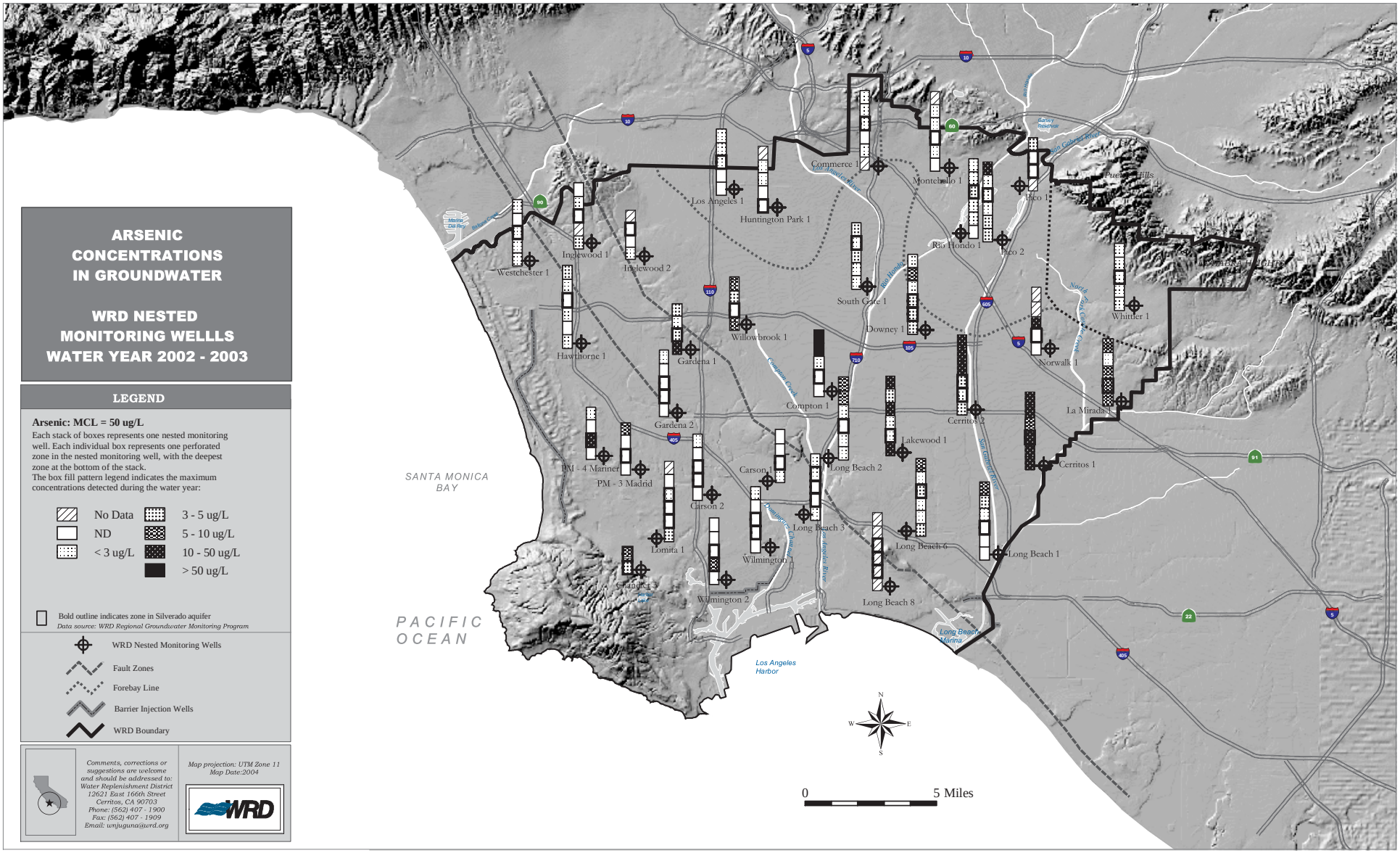

ARSENIC CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
Arsenic: MCL = 50 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< 3 ug/L
3 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L
> 50 ug/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Commerce 1
Los Angeles 1
Huntington Park 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Willowbrook 1
Hawthorne 1
Gardena 1
Gardena 2
Compton 1
Norwalk 1
La Mirada 1
Cerritos 2
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Long Beach 2
Carson 2
Long Beach 3
Long Beach 6
Lomita 1
Wilmington 1
Long Beach 1
Wilmington 2
Long Beach 8
Los Angeles Harbor
Long Beach Marina
0
5 Miles

Figure 4.19

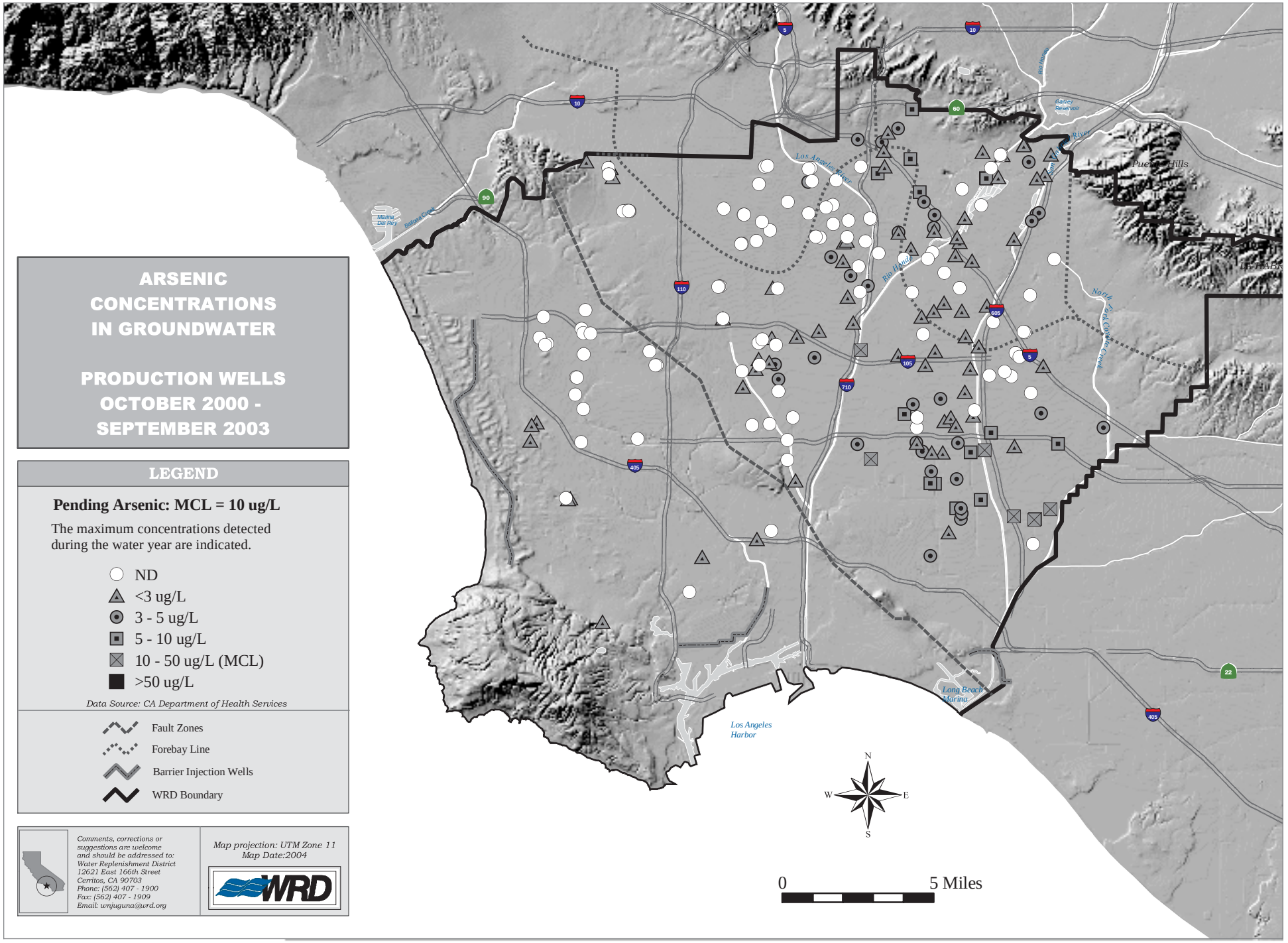

ARSENIC CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003
LEGEND
Pending Arsenic: MCL = 10 ug/L
The maximum concentrations detected during the water year are indicated.
ND
<3 ug/L
3 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L (MCL)
>50 ug/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Malibu Del Rey
Ballona Creek
Los Angeles Harbor
Long Beach Marina
Puente Hills
Harvey Reservoir
N
S
E
W
0
5 Miles

