The exhibits in this section show the physical state of the Chino Basin with respect to changes in groundwater levels since the Judgement and OBMP implementation. The groundwater-level data used to generate these exhibits were collected and compiled as part of Watermaster's groundwater-level monitoring program.

Prior to OBMP implementation, there was no formal groundwater-level monitoring program in the Chino Basin. Problems with historical groundwater-level monitoring included an inadequate areal distribution of wells that were monitored, short time histories, questionable data quality, and insufficient resources to develop and conduct a comprehensive program. The OBMP defined a new, comprehensive, basin-wide groundwater-level monitoring program pursuant to *OBMP Program Element 1 – Develop and Implement a Comprehensive Monitoring Program*. The monitoring program has been refined over time to satisfy the evolving needs of the Watermaster and IEUA, such as new regulatory requirements, and to increase efficiency.

The groundwater-level monitoring program supports many Watermaster functions, such as the periodic reassessment of Safe Yield, the monitoring and management of land subsidence, and the assessment of Hydraulic Control. The data are also used to update and re-calibrate Watermaster's groundwater-flow model, to understand directions of groundwater flow, to estimate storage changes, to interpret water quality data, and to identify areas of the basin where recharge and discharge are not in balance.

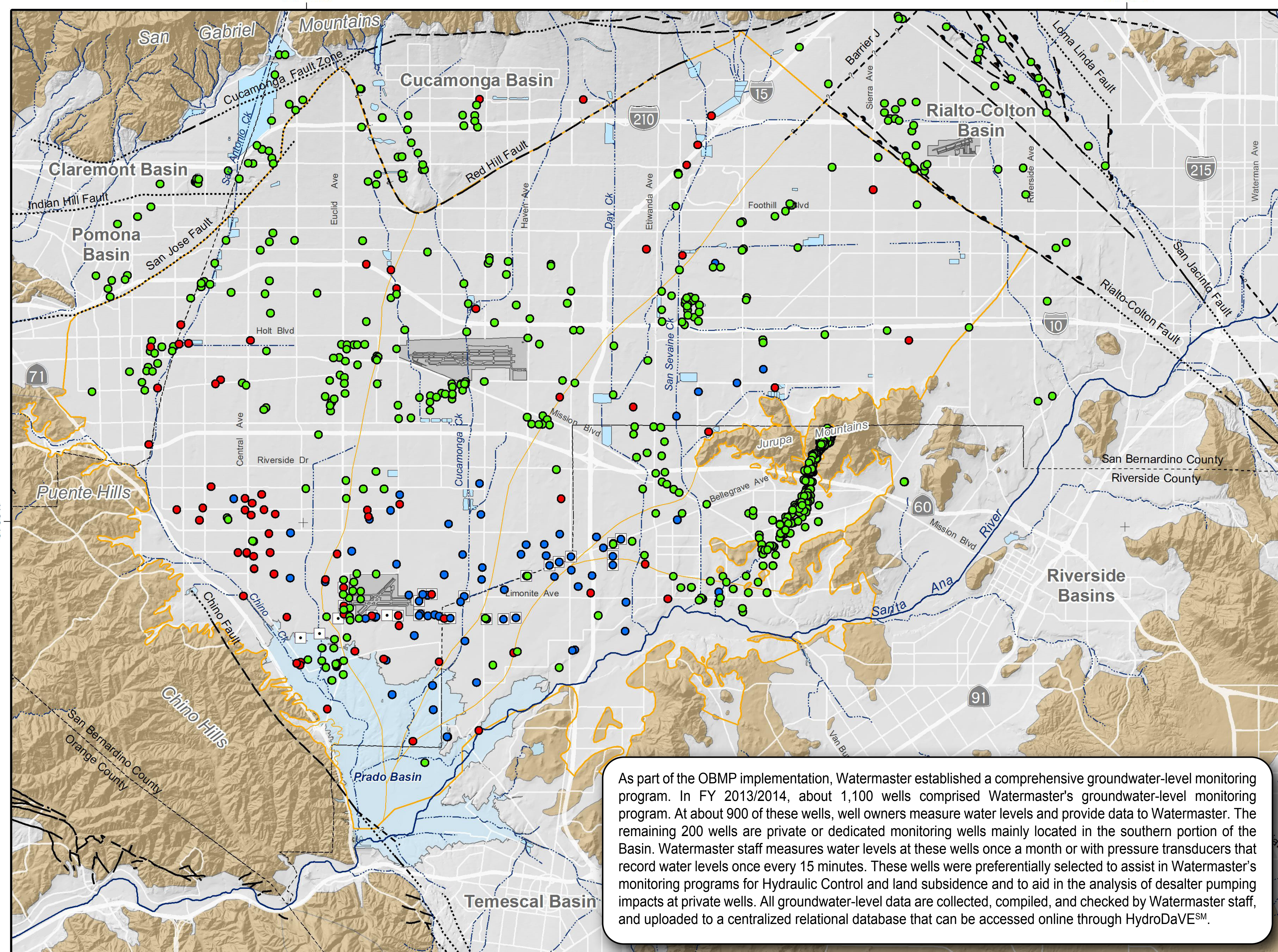
Exhibit 15 shows the locations and measurement frequencies of all wells currently in Watermaster's groundwater-level monitoring program. Water levels are measured at private wells and dedicated monitoring wells by Watermaster staff using manual methods once per month or with pressure transducers that record water levels once every 15 minutes. Water levels are also measured by well owners, including municipal water agencies, private water companies, the California Department of Toxic Substance Control (DTSC), the County of San Bernardino, and various private consulting firms. Typically, water levels are measured by well owners monthly, and Watermaster staff collects these data from the well owners quarterly. All water-level data are checked by Watermaster staff and uploaded to a centralized database management system that can be accessed online through HydroDaVE℠.

The groundwater-level data were used to create groundwater-elevation contour maps for the shallow aquifer system in the Chino Basin for spring 2000 (Exhibit 16), spring 2012 (Exhibit 17), and spring 2014 (Exhibit 18). The contours were used to create 60x60-meter rasterized grids of the piezomtetric surface using an Ordinary Kriging method of interpolation with the ArcMap Geostatistical Analyst extension. The groundwater-elevation rasterized grid for spring 2012 and spring 2014 were subtracted to generate a map of water-level change over the two-year period since the last State of the Basin analysis (Exhibit 19). The groundwater-elevation rasterized grid from spring 2000 and spring 2014 were subtracted to generate a map of groundwater-level change over the 14-year period since the OBMP and Peace Agreement implementation (Exhibit 20).

Achieving "Hydraulic Control" in the southern portion of Chino Basin is an important objective of Watermaster, the IEUA, and the RWQCB. Hydraulic Control is achieved when groundwater discharge from the Chino-North groundwater management zone to Prado Basin is eliminated or reduced to de minimis levels. The RWQCB made achieving Hydraulic Control a commitment for the Watermaster and the IEUA in the Basin Plan (RWQCB, 2004) in exchange for relaxed groundwater-quality objectives in Chino-North. These objectives, called "maximum-benefit" objectives, allow for the implementation of recycled-water reuse in the Chino Basin for both direct use and recharge while simultaneously assuring the protection of the beneficial uses of the Chino Basin and the Santa Ana River. Achieving Hydraulic Control also enhances the yield of the Chino Basin by controlling groundwater levels in its southern portion, which has the effect of reducing outflow as rising groundwater and increasing streambed recharge in the Santa Ana River.

Groundwater-level data are used to assess the state of Hydraulic Control. Data are collected from a selected set of "key wells" and are mapped and analyzed annually. Exhibit 21 shows groundwater-elevation contours and data for the shallow aquifer system within the southern portion of the Chino Basin in spring 2000—prior to any significant pumping by the Chino-I Desalter wells. Exhibit 22 shows groundwater-elevation contours and data for the shallow aquifer system in spring 2014—approximately fourteen years after the commencement of Chino-I Desalter pumping and eight years after the commencement of Chino-II Desalter pumping. These exhibits include a brief interpretation of the state of Hydraulic Control. For an in-depth discussion of Hydraulic Control, see *Chino Basin Maximum Benefit Monitoring Program 2014 Annual Report* (WEI, 2015).

Exhibit 23 shows the location of selected wells across the Chino Basin that have long time-histories of water-levels. The time-histories describe long-term trends in groundwater levels in the different groundwater management zones of the Chino Basin. The wells were selected based on geographic location within the management zone, well-screen intervals, and the length, density, and quality of water-level records. Exhibits 24 through 28 are water-level time-series charts for these wells by management zone for the period of 1978 to 2014. These exhibits compare the behavior of water levels to climate, groundwater production, and recharge, revealing cause-and-effect relationships. To show the relationship between groundwater levels and climate, a cumulative departure from mean precipitation (CDFM) plot is provided. Positive sloping lines on the CDFM plot indicate wet years or wet periods, and negatively sloping lines indicate dry years or dry periods. For example, 1978 to 1983 was an extremely wet period, and it is represented by a positively sloping line. Bar charts of annual pumping and artificial recharge by management zone are shown to characterize the relationships between groundwater levels and pumping and/or artificial recharge.



As part of the OBMP implementation, Watermaster established a comprehensive groundwater-level monitoring program. In FY 2013/2014, about 1,100 wells comprised Watermaster's groundwater-level monitoring program. At about 900 of these wells, well owners measure water levels and provide data to Watermaster. The remaining 200 wells are private or dedicated monitoring wells mainly located in the southern portion of the Basin. Watermaster staff measures water levels at these wells once a month or with pressure transducers that record water levels once every 15 minutes. These wells were preferentially selected to assist in Watermaster's monitoring programs for Hydraulic Control and land subsidence and to aid in the analysis of desalter pumping impacts at private wells. All groundwater-level data are collected, compiled, and checked by Watermaster staff, and uploaded to a centralized relational database that can be accessed online through HydroDaVE[SM].

Basin-Wide Groundwater Level Monitoring Program Wells by Measurement Frequency

- Monthly Measurement
- Measurement by Transducer - Every 15 Minutes
- Owner Measures Water Level at Various Frequencies
- OBMP Management Zones
- Chino Basin Desalter Well
- Streams & Flood Control Channels
- Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

