The exhibits in this section show the physical state of the Chino Basin with respect to groundwater quality, using data from the Chino Basin groundwater quality monitoring programs.

Prior to OBMP implementation, historical water quality data were obtained from the California Department of Water Resources (DWR) and supplemented with data from some producers in the Appropriative Pool and data from the State of California Department of Public Health (CDPH) database. As part of the OBMP implementation *Program Element 1 – Develop and Implement a Comprehensive Monitoring Program,* Watermaster began conducting a more robust water quality monitoring program, which includes obtaining data from well owners through a routine cooperative data collection program and supplementing with data obtained through its own sampling programs. Watermaster obtains the requisite data through several groundwater quality monitoring programs:

- **Annual Key Well Groundwater Quality Monitoring Program.** Historically, water quality data were very limited for the private wells in the southern portion of the Basin. In 1999, the comprehensive monitoring program initiated the systematic sampling of private wells south of State Route 60 in the Chino Basin. Over a three-year period from 1999 to 2001, Watermaster sampled all available wells at least twice to develop a robust baseline dataset. This program has since been reduced to approximately 110 key wells, located predominantly in the southern portion of the Basin: 100 wells are sampled on a triennial basis, and 10 are sampled on an annual basis.

- **HCMP Sampling.** Watermaster collects groundwater quality samples from the nine nested HCMP monitoring wells to demonstrate whether hydraulic control is being achieved. In addition, Watermaster collects monthly samples from four near-river wells to characterize the interaction of the Santa Ana River and groundwater. These shallow monitoring wells along the Santa Ana River consist of two former US Geological Survey (USGS) National Water Quality Assessment Program (NAWQA) wells (Archibald 1 and Archibald 2) and two Santa Ana River Water Company (SARWC) wells (well 9 and well 11).

- **Chino Basin Data Collection (CBDC)**. Watermaster routinely and proactively collects groundwater quality data from well owners, such as municipal producers and other government agencies. Water quality data are also obtained from special studies and monitoring that takes place under the orders of the Regional Board (landfills, groundwater quality investigations, etc.), the Department of Toxic Substances Control (DTSC) for the Stringfellow National Priorities List (NPL) site, the USGS, and others. These data are collected from the well owners and monitoring entities twice per year.

Groundwater quality data collected by Watermaster are used for this biennial State of the Basin report; the triennial ambient water quality update mandated by the Water Quality Control Plan for the Santa Ana River Basin (Region 8) (Basin Plan); and the demonstration of hydraulic control, a maximum benefit commitment in the Basin Plan. Data are also used for monitoring nonpoint source groundwater contamination and plumes associated with point source discharges and to assess the overall health of the groundwater basin. All groundwater quality data are checked by Watermaster staff and uploaded to a centralized database that is accessed through HydroDaVE™.

Exhibit 26 shows all wells with groundwater quality monitoring results for the five-year period of July 2005 to June 2010—the period prior to the 2010 SOB analysis date of June 30, 2010. All available groundwater quality data for this time period were analyzed synoptically and temporally at all the production and monitoring wells. Hence, the data do not represent a programmatic investigation of potential sources nor do they represent a randomized study that was designed to ascertain the water quality status of the Chino Basin. These data do, however, represent the most comprehensive information available to date.

A query was developed to analyze water quality data in the Chino Basin from July 2006 through June 2010 for any exceedances of Primary or Secondary, Federal or State Maximum Contaminant Levels (MCLs), or State Notification Levels (NLs). Wells with constituent concentrations greater than one-half of the MCL represent areas that warrant concern and inclusion in a long-term monitoring program. In addition, groundwater in the vicinity of wells with samples greater than the primary MCL may be impaired from a beneficial use standpoint. Exhibits 27 through 37 show the results of these exceedances graphically for constituents that exceeded the primary MCL in more than ten wells in the Chino Basin; the exceedances are not exclusive to one particular known-point source (*i.e.* Stringfellow Superfund Site). These constituents include total dissolved solids (TDS), nitrate as nitrogen (NO_3-N), perchlorate, total chromium, arsenic, trichloroethene (TCE), tetrachloroethene (PCE), 1,2,3-trichloropropane (1,2,3-TCP), *cis*-1,2-dichloroethene (*cis*-1,2DCE), and 1,1-dichloroethene (1,1-DCE). An exhibit showing hexavalent chromium exceedances in the Chino Basin has also been included to address the recent determination of a CDPH Public Health Goal and the current process of establishing an MCL in California. The water quality standards exceedances are noted on the exhibits, the maximum concentration value for each well is plotted. The following convention sets class intervals on a given map:

Symbol	Class Interval
○ (white)	Not Detected
● (blue)	<0.5x WQS, but detected
● (green)	0.5x WQS to WQS
● (yellow)	WQS to 2x WQS
● (orange)	2x WQS to 4x WQS
● (red)	> 4x WQS

Exhibit 38 shows the locations of various known point source discharges to groundwater and associated areas of degradation. Understanding point sources of concern in the Chino Basin is critical to the overall management of groundwater quality. To ensure that Chino Basin groundwater remains a sustainable resource, Watermaster must closely monitor point source discharges and emerging contaminates of concern. Watermaster works closely with the Regional Water Quality Control Board (RWQCB) and the potentially responsible parties (PRPs) within the Chino Basin. The following is a summary of all the regulatory and voluntary contamination monitoring in the Chino Basin:

- **Plume:** Alumax Aluminum Recycling Facility
  Constituent of Concern: TDS, sulfate, nitrate, chloride
  Order: RWQCB Cleanup and Abatement Order 99-38

- **Plume:** Archibald South Plume – South of Ontario Airport
  Constituent of Concern: volatile organic chemicals (VOCs)
  Order: This plume is currently being voluntarily investigated by a group of potentially responsible parties.

- **Plume:** Chino Airport
  Constituent of Concern: VOCs
  Order: RWQCB Cleanup and Abatement Order 90-134

- **Plume:** California Institute for Men (No Further Action status, as of 2/17/2009)
  Constituent of Concern: VOCs
  Order: Voluntary Cleanup Monitoring
- **Plume:** Crown Coach International Facility
  Constituent of Concern: VOCs and Solvents
  Order: Voluntary Cleanup Monitoring
- **Plume:** General Electric Flatiron Facility
  Constituent of Concern: VOCs
  Order: Voluntary Cleanup Monitoring
- **Plume:** General Electric Test Cell Facility
  Constituent of Concern: VOCs
  Order: Voluntary Cleanup Monitoring
- **Plume:** Kaiser Steel Fontana Site
  Constituent of Concern: TDS/total organic carbon (TOC)
  Order: RWQCB Order No. 91-40 Closed. Kaiser granted capacity in the Chino II Desalter to remediate.
- **Plume:** Milliken Sanitary Landfill
  Constituent of Concern: VOCs
  Order: RWQCB Order No. 81-003
- **Plume:** Upland Sanitary Landfill
  Constituent of Concern: VOCs
  Order RWQCB Order No 98-99-07
- **Plume:** Stringfellow National Priorities List (NPL) Site
  Constituent of Concern: VOCs, perchlorate, N-nitrosodimethylamine (NDMA), heavy metals
  Order: The Stringfellow Site is the subject of US Environmental Protection Agency (EPA) Records of Decision (RODs): EPA/ROD/R09-84/007, EPA/ROD/R09-83/005, EPA/ROD/R09-87/016, and EPA/ROD/R09-90/048.

Groundwater quality data collected from Watermaster's sampling programs, from other special studies, and from monitoring in the Basin under the orders of the RWQCB are used by Watermaster to delineate plumes associated with VOC contamination every two to three years. Exhibit 38 shows the extent of contamination associated with VOC plumes as of 2010. The VOC plumes are illustrations of the estimated spatial extent of TCE or PCE, depending on the main constituent of concern. The methods employed to create these depictions are described on each exhibit. Exhibits 39 and 40 show more detailed delineations of the Chino Airport plume and Archibald South plume, respectively. Because the extensive multi-depth groundwater quality monitoring completed over the last five years in the Chino Airport region, Exhibit 39 shows Chino Airport plume delineation in the shallow and deep aquifers.

Exhibit 41 shows the VOC plumes and features pie charts that display the relative percent of TCE, PCE, and other VOCs detected at groundwater wells within the plume impacted areas. The pie charts demonstrate the chemical differentiation between the VOC plumes in the southern portion of Chino Basin.

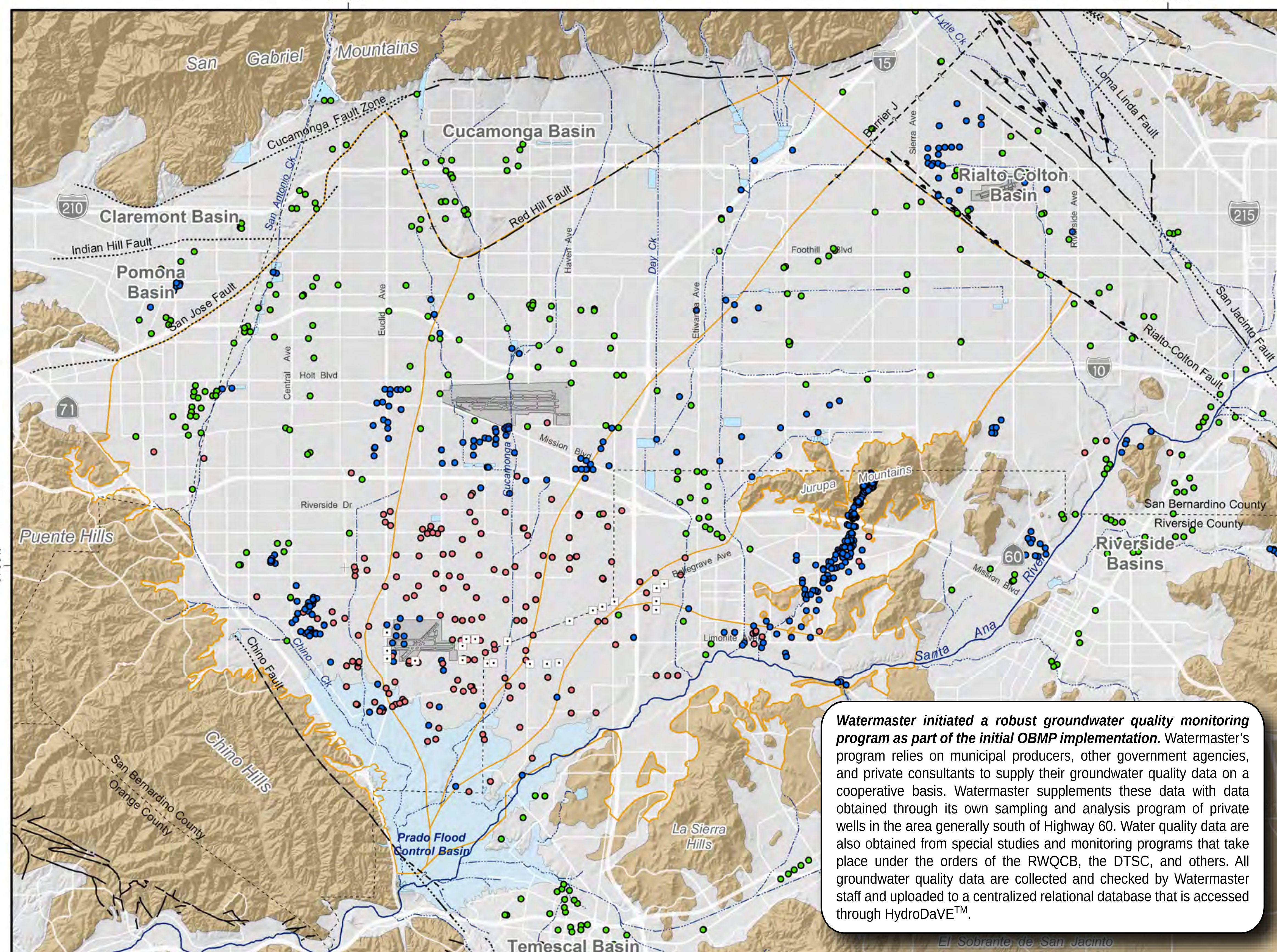
The remaining exhibits in this section display the overall state of groundwater quality in the Basin with respect to TDS and nitrate concentrations.

Exhibits 42 and 43 show trends in the ambient water quality determinations for TDS and NO_3-N by management zone and the associated anti-degradation and maximum benefit water quality objectives. The maximum benefit objectives established in the Basin Plan Amendment (RWQCB, 2004) raised the TDS and NO_3-N objectives for management zones in the Chino-North Management Zone (MZ1, MZ2, and MZ3), based on the maximum beneficial use of the waters of the state ("maximum benefit"). These "maximum benefit" water quality objectives were based on the additional consideration of factors specified in California Water Code Section 13241 and the requirements of the State's Antidegradation Policy (SWRCB Resolution No. 68-16), which requires a demonstration that the change in the objective will be "[…] consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies." The maximum benefit showings have allowed for more efficient and pragmatic water supply planning and salt/nutrient management.

For the establishment of "maximum benefit" based objectives, the RWQCB has required that Watermaster and IEUA demonstrate that raising the objectives will not impact downstream beneficial uses or significantly impact the quality of the Santa Ana River. The CBWM and IEUA must demonstrate hydraulic control to ensure that downstream beneficial uses are not impaired by management activities in the Chino-North Management Zone.

The IEUA and the CBWM are co-permittees for the recharge of recycled water in the Chino Basin. They have obligations codified in the 2004 Basin Plan Amendment that require them to manage the Chino Basin in such a way that there is no groundwater outflow to the Santa Ana River from the main part of the Chino Basin. The elimination of groundwater outflow from the main part of the Chino Basin to the Santa Ana River is referred to as hydraulic control.

Exhibits 44 through Exhibit 51 show TDS and nitrate time histories for selected wells from 1970 to 2010. These time histories illustrate water quality variations and trends within each management zone and the current state of water quality compared to historical trends. The wells were selected based on location, length of record, quality of data, geographical distribution, and screened intervals. Wells are identified by their local name (usually owner abbreviation and well number) or X Reference ID (XRef) if privately owned. The time histories include the CDPH MCL.



Watermaster initiated a robust groundwater quality monitoring program as part of the initial OBMP implementation. Watermaster's program relies on municipal producers, other government agencies, and private consultants to supply their groundwater quality data on a cooperative basis. Watermaster supplements these data with data obtained through its own sampling and analysis program of private wells in the area generally south of Highway 60. Water quality data are also obtained from special studies and monitoring programs that take place under the orders of the RWQCB, the DTSC, and others. All groundwater quality data are collected and checked by Watermaster staff and uploaded to a centralized relational database that is accessed through HydroDaVE™.

Monitoring/Extraction Wells

Municipal Wells

Private Wells

Chino Desalter Wells

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain

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0 1 2 3 4 5 Miles

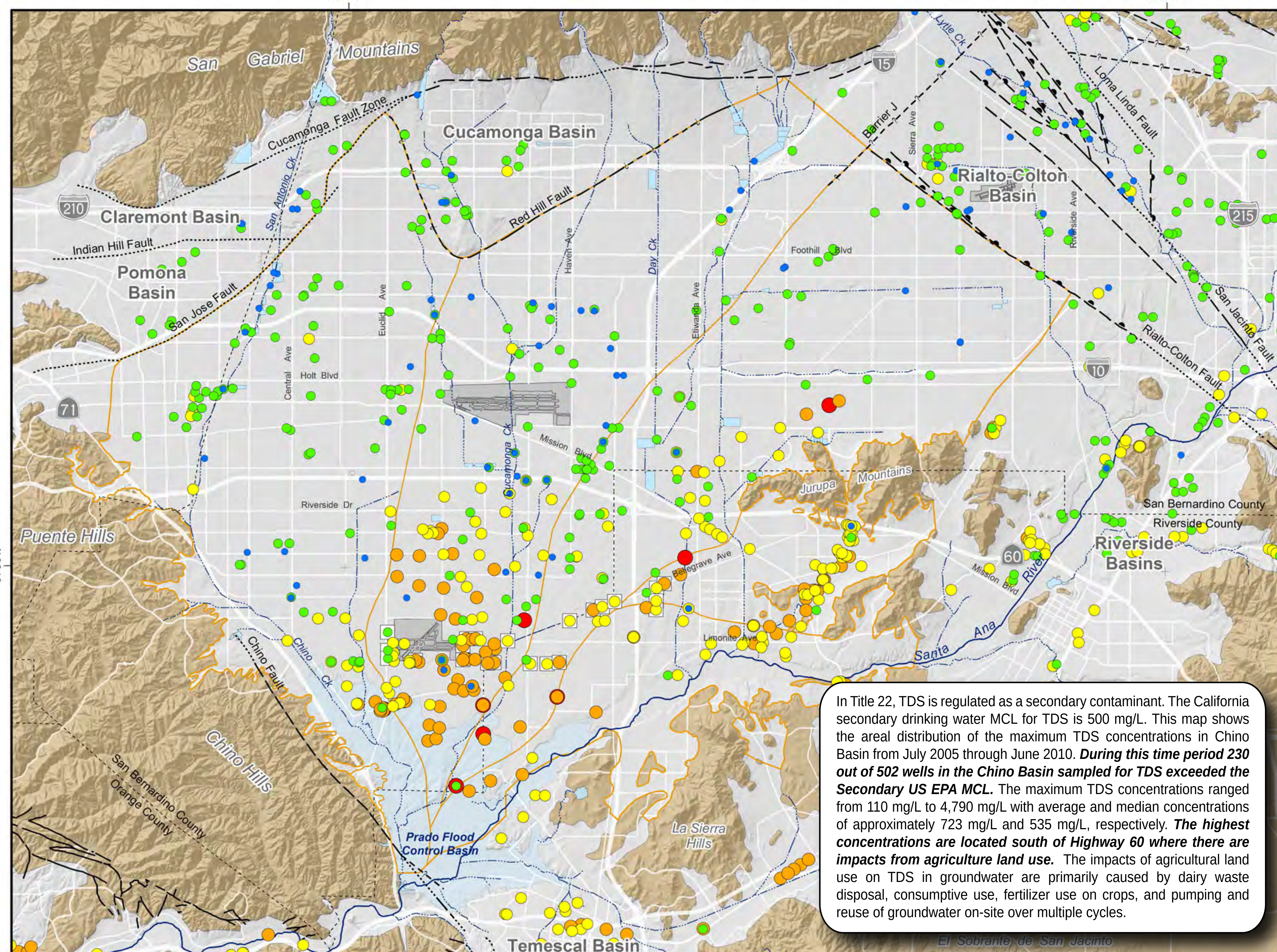
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Wells with Groundwater Quality Data

July 2005 to June 2010

Exhibit 26



Total Dissolved Solids (TDS) (mg/L)

- < 125
- 125 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 2,000
- > 2,000

Secondary US EPA MCL = 500 mg/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

In Title 22, TDS is regulated as a secondary contaminant. The California secondary drinking water MCL for TDS is 500 mg/L. This map shows the areal distribution of the maximum TDS concentrations in Chino Basin from July 2005 through June 2010. ***During this time period 230 out of 502 wells in the Chino Basin sampled for TDS exceeded the Secondary US EPA MCL.*** The maximum TDS concentrations ranged from 110 mg/L to 4,790 mg/L with average and median concentrations of approximately 723 mg/L and 535 mg/L, respectively. ***The highest concentrations are located south of Highway 60 where there are impacts from agriculture land use.*** The impacts of agricultural land use on TDS in groundwater are primarily caused by dairy waste disposal, consumptive use, fertilizer use on crops, and pumping and reuse of groundwater on-site over multiple cycles.