Figure 4.20

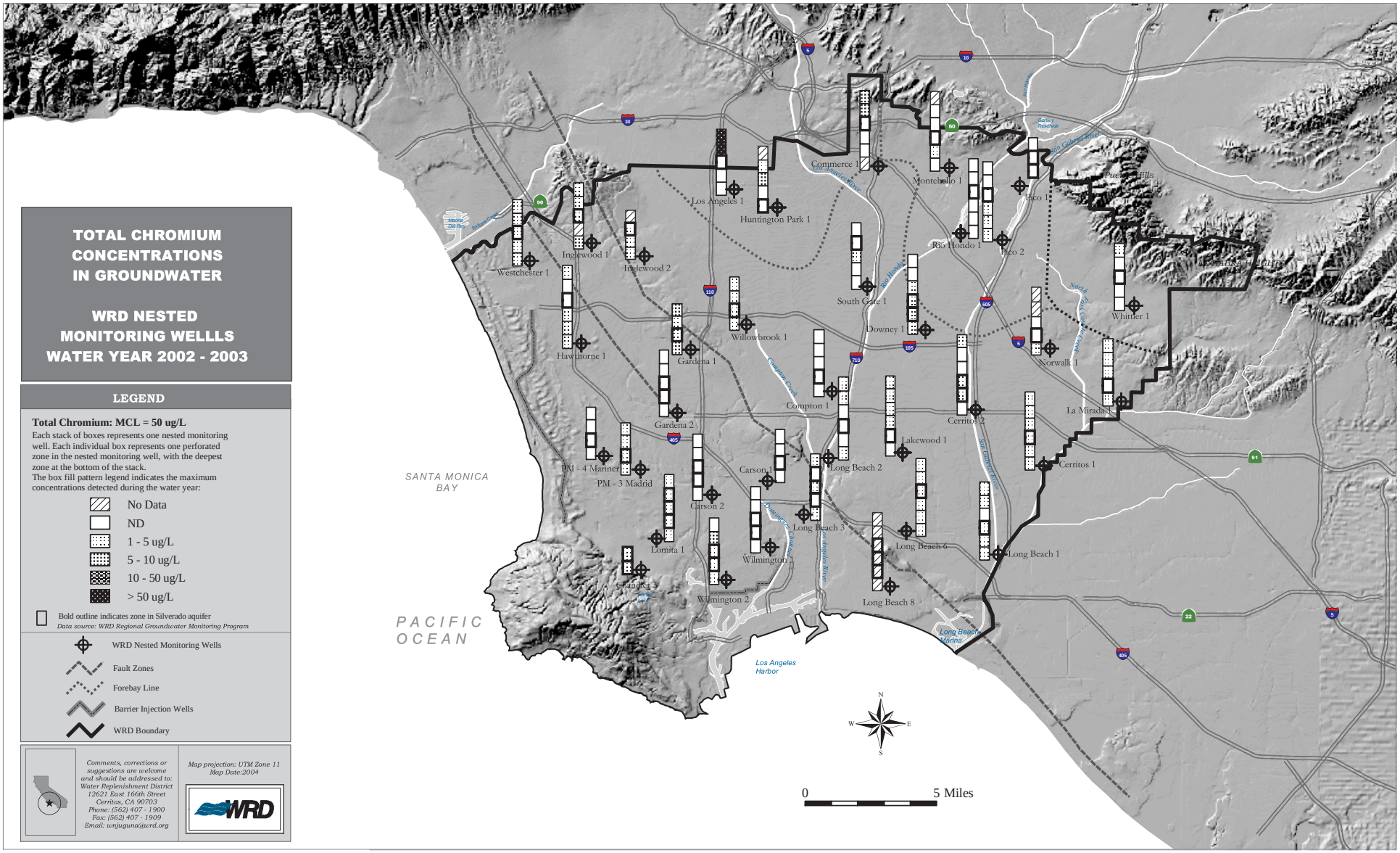

TOTAL CHROMIUM CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
Total Chromium: MCL = 50 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
1 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L
> 50 ug/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Commerce 1
Montebello 1
Los Angeles 1
Huntington Park 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Long Beach 2
Carson 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Torrance 1
Wilmington 2
Long Beach 8
Long Beach Marina
Los Angeles Harbor
0
5 Miles