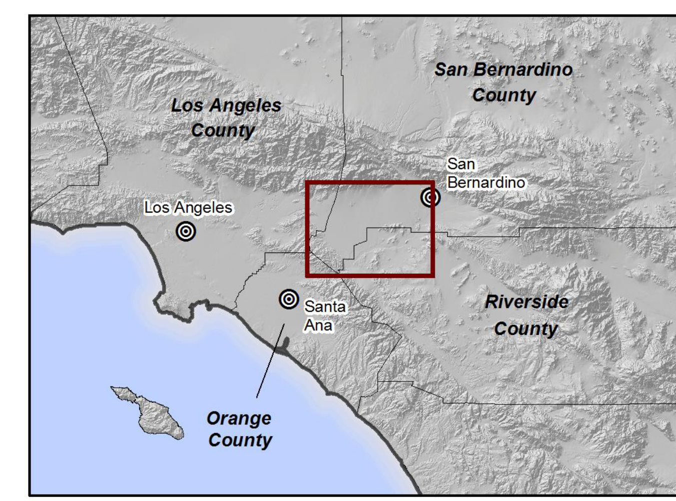
- Quaternary Alluvium

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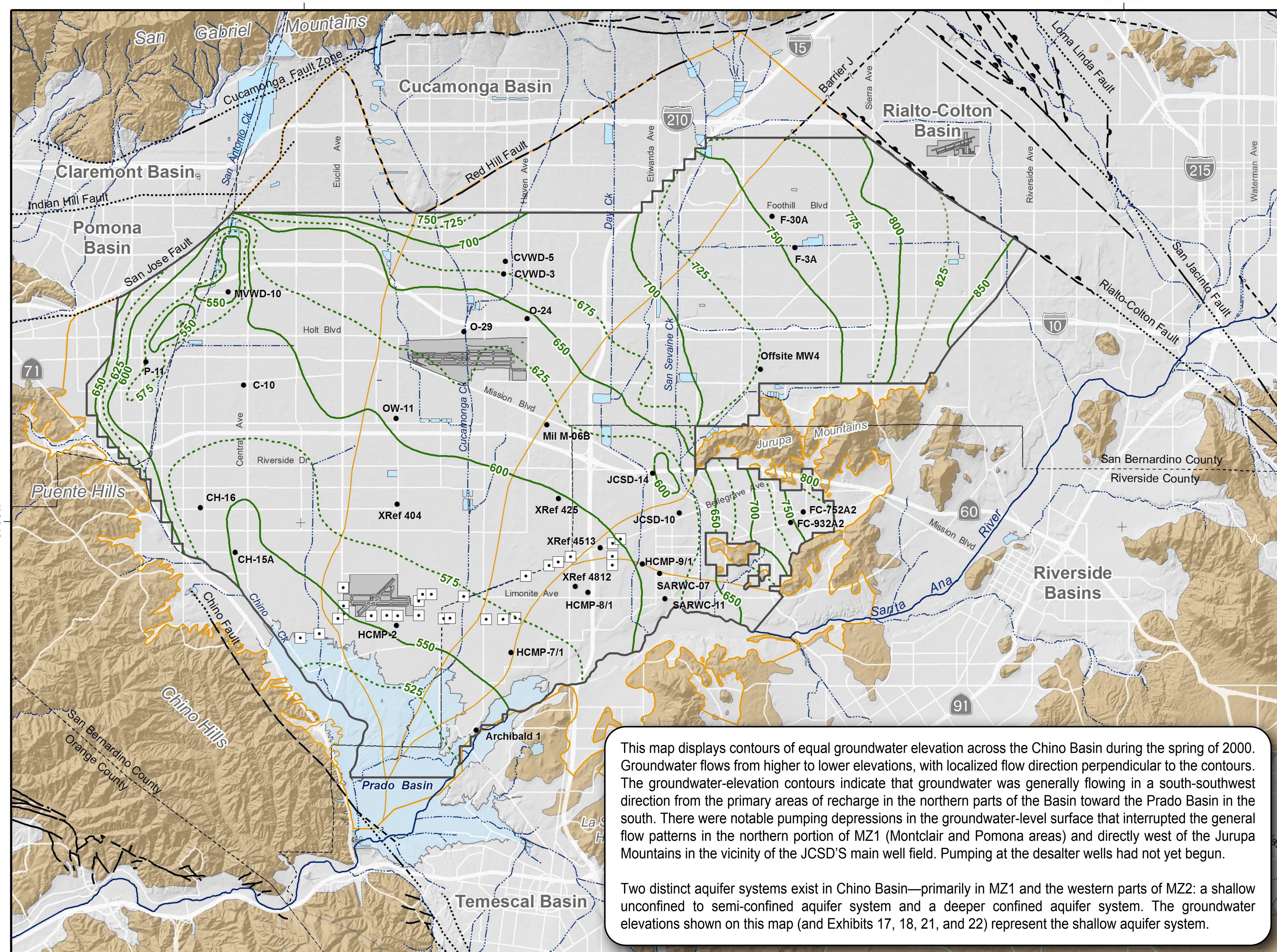
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2014 State of the Basin
Groundwater Levels

Groundwater Level Monitoring Network

Well Location and Measurement Frequency During Fiscal Year 2013/2014

Exhibit 15



This map displays contours of equal groundwater elevation across the Chino Basin during the spring of 2000. Groundwater flows from higher to lower elevations, with localized flow direction perpendicular to the contours. The groundwater-elevation contours indicate that groundwater was generally flowing in a south-southwest direction from the primary areas of recharge in the northern parts of the Basin toward the Prado Basin in the south. There were notable pumping depressions in the groundwater-level surface that interrupted the general flow patterns in the northern portion of MZ1 (Montclair and Pomona areas) and directly west of the Jurupa Mountains in the vicinity of the JCSD'S main well field. Pumping at the desalter wells had not yet begun.

Two distinct aquifer systems exist in Chino Basin—primarily in MZ1 and the western parts of MZ2: a shallow unconfined to semi-confined aquifer system and a deeper confined aquifer system. The groundwater elevations shown on this map (and Exhibits 17, 18, 21, and 22) represent the shallow aquifer system.

800, 775 — Groundwater Elevation Contours (feet above mean sea-level)

Boundry of Contoured Area (contours are not shown outside of this boundary due to lack of groundwater level data)

Well With a Groundwater-Level Time History Plotted on Exhibits 24 through 28

1, 2, 3, 4, 5 — OBMP Management Zones

Chino Basin 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

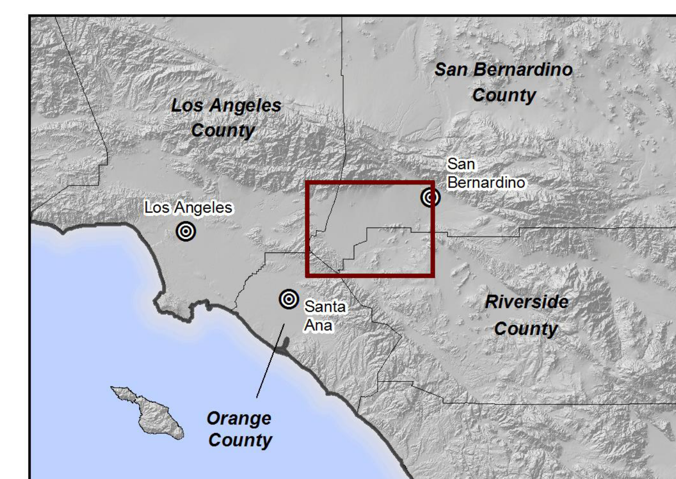
Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain



0 1 2 3 4 5 Miles

0 2 4 6 8 KM

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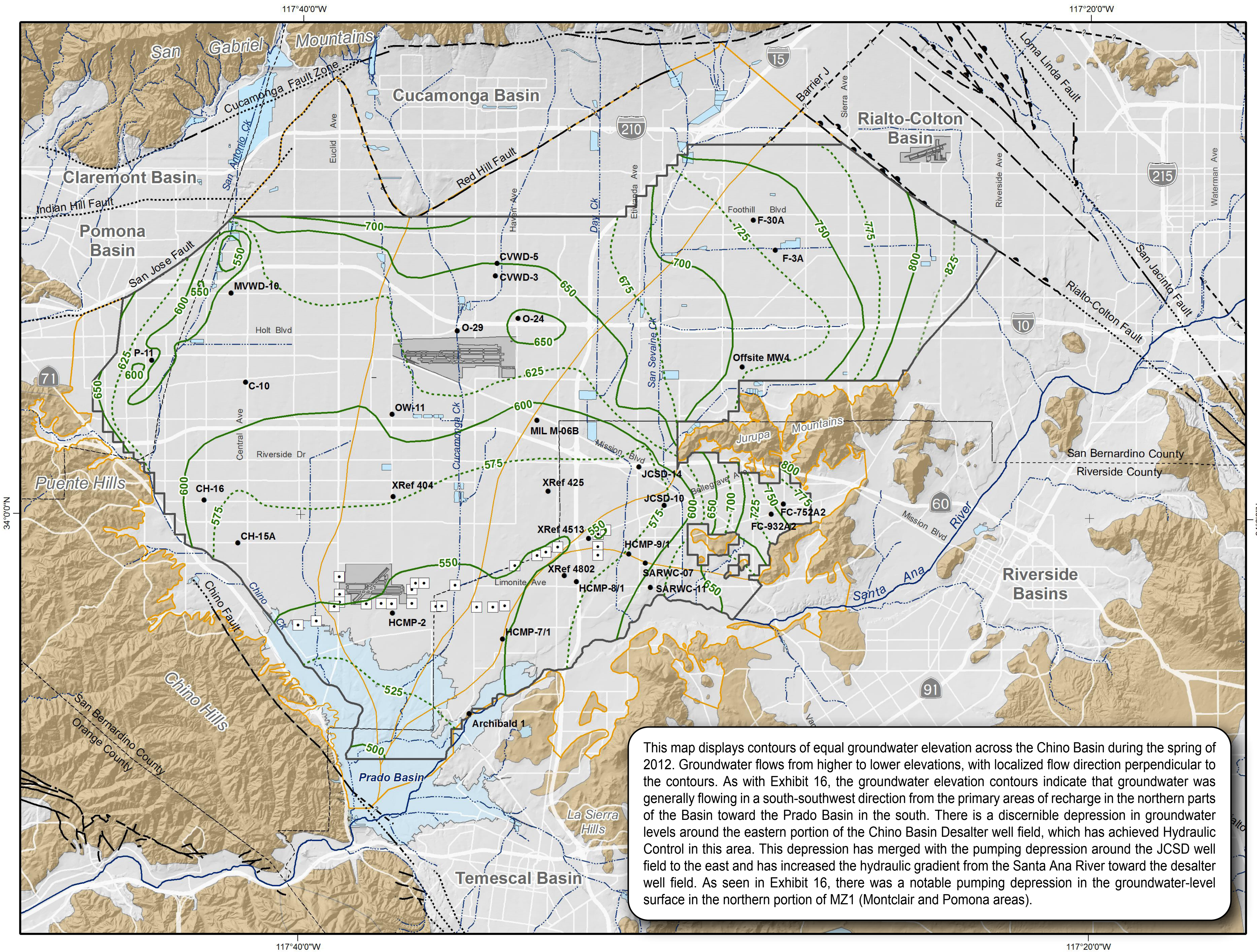
2014 State of the Basin
Groundwater Levels

Groundwater Elevation Contours in Spring 2000
Shallow Aquifer System

Exhibit 16



This map displays contours of equal groundwater elevation across the Chino Basin during the spring of 2012. Groundwater flows from higher to lower elevations, with localized flow direction perpendicular to the contours. As with Exhibit 16, the groundwater elevation contours indicate that groundwater was generally flowing in a south-southwest direction from the primary areas of recharge in the northern parts of the Basin toward the Prado Basin in the south. There is a discernible depression in groundwater levels around the eastern portion of the Chino Basin Desalter well field, which has achieved Hydraulic Control in this area. This depression has merged with the pumping depression around the JCSD well field to the east and has increased the hydraulic gradient from the Santa Ana River toward the desalter well field. As seen in Exhibit 16, there was a notable pumping depression in the groundwater-level surface in the northern portion of MZ1 (Montclair and Pomona areas).