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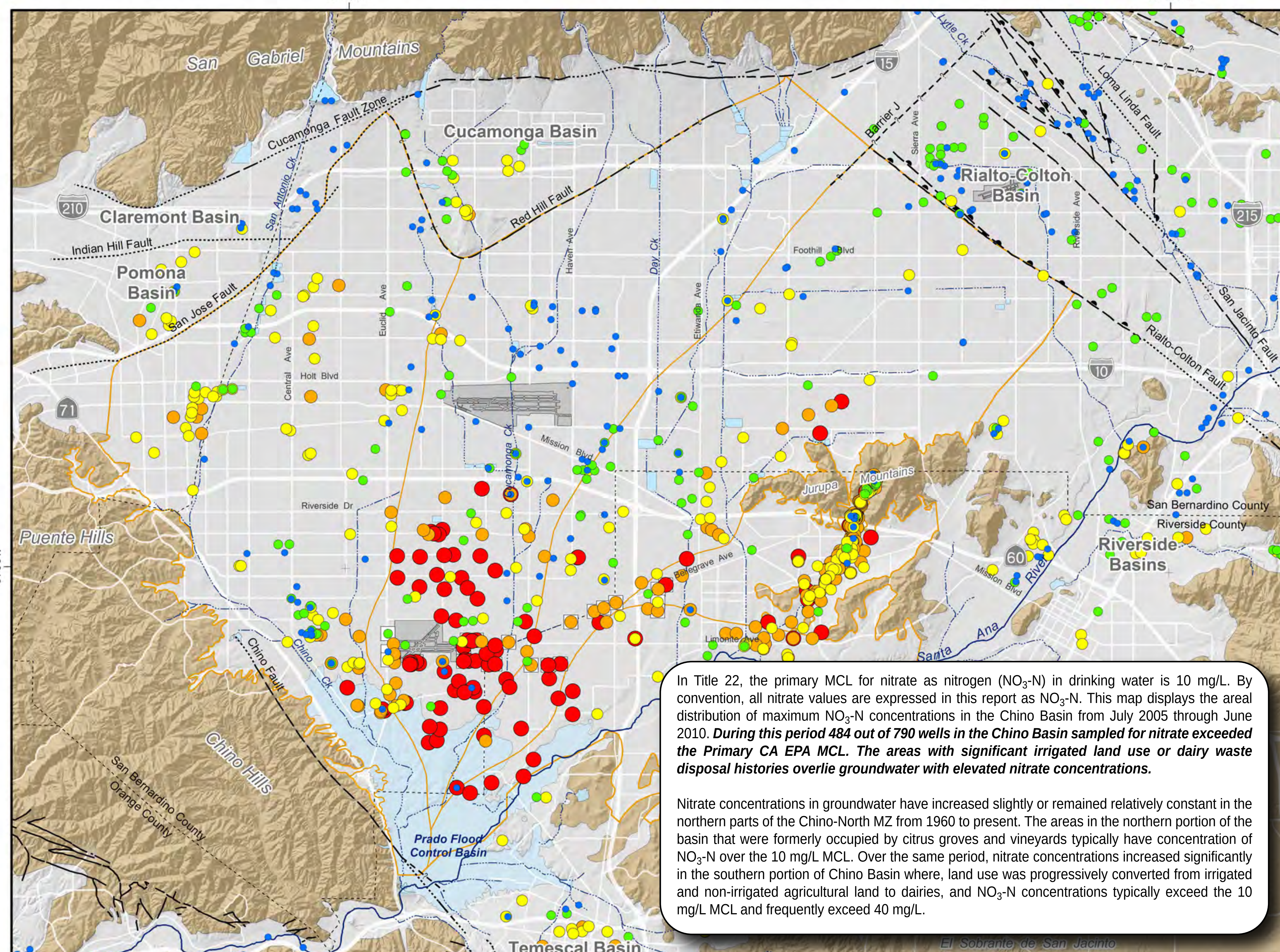
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Total Dissolved Solids in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 27



In Title 22, the primary MCL for nitrate as nitrogen (NO_3-N) in drinking water is 10 mg/L. By convention, all nitrate values are expressed in this report as NO_3-N. This map displays the areal distribution of maximum NO_3-N concentrations in the Chino Basin from July 2005 through June 2010. ***During this period 484 out of 790 wells in the Chino Basin sampled for nitrate exceeded the Primary CA EPA MCL. The areas with significant irrigated land use or dairy waste disposal histories overlie groundwater with elevated nitrate concentrations.***

Nitrate concentrations in groundwater have increased slightly or remained relatively constant in the northern parts of the Chino-North MZ from 1960 to present. The areas in the northern portion of the basin that were formerly occupied by citrus groves and vineyards typically have concentration of NO_3-N over the 10 mg/L MCL. Over the same period, nitrate concentrations increased significantly in the southern portion of Chino Basin where, land use was progressively converted from irrigated and non-irrigated agricultural land to dairies, and NO_3-N concentrations typically exceed the 10 mg/L MCL and frequently exceed 40 mg/L.

Nitrate-Nitrogen (NO3-N) (mg/L)

- ND
- < 5
- 5 - 10
- 10 - 20
- 20 - 40
- > 40

Primary US EPA MCL = 10 mg/L
Primary CA MCL = 10 mg/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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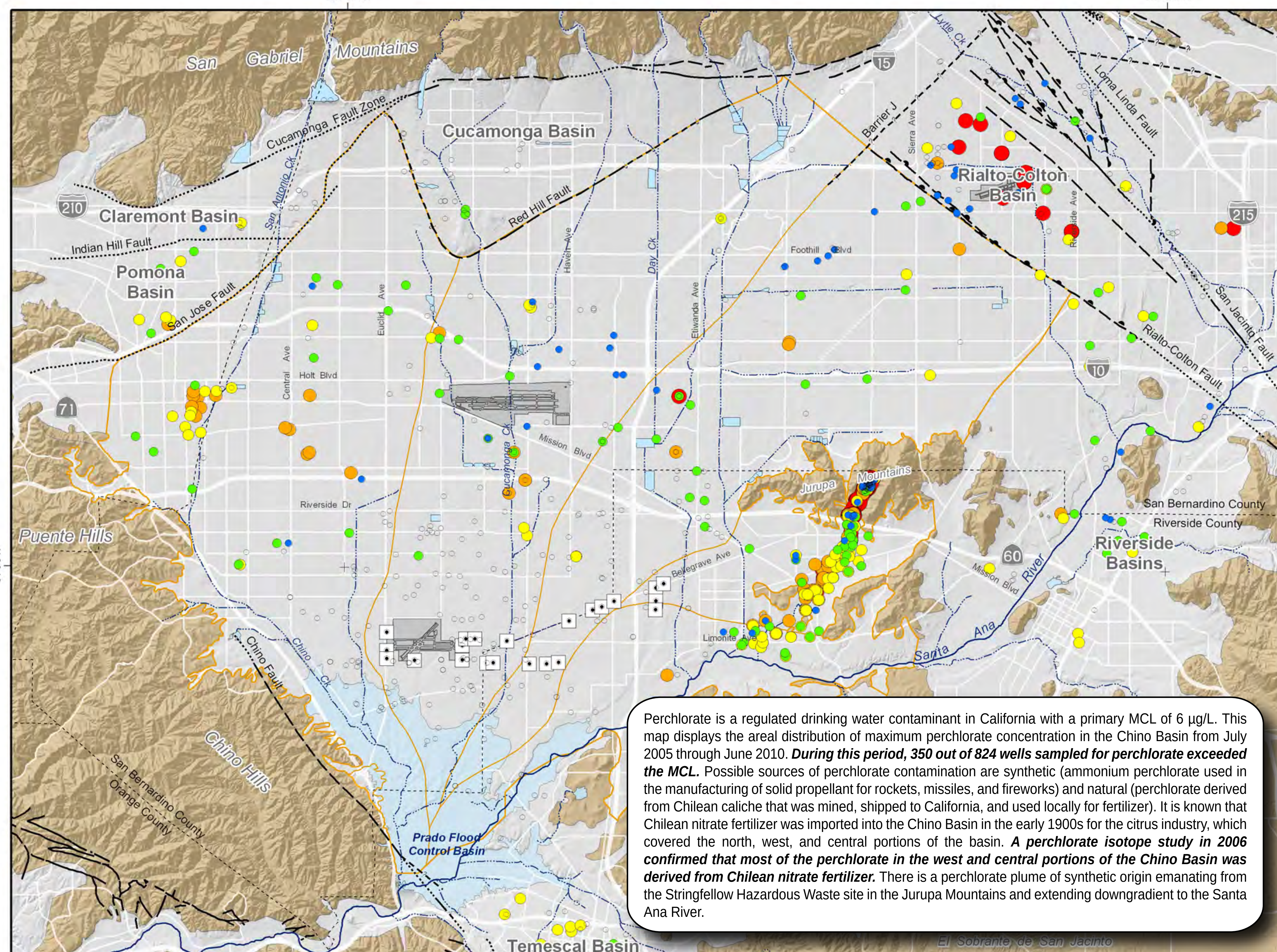
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Nitrate as Nitrogen in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 28



Perchlorate is a regulated drinking water contaminant in California with a primary MCL of 6 µg/L. This map displays the areal distribution of maximum perchlorate concentration in the Chino Basin from July 2005 through June 2010. ***During this period, 350 out of 824 wells sampled for perchlorate exceeded the MCL.*** Possible sources of perchlorate contamination are synthetic (ammonium perchlorate used in the manufacturing of solid propellant for rockets, missiles, and fireworks) and natural (perchlorate derived from Chilean caliche that was mined, shipped to California, and used locally for fertilizer). It is known that Chilean nitrate fertilizer was imported into the Chino Basin in the early 1900s for the citrus industry, which covered the north, west, and central portions of the basin. ***A perchlorate isotope study in 2006 confirmed that most of the perchlorate in the west and central portions of the Chino Basin was derived from Chilean nitrate fertilizer.*** There is a perchlorate plume of synthetic origin emanating from the Stringfellow Hazardous Waste site in the Jurupa Mountains and extending downgradient to the Santa Ana River.

Perchlorate (ug/L)
- ND
- < 3
- 3 - 6
- 6 - 12
- 12 - 24
- > 24

CA Primary MCL = 6 ug/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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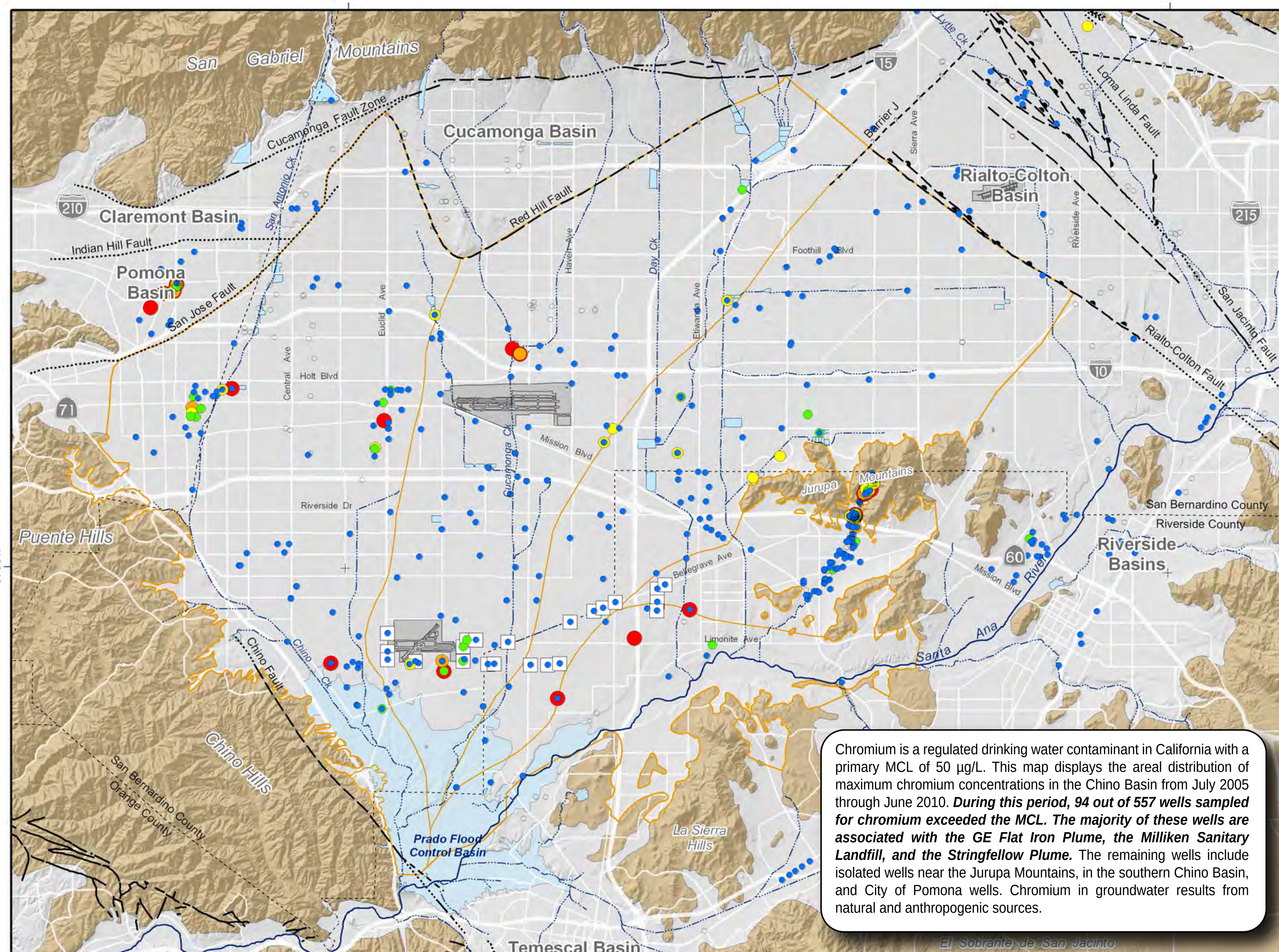
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Perchlorate in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 29



Chromium is a regulated drinking water contaminant in California with a primary MCL of 50 µg/L. This map displays the areal distribution of maximum chromium concentrations in the Chino Basin from July 2005 through June 2010. ***During this period, 94 out of 557 wells sampled for chromium exceeded the MCL. The majority of these wells are associated with the GE Flat Iron Plume, the Milliken Sanitary Landfill, and the Stringfellow Plume.*** The remaining wells include isolated wells near the Jurupa Mountains, in the southern Chino Basin, and City of Pomona wells. Chromium in groundwater results from natural and anthropogenic sources.