Figure 4.21

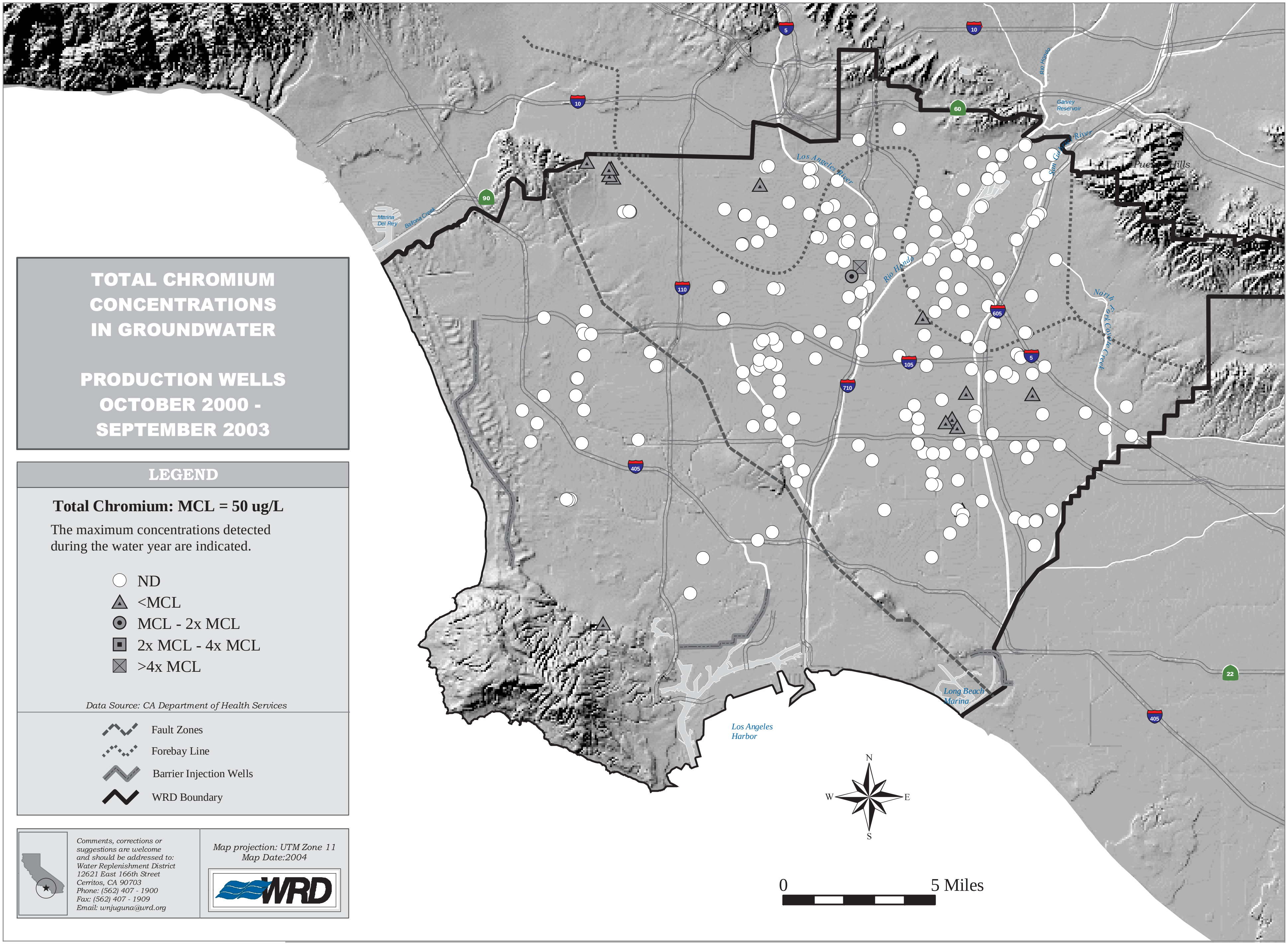

TOTAL CHROMIUM CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003
LEGEND
Total Chromium: MCL = 50 ug/L
The maximum concentrations detected during the water year are indicated.
ND
<MCL
MCL - 2x MCL
2x MCL - 4x MCL
>4x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Ballona Creek
Marina Del Rey
Garvey Reservoir
Puente Hills
Los Angeles Harbor
Long Beach Marina
N
W
E
S
0
5 Miles

Figure 4.22

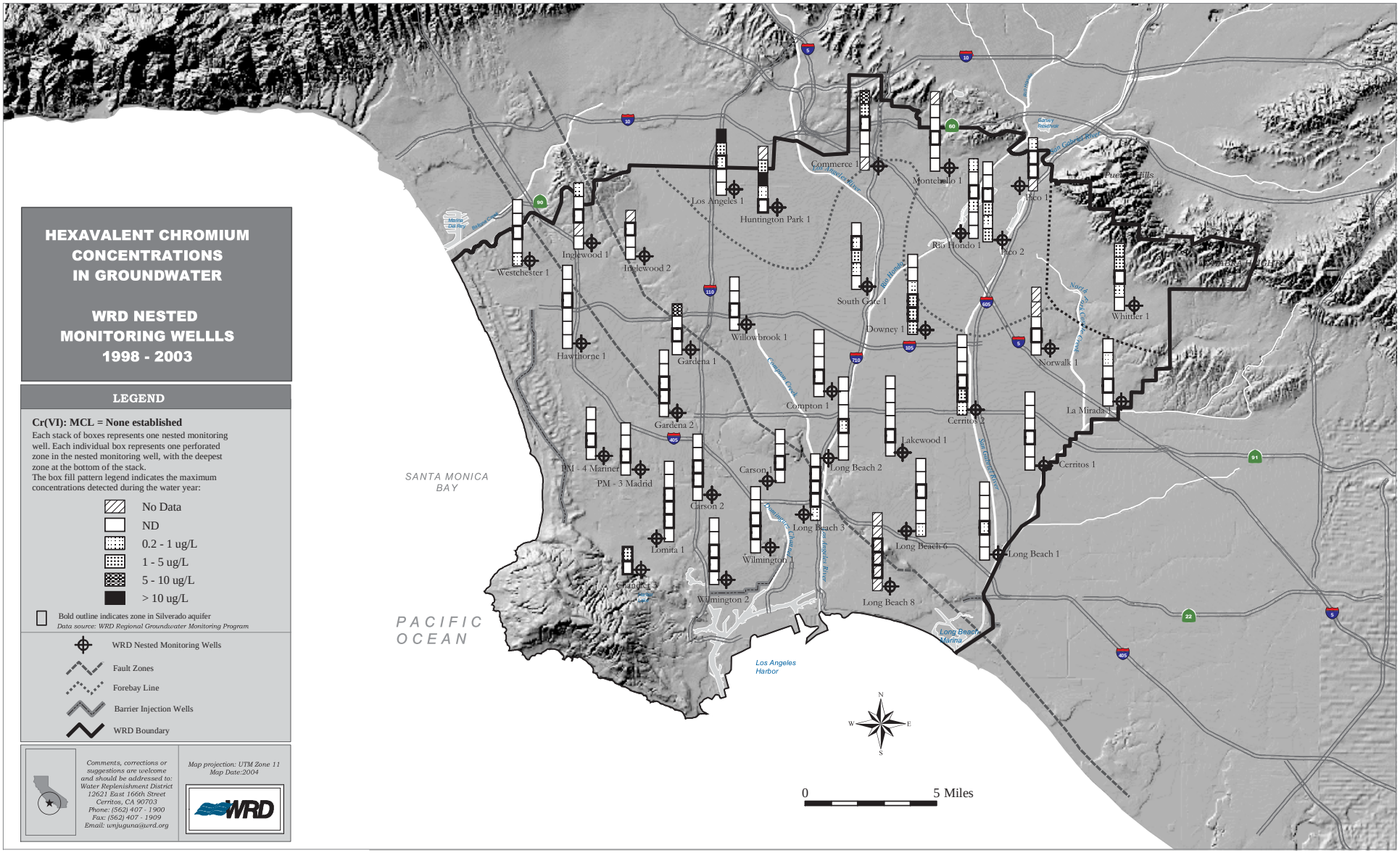

HEXAVALENT CHROMIUM CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS 1998 - 2003
LEGEND
Cr(VI): MCL = None established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
0.2 - 1 ug/L
1 - 5 ug/L
5 - 10 ug/L
> 10 ug/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Montebello 1
Los Angeles 1
Huntington Park 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Willowbrook 1
Hawthorne 1
Gardena 1
Gardena 2
Compton 1
Norwalk 1
La Mirada 1
Cerritos 2
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
0
5 Miles