Groundwater Elevation Contours (feet above mean sea-level)

Boundry of Contoured Area (contours are not shown outside of this boundary due to lack of groundwater level data)

Well With a Groundwater-Level Time History Plotted on Exhibits 24 through 28

OBMP Management Zones

Chino Basin Desalter Well

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

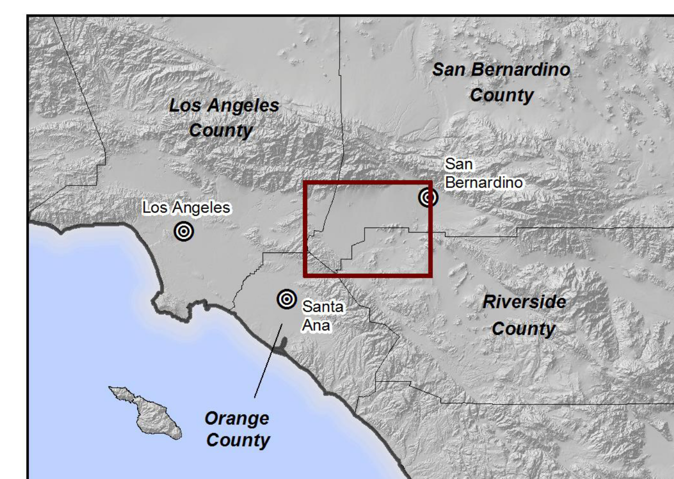
Quaternary Alluvium

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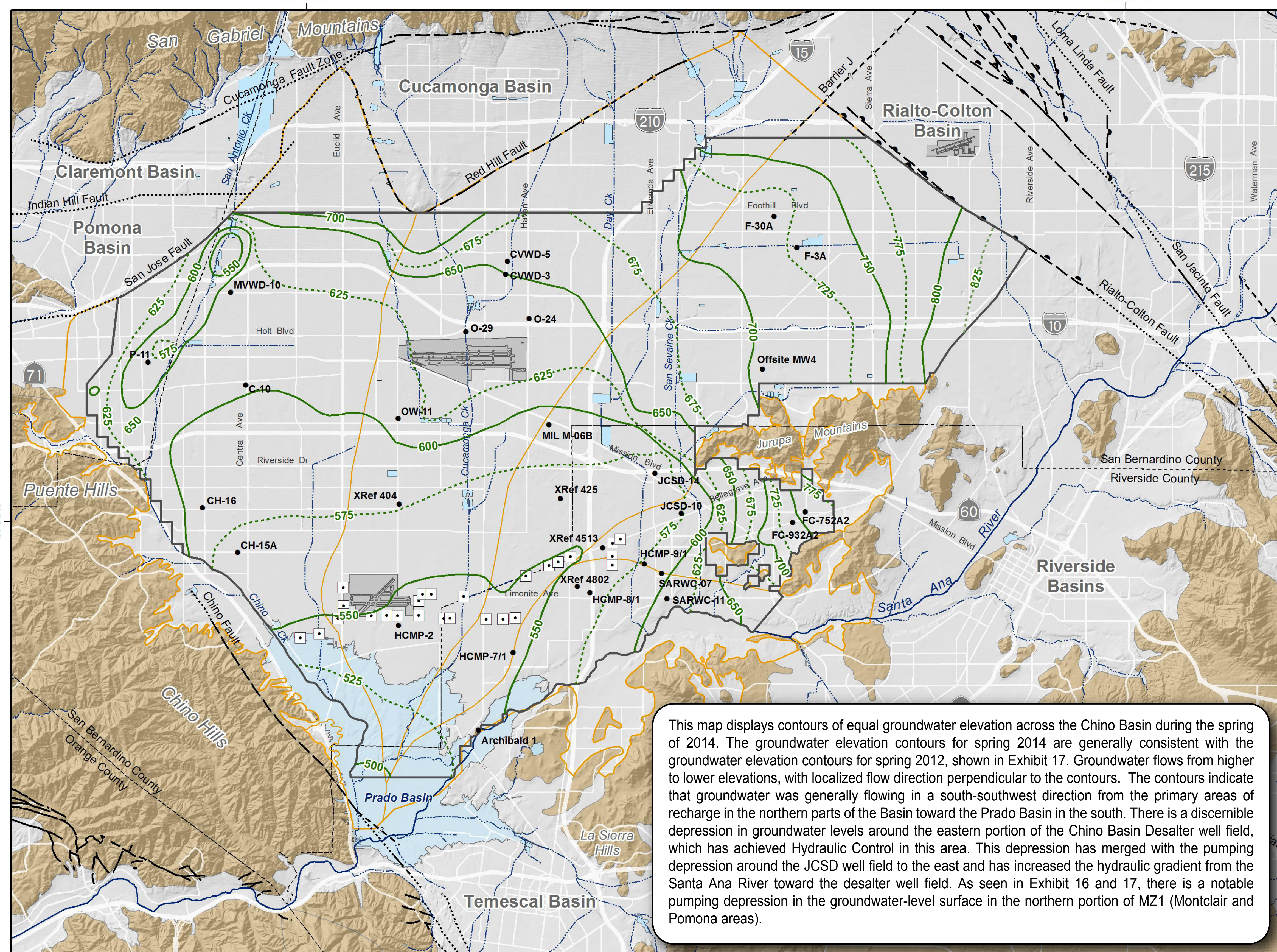
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2014 State of the Basin
Groundwater Levels

Groundwater Elevation Contours in Spring 2012

Shallow Aquifer System

Exhibit 17



This map displays contours of equal groundwater elevation across the Chino Basin during the spring of 2014. The groundwater elevation contours for spring 2014 are generally consistent with the groundwater elevation contours for spring 2012, shown in Exhibit 17. Groundwater flows from higher to lower elevations, with localized flow direction perpendicular to the contours. The contours indicate that groundwater was generally flowing in a south-southwest direction from the primary areas of recharge in the northern parts of the Basin toward the Prado Basin in the south. There is a discernible depression in groundwater levels around the eastern portion of the Chino Basin Desalter well field, which has achieved Hydraulic Control in this area. This depression has merged with the pumping depression around the JCSD well field to the east and has increased the hydraulic gradient from the Santa Ana River toward the desalter well field. As seen in Exhibit 16 and 17, there is a notable pumping depression in the groundwater-level surface in the northern portion of MZ1 (Montclair and Pomona areas).

800 / 775 — Groundwater Elevation Contours (feet above mean sea-level)

Boundry of Contoured Area (contours are not shown outside of this boundary due to lack of groundwater level data)

Well With a Groundwater-Level Time History Plotted on Exhibits 24 through 28

OBMP Management Zones (1, 2, 3, 4, 5)

Chino Basin 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

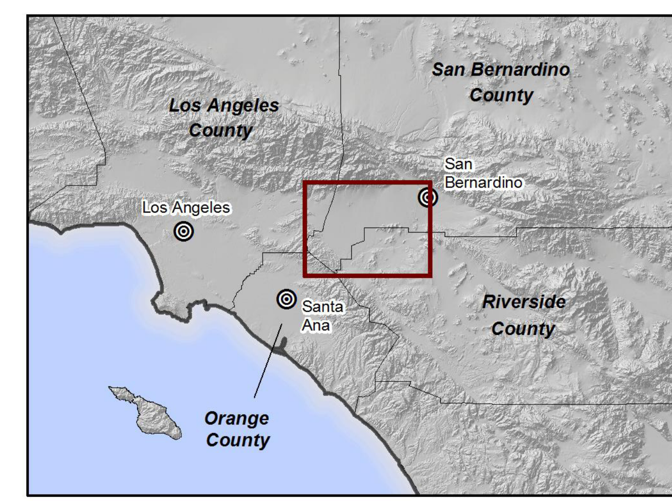
Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain



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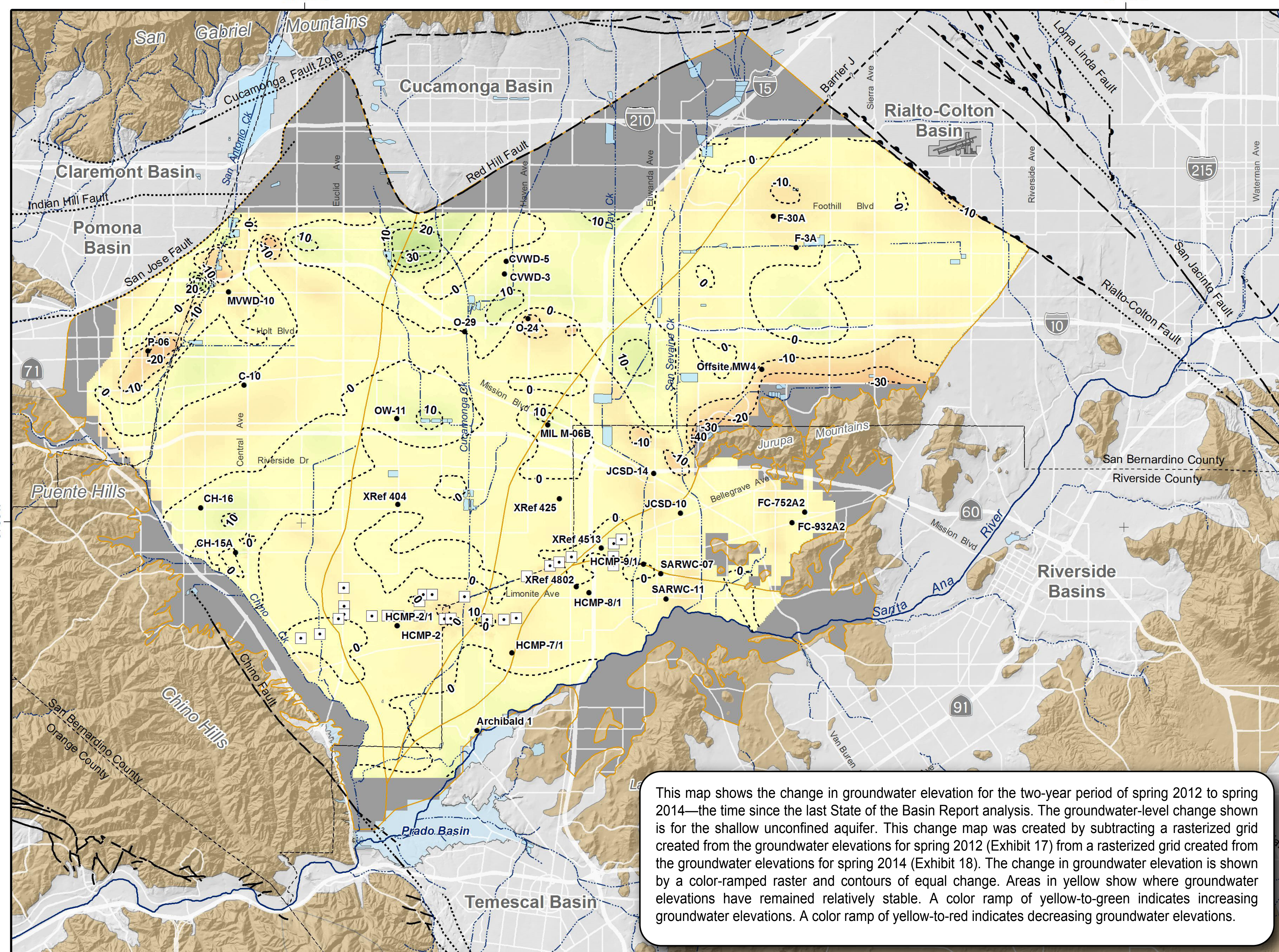
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2014 State of the Basin
Groundwater Levels

Groundwater Elevation Contours in Spring 2014

Shallow Aquifer System

Exhibit 18



This map shows the change in groundwater elevation for the two-year period of spring 2012 to spring 2014—the time since the last State of the Basin Report analysis. The groundwater-level change shown is for the shallow unconfined aquifer. This change map was created by subtracting a rasterized grid created from the groundwater elevations for spring 2012 (Exhibit 17) from a rasterized grid created from the groundwater elevations for spring 2014 (Exhibit 18). The change in groundwater elevation is shown by a color-ramped raster and contours of equal change. Areas in yellow show where groundwater elevations have remained relatively stable. A color ramp of yellow-to-green indicates increasing groundwater elevations. A color ramp of yellow-to-red indicates decreasing groundwater elevations.