Total Chromium (ug/L)

- ND
- < 25
- 25 - 50
- 50 - 100
- 100 - 200
- > 200

Primary US EPA MCL = 100 ug/L
Primary CA MCL = 50 ug/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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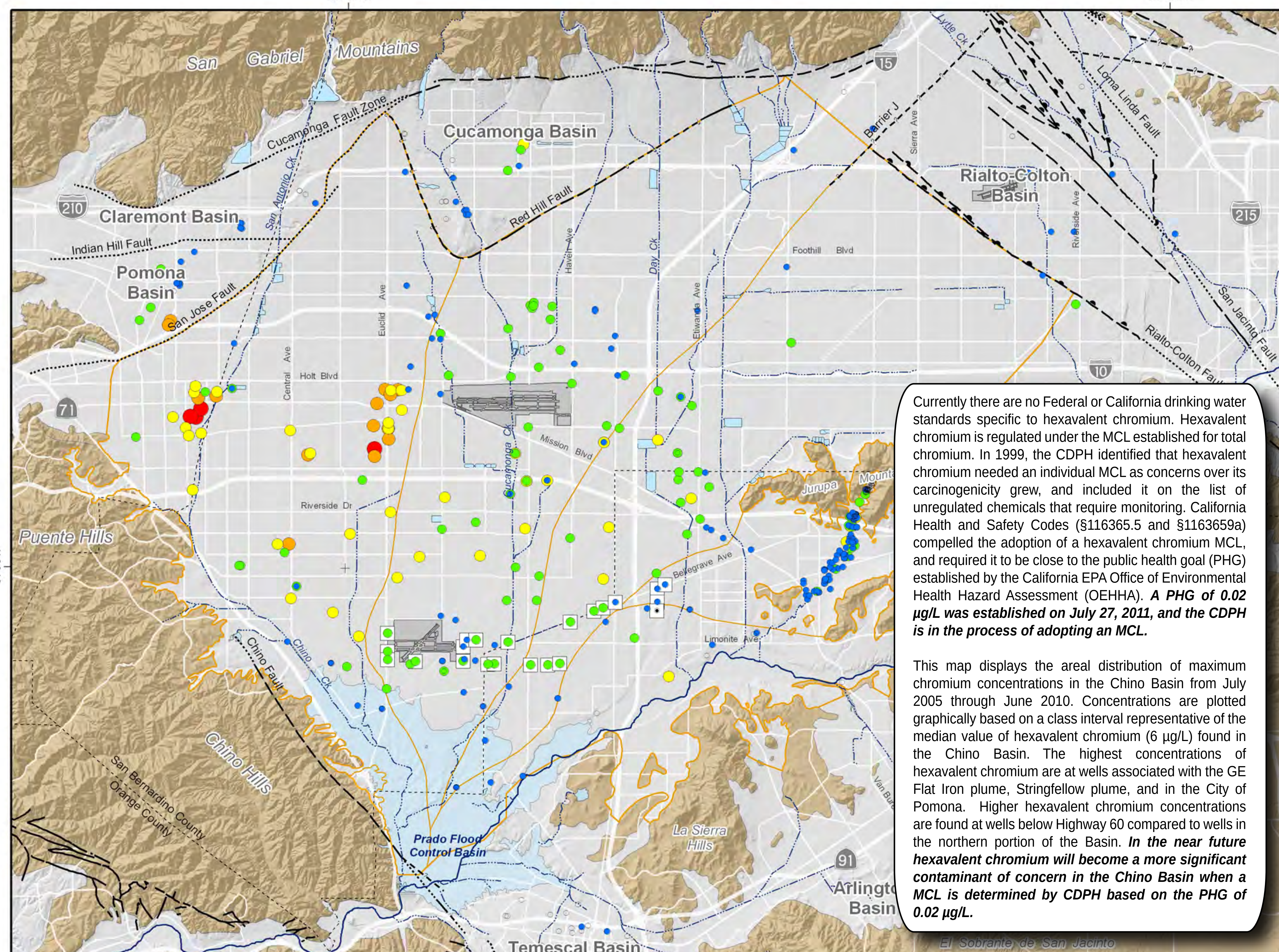
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Total Chromium in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 30



Currently there are no Federal or California drinking water standards specific to hexavalent chromium. Hexavalent chromium is regulated under the MCL established for total chromium. In 1999, the CDPH identified that hexavalent chromium needed an individual MCL as concerns over its carcinogenicity grew, and included it on the list of unregulated chemicals that require monitoring. California Health and Safety Codes (§116365.5 and §1163659a) compelled the adoption of a hexavalent chromium MCL, and required it to be close to the public health goal (PHG) established by the California EPA Office of Environmental Health Hazard Assessment (OEHHA). ***A PHG of 0.02 µg/L was established on July 27, 2011, and the CDPH is in the process of adopting an MCL.***

This map displays the areal distribution of maximum chromium concentrations in the Chino Basin from July 2005 through June 2010. Concentrations are plotted graphically based on a class interval representative of the median value of hexavalent chromium (6 µg/L) found in the Chino Basin. The highest concentrations of hexavalent chromium are at wells associated with the GE Flat Iron plume, Stringfellow plume, and in the City of Pomona. Higher hexavalent chromium concentrations are found at wells below Highway 60 compared to wells in the northern portion of the Basin. ***In the near future hexavalent chromium will become a more significant contaminant of concern in the Chino Basin when a MCL is determined by CDPH based on the PHG of 0.02 µg/L.***

Hexavalent Chromium (ug/L)

- ND
- < 3
- 3 - 6
- 6 - 12
- 12 - 24
- > 24

Currently there is no US or CA EPA MCL; hexavalent chromium is regulated as total chromium which has a CA EPA MCL of 50 ug/L.

A CA Public Health Goal of 0.02 ug/L was established in July 2011.

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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Date: 201100520
File: Exhibit_31.mxd

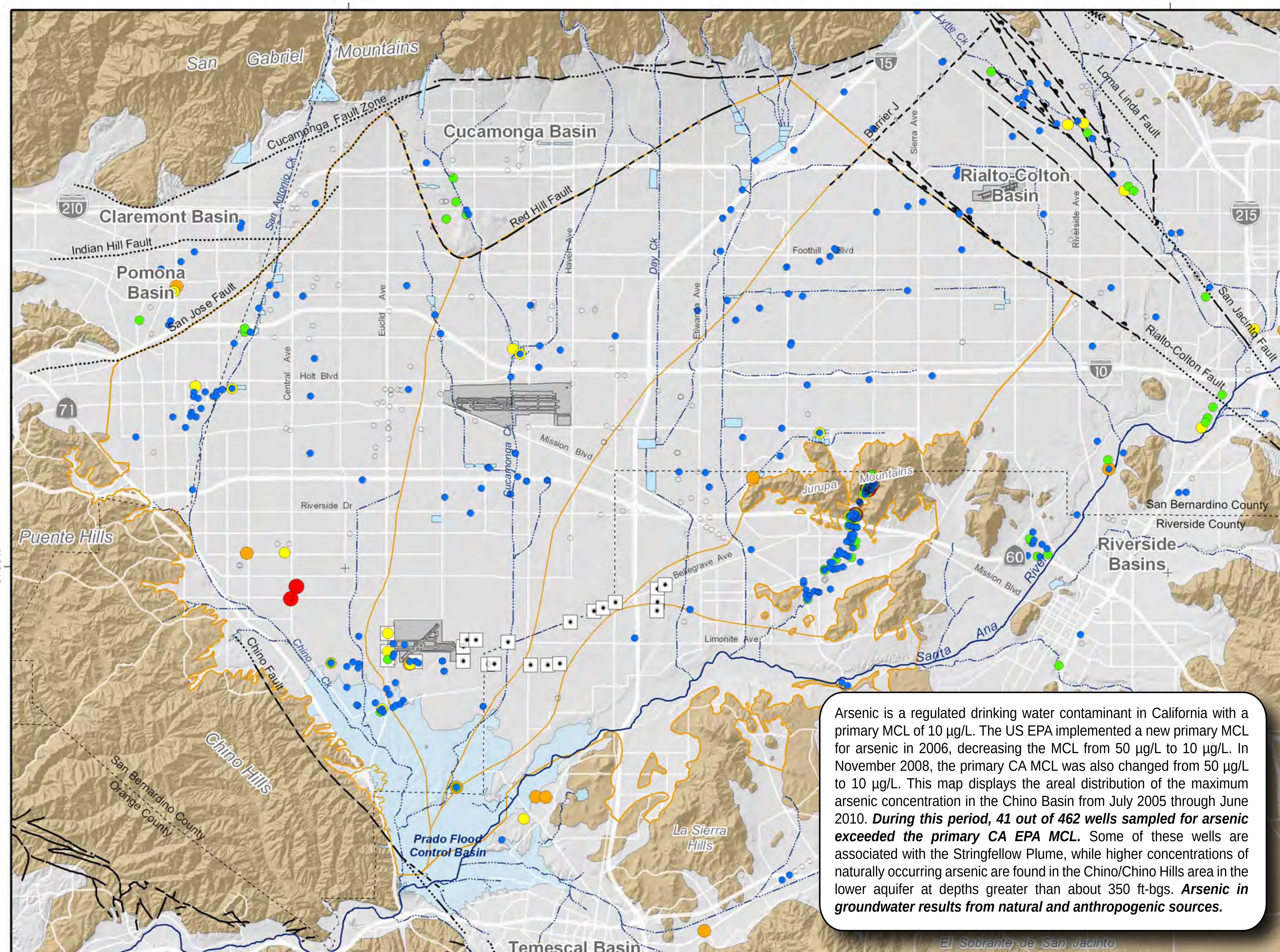
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Hexavalent Chromium in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 31



Arsenic is a regulated drinking water contaminant in California with a primary MCL of 10 µg/L. The US EPA implemented a new primary MCL for arsenic in 2006, decreasing the MCL from 50 µg/L to 10 µg/L. In November 2008, the primary CA MCL was also changed from 50 µg/L to 10 µg/L. This map displays the areal distribution of the maximum arsenic concentration in the Chino Basin from July 2005 through June 2010. ***During this period, 41 out of 462 wells sampled for arsenic exceeded the primary CA EPA MCL.*** Some of these wells are associated with the Stringfellow Plume, while higher concentrations of naturally occurring arsenic are found in the Chino/Chino Hills area in the lower aquifer at depths greater than about 350 ft-bgs. ***Arsenic in groundwater results from natural and anthropogenic sources.***

Arsenic (ug/L)

- ND
- < 5
- 5 - 10
- 10 - 20
- 20 - 40
- > 40

Primary US EPA MCL = 10 ug/L
Primary CA MCL = 10 ug/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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Date: 20110519
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0 1 2 3 4 5 Miles

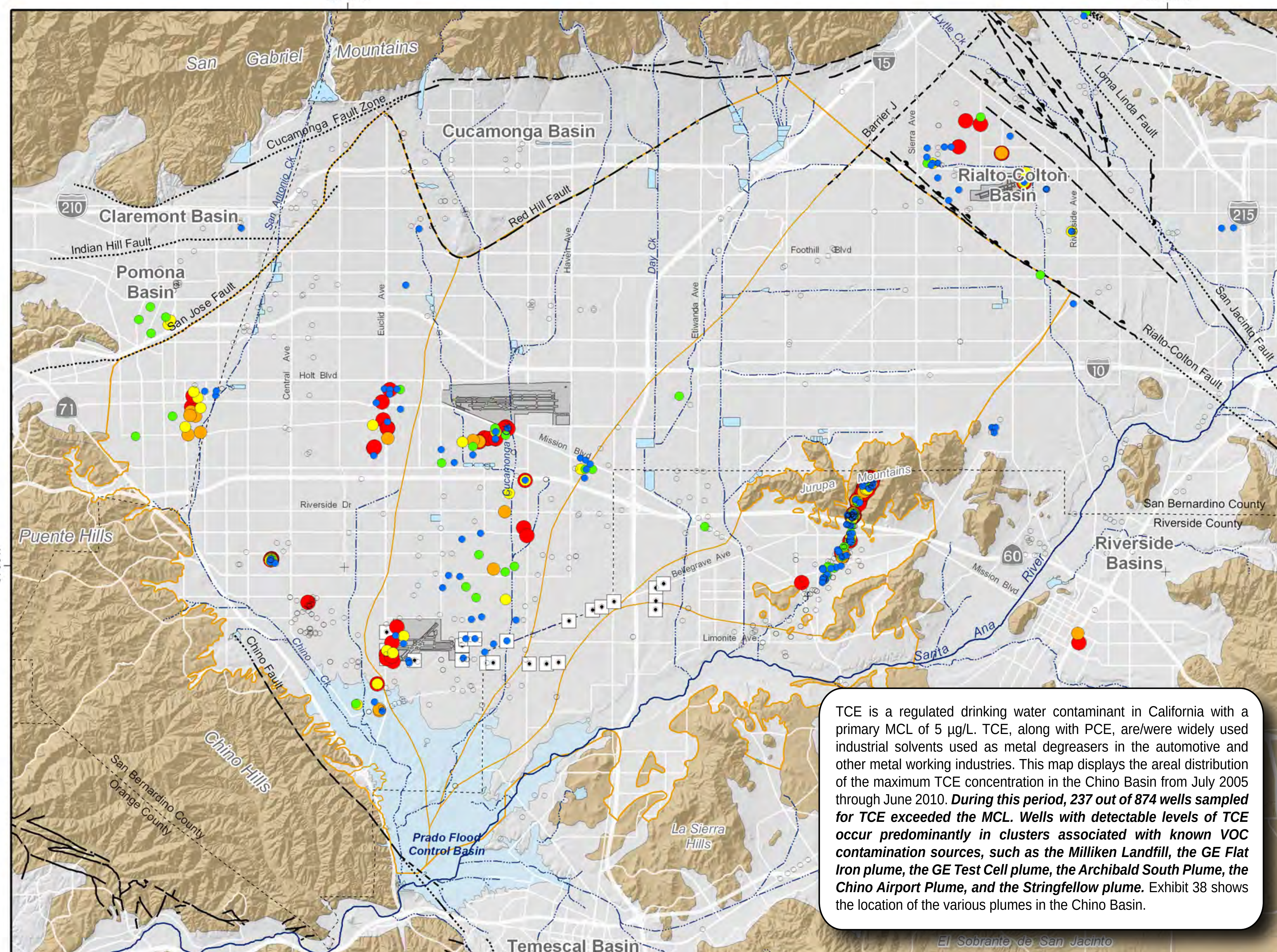
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Arsenic in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 32



TCE is a regulated drinking water contaminant in California with a primary MCL of 5 µg/L. TCE, along with PCE, are/were widely used industrial solvents used as metal degreasers in the automotive and other metal working industries. This map displays the areal distribution of the maximum TCE concentration in the Chino Basin from July 2005 through June 2010. ***During this period, 237 out of 874 wells sampled for TCE exceeded the MCL. Wells with detectable levels of TCE occur predominantly in clusters associated with known VOC contamination sources, such as the Milliken Landfill, the GE Flat Iron plume, the GE Test Cell plume, the Archibald South Plume, the Chino Airport Plume, and the Stringfellow plume.*** Exhibit 38 shows the location of the various plumes in the Chino Basin.

Trichloroethene (ug/L)

- ND
- < 2.5
- 2.5 - 5
- 5 - 10
- 10 - 20
- \> 20

Primary US EPA MCL = 5 ug/L
Primary CA MCL = 5 ug/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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Date: 20110421
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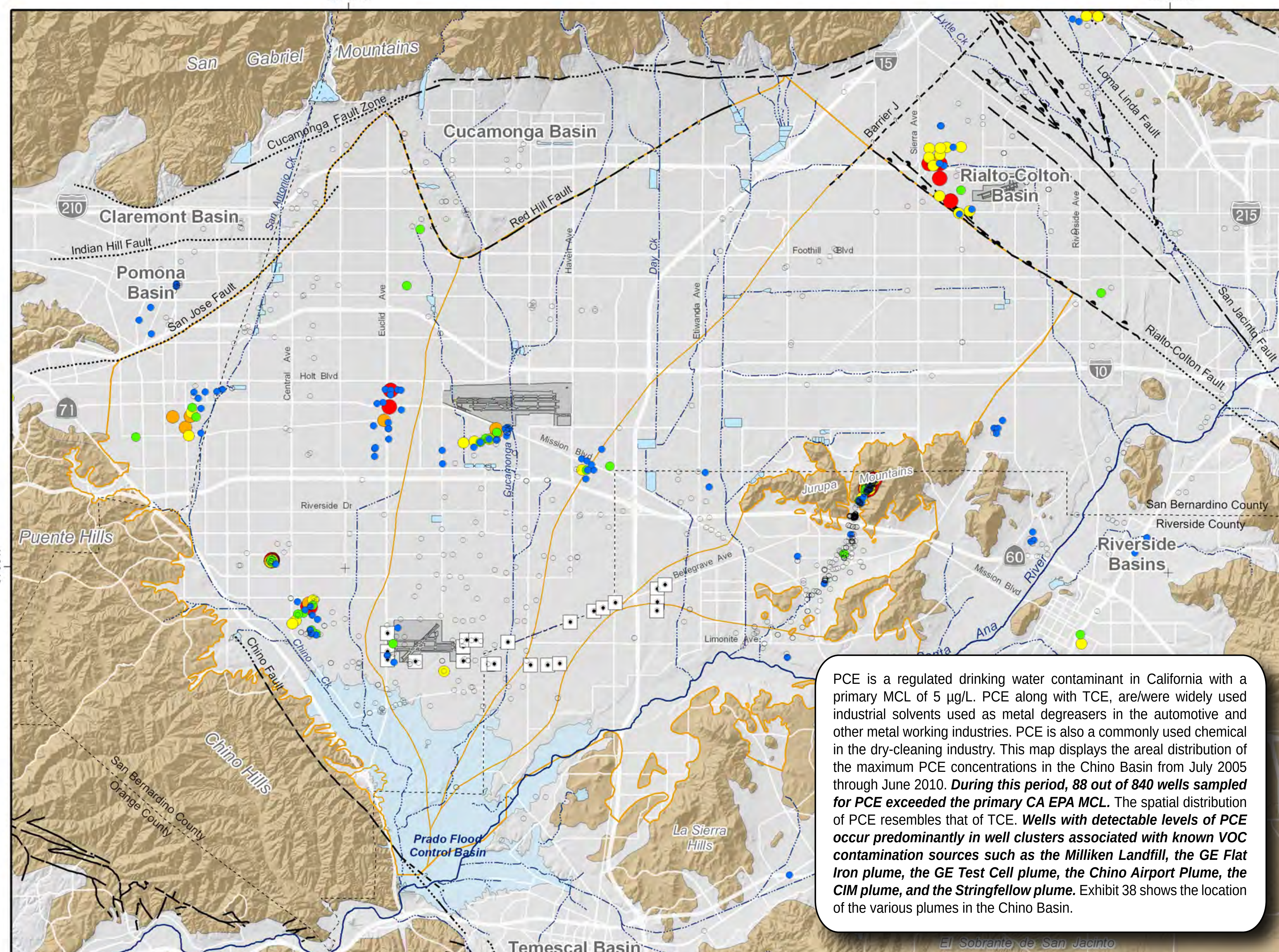
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Trichloroethene (TCE) in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 33



PCE is a regulated drinking water contaminant in California with a primary MCL of 5 µg/L. PCE along with TCE, are/were widely used industrial solvents used as metal degreasers in the automotive and other metal working industries. PCE is also a commonly used chemical in the dry-cleaning industry. This map displays the areal distribution of the maximum PCE concentrations in the Chino Basin from July 2005 through June 2010. ***During this period, 88 out of 840 wells sampled for PCE exceeded the primary CA EPA MCL.*** The spatial distribution of PCE resembles that of TCE. ***Wells with detectable levels of PCE occur predominantly in well clusters associated with known VOC contamination sources such as the Milliken Landfill, the GE Flat Iron plume, the GE Test Cell plume, the Chino Airport Plume, the CIM plume, and the Stringfellow plume.*** Exhibit 38 shows the location of the various plumes in the Chino Basin.