Figure 4.23

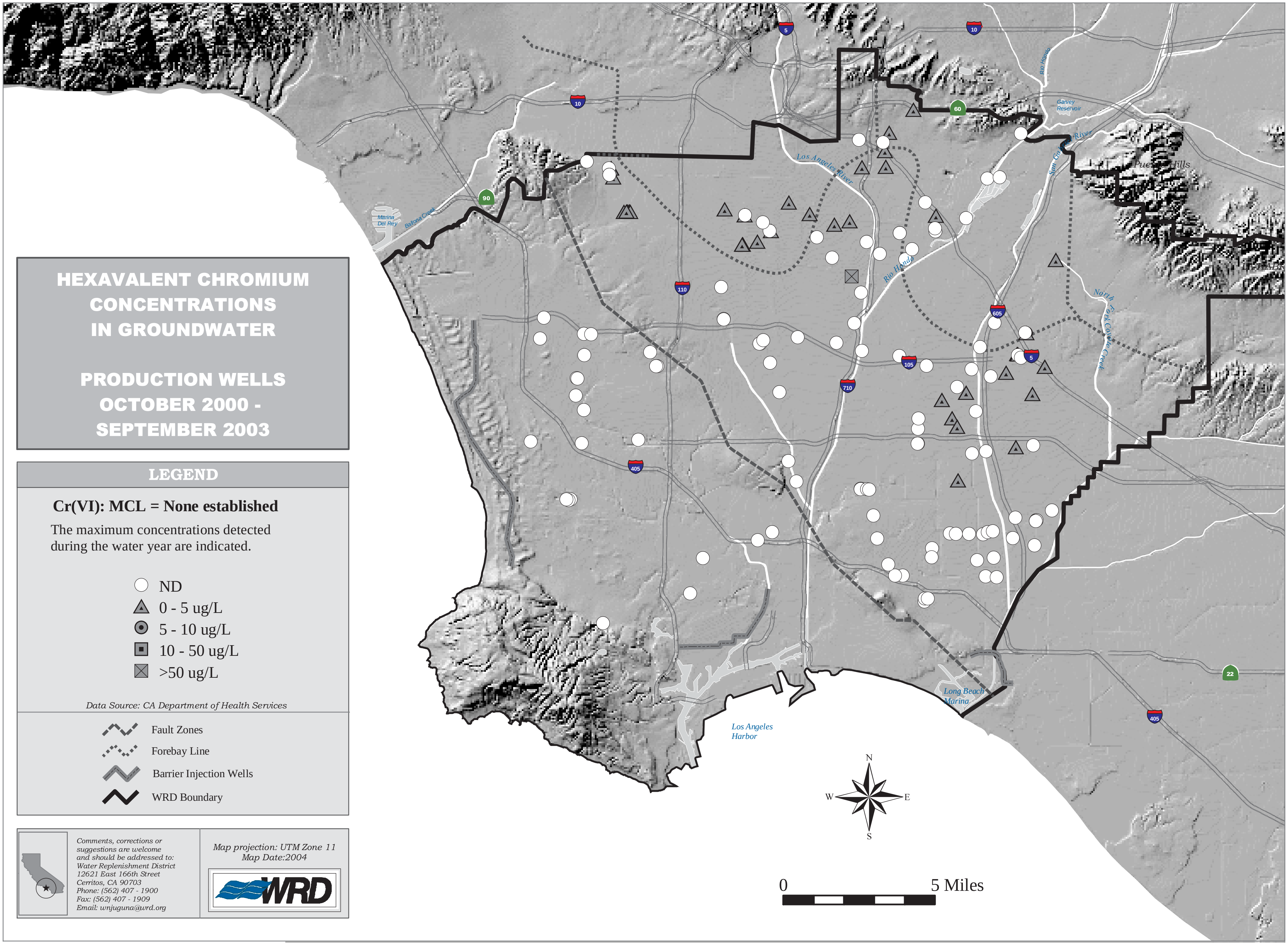

HEXAVALENT CHROMIUM
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 2000 -
SEPTEMBER 2003
LEGEND
Cr(VI): MCL = None established
The maximum concentrations detected during the water year are indicated.
ND
0 - 5 ug/L
5 - 10 ug/L
10 - 50 ug/L
>50 ug/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
Garvey Reservoir
Puente Hills
North Fork Coyote Creek
Long Beach Marina
Los Angeles Harbor
N
E
S
W
0
5 Miles

Figure 4.24

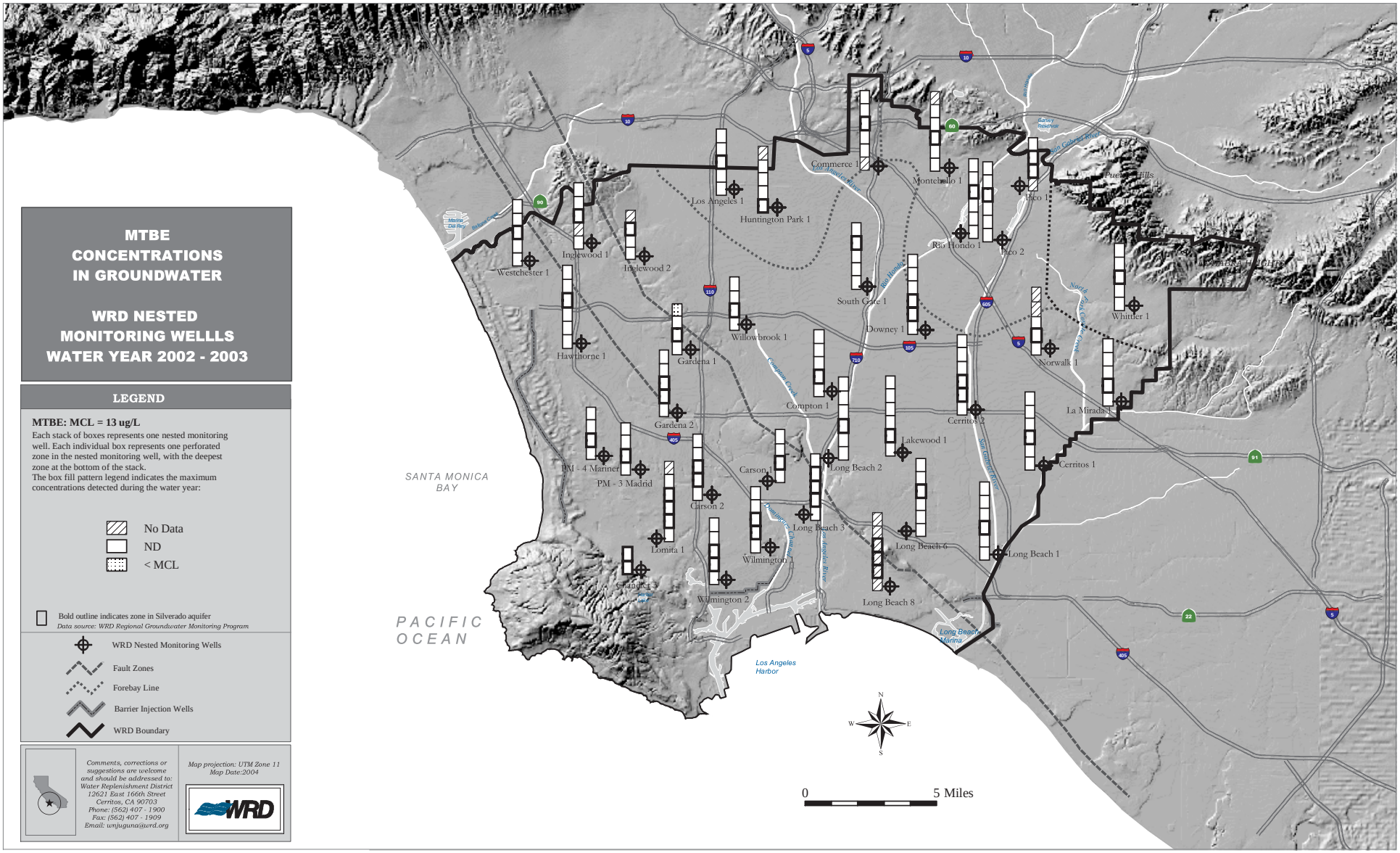

MTBE
CONCENTRATIONS
IN GROUNDWATER
WRD NESTED
MONITORING WELLLS
WATER YEAR 2002 - 2003
LEGEND
MTBE: MCL = 13 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< MCL
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles 1
Huntington Park 1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
Los Angeles Harbor
Long Beach Marina
0
5 Miles
N
W
E
S