Contour of Piezometric Change (ft) Spring 2012 to Spring 2014

Piezometric Change (ft) Spring 2012 to Spring 2014

+120 Increase

-120 Decrease

Area not included in piezometric change calculation due to lack a of groundwater-level data

Well With a Groundwater-Level Time History Plotted on Exhibits 24 through 28

OBMP Management Zones

Chino Basin 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

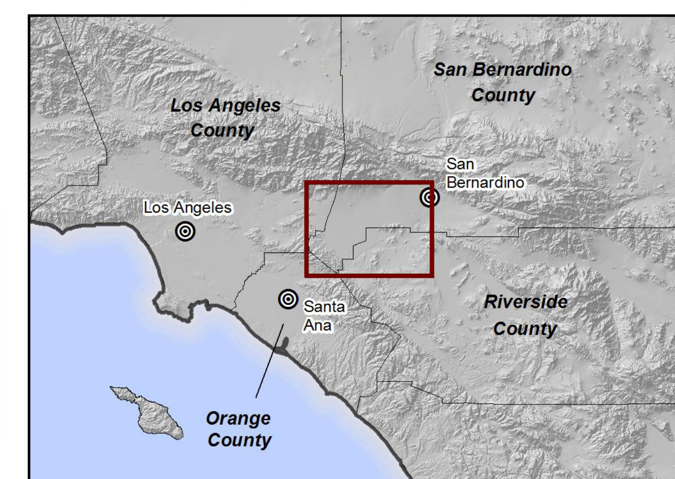
Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain



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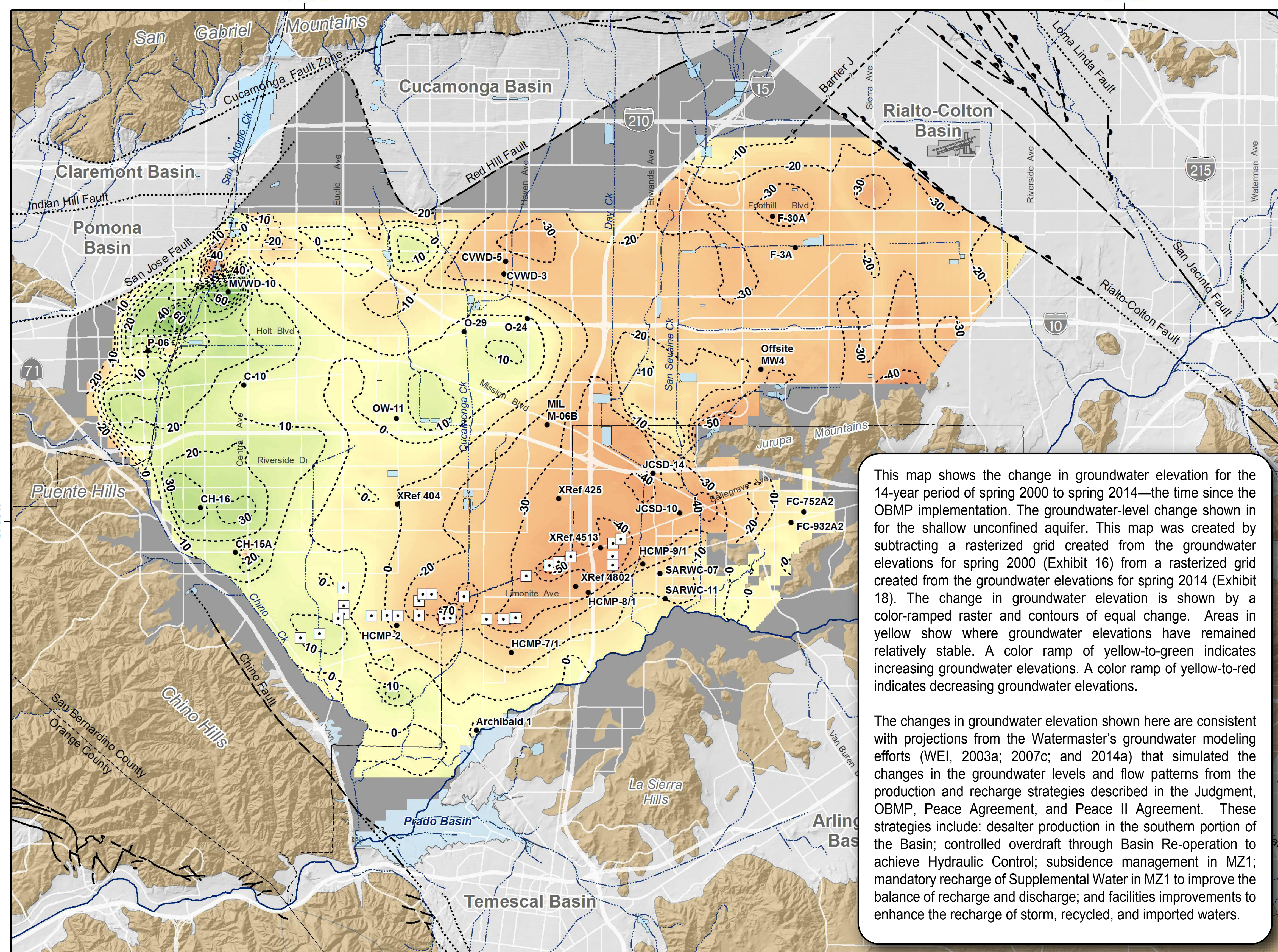
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2014 State of the Basin
Groundwater Levels

Groundwater Level Change from Spring 2012 to Spring 2014

Shallow Aquifer System

Exhibit 19



This map shows the change in groundwater elevation for the 14-year period of spring 2000 to spring 2014—the time since the OBMP implementation. The groundwater-level change shown in for the shallow unconfined aquifer. This map was created by subtracting a rasterized grid created from the groundwater elevations for spring 2000 (Exhibit 16) from a rasterized grid created from the groundwater elevations for spring 2014 (Exhibit 18). The change in groundwater elevation is shown by a color-ramped raster and contours of equal change. Areas in yellow show where groundwater elevations have remained relatively stable. A color ramp of yellow-to-green indicates increasing groundwater elevations. A color ramp of yellow-to-red indicates decreasing groundwater elevations.

The changes in groundwater elevation shown here are consistent with projections from the Watermaster's groundwater modeling efforts (WEI, 2003a; 2007c; and 2014a) that simulated the changes in the groundwater levels and flow patterns from the production and recharge strategies described in the Judgment, OBMP, Peace Agreement, and Peace II Agreement. These strategies include: desalter production in the southern portion of the Basin; controlled overdraft through Basin Re-operation to achieve Hydraulic Control; subsidence management in MZ1; mandatory recharge of Supplemental Water in MZ1 to improve the balance of recharge and discharge; and facilities improvements to enhance the recharge of storm, recycled, and imported waters.

Contour of Piezometric Change (ft) Spring 2000 to Spring 2014

Piezometric Change (ft) Spring 2000 to Spring 2014

+120 Increase

-120 Decrease

Area not included in piezometric change calculation due to lack a of groundwater-level data

Well With a Groundwater-Level Time History Plotted on Exhibits 24 through 28

OBMP Management Zones

Chino Basin 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

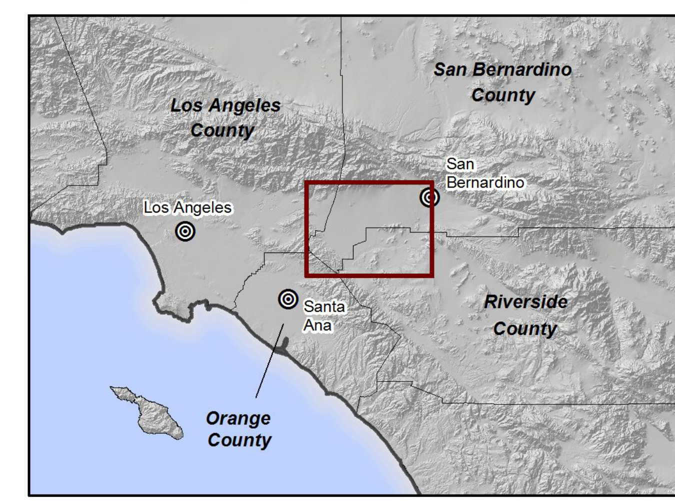
Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain



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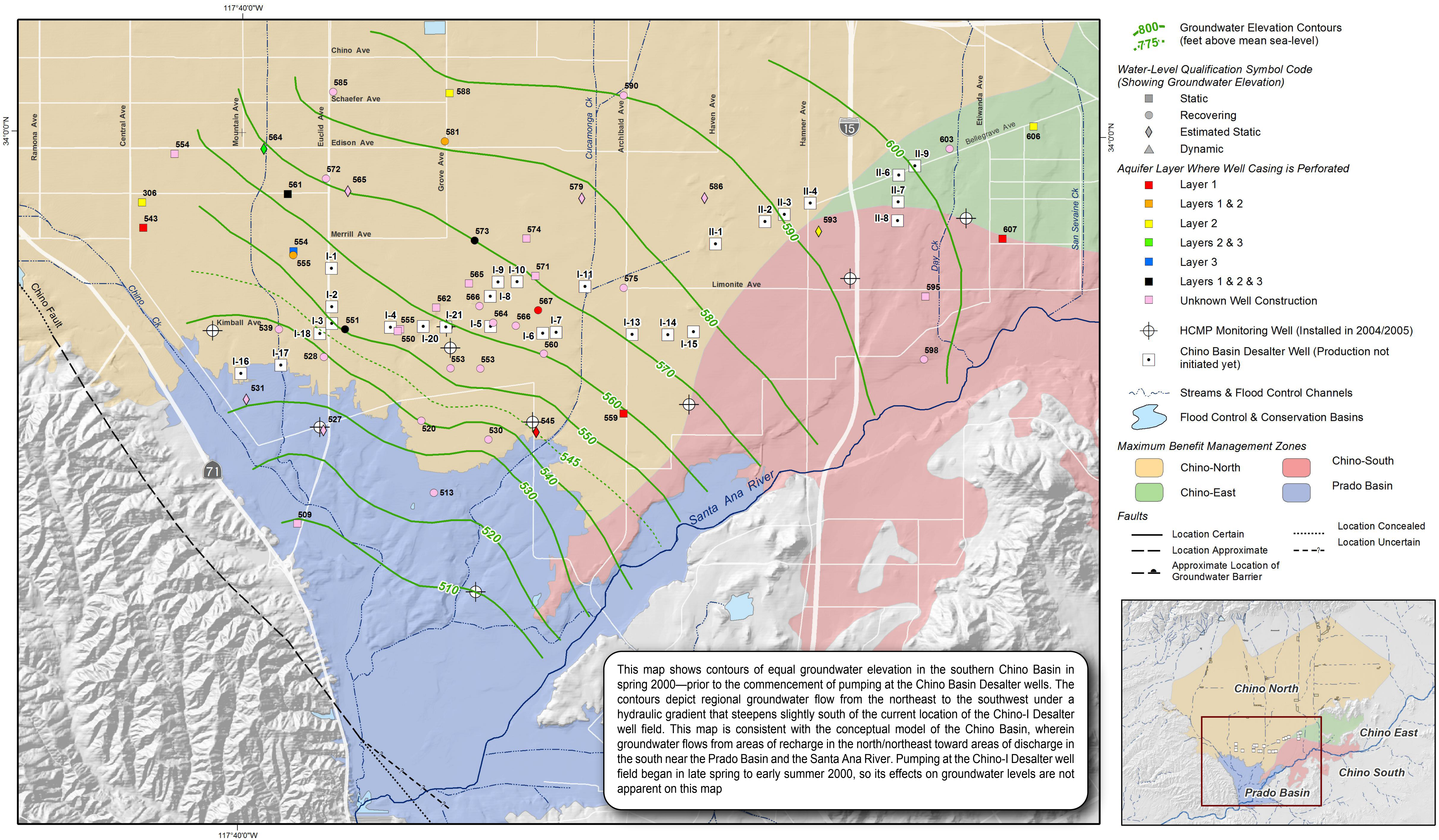
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2014 State of the Basin
Groundwater Levels