Tetrachloroethene (ug/L)

- ND
- < 2.5
- 2.5 - 5
- 5 - 10
- 10 - 20
- > 20

Primary US EPA MCL = 5 ug/L
Primary CA MCL = 5 ug/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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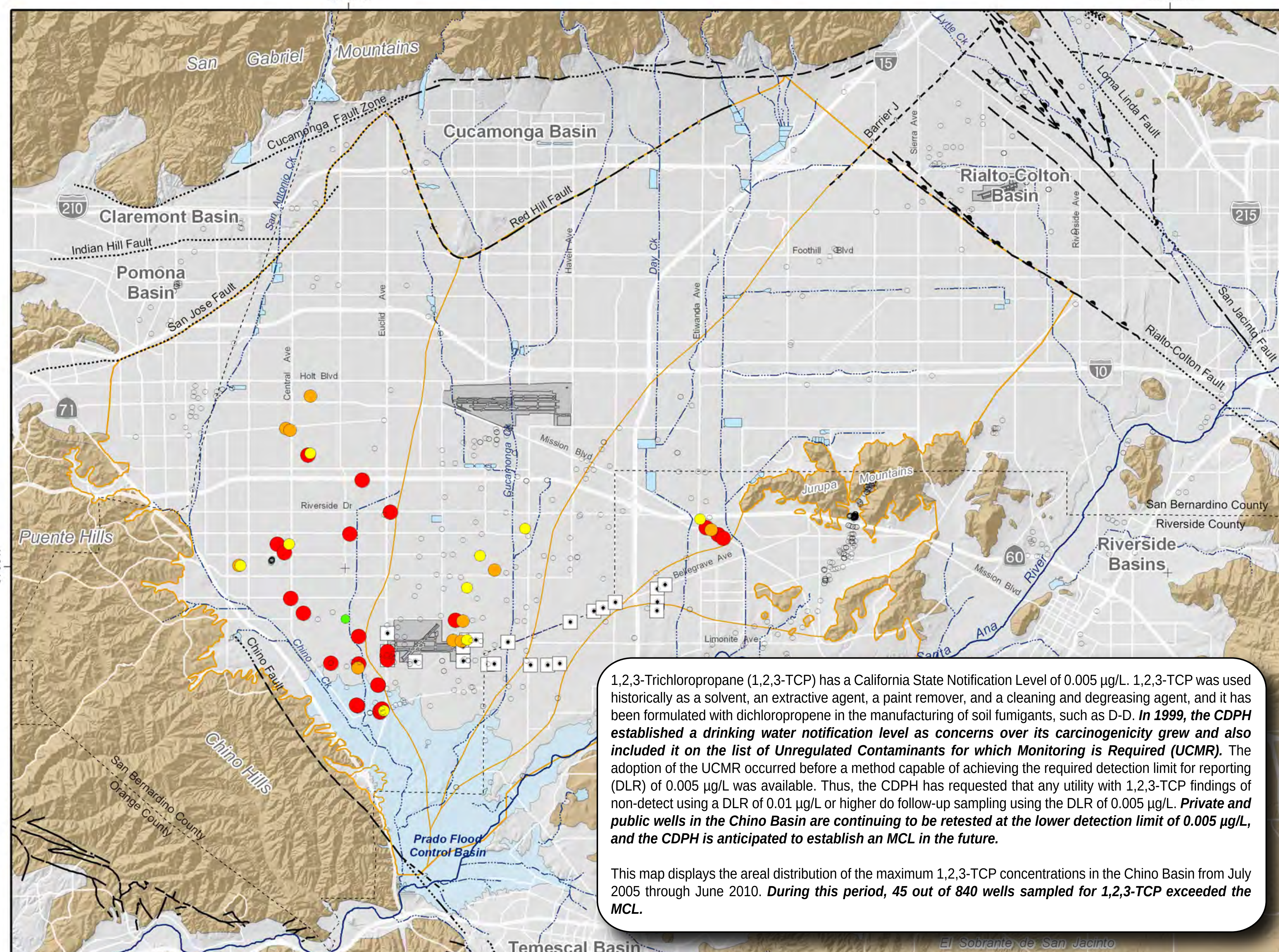
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Tetrachloroethene (PCE) in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 34



1,2,3-Trichloropropane (1,2,3-TCP) has a California State Notification Level of 0.005 µg/L. 1,2,3-TCP was used historically as a solvent, an extractive agent, a paint remover, and a cleaning and degreasing agent, and it has been formulated with dichloropropene in the manufacturing of soil fumigants, such as D-D. ***In 1999, the CDPH established a drinking water notification level as concerns over its carcinogenicity grew and also included it on the list of Unregulated Contaminants for which Monitoring is Required (UCMR).*** The adoption of the UCMR occurred before a method capable of achieving the required detection limit for reporting (DLR) of 0.005 µg/L was available. Thus, the CDPH has requested that any utility with 1,2,3-TCP findings of non-detect using a DLR of 0.01 µg/L or higher do follow-up sampling using the DLR of 0.005 µg/L. ***Private and public wells in the Chino Basin are continuing to be retested at the lower detection limit of 0.005 µg/L, and the CDPH is anticipated to establish an MCL in the future.***

This map displays the areal distribution of the maximum 1,2,3-TCP concentrations in the Chino Basin from July 2005 through June 2010. ***During this period, 45 out of 840 wells sampled for 1,2,3-TCP exceeded the MCL.***

1,2,3-Trichloropropane (ug/L)

- ND
- < 0.0025
- 0.0025 - 0.005
- 0.005 - 0.01
- 0.01 - 0.02
- > 0.02

California Notification Level = 0.005 ug/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain
Location Approximate
Approximate Location of Groundwater Barrier
Location Concealed
Location Uncertain

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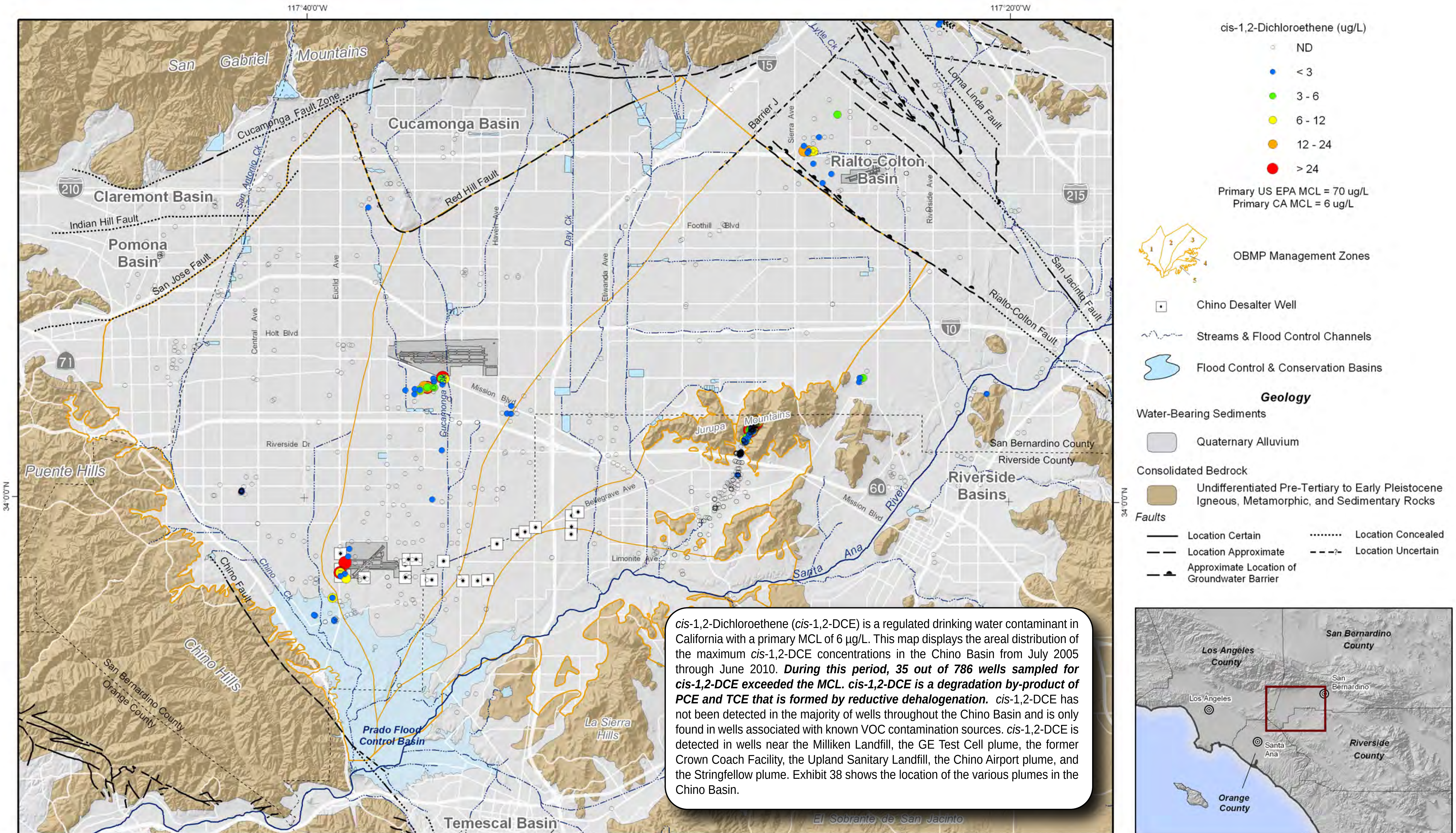
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

1,2,3-Trichloropropane in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 35



cis-1,2-Dichloroethene (*cis*-1,2-DCE) is a regulated drinking water contaminant in California with a primary MCL of 6 µg/L. This map displays the areal distribution of the maximum *cis*-1,2-DCE concentrations in the Chino Basin from July 2005 through June 2010. ***During this period, 35 out of 786 wells sampled for cis-1,2-DCE exceeded the MCL. cis-1,2-DCE is a degradation by-product of PCE and TCE that is formed by reductive dehalogenation.*** *cis*-1,2-DCE has not been detected in the majority of wells throughout the Chino Basin and is only found in wells associated with known VOC contamination sources. *cis*-1,2-DCE is detected in wells near the Milliken Landfill, the GE Test Cell plume, the former Crown Coach Facility, the Upland Sanitary Landfill, the Chino Airport plume, and the Stringfellow plume. Exhibit 38 shows the location of the various plumes in the Chino Basin.

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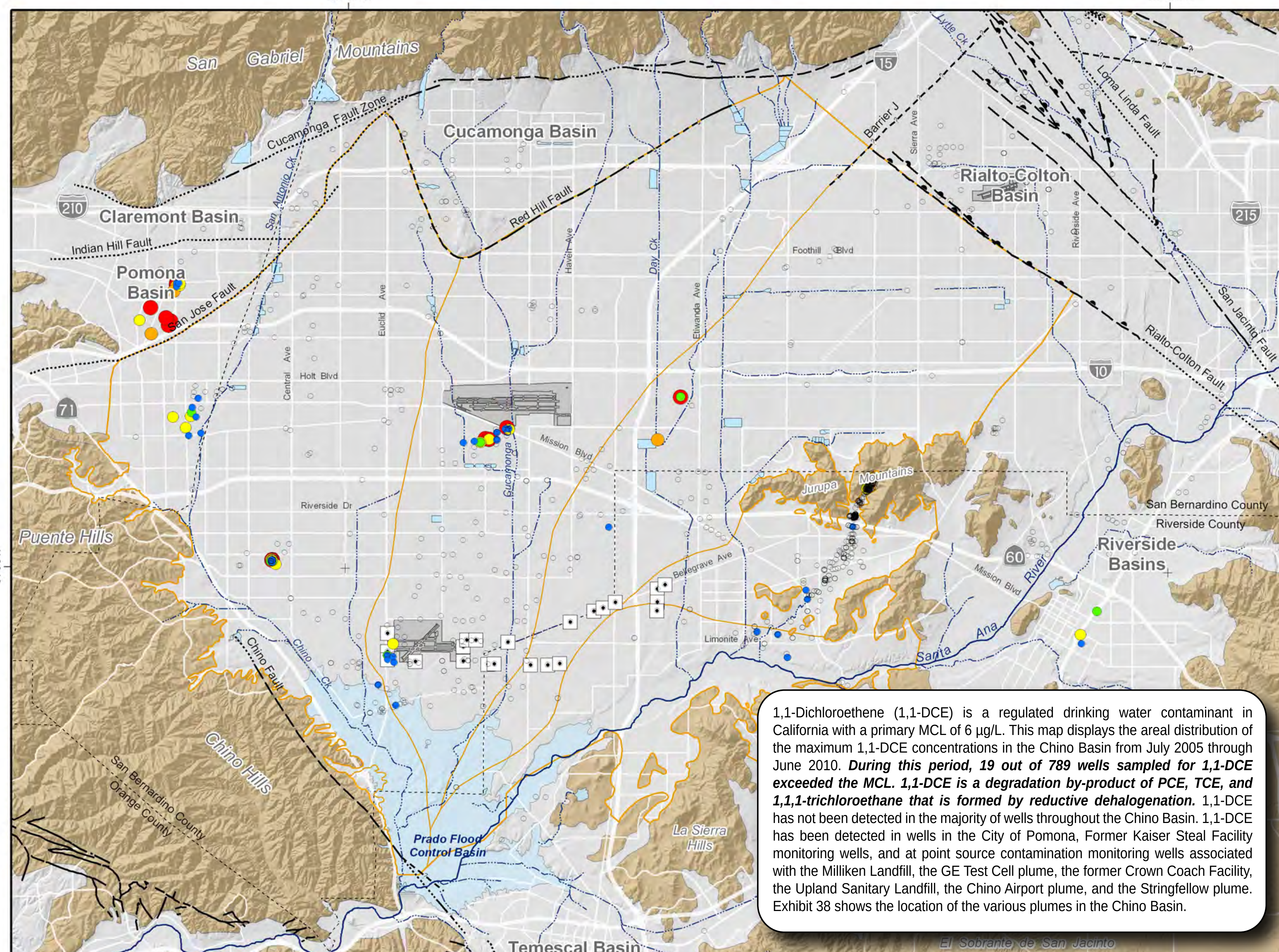
2010 State of the Basin
Groundwater Quality

cis-1,2-Dichloroethene in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 36



1,1-Dichloroethene (1,1-DCE) is a regulated drinking water contaminant in California with a primary MCL of 6 µg/L. This map displays the areal distribution of the maximum 1,1-DCE concentrations in the Chino Basin from July 2005 through June 2010. ***During this period, 19 out of 789 wells sampled for 1,1-DCE exceeded the MCL. 1,1-DCE is a degradation by-product of PCE, TCE, and 1,1,1-trichloroethane that is formed by reductive dehalogenation.*** 1,1-DCE has not been detected in the majority of wells throughout the Chino Basin. 1,1-DCE has been detected in wells in the City of Pomona, Former Kaiser Steal Facility monitoring wells, and at point source contamination monitoring wells associated with the Milliken Landfill, the GE Test Cell plume, the former Crown Coach Facility, the Upland Sanitary Landfill, the Chino Airport plume, and the Stringfellow plume. Exhibit 38 shows the location of the various plumes in the Chino Basin.

1,1-Dichloroethene (ug/L)

- ND
- < 3
- 3 - 6
- 6 - 12
- 12 - 24
- > 24

Primary US EPA MCL = 7 ug/L
Primary CA MCL = 6 ug/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

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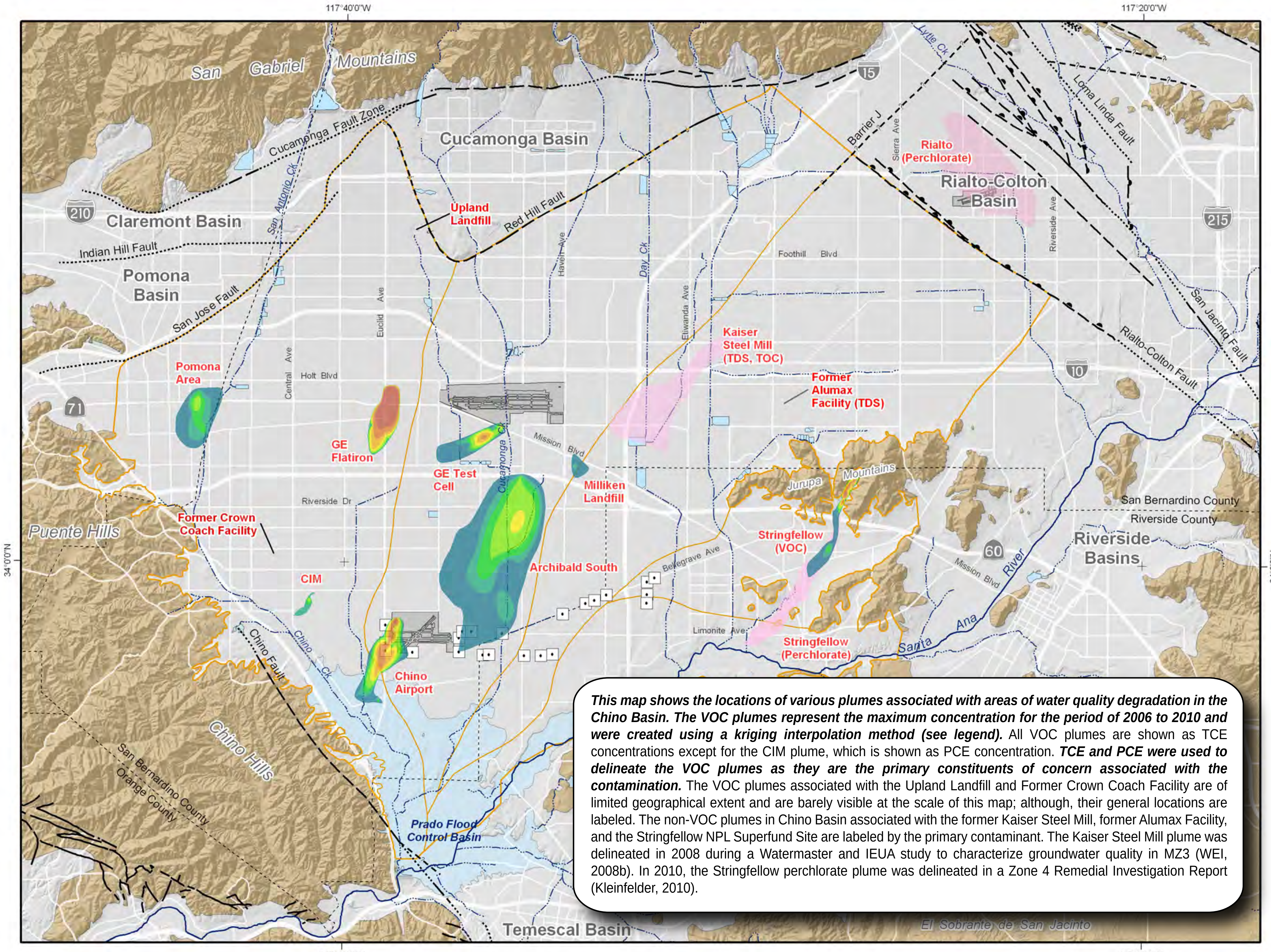
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

1,1-Dichloroethene in Groundwater

Maximum Concentration (July 2005 to June 2010)

Exhibit 37



This map shows the locations of various plumes associated with areas of water quality degradation in the Chino Basin. The VOC plumes represent the maximum concentration for the period of 2006 to 2010 and were created using a kriging interpolation method (see legend). All VOC plumes are shown as TCE concentrations except for the CIM plume, which is shown as PCE concentration. ***TCE and PCE were used to delineate the VOC plumes as they are the primary constituents of concern associated with the contamination.*** The VOC plumes associated with the Upland Landfill and Former Crown Coach Facility are of limited geographical extent and are barely visible at the scale of this map; although, their general locations are labeled. The non-VOC plumes in Chino Basin associated with the former Kaiser Steel Mill, former Alumax Facility, and the Stringfellow NPL Superfund Site are labeled by the primary contaminant. The Kaiser Steel Mill plume was delineated in 2008 during a Watermaster and IEUA study to characterize groundwater quality in MZ3 (WEI, 2008b). In 2010, the Stringfellow perchlorate plume was delineated in a Zone 4 Remedial Investigation Report (Kleinfelder, 2010).