Figure 4.25

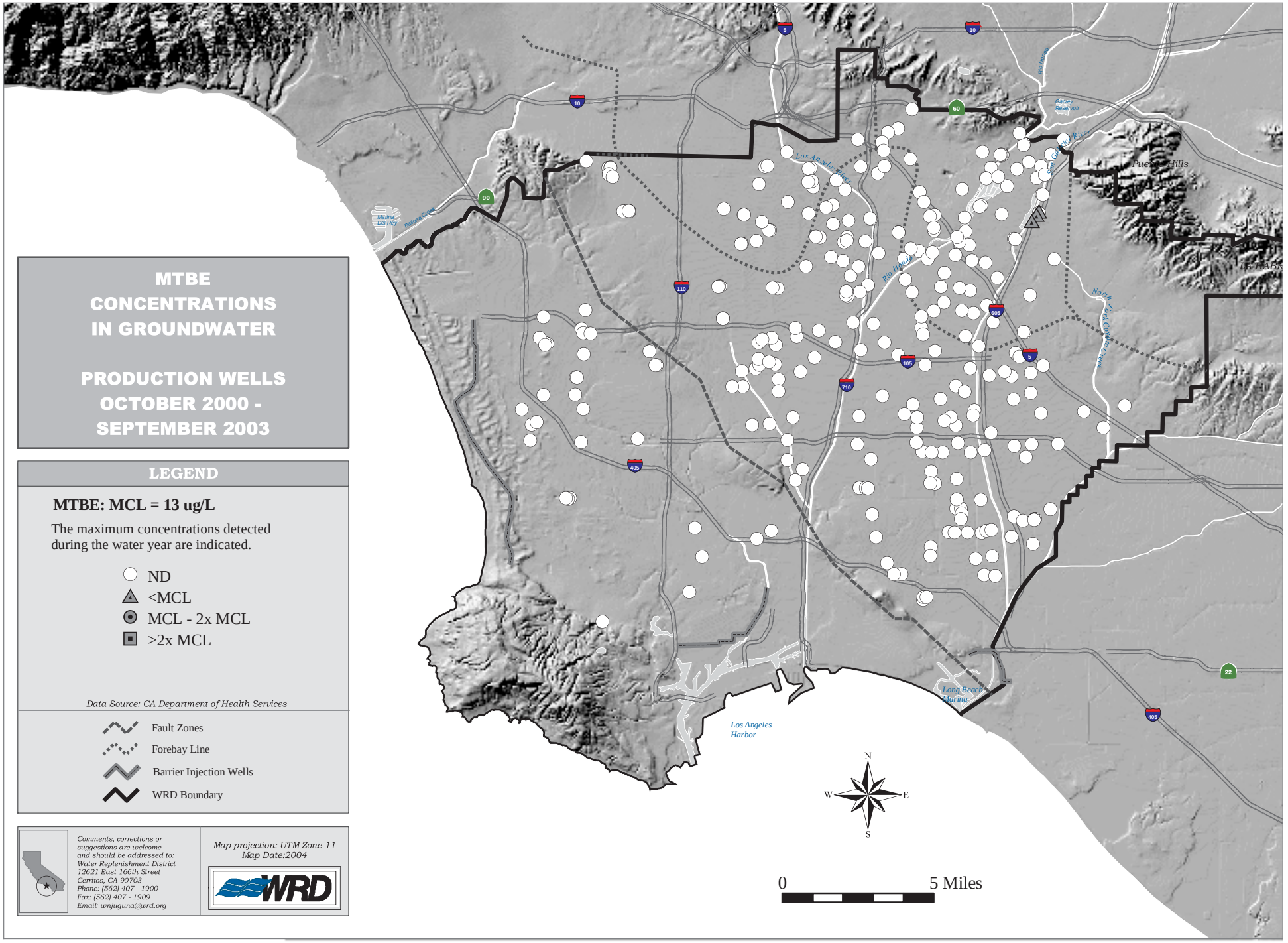

MTBE
CONCENTRATIONS
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 2000 -
SEPTEMBER 2003
LEGEND
MTBE: MCL = 13 ug/L
The maximum concentrations detected during the water year are indicated.
ND
<MCL
MCL - 2x MCL
>2x MCL
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
N
W
E
S
0
5 Miles
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Malibu Del Rey
Ballona Creek
Harvey Reservoir
Long Beach Marina
Los Angeles Harbor
Puente Hills
5
10
60
90
110
605
105
710
405
22

Figure 4.26

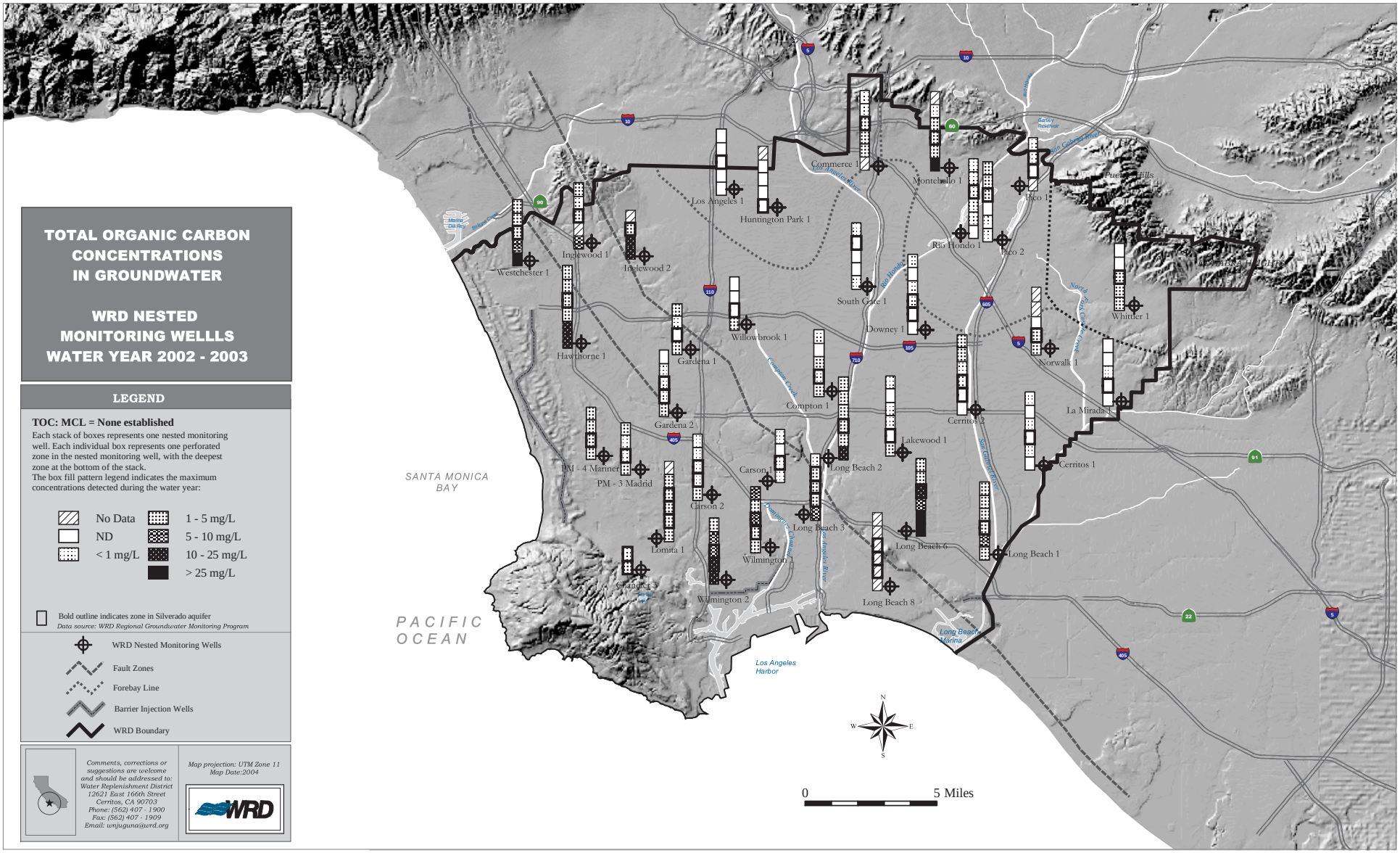

TOTAL ORGANIC CARBON CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
TOC: MCL = None established
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< 1 mg/L
1 - 5 mg/L
5 - 10 mg/L
10 - 25 mg/L
> 25 mg/L
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Commerce 1
Los Angeles 1
Huntington Park 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Inglewood 1
Inglewood 2
Westchester 1
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Long Beach 2
Carson 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Gardena 3
Wilmington 2
Long Beach 8
Rio Hondo
Compton Creek
Dominguez Channel
Los Angeles River
San Gabriel River
Puente Hills
La Habra Heights
N
S
E
W
0
5 Miles