Groundwater Level Change from Spring 2000 to Spring 2014

Shallow Aquifer System

Exhibit 20



This map shows contours of equal groundwater elevation in the southern Chino Basin in spring 2000—prior to the commencement of pumping at the Chino Basin Desalter wells. The contours depict regional groundwater flow from the northeast to the southwest under a hydraulic gradient that steepens slightly south of the current location of the Chino-I Desalter well field. This map is consistent with the conceptual model of the Chino Basin, wherein groundwater flows from areas of recharge in the north/northeast toward areas of discharge in the south near the Prado Basin and the Santa Ana River. Pumping at the Chino-I Desalter well field began in late spring to early summer 2000, so its effects on groundwater levels are not apparent on this map

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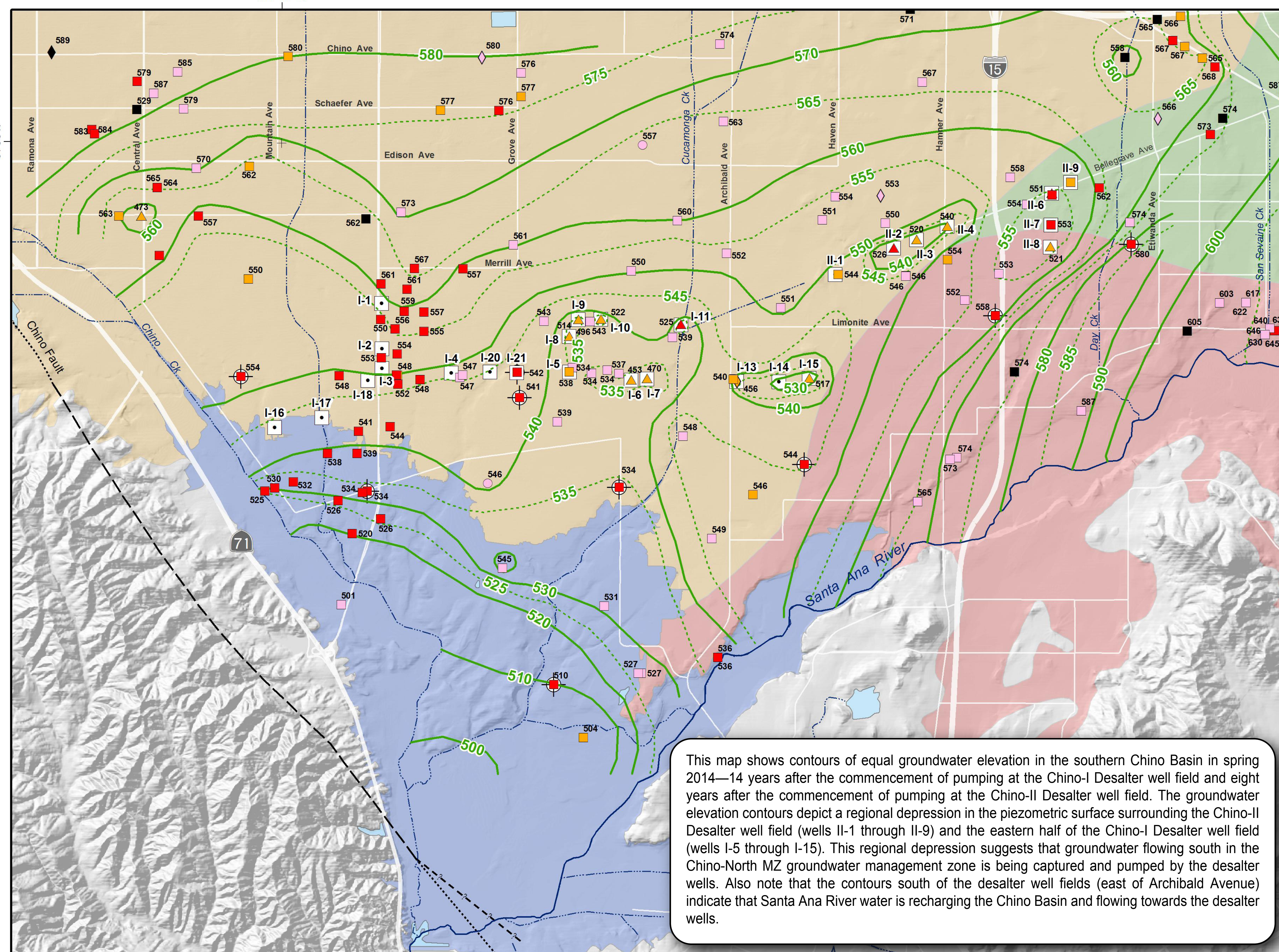
0 1 2 Miles
0 1 2 3 KM

2014 State of the Basin
Groundwater Levels

State of Hydraulic Control in Spring 2000
Shallow Aquifer System

Exhibit 21



This map shows contours of equal groundwater elevation in the southern Chino Basin in spring 2014—14 years after the commencement of pumping at the Chino-I Desalter well field and eight years after the commencement of pumping at the Chino-II Desalter well field. The groundwater elevation contours depict a regional depression in the piezometric surface surrounding the Chino-II Desalter well field (wells II-1 through II-9) and the eastern half of the Chino-I Desalter well field (wells I-5 through I-15). This regional depression suggests that groundwater flowing south in the Chino-North MZ groundwater management zone is being captured and pumped by the desalter wells. Also note that the contours south of the desalter well fields (east of Archibald Avenue) indicate that Santa Ana River water is recharging the Chino Basin and flowing towards the desalter wells.

800 / 775 Groundwater Elevation Contours (feet above mean sea-level)

Water-Level Qualification Symbol Code (Showing Groundwater Elevation)

- Static
- Recovering
- Estimated Static
- Dynamic

Aquifer Layer Where Well Casing is Perforated Color Code

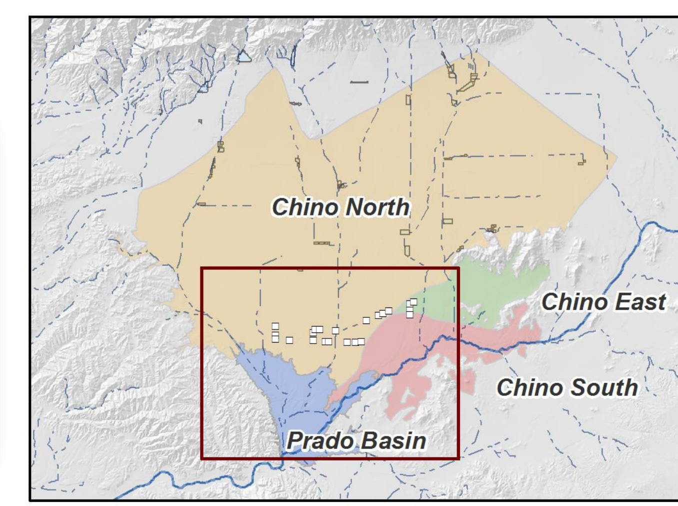
- Layer 1
- Layers 1 & 2
- Layers 1 & 2 & 3
- Unknown Well Construction
- HCMP Monitoring Well
- Chino Basin Desalter Well
- Streams & Flood Control Channels
- Flood Control & Conservation Basins

Maximum Benefit Management Zones

- Chino-North
- Chino-South
- Chino-East
- Prado Basin

Faults

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



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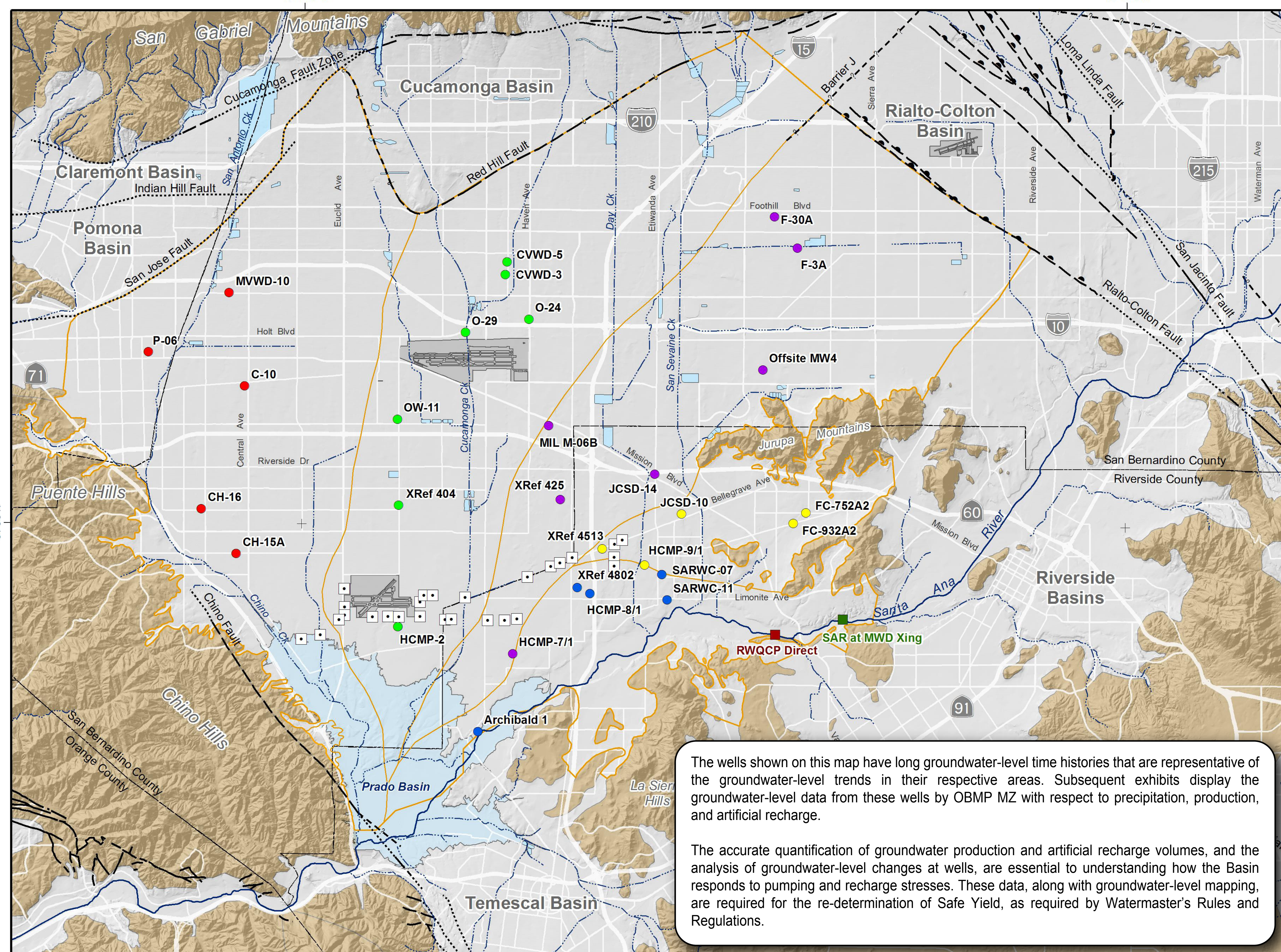
0 1 2 Miles
0 1 2 3 KM

2014 State of the Basin
Groundwater Levels

State of Hydraulic Control in Spring 2014

Shallow Aquifer System

Exhibit 22



The wells shown on this map have long groundwater-level time histories that are representative of the groundwater-level trends in their respective areas. Subsequent exhibits display the groundwater-level data from these wells by OBMP MZ with respect to precipitation, production, and artificial recharge.

The accurate quantification of groundwater production and artificial recharge volumes, and the analysis of groundwater-level changes at wells, are essential to understanding how the Basin responds to pumping and recharge stresses. These data, along with groundwater-level mapping, are required for the re-determination of Safe Yield, as required by Watermaster's Rules and Regulations.