VOC Concentration (ug/L)

- > 0 and ≤ 5
- > 5 and ≤ 10
- > 10 and ≤ 20
- > 20 and ≤ 50
- > 50 and ≤ 100
- > 100 and ≤ 200
- > 200 and ≤ 500
- > 500

The VOC plumes shown on this map are illustrations of the estimated spatial extent of TCE/PCE, based on maximum concentrations measured over a five year period (2006-2010). These plume depictions are for illustrative purposes only and are not intended to be used for analytical purposes. The VOC plume illustrations were created via the Geostatistical Analyst extension in ESRI's ArcView 10, using an ordinary kriging interpolation model with model input parameter estimation and optimization performed by semivariogram analysis in Golden's Surfer 8.09. Interpretations of plume extent and boundary delineation were made based on measured concentrations and local groundwater flow patterns as predicted by the Chino Basin groundwater flow model.

Other plumes (labeled by name and dominant contaminant)

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

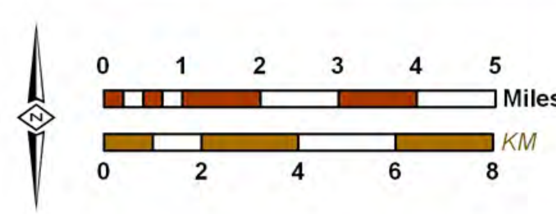
Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain



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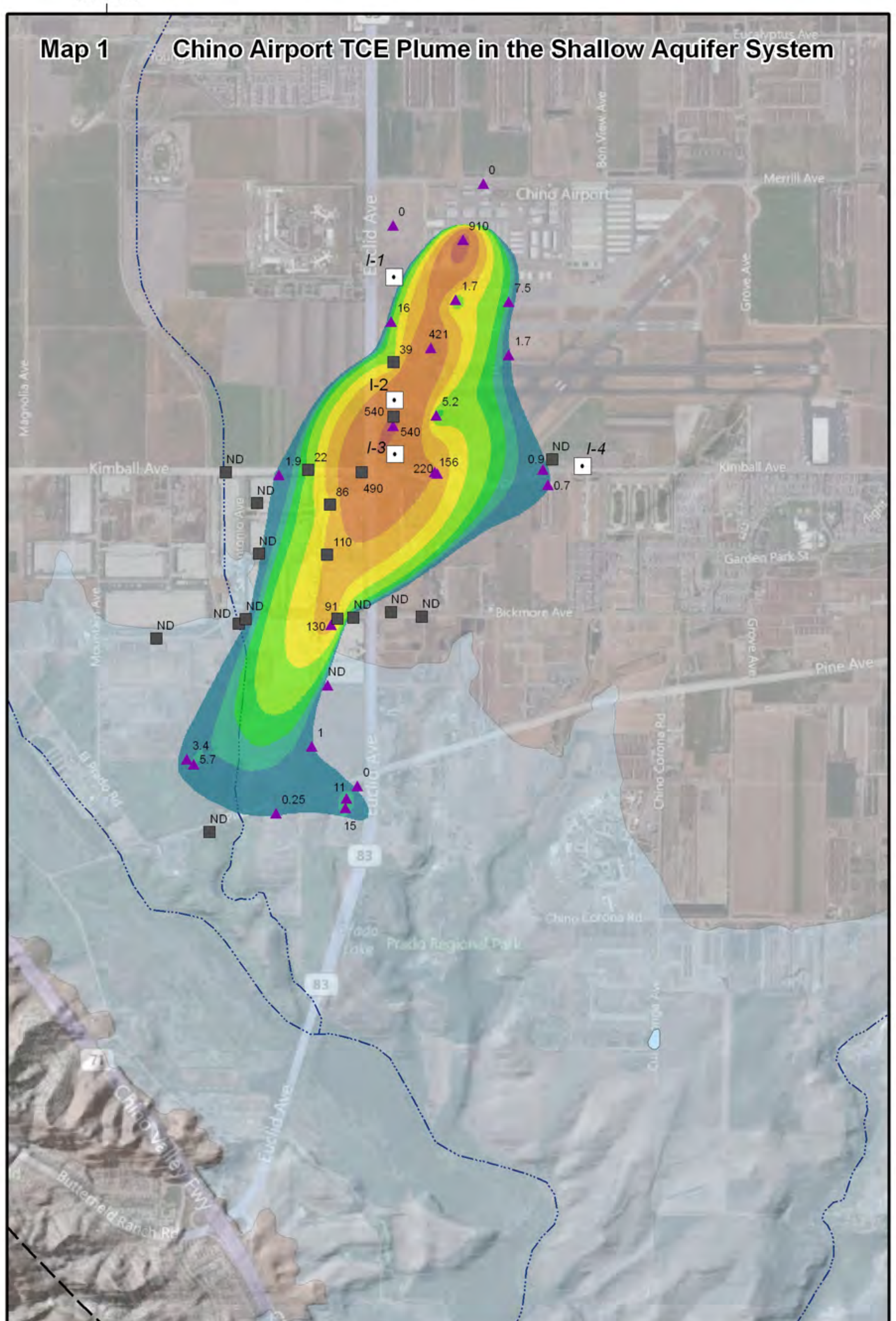
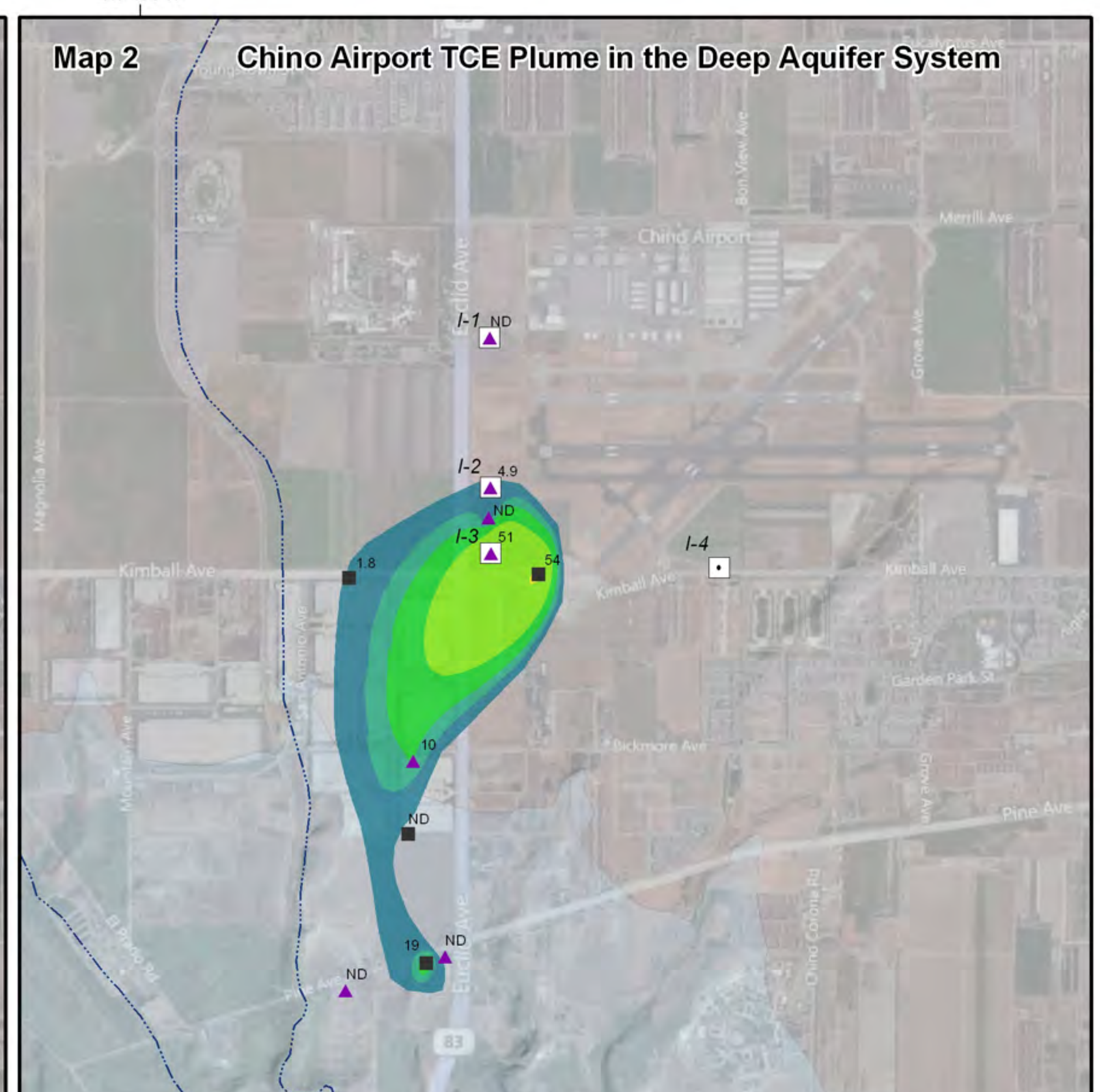
2010 State of the Basin
Groundwater Quality

2010 Delineation of Groundwater Contamination Plumes

Exhibit 38





TCE Concentration (ug/L)

- > 0 and ≤ 5
- > 5 and ≤ 10
- > 10 and ≤ 20
- > 20 and ≤ 50
- > 50 and ≤ 100
- > 100 and ≤ 200
- > 200 and ≤ 500
- > 500

The VOC plumes shown on this map are illustrations of the estimated spatial extent of TCE/PCE, based on maximum concentrations measured over a five year period (2006-2010). These plume depictions are for illustrative purposes only and are not intended to be used for analytical purposes. The VOC plume illustrations were created via the Geostatistical Analyst extension in ESRI's ArcView 10, using an ordinary kriging interpolation model with model input parameter estimation and optimization performed by semivariogram analysis in Golden's Surfer 8.09. Interpretations of plume extent and boundary delineation were made based on measured concentrations and local groundwater flow patterns as predicted by the Chino Basin groundwater flow model.

- Wells & TCE concentration (ug/L)
- HydroPunch Samples & TCE concentration (ug/L)
- Chino Desalter Well
- Streams & Flood Control Channels
- Flood Control & Conservation Basins

These maps depict the TCE contamination of groundwater near the Chino Airport in the southern portion of Chino Basin. ***The County of San Bernardino, Department of Airports (County) has been identified as the primary responsible party and has been conducting investigations of soil and groundwater contamination since 2003.*** The County has constructed and sampled nine shallow monitoring wells on the airport property and 19 depth-specific monitoring wells at eight locations offsite. The County has also collected 100 depth-specific HydroPunch groundwater samples at 27 locations offsite. Groundwater samples have been collected by the Chino Basin Watermaster at private agricultural wells in this area and at one depth-specific monitoring well (HCMP-4), and by the Chino Desalter Authority at its deep production wells (CDA-I-1, -2, -3, and -4).

The multiple depth groundwater quality monitoring at wells in and south of the Chino Airport have allowed for the TCE concentration to be characterized horizontally and vertically. TCE has been detected in both the shallow unconfined aquifer system (see Map 1) and the deeper confined aquifer system (see Map 2). The TCE contamination is more thoroughly characterized in the shallow aquifer system than in the deep aquifer system.

0 0.5 1 1.5 Miles

0 0.25 0.5 1 1.5 2 KM

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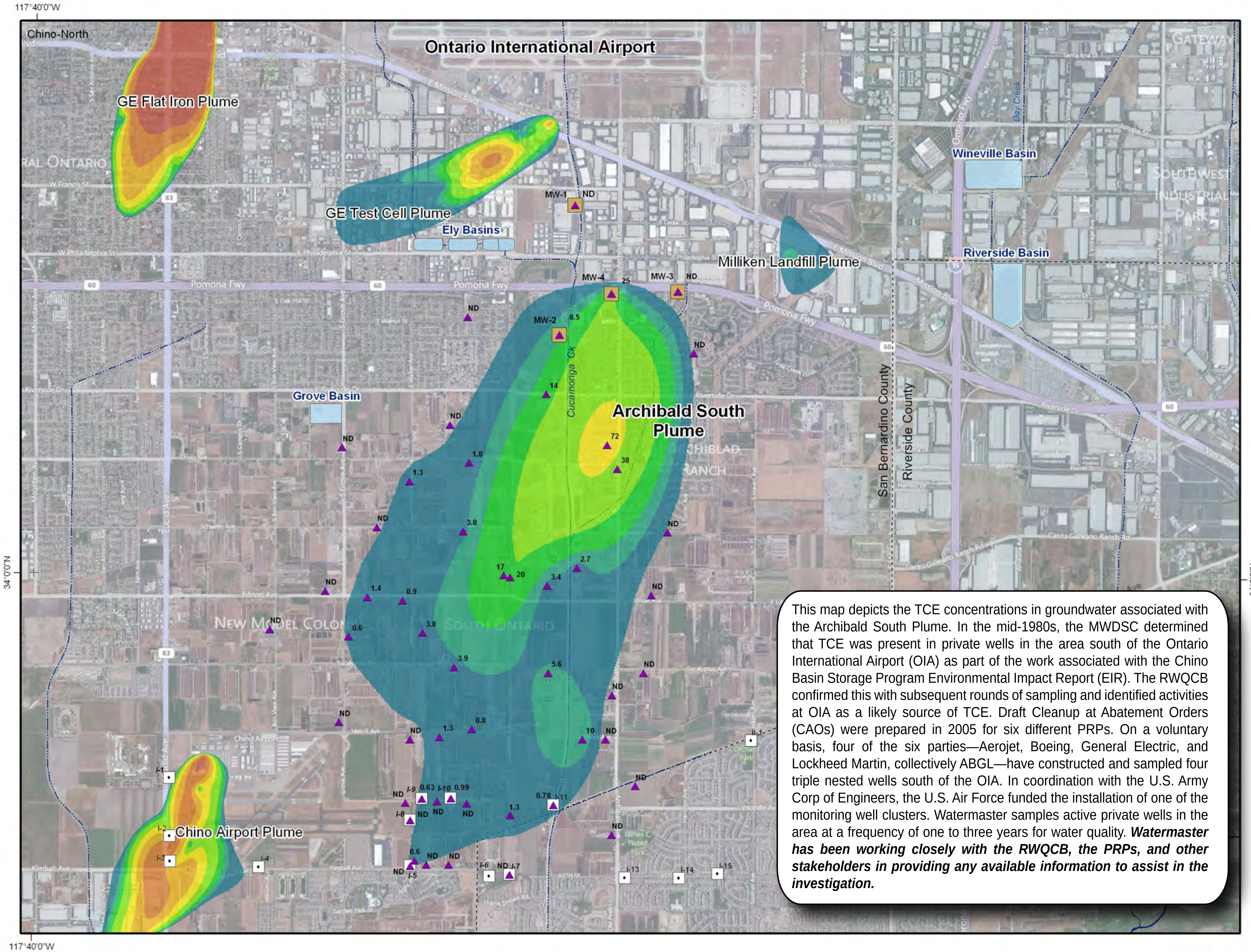
2010 State of the Basin
Groundwater Quality

Chino Airport TCE Plume
Shallow and Deep Aquifers

Exhibit 39



This map depicts the TCE concentrations in groundwater associated with the Archibald South Plume. In the mid-1980s, the MWDSC determined that TCE was present in private wells in the area south of the Ontario International Airport (OIA) as part of the work associated with the Chino Basin Storage Program Environmental Impact Report (EIR). The RWQCB confirmed this with subsequent rounds of sampling and identified activities at OIA as a likely source of TCE. Draft Cleanup at Abatement Orders (CAOs) were prepared in 2005 for six different PRPs. On a voluntary basis, four of the six parties—Aerojet, Boeing, General Electric, and Lockheed Martin, collectively ABGL—have constructed and sampled four triple nested wells south of the OIA. In coordination with the U.S. Army Corp of Engineers, the U.S. Air Force funded the installation of one of the monitoring well clusters. Watermaster samples active private wells in the area at a frequency of one to three years for water quality. ***Watermaster has been working closely with the RWQCB, the PRPs, and other stakeholders in providing any available information to assist in the investigation.***

TCE Concentration (ug/L)

- > 0 and ≤ 5
- > 5 and ≤ 10
- > 10 and ≤ 20
- > 20 and ≤ 50
- > 50 and ≤ 100
- > 100 and ≤ 200
- > 200 and ≤ 500
- > 500

The VOC plumes shown on this map are illustrations of the estimated spatial extent of TCE/PCE, based on maximum concentrations measured over a five year period (2006-2010). These plume depictions are for illustrative purposes only and are not intended to be used for analytical purposes. The VOC plume illustrations were created via the Geostatistical Analyst extension in ESRI's ArcView 10, using an ordinary kriging interpolation model with model input parameter estimation and optimization performed by semivariogram analysis in Golden's Surfer 8.09. Interpretations of plume extent and boundary delineation were made based on measured concentrations and local groundwater flow patterns as predicted by the Chino Basin groundwater flow model.