Figure 4.27

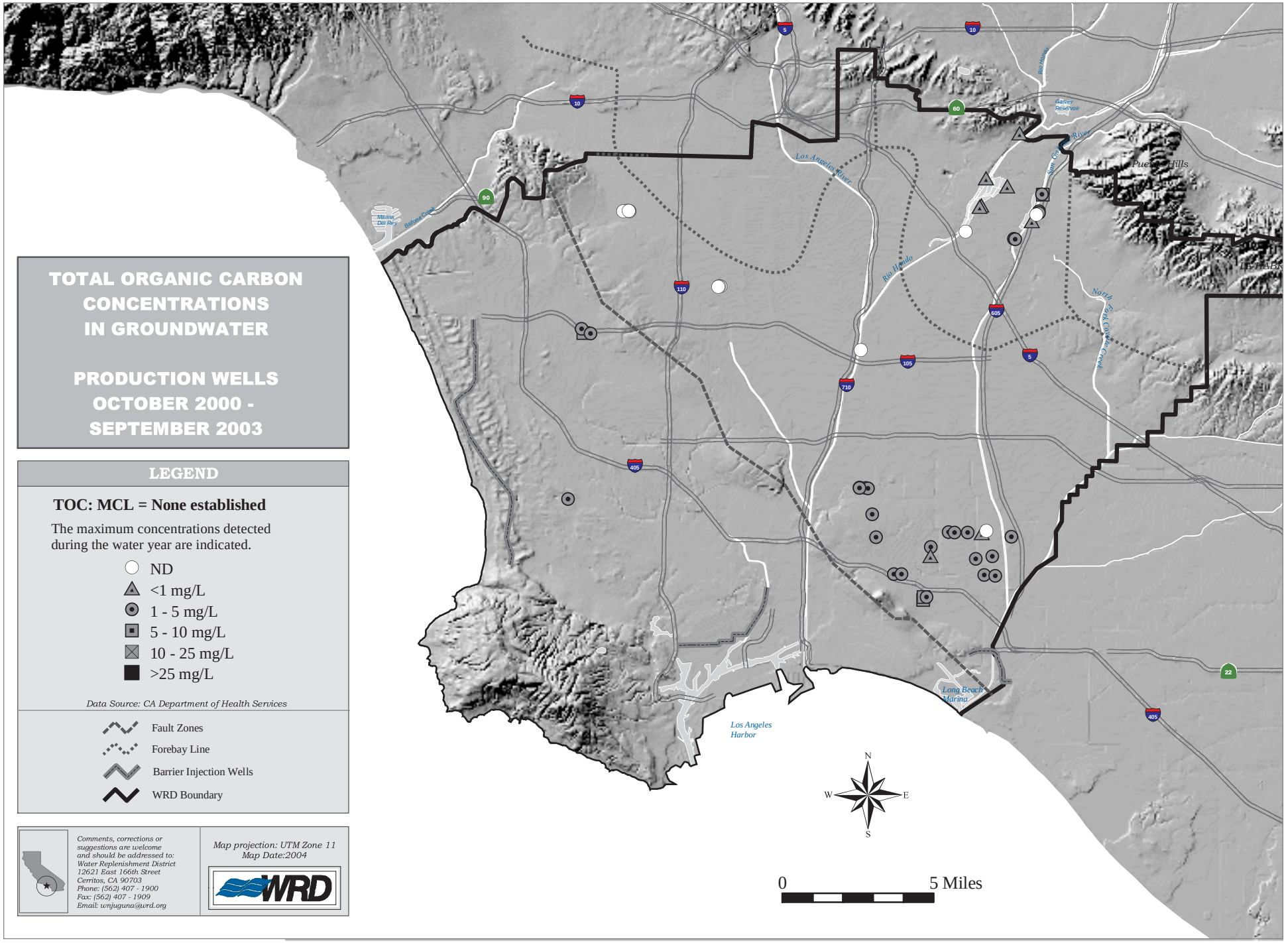

TOTAL ORGANIC CARBON CONCENTRATIONS IN GROUNDWATER
PRODUCTION WELLS OCTOBER 2000 - SEPTEMBER 2003
LEGEND
TOC: MCL = None established
The maximum concentrations detected during the water year are indicated.
ND
<1 mg/L
1 - 5 mg/L
5 - 10 mg/L
10 - 25 mg/L
>25 mg/L
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or suggestions are welcome and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Los Angeles River
Rio Hondo
San Gabriel River
North Fork San Gabriel Creek
Malibu Creek
Marina Del Rey
Los Angeles Harbor
Long Beach Marina
Puente Hills
Garvey Reservoir
N
S
E
W
0
5 Miles

Figure 4.28

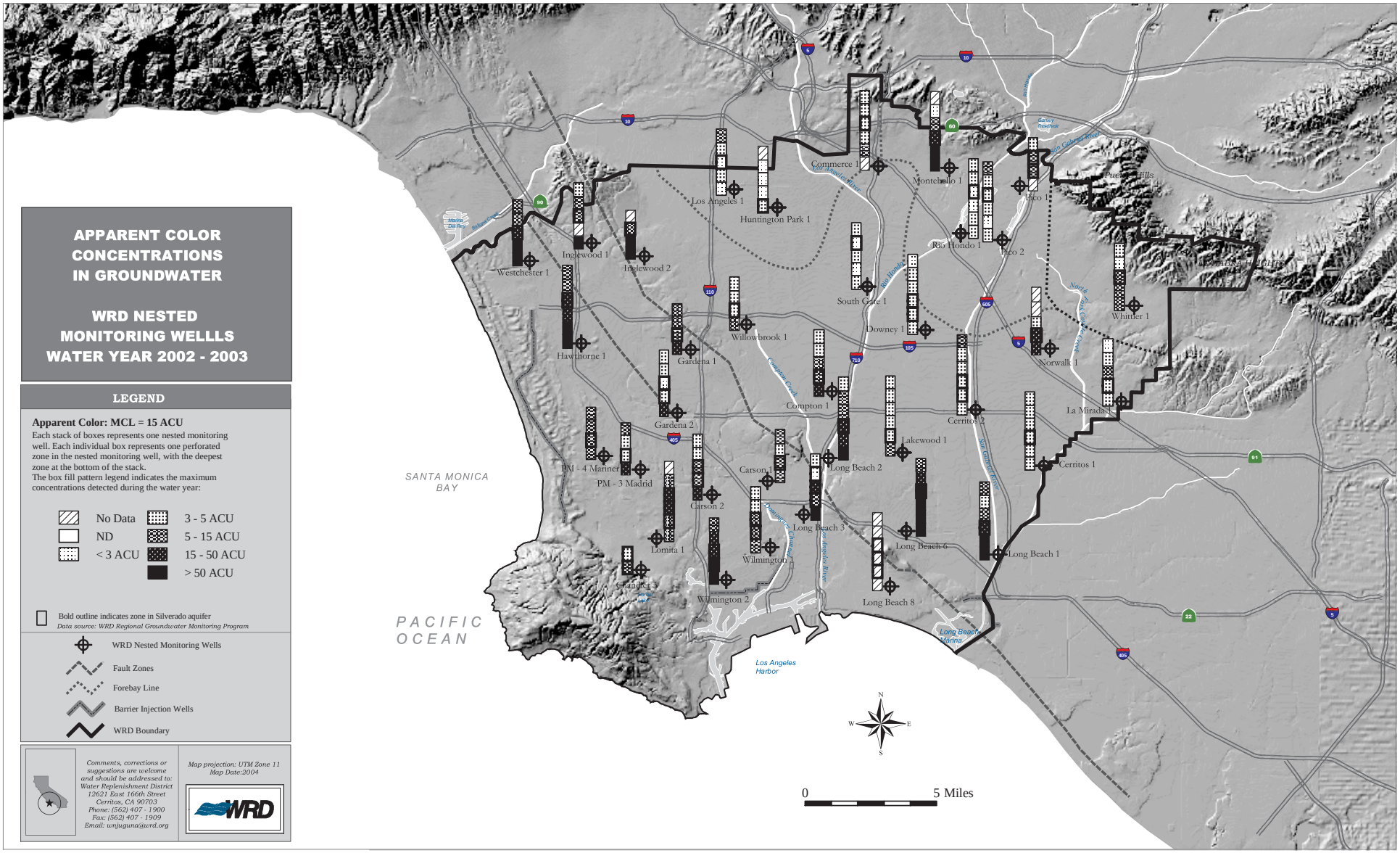

APPARENT COLOR CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS WATER YEAR 2002 - 2003
LEGEND
Apparent Color: MCL = 15 ACU
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< 3 ACU
3 - 5 ACU
5 - 15 ACU
15 - 50 ACU
> 50 ACU
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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wrjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Westchester 1
Inglewood 1
Inglewood 2
Los Angeles 1
Huntington Park 1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
Hawthorne 1
Willowbrook 1
Gardena 1
Gardena 2
South Gate 1
Downey 1
Norwalk 1
Whittier 1
Compton 1
Cerritos 2
La Mirada 1
Lakewood 1
Cerritos 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 1
Lomita 1
Wilmington 1
Wilmington 2
Long Beach 8
0
5 Miles