Wells With a Groundwater-Level Time History Plotted on Exhibit 24 through Exhibit 28

- Wells in MZ1
- Wells in MZ2
- Wells in MZ3
- Wells in MZ4
- Wells in MZ5

Surface-Water Monitoring Sites Plotted on Exhibit 28

- Recycled Water Discharge Location
- USGS Gaging Station
- OBMP Management Zones
- Chino Basin Desalter Well
- Streams & Flood Control Channels
- Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

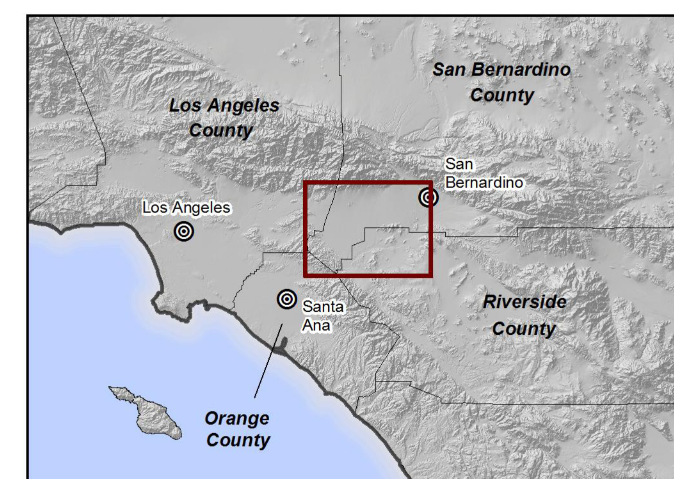
- Quaternary Alluvium

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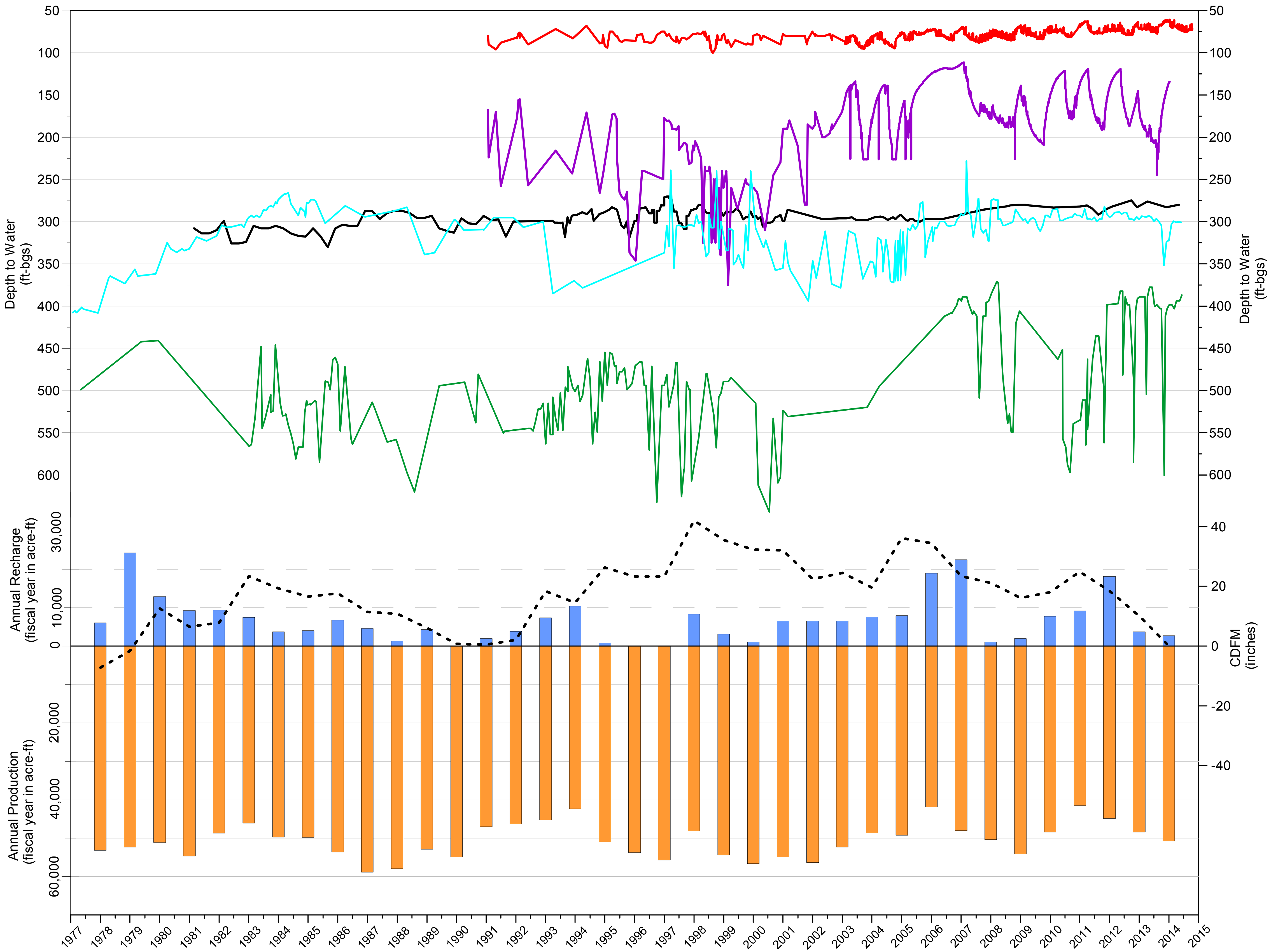
0 1 2 3 4 5 Miles
0 2 4 6 8 KM

2014 State of the Basin
Groundwater Levels

Wells Used to Characterize Long-Term Trends in Groundwater Levels Versus Climate, Production, and Recharge

Exhibit 23



This time-series chart displays groundwater levels at wells, annual production, and annual artificial recharge to basins in MZ1 for the time period since the Judgment to FY 2013/2014. Climate is displayed as a CDFM precipitation plot using PRISM climate data from 1895 to 2014. Upward sloping lines on the CDFM curve indicate wet years or wet periods. Downward sloping lines indicate dry years or dry periods.

Water levels at wells MVWD-10, P-06, and C-10 are representative of groundwater-level trends in the central and northern portions of MZ1. From about 1995 to 2003, water levels generally declined in these areas due to increased production and relatively small volumes of wet-water recharge in MZ1. From about 2003 to 2014, water levels increased and then stabilized due to a decrease in production and an increase in artificial recharge. The changes in water levels in the central and northern portions of MZ1 since 2003 coincide with a dry period and the "put and take" cycle associated with Metropolitan Water District of Southern California's Dry-Year Yield storage program in Chino Basin.

Water levels at well CH-16 are representative of groundwater-level trends in the deep, confined aquifer system in the southern portion of MZ1. Water levels at this well are influenced by pumping from nearby wells that are also screened within the deep aquifer system. During the 1990s, water levels at this well declined by up to 200 feet due to increased pumping from the deep aquifer system in this area. From 2000 to 2007, water levels at this well increased primarily due to decreased pumping from the deep aquifer system associated with poor groundwater quality and land subsidence (WEI, 2007b), and have remained relatively stable since.

Water levels at well CH-15A are representative of groundwater-level trends in the shallow, unconfined aquifer system in the southern portion of MZ1. Historically, water levels in CH-15A have been stable, from 80 to 90 ft-bgs, and showed only small fluctuations in response to nearby pumping. Since 2000, water levels have risen by about 15 feet, which is primarily due to a decrease in local pumping.

Since 2000, groundwater levels in MZ1 have generally increased even though this was a relatively dry period. This groundwater-level recovery in MZ1 is due to decreased groundwater production and increased artificial recharge of supplemental water. The availability of recycled water during this period played an important role in both the decreased groundwater production and the increased artificial recharge in MZ1.

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Date: 05/13/2015
File: Exhibit_24.grf

Groundwater Levels at Wells (Perforated Interval Depth)

- MVWD 10 (540-1,084 ft-bgs)
- P-06 (536-1050 ft-bgs)
- C-10 (350-1,090 ft-bgs)
- CH-16 (430-940 ft-bgs)
- CH-15A (190-310 ft-bgs)

Production, Recharge, and Precipitation

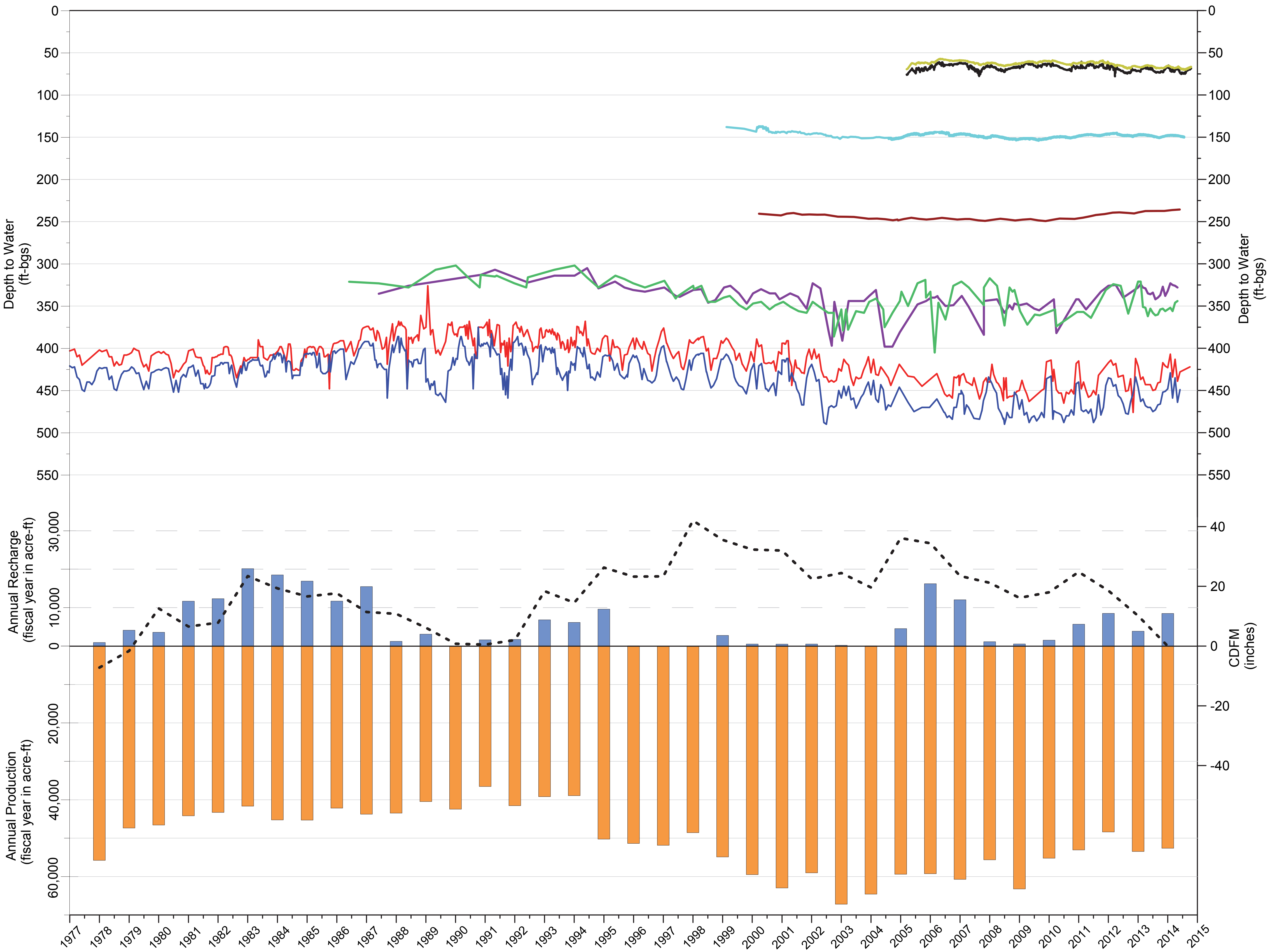
- Recharge of Imported Water and Recycled Water at Basins in MZ1
- Groundwater Production from Wells in the MZ1
- CDFM Precipitation Plot - Data from PRISM 4-km grid for 1895-2014; Spatial Average for Chino Basin

CHINO BASIN WATERMASTER

2014 State of the Basin
Groundwater Levels

Time-Series Chart of Groundwater Levels, Production, Recharge, and Climate – MZ1
1978 to 2014

Exhibit 24



This time-series chart displays groundwater levels at wells, annual production, and annual artificial recharge in MZ2 for the time period since the Judgment to FY 2013/2014. Climate is displayed as a CDFM precipitation plot using PRISM climate data from 1895 to 2014. Upward sloping lines on the CDFM curve indicate wet years or wet periods. Downward sloping lines indicate dry years or dry periods.