- ABGL Monitoring Wells
- Wells & TCE concentration (ug/L)
- Chino Desalter Well
- Streams & Flood Control Channels
- Flood Control & Conservation Basins

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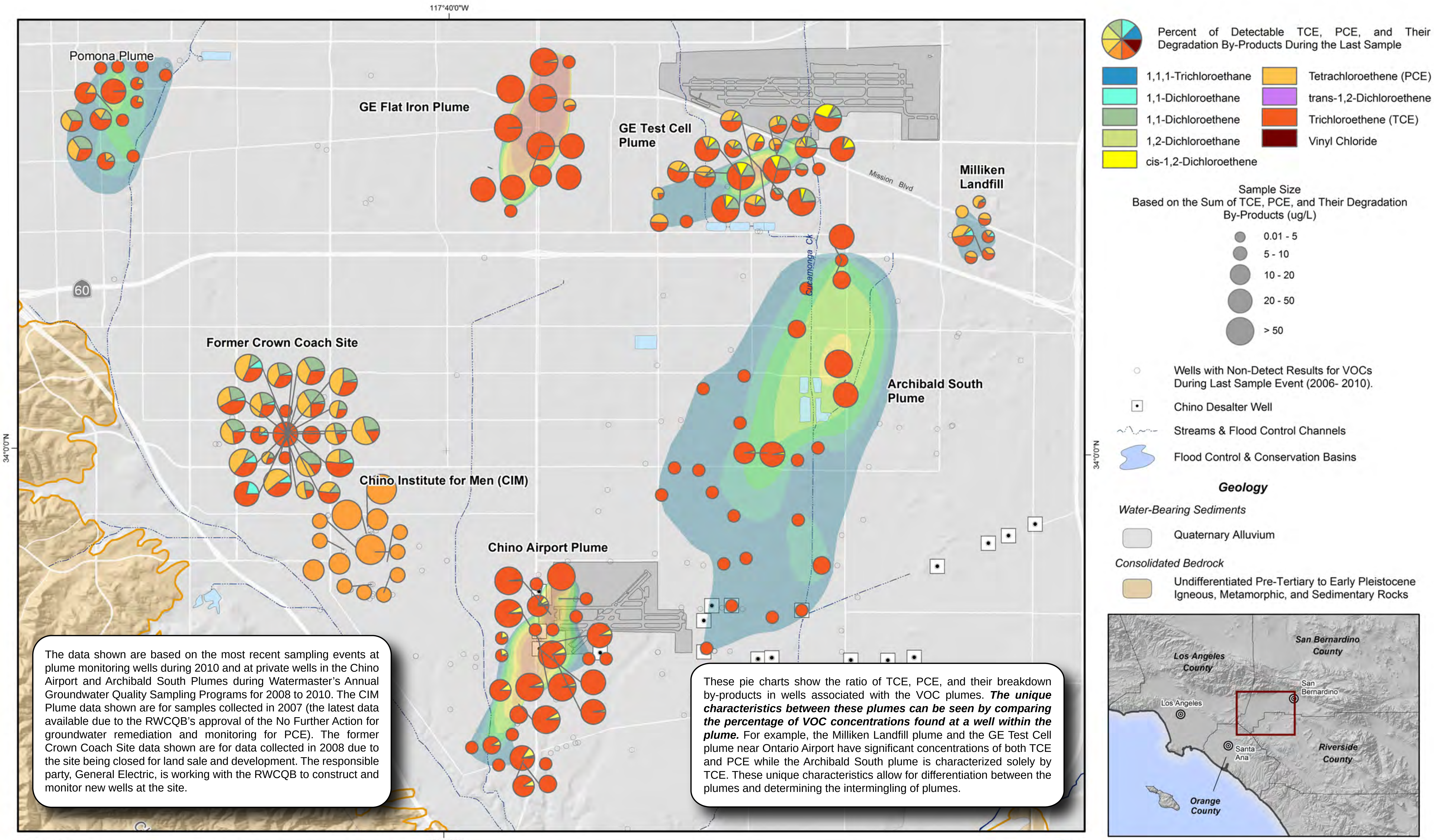
0 0.5 1 1.5 Miles
0 0.25 0.5 1 1.5 2 KM

2010 State of the Basin
Groundwater Quality

Archibald South TCE Plume

Exhibit 40



The data shown are based on the most recent sampling events at plume monitoring wells during 2010 and at private wells in the Chino Airport and Archibald South Plumes during Watermaster's Annual Groundwater Quality Sampling Programs for 2008 to 2010. The CIM Plume data shown are for samples collected in 2007 (the latest data available due to the RWCQB's approval of the No Further Action for groundwater remediation and monitoring for PCE). The former Crown Coach Site data shown are for data collected in 2008 due to the site being closed for land sale and development. The responsible party, General Electric, is working with the RWCQB to construct and monitor new wells at the site.

These pie charts show the ratio of TCE, PCE, and their breakdown by-products in wells associated with the VOC plumes. ***The unique characteristics between these plumes can be seen by comparing the percentage of VOC concentrations found at a well within the plume.*** For example, the Milliken Landfill plume and the GE Test Cell plume near Ontario Airport have significant concentrations of both TCE and PCE while the Archibald South plume is characterized solely by TCE. These unique characteristics allow for differentiation between the plumes and determining the intermingling of plumes.

117°40'0"W

0 0.5 1 1.5 2 Miles

0 0.5 1 1.5 2 2.5 Kilometers

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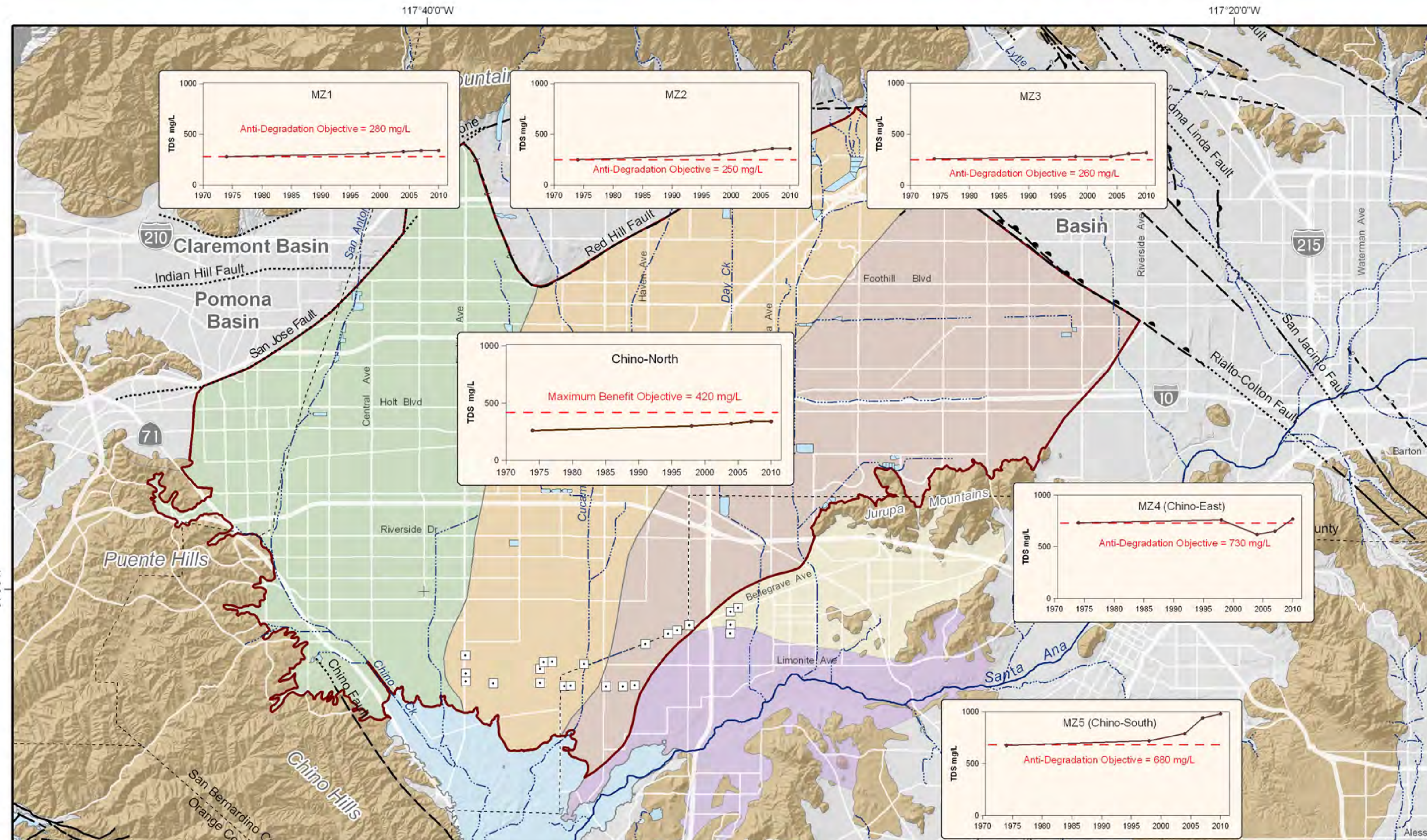
2010 State of the Basin
Groundwater Quality

VOC Pie Chart Comparisons

Wells Within and Adjacent to VOC Plumes

Exhibit 41



Ambient Water Quality Determination

TDS mg/L

Management Zone Objective for TDS

Year

Anti-Degradation Management Zones and Chino-North Maximum Benefit Management Zone

Chino-North MZ

MZ1 MZ2 MZ3

MZ4/Chino-East

MZ5/Chino-South

Prado

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain

The ambient water quality (AWQ) of management zones in the Santa Ana Region is computed on a triennial basis to determine whether each management zone has assimilative capacity for TDS and nitrate concentrations. The AWQ determinations for the historical period from 1954-1973 were used as the basis for the water quality objectives in the 2004 Basin Plan Amendment (RWQCB, 2004). To create assimilative capacity in MZ1, MZ2, and MZ3 within the Chino Basin, less stringent "maximum benefit" objectives for TDS and nitrate were accepted by the Regional Board for a combined Chino-North Management Zone (Chino-North).

Shown here are time histories of ambient TDS concentration for the individual management zones and for the Chino-North management zone. TDS AWQ determinations were made for 1973, 1997, 2003, 2006, and 2009 (WEI, 2000, 2005b, 2008a, and 2011b). The AWQ determination for Chino-North is used for compliance purposes. If the current TDS AWQ were to exceed the maximum benefit objective there would be a mitigation requirement for the recharge and direct use of recycled water equivalent to using recycled water with a TDS concentration less than or equal to the TDS objective. ***The current (2009) AWQ determination for TDS in Chino-North is 340 mg/L. The TDS objective is 420 mg/L. Therefore there is 80 mg/L of assimilative capacity (WEI, 2011b).*** The more recent increases in TDS AWQ determinations are due to the expansion of monitoring programs in the Chino Basin and are not due to an increase in TDS concentrations in the Basin.

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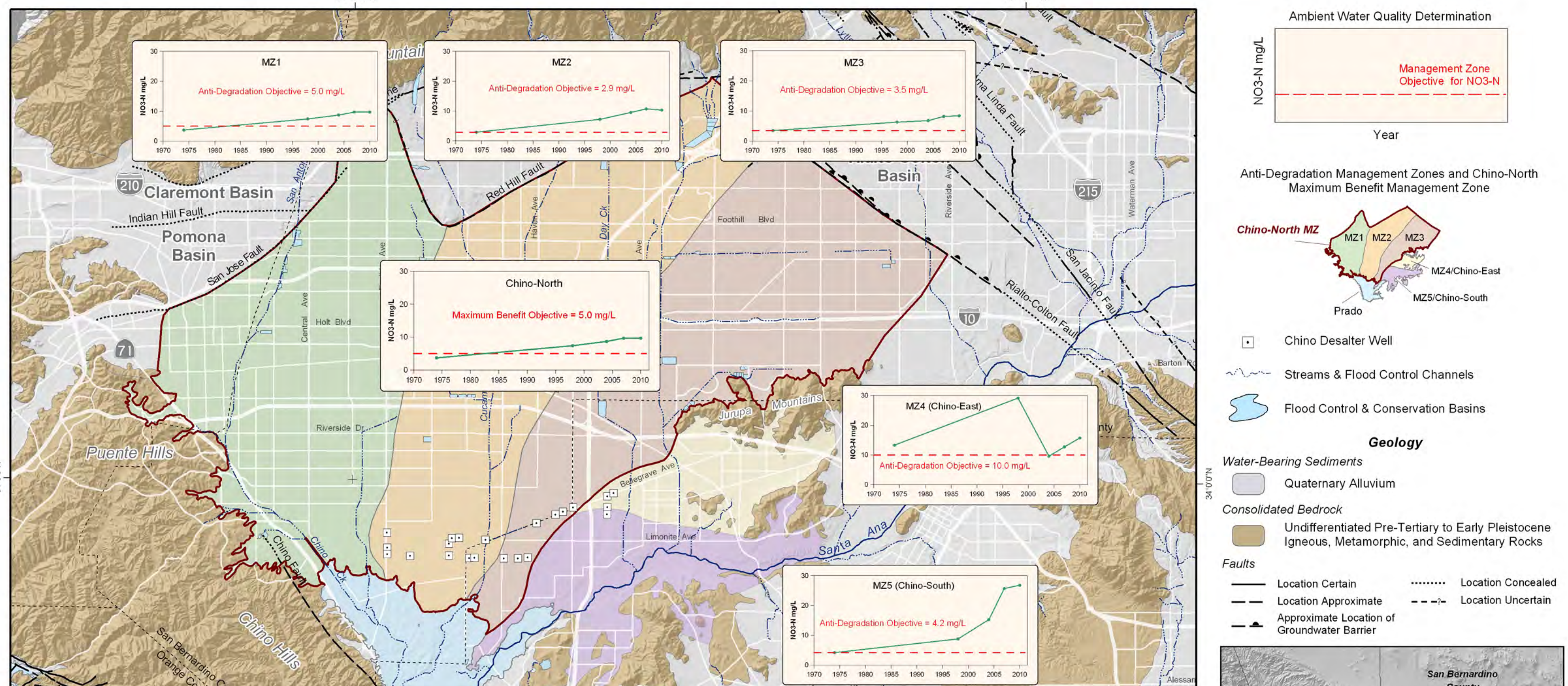
0 1 2 3 4 5 Miles

0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Trends in Ambient Water Quality Determinations for Total Dissolved Solids By Management Zone

Exhibit 42



The ambient water quality (AWQ) of management zones in the Santa Ana Region is computed on a triennial basis to determine whether each management zone has assimilative capacity for TDS and nitrate concentrations. The AWQ determinations for the historical period from 1954-1973 were used as the basis for the water quality objectives in the 2004 Basin Plan Amendment (RWQCB, 2004). To create assimilative capacity in MZ1, MZ2, and MZ3 within the Chino Basin, less stringent "maximum benefit" objectives for TDS and nitrate were accepted by the Regional Board for a combined Chino-North Management Zone (Chino-North).

Shown here are time histories of ambient NO_3-N concentrations for the individual management zones and for the Chino-North management zone. NO_3-N AWQ determinations were made for 1973, 1997, 2003, 2006, and 2009 (WEI, 2000, 2005b, 2008a, and 2011b). The AWQ determination for Chino-North is used for compliance purposes. If the current NO_3-N AWQ were to exceed the maximum benefit objective there would be a mitigation requirement for the recharge and direct use of recycled water equivalent to using recycled water with a NO_3-N concentration less than or equal to the NO3-N objective. ***The current (2009) AWQ determination for NO_3-N in Chino-North is 9.5 mg/L. The NO_3-N objective is 5.0 mg/L. Therefore there is no assimilative capacity (WEI, 2011b)***. The more recent increases in NO_3-N AWQ are due to the expansion of monitoring programs in the Chino Basin, and are not due to an increase in NO_3-N concentrations in the Basin.

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Date: 20110630
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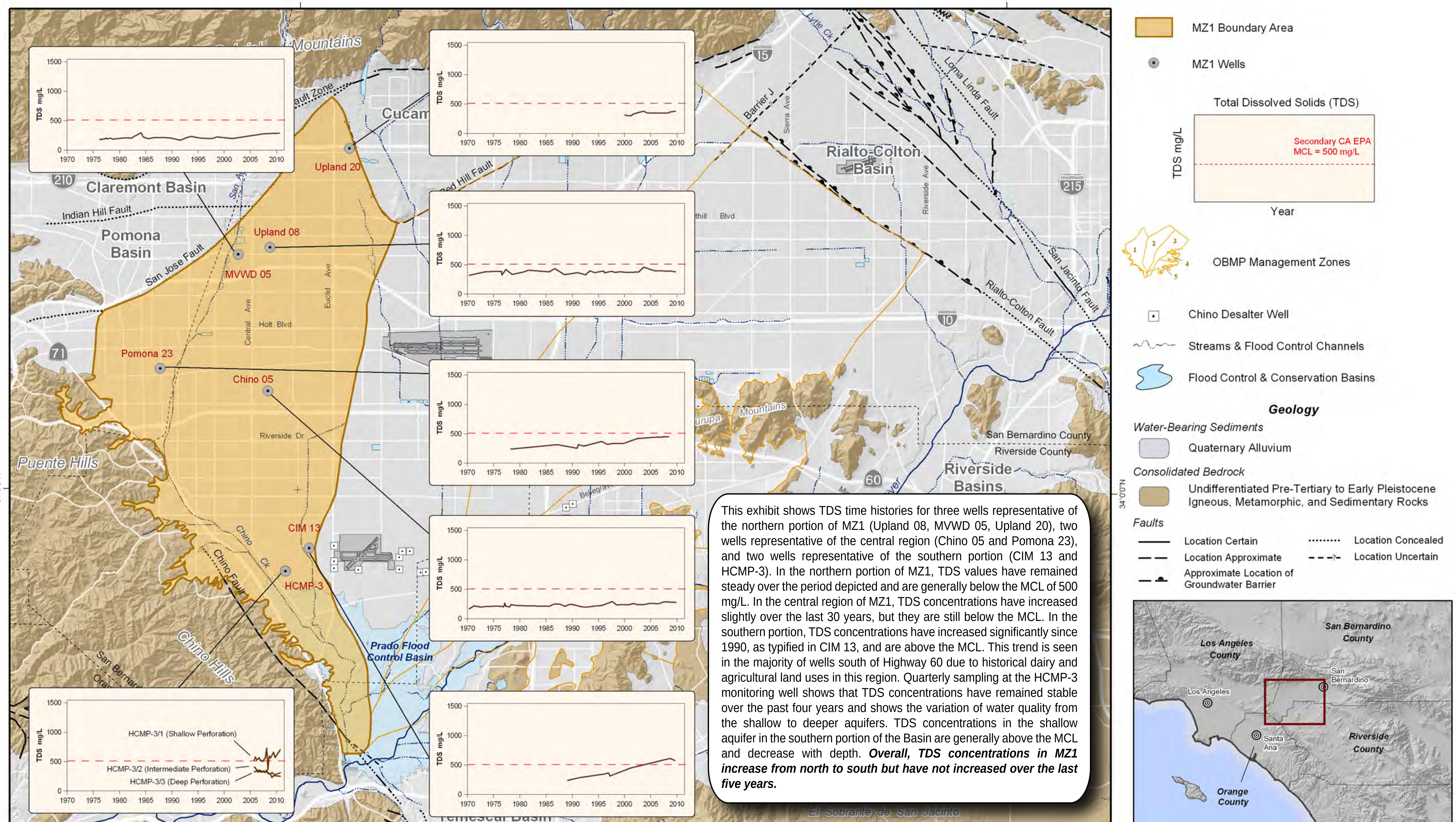
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Trends in Ambient Water Quality Determinations for Nitrate as Nitrogen By Management Zone