Figure 4.29

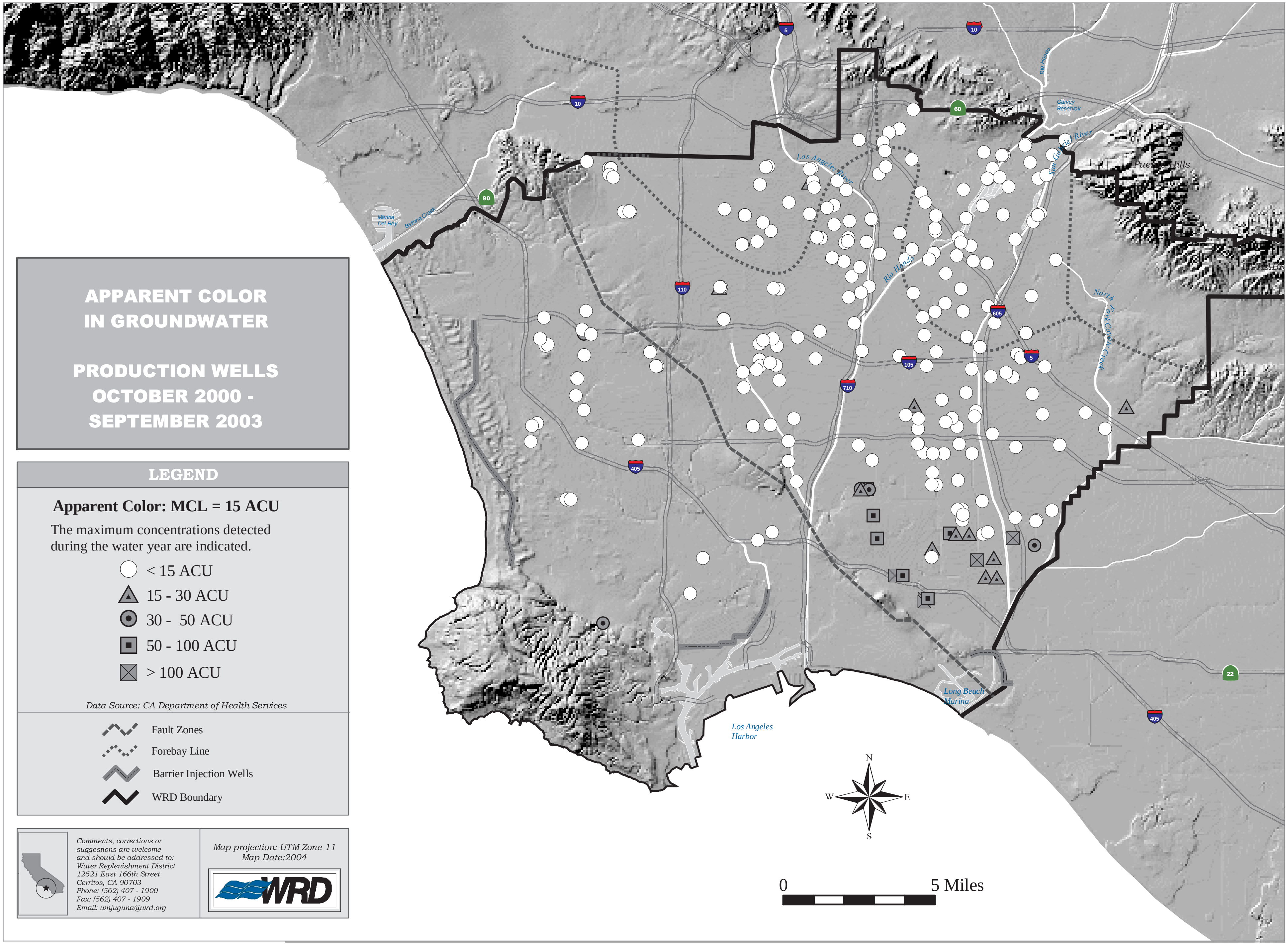

APPARENT COLOR
IN GROUNDWATER
PRODUCTION WELLS
OCTOBER 2000 -
SEPTEMBER 2003
LEGEND
Apparent Color: MCL = 15 ACU
The maximum concentrations detected
during the water year are indicated.
< 15 ACU
15 - 30 ACU
30 - 50 ACU
50 - 100 ACU
> 100 ACU
Data Source: CA Department of Health Services
Fault Zones
Forebay Line
Barrier Injection Wells
WRD Boundary
Comments, corrections or
suggestions are welcome
and should be addressed to:
Water Replenishment District
12621 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
Los Angeles River
Rio Hondo
San Gabriel River
North Fork Coyote Creek
Puente Hills
Garvey Reservoir
Marina Del Rey
Ballona Creek
Los Angeles Harbor
Long Beach Marina
N
S
E
W
0
5 Miles