Water levels at wells CVWD-3 and CVWD-5 are representative of groundwater-level trends in the northern portions of MZ2. Water levels increased from 1978 to about 1990—likely due to a combination of the 1978 to 1983 wet period, decreased production following the execution of the Judgment, and the initiation of the artificial recharge of imported water in the San Sevaine and Etiwanda Basins. From 1990 to 2010, water levels in this portion of MZ2 progressively declined by about 50 feet due to increased production in the region. From 2010 to 2014, water levels increased slightly, likely due to decreased production and increased recharge at the San Sevaine and Victoria basins.

Water levels at wells O-29 and O-24 are representative of groundwater-level trends in the upper-central portion of MZ2. The groundwater levels at O-29 and O-24 followed a similar pattern as groundwater levels at the wells in the northern portion of MZ2.

Water level data at wells OW-11 and XRef 404 (private well) are representative of trends in the lower-central portion of MZ2. Well OW-11 is located adjacent to the Ely Basins, and well XRef 404 is located in the region south of the all the recharge basins in MZ2 and north of the Chino Basin Desalter wells. From 2000 to 2004, water levels at both wells slightly decreased— this is likely due to a combination of a dry period, an increase in production in MZ2, and limited artificial recharge at this time in MZ2. From 2005 to 2014, water levels overall increased at OW-11 about ten feet—this can likely be related to increased recharge at the Ely Basins and other recharge basins in MZ2 for the Chino Basin Groundwater Recharge Program. From 2005 to 2014 water levels at XRef 404 fluctuated within about ten feet, and slightly decreased overall during 2012 to 2014.

Water levels at wells HCMP-2/1 (shallow aquifer) and HCMP-2/2 (deep aquifer) are representative of groundwater-level trends at the southern portion of MZ2, just south of the Chino-I Desalter wells. One of the objectives of the desalter well field is to cause the drawdown of groundwater levels in the southern portion of Chino Basin to achieve Hydraulic Control. See Exhibits 21 and 22 for further explanation of Hydraulic Control. The Chino-I Desalter well field began pumping in late 2000 and production steadily increased until 2008. From 2005 to 2011 there was no notable groundwater-level drawdown at the HCMP-2/1 and HCMP-2/2 monitoring wells since their construction in 2005. However from 2012 to 2014 water levels declined about five feet in both the shallow and deep aquifer monitoring wells of HCMP-2.

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Groundwater Levels at Wells (Perforated Interval Depth)

- CVWD-5 (538-1,238 ft-bgs)
- CVWD-3 (341-810 ft-bgs)
- O-29 (400-1,095 ft-bgs)
- O-24 (484-952 ft-bgs)
- OW-11 (323-333 ft-bgs)
- XRef 404 (274-354 ft-bgs)
- HCMP-2/2 (296-316 ft-bgs)
- HCMP-2/1 (124-164 ft-bgs)

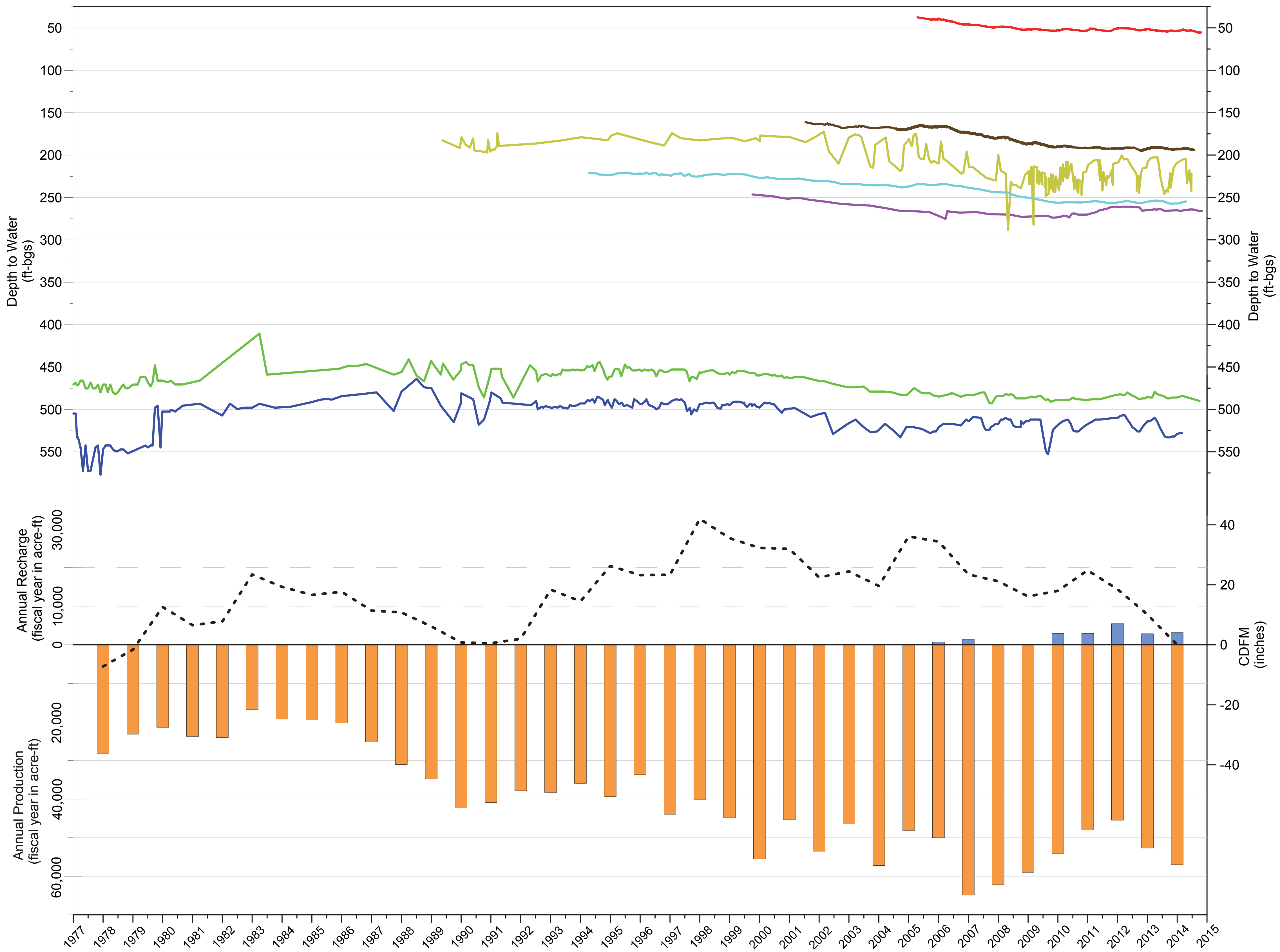
Production, Recharge, and Precipitation

- Recharge of Imported Water and Recycled Water at Basins in MZ2
- Groundwater Production from Wells in the MZ2
- CDFM Precipitation Plot - Data from PRISM 4-km grid for 1895-2014; Spatial Average for Chino Basin

2014 State of the Basin
Groundwater Levels

Time-Series Chart of Groundwater Levels, Production, Recharge, and Climate – MZ2
1978 to 2014

Exhibit 25



This time-series chart displays groundwater levels at wells, annual production, and annual artificial recharge to basins, in MZ3, for the time period since the Judgment to FY 2013/2014. Climate is displayed as a CDFM precipitation plot using PRISM climate data from 1895 to 2014. Upward sloping lines on the CDFM curve indicate wet years or wet periods. Downward sloping lines indicate dry years or dry periods.

Water levels at wells F-30A and F-3A are representative of groundwater-level trends in the northeastern portions of MZ3. Water levels were relatively stable from 1978 to about 1995. From 1995 to 2007, water levels declined by approximately 25-30 feet due to a dry climatic period and increased pumping in MZ3. Since 2007, water levels have remained relatively stable through about 2011, and slightly declined about ten feet during 2012 through 2014.

Water levels at wells Offsite MW4, Mill M-06B, JCSD-14, and XRef 425 (private well) are representative of groundwater-level trends in the central portion of MZ3. From about 1998 to 2010, water levels at these wells progressively declined by about 30 feet due to a dry climatic period and increased pumping in MZ3. From 2010 to 2014, water levels at Mill M-06B, JCSD-14, and XRef 425 have remained relatively stable. Water levels at Offsite MW4 increased by about 10 feet from 2010 to 2012, and have remained stable since. The water level increase seen at Offsite MW4 is likely due to improvements to, and the increase of, storm water and recycled water recharge at the RP3 recharge basins.

Water levels at well HCMP-7/1 are representative of groundwater-level trends in the southernmost portion of MZ3—just south of the Chino-II Desalter well field and just north of the Santa Ana River. From 2005 to 2014, water levels at this well progressively declined by about 15 feet. This decline in groundwater levels is mainly due to pumping at the Chino-II Desalter and is necessary for Hydraulic Control to be achieved in this portion of the Chino Basin; and to enhance recharge of the Santa Ana River to the Chino Basin. See Exhibits 21 and 22 for further explanation of Hydraulic Control.

Since 2000, generally in MZ3 groundwater levels have decreased, annual production has increased, and annual recharge has increased. The period of 2000 to 2014 was relatively dry—as the CDFM precipitation plot indicates.

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Groundwater Levels at Wells (Perforated Interval Depth)

- F-30A (507-864 ft-bgs)
- F-3A (380-854 ft-bgs)
- Offsite MW4 (222-282 ft-bgs)
- Mill M-06B (255-275 ft-bgs)
- JCSD-14 (210-370 ft-bgs)
- XRef 425 (no perf data)
- HCMP-7/1 (70-110 ft-bgs)