Exhibit 43



This exhibit shows TDS time histories for three wells representative of the northern portion of MZ1 (Upland 08, MVWD 05, Upland 20), two wells representative of the central region (Chino 05 and Pomona 23), and two wells representative of the southern portion (CIM 13 and HCMP-3). In the northern portion of MZ1, TDS values have remained steady over the period depicted and are generally below the MCL of 500 mg/L. In the central region of MZ1, TDS concentrations have increased slightly over the last 30 years, but they are still below the MCL. In the southern portion, TDS concentrations have increased significantly since 1990, as typified in CIM 13, and are above the MCL. This trend is seen in the majority of wells south of Highway 60 due to historical dairy and agricultural land uses in this region. Quarterly sampling at the HCMP-3 monitoring well shows that TDS concentrations have remained stable over the past four years and shows the variation of water quality from the shallow to deeper aquifers. TDS concentrations in the shallow aquifer in the southern portion of the Basin are generally above the MCL and decrease with depth. ***Overall, TDS concentrations in MZ1 increase from north to south but have not increased over the last five years.***

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Date: 20110524
File: Exhibit_44.mxd

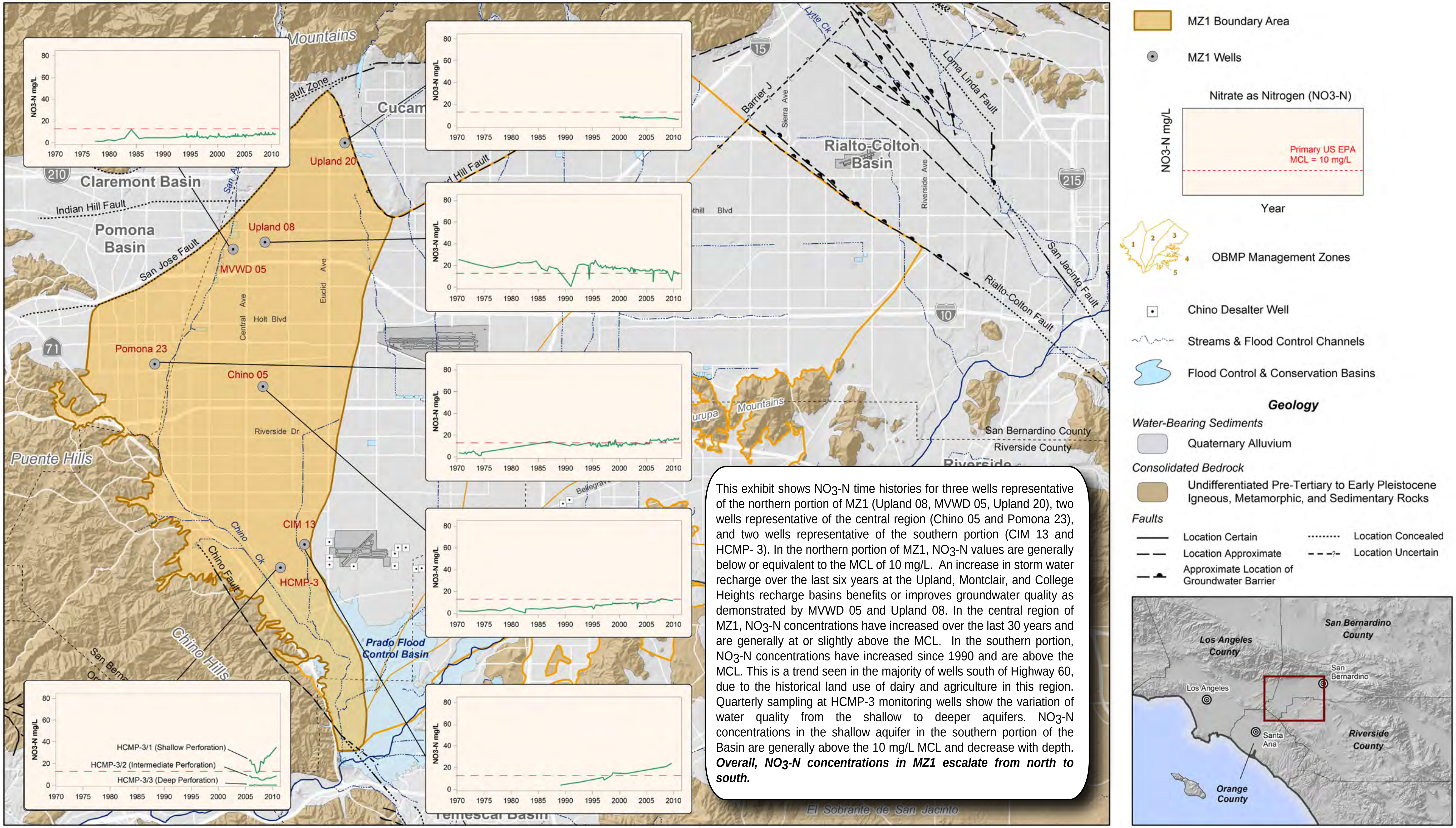
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 1

Trends in Total Dissolved Solids Concentrations

Exhibit 44



This exhibit shows NO3-N time histories for three wells representative of the northern portion of MZ1 (Upland 08, MVWD 05, Upland 20), two wells representative of the central region (Chino 05 and Pomona 23), and two wells representative of the southern portion (CIM 13 and HCMP- 3). In the northern portion of MZ1, NO3-N values are generally below or equivalent to the MCL of 10 mg/L. An increase in storm water recharge over the last six years at the Upland, Montclair, and College Heights recharge basins benefits or improves groundwater quality as demonstrated by MVWD 05 and Upland 08. In the central region of MZ1, NO3-N concentrations have increased over the last 30 years and are generally at or slightly above the MCL. In the southern portion, NO3-N concentrations have increased since 1990 and are above the MCL. This is a trend seen in the majority of wells south of Highway 60, due to the historical land use of dairy and agriculture in this region. Quarterly sampling at HCMP-3 monitoring wells show the variation of water quality from the shallow to deeper aquifers. NO3-N concentrations in the shallow aquifer in the southern portion of the Basin are generally above the 10 mg/L MCL and decrease with depth. ***Overall, NO3-N concentrations in MZ1 escalate from north to south.***

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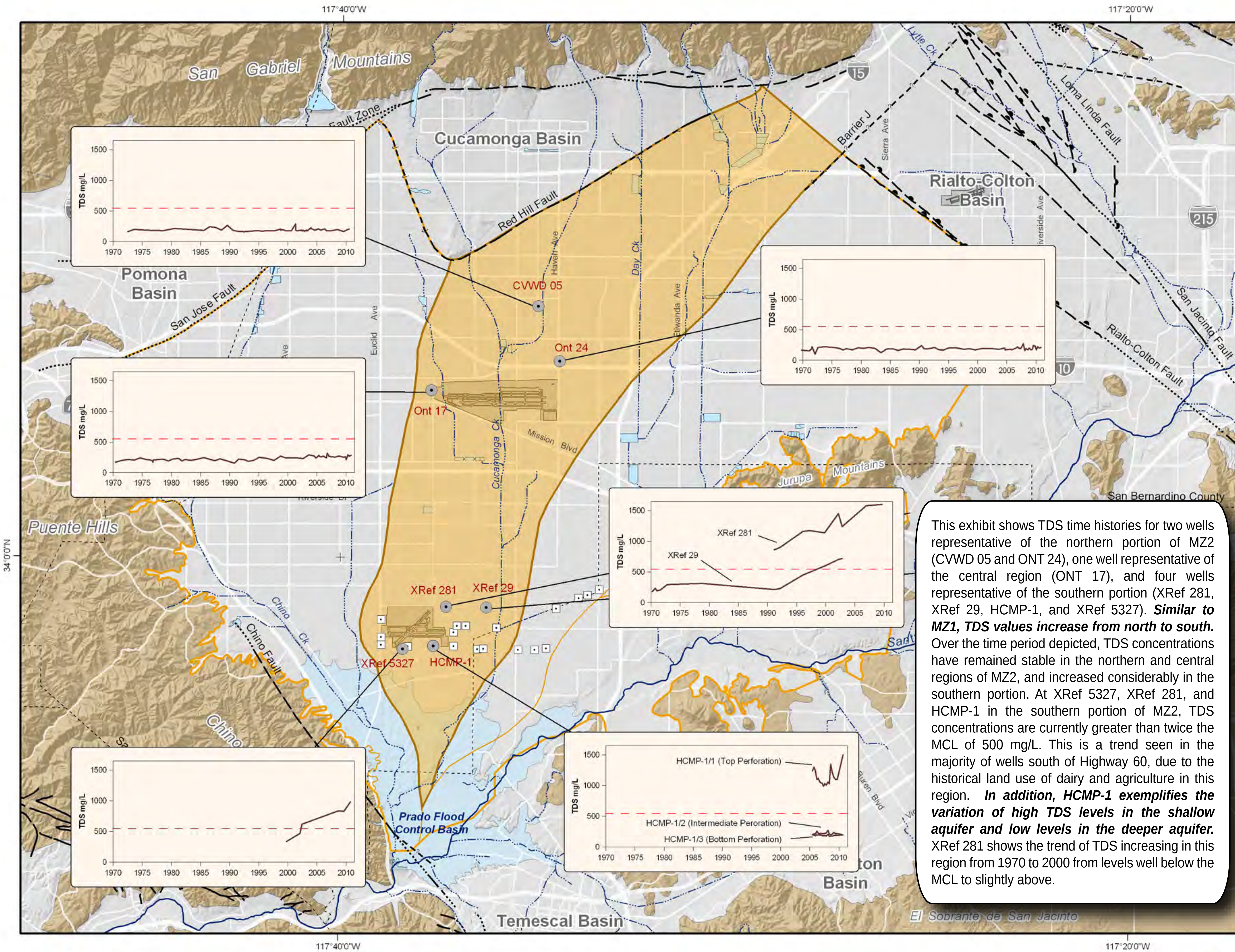
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 1

Trends in Nitrate as Nitrogen Concentrations

Exhibit 45



This exhibit shows TDS time histories for two wells representative of the northern portion of MZ2 (CVWD 05 and ONT 24), one well representative of the central region (ONT 17), and four wells representative of the southern portion (XRef 281, XRef 29, HCMP-1, and XRef 5327). ***Similar to MZ1, TDS values increase from north to south.*** Over the time period depicted, TDS concentrations have remained stable in the northern and central regions of MZ2, and increased considerably in the southern portion. At XRef 5327, XRef 281, and HCMP-1 in the southern portion of MZ2, TDS concentrations are currently greater than twice the MCL of 500 mg/L. This is a trend seen in the majority of wells south of Highway 60, due to the historical land use of dairy and agriculture in this region. ***In addition, HCMP-1 exemplifies the variation of high TDS levels in the shallow aquifer and low levels in the deeper aquifer.*** XRef 281 shows the trend of TDS increasing in this region from 1970 to 2000 from levels well below the MCL to slightly above.

MZ2 Boundary Area

MZ2 Wells

Total Dissolved Solids (TDS)

TDS mg/L — Year — Secondary CA EPA MCL = 500 mg/L

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain — Location Concealed

Location Approximate — Location Uncertain

Approximate Location of Groundwater Barrier

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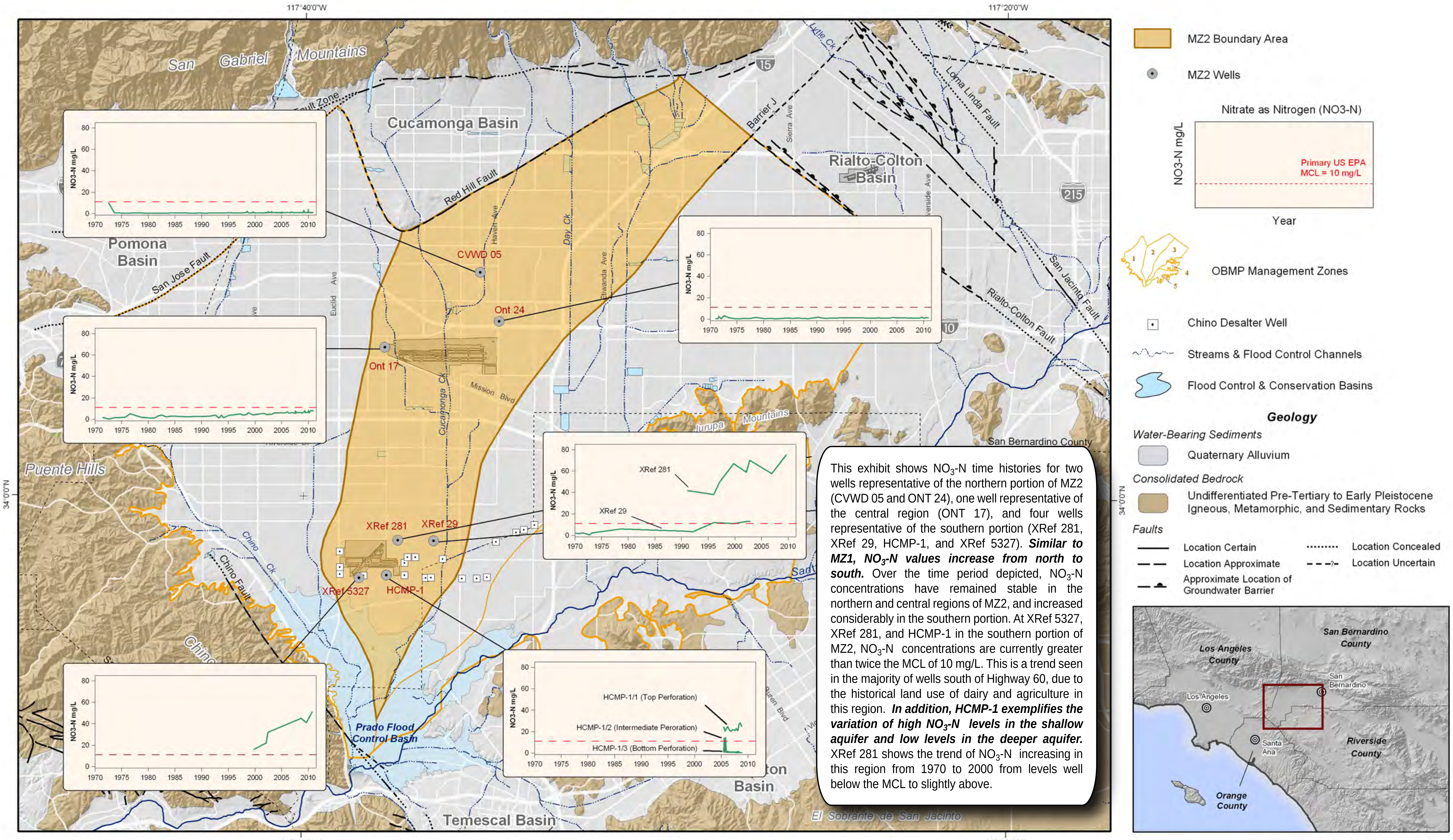
Date: 20110608
File: Exhibit_46.mxd

2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 2

Trends in Total Dissolved Solids Concentrations

Exhibit 46



This exhibit shows NO_3-N time histories for two wells representative of the northern portion of MZ2 (CVWD 05 and ONT 24), one well representative of the central region (ONT 17), and four wells representative of the southern portion (XRef 281, XRef 29, HCMP-1, and XRef 5327). ***Similar to MZ1, NO_3-N values increase from north to south.*** Over the time period depicted, NO_3-N concentrations have remained stable in the northern and central regions of MZ2, and increased considerably in the southern portion. At XRef 5327, XRef 281, and HCMP-1 in the southern portion of MZ2, NO_3-N concentrations are currently greater than twice the MCL of 10 mg/L. This is a trend seen in the majority of wells south of Highway 60, due to the historical land use of dairy and agriculture in this region. ***In addition, HCMP-1 exemplifies the variation of high NO_3-N levels in the shallow aquifer and low levels in the deeper aquifer.*** XRef 281 shows the trend of NO_3-N increasing in this region from 1970 to 2000 from levels well below the MCL to slightly above.