Figure 4.30

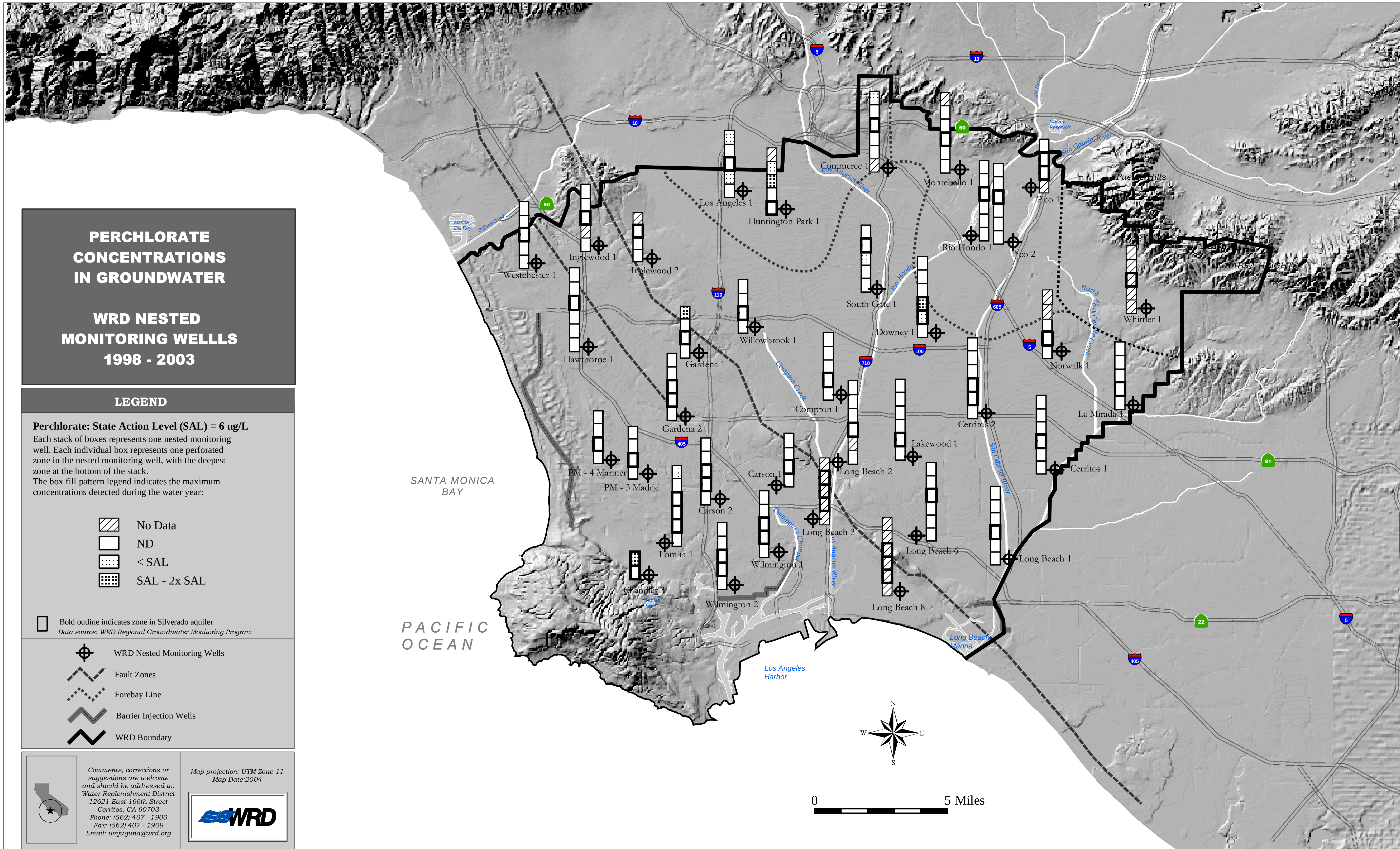
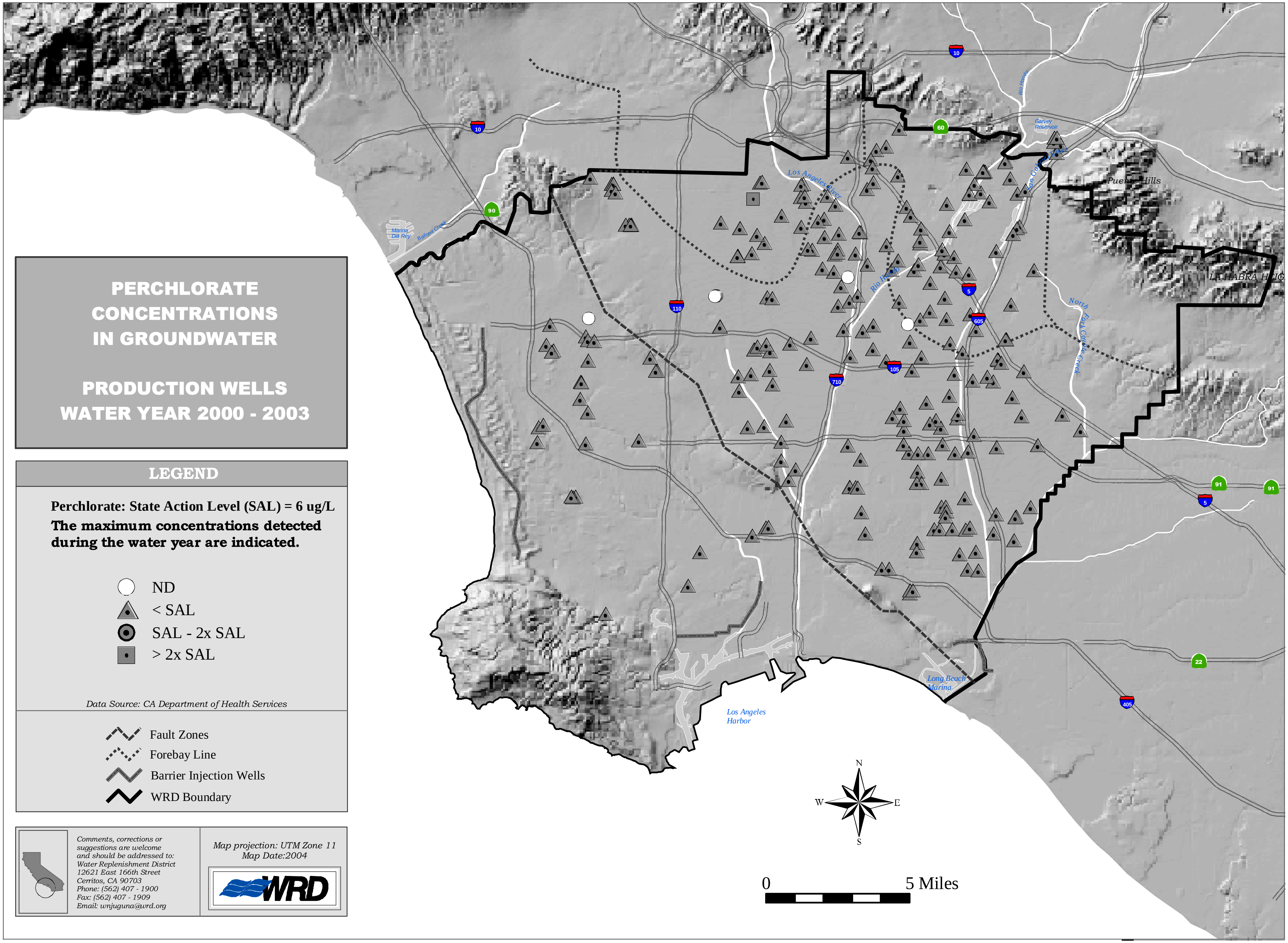

PERCHLORATE CONCENTRATIONS IN GROUNDWATER
WRD NESTED MONITORING WELLLS
1998 - 2003
LEGEND
Perchlorate: State Action Level (SAL) = 6 ug/L
Each stack of boxes represents one nested monitoring well. Each individual box represents one perforated zone in the nested monitoring well, with the deepest zone at the bottom of the stack.
The box fill pattern legend indicates the maximum concentrations detected during the water year:
No Data
ND
< SAL
SAL - 2x SAL
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 East 166th Street Cerritos, CA 90703 Phone: (562) 407 - 1900 Fax: (562) 407 - 1909 Email: wnjuguna@wrd.org
Map projection: UTM Zone 11
Map Date:2004
WRD
SANTA MONICA BAY
PACIFIC OCEAN
Los Angeles Harbor
Long Beach Marina
Westchester 1
Inglewood 1
Inglewood 2
Los Angeles 1
Huntington Park 1
Commerce 1
Montebello 1
Pico 1
Pico 2
Rio Hondo 1
South Gate 1
Downey 1
Whittier 1
Norwalk 1
Hawthorne 1
Gardena 1
Gardena 2
Willowbrook 1
Compton 1
Cerritos 2
Cerritos 1
La Mirada 1
Lakewood 1
Long Beach 2
Long Beach 3
Long Beach 6
Long Beach 8
Long Beach 1
PM - 4 Mariner
PM - 3 Madrid
Carson 1
Carson 2
Lomita 1
Chandler 3
Wilmington 1
Wilmington 2
Puente Hills
Los Angeles River
Rio Hondo
San Gabriel River
Compton Creek
Dominguez Channel
North Fork Coyote Creek
N
S
E
W
0
5 Miles

Figure 4.31



PERCHLORATE CONCENTRATIONS IN GROUNDWATER

PRODUCTION WELLS WATER YEAR 2000 - 2003

LEGEND

Perchlorate: State Action Level (SAL) = 6 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 East 166th Street
Cerritos, CA 90703
Phone: (562) 407 - 1900
Fax: (562) 407 - 1909
Email: wnjuguna@wrd.org

Map projection: UTM Zone 11
Map Date:2004

WRD

Figure 4.32