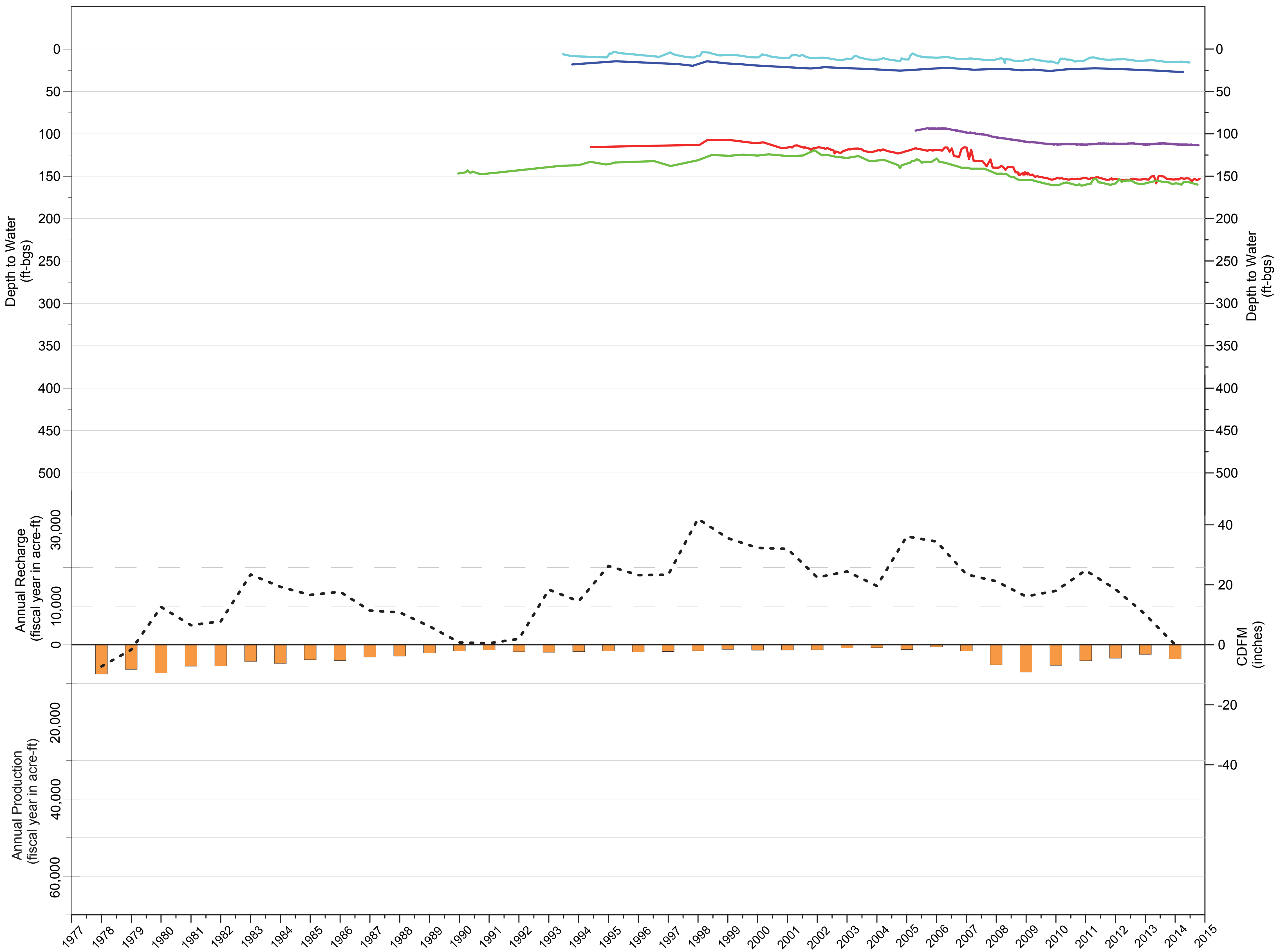
Production, Recharge, and Precipitation

- Recharge of Imported Water and Recycled Water at Basins in MZ3
- Groundwater Production from Wells in the MZ3
- CDFM Precipitation Plot - Data from PRISM 4-km grid for 1895-2014; Spatial Average for Chino Basin

2014 State of the Basin
Groundwater Levels

Time-Series Chart of Groundwater Levels, Production, Recharge, and Climate – MZ3
1978 to 2014

Exhibit 26



This time-series chart displays groundwater levels at wells, annual production, and annual artificial recharge to basins in MZ4 for the time period since the Judgment to FY 2013/2014. Climate is displayed as a CDFM precipitation plot using PRISM climate data from 1895 to 2014. Upward sloping lines on the CDFM curve indicate wet years or wet periods, and downward sloping lines indicate dry years or dry periods.

Water levels at wells JCSD-10, XRef 4513 (private well), and HCMP-9/1 are representative of groundwater-level trends in the western portion of MZ4—in the vicinity of the major well fields of the Jurupa Community Services District (JCSD) and the Chino-II Desalter. Water levels at JCSD-10 and XRef 4513 began to decrease around 2000 and show a notable acceleration in the decline of groundwater-levels around 2006 when pumping at Chino-II Desalter wells commenced. A similar decrease is seen in HCMP-9/1, where water levels decreased by about 20 feet since the well's construction in 2005. Overall in this portion of MZ4, water levels have decreased by about 35 feet since 2000 due to a dry climatic period and increased pumping. The decline of groundwater levels seen at the wells in the western portion of MZ4 is necessary for Hydraulic Control to be achieved in this portion of the Chino Basin. See Exhibits 21 and 22 for further explanation of Hydraulic Control. The decline of groundwater levels in this area is also a concern of the JCSD with regard to production sustainability at its wells.

Water levels at wells FC-752A2 and FC-932A2 are representative of groundwater-level trends in the eastern portion of MZ4. From 2000 to 2014, the water levels at these wells declined by about eight feet.

Since 2000 generally in MZ4, groundwater levels have decreased and annual production has increased. The period of 2000 to 2014 was a relatively dry period—as the CDFM precipitation plot indicates.

Prepared by:

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Groundwater Levels at Wells (Perforated Interval Depth)

- JCSD-10 (no perf data)
- XRef 4513 (no perf data)
- HCMP-9/1 (110-150 ft-bgs)
- FC-752A2 (no perf data)
- FC-932A2 (no perf data)

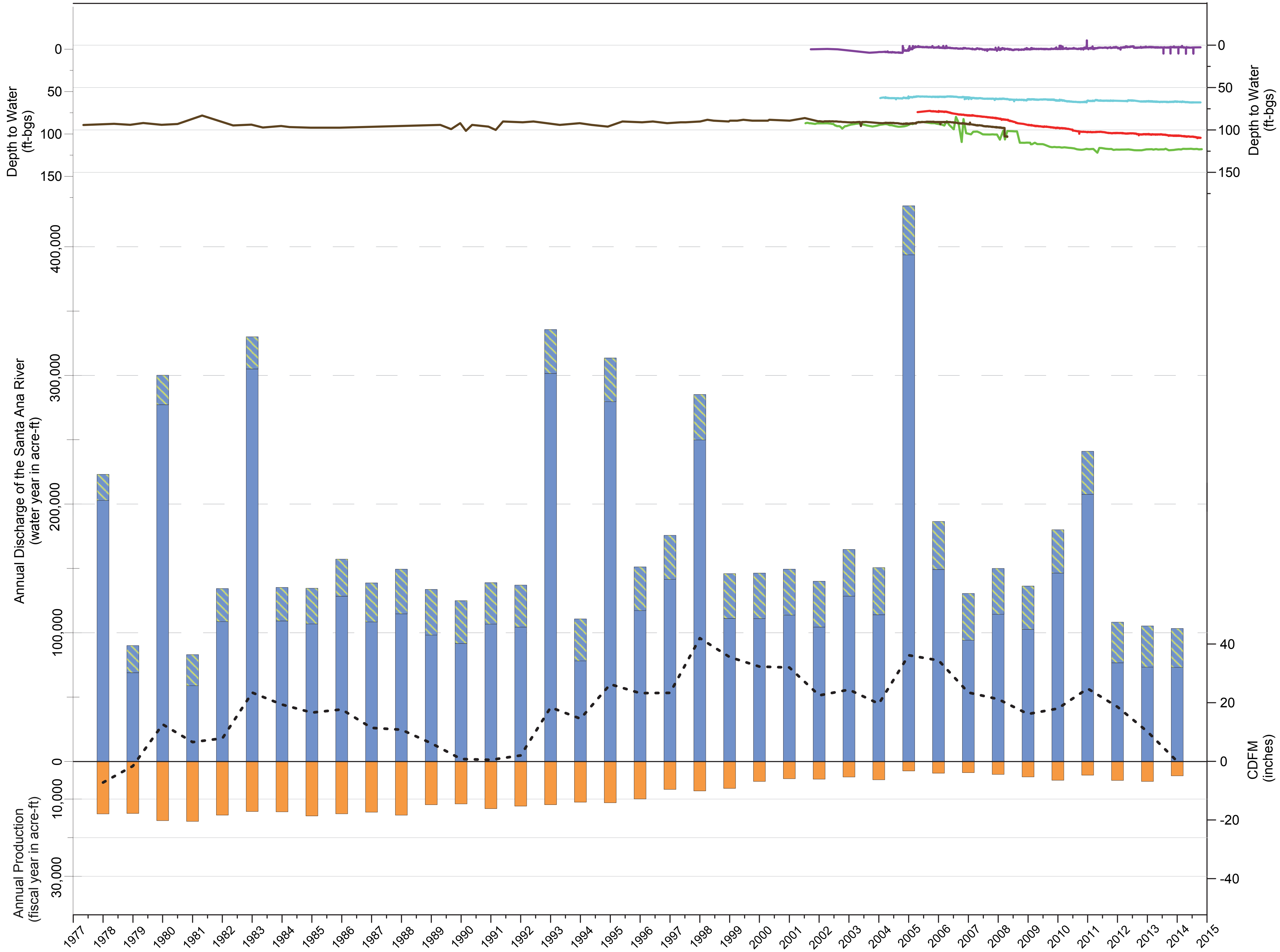
Production, Recharge, and Precipitation

- Recharge of Imported Water and Recycled Water at Basins in MZ4
- Groundwater Production from Wells in the MZ4
- CDFM Precipitation Plot - Data from PRISM 4-km grid for 1895-2014; Spatial Average for Chino Basin

2014 State of the Basin
Groundwater Levels

Time-Series Chart of Groundwater Levels, Production, Recharge, and Climate – MZ4
1978 to 2014

Exhibit 27



This time-series chart displays groundwater levels and annual production at wells in MZ5 and annual discharge of the Santa Ana River through MZ5 for the time period since the Judgment to FY 2013/2014. Total discharge of the Santa Ana River through the MZ5 area is represented by the total flow measured by the USGS at the SAR at MWD Xing station and the total effluent discharged to the Santa Ana River from the City of Riverside's WWTP. Exhibit 23 shows the locations of the SAR at MWD Xing station and the City of Riverside's WWTP discharge location. MZ5 is a groundwater flow system that parallels the Santa Ana River. The discharge of the Santa Ana River shown in this chart represents the total potential volume of Santa Ana River water that can recharge the Chino Basin in MZ5. Climate is displayed as a CDFM precipitation plot using PRISM climate data from 1895 to 2014. Upward sloping lines on the CDFM curve indicate wet years or wet periods. Downward sloping lines indicate dry years or dry periods.

Water levels at wells XRef 4802 (private well), SARWC-07, SARWC-11, and HCMP-8/1 are representative of groundwater levels in the eastern portion of MZ5, where the Santa Ana River is recharging the Chino Basin. From 2005 to 2014, water levels at these wells progressively declined by about 5 to 30 feet. This decline of groundwater-levels is consistent with increased pumping at the Chino Basin Desalter well field and is a necessary occurrence to achieve Hydraulic Control in this portion of the Chino Basin. This decline of groundwater-levels also indicates that recharge of the Santa Ana River to the Chino Basin is being enhanced in this vicinity. See Exhibits 21 and 22 for further explanation of Hydraulic Control.

Water levels at the Archibald 1 well are representative of groundwater levels in the southwestern portion of MZ5, where groundwater is very near the ground surface and could be rising to become flow in the Santa Ana River. Water levels at this near-river well have remained relatively stable since monitoring began in 2000.

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Groundwater Levels at Wells (Perforated Interval Depth)

- XRef 4802 (no perf data)
- SARWC-07 (100-172 ft-bgs)
- HCMP-8/1 (75-115 ft-bgs)
- SARWC-11 (75-230 ft-bgs)
- Archibald 1 (75-85 ft-bgs)

Production, Recharge, and Precipitation

- Flow of the *Santa Ana River at MWD Xing*
- Discharge from the City of Riverside WWTP
- Groundwater Production from Wells in the MZ5
- CDFM Precipitation Plot - Data from PRISM 4-km grid for 1895-2014; Spatial Average for Chino Basin

2014 State of the Basin
Groundwater Levels

Time-Series Chart of Groundwater Levels, Production, Recharge, and Climate – MZ5
1978 to 2014

Exhibit 28