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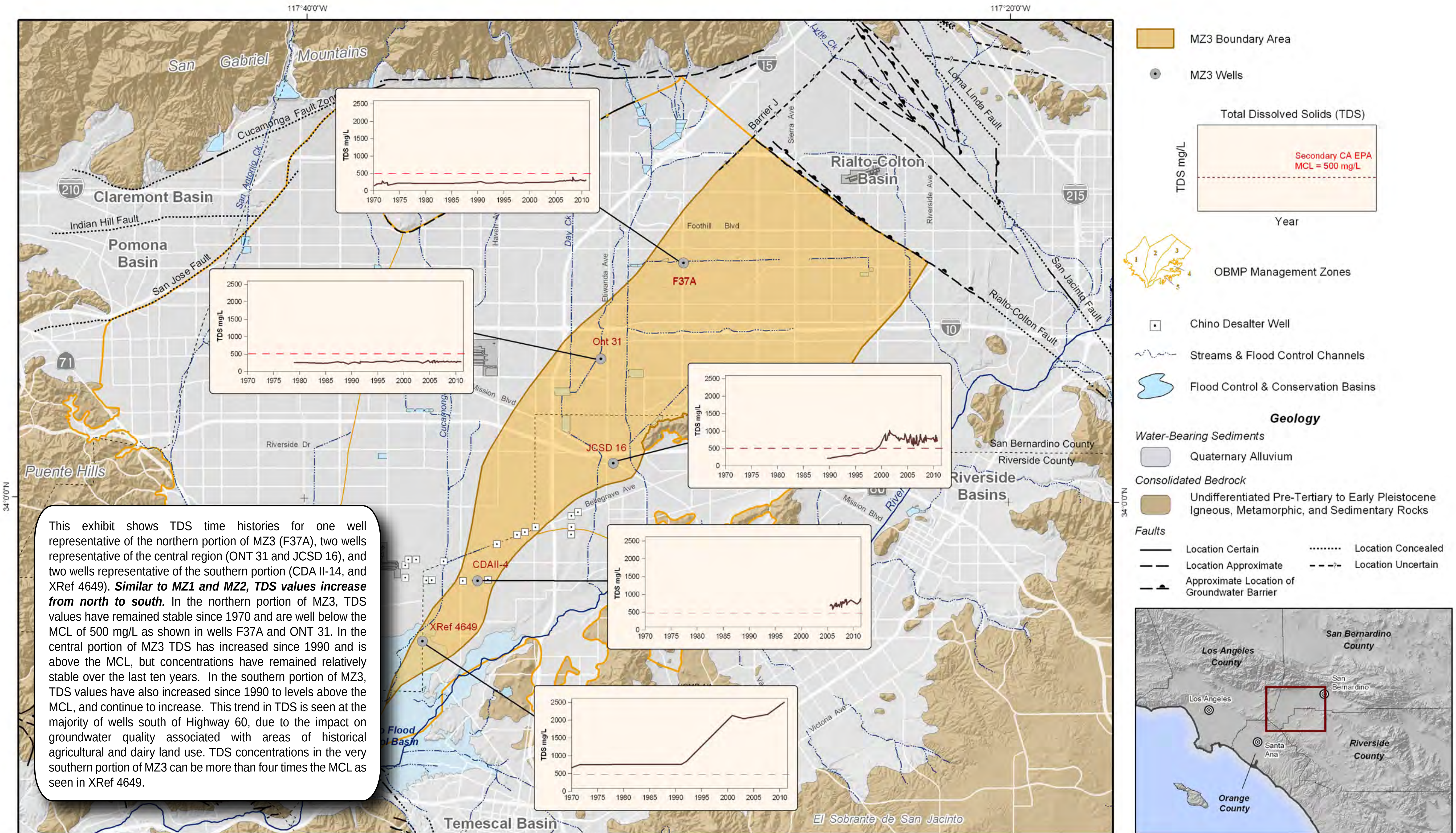
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 2

Trends in Nitrate as Nitrogen Concentrations

Exhibit 47



This exhibit shows TDS time histories for one well representative of the northern portion of MZ3 (F37A), two wells representative of the central region (ONT 31 and JCSD 16), and two wells representative of the southern portion (CDA II-14, and XRef 4649). ***Similar to MZ1 and MZ2, TDS values increase from north to south.*** In the northern portion of MZ3, TDS values have remained stable since 1970 and are well below the MCL of 500 mg/L as shown in wells F37A and ONT 31. In the central portion of MZ3 TDS has increased since 1990 and is above the MCL, but concentrations have remained relatively stable over the last ten years. In the southern portion of MZ3, TDS values have also increased since 1990 to levels above the MCL, and continue to increase. This trend in TDS is seen at the majority of wells south of Highway 60, due to the impact on groundwater quality associated with areas of historical agricultural and dairy land use. TDS concentrations in the very southern portion of MZ3 can be more than four times the MCL as seen in XRef 4649.

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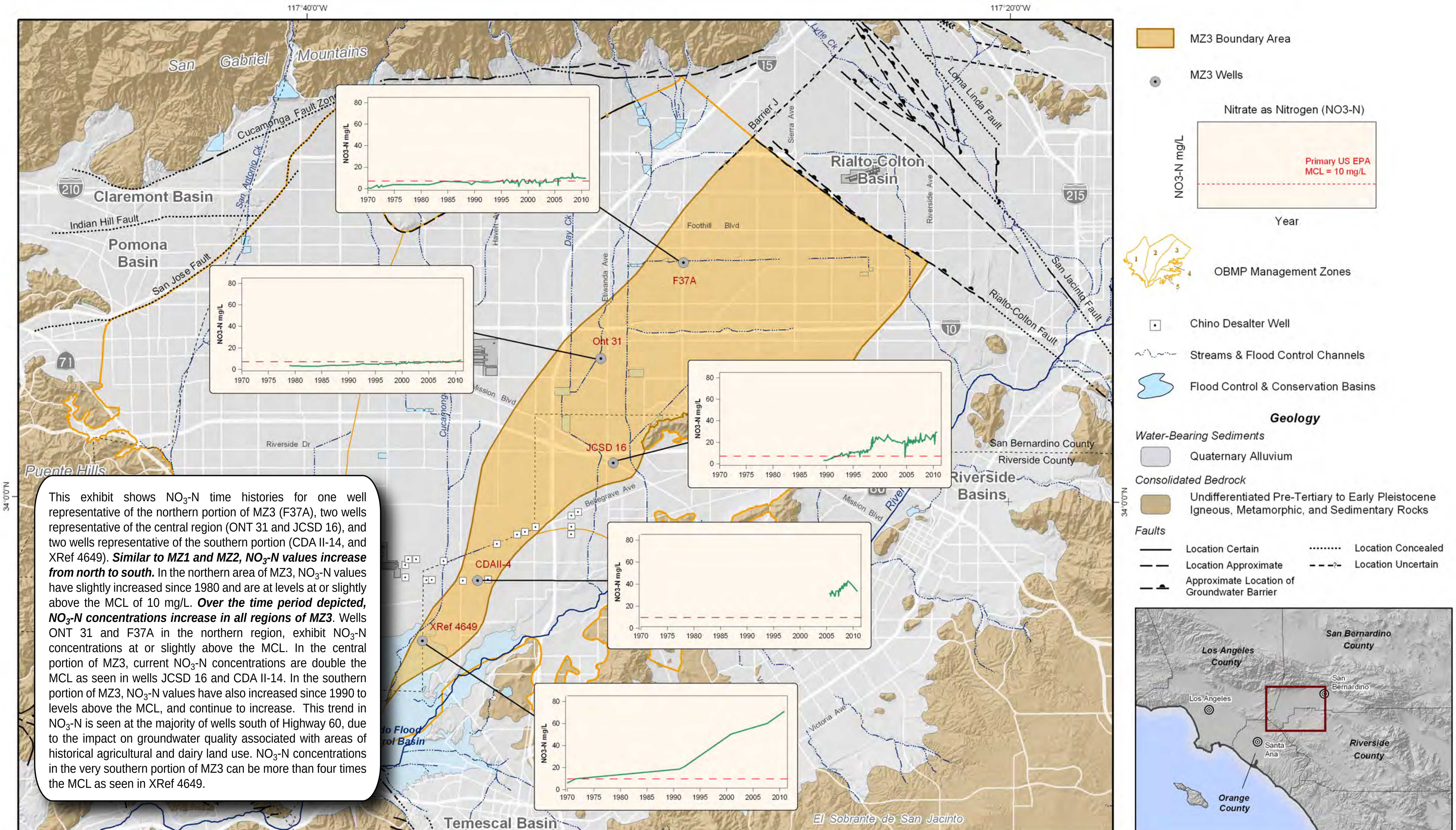
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 3

Trends inTotal Dissolved Solids Concentrations

Exhibit 48



This exhibit shows NO_3-N time histories for one well representative of the northern portion of MZ3 (F37A), two wells representative of the central region (ONT 31 and JCSD 16), and two wells representative of the southern portion (CDA II-14, and XRef 4649). ***Similar to MZ1 and MZ2, NO_3-N values increase from north to south.*** In the northern area of MZ3, NO_3-N values have slightly increased since 1980 and are at levels at or slightly above the MCL of 10 mg/L. ***Over the time period depicted, NO_3-N concentrations increase in all regions of MZ3***. Wells ONT 31 and F37A in the northern region, exhibit NO_3-N concentrations at or slightly above the MCL. In the central portion of MZ3, current NO_3-N concentrations are double the MCL as seen in wells JCSD 16 and CDA II-14. In the southern portion of MZ3, NO_3-N values have also increased since 1990 to levels above the MCL, and continue to increase. This trend in NO_3-N is seen at the majority of wells south of Highway 60, due to the impact on groundwater quality associated with areas of historical agricultural and dairy land use. NO_3-N concentrations in the very southern portion of MZ3 can be more than four times the MCL as seen in XRef 4649.

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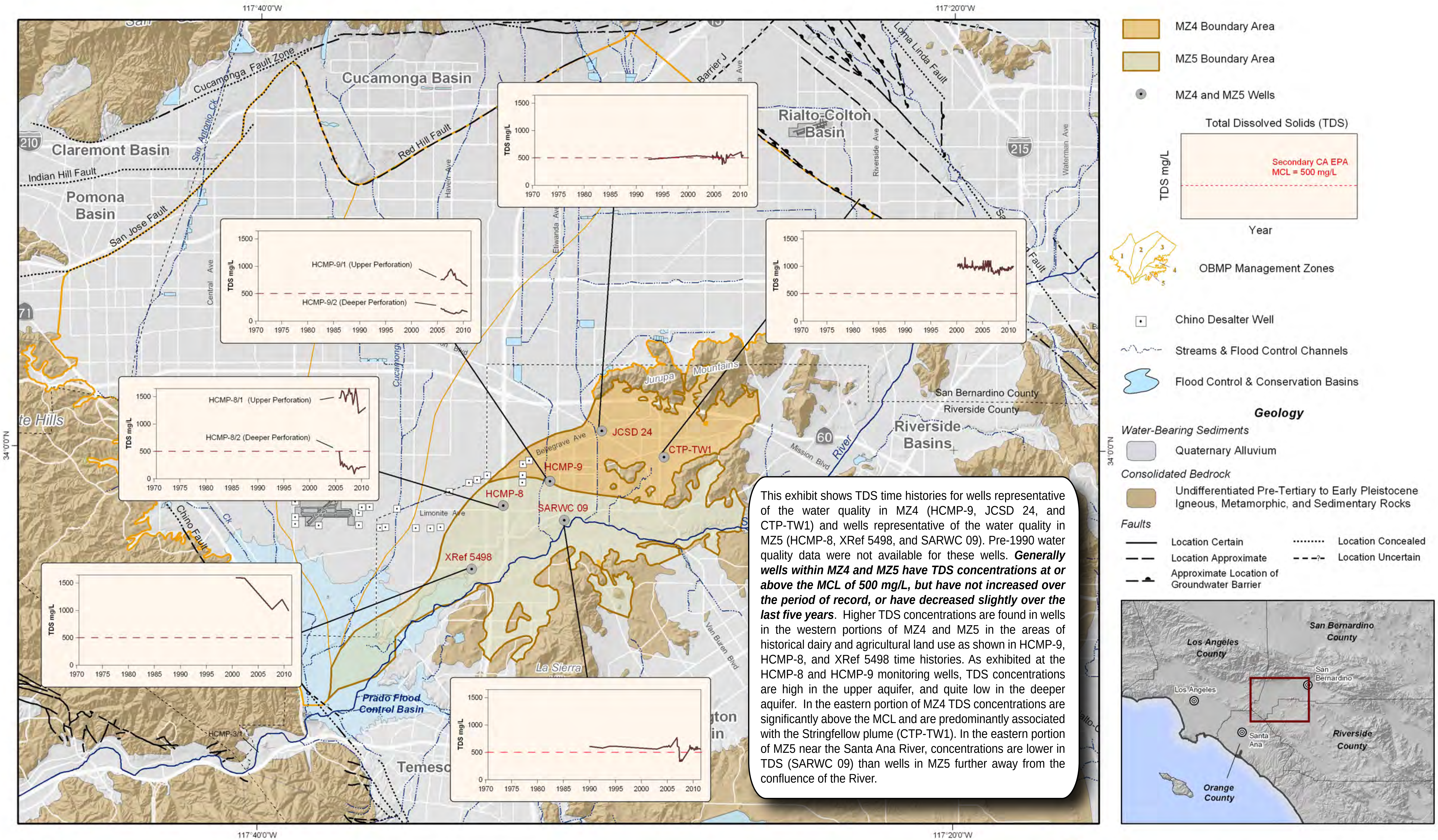
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 3

Trends in Nitrate as Nitrogen Concentrations

Exhibit 49



This exhibit shows TDS time histories for wells representative of the water quality in MZ4 (HCMP-9, JCSD 24, and CTP-TW1) and wells representative of the water quality in MZ5 (HCMP-8, XRef 5498, and SARWC 09). Pre-1990 water quality data were not available for these wells. ***Generally wells within MZ4 and MZ5 have TDS concentrations at or above the MCL of 500 mg/L, but have not increased over the period of record, or have decreased slightly over the last five years***. Higher TDS concentrations are found in wells in the western portions of MZ4 and MZ5 in the areas of historical dairy and agricultural land use as shown in HCMP-9, HCMP-8, and XRef 5498 time histories. As exhibited at the HCMP-8 and HCMP-9 monitoring wells, TDS concentrations are high in the upper aquifer, and quite low in the deeper aquifer. In the eastern portion of MZ4 TDS concentrations are significantly above the MCL and are predominantly associated with the Stringfellow plume (CTP-TW1). In the eastern portion of MZ5 near the Santa Ana River, concentrations are lower in TDS (SARWC 09) than wells in MZ5 further away from the confluence of the River.

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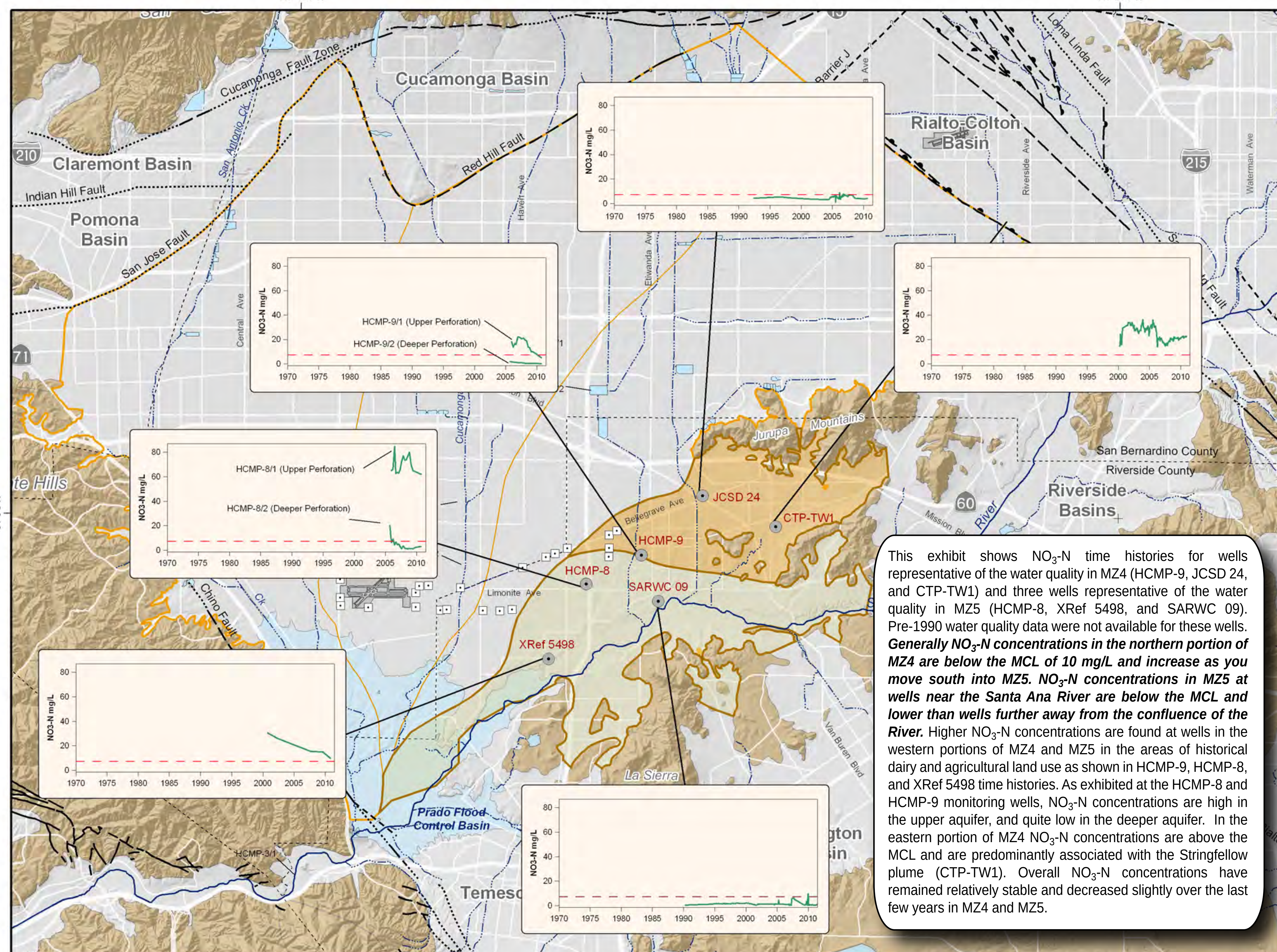
2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 4 and Zone 5
Trends in Total Dissolved Solids Concentrations

Exhibit 50



This exhibit shows NO_3-N time histories for wells representative of the water quality in MZ4 (HCMP-9, JCSD 24, and CTP-TW1) and three wells representative of the water quality in MZ5 (HCMP-8, XRef 5498, and SARWC 09). Pre-1990 water quality data were not available for these wells. ***Generally NO_3-N concentrations in the northern portion of MZ4 are below the MCL of 10 mg/L and increase as you move south into MZ5. NO_3-N concentrations in MZ5 at wells near the Santa Ana River are below the MCL and lower than wells further away from the confluence of the River.*** Higher NO_3-N concentrations are found at wells in the western portions of MZ4 and MZ5 in the areas of historical dairy and agricultural land use as shown in HCMP-9, HCMP-8, and XRef 5498 time histories. As exhibited at the HCMP-8 and HCMP-9 monitoring wells, NO_3-N concentrations are high in the upper aquifer, and quite low in the deeper aquifer. In the eastern portion of MZ4 NO_3-N concentrations are above the MCL and are predominantly associated with the Stringfellow plume (CTP-TW1). Overall NO_3-N concentrations have remained relatively stable and decreased slightly over the last few years in MZ4 and MZ5.

MZ4 Boundary Area

MZ5 Boundary Area

MZ4 and MZ5 Wells

Nitrate as Nitrogen (NO3-N)

NO3-N mg/L

Primary US EPA MCL = 10 mg/L

Year

OBMP Management Zones

Chino Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain | Location Concealed

Location Approximate | Location Uncertain

Approximate Location of Groundwater Barrier

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0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2010 State of the Basin
Groundwater Quality

Chino Basin Management Zone 4 and Zone 5

Trends in Nitrate as Nitrogen Concentrations

Exhibit 51